

Digital preservation preparedness of the National Library of Namibia for digital preservation of documentary heritage: a case study

by

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Declaration

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Dedication

I dedicate this dissertation to my late father and role model, Thomas Mwatjuwandje Apia Uutoni. Continue resting in peace Tate.

Acknowledgement

First and foremost, I would like to thank the almighty God for granting me strength, wisdom, and good health during my studies. Secondly, this study would not have been complete if it was not for the many people's guidance, valuable advice and institutional support towards my study.

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Abstract

The study inquired into the National Library of Namibia's preparedness to digitally preserve Namibia's documentary heritage. The study triangulated the Open Archives Information System Reference Model and the Digital Preservation Capability Maturity Model, which aided to unpack digital preservation concepts. Within the pragmatic paradigm, the study adopted a convergent parallel mixed methods approach and employed a single case study design. The population of the study consisted of users of the National Library of Namibia, management of the Library and Archives Services of Namibia, board members of the Namibia Library and Information Council and selected staff of the National Library of Namibia. The respondents in the quantitative part of the study were selected using a convenient sampling technique while participants in the qualitative aspect of the study were selected using the purposive sampling method. Quantitative data were collected using semi-structured questionnaires, while qualitative data were collected using semi-structured interview guides and a document search guide. ATLAS.ti software version 23.08 was used for the analysis of qualitative data, while SPSS software version 28 was used for descriptive statistical analysis of quantitative data. The study's findings revealed that the National Library of Namibia has made deliberate efforts to digitise some information sources which are in high demand by users. It also found that the National Library of Namibia does not have a digital preservation policy, digital preservation strategies and digital preservation programme to safeguard Namibia's documentary heritage for posterity access. The study concludes that the National Library of Namibia is not prepared to and capable of digitally preserving Namibia's documentary heritage due to the following reasons: lack of appropriate technological infrastructure; limited human resources; lack of knowledge and skills for digital preservation; and challenges associated with e-deposits. The study proposes a digital preservation framework for the National Library of Namibia and for the Namibia library and information sector. This framework could assist the National Library of Namibia to develop policies and guidelines to regulate the digital preservation of Namibia's documentary heritage for posterity.

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List of Acronyms

AIP	Archival Information Package
ARL	Association of Research Libraries
CCSDS	Consultative Committee for Space Data System
CD	Compact Disk
CDP	Collection Development Policy
DISA	Digital Innovation South Africa
DPC	Digital Preservation Coalition
DPE	Digital Preservation Europe
DPCMM	Digital Preservation Capability Maturity Model
ETSIP	Education and Training Sector Improvement Programme
ERPANET	Electronic Resource Preservation and Access Network
HATII	Humanities Advanced Technology and Information Institute
ICT	Information Communication Technology
IFLA	International Federation of Library Associations and Institutions
IKS	Indigenous Knowledge Systems
ISBN	International Standard Book Number
ISSN	International Standard Serial Number
IRs	Institutional Repositories
ISO	International Organisation for Standardisation
IT	Information Technology
KB	Koninklijke Bibliotheek
NAN	National Archives of Namibia
NBC	Namibia Broadcasting Corporation
NDIIPP	National Digital Information Infrastructure and Preservation Programme
NEDLIB	Networked European Deposit Library
NLIC	Namibia Library and Information Council
NLAS	Namibia Library and Archives Services
NLN	National Library of Namibia
NUST	Namibia University of Science and Technology
OAIS	Open Archives Information System

PADI	Preserving Access to Digital Information
TIKA	Turkish Cooperation and Coordination Agency
TDRs	Trusted Digital Repositories
UNAM	University of Namibia
UNESCO	United Nations Educational, Scientific and Cultural Organisation

Chapter 1 : Introduction to the Study

1.1 Introduction

Digital preservation is a broad, evolving, periodic transformation and important facet of digital asset management (Conway, 2010: 65; Oehlerts & Liu, 2013: 93). It is also viewed as a way of preserving information materials, which refers to digital surrogates created by converting analogue materials to digital form (digitisation) and to those that are “born digital” for which there has never been and is never intended to be an analogue equivalent (Hughes, 2004: 4). The aim of digital preservation is to uphold the preserved item for as long as necessary, ensuring its authenticity while also enabling remote access by users (Brown, 2013: 3).

Digital preservation is important for various reasons, which include, but are not limited to, the need to increase access to a broader audience than those who have the resources or the ability to travel to see the physical collections; facilitate new research; aid conservation and preserve heritage (Hughes, 2004: 4; Mutula, 2014: 364). Early preservation activities or practices in libraries and other memory institutions were primarily reserved for reasonably old materials. The age of an information source or document is often measured in terms of centuries (Chowdhury, 2010: 210). Information sources such as paper materials and other information storage and dissemination media deteriorate with age. They deteriorate for the following reasons: inherent factors such as elements built into paper (for example, acid), which cause disintegration of paper materials; external factors which include temperature, humidity, light, insects, rodents and dust particles; structure failure, meaning library materials can disintegrate due to stresses set up in them as a result of fluctuations in temperature and humidity; and handling of resources which includes folding pages of books, materials heavily used, enclosing one book inside, etc. (Onwubiko, 1991: 16). Over time, information sources will inevitably deteriorate, leading to the loss of the information they contain or significant alterations to that information. Therefore, to mitigate the eventual degradation of physical materials, it becomes necessary to duplicate or transfer them onto another medium, or even create entirely new mediums (del Pozo et al., 2010: 291).

Some of the reasons which motivate libraries to initiate digital preservation include, among others, the following:

- Information accessibility: digital resources offer the advantage of being accessible 24/7 from any location with network connectivity, whether through an intranet or the internet, thus saving time;
- Improved searching: digital information can be accessed simultaneously by multiple users at minimal cost, greatly enhancing search efficiency;
- Improved access: digital resources have overcome barriers of time, space, and culture, enabling swift and seamless access to materials dispersed across different geographical locations, leading to increased utilisation by end-users;
- Preservation of resources: digitisation has provided access to copies of materials that would otherwise deteriorate from frequent use in printed form. Digital sources are easier to preserve compared to their printed counterparts, thereby prolonging their lifespan; and
- Space-saving: while print resources require more physical storage space, digital information, despite its substantial content, can be stored in significantly smaller physical spaces (Brown, 2013: 19-22; Paul & Singh, 2014: 223).

The United Nations Educational Scientific and Cultural Organisation (UNESCO) (2016: 12) defines documentary heritage as “a document which ‘documents’ or ‘records’ something by deliberate intellectual intent”. This indicates that document heritage content can encompass written text or graphic information, and the physical carrier may vary, including materials such as paper, papyrus, textile fabric, etc. In the context of this study, documentary heritage refers to information sources available at the National Library of Namibia that were acquired by the National Library of Namibia through legal deposit. These materials include books, manuscripts, journals, newspapers, graphics, etc.

However, long-term digital preservation is frequently neglected by library administration and downplayed in many library operations (Oehlerts & Liu, 2013: 93; Moulaison & Million, 2015: 87). Historically, digital preservation research has primarily concentrated on achieving a single overarching goal: ensuring that information remains usable for future purposes (Chowdhury, 2010: 212). However, in the 21st century, research in digital preservation focuses on long-term maintenance and continued accessibility of content through times and changing technologies (Jantz & Giarlo, 2005). The emphasis in digital preservation has transitioned from the immediate rescue of endangered materials to the recognition that sustaining digital materials

over the long haul necessitates diligent adherence to digital asset management practices (Lavoie & Dempsey, 2004). Digital preservation activities in libraries support several strategic priorities such as: accessing a country's memories; sharing national stories; inspiring knowledge creation, democratic access to content and enriching library user experience (Knight, 2010: 86). It is a norm throughout the world that every society or country should preserve its national documentary heritage because this defines their identity. Each nation's documentary heritage serves as a repository of its history and significantly contributes to the country's development trajectory, as well as the sustainability of its civilisation. The intrinsic worth derived from a nation's documentary heritage is regarded as foundational for fostering unity and expressing the diverse facets of its history. The United Nations Educational, Scientific and Cultural Organisation (2018) contends that the preservation of this heritage is a matter of great concern for experts who are aware of its vulnerability and the associated risks of losing crucial sources of information.

It is crucial to emphasise that digital preservation endeavours necessitate meticulous planning and readiness. Digital preservation preparedness, also referred to as 'readiness,' denotes the capacity to safeguard digital collections for future use (Sinclair et al., 2011: 268). This readiness encompasses the level of organisational awareness regarding specific digital preservation challenges and the implementation of activities aimed at addressing them (Dorner, 2009: 342). Discussions surrounding digital preservation preparedness often center on technology and technical infrastructure (Suleman, 2007: 2; Brown, 2013: 19).

Memory institutions involved in or aspiring toward digital preservation must have a digital preservation policy in place to ensure preservation actions (Dorner, 2009: 345; Li & Banach, 2011; Brown, 2013: 24). They should also possess the capability to hire or cultivate staff with the requisite skills and practices for creating digital materials (Dorner, 2009: 345; Brown, 2013: 284). This study delved into the preparedness of the National Library of Namibia concerning policies, strategies, preservation infrastructure, and staff technical expertise in digital preservation.

1.2 Context of the study

This study focused on the National Library of Namibia (NLN). However, the National Library activities and services are overseen by the Namibia Library and Archives Services (NLAS) and the Namibia Library and Information Council (NLIC). Therefore, this section presents a background of the NLIC and NLAS as key stakeholders that influence policies and oversee the management and operation of the National Library of Namibia. This section also sets the tone on issues of legal deposit, which is the process under which documentary heritage resources at the NLN are acquired. The section concludes by highlighting the documented digital preservation activities in the library fraternity in Namibia.

1.2.1 Namibia Library and Information Council

The Namibia Library and Information Council (NLIC) is a statutory body representing key stakeholders in the Namibian library and information sector. It serves as a platform for planning, coordinating, and promoting the effective utilisation of resources nationwide (Management Development and Research & Network for Information and Digital Access, 2010: 5). The primary objective of the NLIC is to foster the development and utilisation of library and information resources in Namibia for the benefit of its citizens (Republic of Namibia, 2000: 11). Its responsibilities revolve around library and information policy matters and promoting the growth and utilisation of library and information resources in the country.

The Council comprises several key figures including the director of the Namibia Library and Archives Services (NLAS), the librarian of the University of Namibia, the head of the National Library of Namibia, the head of archives, the head of the Parliament Library, the librarian of the University of Science and Technology, and nine other individuals appointed by the Minister of Education who possess expertise in library and information matters (Republic of Namibia, 2000: 11; Smith et al., 2008: 12).

The functions of the NLIC encompass advising the Minister of Education, Arts and Culture on amendments to and the implementation of the National Library of Namibia and Information Policy of Namibia. Additionally, the NLIC supports the information community by facilitating

adherence to standards set by the National Library of Namibia and coordinating legal deposit activities (Republic of Namibia, 2000: 13).

1.2.2 Namibia Library and Archives Services

The Namibia Library and Archives Services (NLAS), operating under the Ministry of Education, Arts, and Culture, serves as the overarching authority responsible for administering libraries and information services throughout Namibia. As a directorate, the NLAS acts as a central agency for implementing both national and international standards related to library and information work in the country (Ministry of Education, 2012: 2). Established in April 1993 during the restructuring of the Ministry of Basic Education, Sport, and Culture, the NLAS comprises five main subdivisions: Community Library Services, the National Library of Namibia, Ministerial Library Services, Education Library Services, and the National Archives of Namibia. The primary goal of the NLAS is to ensure equitable access to knowledge and information for the public, fostering lifelong learning through the establishment and maintenance of professional expertise and a comprehensive network of libraries and information centres throughout Namibia (Namibia Library and Archives Services, 2018).

The functions of the Namibia Library and Archives Services (NLAS) encompass several key responsibilities, including:

- Planning, coordinating, and implementing policies aimed at promoting access to and utilisation of libraries under the NLAS's jurisdiction;
- Supervising the operations, services, and activities of its constituent libraries;
- Providing information, training assistance, and research services to other libraries across Namibia;
- Where applicable, offering financial and material support to enhance the functioning of libraries (Smith et al., 2008: 12).

1.2.3 National Library of Namibia

The National Library of Namibia was established in 1926 and originally served as the reference and subject library for the country's legislative assembly. Following Namibia's independence in 1990, the national library was placed under the Ministry of Education's jurisdiction. Within

the Ministry of Education, the National Library of Namibia became one of five subdivisions under the NLAS directorate, alongside the National Archives of Namibia, Community Library Services, Ministerial Library Services, and Education Library Services. The mission of the National Library of Namibia is to facilitate access to information for all Namibians and Namibian libraries, as well as to support education and research by providing access to national and international information resources (Loubser, 2003: 2025). Additionally, the library has national responsibility for promoting local content creation by encouraging writing in local languages (Ministry of Education, 2012: 3).

With the largest collection of Namibian publications, the National Library of Namibia boasts an extensive archive that includes over 90 newspaper titles, various books (including brochures and pamphlets), more than 1600 periodical titles, Namibian-related theses, manuscripts, cassettes, posters, and CD-ROMs (Loubser, 2003: 2027).

As per Section Five of the Namibian Library and Information Service Act 4 of 2000 (Republic of Namibia, 2000), the National Library of Namibia is mandated to fulfill the following functions:

- Provide support services and conduct research to ensure the provision of library and information services to the people of Namibia;
- Serve as the national centre for conserving materials originating from Namibia or pertaining to Namibia;
- Act as a hub for the collection and preservation of literary manuscripts;
- Develop a collection of materials originating from Namibia through legal deposit or other means;
- Act as a central agency for implementing national and international standards pertaining to library and information work;
- Promote awareness and appreciation of Namibia's national heritage (Republic of Namibia, 2000: 7; Loubser, 2003: 2027; Senzanje & Jacobi, 2012: 7).

The information sources (documentary heritage) gathered by the National Library through legal deposit are held in a physical closed-access collection. These collections may be accessed in the National Library reading rooms to restrict the handling of this material to the minimum, to ensure its permanent preservation (Smith et al., 2008). However, permanent preservation of

these resources requires preservation strategies and policies to regulate preservation activities, access and to ensure posterity. Senzanje and Jacobi (2012: 10) noted that not all publications generated in Namibia have been submitted to the National Library of Namibia. This gap arises from a lack of awareness among some publishers and government ministries regarding the legal deposit framework.

1.2.4 Legal deposit in Namibia

Section Eight (8) of the Namibian Library and Information Service Act 4 of 2000 specifies the legal deposit requirements for documents intended to be generally available in Namibia. It mandates that government offices deposit 20 copies of such documents with the National Archives of Namibia, while non-government producers are required to deposit five copies in a prescribed format and quality to the National Library of Namibia within 14 days of the document becoming generally available (Republic of Namibia, 2000: 8-9). This legal deposit is applicable to materials produced in, about, or by Namibians at the expense of the producer and is utilised to compile a Namibian national bibliography and statistics of national book production. The deposited documents remain the property of the National Library, although for preservation purposes, the Head of the National Library is required to deliver one copy to each designated place of deposit, namely the Namibian National Assembly Library, Keetmanshoop Community Library, and University of Namibia Oshakati Campus Library (Republic of Namibia, 2000: 9).

Section Twelve (12) of the Namibian Library and Information Service Act 4 of 2000 outlines the establishment of the Legal Deposit Committee, which is tasked with various responsibilities. These include advising or making recommendations to the Minister on legal deposit matters, coordinating the activities of places of deposit, and authorizing the Head of the National Library to reproduce entire works received as legal deposit for preservation purposes (Republic of Namibia, 2000: 12).

Although the Act outlines legal deposit procedures and the role of the Legal Deposit Committee, it does not specify the prescribed format of documents for legal deposit. Therefore, this study investigates the provision of e-deposit to the National Library of Namibia.

Hillebrecht (2010: 8) identified the following shortfalls regarding the legal deposit of documentary heritage in Namibia: (1) Although the legal deposit is mandatory, the deposit relies on voluntary cooperation as some depositors are not convinced of the values of having their resources in a public collection; and (2) The number of five copies is seen as a heavy burden by small self-publishers. Hillebrecht (2010: 8) posits that Namibia's cultural heritage is in danger of being irretrievably lost if the opportunities of preserving it are not grasped and he recommends that Namibia should take necessary steps including: legislative provision, institutional empowerment, and human resource capacity building.

1.2.5 Digital preservation activities in Namibia

Preservation activity recorded at the National Library of Namibia thus far is the microfilming of some Namibian newspapers until 1995 (Senzanje & Jacobi, 2012: 10). Since then, no preservation of other information sources has been recorded or known to the researcher to have been recorded. Some preservation activities are recorded at the National Archives of Namibia however, digital preservation requires specialised expertise which was not available at the National Library of Namibia and elsewhere in Namibia (Hillebrecht, 2010: 8).

The National Library of Namibia, as pointed out in Section 1.2.3 does not have a sound digital preservation record. However, institutions such as the National Archives of Namibia have had practical experience in digitising records although they are not digitally preserving these records. The National Archives of Namibia started with a digitisation programme in 1995, an initiative of archivists without many skills, resources and institutional support. This initiative ended without success because of subsequent loss of staff, including the initiator, and lack of continued IT support (Hillebrecht, 2011: 1). In 2008, the National Archives of Namibia formulated a digitisation policy aimed at providing guidance for the digitisation process within the National Archives. This policy was designed to ensure optimal access to and preservation of the national heritage under the custodianship of the National Archives (National Archives of Namibia, 2009: 1).

Since then, the National Archives has digitised by means of scanning most of its photo collection, maps, and many archival documents. According to Hillebrecht (2010: 8), digitisation has hardly been tackled in Namibia especially for sound recording and videos which not only deteriorate slowly but also face problems of obsolescence when the replay

equipment are no longer manufactured. Hillebrecht further states that for the National Archives of Namibia to transfer some of its collections from analogue to digital, they still need to master the process of digital transfer in archival quality and need assistance to digitally preserve these sound recordings and videos. Hillebrecht (2010: 8) concluded that in Namibia there was a shortage of specialised qualified skills needed for digital preservation processes.

A study by Nengomasha (2009: 197) examines electronic records management in the Namibian Public Service in the context of e-government; and found that there was no digital preservation strategy in the Public Service in Namibia. Although digital preservation activities are not recorded in several libraries in Namibia and literature might not be available on digital preservation in Namibia, there are many libraries in Namibia where one can find documentary heritage. These institutions include, amongst others: the Namibian Broadcasting Corporation (NBC) archives, the National Museum of Namibia, and the Namibia Scientific Society (Hillebrecht, 2010: 6).

1.3 Research problem

The overarching problem that prompted this study is that while the National Library of Namibia serves as a national centre for the collection, preservation and access to Namibia's published national heritage (documentary heritage) through legal deposit (Republic of Namibia, 2000), the extent to which the institution is prepared to digitally preserve these materials (that is, born digital and reformatted) to ensure availability and access for posterity, is yet to be established. There is a paucity of studies focusing on digital preservation in Namibia that specifically relate to digital preservation of documentary heritage in the National Library. Studies on digital preservation in Namibia and elsewhere in developing countries have alluded to the lack of digital infrastructure, human resources or technical skills, financial resources as well as attendant proposed policies and strategies (Suleman, 2007; Mapulanga, 2013; Masenya & Ngulube, 2019; Umana, 2019; Keneilwe, 2020; Matlala et al., 2022; Nakale, 2023). There is no empirical evidence known by the researcher that suggests or indicates the preparedness of the National Library of Namibia in digitally preserving its national documentary heritage information resources.

It is in this context that this study investigated the National Library of Namibia's preparedness to digitally preserve the national documentary heritage and with the aim of suggesting a digital preservation framework for the National Library of Namibia which will inform policymakers, and practitioners towards improving methodologies, standards, and good practices in digital preservation.

1.4 Research objective

The study's main objective was to investigate the preparedness of the National Library of Namibia to preserve Namibia's documentary heritage through digital preservation, towards the development of a digital preservation framework for the National Library of Namibia.

1.5 Research questions

To meet the above objective, the study was guided by research questions which focussed on the preparedness of the National Library of Namibia to embrace the digital preservation of its collections. The research questions were informed by the Open Archival Information System (OAIS) Reference Model (Digital Preservation Coalition & Lavoie, 2014), and the Digital Preservation Capability Maturity Model (DPCMM) (Dollar & Ashley, 2015), which formed the study's theoretical framework (discussed in Chapter Two). The following are the research questions:

1.5.1 What are the current preservation practices for information resources at the National Library of Namibia?

1.5.2 What long-term preservation policies and strategies are in place or needed to provide digital access to Namibia's documentary heritage?

1.5.3 What are the views of National Library users, National Library of Namibia staff, NLAS staff, Legal Deposit Committee members and NLIC members on digital preservation of national documentary heritage?

1.5.4 To what extent does the Namibian legal deposit framework make provision for electronic information sources deposit to the National Library of Namibia?

1.5.5 What digital preservation framework is appropriate for the National Library of Namibia?

1.6 Originality of the study

This study is original in the sense that although several studies have been conducted in Africa on digital preservation (Adu & Ngulube, 2016; Motsi, 2017; Magama & Ngoepe, 2018; Anyaoku et al., 2019; Masenya & Ngulube, 2019; Keneilwe, 2020; Balogun & Kalusopa, 2022; Nakale, 2023), gaps exist in the following: there is no study done on the topic of digital preservation of documentary heritage in Namibia. A gap in the literature exists on digital preservation of documentary heritage in national libraries exists across Africa. Furthermore, there are no studies available in Africa that have inquired into the perception of users on digital preservation of documentary heritage. There is also a paucity of literature on digital preservation of documentary heritage in the context of e-legal deposit resources. The current study develops new knowledge on digital preservation of documentary heritage in Namibia and contributes to the body of knowledge in Sub-Saharan Africa in the context of digital preservation planning; national libraries' users' perceptions on digital preservation of resources; and digital electronic deposit and digital preservation of these resources. The study further developed and proposes a digital preservation framework for the National Library of Namibia as well as for the Namibia library and information sector.

1.7 Significance of the study

Libraries' physical objects (for example, books, manuscripts, newspapers) tend to decay gradually, and in the process their information content is slowly eroded; when materials decay, sources become unreadable (Brown, 2013: 200). Thus, libraries are digitising materials that are in danger of being lost in the future, and these include old manuscripts and other pieces of history (Liu, 2004: 339). Information sources preserved through digital preservation are also associated with challenges of long-term access, for example, technology obsolescence, hardware failure, software failure and network failure (Brown, 2013: 204-205). Therefore, libraries need to have long-term preservation measures to address these challenges. Hence, the need for a study to establish what the National Library of Namibia is doing or intends to do to safeguard information sources, sourced through legal deposit, for future use and easy access.

The study is significant to libraries in general and to the Namibia library and information sector specifically because its findings could prompt the National Library of Namibia to devise

strategies for long-term digital preservation and access to Namibia's documentary heritage. Furthermore, the findings of the study are envisaged to provoke discussions on legislation such as electronic legal deposit and digital preservation policies in Namibian libraries. The findings of the study are used to propose a digital preservation framework for the National Library of Namibia as well as for the Namibia library and information sector.

1.8 Overview of the theoretical framework

The study triangulated the Open Archives Information System (OAIS) Reference Model and Digital Preservation Capability Maturity Model (DPCMM) as theoretical models to understand digital preservation at the National Library of Namibia. The OAIS Reference Model is a reference model that has to date been widely accepted by the digital preservation community (Voutssas, 2012: 85). It provides a framework to build and maintain long-term preservation and access to digital materials (Saur, 2006: 42). The OAIS Reference Model also functions akin to a conceptual blueprint, outlining the core components of a preservation repository and the information objects managed within it (Digital Preservation Coalition & Lavoie, 2014: 29).

The DPCMM draws upon functions and preservation services, and it is based on OAIS Reference Model functions, International Organisation for Standardisation (ISO 14721) and trustworthy repository audit criteria (ISO 16363, space data and information transfer systems-audit and certification of trustworthy digital repositories), and when combined set a high threshold for digital preservation capabilities (Dollar & Ashley, 2015: 5). DPCMM is a five-stage maturity continuum developed to conduct gap analysis of current digital preservation capabilities and measures how prepared and capable an institution is or evaluates its capabilities when it comes to preserving resources in its repository (Dollar & Ashley, 2015: 2). It helps identify, protect and provide access to long-term and permanent digital assets (Dollar & Ashley, 2013: 2).

1.9 Overview of the methodology

This study is located in the pragmatic paradigm. Creswell and Creswell (2023: 12) expound that pragmatism is particularly applicable in mixed methods research, where researchers utilise both quantitative and qualitative data. This approach is adopted because it effectively

contributes to gaining the most comprehensive understanding of a research problem. Pragmatism is also regarded as the philosophical partner for the mixed methods approach (Johnson, Onwuegbuzie & Turner, 2007: 13; Christensen et al., 2015: 383; Leavy, 2017: 19; Creswell & Creswell, 2023: 11). Pragmatism served as the guiding philosophy for this study, which employed a mixed methods approach. The term 'mixed methods' refers to research that incorporates diverse methodologies within a single research project (Denscombe, 2010: 137). This approach involves the integration of both qualitative and quantitative research methods and data within the study (Hesse-Biber, 2010: 3; Creswell, 2014: 14; Ivankova et al., 2016: 313; Leavy, 2017: 263; Creswell & Plano Clark, 2018: 52). In this study, the researcher aimed to elucidate the various dimensions of perspectives and views regarding the preparedness and practices of digital preservation of Namibia documentary heritage. Adopting a mixed methods approach can facilitate the attainment of an in-depth understanding of trends and personal perspectives, thereby offering a more comprehensive approach to the research problem and fostering a deeper comprehension (Ivankova et al., 2016: 313). This study employed a single case study research design. The selection of participants for the study was conducted using purposive sampling and convenient sampling techniques. Quantitative data were collected through the administration of semi-structured questionnaires to users of the National Library of Namibia (see Appendix D). Qualitative data were collected through semi-structured interview guides (see Appendices E, F, G and H) for NLIC board members, NLAS management staff members, National Library of Namibia management staff members and NLN IT staff member and a document review guide (see Appendix I) for document reviewed. The quantitative data were analysed using SPSS version 28 to generate descriptive statistics. On the other hand, qualitative data were analysed using ATLAS.ti version 23.08, and the findings were presented in narrative form.

1.10 Limitations of the study

Limitation of the study refers to potential weaknesses or challenges identified by the researcher that are often beyond the researcher's control (Leedy & Ormrod, 2010; Creswell & Creswell, 2023: 232). Since it was not feasible for the researcher to access all National Library of Namibia users, the findings, especially opinions of the National Library of Namibia users, cannot be generalised to the entire population of National Library of Namibia users. The study sought to interview 13 NLIC board members, however, Seven NLIC board members did not

participate in the study due to unavailability and some did not respond to emails and telephone calls during the time of the study. However, the researcher is satisfied with the extent of information elicited from the remaining NLIC board members who participated in the study. Furthermore, although the study aimed to interview the Legal Deposit Committee members who could have been instrumental in providing e-legal deposit perspectives, it was established that this committee was not in existence at the time of data collection. The research also experienced challenges with regards to accessing some documents such as minutes of meetings for NLAS, NLIC and project funding proposal documents. These documents were not available to the researcher. However, those documents which were available for review were adequate to fulfil this secondary data source requirement for the study.

1.11 Delimitations of the study

Delimitations refer to the parameters or boundaries set for the study (Leedy & Ormrod, 2010). In this study, the delimitation is that it is a case study focusing exclusively on the National Library of Namibia (NLN), excluding all other libraries in Namibia. This exclusion is based on the fact that the NLN is the only library mandated by the Namibia Library and Information Service Act 4 of 2000 to serve as the national centre for the preservation of documentary heritage in Namibia. Therefore, other libraries are intentionally excluded from this study. The study investigated digital preservation and preservation of digital resources/information, leaving out issues of metadata, standards, copyright of documentary heritage and guidelines used for digitising library collections and storage and long-term preservation of library materials. This exclusion is based on the fact that although these issues are part of digital preservation, this study was a baseline study for digital preservation preparedness of the National Library of Namibia (NLN) and therefore it was not feasible to include every aspect of every aspect of digital preservation. Namibian literature known to the researcher on the subject of digital preservation (Lukileni-Iipinga & Mnjama, 2017; Umana, 2019; Nakale, 2023) show that there is no institution in Namibia with a digital preservation strategy. The current study established the extent of digital preservation preparedness of the NLN and proposed a digital preservation framework for the National Library of Namibia as well as for the Namibia library and information sector, hence further studies can be conducted to investigate issues of metadata, copyright and standards appropriate for the digital collection of the NLN. The study also focused on the preservation of Namibia's documentary heritage (that is, materials

submitted through legal deposit) leaving out information sources acquired by the NLN through purchase and donation (see Section 1.2). Lastly, the participation of the NLN users was limited to users of the Namibiana collection (documentary heritage) sources leaving out users of the general collection of the NLN.

1.12 Structure of the research report

The study report is made up of seven chapters. Chapter One provides a background to the study. The study's background consists of the history of digital preservation and the trends in digital preservation research. The chapter unpacks the concept of documentary heritage. It also presents the context of the study, where an overview of the National Library of Namibia (NLN) is provided, and the legal deposit concept at the NLN as well as the digital preservation activities undertaken in Namibia are explained. The chapter further sets the scene and presents the statement of the problem emanating from the gaps in literature relating to digital preservation and safeguarding documentary heritage in Namibia. The chapter also presents the study's overall objective and critical research questions.

Chapter Two presents the theoretical framework which guided this study. The study used the Open Archival Information System (OAIS) Reference Model (Digital Preservation Coalition & Lavoie, 2014), and the Digital Preservation Capability Maturity Model (DPCMM) (Dollar & Ashley, 2015) as a theoretical framework. These two models are used in this study to understand digital preservation at the NLN. The chapter discusses the components of OAIS Reference Model and DPCMM and explains how these components are used to understand digital preservation of Namibian documentary heritage stored at the NLN. Chapter Three provides a review of the literature relevant to the study. The chapter covers themes of literature that are derived from the research questions of the study which are based on the theoretical framework guiding this study. Themes covered in this chapter include preservation planning management; preservation policies; preservation strategies; legal deposit as well as electronic resources and challenges associated with digital preservation. In this chapter, the focus is on previous studies done on digital preservation in Namibia, in the region and internationally. These studies' findings were used to guide the researcher in developing research instruments to collect data for the study. Chapter Four presents the study's research design and methodology. It discusses the pragmatic paradigm, the mixed methods approach, and a case

study research design which this study adopted. The chapter further explains the population of the study which includes, the National Library of Namibia's Namibiana collection users, NLIC board members, NLAS management and NLN management staff members. The chapter further discusses the purposive and convenient sampling methods used to select the participants and respondents in this study. The chapter also explains data collection procedure, research instruments (semi-structured interview guides and semi-structured questionnaires used to collect data), data analysis procedures and presents an overview of data presentation. The chapter ends with a discussion of research ethics process and procedures followed in collecting the data. Chapter Five presents the findings. These findings emanate from a mixed methods approach of collecting data which included interviews, document reviews and questionnaires. The findings are integrated and presented according to the following themes which are derived from research questions which guided the study: Current preservation practices for information resources at the National Library of Namibia; Long-term preservation policies and strategies; Views on digital preservation of national documentary heritage; Namibian legal deposit framework; and Electronic information sources and preservation framework appropriate for the National Library of Namibia. Chapter Six provides interpretation and discussion of the main findings of the study. This chapter further integrates discussion of relevant literature and the models used as a theoretical framework for this study. Chapter Seven presents the summary of findings and draws conclusions and makes recommendation from the study.

1.13 Summary of the chapter

Chapter One provided a background to the study by introducing concepts consisting of the history of digital preservation, why digital preservation is important for libraries to preserve their information sources, what necessitates digital preservation, and the trends in digital preservation research. It further unpacked the concept of documentary heritage. The chapter also presents the context of the study, where an overview is provided of libraries' governance in Namibia, the background of the NLN is presented and preservation initiatives in Namibia are also discussed. The legal deposit process at the NLN and Legal Deposit Committee functions were also explained. The chapter further set the scene and formulates the statement of the problem which necessitated this study. Also presented in the chapter is the study's overall objective and the research questions generated to address this objective. The research questions of the study are based on the OAIS Reference Model and DPCM Model, which are the

theoretical models guiding this study. Significance of the study, limitations and delimitations of the study and structure of the research report are also provided in this chapter. The next chapter presents and discusses the theoretical models which guided this study.

Chapter 2 : Theoretical Framework

2.1 Introduction

A theoretical framework, also referred to as conceptual framework, theoretical model or theoretical rationale, is defined as “a general explanation of what the researcher expects to find in a study” (Creswell & Plano Clark, 2018: 43). It is also characterised as a collection of interconnected propositions, concepts, and definitions that offer a structured perspective for specifying the relationship between variables in order to predict and elucidate phenomena (Fox & Bayat, 2014: 29). They are analytical tools used in the research process to guide the study (Ngulube, 2020: 28). A theoretical framework or conceptual framework is important in a study because it provides assumptions and concepts in the form of their definitions and explanations (Neuman, 2014: 85). It also provides a framework that guides the nature of the questions asked and answered in a study (Creswell & Plano Clark, 2018: 44). Bryman (2012: 20) explains that a theory is important in research as it provides a backcloth and rationale for the research being conducted.

Theories also provide possible explanations of why things happen or models how things happen (Bertram & Christiansen, 2014: 117). A theoretical framework links a study with existing knowledge in a subject discipline. Furthermore, it allows a researcher to gain an understanding of the various aspects of the phenomenon studied and to explain the meaning, nature, and challenges of the phenomenon (Trochim, 2006). In mixed methods studies, theoretical frameworks take two forms: (a) the use of a social science framework and (b) the use of transformative framework (Creswell, 2014: 68). The current study uses a social science framework. According to Creswell (2014: 69), a theoretical model may be presented as a literature review or as a conceptual model that helps to explain what the researcher seeks to find in the study. The concept ‘theoretical models’ is used in this chapter to explain the two models used in the study.

This chapter discusses the components of the Open Archives Information System (OAIS) Reference Model and (Digital Preservation Capability Maturity Model) (DPCMM) which are used as theoretical models in this study. The chapter also explains how the OAIS Reference Model and DPCMM are used in various studies that relate to the present study. The OAIS

Reference Model and DPCMM guided the generation of the research questions of this study and therefore, these theoretical models were used to understand digital preservation at the National Library of Namibia. The study triangulated the OAIS Reference Model and DPCMM to come up with a theoretical framework to understand digital preservation at the National Library of Namibia. This chapter also justifies why other models relevant to digital preservation were not used or preferred for this study.

2.2 OAIS Reference Model

The OAIS Reference Model originates from the Consultative Committee for Space Data Systems (CCSDS). Initially, at the behest of the International Organisation for Standardisation (ISO), the CCSDS commenced efforts to establish formal standards for the enduring storage of digital data produced from space missions. These endeavours culminated in the development of an international standard known as the OAIS Reference Model, denoted as ISO 14721 (2012). Initially approved as ISO standard 14721 in 2002, this model has since provided a comprehensive framework for the long-term preservation of digital data. This standard was revised and was approved as an updated ISO standard in 2012. This standard has been used as a framework for digital preservation plans, strategies, and initiatives around the world (Digital Preservation Coalition & Lavoie, 2014: 2). Ngulube (2012: 133) states that the OAIS Reference Model, provides a useful digital preservation tool. Additionally, the OAIS Reference Model furnishes a framework for delineating and contrasting various long-term preservation strategies and techniques (Strodl et al., 2007: 31).

In the digital preservation community, the OAIS Reference Model holds significant prominence and is widely acknowledged as a fundamental standard reference model for archival systems (Becker et al. 2009: 149; Voutssas, 2012). It is esteemed as the sole official standard in the realm of digital preservation (Saur, 2006: 42), underpinning the foundational principles and practices essential for ensuring the long-term viability and accessibility of digital materials. The OAIS Reference Model offers a framework for establishing and sustaining long-term preservation and access to digital materials (Saur, 2006: 42). It functions akin to a conceptual blueprint, delineating the core components of a preservation repository and the information objects managed within it (Digital Preservation Coalition & Lavoie, 2014: 29). Fundamentally, the OAIS aims to preserve information for a designated community over an

extended duration (Becker et al. 2009), highlighting its crucial role in safeguarding digital resources for future generations. According to Wilson (2017: 131), the OAIS Reference Model serves as a guide for conceptualising and developing systems to meet preservation needs at an abstract level. For a more detailed understanding of the OAIS Reference Model and its constituent components, please refer to Figure 2.1.

Although the OAIS Reference Model may be of archival institution nature, the principles outlined in the OAIS Reference Model are applicable to any organisation tasked with the responsibility of ensuring long-term access to information (Consultative Committee for Space Data Systems, 2012: 1-2). It is for this reason that the researcher deemed it appropriate for this study as the National Library of Namibia is one of those organisations entrusted with the responsibility of preserving and making available Namibia's documentary heritage for posterity.

The Consultative Committee for Space Data Systems (2012: 1-1) defines an OAIS as an archive, comprising an organisation potentially a component of a larger entity, comprised of individuals and systems that have committed to preserving information and providing access to it for a specified community. In an OAIS archive, information maintained is deemed to need long term preservation in an era of changing technologies and changing media, data format and changing user community. The OAIS Reference Model over the years has exerted a significant influence on the architectures, workflows, standards and practise of digital preservation and has become part of the bedrock supporting reliable long-term stewardship of digital materials (Digital Preservation Coalition & Lavoie, 2014: 29). The OAIS Reference Model is designed to accommodate information that is not inherently digital (Consultative Committee for Space Data Systems, 2012: 1-1). This capability ensures that the model can effectively manage a wide range of information formats, including both digital and non-digital materials, thereby enhancing its applicability and versatility in preservation efforts. In the context of this study, the OAIS Reference Model is used to explain and provide an understanding of the digital preservation of documentary heritage sources that were either acquired in physical format and those that the National Library of Namibia acquired in digital format through legal deposit.

According to the Consultative Committee for Space Data Systems (2012: 1-1), the OAIS Reference Model offers the following:

- The OAIS Reference Model offers a comprehensive framework with several benefits for the preservation and access of digital information over the long term;
- Enhances understanding and awareness of archival concepts essential for effective preservation and access;
- Equips non-archival organisations with the necessary concepts to actively participate in preservation efforts;
- Establishes a standardised framework for describing and comparing the architectures and operations of current and future archives;
- Provides a structured approach for comparing various long-term preservation strategies and techniques;
- Facilitates comparisons of data models across different archives, aiding discussions on potential evolution over time;
- Allows for expansion to cover preservation of non-digital information, such as physical media and samples;
- Promotes consensus on elements and processes for digital preservation, fostering a larger market for vendor support; and
- Guides the identification and development of standards related to OAIS.

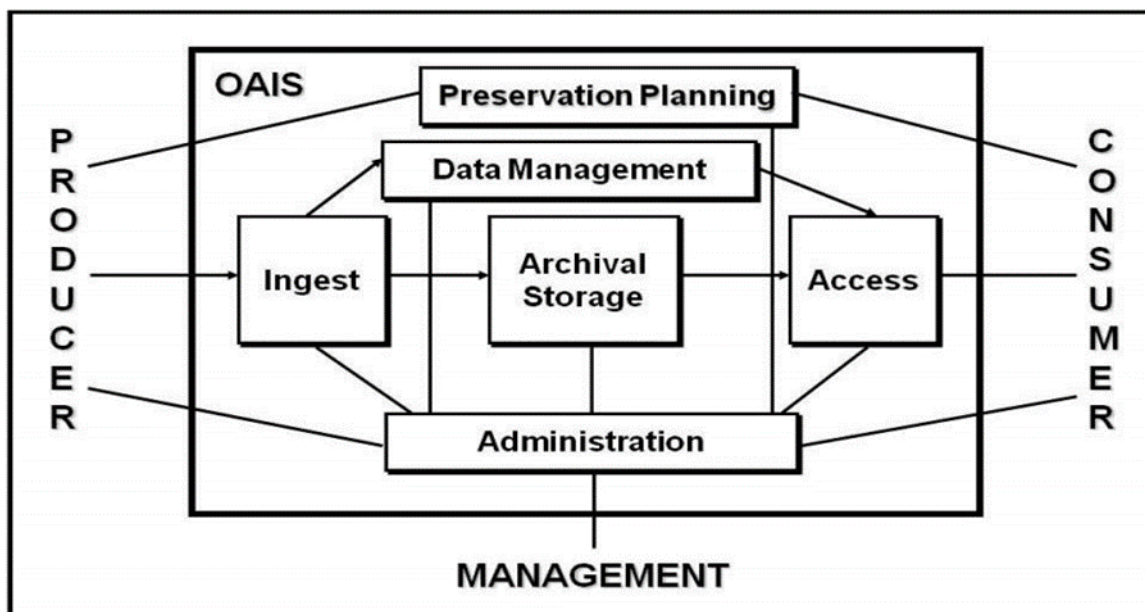


Figure 2.1: Open Archival Information System (OAIS) Reference Model

(Digital Preservation Coalition & Lavoie, 2014: 12)

The OAIS Reference Model (Figure 2.1) consists of four distinct components, with three being explicitly external to the OAIS: management, producer, and consumer. Additionally, there are six internal components: ingest, archive storage, data management, preservation planning, access, and administration (Consultative Committee for Space Data Systems, 2012: 1-2; Digital Preservation Coalition & Lavoie, 2014: 12). Moreover, it addresses aspects such as the migration of digital information to new media and forms, the data models utilized to represent the information, and the exchange of digital information among organizations (Consultative Committee for Space Data Systems, 2012: 1-2).

2.3 Digital Preservation Capability Maturity Model (DPCMM)

The Digital Preservation Capability Maturity Model (DPCMM) draws upon functions and preservation services, incorporating elements from the OAIS Reference Model functions (ISO 14721) as mentioned in Section 2.2. It also integrates trustworthy repository audit criteria outlined in ISO 16363, which pertains to the audit and certification of trustworthy digital repositories. By combining these components, the DPCMM establishes a robust framework that sets a high threshold for digital preservation capabilities (Dollar & Ashley, 2015: 5). Figure 2.2 presents the components of the DPCMM.

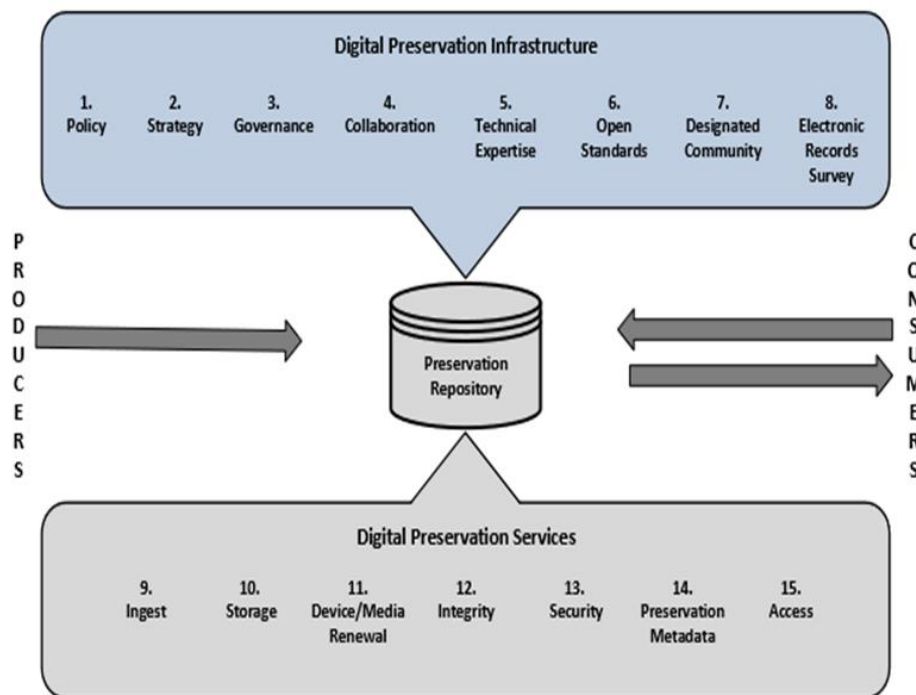


Figure 2.2: Digital Preservation Capability Maturity Model (DPCMM)

(Dollar & Ashley, 2015: 12)

The DPCMM (Figure 2.2) comprises 15 essential components that are vital for ensuring the enduring continuity, accessibility, and preservation of authentic, accessible, and reliable electronic records. In the context of this study the DPCMM components were used to test and understand the long-term continuity, access and preservation of documentary heritage and not electronic records. Each component is described and metrics for each of the five stages of digital preservation capability are identified. The model has three separate but interrelated high-level features: digital preservation infrastructure, preservation repository, and digital preservation (Dollar & Ashley, 2015: 12). This study focused on components under the digital preservation infrastructure and digital preservation services explained in Section 2. 4. Although the OAIS Reference Model has a combination of nine components (see Figure 2.1) (Digital Preservation Coalition & Lavoie, 2014), this study only applied four of the components, namely: preservation planning; management; consumers and the designated community and ingest. The four components of the OAIS Reference Model were selected for the study because they relate to the ultimate objective of this study. The research questions for this study ponder on the following themes: the current preservation practices for information resources at the National Library of Namibia; the long-term preservation policies and strategies in place or needed to provide digital access to Namibia's documentary heritage; the views and attitudes of National Library users, National Library of Namibia staff, NLAS staff, Legal Deposit Committee members and NLIC members on digital preservation of national documentary heritage; and the extent to which the Namibian legal deposit framework make provision for electronic information sources deposit to the National Library of Namibia.

The researcher believes the four components of the OAIS Reference Model enlightened the study and painted a clear picture of the National library of Namibia's to preparedness to preserve Namibia's documentary heritage through digital preservation. The other five components of the OAIS Reference Model were left out because they fell outside of the scope of this study. With regard to DPCMM, although it has 15 components (see Figure 2.2) (Dollar & Ashley, 2015), the study applied only six of the components, namely: policy; strategy; governance; technical expertise; ingest; and access. The six components of the DPCMM were selected because they are the ones this study's research questions are based on and the other nine components were excluded because they fell outside of the scope of the study.

The DPCMM is designed as a five-stage maturity continuum aimed at conducting gap analyses of existing digital preservation capabilities. It serves to gauge an institution's readiness and

capacity for preserving resources in its repository or evaluating its capabilities in this regard (Dollar & Ashley, 2015: 2). Furthermore, it aids in identifying, safeguarding, and facilitating access to long-term and permanent digital assets (Dollar & Ashley, 2013: 2). According to Dollar and Ashley (2015: 5) many organisations with a mandate to preserve and provide access to long-term and permanent electronic records do not yet have the expertise and resources to implement a preservation repository that conforms to the ISO 14721. Using the DPCMM one is able to assess an organisation's current digital preservation capabilities vis-à-vis desired future digital preservation capabilities. This assessment assists an organisation to strategically identify incremental improvements in digital preservation capabilities required to fulfil its mission and mandate (Dollar & Ashley, 2015: 39). The DPCMM employs a five-level or stage approach, ranging from nominal at the lowest end to optimal at the highest end, as depicted in Figure 2.3. In an organisation such as the National Library of Namibia, stage one signifies that a digital preservation program has not been initiated or exists only in theory, whereas stage five represents an organisation with sustained, trustworthy capabilities that are systematically managed and continually improved (Dollar & Ashley, 2015: 9). In this study, the five stages of digital preservation capabilities were studied to establish the level of readiness the National Library of Namibia is at, to digitally preserve documentary heritage. According to Dollar and Ashley (2015: 9), based on the requirements outlined in ISO 14721 and the audit criteria in ISO 16363, the DPCMM components are expected to achieve at least an Intermediate (Stage three) capability.

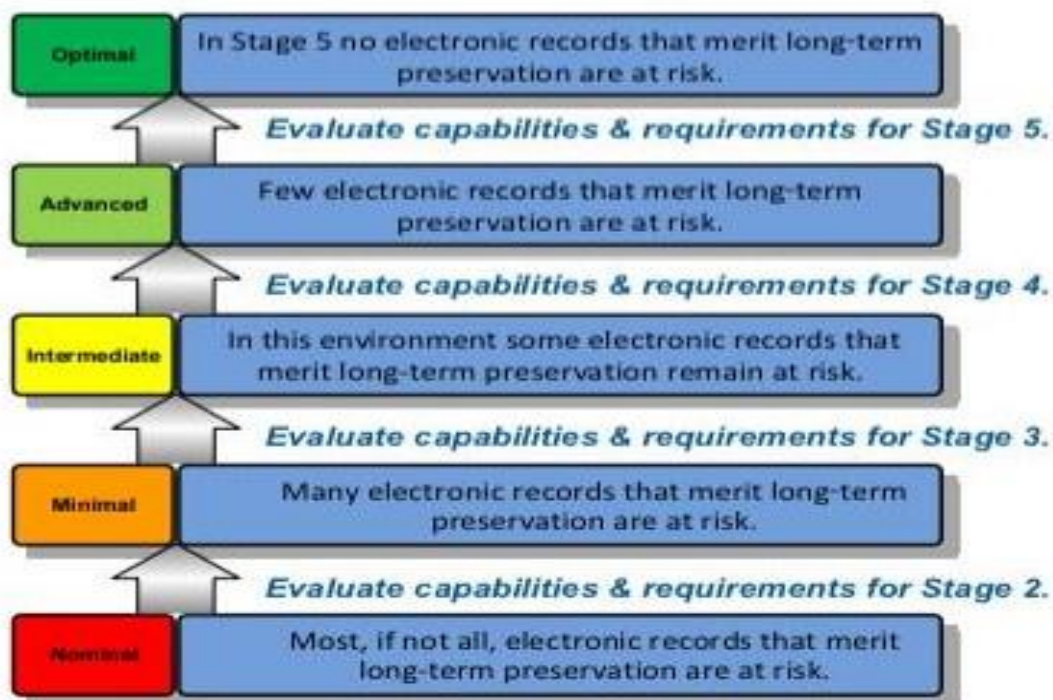


Figure 2.3: Five stages of Digital Preservation Capability

(Dollar & Ashley, 2015: 9)

Although Figure 2.3 depicts electronic records, these stages were relevant to the context of the current study and were used to assess the documentary heritage’s digital preservation, especially of those sources that were deposited via e-deposit at the National Library of Namibia. Figure 2.3 presents five stages of digital preservation capabilities and the explanation for each stage is as follows: Stage one: Nominal digital preservation capability; this stage delineates an environment where the ISO 14721 standards might be recognised by an organisation, acknowledged in principle, or under deliberation but have not yet been formally embraced or put into action by the unit accountable for preservation. This stage also means that the organisation may understand digital preservation issues and concerns. If an organisation is at this stage, it could be that documents or information sources (documentary heritage) are at risk (Dollar & Ashley, 2015: 11).

Stage two: Minimal digital preservation capability; this stage describes an environment where the 2012 version of the ISO 14721 based preservation is not yet in place. In an organisation, there might be some understanding of digital preservation issues and strategies, but this

understanding is limited to relatively few individuals in an organisation (Dollar & Ashley, 2015: 10).

Stage three: Intermediate digital preservation capability; this stage describes an environment that embraces the ISO 14721 specifications and other best practices standards. If an organisation is at this stage in digital preservation capabilities, it means it is completing repeatable projects and fostering collaborations, including shared resources and maintaining trusted digital repositories (Dollar & Ashley, 2015: 10).

Stage four: Advanced digital preservation capability; this stage is characterised by an organisation with robust infrastructures and digital preservation services which are based on ISO 14721 specifications and trustworthy repository audit and certification ISO 16363. At this stage, an organisation involved in digital preservation has multiple stakeholders, for example, publishers of e-publications, and has a framework for digital preservation management (Dollar & Ashley, 2015: 10).

Stage five: Optimal digital preservation capability; this stage is the highest level of digital preservation preparedness that an organisation can achieve. An organisation at this stage should have a strategic focus on digital preservation activities and continues improving these activities. Such an organisation at this level should be conducting proactive monitoring for breakthrough technologies that can enable them to improve their digital preservation performance (Dollar & Ashley, 2015: 10).

2.4 Application of the OAIS Reference Model and DPCMM to the current study

This section explains a number of selected components of the OAIS Reference Model and the DPCMM that were observed in the current study. The researcher believes that these components of the two models are the core components of the ultimate objective of this study as highlighted in Section 2.3. The other components of the OAIS Reference Model and DPCM were left out because they fall outside of the scope of this study. The components studied in this study were derived from Figures 2.1 and 2.2:

Preservation planning: A preservation plan outlines the steps and strategies for safeguarding a particular collection of objects with a defined objective (Becker et al., 2009: 149). It includes services and functions for monitoring the OAIS environment, ensuring the integrity and longevity of preserved digital materials (Consultative Committee for Space Data Systems, 2012: 4-2). Preservation planning entails the responsibility of charting the OAIS's preservation strategy and suggesting suitable modifications to this strategy in light of evolving conditions within the OAIS environment. The preservation planning service plays a crucial role in monitoring the external environment for any changes and potential risks that could affect the OAIS's ability to preserve and maintain access to the information in its custody, such as innovations in storage and access technologies, or shifts in the scope or expectations of the designated community.

Preservation planning then develops recommendations for updating the OAIS policies and procedures to accommodate these changes (Digital Preservation Coalition & Lavoie, 2014: 13). Additionally, it offers recommendations and preservation plans aimed at guaranteeing that the information archived in the OAIS remains accessible to and comprehensible by the designated community over the long term, even in the event of obsolescence in the original computing environment (Consultative Committee for Space Data Systems, 2012: 4-2).

The preservation planning function represents the OAIS's safeguard against a constantly evolving user and technology environment. It detects changes or risks impacting the OAIS's ability to meet its responsibilities, designs strategies for addressing them, and assists in the implementation of these strategies within the archival system (Digital Preservation Coalition & Lavoie, 2014: 13). Moreover, the preservation planning entity monitors the environment and offers recommendations to ensure the sustained accessibility of the stored information over the long term. This may include monitoring of technology and user community as well as evaluation of the preservation strategies and choosing the most appropriate strategy (Strodl et al., 2007: 32). The preservation planning component was used in this study to investigate the first research question which is: What are the current preservation practices for information resources at the National Library of Namibia? The findings on this research question provided an understanding of established digital preservation activities taking place and planned for the National library of Namibia.

Management and governance: Management within the OAIS is responsible for formulating, revising, and sometimes enforcing the overarching policy framework governing OAIS activities. This includes strategic planning, defining the scope of the archived collection, and articulating preservation guarantees. Management may also provide funding and oversight, periodically reviewing policies, performance, and risks. However, day-to-day operations are not within their purview (Digital Preservation Coalition & Lavoie, 2014: 9).

According to the Consultative Committee for Space Data Systems (2012: 2-9) typical interactions between the OAIS and management include:

- Management is often the primary source of funding for an OAIS and may provide guidelines for resource utilisation (personnel, equipment, facilities);
- Management typically undertakes periodic review processes to assess the performance of the OAIS and its progression towards long-term goals, while also evaluating the risks faced by the OAIS and its holdings;
- Management establishes or at least supports pricing policies, where relevant, for OAIS services; and
- Management engages in conflict resolution involving producers, consumers, and OAIS services.

An organisation with a digital preservation mandate should implement a formal decision-making process that aligns with its enterprise information governance framework. This process should clearly define accountability and authority for the preservation of electronic records with permanent value. Long-term preservation, however, may require the creation of new authorities to address the threats of technology obsolescence. The governance framework enables compliance of the preservation repository with applicable laws, regulations, record retention schedules, disposition authorities, and standards (Dollar & Ashley, 2015: 18).

In this study, the management component of the OAIS Reference Model and governance of the DPCMM was used to investigate the first research question: What are the current preservation practices for information resources at the National Library of Namibia? The findings on this research question provided an understanding of the decision-making process and management of digital preservation activities. The findings further assisted in determining

the framework used at the National library of Namibia to carry out their digital preservation activities and determined if these practices are complying to digital preservation principles.

Digital preservation policy: The successful preservation of electronic records, ensuring their accessibility, authenticity, and usability over the long term, hinges not only on digital information technologies but also on the organisational commitment and practices in place. It is imperative for the organisation entrusted with safeguarding long-term legal, fiscal, and historical records to clearly articulate its policy regarding compliance. This entails developing a comprehensive digital preservation policy, which should encompass the purpose, scope, accountability, and methodology concerning the transfer of records, as well as the operational management and sustainability of reliable preservation repositories (Dollar & Ashley, 2015: 16). The study used this component to investigate the second research question which is: What long-term preservation policies and strategies are in place or are needed to provide digital access to Namibia's documentary heritage? The study also analysed and established what stage the National Library of Namibia is at in terms of digital preservation capability (see Figure 2.3).

The findings on this research question provided an understanding of the digital preservation policy of the National library of Namibia's compliance to digital preservation policy requirements, as well as determining the National library of Namibia's digital preservation capability level.

Digital preservation strategy: The organisation responsible for preserving long-term and permanent electronic records must take proactive measures to mitigate risks associated with technology obsolescence. While no single strategy is appropriate for all organisations, information types and resources, there must be plans to periodically upgrade storage devices, storage media and file formats (Dollar & Ashley, 2015: 17). Digital preservation strategies in an organisation need to be continuously monitored because of the inevitable obsolescence of file formats, storage devices and media. Dollar and Ashley (2015: 17) explain that the generally accepted practice is to mitigate the obsolescence of storage device/media through a planned and periodic renewal of strategies. No matter how well an OAIS maintains its current holdings, it will eventually need to migrate much of its holding to different media or to different hardware or software environments to keep them accessible (Consultative Committee for Space Data Systems 2012: 5-1). The CCSDS also notes that the rapid pace of technology evolution makes

many systems much less cost-effective after only a few years. Besides technology changes there are also changes to the knowledge base of the designated community.

The digital preservation strategy component was used to understand the first research question which is: What are the current preservation practices for information resources at the National Library of Namibia and the second research question of the study which is: What long-term preservation policies and strategies are in place or are needed to provide digital access to Namibia's documentary heritage? The digital preservation strategy was used to establish the stage (see Figure 3.3) of digital preservation capability of the National Library of Namibia. The findings on these research questions provided an understanding of the appropriateness of the digital preservation strategies employed at the National library of Namibia in relation to the format of information sources, as well as the digital preservation capability of the National library of Namibia.

Consumers, the designated community, and access: Consumers are the individuals, organisations, or systems that consume, or use, the information preserved by OAIS. This section in the OAIS Reference Model provides the services and functions that support consumers in determining the existence, description, location, and availability of information stored in the OAIS (Consultative Committee for Space Data Systems, 2012: 4-3). Consumers interact with an OAIS-type archive in a variety of ways, including queries for assistance, searches and requests for access to archived information objects. The reference model defines a special class of consumers known as the designated community: a subset of consumers expected to independently understand the archived information in the form in which it is preserved and made available by the OAIS. One of the mandatory responsibilities of an OAIS is to preserve information in such a way that it is independently understandable to its primary users (Digital Preservation Coalition & Lavoie, 2014: 10). These consumers represent a variety of interests, and their access requirements are likely to change over time (Dollar & Ashley, 2015: 14).

In terms of access, the objective of digital preservation is to guarantee that electronic records remain usable, comprehensible and trustworthy for access as far into the future as may be required. This access capability may include the creation and maintenance of user searchable retrieval metadata that can be queried to identify information of interest and disclosure free (redacted to protect privacy, confidentiality and other rights, where appropriate) (Dollar &

Ashley, 2015: 34). Furthermore, the access component is responsible for supporting consumers, for example, users looking for content in finding, requesting and receiving information stored in the system with ease (Strodl et al., 2007: 32). It also includes access control, request coordination, response generation in the form of dissemination information packages and delivery of responses to consumers (Strodl et al., 2007: 32).

The consumers, the designated community and access components was used to investigate the third research question which is: What are the views of the National Library users, National Library of Namibia staff, NLAS staff, Legal Deposit Committee members and NLIC members on digital preservation of national documentary heritage? The research would like to establish how the consumers of information at the National Library of Namibia currently access information preserved by the National Library of Namibia and determine their views on aspects of digital preservation of information sources in the library. These views could assist the National Library of Namibia with future planning and management of digital preservation activities.

Ingest: Ingest refers to receiving and accepting electronic records from records producers (Dollar & Ashley, 2015: 27). Ingest provides the services and functions to accept submission information packages from producers (Strodl et al., 2007: 32). It is a set of processes responsible for accepting information submitted by producers and preparing it for inclusion in the digital repository. Specific functions performed by Ingest include receipt of information transferred to the OAIS by a producer; validation that the information received is uncorrupted and complete; transformation of the submitted information into a form suitable for storage and management within the archival system; extraction and/or creation of descriptive metadata to support the OAIS's search and retrieval tools and finding aids; and transfer of the submitted information and its associated metadata to the archival store (Consultative Committee for Space Data Systems, 2012: 4-1).

The ingest function serves as the OAIS's external interface with producers, managing the entire process of accepting custody of submitted information and preparing it for archival retention (Consultative Committee for Space Data Systems, 2012: 4-1; Digital Preservation Coalition & Lavoie, 2014: 12). Ingest further performs quality assurance and generates information sources which are compliant with the set standards (Strodl et al. 2007: 32). With Ingest, a library receiving documentary heritage, needs to operationalise or set formats of resources it will be

accepting especially with e-deposit. This study used the ingest component to investigate the fourth research question which is: To what extent does the Namibian legal deposit framework make provision for electronic information sources deposit to the National Library of Namibia? The findings on this research question provided an understanding of the nature and prospects of deposits of electronic documentary heritage at the National Library of Namibia. The findings of this research question were resourceful for proposing a digital preservation framework for the National Library of Namibia, as well as for the Namibia library and information sector.

Technical expertise: A viable digital preservation capability requires organisations to have sufficient expertise in electronic records management and digital preservation to support all the infrastructure and requisite key processes, including ongoing professional development for personnel and certification of the repository. Technical expertise may exist within the internal or contracted staff, may be provided by a centralised service bureau, or by external service providers (Dollar & Ashley, 2015: 20). The study used this component to investigate the third research question which is: What are the views of National Library users, National Library of Namibia staff, NLAS staff, Legal Deposit Committee members and NLIC members on digital preservation of national documentary heritage? However, the technical expertise component was only used to investigate the National Library of Namibia staff digital preservation expertise and skills deficit. This component was also used to answer the fifth research question which is: What digital preservation framework is appropriate to the National Library of Namibia? and particularly identifying and recommending the type of training needed by the National Library of Namibia staff members. The findings of these research questions could assist the National Library of Namibia in developing a professional development programme for staff members responsible for digital preservation activities. The findings further contributed to the design of a proposed digital preservation framework for the National Library of Namibia, as well as for the broader Namibian library and information sector.

Security: Digital preservation necessitates processes that control access to the physical repository housing digital content, guarantee the security of electronic records through measures preventing unauthorised access, safeguard the confidentiality and privacy of records and intellectual property rights, facilitate regular backup of electronic records stored at offsite storage facilities, and enable disaster recovery and business continuity measures (Dollar & Ashley, 2015: 32). This aspect was used in this study to understand the first and fifth research questions which are: What are the current preservation practices of information resources at

the National Library of Namibia? and What digital preservation framework is appropriate to the National Library of Namibia? The findings of these research questions are envisaged to shed light on the practices of protecting documentary heritage content in terms of user privacy and confidentiality. The findings of these research questions also assisted in the development of a proposed digital preservation framework for the National Library of Namibia as well as for the Namibia library and information sector.

The researcher considered the OAIS Reference Model and DPCMM appropriate theoretical models for the study because they complement each other in terms of addressing digital preservation issues in memory institutions. The researcher triangulated these two models because triangulating theories has the possibility of enhancing the researcher's understanding of the phenomenon under investigation (Ngulube, Mathipa & Gumbo, 2015: 55). The researcher used the two models to develop and propose a framework that could be suitable for digital preservation at the National Library of Namibia and other libraries. The OAIS Reference Model models the functions involved in the long-term storage of information sources and access to digital information (Muir, 2001: 673). It is appropriate for the planning of digital preservation of national digital cultural heritage content and it is considered the best digital preservation framework (Adu & Ngulube, 2016). Besides, the OAIS Reference Model has been used in several preservation studies and digital preservation projects to provide a roadmap for digital preservation activities (Saur, 2006; Knight & Hedges, 2007; National Library of Finland Digital Preservation Project, 2012; Rudersdorf, 2012; Peyronnin, 2015; Adu & Ngulube, 2016; Anyaoku et al., 2019; Umana, 2019; Keneilwe, 2020; Nakale, 2023).

The OAIS Reference Model and DPCMM were used in this study as benchmarking tools for preservation strategies, drawing insights from other national libraries engaged in the preservation of cultural heritage information sources. A study conducted by the National Library of the Netherlands on digital preservation practices in 15 national libraries across Europe and in the United States of America found that all 15 national libraries stated that their digital repositories are or will be OAIS-compliant in some, if not all, aspects (Van der Verheul & Van Wijngaarden, 2007: 117). Digital preservation has witnessed the development of two frameworks aimed at supporting the establishment of digital preservation solutions. These frameworks include the Utility Analysis approach developed at Vienna University of Technology and the Dutch Testbed designed by the National Archive of the Netherlands (Strodl et al., 2007: 32). According to Strodl et al. (2007: 32), the Utility Analysis framework provides

a clear hierarchical structuring of preservation objectives, documenting the requirements and goals for an optimal preservation solution. On the other hand, the Dutch framework offers a detailed definition of the environment and standardised experimental procedures. Therefore, these frameworks were not appropriate for the current study because they provide guidance and a step-by-step process (objective tree) to implement a digitisation project which is not the focus of this study. The current study focussed on the preservation practices and strategies of the National Library of Namibia.

Another popular model used for digital preservation activities is the Lifecycle Model. This model focuses on understanding and evaluating the long-term costs of preservation and it models the digital lifecycle and calculates the costs of preserving digital information (Davies et al., 2007). It outlines stages involved in digitisation that include creation, capturing, indexing, managing, accessing, retrieving, etc. (Davies et al., 2007). This model is relevant in preservation studies and Mutula (2014) used it to establish the status of digital heritage preservation management in Eastern Africa. However, this model was not appropriate for the current study because the study focussed on the preservation practices and strategies of the National Library of Namibia. The information source's lifecycle and cost of preservation, which are the focal points of the Lifecycle Model, are not part of the scope and focus of this study.

2.5 Summary of the chapter

This chapter discussed the components of the OAIS Reference Model and DPCMM which are used as theoretical models in this study. The chapter explain how these models were used in this study to understand digital preservation at the National Library of Namibia. The chapter also presented how the OAIS Reference Model and DPCMM have been used in other studies that relate to the present study. Finally, it justified why other theoretical models relevant to digital preservation were not preferred for the current study. The next chapter reviews related literature that informed this study.

Chapter 3 : Literature Review

3.1 Introduction

A literature review is a critical assessment and summary of the range of past and contemporary literature in each area of knowledge (Fox & Bayat, 2014: 35). It is considered to be an essential step in reviewing the accumulated knowledge of one's research question (Neuman, 2014:126). It also refers to a discussion of the important research that has previously been done in the field being researched (Bertram & Christiansen, 2014: 13; Maree, 2016: 28). The aim of a literature review is to identify a collection of published research reports that delineate the existing state of knowledge within a particular area. Additionally, it seeks to pinpoint any gaps in that knowledge base that the study intends to address (Gravetter & Forzano, 2016: 48).

In a research project, such as the current one, a literature review provides an overview of the major studies related to the research problem (Creswell & Creswell, 2018: 26) and offers an understanding of the depth and breadth of discussion on relevant philosophical traditions and their connection to the problem (Hart, 2000: 15). According to Fox and Bayat (2014: 36), the literature review signals to the reader that the researcher is acquainted with recent developments in the research area, aiding in the interpretation of the research and the establishment of its relationship with existing knowledge.

The purpose of this literature reviews is to reviews literature on digital preservation. The thematic areas under which the literature is reviewed are largely based on the two theoretical models namely: Open Archival Information System (OAIS) Reference Model (Digital Preservation Coalition & Lavoie, 2014) and the Digital Preservation Capability Maturity Model (DPCMM) (Dollar & Ashley, 2015) (discussed in Chapter Two) which guided this study and the formulation of the study's research questions (highlighted in Chapter One).

In this study, the literature reviewed was based on the numerous sources collected on broader and specific issues relating to digital preservation, particularly on: preservation planning and management; preservation policies; consumers and designated library users; preservation strategies, specifically, digitisation, migration, types of migration techniques, technology emulation and encapsulation; legal deposit of electronic resources; and challenges relating to

the preservation of documentary heritage. Searches were done largely in *Google Scholar* and significant literatures comprising of conceptual literature (technical reports and conceptual papers), especially on preservation strategies, was reviewed. Empirical literature was also reviewed from amongst regional and global literature.

3.2 Preservation planning and management

Digital preservation has recently garnered significant attention from various stakeholders and organisations, including the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the International Federation of Library Associations and Institutions (IFLA). UNESCO (2016: 5) advises that heritage institutions must be pro-active in identifying digital heritage and information for long term preservation before it is lost. Digital preservation planning activities have been embraced by several institutions worldwide but there is little literature on the subject for the African continent. A variety of projects focusing on digital preservation have been observed especially in the western world since 1996. Some of these projects include a Digital Preservation Coalition established in the United Kingdom (UK); Preserving Access to Digital Information (PADI) by the National Library of Australia; the National Digital Information Infrastructure and Preservation Programme (NDIIPP), a project initiated by the Library of Congress; Digital Preservation Europe (DPE) is a coordinated action initiated by the European Union (EU) aimed at enhancing collaboration and synergies among existing preservation initiatives across Europe; the Electronic Resources Preservation and Access Network (ERPANET) is a project led by the Humanities Advanced Technology and Information Institute (HATII) at the University of Glasgow (United Kingdom), in collaboration with partners such as the Schweizerisches Bundesarchiv (Switzerland), ISTBAL at the Università di Urbino (Italy), and the Nationaal Archief van_Nederland (Netherlands).

The Networked European Deposit Library (NEDLIB) is a collaborative project involving European National Libraries aimed at facilitating access to and preservation of digital resources; the Digital Preservation Coalition (DPC) is a digital preservation agenda within the United Kingdom, focusing on developing strategies and best practices for digital preservation. Moreover, digital Innovation South Africa (DISA) is a national collaborative initiative in South Africa aimed at digitising liberation struggle resources and promoting digital innovation in the country. In Africa, national libraries, it seems, have not come to the fore in initiating and

advancing digital preservation initiatives. If they are, it could be that little has been documented.

A national library holds the responsible for strategic planning, coordination, and implementation of preservation activities on a national scale (Krtalić & Hasenay, 2012: 373). However, in the context of this study, preservation activities are collective efforts involving NLAS, NLIC and the National Library of Namibia. Preservation planning is considered the most difficult part of digital preservation in terms of the technical aspects of the process and the financial aspect of the process (Strodl et al., 2007: 32). Digital preservation is a meticulous process that demands thorough planning and meticulously devised procedures to impact the accessibility of information sources (Van der Verheul & Wijngaarden, 2007: 120). Henceforth, this process is referred to as the selection of the appropriate preservation strategy based on organisational requirements and the characteristics of the collection (Farquhar & Hockx-Yu, 2007: 89).

Preservation planning also means a library considering and planning for unavoidable loss of document in the preservation process during migration and emulation processes (Strodl et al., 2007: 30). Van der Verheul and Van Wijngaarden (2007: 110) elucidate that ensuring long-term storage and permanent access to documentary heritage demands significant and ongoing investment in financial, technical and staffing planning at the organisational level. Several libraries with digital preservation initiatives were started as analogue preservation efforts (Chowdhury, 2010: 209). Preservation planning and management play crucial roles in ensuring the longevity and availability of library materials (Krtalić & Hasenay, 2012: 355). Knight (2010: 90) explains that any digital preservation implementation should have clear digital drivers for digital preservation. These drivers include long term preservation mandates; the nature of digital collection; the extent/size of a digital collection, currently and in the future; institutional policy requirements for digital preservation; the status of digital preservation within an institution; and funding for digital preservation.

Becker et al. (2009: 155) propose that preservation planning should transition from ad-hoc decision-making to a systematic and ongoing management activity. Preservation planning and decision-making typically involve highly skilled and trained professionals who play a crucial role in guiding the process. These individuals are responsible for providing support throughout the decision-making process, particularly in selecting software tools that ensure comprehensive

traceability and documentation of all factors that impact the final decisions; preservation planning should determine preservation levels, policy issues, defining characteristics of objects, and the need for preservation (Van der Verheul & Wijngaarden, 2007: 120).

According to Becker et al. (2009: 137), a preservation plan delineates a series of preservation measures that an accountable institution must implement in reaction to recognised risks concerning a particular group of digital objects. Furthermore, this plan considers preservation policies, legal responsibilities, organisational technical limitations, and user needs. According to Becker et al. (2009: 137), a preservation plan should have the following elements:

- Identification: The preservation plan should have a unique identifier for easy reference and retrieval;
- Status and triggers: It should indicate the current status of the plan (e.g., being defined, awaiting approval, or active) and the events or triggers that prompted its creation or revision;
- Description of the institutional setting: This section should outline the institutional context, including the organisation's mandate, designated community, and relevant legal and operational policies;
- Description of the collection: It should specify the objects to be preserved, including their names and types;
- Requirements for preservation: Detailed requirements underlying preservation decisions should be outlined here, such as process characteristics and cost limits;
- Evidence of decision for preservation strategy: This part is crucial for documenting accountable decisions, including alternative actions considered, evaluation results, the chosen preservation strategy, and its expected impact on the collection;
- Cost: Estimated costs associated with implementing the preservation plan should be specified;
- Role and responsibilities: This section should define the roles and responsibilities of individuals involved in carrying out, monitoring, and potentially re-evaluating the plan; and
- Preservation action plan: Concrete actions to be taken to ensure the longevity and accessibility of the digital collection over time (Becker et al., 2009).

According to Van der Verheul and Van Wijngaarden (2007: 110), planning digital preservation activities requires an understanding and overview of recent developments in the field of digital preservation. Digital preservation planning also requires workflow planning (see Figure 3.1). A workflow can be divided into three phases: (a) creation/characterisation: this can refer to mass digitisation of content which serves as a means of preservation also known as digitisation for preservation. This phase also refers to born-digital sources/content which the library has not created but for which the library needs to ensure future preservation. This process includes identification, validation, and description (preservation metadata); (b) storage: digital objects, herein referred to as documentary heritage, need a unique identifier before it can be stored, the resource can be optimally packaged, and it has to be stored in a safe environment. Documentary heritage has to be checked regularly to establish if it is still in good condition. The library needs to set up and maintain a digital storage system and they require constant quality management. Information carriers have to be refreshed and the integrity of the bits and the bytes has to be guarded; and (c) representation: a digital publication always need a computer programme to be translated into readable language for it to be accessible. However, programme obsolescence is a threat to publication access (Van der Verheul & Van Wijngaarden, (2007: 111). An illustration of workflows planning is presented in Figure 3.1.

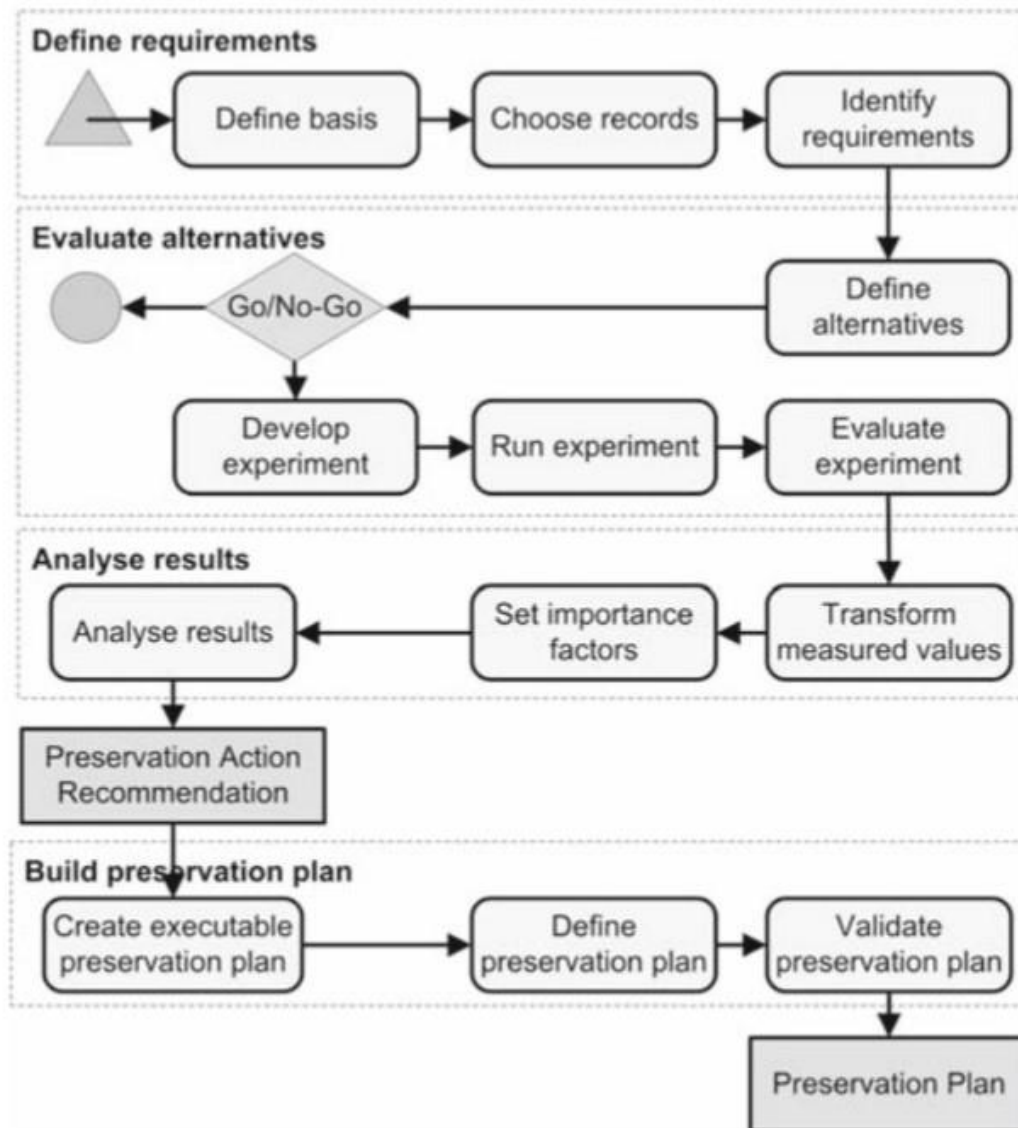


Figure 3.1: Preservation planning workflow

(Becker et al., 2009: 141)

Figure 3.1 depicts a three-phase process consisting of a total of 11 steps; these steps enable a library to have a detailed digital preservation workflow and they are as follows:

- **Define basis:** this step focuses on describing the collection to be considered for digital preservation and legal issues. It also describes the environment in which the preservation process takes place including institutional policies for preservation (Strodl et al., 2007: 33);
- **Choosing records:** The step of choosing records involves selecting sample records that represent the various characteristics of the collection under consideration. These samples are used for evaluating preservation alternatives (Strodl et al., 2007: 33). This step describes

the set of objects that forms the scope of the current plan, and selects a subset of representative objects for experimentation (Becker et al., 2009:142);

- Identify requirements: this step is considered the heart of preservation planning (Becker et al., 2009: 142). This step establishes the requirements and goals for a preservation solution within a specific application domain. This stage includes defining the characteristics of resources, preservation processes such as usability and complexity, personnel, technical, start-up and operational expenditures cost (Strodl et al., 2007: 33);
- Define alternatives: defining the possible courses of action to be taken into consideration (Becker et al., 2009:145). This step includes defining suitable digital preservation strategies and costs for these strategies (Strodl et al., 2007: 33);
- Go/No-Go: this step involves re-evaluating the current situation and assessing whether it is feasible and cost-effective to proceed with the planning process. During this step, the library defines the requirements, explores alternatives, and estimates resources to determine the feasibility of proposed strategies. It is crucial for making decisions about whether to continue with the evaluation process, justify the abandonment or postponement of certain preservation strategies, or proceed with alternative approaches (Strodl et al., 2007: 33);
- Develop experiment: this step involves establishing and documenting the configuration of the tools used for conducting experiments, thereby laying the foundation for the execution of experiments in the subsequent step (Becker et al., 2009: 146). At this stage, the library creates a detailed development plan for each experiment, outlining the software and hardware systems needed for the experiment environment. Additionally, mechanisms for capturing and documenting the results of the experiments are established (Strodl et al. 2007: 34);
- Run experiment: this stage is meant to test the preservation strategies defined at step four (Strodl et al., 2007: 34). During this step, a series of experimental results are generated, which are then analysed and stored as evidence. In the case of conversion, the resulting output files are stored for future reference and analysis;
- Evaluate experiments: In this stage, the experiments are evaluated to assess the extent to which they meet the requirements defined in the objective. Recording the evaluation of the experiment results finalises the empirical evidence base for decision-making, marking the conclusion of the second phase of the preservation planning workflow;

- Transform measured values: this stage is meant to determine the unacceptable results of a specific strategy and serves as a dropout criterion for preservation strategies (Strodl et al., 2007: 34);
- Set importance factors: during this step, importance factors are assigned to each objective based on the specific preferences and requirements of the scenario; and
- Analyse results: in the final step of the digital preservation planning workflow, all the evidence produced during the previous phases is thoroughly considered. Performance measures for individual objectives are aggregated into a single comparable value for each strategy.

The above preservation planning process should be brief, objective and well documented for it to be effective (Strodl et al., 2007: 34). One of this study's research questions is to ascertain what long-term preservation policies and strategies are in place or are needed to provide digital access to Namibia's documentary heritage. The above digital preservation planning workflow was used as a benchmark to establish the practices at the National Library of Namibia for digital preservation. The digital planning workflow was also used to establish if the National Library of Namibia is ready to digitally preserve the documentary heritage in its collection. In the context of this study, digital preservation readiness refers to (1) the level of organisational awareness of specific digital preservation planning issues; and (2) the managed activities that specifically address digital preservation currently taking place within an organisation (Dorner, 2009: 342).

A survey conducted on best practices in digital preservation by the National Library of Netherlands in several European countries and the United States of America (USA) revealed that these libraries are aware of the need to plan for future representation to be able to keep digital objects accessible for future generations and for embedding of digital preservation within the library structure (Van der Verheul & Wijngaarden, 2007: 111). A study by Knight (2010: 86) at the National Library of New Zealand, concludes that one of its priorities in digital preservation is to promote the creation, sharing and preservation of information that reflects the country's histories, identities, cultures, stories, language, values and beliefs. Hedstrom (1998: 200) noted as far back as the 1990s, that planning for preservation must become an integral part of the design and management of a library. Del Pozo, Long and Pearson (2010: 297) advise that the following should take place before a library makes a preservation strategy

decision: the library should identify that there is a requirement or intention to preserve resources; identify and describe specific characteristics and properties of the objects that the institution wishes to preserve and define the timeframe needed for the objects to be preserved. Krtalić and Hasenay (2012: 372) conclude that preservation management is brought together within components, such as policies and strategies, financial issues, legal regulations, knowledge and competences, preservation methods and techniques and user needs.

A study by the National Library of the Netherlands between 2005 and 2006 on the best practices in digital preservation in 15 national libraries (Australia, Austria, Canada, China, Denmark, France, Germany, Japan, the Netherlands, New Zealand, Portugal, Sweden, Switzerland, the United Kingdom and the United States of America) established that digital preservation may include cooperative activities between two or more library units (Van der Verheul & Wijngaarden (2007: 112). Another notable aspect of planning for digital preservation is that when e-deposit was introduced in libraries such as Koninklijke Bibliotheek (KB), a new department in the library called e-depot was established. E-deposit should be integrated with the existing deposit workflow (Van der Verheul & Wijngaarden, 2007: 112). This aspect of planning is commendable and a good practice which other national libraries especially in Africa could learn from. A study by Van der Verheul and Wijngaarden (2007) was instrumental in formulating questions, in the current study, for the National Library of Namibia management staff in order to determine how e-deposit were handled and if the library has a dedicated unit for facilitating e-deposits.

In Africa, a study by Masenya and Ngulube (2019: 4) on digital preservation practices in academic libraries in South Africa revealed that 68.2% of the respondents indicated that they had a formal digital preservation programme in their institutions, and the majority (95.5%) of respondents indicated that they had undertaken efforts to preserve digital materials. Masenya and Ngulube (2019: 4) found that the majority of academic libraries in South Africa were dedicated to implementing digital preservation programmes in their institutions. Furthermore, these libraries had initiated efforts to preserve digital materials within their establishments. These institutions' reason for digital content preservation was to ensure long term access to digital resources (Masenya & Ngulube, 2019).

Digital preservation planning and management have presented some challenges to libraries and institutions. In a baseline study conducted by Kalusopa and Zulu (2009: 106) on the state of

digital heritage material preservation in Botswana, it was revealed that several challenges hinder libraries from effectively preserving their resources. These challenges include the absence of coordinated national initiatives and programmes on digitisation, gaps in the required human resources in terms of knowledge, skills and competencies to drive digital heritage material preservation in heritage institutions, as well as the lack of standards in digital heritage material preservation regarding hardware, software, storage media and metadata.

These findings concur with the findings of Mutula (2014: 372) on the status of digital heritage preservation management in Eastern Africa, which established that institutions responsible for heritage management were ill-equipped to function in this role effectively. Besides the capacities and absent of initiatives, Ngulube (2012: 131) states that although national libraries have a role to document and preserve their respective countries' documentary heritage, in Sub-Saharan African countries, not much has been done in facilitating the capture and preservation of long-term access in an Information Communication Technology (ICT) driven environment. The findings of Ngulube (2012) calls for further investigations to determine the underlying reasons why national libraries in Sub-Saharan region are not actively involved in long-term preservation of documentary heritage. Hence these literatures were used to ascertain how prepared the National Library of Namibia is in terms of infrastructure to digitally preserve Namibia's documentary heritage.

A study by Majumdar (2005: 187) on preservation and conservation of literary heritage in India concluded that libraries were not equipped with the financial resources for upkeep and preservation of their precious collections. Furthermore, a study by Gbaje and Mohammed (2013: 483) in Nigeria revealed that there is a lack of institutional support for digital preservation activities. Asproth (2005: 35) concludes that most of the challenges associated with digital preservation are strategic, organisational and structural, and not technical. The researcher identified a gap in the literature on preservation planning in the African continent.

Literature consulted on preservation management and planning reflects that there are quite a few digital preservation projects recorded in several European countries as well as in the United States of America and only a handful projects have been recorded in Southern Africa, to the knowledge of the researcher. A gap thus exists in terms of projects undertaken by national libraries in African countries, especially those which are entrusted with preserving national documentary heritage. There have been few or isolated studies done on digital preservation

management in academic libraries and very few on national libraries in Africa with a number of these studies highlighting challenges experienced. However, details from such studies regarding the detailed planning processes and workflow for these isolated cases are missing in the literature. The state of and challenges to the National Library of Namibia regarding planning and management of digital preservation activities are not documented and not known, to the researcher's knowledge; therefore, the significance of this study which investigated how the National Library of Namibia was planning and managing digital preservation activities to ensure access, for posterity, to Namibia's documentary heritage.

3.3 Preservation policies

Preservation policies are important to provide a roadmap to achieve long-term access and the future of digital preservation (Adu & Ngulube, 2016: 755); to provide guidance and authorisation on the preservation of digital materials; and to ensure authenticity, reliability and long-term accessibility (The Electronic Resources Preservation and Access Network, 2003: 3). According to Drijfhout, (2007: 58), a digital preservation policy would state the principles and long-term direction that would guide preservation strategies and actions. Li and Banach (2011) explain that developing preservation policies ought to be the first step toward guaranteeing preservation action. Li and Banach further state that preservation policies should make clear what content requires short, medium, or long-term preservation. Nooman (2014: 12) explained that the goal of a digital preservation policy is to provide guidance and authorisation on the preservation of digital materials and to ensure the authenticity, reliability and long-term accessibility of them. A digital preservation policy is deemed essential for managing the risks linked to rapid computer hardware and software obsolescence. It serves as a strategic plan of action for safeguarding digital objects (Gbaje & Mohammed, 2013: 484).

Nooman (2014) explains that a good digital preservation policy should contain some of the following elements:

- **Introduction and Purpose:** this section provides a contextual background and rationale for the policy, outlining the necessity and objectives behind implementing digital preservation measures;

- **Mandate:** the policy describes the overarching goals and intentions of the institution's digital preservation program, often aligning with the organisation's broader mission and objectives.
- **Scope:** this part defines the boundaries and priorities of digital preservation efforts, specifying which types of materials will be preserved, including born-digital resources, digitised materials, and commercially available digital content.
- **Challenges:** in this section, the policy identifies and addresses the various challenges and risks associated with digital preservation, articulating the obstacles and potential dangers involved in preserving digital materials.
- **Principles:** a statement that addresses the values and philosophy by which an organisation operates its digital preservation programme articulates the guiding principles and beliefs that shape how the organisation approaches and conducts its efforts in preserving digital materials;
- **Roles and Responsibilities:** this section entails identifying and delineating the different roles involved in the digital preservation process, categorising these roles at both institutional and unit levels within the organisation. This may include establishing group roles or identifying individual roles pertinent to the effective execution of digital preservation activities;
- **Selection and acquisition:** criteria for selecting materials for preservation; and
- **Access and use:** this section comprises a statement that addresses the principles of open access, along with delineating the levels of restrictions and limitations in providing certain services.

Several national libraries, research libraries, and academic libraries worldwide, particularly in Western countries, have acknowledged the importance of implementing digital preservation policies. A survey conducted by the National Library of the Netherlands across various European countries and the USA found that most national libraries are cognisant of the necessity for comprehensive preservation policies (Van der Verheul & Van Wijngaarden, 2007: 111). Additionally, research conducted by Li and Banach (2011) on digital preservation practices within institutional repositories in the USA, revealed a growing trend among research libraries towards advancing their digital preservation initiatives through the formulation of preservation policies. Other notable studies include a study by Dressler (2017), on the current state of digital preservation policies at member libraries of the Association of Research

Libraries (ARL) in the USA, which established that 40% of the institutions had preservation policies. The study also reveals that 26% of the institutions indicated that they have preservation policies and provided templates for these policies. However, these policy templates lacked details on how they will be carried out and who will be responsible for completing the work.

An online survey conducted by Dorner (2009: 344) in New Zealand regarding digital preservation readiness in government institutions found that 76.9% of participating institutions reported lacking a digital preservation policy or strategy. Similarly, a study by da Silva Júnior and Manuel Borges (2017) examining the implementation of digital preservation policies at institutional repositories of Brazilian Federal Universities revealed the absence of published digital preservation policies in these universities. Additionally, Rachman (2019) observed that academic libraries in Indonesia had yet to establish digital preservation policies.

In Africa, a study by Masenya and Ngulube (2019: 7) on digital preservation practices in academic libraries in South Africa establish the majority of respondents (77.3%) had written digital preservation policies in place. A study by Matlala et al. (2022) which investigated the state of digital records preservation in South Africa's public found an absence of legislation and policies. A study by Kalusopa and Zulu (2009) in Botswana reveals a lack of a national policy framework and weak policy formulation on digital heritage material preservation and relevant legislation on ICTs, especially on digital material preservation. The same sentiments were revealed by Mutula's (2014) study, which found weak policy and regulatory frameworks in Eastern Africa. Besides weak digital preservation policies, inadequate policies to support the implementation of long-term preservation of digital content was found by Ndegwa et al. (2022) in Kenyan institutional repositories. A study at the National Library of Nigeria reveals that the national library has a digital preservation policy guideline (Gbaje & Mohammed, 2013: 487).

A study by Anyaoku et al. (2019: 51) on institutional repositories (IRs) established in 24 university libraries across Africa revealed that (58.3%) of respondents developed digital preservation policies to oversee the implementation of digital preservation for IR contents. Conversely, in South Africa, a study by Netshakhuma (2021: 15) evaluating the preservation of cultural heritage materials at the University of Witwatersrand found a deficiency in a policy framework developed by the university to manage cultural heritage materials. Research conducted by Balogun and Kalusopa (2022) on digitisation of Indigenous Knowledge Systems

(IKS) in Institutional Repositories (IRs) in South Africa highlighted that several institutions lack policies to guide the digital preservation of IKS. Additionally, respondents were unaware of any policies specifically addressing the digital preservation of IKS. Hence, lack of preservation policy and strategies to manage digital heritage materials was also noted in most Ghanaian institutions (Boamah, 2014). A study by Kaminyoge and Chami (2018: 112) assessed the preservation of archival heritage resources in the Zanzibar national archives and found that the legal framework and the Archives Act is ineffective and does not cover digital methods for preserving documentary heritage.

A study by Gbaje and Mohammed (2013: 488) in Nigeria found that although the National Library of Nigeria has a digitisation policy, it faces the following challenges in implementing this policy: insufficient awareness of the challenges related to digital preservation, inadequate funding, shortage of skilled manpower, lack of appropriate equipment, and a deficit in trained staff within the digitisation unit are notable issues. The challenges identified by Gbaje and Mohammed, could be as a result of lack of elements of good preservation policy highlighted by Nooman (2014). The lack of digital preservation policies means that in the event of technological obsolescence, librarians would not be able to react urgently to the changes (Olatukun, 2008: 3; Kavishe & Dulle, 2016: 4). Research conducted by Anyaoku et al. (2019) in 24 university libraries across English-speaking African countries indicated that the majority of these libraries, which maintained institutional repositories (IRs), had formulated digital preservation policies to steer the implementation of IR contents. However, the context and nature of these policies were not established.

Drijfhout (2007: 63) suggests that while there is still much work to be done, South Africa does have some significant components in place that could form the foundation of a national digital preservation policy. Various fragments of preservation policies are discernible within South Africa. Drijfhout (2007) concludes that South Africa has a long way to go in this regard. Pickover (2009: 8) states that several institutions lacked policy frameworks to guide institutions and countries at a national and institutional level. Nooman (2014: 22) asserts that a well-crafted digital preservation policy represents a significant achievement for an institution as it lays the groundwork for establishing an effective digital preservation program. In Namibia, there are notable studies on the context in which digital preservation is carried out. A study, in the context of the Office of the Prime Minister of Namibia, by Nakale (2023) revealed the unavailability of a digital preservation policy. A study carried out by Umana (2019:133) which

investigated practices of long-term digital preservation activities in institutional repositories at Namibian academic libraries concluded that Academic Library A operates without clear guidance or policy, while Academic Library B operates without any policy to regulate long-term preservation activities.

Literature consulted on digital preservation policies has indicated that several institutions lack digital preservation policies, policies are not clear, there is weak policy framework or there is a lack of good preservation policies. The researcher did not come across a study in the literature that investigated the implementation of digital preservation policy or studies that validate or went to the extent of investigating Nooman's (2014) elements of good preservation policy. In the context of Namibia and the National Library of Namibia, the status of preservation policy or plans to develop this policy is yet to be established by this study. This study aimed to establish if the National Library of Namibia had a digital preservation policy and, if so, ascertain its completeness, that is, if it had all the elements of what is considered as a good preservation policy.

3.4 Consumers and designated library users' access

One of the research questions for this study focuses on the NLN's users' views and attitudes on use and access to digital preservation of national documentary heritage. According to Doyle et al. (2007: 1), digital preserved resources should fulfil several criteria: end-users must have access to the preserved digital documents; the content should be executable, allowing the host machine to render the document in its original environment; and the end-user should be able to interpret and understand the content of the digital document. The OAIS Reference Model recommends that preserved information should be independently understandable to the consumers who interact with this information (Digital Preservation Coalition & Lavoie, 2014: 10). Hedstrom (1998: 192) emphasises that digital preservation should aim to ensure users' satisfaction through access and utilisation of digital materials, while concurrently meeting the immediate needs of the users. Access to legal deposited materials cannot be over-emphasised, Lariviere (2000: 44) elucidates that electronic publications require access before users can retrieve the available information. Technical and legal considerations need to be taken into consideration, for example, the library needs to make sure that information is accessible both currently and retrospectively. In the same vein, the legislation must include provisions ensuring

the deposit resources are accessible by end-users (Lariviere, 2000: 44). In their study on digitisation initiatives by libraries in India, Paul and Singh (2014: 235) outline various reasons that encourage library patrons to utilise digital resources, such as network availability, simplified search processes, ease of use, and decreased reliance on library personnel for locating print materials. A study by Zarei and Abazari (2011: 848) conducted research to assess the web-based services offered by national libraries in Asia. Their findings indicated that the majority of National libraries in Asian countries do not offer online services.

In the current study, NLN users depend highly on staff members to access the Namibian documentary heritage, which, in the view of the researcher, inconveniences library users. In Africa, the state of national libraries providing services and documentary heritage online is yet to be established. A study by Zarei and Abazari (2011: 848) in Asian national libraries concludes that library resource quality at the perceived level of service is less than their minimum expectations. A study by Koninklijke Bibliotheek (2004-2005) involving 15 national libraries across Europe and the USA, established that since these libraries began to digitally preserve their materials, their main target has been to improve access to their collection (Saur, 2006: 48).

At the National Library of Estonia places user-friendly access to digital materials among its top priorities for development. It has adopted a proactive stance in ensuring that authorized users can access e-services and e-collections seamlessly, whether within the library's local network or over the internet. Additionally, the library is focused on creating a unified information portal to enhance compatibility across all e-services and e-collections, facilitating comprehensive searches across databases (Andresoo, 2009: 7). Stephens and Gibby (2011: 62) recommend that web archives and deposited materials (e-deposits) should be accessible remotely to off-site users, as well as those on library premises, with minimal additional restrictions on the number and types of readers accessing the materials. A survey conducted by the British Library underscores the importance of ensuring accessibility for e-materials, suggesting that collecting such materials serves little purpose if they cannot be accessed (Stephens & Gibby, 2011: 62). Inasmuch this is true, it can also be said that one of the purposes of digital preservation especially of documentary heritage, is to make these resources accessible for posterity. However, according to Seadle (2004: 121) digital preservation is no guarantee of access. To ensure access to digitally preserved documentary heritage, an institution needs to devise access strategies. Van der Hoeven and Van Wijngaarden (2005: 1) outline that

permanent access strategies are typically categorized into migration and emulation. Doyle et al. (2007: 6) argue that it is crucial for end-users to specify precisely what needs to be preserved within the preservation environment and in what manner. Although this can lead to abuse of information resources, Lariviere (2000: 53) advises that to avoid abuse of free access to deposited resources in libraries, access should be limited; however, the producer (publishers/authors) of these information sources should be required to permit a limited number of concurrent users to allow ease access and use of information.

The literature reviewed in this section show that libraries' end users' need for access to e-publications, is one of the motives for use of e-publications. Much of the literature available is of studies conducted in European countries. Literature from the user's perspectives regarding digitally preserved documentary heritage resources in African national libraries is significantly absent. Hence this study investigates how national library users access documentary heritage and ascertains their views on aspects of digital preservation of information sources at the National Library of Namibia.

3.5 Preservation strategies

Preservation strategies encompass methods aimed at ensuring the permanent accessibility of stored materials (Saur, 2006: 20). This involves transferring digital information onto newer media before the old media becomes obsolete, making data retrieval impossible (Lee et al., 2002: 94). The long-term digital preservation process involves developing and implementing strategies to ensure sustained accessibility to these objects (Van der Hoeven, Lohman & Verdegem, 2007: 124). Libraries have developed various strategies and tools over the years for transmitting printed sources across different media formats (Dahlström, 2010: 83). This transmission of documents can be considered as preservation strategies. Houghton (2016) explains that the shorter lifespan of digital materials makes the need for timely and effective preservation actions or strategies urgent.

Digital preservation in many instances is necessitated by the obsolescence of digital media and if this content is not preserved in an appropriate form; over time, older media may become inaccessible and suffer from physical deterioration (Thibodeau, 2002: 12). Seadle (2004: 119) states that selecting materials for digital preservation depends on the following three criteria:

(1) materials are both valuable and endangered; (2) materials appropriate for digitisation procedures and standards for these materials exist; and (3) whether copyright allows reasonable access for educational and research purposes.

A study by Koninklijke Bibliotheek (KB) in 2005, found that numerous libraries involved in the research believed that no single preservation strategy existed to ensure long-term preservation and access for all various types of digital objects (Van der Verheul & Wijngaarden, 2007: 118). The Consultative Committee for Space Data Systems (2012: 4-16) explains preservation strategies can be done on two principles: (1) Technology preservation: This method aims to maintain data in specific logical or physical formats and employs the original technology associated with those formats to access the data and replicate the object; (2) Object preservation: This preservation approach centers on maintaining fundamental characteristics of objects, which are explicitly defined and independent of specific hardware or software. In the current study the above-mentioned two principles are used because the National Library of Namibia has documentary heritage that includes both digital and physical formats.

3.5.1 Digitisation

One of the study's research questions is to determine the current preservation practices of the National Library of Namibia. As highlighted in Chapter One, the National Library of Namibia has much documentary heritage in physical format or medium. The process of digital preservation differs fundamentally from that of preserving physical objects (Thibodeau, 2002: 13). Seadle (2004: 121) states that digitisation is an acceptable method of preservation of library materials. For the documentary heritage at the National Library of Namibia to be digitally preserved, the resources first need to be converted into a digital format through a process of digitisation. In the context of this study, digitisation is considered as a strategy (a tool) to enable digital preservation of documentary heritage sources currently held in print format at the National Library of Namibia. All physical information carriers inevitably degrade over time, resulting in the loss of the information they contain. To mitigate the eventual degradation of physical materials, the information they hold must be duplicated or reconstructed onto another instance of the medium (del Pozo et al., 2010: 291).

It is crucial to distinguish between two digitisation strategies: "mass" and "critical." Mass digitisation involves systematically digitising an entire large collection, document by document, without specific discrimination among documents. Conversely, the critical digitisation strategy targets a single document or a limited set of documents within a collection (Dahlström, 2010: 85-86). In the context of this study, critical digitisation is appropriate as the focus is only on documentary heritage resources acquired by the National Library of Namibia through legal deposit and not the whole collection of the National Library of Namibia. This form of digitisation emerges from preservation projects with the objective of creating replacement copies of deteriorating texts or enhancing the accessibility of rare physical collections (Coyle, 2006: 642). The National Library of Namibia's documentary heritage needs to be digitally preserved for posterity and to provide wide access as its access is limited in the present (physical) format of documents. Dahlström (2010: 84) explains that digitisation is a complex chain of affairs, involving planning, budgeting, selection, etc. Digitisation in many libraries is aimed at access to library resources by the broader audience (Van der Verheul & Van Wijngaarden, 2007: 115). With the National Library of Namibia, the documentary heritage resources are still in closed collections and this study aimed to establish the National Library of Namibia's strategy regarding providing access to these collections to remote library users. A study by Smith and Rowley (2012: 276) on public libraries in the UK established that digitisation was viewed largely as a tool for broadening access and promoting resources, rather than a sustainable form of preservation. A study by the KB Library in 2005 established that several libraries across Europe and the USA started with digitisation of material for access (Van der Verheul & Van Wijngaarden, 2007: 112) and the study also established that a number of these libraries have set up a new working structure to ensure that the necessary measures for digitisation are implemented as smoothly as possible.

Lopatin (2006: 273) found that libraries are undertaking digitisation projects to provide wider access and to preserve materials. Through digitisation, libraries can provide access to all sorts of materials including text, photographs, manuscripts, audio and moving image materials (Lopatin, 2006: 273). As a number of documentary heritage resources at the National Library of Namibia are in the physical format, they need to be digitised to provide access to the wider community and for preservation purposes. According to Van der Verheul and Van Wijngaarden (2007: 114) national libraries all over the world are taking the lead in large-scale mass digitisation. A study conducted by Smith and Rowley (2012) revealed that librarians expressed a keen interest in digitising and integrating more digital content into their services for the

public. However, they encountered limitations due to financial constraints and concerns regarding the long-term sustainability of digital documents. Additionally, they faced challenges in meeting user expectations regarding digital resources. This study's findings align with desk research conducted by Pandey and Kumar (2020: 26), which identified common impediments in digitisation projects, including inadequate funding, the absence of a national-level digital preservation policy, and a lack of technical infrastructure.

In Africa, a study by Dzandza (2019) on digitising the intellectual output of Ghanaian universities revealed that these libraries experienced the following challenges in digitising their resources: lack of adequate and modern equipment; lack of trained personnel; lack of IT skills; and lack of support from IT units in the libraries. Another study by Iwhiwhu and Eyekpegba (2009) on digitisation projects in Nigerian university libraries revealed that libraries lack a written policy on digitisation, have inadequate ICT infrastructures and person power, and that funding and inadequate government support were challenges hindering the digitisation process.

In another context, research on the state of digitisation and digital collection development in public libraries in Croatia by Vrana (2010: 325), found that public libraries-initiated digitisation projects independently, thereby acquiring the necessary experience and skills to facilitate future digitisation endeavours. A study by Motsi (2017) on preservation of endangered archives in Mali, concludes that digitisation can make it possible to provide access to information on obsolete carriers and formats. A study by Balogun and Kalusopa (2022) on digitisation of Indigenous Knowledge Systems in IRs in South Africa revealed that the South African government has invested a lot in the Digitisation of Indigenous Knowledge.

A number of challenges has been identified in digitisation projects in Africa. A study by Seles (2016: 167) on the applicability of Trusted Digital Repositories (TDRs) to the Eastern African archival context, established that digitisation projects often failed to consider the long-term viability of digital records. Seles' study (2016: 167) further highlighted that digitisation of records encountered challenges when decision makers failed to recognise the long-term investments required to ensure the continued accessibility and integrity of digitised records. Seles' study (2016: 167) concludes that there is no cohesive strategy in place to guide African archival practitioners, either across the continent or within different regions, in effectively supporting digitisation efforts and the preservation of digitised records. This study explores

what the National Library of Namibia practices or plans regarding its physical documentary heritage resources.

3.5.2 Migration

Migration is the act of relocating digital content or data from one hardware and software setup to another, or from an older generation of computer technology to a newer one (Lee et al., 2002: 104; Cornell University Library, 2003). Migration, as described by Van der Verheul and Van Wijngaarden (2007: 118), involves modifying the object itself to fit into a new environment. Similarly, the Consultative Committee for Space Data Systems (2012: 5-2) defines digital migration as the process of transferring digital information with the goal of preserving it within the OAIS. This transfer has three attributes, namely:

- Emphasis on preserving the complete information content intended for preservation;
- Viewpoint that the new archival implementation of the information replaces the old; and
- OAIS retains full control and responsibility for all aspects of the transfer.

Brown (2013: 211) delineates three forms of migration. First, 'Normalisation', also referred to as migration on ingest, and seeks to reduce the variety of formats preserved in a repository by actively converting them to a limited number of preferred formats during the initial ingestion process. This approach invests resources up-front, with the intention of minimising the complexity of future preservation but it incurs the risk of nugatory effort. (2) Migration on obsolescence; conversely, leaves migration until the last possible moment, on the basis that this is the point at which effort is justified and allows economies of scale through mass migration. (3) Migration on access; this form of migration takes a middle way, by investing effort only when an object is actually required to be accessed. Once migrated, the repository may choose to retain the new manifestation to avoid the inefficiency of repeated migration. Migration involves converting an object into a newer or more sustainable file format (Becker et al., 2007), with the goal of preserving the original appearance and functionality of the digital object (Tripathi, 2018: 9).

Migration targets the digital object itself with the objective of altering it in a manner that ensures software and hardware advancements do not impact its availability and original representation (Van der Hoeven & Van Wijngaarden, 2005: 1; Van der Hoeven et al., 2007: 124). Okoh and Saliu (2014: 15) elaborate that migration encompasses various tasks involving

the periodic copying, conversion, and transfer of original data from one technological generation to the next. Altering or updating the format of an object enables its rendering in contemporary systems (Van der Hoeven & Van Wijngaarden, 2005: 1). Migration serves as a preservation tactic aimed at maintaining digital objects either in their existing file format or transitioning them to a format that is more manageable, guaranteeing sustained access (Tripathi, 2018: 9). The primary goal of this preservation approach is to uphold the integrity of digital objects, enabling clients to retrieve, display, and utilise them despite the continual advancements in technology (Lee et al., 2002: 104).

A study by Anyaoku et al. (2019: 49) revealed that most (75%) of African academic libraries engaged in digital preservation activities, and migration emerges as the prevailing preservation strategy adopted by these libraries. For instance, the National Library of Netherlands advocates for migration as a preservation tactic to ensure that future users can access objects in a preferred format, especially when no alternative method is available to make a document accessible (Van der Verheul & Van Wijngaarden, 2007: 119).

Although migration as a digital preservation strategy seems to be popular amongst institutions with digital preservation activities, this strategy is not suitable for more complex digital information because in the process much of the functionality of the publication will be lost (Muir, 2001: 663). However, migration can be used effectively in some situations, but it is problematic when applied to large heterogeneous collections like deposit collections (Muir, 2001: 677). Van der Hoeven and Van Wijngaarden (2005: 2) suggest that migration is typically considered a strategy for objects with a shorter lifespan, typically up to 10 years. They further elaborate that the risk associated with multiple migration cycles diminishes the authenticity of the object, making this strategy less ideal for long-term preservation.

Migration of documents with the same format family can lead to unintended and potentially significant alterations to the original object, potentially affecting the appearance of the publication (Van der Hoeven & Van Wijngaarden, 2005: 2; Strodl et al., 2007: 31). Another challenge associated with migration is that once data is earmarked for long-term preservation, it necessitates regular treatment of all selected content (Deegan & Sutherland, 2009: 165). This treatment involves the migration process, which must be repeated when the current format becomes obsolete, potentially leading to further data loss (Tripathi, 2018: 9). The loss of data in this process occurs because migration and reformatting involve transferring data from one

software and hardware platform to another, requiring changes in the format of the data (Deegan & Sutherland, 2009: 165).

The Consultative Committee for Space Data Systems (2012: 5-3) observed that digital migration is both resource-intensive and time-consuming, presenting the OAIS with elevated risks of potential information loss. Van der Hoeven and Van Wijngaarden (2005: 2) identify a weakness with the digital migration strategy and state that:

As migration does not preserve the environment in which the objects are represented, functionalities like scrolling and searching through text, clicking on a cross-reference, or running a query on a database, cannot be preserved authentically.

A study by Adu and Ngulube (2016: 758), which examined the digital preservation strategies in Ghana, found that backup and migration are the most widely implemented digital preservation strategies across ministries and government agencies. Lee et al. (2002: 97) emphasised that while migration may suffice for short-term preservation of simple digital resources created on prominent application packages, it is not a dependable solution for medium to long-term preservation or for more complex digital resources. Migration as a digital preservation strategy requires sound planning.

Hedstrom (1998: 198) stressed that planning for migration poses challenges due to the limited experience with the types of migrations required to sustain access to complex digital objects over an extended period. Hedstrom further states that when a custodian assumes responsibility for preserving a digital object it may be difficult to predict when migration will be necessary, how much reformatting will be needed, and how much migration will be needed (Hedstrom, 1998: 198). A study by Kavishe and Dulle (2016: 1) on the preservation skills and strategies used by the University of KwaZulu-Natal Libraries (South Africa) established that librarians need training in migration and emulation preservation strategies. According to Van der Verheul and Van Wijngaarden (2007: 119), to preserve functionality, migration might not be the right solution and emulation offers more promise. A study by Anyaoku et al. (2019) on the IRs developed in 24 university libraries in Africa established that the popular or common preservation strategy (75%) is migration.

Despite digital migration shortfalls, institutions have fundamental reasons and motivations for preserving their content via digital migration strategy. These motivation/motivators include (Consultative Committee for Space Data Systems, 2012: 5-3):

- Enhanced cost-effectiveness: The rapid advancement of hardware and software technologies leads to increased storage capacities and faster transfer speeds at lower costs. However, it also accelerates the obsolescence of certain media formats and software used for representation information;
- Evolving consumer-service expectations: Consumers of OAIS demand higher levels of service due to advancements in technology, prompting OAIS to adapt and offer different access performance levels to meet these changing demands over time; and
- Media degradation: Digital media degrades over time, becoming less reliable for preserving data. Even with error correction mechanisms, media eventually becomes unreliable and requires replacement. Consequently, Archival Information Packages (AIPs) need to be transferred to newer media to ensure data integrity (Consultative Committee for Space Data Systems, 2012: 5-3).

Digital migration of information sources encompasses various forms and categories, as outlined by Lee et al. (2002: 96) and the Consultative Committee for Space Data Systems (2012: 5-4). These entities identified four primary types of digital migration, categorised based on whether they alter the bit sequences or retain them unchanged.

Lee et al. (2002: 96) explained that migration is categorised into four categories: refreshment, replication, repackaging and transformation. The four categories are further divided into two sub-categories. With the sub-categories, one of the sub-categories focuses on digital migration that does not change the bit in the process of migration and with the other, the bits of information sources change in the process of migration. The four categories are explained below:

Types of migration that do not change the bits:

- **Refreshment:** This form of digital migration involves replacing a media instance containing one or more Archival Information Packages (AIPs) with another instance of the same type. This replacement is accomplished by copying the bits from the old medium to the new one, while maintaining the existing storage infrastructure for

locating and accessing the AIP. Refreshment ensures the preservation of a reliable copy of the bit stream of a digital object without altering the storage setup (Lee et al., 2002: 96; Consultative Committee for Space Data Systems, 2012: 5-5-6); and

- **Replication:** In this type of digital migration, there is no alteration to the packaging information, content information, or Preservation Description Information (PDI). The bits used to represent these information objects are preserved during the transfer to either the same or a new media-type instance (Consultative Committee for Space Data Systems, 2012: 5-5).

The types of migration that change the bits:

- **Repackaging:** In this form of digital migration, there are changes made to the bits representing the packaging information. The packaging information is essential for defining and establishing relationships, particularly between the content information and the Preservation Description Information (PDI). If the content information and PDI consist of multiple components, the packaging information may be tasked with delimiting and relating these components. Repackaging ensures the availability of a manageable package for the object (Lee et al., 2002: 96; Consultative Committee for Space Data Systems, 2012: 5-5-6); and
- **Transformation:** This type of digital migration involves alterations to the content information or bits while attempting to preserve the full information content. These modifications result in changes to specific bits within the content information or PDI, accompanied by corresponding adjustments in the associated representation information. Transformation modifies the bit-stream of a digital object (Lee et al., 2002: 96; Consultative Committee for Space Data Systems, 2012: 5-5-6).

3.5.3 Technology emulation

Another popular digital preservation strategy is digital emulation, also known as technology emulation. Emulation, as described by Lee et al. (2002: 104), involves replicating the functionality of one system using another system of a different type. It entails setting up a system to operate in a manner similar to another system, allowing it to execute its programs. Emulation is essentially the recreation of the technical environment necessary to access and utilise digital resources, for example, games or interactive multimedia content (Cornell

University Library, 2003; Doyle et al., 2007: 2; Strodl et al., 2007: 30; Brown, 2013: 212). According to Brown (2013:212), the use of emulation has been common practices in the preservation of games, and very early computer systems.

Technology emulation aims to provide programme and create new software that mimics the operations of older software and hardware to replicate its performance in a specific environment (Becker et al., 2007; Strodl, 2007: 31; Okoh & Saliu 2014: 14). These hardware and software are called emulators, and they are used to create the functionality of obsolete technical environments on modern computer platforms (Muir, 2001: 664). Van der Hoeven and Van Wijngaarden (2005: 4) state that emulation is a process of bringing digital objects back to life in their original environment on top of a different environment. Van der Verheul and Van Wijngaarden, (2007: 119) explain that emulation is also often used where migration has failed, for example, when preserving a website. This preservation strategy does not centre on the digital object itself, such as documentary heritage resources in this study, but rather on the hardware and software environment in which the object is displayed or was originally created (Van der Hoeven & Van Wijngaarden, 2005: 1; Van der Hoeven, Lohman & Verdegem, 2007: 124). Strodl et al. (2007: 30) elucidate that in the realm of digital preservation, emulation entails recreating a particular version of a software system required to access a file in an obsolete version or format. Documentary heritage at the National Library of Namibia, regardless of what format they may be preserved in, will eventually become obsolete one day, and thus digital emulation of software and hardware at the National Library is necessary.

Emulation is seen as a just-in-time tactic where one computer system replicates the operations of another system, accessing data intended for the original system (Deegan & Sutherland, 2009: 165). When emulations are developed for long-term preservation purposes, their deployment marks a seamless extension of the representation information utilized by the access software they are intended to support (Consultative Committee for Space Data Systems, 2012: 5-15). It can be said that emulation is a strategy appropriate for the digital preservation of documentary heritage that is born digital. In the context of this study, emulation will be appropriate in two ways: for documentary heritage materials electronically deposited in the National Library of Namibia, if there is any, or for documentary heritage materials digitised by the National Library of Namibia.

Digital emulation is regarded as a cost-effective method of preserving data because emulation is only activated when necessary. It presents a potential solution for the long-term preservation of highly intricate documents stored in libraries but no longer maintained by their original creators (Deegan & Sutherland, 2009: 165). Studies (Lee et al., 2002; Knight, 2010; Adu & Ngulube, 2016) have shown that technology emulation is a common preservation strategy. This preservation strategy allows the long-term preservation of digital material (Muir 2001: 664).

Technology emulation provides several benefits over other digital preservation strategies. Lee et al. (2002: 95) states that the advantages of emulation is a re-creation of the look and feel of the resource, and further explain that emulation potentially offers the best solution for very long-term preservation of digital material. According to Woodyard (2000), emulation could be a more suitable solution than migration for long-term access to complex digital resources. However, technology emulation is associated with some challenges. One of the disadvantages is the undefined nature of technological change and the complexity of creating emulator specifications (Lee et al., 2002: 96). Van der Verheul and Van Wijngaarden (2007: 119) state that emulation for digital preservation is considered problematic because of the expectations that emulators are themselves victims of technological change which would not solve the preservation problems. The objective of emulation is to preserve the original appearance, functionality, and user experience of the digital object. This strategy revolves around replicating the technical environment of the resource, ensuring that the original object or a refreshed copy retains its usability in the future (Granger 2000; Lee et al., 2002: 95; Van der Verheul and Van Wijngaarden, 2007: 119). Emulation is often perceived as technically complex, costly, and time-consuming (Van der Hoeven & Van Wijngaarden, 2005: 1). Figure 3.2 illustrates the process of digital emulation.

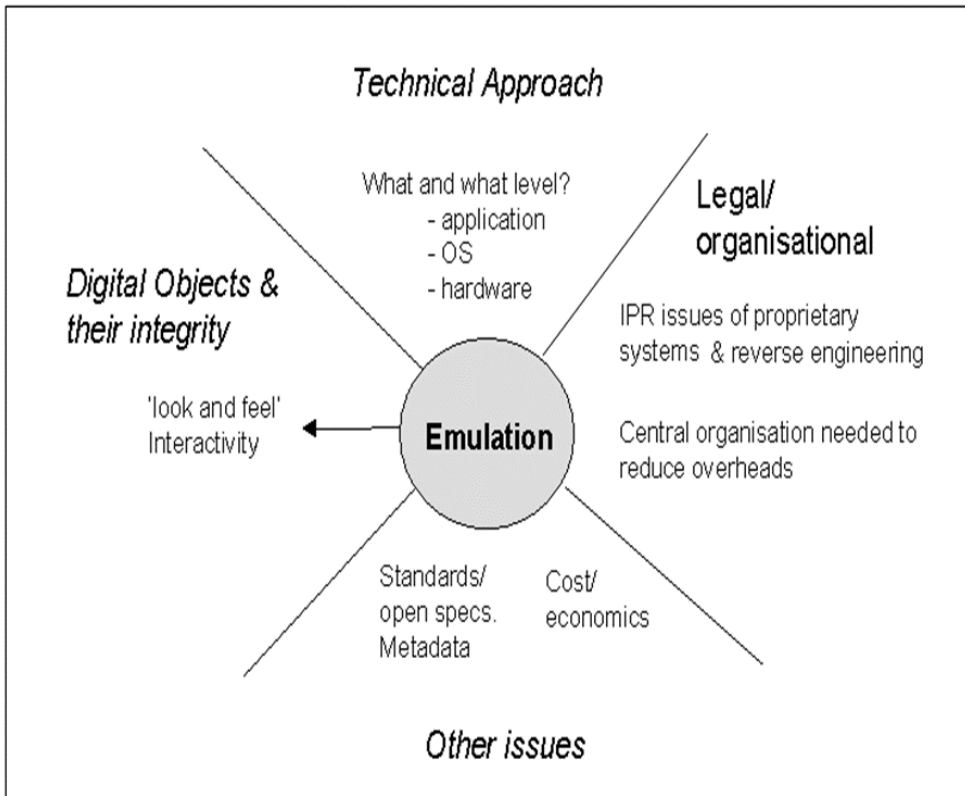


Figure 3.2: Emulation concepts

(Granger, 2000)

The Consultative Committee for Space Data Systems (2012: 5-15) elaborates that once emulation is implemented, the resultant systems are particularly susceptible to previously unidentified software errors, which could significantly compromise ongoing access to information. A study by Adu and Ngulube (2016), which examined the digital preservation strategies in Ghana, found that emulation was the least implemented strategies at 4.2%. In the study conducted by Adu and Ngulube, emulation seemed to be unfamiliar and unknown to the respondents. Similarly, in a study by Anyaoku et al. (2019) on the institutional repositories developed in 24 university libraries in Africa, 30% of the respondent's indicated awareness of emulation.

3.5.4 Encapsulation

Encapsulation is a method aimed at bundling a digital object with all necessary components for accessing it (Lee et al., 2002: 104). Its purpose is to tackle the issue of technological obsolescence concerning file formats by embedding the specific instructions for interpreting

the digital object into the encapsulated information (Lee et al., 2002: 98). This technique is applicable to digital resources with well-known formats that are unlikely to be frequently accessed. It is categorised as a form of migration, involving the creation of the original application used for creating or accessing the digital object on future computing platforms (Lee et al., 2002: 98). Lee et al. (2002: 96) argue that encapsulation forms a solid foundation for long-term preservation. Challenges associated with encapsulation include the necessity for applications to generate encapsulated records, potential storage overhead due to including format documentation within each record and managing information regarding unpublished data formats (Lee et al., 2002: 96). The concepts of digital encapsulation are depicted in Figure 3.3.

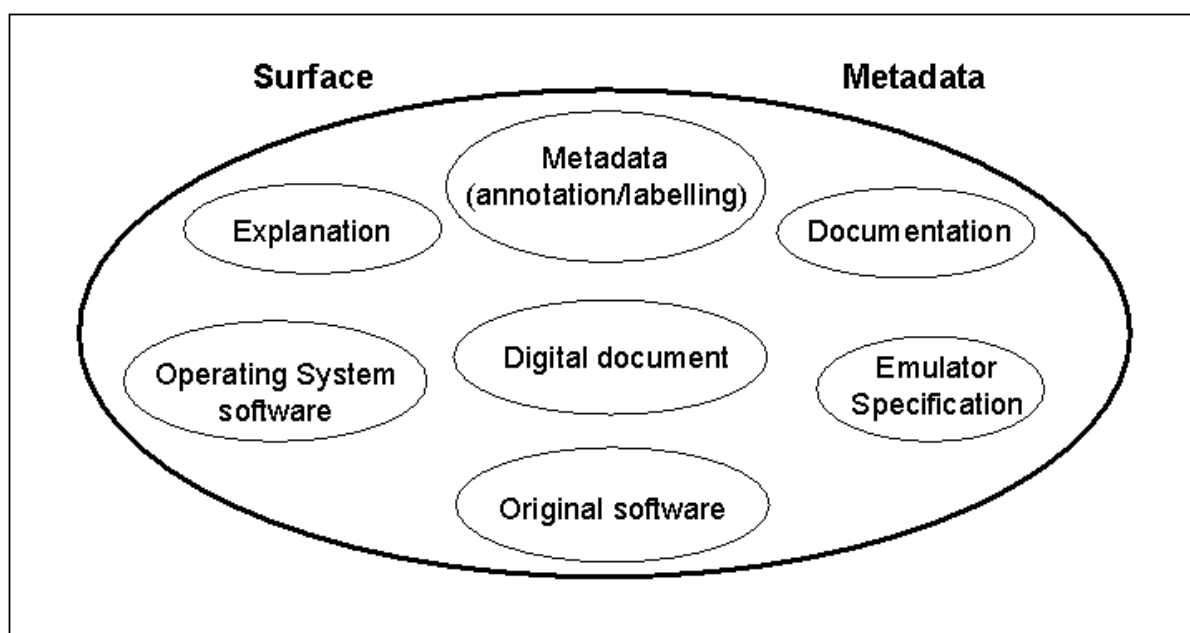


Figure 3.3: Encapsulation

(Granger, 2000)

The strategies discussed (emulation, migration, encapsulation) have many advantages and disadvantages. Table 3.1 presents a comparison of the digital preservation strategies discussed in Sections 3.5.2, 3.5.3 and 3.5.4, their advantages, disadvantages and their main domains.

Table 3.1: Advantages and disadvantages of preservation techniques

Technique	Advantages	Disadvantages	Domain
Emulation	Maintains the look and feel.	The complexity of creating emulator specifications.	Application software.
		The large amount of information that must be preserved.	Complex digital resources such as those that contain executable files.
		Archaic software required to access information.	Resources for which there is a lack of sufficient knowledge.
			Resources for which the value is unknown and for which future use is unlikely.
		Resources whose look and feel are important.	
Migration	Does not need to retain original applications.	Significant cost for long-term preservation.	Resources that are actively accessed and managed, such as scientific data or database.
	Supports active access and management.	Information degradation.	Resources whose formats are sufficiently well known.
		Lack of preservation metadata.	
Need for continued diligence on the part of archivists.			
Encapsulation	Maintains preservation information.	Knowledge about the format must be preserved.	Resources that are unlikely to be accessed and managed actively.
		Systems required for capturing the digital information.	Resources whose formats are sufficiently well-known.

Adapted from Lee et al. (2002: 102)

Lee et al. (2002: 102) suggest that among the three digital preservation strategies (outlined in Table 3.1), emulation is well-suited for intricate resources and application software, particularly those where the appearance and functionality of digital information hold significance. They further argue that migration is best suited for resources that are actively utilised and overseen, whereas encapsulation is more fitting for resources that are less likely to be actively accessed.

Strodl et al. (2007: 30) emphasise that the selection of preservation strategies and specific software tools, particularly for emulation and migration, should align with the specific needs and circumstances of individual institutions. Suleman (2007: 7) observes that digital preservation of heritage, including documentary heritage, remains an ongoing endeavour in Africa, characterised by keen interest but insufficient capacity and resources. Highlighting the dynamic nature of the challenge, Thibodeau (2002: 28) underscores that the problem of digital preservation continually evolves alongside advancements in information technology, necessitating evolutionary solutions. Adu and Ngulube's (2016) study on digital preservation strategies adopted across various ministries and agencies in Ghana reveals a range of approaches, including migration, emulation, and cloud computing. Van der Verheul and Van Wijngaarden (2007: 119) suggest that migration may not always be the most suitable solution for preserving functionality, with emulation offering greater potential in some cases. Despite the advantages of digital preservation for libraries, Krtalić and Hasenay (2012: 359) point out that many libraries encounter challenges in carrying out preservation activities.

Digital preservation activities are associated with challenges, especially in the African context. Most African countries are grappling with identifying strategies that they can use to deal with digital preservation issues. A study by Anyaoku et al. (2019: 49) on the IRs developed in 24 university libraries in Africa established that 35% of the respondents indicated that they use encapsulation. Kavishe and Dulle (2016: 10) in their study, indicate that several librarians at the University of KwaZulu-Natal Libraries (South Africa) were not trained to meet the obsolescence of technology, and thus they need training in migration and emulation techniques. It can be said that a library needs to have a clear purpose and knowledge of the nature of digital preservation strategies convenient for the resources (documentary heritage) as well as the library's capability and preparedness.

Literature reviewed relating to digital preservation strategies has given an insight into various strategies libraries use to digitally preserve their resources. The literature reviewed also alludes to a lack of equipment, training and personnel issues. It also indicates popular digital preservation strategies in African libraries, however, the literature reviewed does not reflect the motives of libraries for choosing the desired digitally preservation strategies explained by the Consultative Committee for Space Data Systems (2012). The literature reviewed also does not adequately reflect the benefits that libraries associate with their preferred digital preservation strategies. The present study attempts to address some of these gaps through its investigation of preservation strategies used by the National Library of Namibia.

3.6 Legal deposit of electronic resources

Digital legal deposit also known as e-deposit is based on ingest, a component known for web archiving in the OAIS Reference Model, a theoretical model used in this study (Van der Verheul & Van Wijngaarden, 2007: 117). E-deposit introduces new dimensions to legal deposit does not present in print deposits such as, publishers in setting up the deposit process, electronic user access, the digital right management and data protection (Gibby & Green, 2008: 55). Legal deposit has a significant impact on multiple facets of digital preservation (Saur, 2006: 25). Its primary objective is to guarantee the enduring preservation of a country's intellectual and cultural heritage (Muir, 2001: 652).

A study by the KB Library in 2005 established that most national libraries in Europe and USA build their collections based upon their legal deposit obligation as a deposit library (Verheul & Wijngaarden, 2007: 113). With technological advancement, countries such as Germany, the Netherlands, the UK, France and Italy have embraced the concept of digital legal deposit (International Publishers Association, 2014: 1). Although national libraries in the developed world seem to embrace digital legal deposit, much is not known or documented, to the knowledge of the researcher, about digital legal deposit and national libraries in Africa. One of the countries in Africa surfacing in the literature on e-deposit is South Africa. In 2004, the National Library of South Africa initiated an examination of electronically published documents, identifying them as part of the legal deposit domain (Drijfhout, 2007: 60). The present research explores the National Library of Namibia's role in acquiring electronically published documentary heritage.

Digital legal deposit allows digital content such as e-books, e-journals and website content to be collected and archived. Research conducted by De Beer et al. (2016: 99) regarding the obstacles encountered by national libraries in handling the legal deposit of electronic books revealed significant challenges. These included the absence of legislation specifically addressing legal deposit, as well as the lack of institutional policies, and established procedures for depositing such materials. The current study aims to establish the extent to which the National Library of Namibia is prepared to embrace the concept of digital legal deposit. Legal deposit legislation should include two categories of electronic publication. These categories are offline or tangible publication; these are the types of information sources made available on a physical data carrier such as diskettes and CD-ROMs. Legal deposit legislation should explicitly mandate the deposition of digital materials alongside any related software manuals and accompanying materials necessary to facilitate their use. The second classification encompasses online materials, which are resources solely existing as a single copy stored on a computer host system or within the global collection of computer systems known as the internet (Lariviere, 2000: 40-41). Lariviere (2000: 44) underscores the significant challenge of technological obsolescence in achieving the long-term accessibility objective for researchers in the context of electronic legal deposit. Consequently, it is imperative for legal deposit legislation to authorize national libraries to undertake actions such as copying, reformatting, or migrating deposited publications for preservation purposes.

Section Three of the Namibia Library and Information Service Act 4 of 2000 explains the context and procedures for legal deposit at the National Library of Namibia; the procedures stipulate that government offices are to submit 20 copies of their publications to the National Archives of Namibia while the producer of information other than government offices deposit five copies of the document with the National Library. The source of information acquired through legal deposit shall remain the property of the National Library (Republic of Namibia, 2000). However, the Namibia Library and Information Service Act 4 of 2000 is silent about the conversion of these information sources into other formats nor does it make provision for e-legal deposit. Therefore, this study seeks to establish the stance of the National Library of Namibia and NLIC legal deposit committees, on e-legal deposit.

Nsibirwa et al. (2014: 61) observes that many countries are undergoing revisions or have already revised their legal deposit legislation in response to the significant rise in electronic publications. This trend is evident in Namibia as well. In countries like Estonia, the collection

and archiving of online publications have become routine tasks for the national library. This shift was facilitated by the enactment of the Legal Deposit Copy Act in 2006, driven by the necessity to establish a digital archive for long-term preservation purposes (Andresoo, 2009: 4-5). A study conducted by the British Library found that the emergence of online publishing has prompted national libraries worldwide to prioritise the capture of e-publications and engage in web archiving efforts (Stephens & Gibby, 2011: 62). Besides embracing e-deposit, a several national libraries in Europe have introduced the concept 'web archiving' resources that are not necessarily deposited in libraries but are available online. In Estonia for example, in the selection of these web resources one of the principles is that such sources should contain important information from the viewpoint of cultural heritage (Andresoo, 2009: 4).

A study conducted by the British Library in 2009 to assess the status of legal deposit for electronic publications in 34 national libraries across Europe revealed that the majority of these countries have enacted and implemented legislation that imposes legal deposit obligations or allows libraries to archive materials for at least one category of electronic publishing (Stephens & Gibby, 2011: 59). Legislation pertaining to e-legal deposit entails considerations of various issues, including evaluating technical deposit processes, determining territoriality (place of publication), managing electronic user access, and copying, implementing digital rights management, addressing digital preservation concerns, and ensuring compliance with data protection regulations. These considerations are typically not addressed in traditional print legal deposit legislation (Stephens & Gibby, 2011: 59). The British Library survey revealed widespread adoption of e-legal deposit laws in national libraries across Europe, with 82% of respondents indicating implementation (Stephens & Gibby, 2011: 62). These laws typically permit the collection of freely available websites as well as commercial or protected online publications. However, Alexandrov's study (2018) focusing on the transformation of digital legal deposit, particularly legislative and public access regulations, highlighted that full implementation of digital legal deposit has not yet been achieved in all European Union member states. Alexandrov (2018) concludes that the major challenges for to a further digital legal deposit development are specified as legislative, technological, financial, and social.

By the year 2000, while several European countries had included electronic publications in their legal deposit legislation, in Africa, South Africa was the only country noted to have had included electronic publication in its legal deposit legislation (Lariviere, 2000: 43). However, research conducted by Nsibirwa et al. (2014) examining the legislative, regulatory and policy

framework related to the preservation and access of legal deposit materials, discovered that while the South African legal deposit Act covers electronic materials, most depositories lacked policies for managing or collecting such materials. The status of other African countries, including Namibia, regarding this matter was unclear at the time of the study. Therefore, this research aimed to assess the status of e-deposit at the National Library of Namibia.

In New Zealand, before the national library introduced e-legal deposit legislation, the library requested for permission to copy electronic publications, as this enabled the national library to harvest content from websites. However, this method proved to be slow, time-consuming, and unsustainable. Some publishers did not respond to the library's requests, while others outright declined to allow their sites to be harvested (Elliott, 2011: 3). This approach to collecting documentary heritage is advisable for national libraries like the National Library of Namibia, which lack e-legal deposit legislation. The implementation of electronic legal deposit at the National Library of New Zealand was perceived as a way to ensure the perpetual availability of New Zealand's digital heritage (Elliott, 2011: 3). Electronic documents enable the library to collect, preserve, and provide access to published documentary heritage for the benefit of present and future generations (Elliott, 2011: 10).

In crafting electronic legal deposit legislation, a lesson learned from New Zealand's experience is that consultation with publishers of electronic publications should be held to gauge their opinions on the requirement process. New Zealand has devised four strategies (strands) that guide them in the collection of online publications, and these are (a) Harvesting of publications on websites involves the process of gathering copies of publications, cataloguing them in the National Library's database, and storing and preserving them in the National Digital Archive. Some of these harvested publications are made publicly accessible without restrictions, allowing remote access to users; (b) Harvesting of websites involves the selection of specific websites based on developed guidelines. Once a website is selected, an initial harvest is conducted, and the frequency of subsequent re-harvesting is determined. These harvested website copies are made accessible remotely through descriptive records in the National Library catalogue; (c) Event harvesting focuses on gathering websites associated with specific events such as central and local government elections or significant national or international sports events. These event-hosting websites are accessible through descriptive records in the National Library catalogue, and (d) Whole-of-domain harvesting: The National Library of New

Zealand has commissioned the internet Archive to undertake two whole domain harvests on its behalf (Elliott, 2011: 6-7).

The KB Library's 2005 study in Europe and the USA revealed that libraries engaged in web harvesting and archiving expressed concerns about the suitability of storage and access systems for long-term preservation and permanent access (Verheul & Wijngaarden, 2007: 117). Lariviere (2000: 40) proposes amending current legal deposit laws to explicitly include electronic resources due to the increasing availability of materials in electronic format, emphasising the risk of permanent loss if not deposited. Lariviere (2000: 56) stresses the importance of involving all national legal deposit agencies in discussions, highlighting their crucial role in preserving cultural and intellectual heritage and ensuring democratic access to information. De Beer et al. (2016: 99) note that national libraries undertaking legal deposit of electronic publications face various challenges, including legal deposit legislation and institutional policies. In Namibia, Senzandje's (2014: 113) study exploring publishers' knowledge, attitudes, and practices toward legal deposit found challenges such as some publishers failing to deposit their publications with the National Library of Namibia.

In summary, the literature reviewed on the e-deposit framework shows that studies have indicated that e-legal deposit has been at centre stage of many European national libraries since the early 2000s. In Africa, the only country featuring in the literature on e-deposit is South Africa. However, the extent to which the National Library of South Africa has executed this legislation is not documented. For Namibia and other African countries no literature known to the researcher seems to be available on e-legal deposit. Literature on Western countries have also indicated that national libraries, for example, New Zealand are embracing web archiving/harvesting to build or collect documentary heritage sources. How national libraries in Africa are incorporating electronic publications in their legal deposit procedures appears not to be known or documented in the literature. Hence the importance of this study to ascertain the extent to which the Namibian legal deposit framework makes provision for electronic information sources deposit with the National Library of Namibia.

3.7 Challenges relating to the preservation of documentary heritage

Digital preservation presents many challenges to libraries in general. Strodl et al. (2007: 31) observed that born-digital multimedia which are inherently interactive present a challenge or difficulties in preservation because of the complexities of their format which are ephemeral and unstable. Masenya and Ngulube (2019) conducted a study on the preservation of digital resources in academic libraries in South Africa, revealing that these libraries faced challenges in preserving their digital resources primarily due to the absence of standards and policies, and the threat of technological obsolescence, compounded by insufficient management support.

Studies (Mkuwira, 2015; Pandey & Kumar, 2020; Awamleh & Hamad, 2022; Friday & Eze, 2022; Matlala et al., 2022) identified several challenges associated with the digital preservation of documentary heritage, including the lack of necessary equipment, underdeveloped ICT facilities, shortages of storage equipment, and a lack of technical infrastructure. Ngulube (2012: 131) states that although national libraries have a role to document and preserve their respective countries' documentary heritage, in Sub-Saharan African countries, not much has been done in facilitating the capture and preservation of long-term access in an ICT-driven environment.

Ngulube (2012: 131-132) identified challenges experienced by national libraries to digitally preserve their resources and other institutions with digital preservation initiatives. These challenges include:

- Lack of a comprehensive government-wide framework for managing electronic information resources;
- The inadequate political will to deal with the technical, financial, legal and political challenges of providing permanent public access to published electronic government information resources;
- Failure by national libraries and national archival institutions to closely collaborate to keep electronic resources safe for users, now and in the future;
- Limited initiatives at national libraries and national archives to identify, collect, store and preserve online publications; and
- Legal deposit legislation does not include electronic publications that incorporate online publications and websites.

A study by Mkuwira (2015; 61-62) on preservation of documentary heritage in Malawi found that challenges faced when preserving these materials include lack of purposely built infrastructure, limited funding and understaffing. Another study by Okoh and Saliu (2014: 11) in Nigeria, which investigated the level of librarian's awareness on digital preservation strategies, revealed that many libraries lack formal digital preservation policy. The study also established that while many librarians have no training on digital preservation, many librarians have low-level knowledge about digital preservation. The Okoh and Saliu (2014) study also found a lack of management support as well as a lack of standard policies among the libraries that participated in the study. Another study by Gbaje and Mohammed (2013: 483), which examined the nature of digital preservation policy at the National Information Centres in Nigeria, found that the digital preservation policy is not adequate to ensure long-term preservation. Studies such as (Balogun & Adjei, 2019; Keneilwe, 2020; Hassan et al., 2022; Matlala et al., 2022) concluded that lack of policies, and absence of national digitisation policies are some of the impediments to success of digital preservation activities. The study also revealed the lack of institutional support. Furthermore, a study by Kaminyoge and Chami (2018: 111) which assessed the preservation of archival heritage resources in the Zanzibar National Archives established that the Zanzibar National Archives has failed to employ an up-to-date scientific technology in the management and preservation of documentary heritage due to budgetary limitations.

A study by Masenya and Ngulube (2019: 6) on digital preservation practices in academic libraries in South Africa revealed that respondents considered the following as inadequate: staff with expertise in digitising resources, inadequate funding to purchase enough infrastructures, lack of human resources, lack of relevant training, software obsolescence, and low awareness on preservation issues as libraries. Similarly, a study by Anyaoku et al. (2019: 55) on the IRs developed in 24 university libraries in Africa established that the majority of respondents (56%) indicated that they do not have long-term funding and lack the necessary technical staff with required skills to handle and manage their IR. The lack of technical skills and expertise to manage digital preservation activities was also identified in studies: by Kauraisa (2019) which investigated the role of the National Library of Namibia in providing information in a digital age; a study by Umana (2019) which investigated long-term digital preservation activities in institutional repositories at Namibian academic libraries; Keneilwe (2020) which assessed the digital preservation capability maturity readiness within the context of e-government in Botswana public service; Gbaje (2011) which examined digital preservation strategies in the

national information centres in Nigeria; Balogun and Adjei (2019) which examined the current state, prospects and challenges in digitising archival collection at the National Archives of Nigeria; and Awamleh and Hamad (2022) which explored the status of digital preservation at academic libraries in Jordan. Asproth (2005: 51) concluded that most of the challenges associated with digital preservation are strategic, organisational and structural and not necessarily technical.

3.8 Summary of the chapter

The literature reviewed in this chapter highlighted some of the studies and findings on the planning and management of digital preservation in libraries, digital preservation policies, consumers of preserved information sources in libraries, preservation strategies and electronic legal deposit. To a large extent, literature reviewed on digital preservation strategies are conceptual literature. This is because of limited empirical studies especially on the two strategies ‘emulation’ and ‘encapsulation’. These themes are the key components of the OAI Reference Model and DPCMM, which are used as theoretical models and inform the current study. The literature review also revealed some of the general and specific challenges experienced by institutions and libraries that have been involved in digital preservation projects, for example, lack of policies and legal frameworks, lack of institutional support, and limited funding. These challenges reflected in literature are important to the current study as they informed crafting of questions on matters investigated in the study which addressed gaps in the literature. The literature reviewed also identified several gaps in literature relating to the digital preservation of documentary heritage. These gaps include: planning for digital preservation in African national libraries; the implementation and nature of digital preservation policies; access to digitally preserved documentary heritage; and e-legal deposit in Africa. Although there are a few studies (Ngulube, 2012; Oko & Saliu, 2014; Mkuwira, 2015; Adu & Ngulube, 2016; Kavishe & Dulle, 2016; Kaminyoge & Chami, 2018; Balogun & Adjei, 2019; Masenya & Ngulube, 2019; Umana, 2019; Keneilwe, 2020; Masenya & Ngulube, 2020; Balogun & Kalusopa, 2021; Nakale, 2023) which focused on random issues on digital preservation in Africa, there is a deficit of studies in Africa which focus on the extent to which national libraries are prepared to digitally preserve documentary heritage. The next chapter presents the study’s methodology.

Chapter 4 : Research Design and Methods

4.1 Introduction

Research methodology is described as a broad approach to scientific inquiry specifying how research questions should be asked; it also includes worldviews (philosophical assumptions), research designs, sampling logic, data collection, analysis, and interpretation that researcher propose for their studies (Teddlie & Tashakkori, 2009: 21; Creswell & Creswell, 2023:17). In other words, it is also referred to as a step-by-step plan on how a research project will be carried out (Leavy, 2017: 263). This chapter presents and discusses the pragmatic paradigm which was adopted for this study. The chapter also discusses the mixed methods research approach and case study research design which this study applied. The chapter further discusses the population of and sampling for the study, data collection procedures, research instruments, data analysis and presentation, and research ethics.

4.2 Philosophical assumptions

Philosophical assumptions in mixed methods research consist of a basic set of beliefs or assumptions that guide inquiries (Guba & Lincoln, 2005). Creswell and Plano Clark (2018: 35) describe these assumptions as a worldview. Worldviews are also known as paradigms (Creswell & Plano Clark, 2018: 35; Creswell & Creswell, 2023: 7). Philosophical assumptions are ideas and assumptions, which underlie the design and approach to the research. According to Denscombe (2009: 117), philosophical assumptions

underpin the perspective that is adopted on the research topic, they shape the nature of the investigation, its methods and the questions that are asked, they specify what types of things qualify as worthwhile evidence, and they point to the kind of conclusions that can and cannot be drawn based on the investigation.

In research, there are two areas of philosophy, namely, ‘ontology’ and ‘epistemology’. Ontology refers to “an area of philosophy that deals with the nature of being, or what exists; the area of philosophy that asks what is and what the fundamental categories of reality are” (Neuman, 2014: 94). Ontology is concerned with the issue of what exists, or the fundamental

nature of reality. Epistemology, on the other hand, refers to “an area of philosophy concerned with the creation of knowledge; it focuses on how we know what we know or what are the most valid ways to reach the truth” (Neuman, 2014: 95). It is also considered as the issue of how we know the world around us or what makes a claim about it true (Neuman, 2014: 95).

A research paradigm represents a worldview that defines, for the researchers who hold this view, what is acceptable to research and how this should be done (Bertram & Christiansen, 2014: 22). Neuman (2014: 96) explains that a scientific paradigm is a whole system of thinking which includes basic assumptions, the important question to be answered or puzzles to be solved, the research technique to be used. A paradigm determines choices such as what kind of questions are supposed to be asked, how to collect data and how to interpret the data (Bertram & Christiansen, 2014: 22).

The current study is located within the pragmatic paradigm. Creswell (2014: 11) explains that pragmatism applies to mixed methods research where the researcher uses both quantitative and qualitative data because they work to provide the best understanding of a research problem. Pragmatism is also regarded as the philosophical partner for the mixed methods approach (Denscombe, 2008: 273). Pragmatism guided this study as it used the mixed methods approach. The philosophy of mixed methods research is considered to be pragmatism (Johnson, Onwuegbuzie & Turner, 2007: 113). According to Creswell (2014: 11), pragmatism is not committed to any system of philosophy and reality, and this applies to mixed methods research too; hence individual research has a freedom of choice to choose methods, techniques, and procedures of research that best meet their needs and purposes. And therefore, pragmatism opens the door to multiple methods, different worldviews, and different assumptions as well as different forms of data collection and analysis.

In pragmatism, researchers decide what they want to study based on what is important within their value systems (Teddlie & Tashakkori, 2009) and the emphasis is on the problem-driven nature of inquiry and learning (Denscombe, 2008: 280). Schoonenboom (2019: 288) explains that the aim of research within the pragmatic paradigm is not to obtain timeless knowledge, but rather to solve temporary problems, understanding research as involving a succession of experiences where previous beliefs are revised based on specific research actions. This study is based on a problem of long-term access to documentary heritage, for posterity. The study attempts to solve problems associated with the accessibility of documentary heritage at the National Library of Namibia and envisages to address problems associated with policies, e-

deposit of electronic resources as well as suggesting a framework appropriate to digitally preserve documentary heritage. Hence the relevance of pragmatism as a worldview or paradigm within which to locate this research. The pragmatic paradigm offers an epistemological justification (via pragmatic epistemic values or standards) and logic (use a combination of methods and ideas that helps with the best frame with which to address and provide tentative answers to one's research questions) for mixing approaches and methods (Johnson et al., 2007: 125). Just like in many paradigms, here too the outcomes of research inquiry are used to modify existing beliefs (pragmatism), intersubjective understanding (constructivism) and objective knowledge (positivism) (Schoonenboom, 2019: 288). In pragmatic, research can be said to be successful to the extent that it contributes to solving temporary problems (Schoonenboom, 2019: 288).

One of the research questions of the current study is: What are the views of National Library users, National Library of Namibia staff, NLAS staff, Legal Deposit Committee members and NLIC members on digital preservation of national documentary heritage? In the pragmatism paradigm, the researcher needs to engage the situation from the viewpoint of the participants (Bertram & Christiansen, 2014: 26) which is indeed the case in this study. Thus, the pragmatic paradigm is deemed appropriate for the study.

4.3 Research approach

The study used a mixed methods approach. The concept 'mixed methods' applies to research that combines alternative approaches within a single research project (Teddlie & Tashakkori, 2009: 4; Denscombe, 2010: 137; Bryman, 2012: 628). Mixed methods involve combining or integrating of qualitative and quantitative research and data in a research study (Teddlie & Tashakkori, 2009: 8; Hesse-Biber, 2010: 3; Creswell, 2014: 14; Ivankova et al., 2016: 313). In the context of this study, the researcher integrates qualitative and quantitative research and data to understand the preparedness of the National Library of Namibia to digitally preserve its documentary heritage. Tashakkori and Creswell (2007: 8) refer to mixed methods as research in which the investigator collects and analyses data, integrates the findings and draws inferences using both qualitative and quantitative approaches in a single study. Johnson et al. (2007: 113) explain that it refers to an approach to knowledge (theory and practice) that

attempts to consider multiple viewpoints, perspectives, positions, and standpoints (always including the standpoints of qualitative and quantitative research).

Denscombe (2008: 272) explains that some researchers use mixed methods: (a) to improve the accuracy of their data; (b) to produce a more complete picture by combining information from complementary kinds of data or sources; (c) to avoid biases intrinsic to single-methods approaches and compensate specific strengths and weaknesses associated with a single method; (d) as a way of developing the analysis and building on initial findings; and (e) as an aid to sampling with or screening participants in questionnaires for inclusion in interviews. In this study, mixed method is used to produce a complete picture (from the multiple groups of participants in the study) on aspects of digital preservation. Hesse-Biber (2010: 3-5) describes five reasons researchers use the mixed methods approach: (1) method triangulation: use of more than one method while studying the same research question to determine the dimension of a research problem; (2) complementarity: allows the researcher to gain a fuller understanding of the research problem and/or to clarify a given research result; (3) development: mixed methods often support the development of a research project by creating a synergistic effect; (4) initiation: a study's finding may raise questions or contradictions that will require clarification, thus initiating a new study; and (5) expansion: refers to enabling future research endeavours and allows researchers to extend the range of inquiry.

The researcher in this study chose to use a mixed methods approach: (1) for method triangulation to fully understand the issue of digital preservation of documentary heritage at the National Library of Namibia from the perspective of different stakeholders; (2) to avoid biases inherent in single-method approaches and to compensate specific strengths and weaknesses associated with a single method; and (3) for complementarity reasons in order to clarify the research result emerging from the study and to develop a framework which will provide a clear roadmap for digital preservation activities at the National Library of Namibia.

The use of mixed methods in a study reflects an attempt to secure an in-depth understanding of the phenomenon in question (Denzin, 2012: 82). In the mixed methods field, there are three core mixed methods approaches, namely: convergent parallel mixed methods, the explanatory sequential mixed methods, and the exploratory sequential mixed methods (Creswell & Creswell, 2018: 217). This study adopts the convergent parallel mixed methods approach. Convergent parallel mixed methods is considered a popular approach to mixed methods

research (Creswell & Plano Clark, 2018: 68). The convergent approach is also known or referred to as the concurrent parallel or simultaneous mixed methods approach (Teddlie & Tashakkori, 2009: 26; Creswell & Plano Clark, 2018:65). Creswell (2014: 15) explains that convergent parallel mixed methods is a form of mixed method approach in which the researcher converges or merges quantitative and qualitative data to provide a comprehensive analysis of the research problem.

This approach occurs in research when the researcher intends to bring together the results of the quantitative and the qualitative data analysis so they can be compared or combined (Creswell & Plano Clark, 2018: 65). With this design, the researcher collects both forms of (qualitative and quantitative) data at roughly the same time, analyses them separately and then integrates the information in the interpretation of the overall results to see if the findings confirm or disconfirm each other (Teddlie & Tashakkori, 2009: 26; Creswell, 2014: 15; Creswell & Creswell, 2018: 217). The assumption of using this approach is that both qualitative and quantitative data provide different types of information (Creswell & Creswell, 2018: 217). The convergent parallel mixed methods approach in this study is used to investigate the National Library of Namibia's preparedness for and practices of digital preservation. The researcher simultaneously triangulated similar questions to different participants (librarians, NLAS staff and NLIC members). Furthermore, the interviews and distribution of questionnaires were done concurrently. The researcher assumed that the participants would provide different views, based on their working perspectives, on the digital preservation of documentary heritage at the National Library of Namibia.

Creswell and Plano Clark (2018: 223) provide strategies used to merge the two sets of results. These strategies include: the researcher should identify content areas represented in both datasets and compare, contrast, and/or synthesise the results in a discussion or table; identify differences and similarities within one set of results based on dimensions within the other set; and create a joint display to array the quantitative and qualitative results and create a comparison discussion. Regarding the interpretation of the merged results, Creswell and Plano Clark (2018: 223) explain that the researcher should summarise and interpret the separate results, discuss to what extent and in what ways results from the two types of data converge, diverge, relate to each other, and/or produce a more complete understanding; and explain divergence if it occurs. The mixed methods approach is associated with the pragmatist, interested in both narrative and numeric data and their analysis (Teddlie & Tashakkori, 2009:

4). In this study, the researcher sought to establish the dimension of perspectives and views on preparedness for and practices of digital preservation of Namibia's documentary heritage. A mixed methods approach can help gain an in-depth understanding of trends and personal perspectives, providing a more elaborate approach to the research problem and a deeper understanding (Ivankova et al., 2016: 313). Another benefit associated with mixed methods is that it enables the researcher to simultaneously ask confirmatory and exploratory questions and therefore verify and generate theory in the same study (Teddlie & Tashakkori, 2009: 33).

Furthermore, some of the benefits associated with using the convergent parallel mixed methods approach include the fact that data can be collected and analysed separately and independently, using the techniques traditionally associated with each; and it facilitates the direct comparison of participants' perspectives gathered in an open-ended questioning format with perspectives drawn from the researcher's standpoint (Creswell & Plano Clark, 2018: 72). Accordingly, the convergent parallel approach is associated with challenges such as: having unequal sample sizes meaning that the researcher needs to consider the consequences of having and using different sample sizes when merging the two datasets; the need to merge text and numerical datasets; it can be challenging to merge two sets of very different data; and lastly, the challenge of explaining the divergence when comparing results which is difficult to resolve and may require the collection of additional data (Creswell & Plano Clark, 2018: 65).

4.4 Research design

Research design refers to the overall plan for conducting research (Creswell & Guetterman, 2021: 682). This study uses a case study design. Neuman (2014: 42) defines a case study as "an in-depth examination of an extensive amount of information about very few units or cases for one period or across multiple periods of time". Although a case study is often used by researchers in the interpretivist paradigm (Bertram & Christiansen, 2014: 42), it is deemed suitable for this study because case studies are frequent sites for mixed methods research (Bryman, 2012: 68). Creswell and Plano Clark (2018: 106) explain that in mixed methods research, case study design uses both types of data gathered concurrently in a convergent approach and the results are merged to examine a case and/or compare multiple cases.

The current study uses a single case study and a holistic case study design. One of the rationales for using a case study is testing a well-formulated theory (Yin, 2014: 47). In this study components of the OAIS Reference Model and MMCP discussed in Chapter Two were being investigated. Bryman (2012: 66) explains that a case study entails the detailed and intensive analysis of a single case. In this study the National Library of Namibia serves as the ‘case’ with the focus on its digital preservation preparedness. One of the benefits of the holistic case study design is when the theory underlying the case study is itself of a holistic nature (Yin, 2009: 50). In the case of this study, a holistic single case study was appropriate as the two models used as theoretical models are of holistic nature. One of the benefits of using a single case study is that single case studies can confirm, challenge, or extend the theory (Yin, 2009: 47). A single case study may involve more than one unit of analysis (Yin, 2009: 50). In the context of this study, the study focuses on five units of analysis: NLAS, NLIC, Legal Deposit Committee members, National Library of Namibia staff and National Library of Namibia users, to provide responses required to address the overall objective of the study.

A case study focuses on one or just a few instances of a particular phenomenon to provide an in-depth account of an event, relationships, experience, or processes occurring in the particular instance (Choemprayong & Wildemuth, 2009: 51; Denscombe, 2010: 52). Case studies examine individuals, groups, organisations, events, etc. A case study design enables the researcher to delve deep into the intricacies of the situation to describe matters in detail, compare alternatives or, perhaps, provide an account that explores particular aspects of the situation (Denscombe, 2014: 57). The current study uses a case study design to investigate and explore the National Library of Namibia’s preservation practices to establish how prepared it is to digitally preserve documentary heritage.

Some of the benefits associated with the case study are: it clarifies the researcher’s thinking, allows a researcher to link abstract ideas with the concrete, specific case that the researcher is observing in detail. A case study provides for further discovery and problem-solving and explores the boundaries between related concepts. Case studies can also make visible the details of social processes and mechanisms by which one factor affects others (Neuman, 2011: 43). In the case of this study, little was known about the digital preservation of documentary heritage at the National Library of Namibia, and the study hoped to shed more light on the preservation strategies, practices and policies which are intended to inform information practitioners to improve their preservation practices. There are, however, disadvantages or

limitations in using a case study design. For example, the data are often unique to the studied event and case studies do not provide or provide little basis for scientific generalisation (Yin, 2009: 15) and the generalisation of the findings beyond the setting in which the study was conducted; conclusions are sometimes subjective; and the findings are generally not predictive (Choemprayong & Wildemuth, 2009: 53). Notwithstanding inherent shortcomings of a case study, a case study design was found appropriate to address the unique issues related to digital preservation of documentary heritage as the National Library of Namibia is the only institution tasked to preserve the Namibian documentary heritage. However, one of the research questions of this study is to propose a digital preservation framework for the National Library of Namibia; it is envisaged, however, that this framework will not be limited to the National Library of Namibia but could be adopted/adapted by and benefit other memory institutions in Namibia, or perhaps even beyond is similar circumstances prevail.

4.5 Population and sampling

The population of a study refers to “the study objects and consists of individuals, groups, organisations, human products, and events, or the conditions to which they are exposed” (Welman, Kruger & Mitchell, 2005: 52). In this study, the population consists of all 15 members of NLIC. However, the two NLIC members, the head of NLAS and Head of the National Library of Namibia, who are automatically the members of NLIC because of their positions and the institutions they head, were required to participate in their capacity as heads of institutions, therefore, the total number of NLIC participants were 13. NLIC members are believed to be valuable key informants in this study because one of their functions is to establish a legal deposit committee, advise the Minister of Education on legal deposit issues and coordinate the activities of the place of deposit (Republic of Namibia, 2000: 13).

The study population further included members of the Legal Deposit Committee. The Legal Deposit Committee consists of seven members. These members comprised the head of the National Library of Namibia, head of the National Archives of Namibia, and heads of the three deposit libraries, highlighted in Section 1.2.4 (Chapter One), one NLIC member, and a representative of producer/publisher of documentary heritage. The population of the Legal Deposit Committee consists of seven members, however, three Legal Deposit Committee members, that is, the head of National Library of Namibia, head of the National Archives of

Namibia and one other NLIC member, who are automatically the members of NLIC because of their positions and the institutions they head, were required to participate in their capacity as members of NLIC and heads of institutions they are heading; therefore, the total number of Legal Deposit Committee participants were four.

The Legal Deposit Committee, chaired by the head of the National Library, was deemed to consist of valuable key informants in this study because of their functions: (a) advising or making recommendations to the Minister on any matter concerning legal deposit or any matter which has been referred to it by the NLIC regarding legal deposit; (b) their role to co-ordinate the activities of places of deposit concerning legal deposit or give advice to places of deposit on any matter which concerns legal deposit; and (c) their role to authorise the head of the National Library to reproduce, for purposes of preservation, entire works received as a legal deposit (Republic of Namibia, 2000: 11).

The study population also included members of the NLAS directorate management in the Ministry of Education because NLAS is an umbrella body that administers Namibia libraries and information service, and under which the National Library of Namibia falls as a division. Seven NLAS management staff were identified to participate in the study, which includes NLAS director, deputy director, head of Community Library Services, head of Ministerial Library Services, head of Education Library Services and the head of National Archives of Namibia. The study also included three National Library of Namibia management staff, which consists of the head of the National Library of Namibia, senior librarian responsible for the user service department and senior librarian responsible for bibliographic services. The National Library of Namibia management were identified to provide insight on the current preservation practices, if there were any, and on preservation strategies. The last group of the study population was the National Library of Namibia users.

In the 2020/2021 financial year, a total of 514 users requested for Namibian documentary heritage materials from the National Library of Namibia (National Library of Namibia, 2021). Library users were important in this study, as they are the end-users of the legal deposit material and their views on digital preservation of the legal deposit collection and the electronic legal deposit are critical in devising digital preservation strategies. A sample of end-users was selected to participate in the study. The study was limited to the National Library of Namibia users, who use the Namibian documentary heritage materials. Users who use the general

collection, computers for internet purposes, interlibrary loans and newspapers were excluded from this study. Sampling involves making decisions about which people, setting and events to include in the study (Bertram & Christiansen, 2014:59). In mixed methods research such as this one, sampling involves combining well-established qualitative and quantitative techniques to answer research questions (Teddlie & Yu, 2007). The study used non-probability sampling, specifically the purposive sampling technique, to select participants for the study. With purposive sampling, the researcher makes specific choices about which individuals, groups or objects to include in the sample as the researcher is interested in a particular case (Bertram & Christiansen, 2014: 60). The goal for selecting the specific group of individuals is to include those who will yield the most relevant and plentiful data or are “information-rich” to a given topic of study (Yin, 2016: 93).

Purposive sampling is typically associated with qualitative research and may be defined as selecting a relatively small number of units because they can provide particularly valuable information related to the research questions (Teddlie & Tashakkori, 2009: 25) and lead to greater depth of information from a smaller number of carefully selected cases (Teddlie & Yu, 2007: 83; Denscombe, 2014: 41). With this sampling procedure, the researcher intentionally selects participants who have experienced the phenomenon, or the key concept being explored in the study (Creswell & Plano Clark, 2018: 173). Purposive sampling technique can be applied when sampling special or unique cases, for example, this technique is employed when the individual case itself, or a specific group of cases, is a major focus of the investigation (Teddlie & Yu, 2007). Purposive sampling techniques were used in this study to identify 13 NLIC members, seven NLAS staff members in management and staff members of the National Library of Namibia.

Another sampling technique that was used in this study is convenience sampling. Convenience sampling involves choosing a sample that is easy for the researcher to reach and where there is willingness to participate in the study (Teddlie & Tashakkori, 2009: 170; Bertram & Christiansen, 2014: 26; Yin, 2016: 95). Participants were selected based on their availability and willingness to respond (Teddlie & Yu, 2007: 78; Gravetter & Forzano, 2009: 141). The participants under the category of users and researchers at the National Library of Namibia were selected using convenient sampling.

The study targeted a sample size of 221 of Namibia's documentary heritage users at the National Library of Namibia. The sample size of 221 out of a population of 514 was arrived at by using the Raosoft (2004) sample size calculator with a confidence level of 95% and a margin of error of 5%. The participants were selected conveniently based on the visits of users or those users who were using the Namibian documentary heritage collection at the National Library of Namibia during the duration of data collection for this study.

Users of the Namibian documentary heritage resources at the National Library of Namibia were identified with the help of the library staff. The assistance of National Library of Namibia staff was required to identify library users because the information sources published in Namibia are stored in the National Library of Namibia in closed collections and members of the public do not have access to these collections. One needs to approach a librarian at the reference desk for assistance to locate what one is looking for and the librarian goes into the stack rooms to retrieve the requested source and hands it to the library user. Thus, librarians are in the know of which library user is using these materials.

The study used parallel mixed methods sampling. Such sampling involves the selection of units of analysis for a mixed methods study through the parallel use (simultaneously or with some time-lapse) or both probability and purposive sampling (non-probability) strategies (Teddlie & Tashakkori, 2009: 186). With the mixed methods sampling, one type of sampling procedure does not set the stage for the other but instead, both probability and purposive sampling (non-probability) procedures are used simultaneously (Teddlie & Tashakkori, 2009: 186). In this study purposive sampling was done first and once all the units of analysis were selected and interviewed, the researcher proceeded to the conveniently selection of the National Library of Namibia users. One of the benefits of parallel mixed methods sampling is that it allows a researcher to triangulate results from the separate components (qualitative and quantitative) (Teddlie & Tashakkori, 2009: 187). The population of the study and respective samples are captured in Table 4.1.

Table 4.1: Participants in the study

Category of participants/sub-populations	Sub-population size	Sampling type	Sample size
NLAS management	7	Purposive sampling	6
NLIC members	15	Purposive sampling	13
National Library of Namibia management staff	10	Purposive sampling	3
National Library of Namibia IT staff member	1	Purposive sampling	1
National Library of Namibia users	514	Convenient sampling	221

4.6 Data collection methods

Research methods include specific strategies and procedures for implementing research design (Teddlie & Tashakkori, 2009: 21). The study used interviews, questionnaires and document search and review to collect data.

4.6.1 Interviews

Research interviews are methods of data collection that use people's responses to a researcher's questions as to their source of data (Denscombe, 2014: 184). An interview refers to a two-way conversation in which the interviewer asks the participant questions to collect data and learn about ideas, beliefs, views and opinions (Zhang & Wildemuth, 2009: 222; Nieuwenhuis, 2016: 92). An interview is a good data collection tool for finding out what a person thinks (attitudes and beliefs) and describing people's perceptions and understanding (Bertram & Christiansen, 2014: 82). Interviews are a valuable source of information used to obtain rich descriptive data that will help a researcher understand the participant's construction of knowledge and social reality (Nieuwenhuis, 2016: 93). Consequently, they are a powerful data collection strategy and provide ample opportunity for interviewers to ask for explanations about vague answers or to provide clarification if a response is not clear (Teddlie & Tashakkori, 2009: 229).

In this study, interviews were targeted at NLIC members, NLAS, NLAS IT and the National Library of Namibia staff (see Appendixes E, F, G and H) to collect their views and attitudes and explore their understanding of digital preservation as well as to establish the current preservation strategies, if there were any. Interviews were used to collect data for the following

research question: What are the current preservation practices for information resources at the National Library of Namibia?; What long-term preservation policies and strategies are in place or needed to provide digital access to Namibia's documentary heritage?; What are the views of National Library users, National Library of Namibia staff, NLAS staff, Legal Deposit Committee members and NLIC members on digital preservation of national documentary heritage?; and To what extent does the Namibian legal deposit framework make provision for electronic information sources deposit to the National Library of Namibia? Interviews allow the researcher to ask probing and clarifying questions, and to discuss research participants' understanding with them (Bertram & Christiansen, 2014: 83). Some of the benefits of interviews include the ability of a researcher to ask questions to obtain more detailed information if the respondent has not given sufficient detail initially and the ability of the researcher to collect much more detailed and descriptive data in an interview than through using a questionnaire (Bertram & Christiansen, 2014: 26).

This study used semi-structured interview guides, also known as open-ended interviews. With semi-structured interview, the interviewer has a clear list of issues to be addressed and questions to be answered (Denscombe, 2014: 186). In semi-structured interview, there are certain open questions that are asked and these are followed by further probing and clarification to gain worthwhile detailed insights (Denscombe, 2014: 204; Nieuwenhuis, 2016: 93). A semi-structured interview, allows an interviewee to develop ideas and speak more widely on the issues raised by the researcher (Denscombe, 2014: 186). With this type of interview, participants may propose solutions or provide insight into events or subjects being studied (Nieuwenhuis, 2016: 93). The researcher believes semi-structured interviews were appropriate for the study because they allowed participants to express their attitudes and perceptions through open-ended questions on the preservation of documentary heritage in Namibia. The researcher also believes that interviews were suitable for the study, as they had been successfully used on other digital preservation studies (Peyronnin, 2015; Kaminyoge, & Chami, 2018; Awamleh & Hamad, 2022; Balogun & Kalusopa, 2022). Since the study was conducted during the COVID-19 pandemic (2020-2021), some participants opted to be interviewed virtually. Participants who opted to be interviewed virtually were interviewed via Microsoft Teams and Zoom platforms.

4.6.2 Questionnaires

Questionnaires are useful when used with large numbers of respondents; when what is required tends to be straightforward information relatively brief and uncontroversial; and when the respondents can read and understand the questions (Denscombe, 2010: 166). Questionnaires can also be used to investigate the opinions, attitudes, views, beliefs and preferences of participants on the subject matter (Denscombe, 2010: 157). The current study used a semi-structured questionnaire (see Appendix D). Semi-structured questionnaires ask more open-ended questions than closed questions (Bertram & Christiansen, 2014: 76). Although semi-structured questionnaires take respondents much longer to complete than structured questionnaires, open-ended questions allow respondents to write their own opinions or record their own experience concerning a particular issue without being constrained by closed responses (Bertram & Christiansen, 2014: 76).

Another advantage of open-ended questions is that the information gathered is likely to reflect the full richness and complexity of the views held by the respondent, as respondents can express themselves in their own words (Denscombe, 2010: 165). However, one of the setbacks associated with open-ended questions is that they demand more effort and time from a respondent, which might reduce the respondents' willingness to take part in the research (Denscombe, 2010: 156).

In this study, questionnaires were used to collect data from National Library of Namibia users. The questionnaire was based on the third research question of the study which is: What are the views of National Library users, National Library of Namibia staff, NLAS staff, Legal Deposit Committee members, and NLIC members on digital preservation of national documentary heritage? The 'National Library users' aspect of this question was the focus of the questionnaire. The questionnaires were administered in hardcopy by the researcher at the National Library of Namibia and respondents were expected to, as far as was possible, to complete them while in the library and return to the researcher or the box at the reference desk in the library or take them home and return them the next day (an attempt) to increase the return rate). The researcher collected data daily for eight months (June 2022 to January 2023). The researcher explained verbally the significance of participating in the study to encourage participation in the study. Bertram and Christiansen (2014: 77) explain that when the researcher administers the questionnaires personally, this helps the researcher to provide explanations if

and where misunderstandings arise. In previous preservation studies, questionnaires have been used (Adu & Ngulube, 2016; Anyaoku et al., 2019) to investigate the practice of digital preservation and digital preservation strategies.

4.6.3 Document search and review

A further data collection method used in this study was the search for existing relevant documents (see Appendix I). Documents can be treated as sources of data and an alternative to questionnaires, interviews or observation (Denscombe, 2010: 217). Document search refers to compiling or accumulating objects such as documents, electronic sources, websites and policy documents (Yin, 2016: 155). It also involves locating materials and obtaining permission to use the materials (Creswell, 2013: 174), and careful consideration, selection and examination of printed and other sources available (Fox & Bayat, 2014: 72). During the process of research, the researcher may collect qualitative documents. This may include public documents such as government publications, reports, newspapers articles, minutes of meetings, or private documents such as personal journals and diaries, administrative documents, letters and emails (Yin, 2009: 103; Creswell, 2014: 190; Nieuwenhuis, 2016: 88). With document search, the researcher focuses on all types of written communications that may shed light on the phenomenon that is being investigated (Nieuwenhuis, 2016: 88).

Some of the benefits associated with the document search method are: easy accessibility of documents as most information is conveniently available without much cost and prior appointment, unlike interviews (Denscombe, 2010: 220). Document search also provides other specific details to corroborate information from other sources and the researcher can make inferences from these documents (Yin, 2018: 115). Document search presents challenges, especially with private documents and restricted documents. In such cases, the researcher needs to negotiate with those who hold the data before being granted the privilege to access such documents (Denscombe, 2010: 220). Another notable limitation is the abundance of materials as one may get lost in reviewing such materials and waste a lot of time (Yin, 2014: 105). In this study, the following documents were reviewed and analysed: policy documents, minutes of meetings of NLIC, NLIC research reports, Legal Deposit Committee minutes of meetings and reports, government publications, NLAS and the National Library of Namibia publications, the National Library of Namibia websites and any published or unpublished documents the researcher could come across that contained information on legal deposit, electronic legal

deposit, preservation of resources at the National Library of Namibia and digital preservation. These documents were reviewed to understand aspects of the OAIS Reference Model and DPCMM such as planning and administration and long-term access to Namibia's documentary heritage. Document search and review were deemed appropriate for this study because of the data this source had to offer the study as well as the fact that it has been successfully used in digital preservation studies (Oehlerts & Liu, 2013; Mutula, 2014; Sahoo and Mahanty, 2015).

4.7 Validity and reliability

Validity in research refers to the extent to which an instrument measures what it is supposed to measure (Pietersen & Maree, 2016: 239). Validity is also referred to as the credibility of data and refers to the extent to which researchers can demonstrate that their data are accurate and appropriate (Denscombe, 2014: 297). Bertram and Christiansen (2014: 188) explain that validity can be enhanced during data collection and data analysis to reflect the participant's reality. In this study, the researcher used a digital audio recorder (with the permission of the participants). Using an audio-recording device to record interviews verbatim means that the transcripts would be more accurate than if the researcher simply jotted down notes during the interview (Bertram & Christiansen, 2014: 188). The researcher used peer debriefing to test the validity of the study. A debriefing is a personal communication, typically verbal, in which the researcher provides detailed information to the participants regarding the study's purpose, any instances of withholding information, and any instances of deception (Teddlie & Tashakkori, 2009: 201). Debriefing involves locating a person (a peer debriefer), who reviews and asks questions about the qualitative study so that the account will resonate with people other than the researcher. This strategy involves an interpretation beyond the researcher and invested in another person who adds validity to an account (Creswell, 2014: 202). Peer debriefing introduces an individual into the data gathering and analysis procedures to allow the researcher to clarify interpretations and identify possible sources of bias (Teddlie & Tashakkori, 2009: 295). In this study, peer debriefing was done before data collection. The research instruments were given to seasoned professionals in the information science field from the Department of Social Sciences (University of Namibia) as well as from the University of Namibia Library (the researcher is based at the University of Namibia). These professionals were purposively selected, and they provided valuable comments which in return enhanced research instruments. This was done to ensure that the instruments appear to measure what they were supposed to

measure, also known as face validity (Pietersen & Maree, 2016: 240). In the case of this study, peer debriefing led to the inclusion of the National Library of Namibia IT staff member among the study's participants, who was initially not considered by the researcher.

Denscombe (2010: 62) explains that the use of multiple methods in a single study facilitates the validation of data through triangulation. The study also used methodological triangulation. Methodological triangulation refers to relying on different sources to collect data (Bertram & Christiansen, 2014: 188; Yin, 2016: 87). It relied on three data collection methods: interviews, document search and review, and questionnaires to collect data. The mixed methods approach helped the researcher to check and verify findings from the interviews against the findings from the document search to ensure their validity and accuracy. In terms of document search, validity of the resources which were consulted were assessed in terms of the following criteria: authenticity - whether the documents are genuine and are what they purport to be; representativeness - whether the documents are complete and edited; and credibility - whether the documents are accurate, free from bias and errors, assess who produced the documents and for what purpose, etc. (Denscombe, 2010: 222).

Reliability refers to the extent to which a measuring instrument is repeatable and consistent (Bertram & Christiansen, 2014: 186; Denscombe, 2014: 298; Pietersen & Maree, 2016: 238). In other words, if the instrument is administered to different respondents from the same population, the findings should be the same. The goal of reliability is to minimise the errors and biases in a study. This means that if a later investigator follows the same procedures as described by an earlier investigator and conducts the same study all over again, the later investigator should arrive at the same findings and conclusions (Yin, 2014: 49). In the current study, the questionnaires were pre-tested before the study was conducted. Pre-testing refers to the testing of a data collecting instrument or method before it is used (Bertram & Christiansen, 2014: 206). The questionnaires were given to a conveniently selected small sample of ten documentary heritage resources users at the National Library of Namibia to determine whether the users understood the questions the way they were intended by the researcher and that the respondents would not need many explanations. This was done in the month of May 2022, a month before the actual data collection commenced. The pre-testing was done with the assistance of the staff members at the National Library of Namibia. Pre-testing identifies problem areas in the questionnaire (Bertram & Christiansen, 2014: 77), therefore, if any problems are identified in the pre-test, changes will be made before it is administered to the

public. In this study, pre-testing led to the rectification of what access to information sources remotely meant (see Question 12 in Appendix D). This question was initially not clear to those who participated in the pre-testing, and hence rectified.

4.8 Data analysis and presentation

Data analysis refers to the systematic organisation, integration and examination of data, connection of data to concepts and identification of broad trends or themes (Neuman, 2011: 507). In mixed methods research such as this one, data analysis involves the integration of statistical and thematic techniques (Teddlie & Tashakkori, 2009: 26). Since both qualitative and quantitative data were collected in this study, the data collected through the three data collection methods (interviews, document review and questionnaires) were analysed using a convergent parallel mixed methods approach. That is, the two datasets (involving qualitative and quantitative data) are analysed separately and are then brought together (Creswell, 2014: 222; Creswell & Plano Clark, 2018: 209). In this study, qualitative and quantitative data were analysed separately. The researcher first analysed qualitative data from interviews and document reviews, and then analysed quantitative data collected via questionnaires, and these datasets were then be merged for interpretation. With this approach, the researcher makes the comparison of multiple data sources (triangulation) within a discussion before concluding (Teddlie & Tashakkori, 2009: 27; Creswell, 2014: 222; Yin, 2016: 306; Creswell & Creswell, 2018: 220).

Qualitative data generated from interviews, document review and open-ended questions in questionnaires in this study were analysed using the content analysis technique and a qualitative computer software programme ATLAS.ti (Creswell & Plano Clark, 2011: 206). ATLAS.ti was used to code, organise and sort information in preparation for analysis and interpretation of findings. The data were presented mainly in the form of descriptive narratives, with a few direct quotes from the participants. Quantitative data generated from questionnaires in this study were analysed using the Statistical Programme for Social Sciences (SPSS) software (Creswell & Plano Clark, 2018: 214), to present descriptive information. Quantitative data were presented in statements, tables and figure (Creswell & Plano Clark, 2018: 209).

In addition to the convergent parallel mixed methods approach, there are two broad qualitative and quantitative data analysis approaches, namely inductive and deductive (Bertram & Christiansen, 2014: 117). Induction entails a definite move in the data from the specific to the more general. The data generated from this process is used in an attempt to discover relationships or patterns through careful scrutiny (Bertram & Christiansen, 2014). Deduction on the other hand, is a conclusion reached by reasoning from general principles to a particular case (Fox & Bayat, 2014: 106). In contrast to an inductive approach, it is possible for the researcher to have a clear theoretical model or set of concepts beforehand and use this framework to analyse the data and make conclusions (Bertram & Christiansen, 2014).

Bertram and Christiansen (2014: 117) explain that the key difference between the two approaches is that in inductive reasoning, the categories (themes) emerge from the data, while in deductive reasoning, the researcher start with a set of categories, which are then used to categorise and organise the data. In this study, the researcher analysed data according to themes emerging from the two theoretical models (discussed in Chapter Two), however, further themes emerged from both qualitative and quantitative data.

There are several ways to merge two datasets in a convergent parallel mixed methods approach. The study used the side-by-side comparison approach (Creswell & Creswell, 2018: 120). With this approach, comparison can be seen in the discussion section. The researcher can either first report the quantitative statistical results then discuss the qualitative findings or vice-versa, that either confirm or disconfirm the statistical results (Creswell & Creswell, 2018: 120). Data analysis was divided into sections based on themes drawn from the two theoretical models informing this study and the research questions. The presentation of results was through written descriptions, numerical summarisations and figures. The two datasets (qualitative and quantitative data) were then compared to each other to produce a single interpretations and conclusions were made.

4.9 Ethical consideration

Ethical considerations in research include the well-being of the participants in a study (Teddlie & Tashakkori, 2009: 198). Research ethics deals primarily with the interaction between researchers and the people they study. Ethics in research is an important consideration in research especially if it is involving humans and animals (Bertram & Christiansen, 2014: 64). Bertram and Christiansen (2014: 66-67) explain three ethical principles: (a) autonomy: referring to a researcher getting the consent of every person who will participate in the study; (b) non-maleficence: meaning the researcher should not harm the research participants; and (c) beneficence: the research should be of benefit either directly to the research participants, or more broadly to other researchers. This study is envisaged to be beneficial to participants in the following manner: to NLAS and NLIC, the study conclusions could inform the formulation of policies; to the National Library of Namibia staff, the study could lead to the development of preservation strategies that will enable the library to provide services remotely; and to National Library of Namibia users, the study could be beneficial in that should the National Library of Namibia consider preserving and acquiring digital resources, they will be able to access the Namibian documentary heritage material remotely and at their convenience. This section addresses the ethical considerations which were adhered to in the data collection process for both qualitative and quantitative data and after the study.

4.9.1 Institutional approval

Before a study is conducted, the researcher needs to obtain the necessary permissions. Permission refers to approval obtained from individuals in authority to gain access to sites and to study participants. The researcher applied for ethics clearance from the University of Cape Town where the study is registered (see Appendix A). On the basis of this ethics clearance, permission to use the National Library of Namibia, as a research site, was sought from the Ministry of Education, Arts, and Culture (see Appendix B) and from the Directorate of Namibia Library and Archives Services (see Appendix C) which is a custodian of the National Library of Namibia.

4.9.2 Informed consent

Informed consent refers to research participants agreeing to take part in the study and participants should understand what they are agreeing to (Teddlie & Tashakkori, 2009; Neuman, 2011: 149; Thomas, 2011: 69; Bertram & Christiansen, 2014: 66). Participants need to know the nature and purpose of the study, expected benefits of the study, and information about confidentiality and anonymity (Thomas, 2011: 69-70). Consent forms are distributed to potential participants to ensure that the voluntary nature of participation in the research project and details of the study have been explained to participants (Teddlie & Tashakkori, 2009: 199). Consent forms may also include provisions related to participants' right to privacy, which include the related issues of anonymity and confidentiality (Teddlie & Tashakkori, 2009: 199). The researcher explained in writing and verbally at the time of data collection (see Appendix J) to National Library users, National Library of Namibia staff, NLAS staff, NLAS IT and NLIC members that the purpose of the study was to investigate the preparedness of the National library of Namibia to preserve Namibia's documentary heritage through digital preservation. Participants were also informed that the study was in fulfilment of a PhD at the University of Cape Town and that it sought their experiences and views on the subject. Before participants were interviewed and completed the questionnaires, they were requested to consent to participate in the study. The consent form clearly indicated that their participation was voluntary, and participants could decide whether or not to participate in the study. Participants could withdraw from participating in the study at any time if they so wished without being intimidated and providing reasons. Interviewed participants were also asked for permission by the researcher to use a voice recorder to capture the interviews. No incentives were provided for participating in the study. No harm in any form to participants, was anticipated.

4.9.3 Anonymity and confidentiality

Anonymity in research refers to ethical protection that participants remain nameless, their identity is protected from disclosure and remain unknown (Neuman, 2011:152). The researcher protects privacy by not disclosing participants' identity after information is gathered. Confidentiality refers to the ethical protection for those who are studied by holding research data in confidence or keeping them secret from the public and not releasing information in a way that permits aligning specific individuals to specific responses (Neuman, 2011:153). Creswell (2014) urges researchers to respect the privacy of participants. Some aspects to

consider include: how the study protected the anonymity of individuals, roles and incidents in the project. In this study, participants were assured of the confidentiality of the information which they will provide the researcher with for the study. The researcher protected the identities (see Chapter Five for evidence) of the different individuals when reporting the research findings so that the report does not cause any harm to the participants. The research findings were analysed and presented using codes to refer to participating individuals to protect their identities. In this research, the confidentiality and anonymity agreements were enclosed in the informed consent (see Appendix J).

4.10 Evaluation of study's methodology

The study utilised the pragmatic paradigm, employed a single case study design and employed a convergent parallel mixed methods approach. The methodological triangulation (semi-structured questionnaire, structured interview guides and document review guide) yielded good results. The use of mixed method approach assisted the study to eliminate the limitations associated with single research approaches. Furthermore, the pre-testing and debriefing of instruments assisted to cement the instruments and closed all potential shortfalls. The researcher is confident that, on the whole, the methodology adopted in this study aided in addressing the study's objective and in responding to the research questions generated to address the study's objective.

One of the methods that in the view of the researcher did not yield good results was the document search and review guide. Although this instrument was carefully designed to assist with retrieving all necessary documentations to substantiate responses provided participants, the researcher experienced challenges with access to all necessary documents for review. The main challenges were participants' reluctance to provide the documents requested. These documents included minutes of meetings, policies, proposal documents, etc. Challenges experienced in this study and considered to be one of the weakness of document reviews, is that retrieving documents can be difficult and that some documents may be deliberately withheld (Yin, 2018: 114).

4.11 Summary of the chapter

The chapter discussed philosophical assumptions or the world view (pragmatic paradigm) within which the study is located. The chapter also discussed the research approach and design adopted in this study. It further provided a justification for data collection methods (interviews, questionnaires and document review). The population, sampling techniques and procedures were also discussed in this chapter. The chapter explained how data collected in the study were analysed and presented. Matters of validity and reliability were discussed. An evaluation of the study's overall methodology was covered as well as ethical considerations. Ethical considerations? The next chapter presents the findings of the study.

Chapter 5 : Presentation of Findings

5.1 Introduction

This chapter presents the findings of the study. The data were collected through the use of semi-structured interviews, questionnaires and document search and review, as elaborated in Chapter Four. In this study, qualitative data were collected through semi-structured interviews and document search and review. Semi-structured interviews were conducted with purposively selected Namibia Library Information Council (NLIC) board members who served during the 2018-2021 term, Namibia Library and Archives Services (NLAS) management, National Library of Namibia management staff and National Library of Namibia (NLN) IT librarian. Selected policy documents, minutes of meetings, annual reports and government publications were reviewed. Qualitative data of the current study were analysed using ATLAS.ti version 23.08 qualitative data analysis software and these findings are presented in the form of narratives.

Quantitative data were collected through a semi-structured questionnaire. The questionnaires were administered in hard copies by the researcher to conveniently selected NLN user respondents. The quantitative data were analysed using SPSS version 28 for descriptive statistical analysis. The findings of quantitative data analysis are presented in forms of graphs, charts, tables and figures. In presenting these figures in some instances, percentages have been rounded off to the nearest whole and therefore totals might sometimes be presented at 100% but are actually slightly less or slightly more.

Research findings for the study are presented according to the following headings which are derived from research questions which guided the study:

- Current preservation practices for information resources at the National Library of Namibia;
- Long-term preservation policies and strategies;
- Views on digital preservation of national documentary heritage;
- Namibian legal deposit framework and electronic information sources; and
- Preservation framework appropriate for the National Library of Namibia.

Each research instrument was organised according to the above themes and each instrument had a general question. Here interview participants and questionnaire respondents were asked to provide further comments or suggestions regarding digital preservation documentary heritage at the National Library of Namibia (see Q19 in Appendix D, Q11 in Appendix E, Q18 in Appendix F, Q34 in Appendix G, Q20 in Appendix H). Findings to these questions are presented under the appropriate themes above.

5.2 Response rate and profile of respondents

Neuman (2014: 342) defines response rate as the percentage of all respondents in the initial sampling frame who were located, contacted, eligible, agreed to participate, and completed the entire questionnaire. It is also referred to as the percentage of people in the sample selected for the study who actually participate (Christensen et al., 2015: 164). In this study for qualitative data sources, the researcher aimed to reach a sample size of 23 participants who were purposively sampled (see Table 4.1 in Chapter Four). This sample size was made up of NLAS management, NLIC board members, National Library of Namibia management staff and the NLN IT person. The study managed to interview 16 participants representing a 70% response rate. Seven NLIC members did not participate in the study due to unavailability and some did not respond to emails and telephone calls.

Although the study aimed at interviewing the Legal Deposit Committee members, at the time of data collection it was established that this committee was not in existence. NLIC minutes reviewed (Namibia Library and Information Council, 2019: 2) revealed that the Legal Deposit Committee was constituted in 2019; however, the current study established that this committee never had a meeting. The supposed Legal Deposit Committee members, when contacted for interviews, indicated that they did not have any meetings for the past five years. The study established that the Legal Deposit Committee was only constituted after the fieldwork for the current study was completed. This Committee's first meeting took place on 5 June 2023.

The study targeted a sample size of 221 Namibiana collection users at the National Library of Namibia (see Table 4.1 in Chapter Four). This sample size of 2021 from a population of 514 was selected using the Raosoft (2004) sample size calculator as explained in Chapter Four. The study yielded 82 responses, representing a 37% response rate. After eight months of data

collection, the research reached a saturation point. Although the Namibiana collection user population in 2021 was 514 (National Library of Namibia, 2021: 18), the research reached a saturation point after 82 respondents. One of the challenges associated with low response rate of self-administered questionnaires is that many people do not complete and return questionnaires and that a researcher lacks control over the conditions under which questionnaires are completed (Neuman, 2014: 345). In this study, the researcher encountered five questionnaires that were not adequately completed but were still usable. This lack of completion could be as a result of a challenge explained by Neuman (2014: 345) that no one is present to clarify questions or to probe for more information when respondents give incomplete responses. Therefore, in this chapter, the total number of respondents varies in the reporting of different questionnaire items.

There was a further contributing factor to the low questionnaire response rate. The researcher established that the 514 Namibiana collection (documentary heritage) users mentioned earlier in this section represents the number of enquiries to the Namibiana collection. It was evident from the National Library of Namibia users' register that although 2020/2021 documentary heritage users stood at 514, the 514 were requests for documentary heritage sources and that some users repeatedly used documentary heritage sources many times in the year and were required to sign in the register every time they visited the National Library of Namibia. The NLN system of collecting usage statistics required that every request be registered as a new user every time a user visited the library and that the NLN records the statistics of requests and not that of individual users. This means that enquiries came from a smaller population than the number of 514 indicated in the National Library of Namibia 2020/2021 annual report. This in turn means that effectively this study achieved a higher questionnaire response rate than the 37% mentioned earlier.

The interview participants and questionnaire respondents in the study were coded as presented in Table 5.1.

Table 5.1: Response rate for the respondents and participants

Participants/respondents	Target	Participants	Codes
NLAS management	6	6	NLAS1 to NLAS6
NLIC members	13	6	NLC1 to NLC6
NLN IT librarian	1	1	IT
National Library of Namibia management staff	3	3	NLM1 to NLM3
National Library of Namibia users	221	82	Respondents

5.3 Demographic features of the study

This section presents the demographic details of participants (interviews) and respondents (questionnaires) of the study. For confidentiality and maintenance of anonymity of interviewed participants, details pertaining to affiliation participant’s institution, designation, department and number of years in the current position are withheld in this chapter.

5.3.1 Demographic details of respondents

This section presents demographic details of the study’s questionnaire respondents (National Library of Namibia users). These details include: respondents’ age, types of users who used the Namibiana collection and Namibiana users’ level of education.

Table 5.2: Age of respondents (N=82)

Age group	Frequency	Percentage
10 - 20yrs	13	16%
21 - 30yrs	26	32%
31 - 40yrs	15	18%
41 - 50yrs	14	17%
51 - 60yrs	8	10%
61 & above	6	7%
Total	82	100%

Table 5.2 shows that the documentary heritage at the National Library of Namibia was mostly used by users between the age group 21 to 30 at 26 (32%) and least used by senior citizens aged 61 and above at 6 (7%).

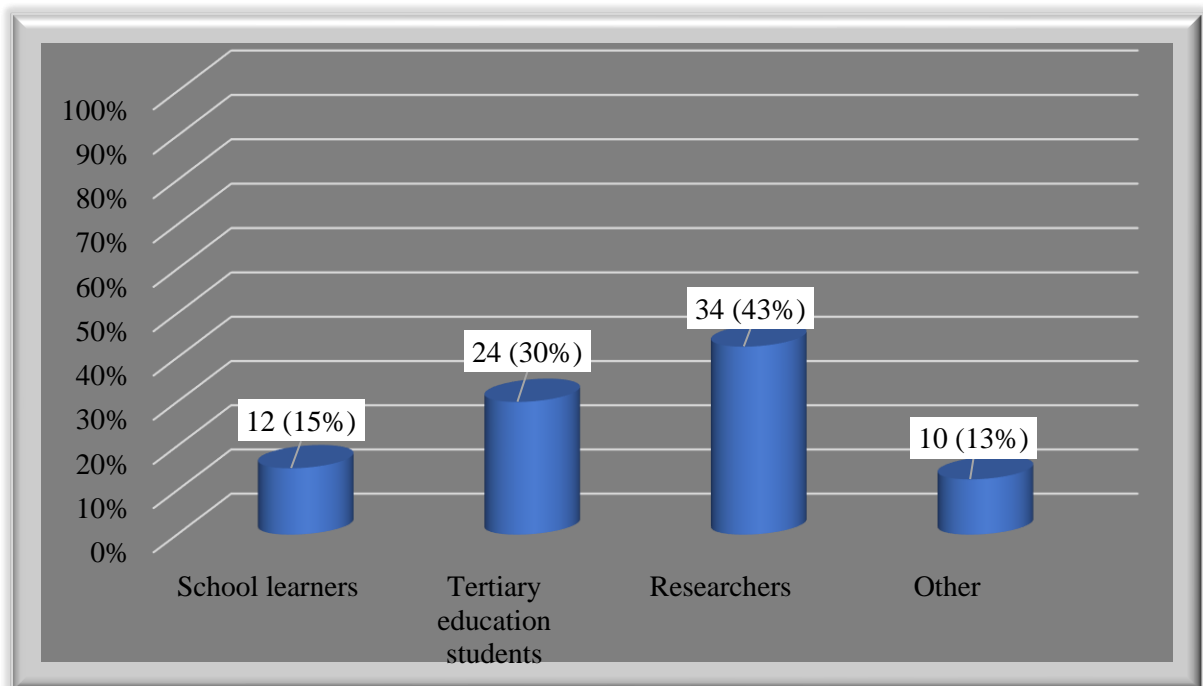


Figure 5.1: Namibiana collection users (N=80)

From Figure 5.1 it can be observed that the majority of the Namibian collection users who participated in the survey were researchers at 34 (43%), whilst the least number of users in the ‘Other’ category, which was made up of community activists, journalist, librarian, self-employed, at 10 (13%).

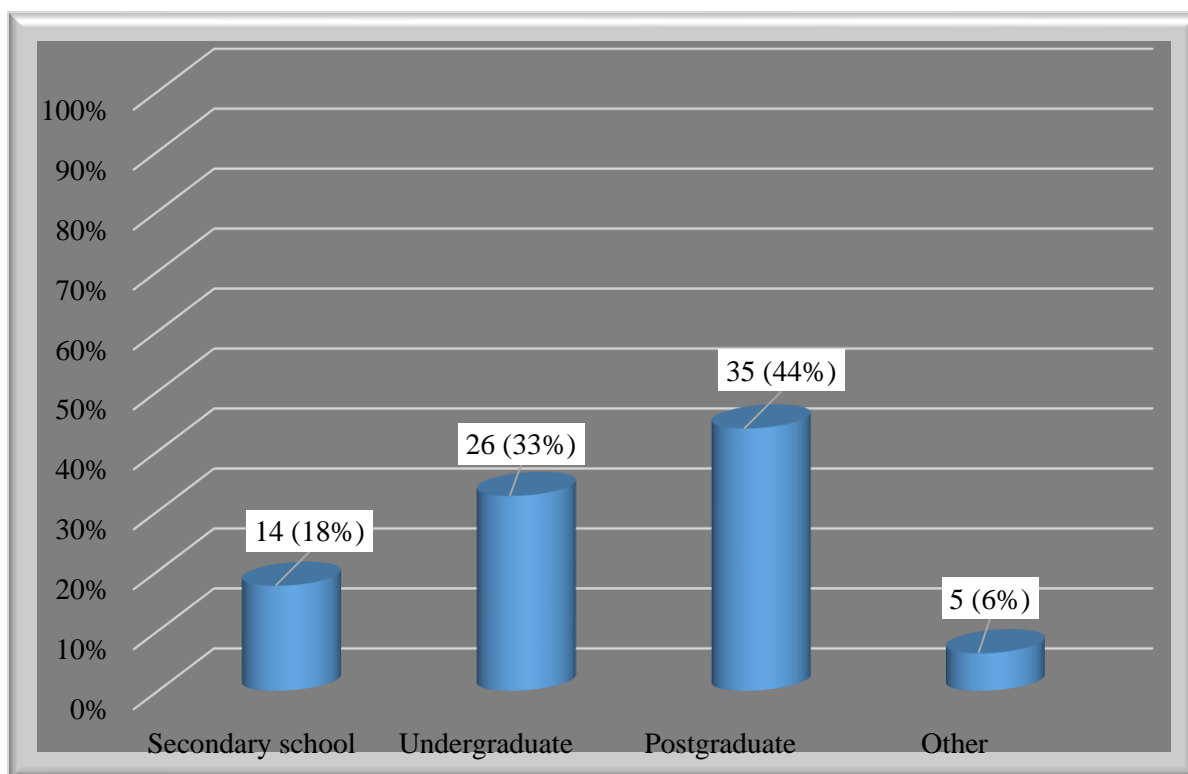


Figure 5.2: Respondents level of education (N=80)

Respondents were asked to provide their highest qualification and it can be observed in Figure 5.2 that the majority of respondents who participated in the survey were postgraduate qualification holders at 35 (44%), whilst the least category ‘Other’ respondents included undergraduate drop-out at 5 (6%).

5.4 Current preservation practices for information resources at the National Library of Namibia

The first research question of the study aimed to establish what the National Library of Namibia was doing, with respect to preservation practices of any kind (physical or digital) to the Namibiana collection it had in its custody. This research question was directed to the National Library of Namibia management staff, that is, the head of National Library of Namibia and two senior librarians, User Service and Bibliographic Services; NLAS management; and NLIC board members. Selected documents were identified to provide insight into the preservation activities at the National Library of Namibia.

The findings to this research question are presented under the following themes:

- Preservation activities at the National Library of Namibia;
- NLAS and NLIC views on the preservation activities at the National Library;
- Preservation methods; and
- Challenges with preserving information sources.

5.4.1 Preservation activities at the National Library of Namibia

The study sought to establish the type of preservation activities that the National Library of Namibia was undertaking for both physical and electronic information held in the Namibian collection. When asked what preservation activities the National Library of Namibia was currently engaged in, the responses were as follows:

NLM1

“We preserve mostly legal deposit collection. We have books small and large print, newspapers, periodicals, journals, DVDs, cassettes that are preserved at the National Library. Currently, we are preserving them in the way these materials came in and we did not yet start with a digitisation process.”

NLM2

“We are digitising some of the materials from the Namibiana collection especially those that we see that are needed by researchers, we are selecting them on the basis of condition especially those that are seemingly fragile and those that are being used more often by users.”

NLM3

“Currently, we are depending on copies that publishers are giving to us and mostly it’s in manual/printed form (printed from publishers). As we know that things are changing, we find publishers that are publishing in electronic form but the National Library is not really ready for that.”

5.4.2 NLAS and NLIC views on the preservation activities at the National Library

NLAS and NLIC board members were asked if they were aware of any digital preservation activities at the National Library. Below are the NLAS responses:

NLAS1

“Yes, we started with the project to digitise some of the materials at the National Library. Some years back, we had a project to digitise a number of records every day.”

NLAS2

“Not really, some years back, the National Library was digitising old newspapers but, I don’t know where that ended.”

NLAS3

“Yes, the National Library of Namibia has started embarking on digital preservation of the old publications of the Namibiana Collection. The project started off and it is progressing forward, although it is being executed at a slow pace, due to the challenges of understaffing and the shortage of the required equipment. Apart from digital preservation of the Namibian Collection, the National Library is also in agreement with two local newspapers, namely: the Windhoek Observer and the Informante – they are surely supplying the National Library of Namibia with digital/electronic newspapers for preservation.”

NLAS4

“I am not quite sure about the National Library, I only know of the National Archives, where they have a digitisation project and digitising old records. With the National Library, they want to start the process, but I don’t know how far they have gone.”

NLAS5

“Yes, I think they were busy digitising old newspapers but due to lack of equipment, this is moving at a slow pace.”

NLAS6

“We are in a process of reviewing our preservation policy, the National Library is driving this process and legal deposit act, we are also digitising materials.”

Below are the NLIC board members’ responses:

NLIC1

“Yes, both National Library and National Archives started with scanning of documentary heritage (a few materials were digitised). So, it was needed to be there thus both institutions were scanning materials.”

NLIC2

“Yes, I know at one stage at National Archives they were digitising records, and also there was an anti-colonial record project whereby materials were digitised but this was done with external funding. If I am not mistaken, the funding was from Germany, I am just not sure of the current situation and how far they have gone with digitising these materials. However, I am aware of the shortage of staff and equipment to do that work. They need support in terms of staff and computer equipment.”

NLIC3

“No, not at this moment. But we had a discussion at NLIC level to mobilise for resources to acquire necessary equipment and train human capital to make sure that as we move forward, these resources are in place to enable digitisation projects go ahead.”

NLIC4

“No, they don’t have the equipment or the server. They don’t have any place to even preserve digitally born legal deposit that they receive. If they save the legal deposits on a computer is not secure because if something happens to that computer, it is lost again. I don’t think they have anything.”

NLIC5

“Attempt has been made with the digitisation project but only concentrated on local newspapers because newspaper has value for historical research. There are also some materials like journals being captured or digitised.”

5.4.3 Preservation methods

Interviews (NLM3) established that the National Library of Namibia is preserving information sources by means of digitising scarce resources such as old books that are not in print anymore. NLM1, NLM2 and NLM3 explained that the National Library of Namibia did not yet start with the digitisation of compact discs (CDs), cassettes and video tapes specifically music and short films. Currently, CDs, cassettes, and video tapes were kept the way they were or were received. NLM1 revealed that the National Library of Namibia used scanning as a preservation method to preserve documentary heritage. When asked what preservation methods/strategies were currently being used, National Library management staff members had the following to say:

NLM3

“With scanning, we see what are the users mostly requesting for or what materials are in demand. The selection of materials to scan is based on high demand/usage, fragile resources and these materials are upload on the server.”

NLM3 explained that scanning of information sources started in 2017, however, the information sources scanned were not yet available to the public. They were kept in the computers they were scanned into. Interviews (NLM1 and NLM2) established that the content of information sources scanned by the National Library of Namibia for preservation purposes has not yet been made available to the public or to National Library users. A follow up question *“Are there any reasons why they are not availed to the users?”* was asked. The responses were as follows:

NLM1

“I think it is because of the fact that metadata has not been added to the documents scanned yet and they are not available in the National Library’s library management system. Thus, we are not able to avail them to the users.”

NLM2

“There are plans to avail them to the public. Like now we are working on the implementation of Koha library management system at the National Library. Koha library management system will enable us to provide access to the public. Plans are in place to avail them on the system.”

5.4.4 Challenges with preserving information sources

Responses from NLM1, NLM3 and NLIC5 highlighted that the National library of Namibia was experiencing some challenges with preserving information sources in their collection. The interview participants had the following to say:

NLM1

“One of the challenges we have is preserving CDs, cassettes and videos specifically music and short films.”

NML3

“The library does not have a dedicated scanning machine for scanning purposes. Our main aim is to acquire proper equipment for scanning purposes and have dedicated staff members to be assigned for scanning.”

NLIC5

“There is a difference between scanning and capturing them in a digital form but the processing of this materials so that they can be accessed is another thing. The one challenge which we had is that the mass server acquired never really worked as far as I know and it became a white elephant.”

NLIC5 narrated that a server was acquired more than 10 years ago through an Education and Training Sector Improvement Programme (ETSIP) project, but this server never worked due to a number of critical challenges. Interviews (NLIC5) established that information sources were scanned but the storage of these materials became a challenge because content scanned were either stored/saved in computers and hard drives which was not supposed to be the case because computers did not have capacity to house these scanned files. Furthermore, these information sources scanned were not remotely accessible remotely by the National Library

users. Other challenges which led to the failure of the digital preservation activities at the National Library of Namibia included:

Staffing: Responses from NLAS1, NLIC5, NLM2 and NLM3 indicated that the National Library of Namibia only scanned a few information sources per year because of a shortage of staff. The National Library of Namibia did not have sufficient capacity in terms of staff members to work on the digitisation project. Staff members who were scanning the documentary heritage were doing rotations. No one was assigned to do these activities and no specific person was assigned for this project.

Technological knowhow: Interviews (NLAS1 & NLIC5) established that technology knowhow was not at the standard where it needed to be because the staff members assisting were not qualified nor had the necessarily skills. The National Library need librarians and senior librarians to do these projects. There was a need for someone to do quality control, metadata, etc.

Infrastructure: responses from NLM2 and NLM3 indicated that the National Library of Namibia did not have technological infrastructure to hasten the process and also to make sure materials were handled the way they should be for example, scanning machines, computers, software, etc. NLAS management was asked if there were any immediate plans from NLAS to recruit more staff at the National Library and if there was a strategy in place to fill the staffing gap? NLAS1 explained:

“From 2015, NLAS reviewed the staffing structure for National Library, in the current NLAS structure, there are few positions. There was an exercise to review the positions and we have done that. We have identified the positions required at National Library but while we were in the process of addressing these positions, the economic downturn started and the process was halted for the whole Ministry of Education Arts and Culture. We were told to continue managing with what we have. When the economy improves, we will revert to the plan to improving the structure.”

Interviews with the National Library of Namibia management staff members established that a new proposed structure was in place. However, this structure would need to be approved by the Office of the Prime Minister when financial resources were available. NLM3 pointed out

that beside scanning, the National Library of Namibia was not preserving its information sources by use of any other strategies. NLAS1 and NLAS3 explained that the National Library of Namibia had engaged a Turkish Cooperation and Coordination Agency (TIKA) for possible funding and the National Library of Namibia was working on a funding proposal to purchase digitised materials (scanners and computers). Document reviewed (that is, NLAS annual report) (National Library of Namibia, 2021: 4) revealed that at the meeting held among TIKA, National Library of Namibia and NLAS in 2020, the National Library of Namibia advocated for funding of resources for its visually impaired users. The purpose of this initiative was to add more information sources to the collection in the library for visually impaired users. Interviews (NLM1) revealed that the initial proposal to TIKA was changed to a general digitisation of documentary heritage in order to increase the chances of getting funding. The researcher could not, however, establish from the proposal document submitted to TIKA, the content of the proposal submitted as the project proposal was not availed to the researcher.

5.5 Long-term preservation policies and strategies

The study's second research question sought to find out if the National Library of Namibia had long-term preservation plans, policies and strategies in place or that were planned for to provide digital access to Namibia's documentary heritage. This research question was targeted at the selected National Library management staff members, NLN IT librarian and NLIC board members. The findings relating to this research question are presented under the following sub-themes:

- Long-term digital preservation plans;
- Digital preservation preparation and investments;
- Digital preservation programme;
- Long-term digital preservation policies;
- Long-term digital preservation strategies; and
- Equipment, budget and human resources for digital preservation.

5.5.1 Long-term digital preservation plans

The National Library of Namibia management staff were asked to reflect on what the National Library of Namibia was doing to ensure long-term accessibility to documentary heritage.

NLM3 explained that the National Library of Namibia was planning to use an open-source library management system (Koha library management system) to replace Symphony that the National Library of Namibia was currently using. Interviews (IT) established that training on Koha library management system was provided to the NLN IT librarian. IT indicated that Koha library management system is set up at the National Library of Namibia but not installed. The IT respondent explained that:

“With Koha library management system, if the National Library resumes digitising content and with the acquired e-content external users will be able to access them.”

Response from NLM3 indicated that the National Library of Namibia was planning to be a hybrid library. The National Library of Namibia wanted the digitised resources and those that were acquired in digital form to be made available to the public on the National Library of Namibia’s database. The desire for going hybrid was necessitated by the National Library users’ increased demand for digital resources and queries for remote access to the National Library of Namibia collection. NLM3 explained that:

“Our main plan is to go into automation in the near future. Which means that we have to assign and train staff members in the area of digitisation, acquire necessary resources and equipment, and train users on how to access the digitised materials.”

On their part, NLIC board members were asked to explain what the NLIC board was doing or had done to ensure the long-term accessibility to documentary heritage in Namibia:

NLIC1

“On issues of preservation policies and NLIC making sure that the policies are available, from the time that I joined NLIC, we did not address the issues of policies. Maybe we assume that the institution will rely on the Library and Information Service Act and Archives Act.”

NLIC2

“In our term between 2018 to 2020 we did not do much. Apart from strategising and coming up with an NLIC strategic plan 2020 to 2025, not much is done. We had some several objectives in the strategic plan which were supposed to look into but,

unfortunately in 2020 not much was done due COVID-19. But the time our tenure ended, we hope that this year (2022) we will be able to implement those objectives in our strategic plan. In the strategic plan, there is an objective on digitisation.”

NLIC3

“At NLIC level, we developed a strategic plan which spells out all the key strategic issues we should focus as council members of NLIC. We are trying our best in terms of developing strategies to digitise materials but maybe we need more financial support. The National Library needs more financial support in terms of getting the necessary equipment for digitising materials to help the nation.”

NLIC4

“What NLIC has done is that it established a legal deposit committee to provide support to places of deposit and to ensure that all Namibian publications are submitted to the National Library. The head of the National Library is the chairperson of the legal deposit committee and it is only the National Library that can enforce this legal deposit through some punitive activities as indicated in the Library and Information Service Act 4 of 2000.”

NLIC5

“When it comes to digital preservation, this is the function which is bestowed upon the National Library of Namibia. From my experience and knowledge, NLIC did not do much per se due to a number of reasons.”

“The only thing that I would say NLIC assisted was the provision of some financial resources towards preservation of newspapers which constituted very important materials in terms of local knowledge and heritage of the country. This preservation was mainly targeting at the legal deposit centres.”

NLIC6

“No, in our meeting there was no discussions about long-term preservation of documentary heritage in Namibia.”

From these responses it is evident that in the past, NLIC assisted with funding the binding of newspapers at the National library and the legal deposit centre.

5.5.2 Digital preservation preparation and investments

The study sought to establish the kind of digital preservation preparations or investments made for the National Library of Namibia to digitally preserve national documentary heritage. The investment sought for was in terms of infrastructure, human capital, etc (see Q6 in Appendix G). Responses from NLM1, NLM2 and NLM3 indicated that in terms of infrastructures, the Directorate of Library and Archives Services (NLAS) purchased two servers, one for the National Library of Namibia and another for the National Archives of Namibia. One of the servers will be used for storing the National Library of Namibia and National Archives of Namibia databases, whilst the other will be used as a back-up system. One of the servers was set up and running, and the back-up to be housed at the Office of the Prime Minister was yet to be set up.

Document reviewed, National Library of Namibia annual reports 2020/2021 (National Library of Namibia, 2021: 20) revealed that in the 2020/21 financial year, the National Library requested NLIC to procure two servers for the National Archives of Namibia and National Library of Namibia to ensure optimal preservation of the national documentary heritage of Namibia. The request was granted, and these servers were procured and received by the National Library of Namibia in January 2021.

Interviews (NLM1) established that at the time of this study, the National Library of Namibia, NLAS and NLIC had not made any human, capital or financial investment toward digital preservation of documentary heritage. NLM1 explained:

“No investments made yet, these things are still in discussion but up to now, I would say that there is no solution. When you check on our annual budget, these activities (digital preservation) are not catered for. It seems like it can be obvious and it should be done as ordinal activity, this is maybe how it has been seen. I could be wrong but if this activity can be seen as critical then we can talk about bringing in equipment and more funding.”

NLM2 explained that the reason for not having made investment in digital preservation activities to date was because the National Library of Namibia got its funding from the Ministry of Education, Arts and Culture (Government) and the National Library of Namibia usually received a constant answer that there was no money. The National Library was not given a budgetary provision from Government by its line Ministry. Because of lack of budgetary provision from the government, the National Library management has decided to get financial resources elsewhere. NLM3 indicated that through the Ministry of Education, Arts and Culture, the National Library of Namibia had been in discussion with a non-governmental organisation, TIKA (a Turkish organisation), and a funding proposal for infrastructure and human resources had been drafted and submitted for consideration by TIKA.

Interviews with National Library of Namibia management established that the National Library of Namibia was short staffed. With its current staff complement they were not able to do any digital preservation work. Attempt at recruiting more staff has been made and a submission was done to relook at the staff structure of the National Library; however, the Ministry of Education, Arts and Culture indicated that there was no money for a new structure. Document review (the National Library of Namibia annual report) (National Library of Namibia, 2021: 10) showed that in the National Library of Namibia organisational structure, there are two vacant positions, a librarian grade nine and an assistant librarian grade 10 in the Bibliographic Section. Document review (Namibia Library and Information Council, 2020: 10) showed that, the NLIC board committed itself to conduct a human resources skills audit and gap analysis, develop a competency framework and develop an HR development plan for NLAS.

Responses from NLM2 and NLM3 indicated that the National Library of Namibia was planning to establish partnerships and engage other libraries and organisations to enable it to prepare for digital preservation. NLM2 explained:

“In terms of staff members, we also sent a collaboration request for partnership with NUST, because they have already something small in place, we are hoping that NUST will assist us with training our staff members and we are also looking at staff exchange and skills transfer.”

The plans of the National Library of Namibia were further explained by NLM3:

“We engaged the National Library of South Africa, and they gave us a presentation in 2021 and they invited us to go visit their library and see their set up but due to COVID-19. We are planning to visit National Library of South Africa and we are hoping that they provide us with expertise and share their experience.”

Interviews with the National Library of Namibia management revealed that the National Library of Namibia was also looking for possibilities of opting for collaboration with other institutions with regards to sharing of resources, for example, digitisation machines since such equipment is expensive. The National Library of Namibia was in a process of engaging the Ministry of Home Affairs. NLM3 indicated that the Ministry of Home Affairs had equipment (scanners) but the National Library of Namibia was still in the process of writing a letter to them to request collaboration. Minutes of the NLIC board meeting (Namibia Library and Information Council, 2019: 5) revealed that NLIC board resolved that the University of Namibia Library, which had procured sophisticated digitisation equipment, should work with other libraries and on the modality on how to make use of the digitisation machine. NLM3 pointed out that this arrangement never materialised and this collaboration is yet to be implemented. One of the challenges that stalled this collaboration is the space for storage. Interviews (NLM1) established that the National Library of Namibia does not have adequate storage capacity to store the digitised materials.

On the basis of the NLIC board’s responsibility to administer the Namibia Library and Information Fund, NLIC board members were asked to share the kind of digital preservation preparations or investments the National Library has made or put in place during their tenure (see Q3 in Appendix E). NLIC members responded as follows:

NLIC1

“There was an attempt on issues of digital preservation of documentary heritage some years back. A server was acquired 12 years ago but the project did not materialise and the acquired server was never used. The plan was to accommodate National Library and National Archives but this server was not utilised. In 2021, we were trying to see how we can put the server to good use and attempt to buy some equipment and software,

but this process was not finalised. Supplementary tools for preservation were not acquired and installed on the server e.g. scanners and other instruments.”

NLIC2

“That one I wouldn’t know, no investment that I know of. But in the current NLIC board term, the issues of funding, infrastructures would be looked into.”

NLIC3

“What we did is to put the plan in place. The current NLIC 2022-2024 should now focus and shift the focus and make sure that infrastructure is there, human capital is there and ensure that digitisation takes place. We spoke about this last week, the need to approach external funders, write grant proposals for digital equipment. The government has also indicated its willingness to support provided that the budget is there. But we were requested to submit all the items we need in terms of equipment for digitisation. We are preparing to actually put these ideas into practice, but they are not yet in practice.”

NLIC4

“To my knowledge, nothing has been done. The National Library needs equipment, hardware, software, staff training and other resources to enable it to conduct any digital preservation. What I understood from the last NLIC meeting, the first meeting of the new council 2022-2024 is that the member (Head of National Library) indicated that the Ministry of Home Affairs has some equipment, large scanning equipment and that she would consult with them to establish if the National Library will be able to make use of that equipment. So that is the possibility of the future. Besides that, nothing else as far as I know.”

NLIC5

“There were some investments which were done, over 10 years ago through the Education and Training Sector Improvement Programme (ETSIP). This programme had a component of preservation, where digitisation was planned and funding was secured.”

Interviews (NLIC board members) established that some financial investments were made in the form of hardware and software infrastructure. With regards to hardware, a mass storage server was acquired through the ETSIP programme. This server cost almost a million Namibian dollars (figures not provided to the researcher). This server is physically housed in the National Archives. The understanding at the time the server was bought was that preservation was supposed to be a shared responsibility between the National Library and the National Archives. In addition, there were also computers and scanners acquired.

NLIC5

“There were issues when it came to practical usage of this server, which pointed to a number of deficiencies in the project. Although massive investment was done on the server, there was no adequate IT skills to operate, implement and manage the project.”

Responses from the NLIC board members indicated that with the ETSIP programme, staff members were recommended to be trained in the aspects and process of digitisation processes. Between the year 2013/2014 two permanent staff members, one from the National Archives of Namibia and one from the National Library of Namibia were selected to go for digitisation training in South Africa for the duration of a month. NLIC5 explained that two staff members were sent to South Africa because such training was not available in Namibia. The researcher wanted to establish what happened to the ETSIP investments since at the time of the study there seemed to be nothing much happening in terms of digitisation and digital preservation activities. It was also established from the interviews with NLIC board members that there were a number of challenges which hindered the successful implementation of the digitisation project. NLIC5 narrated that:

“A project of such nature needs a project management approach. So, this became a challenge because the implementation of the project was not done in a systematic way. A project must have a starting date and how, who is going to do what and when, etc. The challenge was that the approach to this project was not properly executed, planned and also human resources was a huge challenge in terms of capacity and requisite skills required to implement a project of such nature. There was an issue of preparations and scanning materials, etc.”

“Another challenge was the structure of the National Library staff establishment; staff members are not adequate even to execute the day-to-day function of the National Library. This was an additional project which required additional human resources to implement the project. Human resources were not available which means that the National Library had to make use of existing staff members to implement the project, which became a huge bottle neck. An attempt was done for staff members to work on this project on overtime basis and hire contractual workers especially for scanning purposes, but the challenge was capacitating them.”

Responses from NLIC board members revealed that there were other challenges relating to issues of supervision, standardisation and metadata, preservation formats, preservation guidelines, preservation policy which were not in place. The NLAS 2017/2018 annual report (Namibia Library and Archives Services, 2018: 19) showed that the National Library of Namibia’s digitisation project exercise was moving at a slow pace due to staffing, equipment and training challenges.

5.5.3 Digital preservation programme

The study sought to establish if the National Library of Namibia had a formal digital preservation programme (see Q7 in Appendix G). The researcher wanted to establish the purpose of this programme and if there was no programme, the reasons for not having such a programme. Interviews with the National Library of Namibia management staff established that the National Library of Namibia had no digital preservation programme at the time of the study and that the National Library was yet to develop one. The researcher wanted to establish what was informing the National Library in terms of its digitisation or preservation activities. NLM2 explained that:

“Sometimes it is the demand from the public, and then our own views that some of the library materials are worn out because of excessive use and some of them are getting old so the papers are fragile.”

When asked for the reasons why the National Library had no digital preservation programme, the National Library management staff members had the following to say:

NLM2

“I think it was just not considered at the beginning of the year 2017, but it is important that we have it and we are going to look into it. At the moment digitisation at National Library is not a formal thing. It has not been formalised but when our TIKa proposal is approved and we have finances and equipment, our programme will be formalised, and we are going to have everything in place.”

NLM3

“The management team of the National Library we are trying but we don’t have anything in place but we will have it soon. We have started talking about it and planning. The physical plan is not in place, but the discussion has started.”

Although the National Library of Namibia is said to have started talking about or planning to have a digital preservation programme, were the TIKa proposal to be approved, the researcher could not establish who would be responsible for the implementation of this programme. When the management team of the National Library of Namibia was asked if the National Library had plans to cooperate with any other institution in digital preservation activities, they had the following to say:

NLM1

“The National Library is looking into the possibility of working with the National Archives for digital preservation activities.”

NLM2

“For digitisation of newspapers, the Namibian Newspaper (a newspaper company) is working with us, and they are the main people digitising the newspaper and they produced/converted these newspapers into DVD-CD. We have also worked with Legal Assistance Centre. We have been providing them with government gazettes to scan most of the laws and regulations that were not yet on their website. They scanned these laws and uploaded them on their website. They are now all available on the Legal Assistance Centre website, however these laws are not accessible via the National Library website, but they are available to public.”

NLM3

“We plan to cooperate with Ministry of Home Affairs as they have equipment, TIKA, Namibia University of Science and Technology (NUST), University of Namibia (UNAM), National Library of South Africa. What we have in mind is the cooperation with these partners for possible funding, resource sharing, human resources (training and expertise).”

From the National Library of Namibia management staff responses, it is evident that although the National Library of Namibia had no digitisation programme, the National Library was experiencing the following challenges: The National Library at the time of the study was not scanning any documents for preservation purposes. They used to scan newspapers in the past but they stopped because there was no space on the server and no dedicated staff member to do this. The scanned newspapers and documents were saved in the server; however, this content was not accessible to the users or the public. Interviews (NLM1, NLM2 & NLM3) established that when the library received e-content from publishers, it was saved on a server. The National Library of Namibia was planning to have a link on the National Library website to all electronic content. At time of the study, electronic documents were not accessible by outsiders, however, users could be assisted to access them in the library.

5.5.4 Long-term digital preservation policies

The study sought to establish if the National Library of Namibia had any guidelines or policies guiding the National Library of Namibia in its digital preservation activities. NLIC board members were asked to reflect on guidelines or policies that NLIC developed/adopted for digital preservation of documentary heritage at the National Library of Namibia and in the library and information service in Namibia (see Q4 in Appendix E). Below are the responses. NLIC1 indicated that the NLIC board did not develop any guideline or policy for digital preservation and the reasons given are that:

NLIC1

“I think there was no direction. There was no department that could spearhead the discussion of such a policy. Even with the National Library and National Archives, they had these inhouse policies, drafted by the staff member but they were not approved by management and government structures. I thought it would have been better if there

was a department that was responsible or if in NLIC there were some people identified to supervise and provide best practice guidelines on how these should be done.”

NLIC2

“NLIC developed a strategic plan 2020-2025.”

NLIC3

“Currently, the strategic plan is the only document in place. But this does not prevent us to develop a policy for digitisation for the National Library and broadly for the library and information service in Namibia. But we have not reached that stage yet.”

NLIC4

“No, I don’t know of anything. I believe that it is the function of the National Library with the support of NLAS to develop policies in this regard. And then to indicate the resources and financial needs to fulfil their mandate. NLIC can support them in this endeavour and bring their plight to the Minister of Education, Arts and Culture to give them the necessary support.”

NLIC5

“No digitisation or digital preservation policy. I think it was the issue of putting the cart before the horse. The policy (preservation policy) which was there is a preservation of physical materials. This policy was needed to solve the challenges experienced which I spoke about. You need these policies to stipulate procedures to follow.”

NLIC6

“No policy.”

NLAS management staff were asked to indicate if they are aware of a digital preservation policy at the National Library of Namibia? (see Q4 in Appendix F) Their responses:

NLAS1

“I think there are draft inhouse guidelines, our Library and Information Act is outdated, and much of policies/guidelines need to be informed by the Act. Discussions are

ongoing and this year 2022, we will start the processes of engaging stakeholders to review the Act. It needs to accommodate digitisation and digital preservation.”

NLAS2

“No, I am not aware of any.”

NLAS3

“Currently there is no digital preservation policy at the National Library, as the current Namibia Library and Information Service Act 4 of 2000 omitted the digital aspects, however, the institution is planning to review such this Act and other legal frameworks, with the aim to ensure that technological facets are catered for.”

NLAS4

“Not sure, when it come to the National Library. I only know of legal deposit policy.”

NLAS5

“No, I am not aware of any. However, I know that in NLIC, discussions have started to review Namibia Libraries and Information Service Act so that the Act can accommodate digital resources. The discussions are at initial stages, discussion started in 2022.”

Interviews with NLIC board members, NLAS management and National Library of Namibia management established that the National Libraries of Namibia had no digital preservation policy or guidelines to guide National Library of Namibia digitisation activities, nor did it have a policy on preservation of its physical resources. The National Library management staff members had the following to say:

NLM1

“No, I am not aware about any plan at all or guidelines but these need to be in place.”

NLM3

“In the draft Collection Development Policy (CDP) that we have, there is a part on preservation but we don’t have a standalone preservation policy. It is combined with CDP.”

Interviews (NLM3) established that the National Library of Namibia's Collection Development Policy was still in a draft format, and it is not approved by the structures (NLAS and the line Ministry). NLM3 explained that one of the reasons why the Collection Development Policy was not finalised and approved was because of the Namibia Library and Information Service Act 4 of 2000 which is silent on electronic resources. The Namibia Library and Information Service Act 4 of 2000 revision was expected to guide the National Library's Collection Development Policy. Document review revealed that the Collection Development Policy of the National Library of Namibia (National Library of Namibia, 2015: 10) Section 4.1.7 which talks about preservation, states that a copy of a documentary heritage resource deposited through legal deposit will be preserved for future generations and its use is very restricted. The policy further states that with regards to newspapers, these are being microfilmed for preservation purposes; periodicals will be bound on a yearly basis. This policy states that digitisation is a viable method of disseminating information contained in frail documents (National Library of Namibia, 2015: 10). Interviews with the National Library of Namibia management staff and document reviewed established that the National Library of Namibia Collection Development Policy did not contain a section on digital preservation of documentary heritage. NLM1 further explained that:

“One of the contributing factors to having no policy is the lack of an IT Librarian, someone with IT expertise but a trained librarian. In the National Librarian case, we have a pure IT person with no background of library education. Sometimes the IT person does not understand the library language when you raise some library specific issues.”

Document review established that there was a draft digitisation policy at the National Archives of Namibia which was drafted in June 2008 and updated in September 2009 by the former head of the National Archives of Namibia. The purpose of this policy was to guide the process of digitisation in the National Archives of Namibia for optimal access to, and preservation of, the national heritage entrusted to the National Archives of Namibia. The draft digitisation policy addressed the following aspects or components: selection criteria and priorities, care for originals before and after digitisation, technical standards, access and additional considerations (National Archives of Namibia, 2009: 1-6). This policy was supposed to be updated on a yearly basis, but it had not been updated since 2009 nor was it approved by NLAS and the line Ministry.

5.5.5 Long-term digital preservation strategies

National Library management staff members and the NLN IT librarian were asked to provide an insight into what the National Library of Namibia was doing to manage digitally preserved (scanned content) to ensure access, for posterity, to its documentary heritage (see Q14 in Appendix G and Q4 in Appendix H). Responses from National Library of Namibia management staff and IT librarian indicated that these documents were not preserved further. IT stated that, *“These documents are saved as PDF pocket document files, they don’t change much and they don’t corrupt that much”*. IT explained that the content digitised in the past by the National Library of Namibia were saved into two types of electronic format, some were in portable document format (PDF) and some in JIF, a format that can be used by many different applications and programs. These documents were to be loaded on the recently acquired servers to be viewed on the website when the National Library of Namibia implements the new library management system (Koha library management system). NLM1 stated that:

“We are not providing users with access to these electronic resources; only currently that we have started putting them on the network and what we are thinking and working on is that especially government publications, we will provide a link on our website so that users could access them. This will also apply to the information sources that are already scanned.”

With regards to the physical Namibiana collection, responses from National Library of Namibia management staff indicated that at the time the study, the National Library of Namibia had no strategies in place to digitally preserve it. The National Library management staff members explained that:

NLM1

“No immediate plan to digitise them. If we were to be a set up library with all the necessary equipment, we would have a plan but currently we have no plans.”

NLM2

“We are yet to create a platform and metadata for National Library users to access. At the moment the scanned materials are stored in computers.”

NLM3

“The digitised content is still on computers where they were digitised (scanned). We are sitting with this problem because we requested for offsite back up from Office of the Prime Minister. We don't want users to access the content in this computer until we have back up for it. We do not want to lose this content.”

Interviews (NLM1, NLM2 & NLM3) established that the National Library of Namibia was discussing how it would make the content accessible. The library was considering providing the digitised content on the National Library website. When asked, “What digital preservation strategies is the library planning to adopt or currently using to convert the physical sources into electronic format?”, participants NLM1, NLM2 and NLM3 stated that the National Library had no digital preservation strategies for different types of documentary heritage sources held at the National Library of Namibia. Interviews (NLM1) established that there was no ongoing discussion to implement digital preservation of physical documentary heritage. NLM1 indicated that:

“We are at the moment worried that we are receiving in electronic format. The ones in the stack room (physical ones), there is no discussion on their digital preservation.”

Interviews with the National Library of Namibia management staff members established that the National Library had started receiving electronic documents as part of legal deposit. The researcher wanted to establish how these electronic resources would be digitally preserved, and if the National Library had plans for this to avoid obsolescence in the future. Participants NLM1 and NLM2 indicated that at the moment these electronic resources were not being preserved and that the National Library was just starting with e-deposit and discussions. The National Library of Namibia believed, that when the TIKA proposal is approved, the digital preservation strategies discussions would start.

When asked about how often documentary heritage sources storage devices and file formats were or would be updated, IT responded that the content digitised, and the content received electronically by the National Library of Namibia were in PDF pocket files and not regularly updated. The study further wanted to establish how these files/formats/storage devices and media were or would be monitored for obsolescence and if the National Library of Namibia had a budgetary provision for this. The IT respondent explained that:

“Regarding monitoring, I have not come across such or a need to change or migrate them because they are still accessible with Version 4.5 of PDF, with the new 13 version, those documents are still accessible.”

Participants NLM1, NLM2 and NLM3 indicated that the National Library was not yet doing any updates on the formats and had no budget provision for this exercise. When the management of the National Library was asked “How often are documentary heritage sources reviewed to establish if they are still in good use condition?”, the participants’ responses were as follows:

NLM1

“Not checked. We normally don’t check those files as to whether they are available.”

NLM2

“No, we have not reviewed them. What we discovered was that some of the materials we digitised/scanned here were also scanned or digitised by the National Archives of Namibia. So, what we did was to ask the National Archives of Namibia for the list of their digitised materials so we do not duplicate.”

NLM3

“That is the problem that we are having, our structure needs to be reviewed because we are qualified librarians and we don’t really have technical expertise; we need to have someone here, a system analyst or technical analyst, people who can guide us the librarians with technical expertise.”

Interviews (NLM1, NLM2 & NLM3) established that the National Library of Namibia management were not aware of what the National Archives of Namibia was digitising and digitally preserving. However, the National Library of Namibia was aware that the content digitised by the National Archives of Namibia was not available to the public remotely. Responses from IT and National Library of Namibia staff members established that the National Library of Namibia was in a process of migrating from Symphony to Koha library management systems. Document review (Namibia Library and Archives Services, 2022: 110) revealed that staff members of the National Library of Namibia attended a Koha library management system introduction training at the Goethe-Institut Namibia on the 17th of

September 2021. The workshop focused on circulation, cataloguing and creating barcodes for library materials.

5.5.6 Equipment, budget, and human resources for digital preservation

The study investigated whether the National Library of Namibia had the necessary equipment, budget provision and human resources for preserving documentary heritage sources digitally (see Q6 in Appendix G). Interviews with the National Library of Namibia management staff members revealed that the National Library of Namibia did not have the required equipment, budgetary provision, and human resources in place for digital preservation activities. With regards to human resources, responses from NLM1 and NLM3 indicated that the National Library of Namibia had two vacant positions, one for an assistant IT librarian and one for a librarian in the Bibliographic Section. The NLAS 2018/2019 annual report (Namibia Library and Archives Services, 2019: 63) revealed that one area which needed attention was the area of staff capacity at all levels. However, the National Library of Namibia was informed by NLAS that there were no financial resources to recruit new staff members.

With regards to equipment, the National Library of Namibia management staff indicated that the National Library did not have adequate resources. The National Library of Namibia had a small flatbed scanner. Although it worked and was used for scanning, it was not suitable for a digitisation programme, especially a mass digitisation project. NLM1 explained that:

“One of our initiatives we came up with was to write a proposal to TIKa, through the Turkish Embassy in Namibia, to see if they can assist us with a big scanner and other digitisation equipment. Besides the proposal for equipment, we have also requested for training of staff members.”

The researcher wanted to understand what would happen should the TIKa proposal be approved and equipment secured, and if the National Library of Namibia had the human capital to drive the digitisation project. NLM1 explained that:

“We don’t have capacity in terms of human capital but what we have discussed with TIKa was that we requested them to see if they can facilitate training as well for us in order to capacitate us to be able to carry the whole project. Should we get the

equipment and not training from TIKA, I think we will have to go back to our line Ministry, the Ministry of Education, Arts and Culture to request for training.”

5.6 Use and views on digital preservation of national documentary heritage

The third research question for the study was aimed at gauging views of participants and respondents on the digital preservation of documentary heritage at the National Library of Namibia. This research question targeted the respondents and all the participants of the study. The findings relating to this research question are presented under the following themes:

- Use of Namibiana collection;
- Views of National Library users on digital preservation of national documentary heritage;
- National Library of Namibia management staff members, NLAS and NLIC board members' views on importance of digital preservation of national documentary heritage;
- Benefits of having Namibia's documentary heritage digital preserved;
- Library user support; and
- Perspective on remote access.

5.6.1 Use of Namibiana collection

This section presents survey findings from the users of the Namibiana collection (documentary heritage) who participated in the study. The section contains the following content: the frequency of use of the Namibiana collection, preference of format, accessibility of the Namibiana collection, satisfaction with accessing the Namibiana collection and remote accessibility of the Namibiana collection. The section also presents cross tabulation data on the following: age group and use frequency, user type and use frequency, user level and online preference, user type and online preference, age group and satisfaction of access, user level and satisfaction of access and user type and satisfaction.

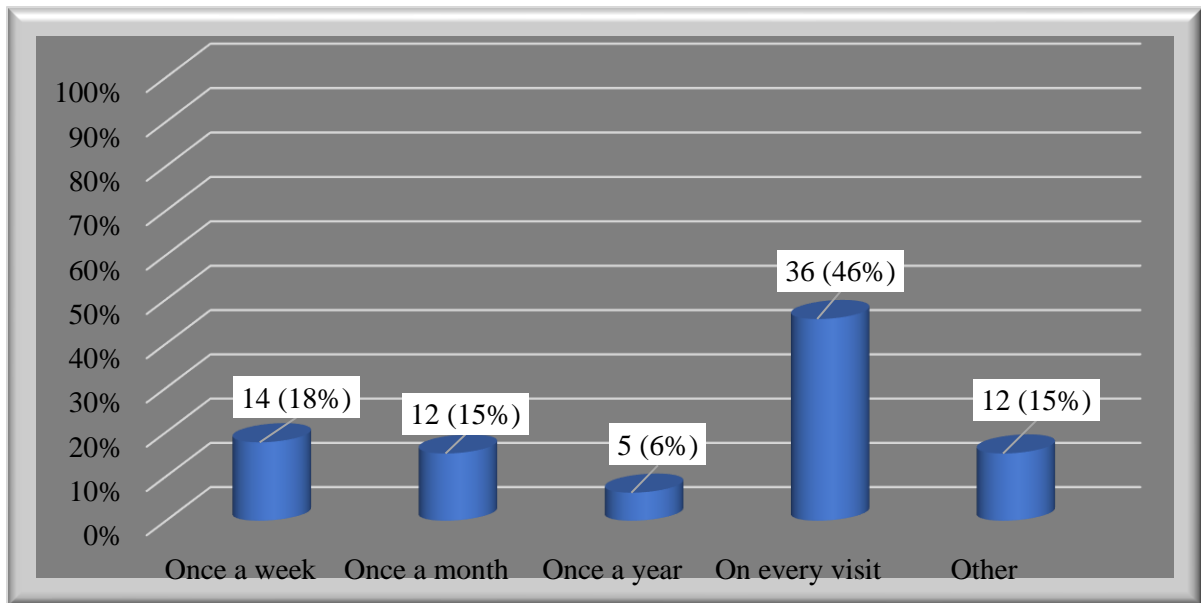


Figure 5.3: Frequency of resources use (N=79)

Respondents were asked to indicate how often they used the Namibiana collection at the National Library. Figure 5.3 shows that the majority of respondents 36 (46%) indicated that they used the Namibiana collection on every visit to the National Library. The ‘Other’ options for frequency included: three weeks research trip, first time, three months, not so often, occasionally, and when a research need arises.

Table 5.3: Age group and use frequency cross tabulation (N=79)

Respondents' age group	Use frequency					Total
	Once a week	Once a month	Once a year	Every time I visit NL	Other	
10 - 20yrs	3	3	1	6	0	13
21 - 30yrs	4	2	1	11	6	24
31 - 40yrs	3	3	2	5	2	15
41 - 50yrs	1	3	0	7	2	13
51 - 60yrs	2	0	1	5	0	8
61 & above	1	1	0	2	2	6
Total	14	12	5	36	12	79

Table 5.3 shows respondents’ age group and use frequency. The respondents between the age group of 21-30 years, using this collection every time they visited the National Library of Namibia, were the majority 11 respondents that used the Namibiana collection.

Table 5.4: User type and use frequency cross tabulation (N=65)

Documentary heritage user type	Use frequency				Total
	Once a week	Once a month	Once a year	Every time I visit the NL	
School learners	3	3	1	5	12
Tertiary education students	3	1	1	14	19
Researchers	7	5	2	11	25
Other	1	2	1	5	9
Total	14	11	5	35	65

Table 5.4 captures respondents who answered to types of users and use frequency. Researchers used the Namibian collection the most (25), that is, overall use frequency.

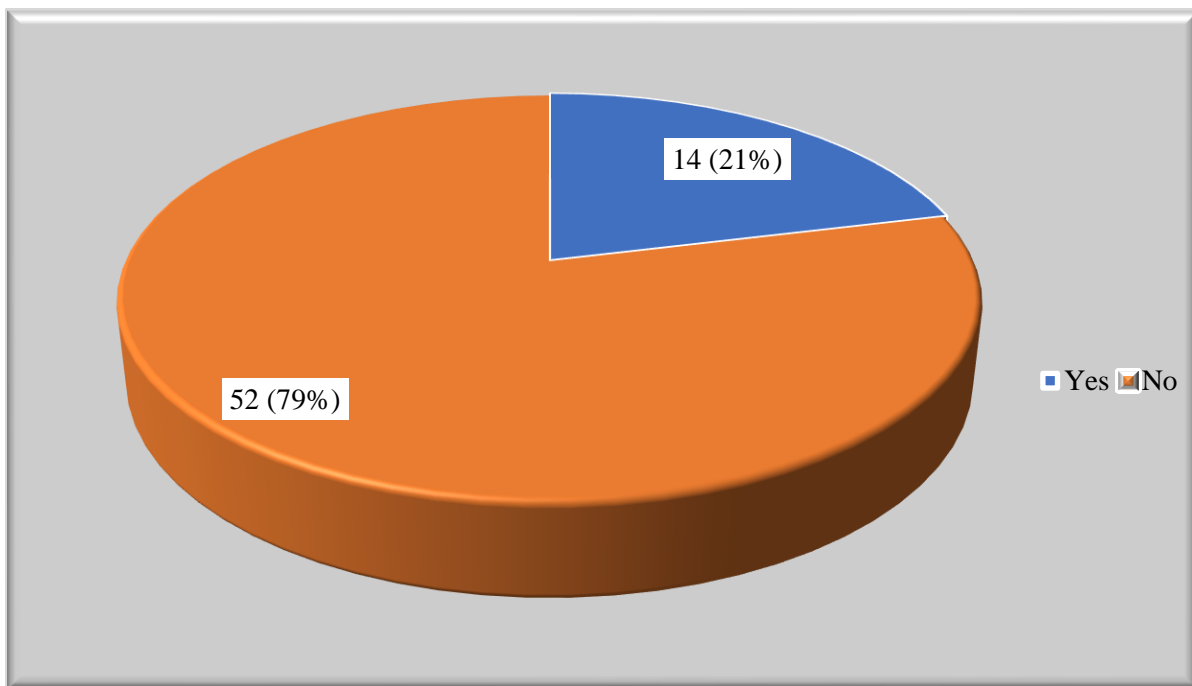


Figure 5.4: Online use of Namibiana collection (N=66)

Respondents were asked if they have used the Namibiana collection online. As presented in Figure 5.4, 52 (79%) indicated no whilst 14 (21%) indicated that they had used online content.

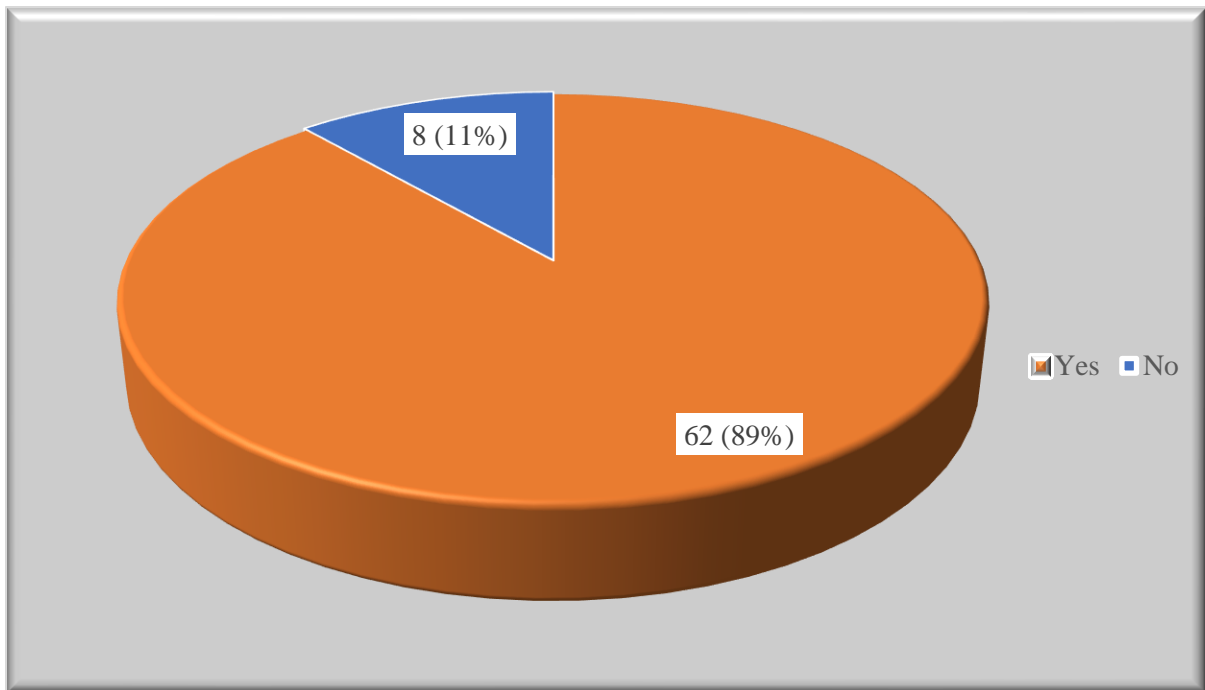


Figure 5.5: User's preference for online sources (N=70)

Respondents were asked (see Q8 in Appendix D) whether they wished the National Library could convert the Namibiana collection into electronic format for online access. Figure 5.5 shows that a majority of 89% of those who responded agreed that they wished the National Library of Namibia could convert the Namibiana collection into electronic format.

Table 5.5: User level and online preference cross tabulation (N=69)

Documentary heritage user level	Online preference		Total
	Yes	No	
Secondary school learners	9	3	12
Undergraduate students	18	1	19
Postgraduate students	30	3	33
Other	4	1	5
Total	61	8	69

Table 5.5 shows that postgraduate students (30) were the majority that preferred an online Namibiana collection.

Table 5.6: User type and online preference cross tabulation (N=69)

Documentary heritage user type	Online preference		Total
	Yes	No	
School learners	8	2	10
Tertiary education students	16	1	17
Researchers	31	3	34
Other	7	1	8
Total	62	7	69

As presented in Table 5.6, researchers (31) were the majority that preferred online format.

Table 5.7: Ease of accessibility of documentary heritage (N=16)

Accessibility of documentary heritage	Frequency	Percentage
Always accessible online	3	19%
Sometimes not accessible online	9	56%
Difficult to access online	4	25%
Total	16	100%

Those who responded that they used the Namibiana collection online were asked how easily accessible the Namibiana collection was online (see Q9 in Appendix D). This question was one of the least answered questions by the respondents (only 16 respondents).

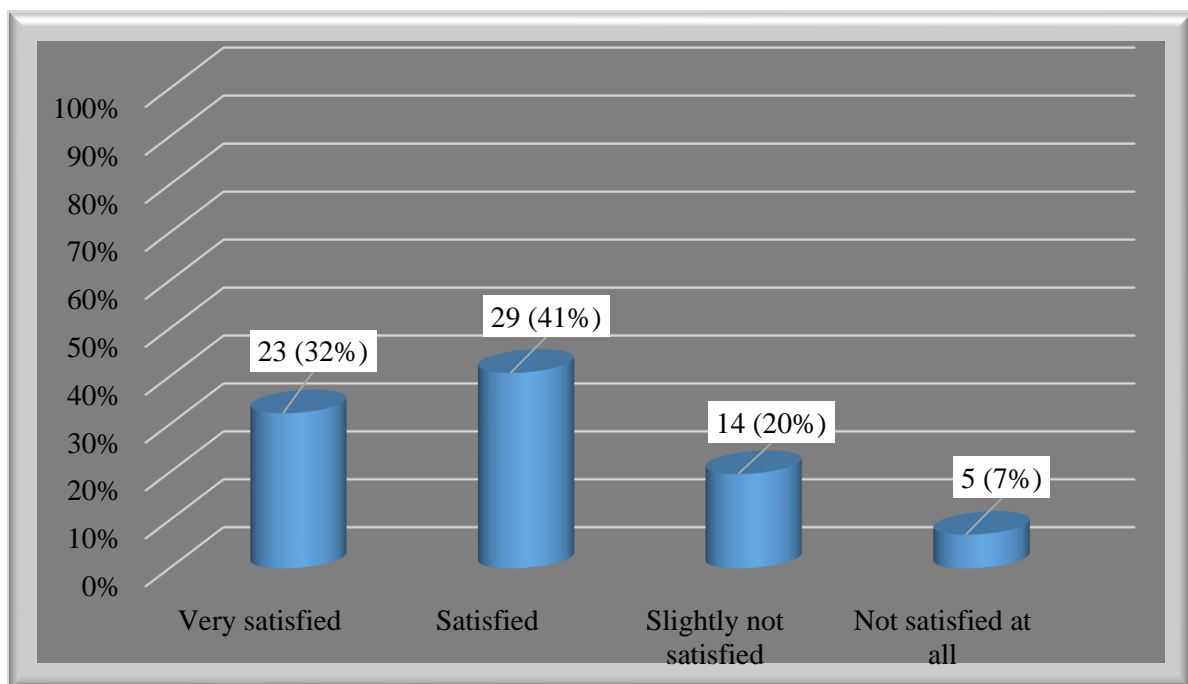


Figure 5.6: Satisfaction with access of Namibiana collection (N=71)

Respondents as presented in Figure 5.6 were asked to indicate how satisfied they were with the process of accessing the Namibiana collection. The majority an aggregated (52) respondents were satisfied with the process of accessing the Namibiana collection.

Table 5.8: Respondents' age group and satisfaction with access cross tabulation (N=71)

Respondents' age group	Satisfaction with access				Total
	Very satisfied	Satisfied	Slightly not satisfied	Not satisfied at all	
10 - 20yrs	0	3	5	2	10
21 - 30yrs	9	10	3	1	23
31 - 40yrs	5	5	1	2	13
41 - 50yrs	5	6	2	0	13
51 - 60yrs	1	5	2	0	8
61 & above	3	0	1	0	4
Total	23	29	14	5	71

As illustrated in Table 5.8, the majority (an aggregated 52) of the respondents across age groups were satisfied with the process of accessing the Namibiana collection, whilst an aggregated (19) respondents were not satisfied.

Table 5.9: User level and satisfaction with access cross tabulation (N=70)

Documentary heritage user level	Satisfaction with access				Total
	Very satisfied	Satisfied	Slightly not satisfied	Not satisfied at all	
Secondary school learners	0	4	5	2	11
Undergraduate students	12	5	5	1	23
Postgraduate students	10	15	4	2	31
Other	1	4	0	0	5
Total	23	28	14	5	70

Table 5.9 shows that the majority (an aggregated 51) of the respondents across user levels were satisfied with the process of accessing the Namibiana collection, whilst an aggregated 19 respondents were not satisfied.

Table 5.10: User type and satisfaction with access cross tabulation (N=69)

Documentary heritage user type	Satisfaction with access			
	Very satisfied	Satisfied	Slightly not satisfied	Not satisfied at all
School learners	0	3	4	2
Tertiary education students	7	10	3	1
Researchers	13	11	5	2
Other	3	4	1	0
Total	23	28	13	5

Table 5.10 reflects that the majority of respondents 51 across all user type categories were satisfied with the process of accessing the Namibiana collection, whilst 18 respondents were not satisfied.

Table 5.11: Reasons for accessing the Namibiana collection (N=74)

Reasons	No. of respondents in percentage	Comments
Research	56 (76%)	<ul style="list-style-type: none"> • Academic research • Busy with doctorate degree • Community history/national • For my undergraduate studies • New researcher • To get new information to add to my study
Study	32 (43%)	<ul style="list-style-type: none"> • It is reliable • It is very important to study • To get further information
Leisure	16 (22%)	<ul style="list-style-type: none"> • For knowledge
Interest in Namibian history	29 (39%)	<ul style="list-style-type: none"> • 1904 – 1908 Genocide • Comparing different narratives • Namibia history needs to be written particularly by young Namibians • To know more about Namibian history • To know more about national history • Understanding the past, present of Namibia
Other	4 (5%)	<ul style="list-style-type: none"> • Ethnopedology • In support of Namibian authors • Novelist

Respondents were asked to provide reasons for accessing the Namibiana collection (see Q11 Appendix D). They were told that they could select more than one option and provide a

comment, if they had any. Table 5.11 presents the reasons provided by respondents for accessing the Namibiana collection. The findings highlighted that the majority of respondents 56 (76%) reasons was research, whilst the least respondents 4 (5%) reasons was 'Other'.

5.6.2 Views of National Library users on digital preservation of national documentary heritage

This section presents the views of the National Library of Namibia users, NLAS and NLIC board members on digital preservation of documentary heritage held at the National Library of Namibia.

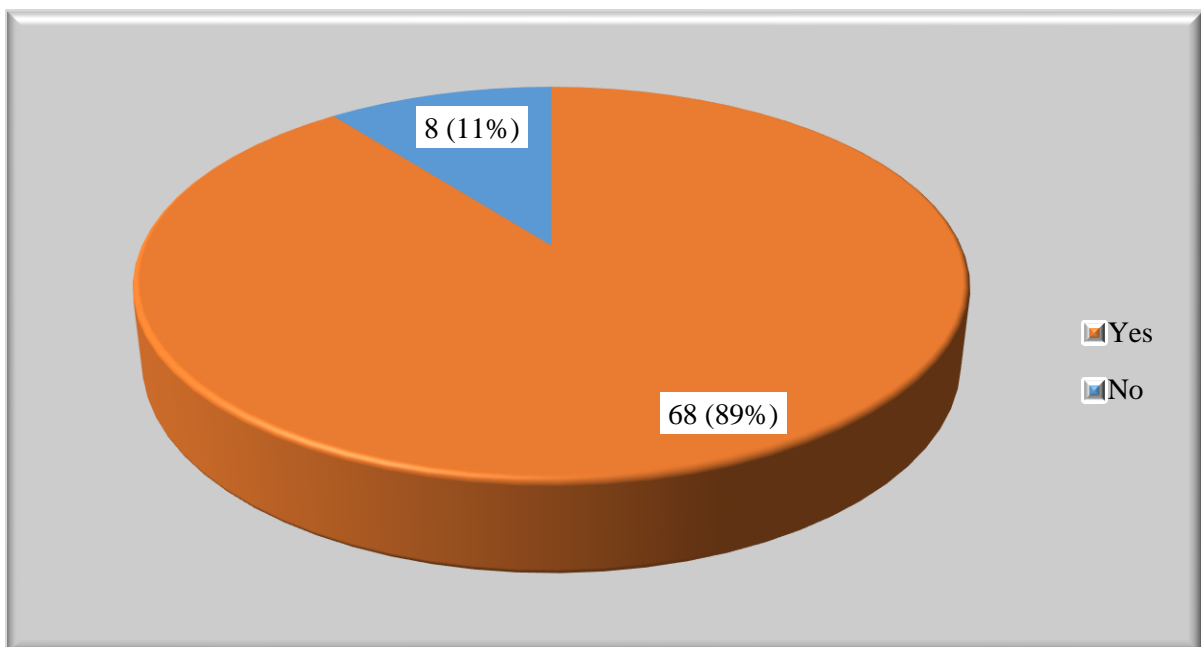


Figure 5.7: Preference for digital preservation (N=76)

Respondents were asked if they would like the National Library of Namibia to digitally preserve every Namibian publication in the library. Figure 5.7 shows that a majority 68 (89%) of the respondents would like the National Library to digitally preserve every Namibian publication in the library.

Table 5.12: User level and digital preservation preference cross tabulation (N=74)

Documentary heritage user level	Digital preservation		Total
	Yes	No	
Secondary school learners	11	2	13
Undergraduate students	23	1	24
Postgraduate students	30	3	33
Other	3	1	4
Total	67	7	74

Table 5.12 presents a cross tabulation between National Library user level and their preference for digital preservation of Namibian publications. The majority of respondents (67) across user levels preferred Namibiana publications to be digitally preserved, whilst (7) respondents preferred Namibiana publications not to be digitally preserved.

Table 5.13: User type and digital preservation preference cross tabulation (N=74)

Documentary heritage user type	Digital preservation		Total
	Yes	No	
School learners	9	2	11
Tertiary education students	20	0	20
Researchers	31	3	34
Other	6	3	9
Total	66	8	74

Table 5.13 presents a cross tabulation between National Library user type and their preference for digital preservation of Namibian publications. The majority of respondents (66) across user types preferred Namibiana publications to be digitally preserved, whilst (8) respondents preferred Namibiana publications not to be digitally preserved.

Respondents were asked to justify their preference for preferring every Namibian publication in the National Library of Namibia to be digitally preserved. The respondents indicated that when the Namibian publications are digitally preserved it save users time, it saves space in the library, the resources became remote accessible, resources are easily and better accessible and it is good for posterity. Most respondents also indicated that it was safer because physical copies can be easily lost. Other views included that the digital option is cost effective, ensures durability and error free storage of digital information when it is required. Verbatim views from the respondents are presented bellow under the following themes: protection against loss; access and posterity.

Protection against loss

“Protection against physical loss.”

“Anything can happen, the library can burn down, books (archiving) can be stolen and what not, but if information is stored correctly in the cloud it can be stored successfully.”

“Because if it is saved or preserved digitally then it is hard to be destroyed.”

“If the publications are preserved digitally there will not be any wear and tear to the documents. The world is moving to a digital era, Namibia should try and keep up.”

“People who do not know their history are a lost society in my view. It is also, important to preserve the publication for future generations. I also think that it is the only best precaution in case the building burns.”

“Preserving the collection is very important in case of incidents such as when the library burns down or other natural disasters that could cause the whole library collection to be lost, so preserving it will ensure that the collection is safe.”

“The National Library of Namibia is a custodian of the nation's key knowledge resources, so it is very important to ensure that every knowledge is not lost to posterity and that information is available for research in future generations to come, and to avoid the deterioration of sources.”

“To make it easy for everyone studying. It is frustrating to come to the library and not to get what you want, for instance not to get information you are looking for.”

Access and posterity

“Archiving and safe-keeping of Namibian publications digitally will ensure easier access, remote access and preserving it for longer period.”

“Because it is way faster than searching for the printed book.”

“Because when the information is online it can be accessed remotely.”

“Digitalisation allows the user to access information anywhere, anytime, in other words it will save the users time. Preservation allows user’s to access information in future.”

“I am unable to come to the library as frequently as I would like so it would be nice to access it wherever I am.”

“Digital preservation will ensure that such materials are preserved for future reference, widespread circulation guaranteed.”

“I would like the national library to digitally preserve Namibian publications to increase access for people to be able to use those resources remotely. This would also prevent the deterioration of these information sources.”

“If Namibian publications are digitised it will increase and improve the access to the collections. Anyone can be able to access the collection content across the globe. Users will no longer be limited to access it and it will save users cost that they use for transport to access this collection.”

“In this way I can access the resources I need without having to go to the library physically.”

“It might be beneficial to the next generation for preservation, in case the print materials get dissolved.”

“It will be convenient and fast to access information which is available online.”

“It would be a great resource for local students, researchers and international ones and would promote Namibia's history, scholarship to a wider audience.”

“Many scholars abroad write and publish nonsense about Namibian history. To make all sources available online would help put the record straight.”

“Materials can be readily available online. That’s cutting costs of physically going to the library. I can access the information anywhere, even when travelling abroad. Makes information available to the public, national and international.”

“Not everyone can be able to reach the national library, this might be because of financial issues or living far from the city, this really disadvantages other students from different campuses.”

“To make this collection more accessible remotely, it will also protect the collection from being destroyed in event of natural disaster.”

“To preserve for posterity and to avoid theft or disappearance of key publications for users/remote users/Diaspora based persons to access digitally preserved must.”

“We are moving to a digital world, so the national library must follow suit. Online resources are easy to access, saves time and can be accessed from anywhere.”

“We live in an unknown world with national documentary heritage being digitalised. Future generations can forever have access to such information as it may not get damaged or destroyed after all its the internet.”

“Yes, so that users and the general public can have immediate access to national documentary heritage. This would help to promote and give more exposure to the Namibiana collection.”

Interview participants and questionnaire respondents were asked to provide comments or suggestions regarding digital preservation of documentary heritage at the National Library of Namibia (see Q19 in Appendix D, Q11 in Appendix E, Q8 in Appendix F, Q34 in Appendix G and Q20 in Appendix H). Responses relating to posterity for use of the Namibiana content were as follows:

“Digital preservation is very crucial for future use of information.”

“Digitalisation will help improve information sources for future generations because if they are only kept in print that may not make it to the next 10-15 years. Digital preservation will also help users access all the information they need in the comfort of their homes.”

“Please digitalise Namibian collections in order to preserve it for future use and ease of use.”

“The world is moving to digital. Therefore, it is vital for National Library to use that platform for future use.”

“There is a need to preserve oral history from the local historian while they are alive. We need them in our communities to tell us more about our ancestors’ ways of life and values.”

“We are now in the 4th industrial revolution, thus everything has to do with technology; preserving documentary heritage in digital format will benefit more generations to come, because information will be kept safe and easily accessible.”

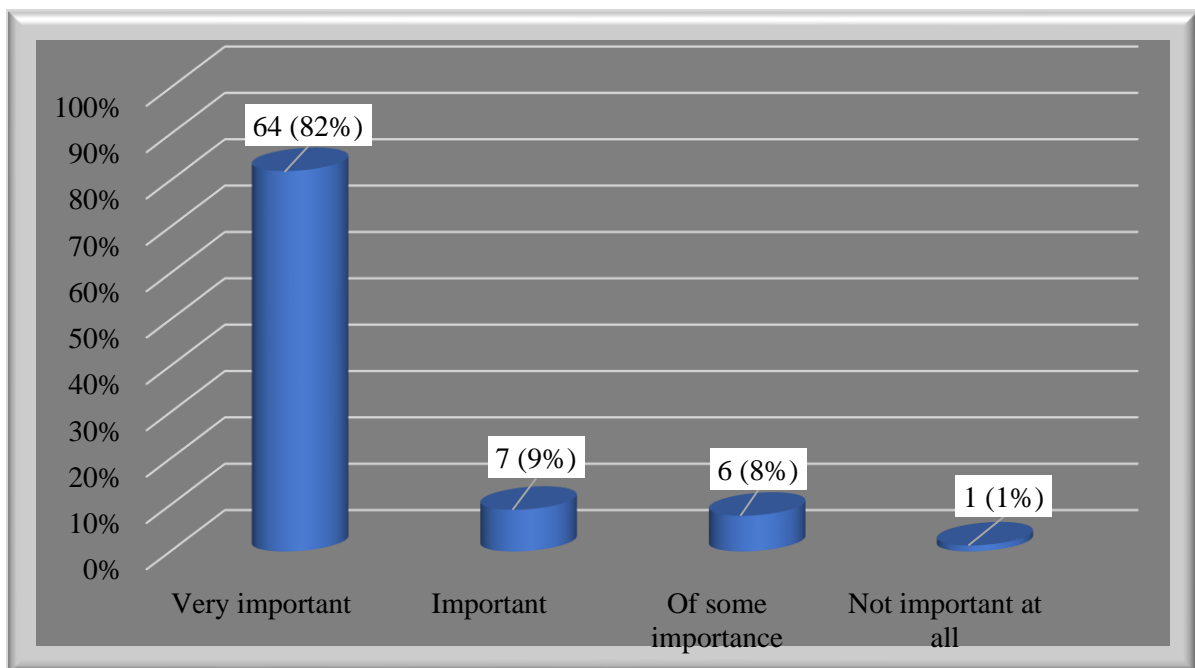


Figure 5.8: Importance of digital preservation (N=78)

User respondents were asked to indicate how important it was to digitally preserve Namibiana publications. Figure 5.8 shows a majority, an aggregated 91% of the respondents indicated that it was important to digitally preserve Namibian publications.

Table 5.14: Respondents' age group and digital preservation importance cross tabulation (N=78)

Age group of respondents	Preservation importance				Total
	Very important	Important	Of some importance	Not important at all	
10 - 20yrs	8	2	2	1	13
21 - 30yrs	21	3	1	0	25
31 - 40yrs	12	0	1	0	13
41 - 50yrs	12	1	0	0	13
51 - 60yrs	7	0	1	0	8
61 & above	4	1	1	0	6
Total	64	7	6	1	78

Table 5.14 shows that a majority (21) of respondents indicated that it was very important to digitally preserve Namibian publications.

Table 5.15: User level and digital preservation importance cross tabulation (N=76)

Documentary heritage user level	Digital preservation importance			
	Very important	Important	Of some importance	Not important at all
Secondary school learners	9	2	2	1
Undergraduate students	22	1	1	0
Postgraduate students	28	4	1	0
Other	4	0	1	0
Total	63	7	5	1

Table 5.15 reflects that the postgraduate students were the majority (28) of respondents that indicated that digital preservation was very important, followed closely by undergraduate students at 22 respondents.

Table 5.16: User type and digital preservation importance cross tabulation (N=76)

Documentary heritage user type	Digital preservation importance			
	Very important	Important	Of some importance	Not important at all
School learners	7	2	2	1
Tertiary education students	19	1	1	0
Researchers	29	3	1	0
Other	7	1	2	0
Total	62	7	6	1

Table 5.16 shows that the majority (an aggregated 69) of respondents across user types felt that it was important to digitally preserve Namibian publications.

Table 5.17: Importance of digitally preserving the Namibiana collection (N=82)

Reasons for importance of digital preservation	No. of respondents percentage	Comments
For posterity use	37 (45%)	<ul style="list-style-type: none"> • Future generation needs to know our history • Physical materials get worn out • Sovereign archiving of Namibian resources
To increase access	63 (77%)	No comments provided
For remote use	44 (54%)	<ul style="list-style-type: none"> • For internet researchers • National library may introduce mobile library for rural people • Not all people live near Windhoek • To ensure that Namibia's history is not misinterpreted by foreign scholars • To widely access information remotely
To avoid deterioration of sources	54 (66%)	<ul style="list-style-type: none"> • Especially for very old books • If physical copies are lost or damaged the digital copy can still be used • Manual things may deteriorate with time • Some very old documents are disintegrating • This is the best practice elsewhere • This is very important as most of our resources are very fragile • To increase durability • We need to keep information for the future use
Other reasons	7 (9%)	<ul style="list-style-type: none"> • Cheaper • Greater audience • It will be quick to access from anywhere • More researchers will work on Namibia • To save the heritage of this country

Questionnaire respondents were asked to give their views on why it was important to digitally preserve the Namibiana collection (see Q17 in Appendix D). They were given the option to select more than one answer and provide additional comment if they had any. As captured in Table 5.17 the majority of the respondents (77%) indicated that it was important to digitally

preserve the Namibiana collection to increase access. Unfortunately, no comments were provided for this reason.

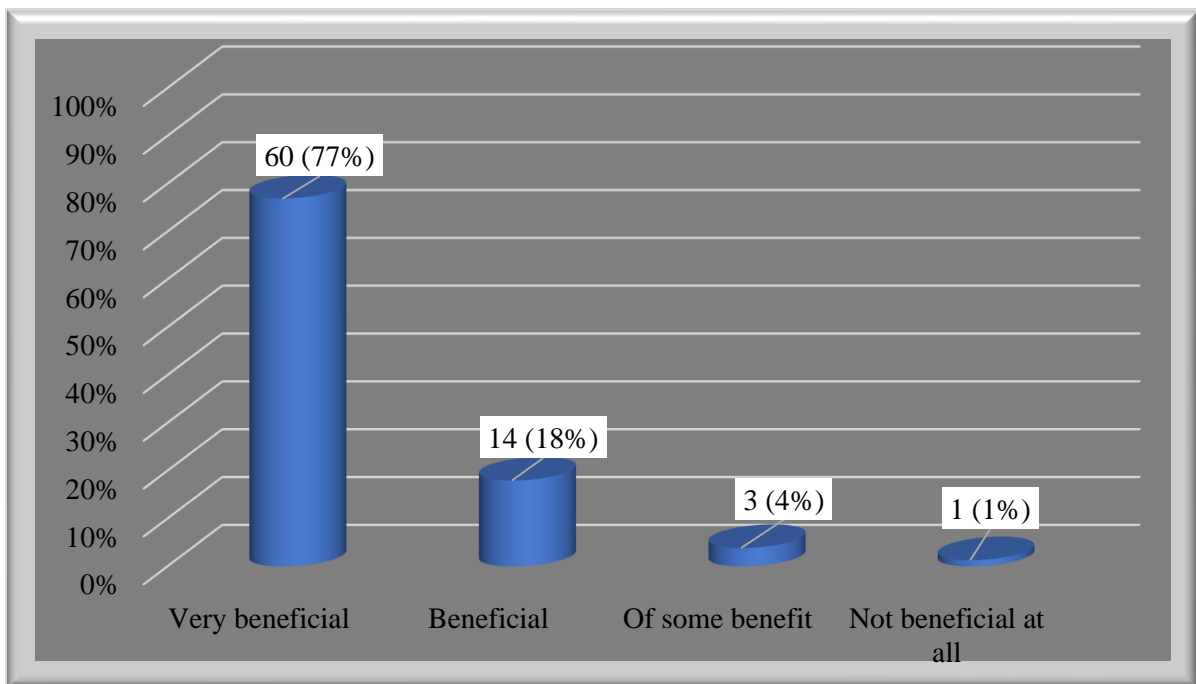


Figure 5.9: Extent of digital preservation benefits (N=78)

Respondents were asked to indicate the extent to which digital preservation of Namibian publications was beneficial. Figure 5.9 shows that the majority of the respondents 60 (77 %) indicated that digital preservation was very beneficial, followed by beneficial at 14 (18%), giving a total of 74 (95%) of respondents finding it beneficial to digitally preserve Namibian publications.

5.6.3 National Library of Namibia management staff members, NLAS and NLIC board members' views on importance of digital preservation of national documentary heritage

The management of the National Library of Namibia, NLAS and NLIC board members were asked to give their views on the importance of the National Library to digitally preserve national documentary heritage. The views of National Library staff members, NLAS and NLIC were as follows:

NLM1

“Time has changed and so many people are doing their studies outside the country and we have to change from the old traditional way to the digital era. So, preserving documentary heritage is of utmost importance.”

“If we move toward digitisation, and preserve our collection in a digital format, we will be safer and the country heritage is still with us. But with hard copies sitting here which are not digitised, in case of a disaster, it’s gone.”

NLM2

“I think it is crucial because most of the people in Namibia, they don’t come to Windhoek to access materials physically. If these materials are available digitally, then everybody in the country will be able to access those materials. I also think that it is a way to let the citizens of this country to be aware of what is available in their country especially with regards to information and knowledge. They will be able to use information available to develop themselves and to align themselves with government policies, etc.”

NLM3

“It is important because over the years printed sources start wearing off and whenever something is in a digital form it is easy to maintain and carry them around. One good thing about electronic documents is the accessibility. You can access from anywhere, now we no longer have time to go to the library and carry heavy books. If a document is an electronic form, it is easy to handle from the library administration point and easy to preserve. We need to start thinking in that direction although we cannot get away without print resources.”

NLAS1

“The world is moving digitally and as such we need to move with time. For the National Library, our plan is to have both print and electronic records. With electronic resources, there are always challenges e.g., systems, technical knowhow, you need a backup of printed copies. We need to preserve these documents digitally.”

NLAS3

“The process of digital preservation of the national documentary heritage at the National Library is very essential, as it entails various ways of ensuring that the data are surely captured electronically, using tools such as both the hardware and the software. It is further bringing in the component of warranting that the availability and the accessibility of this information is guaranteed for all of the library-users and as well as to preserve for posterity and for the future generations.”

NLAS4

“I think it is important that we preserve these documentary heritages, as we are all aware that we are moving to the digital world; almost everything is online, I feel it is important as much we have them in printed copies, we should make provision to have them digitally preserved so that they can be accessible via electronic means. As we only have one National Library, we need to cater for all researchers and users across the country. Sometimes it’s very difficult if somebody requires one a specific document and they need to travel from where they are to access them. So, it is important to preserve these materials and avail them via electronic means.”

NLAS5

“My views are that it is very important to preserve those documentary heritage documents and also for space because we do not have enough physical space at the National Library.”

NLIC1

“It is very important activity, that it should be taken seriously but where I see the challenges, there are a lot of gaps, more especially the legal deposit because there is no clarity on who is supposed to make sure that the legal deposit is all collected and forwarded to the National Library.”

NLIC2

“If we don’t digitise such documents, after some time, we will lose this information. To me digitisation is very important because some of the materials at the National Archives has value for future generation and we need that information to be stored in a manner that can be usable and can be easily accessible.”

NLIC3

“I think it is very important to make sure that documents are digitised. Important documents e.g., policies and others which have historical and research value are digitised. It is important not only for preservation but for easy access to the community. For users with access to technology wherever they are in Namibia. The world is going towards digitisation of materials and publications and although we know that some part of Namibia, digital divide still exists, but I think a large proportion of the population can access materials digitally.”

NLIC4

“I think it will help future generations to understand our social and political personal history, which is important for sustainable development and good governance. Digital preservation is the key to future access to our documentary heritage.”

NLIC5

“From a professional point of view, this cannot be over-emphasised.”

5.6.4 Benefits of having Namibia’s documentary heritage digital preserved

Interviewed participants stated that it was important to digitally preserve Namibian documentary heritage because of the following benefits:

- Enhanced access to wider audience;
- Digital copies are easy to manage;
- For history story-telling. At the moment, story-telling with elders is not documented or recorded;
- Secure the national documentary heritage so that it serves the research and scholarly needs of Namibians, and researchers from outside Namibia;
- Unlimited accessibility of documents and newspapers to thrive economically, socially and politically;
- For posterity and long-term usability;
- For materials that are old and can’t be handled anymore otherwise they will damage or deteriorate;

- To safeguard from physical damage from handling of such documents and from disaster e.g., water; and
- The documentary heritage can be back-ups elsewhere, even if something happened at the National Library one will have access.

When National Library of Namibia management staff, NLAS and NLIC board members were asked what they consider as benefits of having Namibia's documentary heritage digitally preserved and who will benefit (see Q6 in Appendix E, Q3 in Appendix F, Q24 in Appendix G), two categories of National Library of Namibia users were identified, that is, local users and international users and that these users will benefit in the following way:

- The Namibian community and the future generation which need to know Namibian history;
- Learners, students, politician, researchers, authors, government officials for study purposes, decision-making and have informed citizens and knowledgeable people;
- Digitally preserved national documentary heritage allow multiple users to use information from their comfort of their offices and homes, without wasting time and funds on transport, which could be a challenge to some of library users;
- Researchers around the world who want to research about Namibia; instead of them traveling to the National Archives and National Library to access these materials;
- Equal access to quality information promotes investments, it promotes opportunities for the youth and at the same time the citizens would be able to better their lives; and
- It will benefit Namibian children from a history point of view, e.g., anti-colonial history, our children need to know.

5.6.5 Library user support

This section presents findings on the support accorded to Namibiana collection users remotely. The section further presents plans for the National Library of Namibia in relation to providing remote services. It also presents users' views and suggestions on reduction of users' dependency on library staff members when searching for documentary heritage sources.

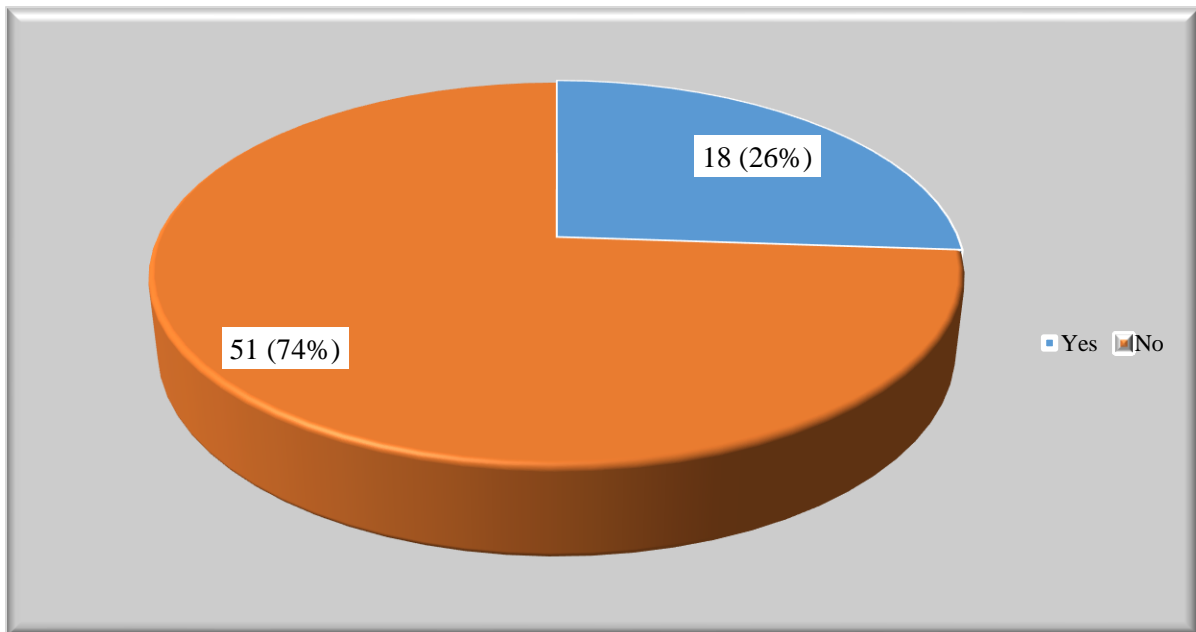


Figure 5.10: Respondents' ability to access resources remotely (N=69)

User respondents were asked to indicate if they could access information sources (Namibiana collection) remotely. Figure 5.10 shows that the majority 51 (74%) did not access the Namibiana collection remotely.

Respondents who answered 'yes' to remote access (see Q12 in Appendix D) were asked to provide their views if remote access to information sources reduced dependency on library staff to access and locate resources in print form. Below were respondents' responses:

“Library staff remain indispensable to educate first time users or to help locate non-published archived sources.”

“No, because not every individual has electronics, therefore some prefer print over electronic form. I personally would like to encounter people and to be surrounded by people and not electronics in general - it is a place of silence and a place of people.”

“No, you need a librarian to help you sometimes.”

“Searching on my own reduces dependency on Library staff to locate resources in soft copy but not in print.”

“Yes, it does reduce that and in so doing it gives/provide the youngsters who do not have access to digital devices to have enough time to do other works/researching.”

“Yes, it does, because information is easily accessed from the internet but still they [Librarians] play a role in helping out locating information that is not available on the internet.”

“Yes, it has helped reduce, in different ways time resources to reach the library (travel). One works independently and freely for many hours without being restricted with time limits. Free access guarantees, free flow of information. Access creates the personal information hub.”

“Yes, because it saves time and petrol to drive to the library and there are chances where it is not guaranteed to find the textbook you are looking for at the library, so it’s more convenient to have access to the textbook besides the library.”

“Yes, no need their labour. It will save you time.”

Table 5.18: Types of support provided to users (N=73)

Types of support	Responses	Percentage
Manuals/User guides	31	42%
Interactive services with librarians	48	66%
Downloading and borrowing resources online	18	25%
Frequently Asked Questions (FAQ) services	12	16%
Other remote support	4	5%

Respondents were asked to indicate the type of support provided by the National Library when searching/using documentary heritage remotely (see Q14 in Appendix D). Respondents could select more than one option. As reflected in Table 5.18, the majority 48 (66%) of the respondents indicated that they received support in the form of interactive services with the librarians. The 4 (5%) respondents who indicated ‘Other remote support’ specified that this included calls, emails and scanning.

5.6.6 Perspective on remote access

Interviews with the National Library of Namibia management staff and NLN IT librarian revealed that digitally preserved documentary heritage sources were not remotely accessible by users yet. National Library users needed to come in person to access the Namibiana collection even if some of it is digitised:

NLM1

“We should come up with a plan to make it accessible to them.”

NLM2 indicated that the National Library of Namibia was not in a process nor had started the process of developing a plan yet. When asked how the library was providing access to users that were not able to come in physically to the National Library, Respondent NLM2 explained:

“What we are doing right now is that sometimes users call and request for a document and what the National Library is doing is to scan that item and send to users.”

Interviews with the National Library of Namibia management staff and IT librarian established that with electronic documents received by the National Library of Namibia from publishers, when these materials were requested by users, the National Library of Namibia shared such resources with users via email. Besides sharing scanned documents, the National Library of Namibia at the time of the study did not provide any other remote support to access the Namibiana collection. When the management of the National Library of Namibia and NLN IT librarian were asked what measure or plan was in place for the National Library of Namibia to ascertain if documentary heritage in digital form is secure, NLM3 and IT responses were as follows:

NLM3

“The back-up to the digitised content is with the IT person. That is the back-up that we want to send to Office of the Prime Minister for further backing up because we don't want the database and back-up here in the same place. We procured two servers last year (2021) and one of them is mainly just for back-up and the other is for the library system Koha library management system we are migrating to.”

IT

“The new system Koha library management system is a secured line, between IT and end user. Only the IT person and senior librarian can upload content to the server.”

Both the study’s interview participants and questionnaire respondents (see Q19 in Appendix D, Q11 in Appendix E, Q8 in Appendix F, Q34 in Appendix G and Q20 in Appendix H) were asked to provide comments or suggestions regarding digital preservation of documentary heritage at the National Library of Namibia. The responses with regards to remote access of the Namibiana content were as follows:

“As we are in the 4th industrial revolution, it’s an ideal way. Researchers all over the world would have access to information about Namibiana context.”

“Digital preservation of documentary heritage will help everyone to meet their needs and it will make it easy for everyone to have access to information they are looking for.”

“Digital preservation is helpful to people to easily access information online but at the same time it will disadvantage people that have no access to the internet.”

“Digital preservation of documentary heritage is important at the National Library because it prolongs the life of library materials like hard copy materials in converting materials into digital form and this will make it easier for people to retrieve whatever they want.”

“Digitisation of the Namibian collection would be of great benefit to the country. It would allow more access to the collection and allow for safer preservation as most of the materials are in a fragile condition. As a result, they are moved to that last copy collection, then users would not have access at all. Also, digitisation is important as we have had a case where the National Library is the only depository with the copy of a book as it was out of print.”

“Having this heritage at the library will help keep the public informed with facts rather than confused with fiction. They are important defenders in the fight against misinformation. It is a good thing indeed.”

“I suggest making highly important information such as the History a priority as lots of researchers and historians come in for historical/political information. Then Education as students travel from far to access information.”

“Increase use of computer use in library, provide up-to-date online services and information access of Namibia collection online and remotely.”

“It is good to digitally preserve the documentation for life keeping and for quick access.”

“Multiple users can use it thus replacing the reserve reader library section. Digitalization must ensure, maintain original standards from the copies published.”

“Digital preservation is crucial in keeping records of archive documentation of all national history of Namibia.”

“I am delighted to see that there is a need for digital preservation for our Namibian documents for better keeping and easy access without tearing apart and losing very important information.”

5.7 Namibian legal deposit framework and electronic information sources

The study’s fourth research question was aimed at establishing the extent to which the Namibian legal deposit framework made provision for electronic information sources deposit to the National Library of Namibia. Research findings relating to this research question are presented in this section under the following headings:

- Electronic information sources deposit at the National Library of Namibia;
- Harvesting of electronic information sources;
- Challenges experienced with electronic resources deposit; and

- Namibia Library and Information Service Act 4 of 2000.

5.7.1 Electronic information sources deposit at the National Library

The study sought to understand if the National Library of Namibia received and accepted electronic documentary heritage sources via legal deposit. Interviews with the National Library of Namibia management staff established that the National Library of Namibia received electronic documents. The electronic documents received by the National Library included: *The Observer* newspaper, books from some publishers, journals, and government publications from some ministries e.g., annual reports and strategic plans. These materials were received in PDF format.

Responses from the National Library of Namibia management staff indicated that the NLN did not have a framework in place to facilitate e-legal deposit or to legally compel publishers to deposit electronic publications. Since the National Library of Namibia is mandated to issue ISBNs and ISSNs, when the National Library issues International Standard Book Numbers (ISBNs)/International Standard Serial Numbers (ISSNs), it negotiates with publishers to deposit their publications in any format. Documents reviewed (Ministry of Basic Education and Culture, 1997: 34; Republic of Namibia, 2000: 8-9) revealed that the existing legal frameworks do not mention legal deposit and harvesting of electronic documents. Section 8 of the Namibia Library and Information Service Act 4 of 2000 (Republic of Namibia, 2000: 8), the Act does not provide details with regards to the prescribed format and quality of resources that should be deposited at the National Library of Namibia. However, the Ministry of Basic Education and Culture (1997: 33) stipulates that the National Library will facilitate the sharing and supply of resources by way of its access to international electronic bibliographic and information networks, databases, and resources. Document reviewed (Namibia Library and Information Council, 2020: 11) indicated that NLIC recognises that the legal framework for the Namibia library and information sector is outdated. This document review found that the NLIC board had committed itself to reviewing the Namibia Library and Information Service Act 4 of 2000 and Archives Act of 1992 as well as ensuring that all the critical operational policies, standard operating procedures and manuals for the Namibia library and information sector are updated.

The National Library of Namibia management were asked if the National Library was ready and had the capacity to receive e-publications e.g., infrastructure, human capital, etc. Below are their responses:

NLM1

“No, the National Library has no capacity at the moment but maybe with time, things will be put in place. We are still waiting for equipment and capacity of staff members. We are also waiting for the revised Information Service Act. By the time the Act is revised, we hope these will be in place. At the moment, the head of the Bibliographic section receives these electronic documents and enters them into the database, by cataloguing them.”

NLM3

“Not really, we are not ready. That is, in terms of personnel and machinery. With us, we have more administration officers than librarians, we really don't have enough qualified librarians. The qualified librarians do not have the technical skills and expertise to work in a digital environment. A lot needs to be done to build capacity.”

The National Library of Namibia management were asked to provide details regarding the policy guideline which guides the process of e-publication deposit. The responses were as follows:

NLM1

“No, no guidelines on how the section should handle the e-content. We are waiting for the revision of the Namibia Library and Information Service Act. However, there was a suggestion from NLAS management that we should come up with a write-up of how we are planning to handle this process and we are still in the process of writing this document. This document will guide us.”

NLM2

“I know that there are no guidelines.”

NLM3

“Yes, collection development policy which is under review.”

Interviews (NLM1, NLM2 & NLM3) established then that the National Library of Namibia did not have guidelines to regulate and guide the process of e-deposit. One of the reasons given during the interviews (see above responses) is that National Library is waiting for the revision of the Namibia Library and Information Service Act, Act 4 of 2000. The National Library of Namibia was anticipating the revised Namibia and Information Service Act of 2000 in order to accommodate electronic legal deposit. The National Library of Namibia believed that aspects of electronic legal deposit would be part of the new Act and the National Library of Namibia would draw its guidelines and regulations from the Act. NLM2 explained that at the moment (that is at the time of the study), the National Library of Namibia was missing out because some people preferred to publish in electronic format. Even if the National Library, received electronic documents; NLM2 explained that:

“We are unable to make them available to the public. It is just not the National Library but the general public is missing out on this information.”

5.7.2 Harvesting of electronic information sources

The study sought to understand if besides legal deposit, the National Library of Namibia harvested e-publications (e.g., oral history) from elsewhere. The National Library of Namibia management staff pointed out that to a certain extent, the NLN was harvesting e-publications. The e-publications digitally harvested included all resources published in Namibia, except pamphlets and dairies. For the selection criteria and process used to harvest these resources, the National Library was guided by the Namibia Library and Information Service Act 4 of 2000 and the National Library of Namibia Collection Development Policy. NLM3 explained that the National Library of Namibia harvested e-publications by means of contacting ministries, publishers, etc. NML1 narrated that the National Library of Namibia had a small budget for purchasing mostly printed resources and to acquire books published outside Namibia with content about Namibia. Participant NLM1 indicated that the responses were good and at times the National Library of Namibia receives a link to e-publications and the National Library downloaded the material. NLM1 further explained that:

“If we see something being published, book launch, etc. event we see on social media, the librarian contacts the organisers. The National Library also sends out letters to ministries requesting for these publications.”

Contrary to what NLM1 said, Participant NLM2 stated:

“No, the National Library does not harvest e-publications because of human resources. We are supposed to be doing this but due to limited human resources, we are unable to do it. Because of human resources, we are also not able to fulfil most of the legal deposit requirements which we are supposed to do to perform the function of the National Library; we are mostly failing because of human resources.”

NLM2 explained that the National Library of Namibia was failing in fulfilling most of its legal deposit obligations because of skill sets challenges and limited human resources. NLM2 further stated that:

“I have been at the National Library of South Africa, and in comparison, with what we have, it is like we are just an ordinary library, not a National Library. Because at National Library of South Africa, for example, in each department you will have people who are dealing with functions; here you have one person dealing with many functions, so the staff members here are overloaded.”

When the National Library of Namibia management staff members were asked if the National Library had a unit/department or a dedicated staff member responsible for administering deposit of e-resources, they responded as follows:

NLM1

“Currently, it is the Bibliographic section doing that. We would like to have a section or a librarian solely responsible for e-deposit. We need someone to catalogue these materials and manage the database.”

NLM2

“No, only the senior librarian and the head of Bibliographic section are responsible. In that section, they are just two, a senior and a librarian. So, activities relating to e-deposit, harvesting of electronic resources and processing of these resources, the head of bibliographic section is doing them.”

NLM3

“Not really. At the moment this is done by the head of Bibliographic and Reference sections.”

5.7.3 Challenges experienced with electronic resources deposit

The National Library of Namibia management staff members were asked to give their views on challenges (if any) the National Library was experiencing with e-publication deposit. They responded that one of the challenges of harvesting electronic documents was the continuous changing and closing of the websites of institutions and that of content not being available for long on these websites. This hampered the process of harvesting of documents from such institutions. It was also established from interviews with National Library of Namibia management that the NLN had no capacity (human resources) and infrastructure to harvest Namibian content on government websites and other materials published electronically (e.g., annual reports) that had value in terms of Namibiana content. A review of the NLAS 2017/2018 annual report (Namibia Library and Archives Services, 2018: 20) revealed that one of the greatest challenges in the harvesting of legal deposit materials was in the sourcing of government publications. The challenges were due to, amongst others, lack of responsible contact persons and the frequent turnover of staff in different Ministries.

Interviews (NLM2) also established that another challenge experienced by the National Library of Namibia was that some publishers felt like there was no need to deposit their publications with the National Library because they were publishing with Amazon and only preferred to give the National Library links to their publications. However, for the National Library of Namibia to access these publications, the National Library was required to pay for access. Interviews with the National Library of Namibia staff members established that with the Namibia Library and Information Service Act 4 of 2000 being outdated, the National Library could not force publishers to deposit electronic publications as it has no legal framework and power to do so. NLM3 pointed out that the National Library was trying to establish mutual relations with publishers to get electronic publications. NLM3 explained that the more loyal publishers were committed and had been depositing their publications with the NLN.

The National Library of Namibia has also been experiencing an administrative challenge of uploading e-publications deposited on the National Library of Namibia management system

(Symphony). The National Library of Namibia has to go through their service provider in South Africa who was responsible for uploading content on the National Library management system. The National Library of Namibia had a further problem of storing electronic publications because of the library server problem and the challenges of user access to these materials.

When asked to provide comments or suggestions regarding digital preservation of documentary heritage at the National Library of Namibia, NLIC2 stated the following:

“The problem with legal deposit is that not so many government institutions and departments are aware about legal deposit. NLIC is planning to have some outreach programmes e.g., radio and other platforms to inform these institutions and public about legal deposit and the Act. The Act needs to be publicised.”

5.7.4 Namibia Library and Information Service Act 4 of 2000

At the time of data collection for this study, the Namibia Library and Information Service Act 4 of 2000 did have a section that mentioned e-legal deposit. The study sought to establish if there were any discussions or if a process has begun to amend this Act to include e-legal deposit. This question was directed to NLIC board members who served between the year 2018 to 2021. The following were the responses from the NLIC board members:

NLIC1

“The only plans that I am aware of is to amend the Namibia Library and Information Service Act 4 of 2000.”

NLIC2

“Yes, I think that one of the strategic objectives of the NLIC strategic plan (2020-2025) is to look at the two Acts, Archives Act of 1992 and Namibia Library and Information Service Act 2000. These Acts need to be amended because since they were enacted, a lot of things has taken place, for example, we are talking about electronic resources, legal deposit which I think is section 8. We have electronic material and e-books; how will these books be treated. The Act is silent about it and a person gets away with it because the Act does not talk about electronic resources.”

NLIC3

“We acknowledge that the Act is very old. 2000 is many years ago, so it will be reviewed and we hope that from next year (2023) it will be ready to be submitted to parliament.”

NLIC4

“Yes, there has been discussions and NLIC board feels that there is a need for revision of the Act because it is just not e-deposit. Other aspects as well but we agreed that it should be revised but the process has not begun.”

NLIC5

“Discussions were done, we were very much aware of the deficiency of the Namibia Library and Information Service Act and the Act has been overtaken by developments especially in the technological and library and information service. That Act of 2000, that is when it was passed but it could be that it was formulated in the 1990s.”

NLIC6

“No, there was nothing.”

NLIC board members interviewed agreed that the Namibia Library and Information Service Act 4 of 2000 is outdated and that the new NLIC board 2022-2024 would start the review process. At the time of collecting data for this study, the 2022 to 2024 NLIC board members were barely a month in the Council and discussions regarding the revision of the Act 4 of 2000 had not yet started. From the interviews it was established that the review of the Namibia Library and Information Service Act 4 of 2000 was going to begin in year 2022. However, it was not clear when the process will be finalised because the revision of the Act is a long process which includes consultation and input from various stakeholders. NLIC3 explained that:

“One of the aspects which will be included in the legal deposit is harvesting of electronic resources (e-content) because it is efficient, fast, and cost effective for the publishers who are required to deposit a large number of publications to the National Library.”

5.8 Preservation framework appropriate for the National Library of Namibia

The study's fifth research question focused on an appropriate digital preservation framework for the National Library of Namibia. Hence the study sought the views of NLAS and NLIC board members on the digital preservation framework they wish to see in the Namibian library and information sector. Research findings relating to this research question are presented in this section under the heading, suggested preservation framework.

5.8.1 Suggested preservation framework

When NLIC board members were asked about the kind of digital preservation framework they want to see in the Namibia library and information sector (see Q10 in Appendix E), they suggested the following:

NLIC1

“The first one I would love is to see is a framework on the issues of collection development, and I would want to see a policy or framework providing guidelines on how to preserve electronic or digital documentary heritage.”

NLIC2

“I would like to see libraries in Namibia working together so that, for example, if one library has equipment for digitising, other libraries could make use of the limited resources together. Sharing resources because resources especially machines are expensive.”

NLIC3

“What I would like to see happen is extensive investment in systems, technology and equipment. I would like to see a system where all Namibian communities and school libraries are operating through a single system with the capacity to make sure that everybody wherever they are, they can search and access those materials which are in digital form and actually have access to full text materials.”

NLIC4

“I would like to see a framework that formalises the country commitment, also financial commitment, to the long-term digital preservation of and access to all its physical and digital heritage.”

NLIC5

“I would say that the first important thing is that we should have proper legal frameworks which talks to some of the critical issues in the library and information service. This will help because whatever you do that is not supported by the legal framework, it will not work. So, the legal framework or policies should be in place.”

When asked about their views on the kind of digital preservation framework they would want to see in the Namibia library and information sector, NLAS management responses were as follows:

NLAS1

“I would want to see these documents freely online, although some of these documents are copyrighted.”

NLAS2

“If we can have something digital. Collaboration is need with other institutions e.g., University of Namibia, with uniform access and providing links to different database for institutions and users access documents through a union online catalogue, sharing resources e.g., union catalogue.”

NLAS3

“Digital perseveration could be catered for by a number of legal frameworks, such as; the Electronic Documents and Records Management System Policy, Information Communication Technology Policy, E-Governance Policy, Intellectual Property and Copyright Act, to mention but a few. The existing Namibia Library and Information Service Act, (Act Number 4 of 2000) and Information for Self-Reliance and Development – a Policy Framework for Libraries and Allied Information Agencies for Namibia calls for speedy revision, to accommodate electronic/digital preservation of data.”

NLAS4

“With libraries moving and embracing 4IR, we would want to have digital resources and provide digital resources to our users e.g., provision should be made to provide e-resources to our users, but we also need to consider if our users have access to these resources.”

NLAS5

“I think we should coordinate these activities so we do not duplicate efforts. Maybe as a sector we should say NUST digitise that, UNAM that, etc. and maybe having one repository, where all digitised resources in libraries are deposited and accessible to users and for research.”

NLAS6

“Currently we are paying a lot of money in subscription fees e.g., to EBSCO Host and Emerald. In my view, it would be best if we can form a consortium with our universities and we can interlink with each other, pay less and have more databases available. We can subscribe to e-resources and have more databases available. Form a consortium, pay less and more resources and database available.”

5.9 Summary of the chapter

Chapter Five presented the research findings from the semi-structured questionnaire, interviews and document search and review. These findings were integrated and organised according to thematic areas which are derived from the study’s research questions. The study’s findings were presented in both tables and figures and in the form of descriptive narratives. The findings show that the majority of users of documentary heritage sources at National Library of Namibia are researchers. The findings established that the documentary heritage sources digitised at the National Library of Namibia were not available to users remotely and they were not digitally preserved. The findings revealed that digital preservation of documentary heritage is important and has a lot of benefits to users and to the National Library, however, the National Library of Namibia did not have a digital preservation programme, digital preservation policy or long-term digital preservation strategy in place. The findings also revealed that the National Library of Namibia received e-deposits and harvested electronic

documentary heritage. The next chapter discusses the main findings of the study in the context of literature reviewed and the theories guiding the study.

Chapter 6 : Interpretation and Discussion of Main Findings

6.1 Introduction

This chapter provides interpretation and discussion of the main research findings. Christensen et al. (2015: 476) explain that the purpose of a discussion in a research report is to interpret and evaluate the results obtained. This chapter summarises the overall findings, compares the findings with relevant literature and provides critical input from the researcher relating to findings (Creswell & Creswell, 2023: 212). The chapter further discusses how the Open Archival Information System (OAIS) Reference Model and Digital Preservation Capability Maturity Model (DPCMM) explain and support the findings of this study. The main findings of this study are discussed under the following themes which are derived from research questions that guided the study:

- Current preservation practices for information resources at the National Library of Namibia;
- Long-term preservation planning, policies and strategies;
- Views on digital preservation of national documentary heritage;
- Namibian legal deposit framework and electronic information sources; and
- Preservation framework appropriate for the National Library of Namibia.

6.2 Current preservation practices for information resources at the National Library of Namibia

The first research question of the study was aimed at establishing what the National Library of Namibia (NLN) is currently engaged in concerning preservation practices of any kind (physical or digital) for the Namibiana collection housed at the NLN. This section presents a discussion on the following themes:

- Preservation practices at the National Library of Namibia; and
- Challenges with preserving Namibia's documentary heritage information sources.

6.2.1 Preservation practices at the National Library of Namibia

The NLN, as reflected in the findings in Section 5.4 in Chapter Five, preserves resources by scanning some materials from the Namibian collection, especially those that are in demand by researchers as well as those that are identified as seemingly fragile, scarce resources such as old books that are not in print anymore and used more often by users. These findings imply that the NLN was doing the bare minimum with regard to the digital preservation of Namibia's documentary heritage. In the context of this study, digital preservation practice means the process of maintaining a digital object for as long as required, in a form which is authentic and accessible to users (Brown, 2013: xii). The findings of this study suggest that the NLN did critical digitisation which is digitisation activity of limited documents in a collection (Dahlström, 2010: 85). Although normally this digitisation arises out of preservation projects whose aim is to produce replacement copies of texts (Coyle, 2006: 642), the NLN has no formal digitisation programme currently and it is yet to develop a digitisation programme. A study by Knight (2010) in New Zealand found that when developing a digital preservation programme, one should define the exact purpose of the digital preservation programme, implementation strategies, staffing aspects and how to get started. The lack of a digital preservation programme at the NLN could explain why there were no standardised preservation practices at the NLN and the lack of a preservation programme can be attributed to limited strategic planning related to digital preservation; limited human resources; inadequate infrastructure; technical know-how, etc.

The content of information sources digitised by the NLN was not made available to the public or to NLN users. One of the reasons given by the NLN for the unavailability of digitised materials to users is that metadata had not yet been added to the scanned documents. With these findings, it could be concluded that the NLN was not ready to digitise Namibian documentary heritage. These findings relate to Balogun and Adjei's (2019: 617) study which concluded that institutions in Nigeria were not ready to digitise their collections.

In terms of digital preservation capability, in the context of the Digital Preservation Capability Maturity Model (DPCMM) (Dollar & Ashley, 2015: 9), the NLN was found to be at stage one. At this stage, according to ISO 14721 standards, the NLN had not formally implemented digital preservation (Dollar & Ashley, 2015: 11) which can be interpreted to mean that most, if not all, electronic documents that merit long-term preservation are at risk (Dollar & Ashley, 2015:

11), and that the NLN is not capable of digitally preserving documentary heritage in its custody. The findings of the study can also be interpreted to mean that there is no digital preservation programme in place or planned although digitisation of resources is practised. With reference to the Open Archival Information System (OAIS) Reference Model (Digital Preservation Coalition & Lavoie, 2014: 12), an organisation with a digital preservation mandate should have a formal decision-making process aligned to its enterprise information governance framework that assigns accountability and authority for the preservation of electronic records with permanent value (Dollar & Ashley, 2015: 18). In terms of preservation planning in the context of the OAIS Reference Model, the findings of the study can be interpreted as the NLN not being in line with the OAIS environment. The NLN ought to have a digital preservation plan which serves as a blueprint for preservation activities and ensures that documentary heritage at the NLN remains accessible over a long term, even if the original format becomes obsolete (Consultative Committee for Space Data Systems, 2012: 4-2). Although the findings of the study suggest that the NLN did not have a preservation programme and a clear governance framework, it was committed to preserving resources that were deemed too vulnerable as reflected in Sections 5.4.1 and 5.5.5 of Chapter Five. In summary, although the NLN did not have a formal digital preservation programme, it has been practising critical digitisation to safeguard fragile documents and documents in high demand by users.

6.2.2 Challenges with preserving Namibian documentary heritage information sources

It would appear that the NLN has been experiencing the following challenges with the preservation of documentary heritage: lack of technological infrastructure, for example, scanning machines, computers, software, etc. (for print and audio-visual resources) and technical expertise for preserving CDs, cassette and music video and short films (see Section 5.4.4 of Chapter Five). The NLN management revealed that other challenges which led to the failure of the preservation activities at the NLN included a shortage of staff with technical skills and a lack of dedicated staff members to manage preservation activities and processes (quality control, metadata, etc.). These findings suggest that preservation activities might have been taken on without thorough planning and commitment of the NLN management and without due diligent planning in terms of financial, human resources and infrastructure. Hence, the

NLN was faced with the above-mentioned challenges which could be addressed through planning and commitment.

Similar sentiments were expressed in the findings of Awamleh and Hamad's (2022) study which recounts that libraries are experiencing issues related to a lack of equipment necessary for digital preservation, lack of expertise in digital preservation, lack of training and skills on digital preservation and inadequate funding. A study by Voutssas (2012: 90) affirmed the lack of significant digital preservation projections in Latin America attributed by limited preservation knowledge, technological issues, etc. Although the NLN was inundated with challenges of equipment and technical know-how from the available staff complements, the researcher believes these challenges could be resolved through collaborations with other institutions as suggested in the proposed digital preservation framework for the NLN and Namibia library and information sector (see Section 7.6.6 in Chapter Seven).

The researcher believes that collaboration could mitigate the above mentioned challenges because elsewhere, for instance a study by Mannheimer and Cote (2017: 111) in the USA, concluded that collaboration is a powerful tool for addressing digital preservation challenges. Mannheimer and Cote's (2017: 110) study explained that shared digital preservation services allow for cost-sharing, collective training and development of expertise and ongoing support. Similar sentiments are also shared in a study by Svärd's (2017: 283) which concluded that the solutions needed to mitigate the long-term preservation challenges is to collaborate across sectors. The findings of this study point to challenges such as lack of technical skills and dedicated staff members for digital preservation as factors which led to the failure of the preservation activities at the NLN. Preservation planning could be one way of addressing the challenges experienced by the NLN. Preservation planning service as depicted in the OAIS Reference Model monitors the external environment for changes and risks that could impact the OAIS's ability to preserve and maintain access to the information in the NLN custody (Digital Preservation Coalition & Lavoie, 2014: 13). In summary, the NLN was faced with numerous challenges which include lack of technical infrastructure and adequately trained staff members. These challenges hinder the NLN to carry out preservation activities.

6.3 Long-term preservation planning, policies and strategies

The discussion in this section addresses long-term digital preservation planning, policy and strategies at the NLN. The study sought to discover if the NLN had long-term preservation digitisation plans, digitisation policies and digital preservation strategies in place and if the NLN was planning to provide digital access to Namibia's documentary heritage. The discussion in this section is presented under the following themes:

- Digital preservation preparation and investments;
- Cooperation for digital preservation activities;
- Digital preservation policies; and
- Preservation strategies.

6.3.1 Digital preservation preparation and investments

The study sought to investigate investment made by the NLN in terms of infrastructure, human capital, etc. towards digital preservation planning.

6.3.1.1 Human resources

In terms of the human resources required for digital preservation activities at the NLN, at the time of this study, the National Library had not made any provision or investment for human resources towards the digital preservation of documentary heritage (see findings in Section 5.5.6 of Chapter Five). One of the reasons for not yet investing in human resources for digital preservation activities is that the NLN got its funding from the Ministry of Education Arts, and Culture (Government) and the Ministry for years had not availed funding to fill many vacant positions at the NLN. Documents reviewed showed that the approved structure (organogram) of the NLN reflected vacant positions that were yet to be filled. As a result, the National Library remained understaffed. The lack of adequate staff at the National Library could thus be attributed to a lack of recruitment policies.

The findings of this study are somewhat similar to the findings of a study by Nsibirwa et al. (2014: 58) which found that 55% of depository libraries in South African depositories did not have policies to recruit and train staff. The shortage of staff members at the NLN was

highlighted in a study Kauraisa (2019: 52) which found that the National Library has a shortage of staff entrusted with digitisation and preservation of national heritage. Kauraisa (2019: 53) concluded that the staff members at the NLN had no technical skills and knowledge and had only received on-the-job training for digitising newspapers. These findings concur with a study by Masenya and Ngulube (2019: 6) which concluded that most libraries and archival institutions are inundated by digital preservation challenges such as a lack of practical capacity to preserve records, lack of training and skills towards long-term preservation, lack of staff with experience in digitising resources, absence of staff development programmes, lack of training of staff and insufficient staff members. Similarly, Balogun and Adjei (2019: 618) in Nigeria revealed that issues such as lack of funding and lack of trained personnel are the major challenges facing the digitisation project. Anyaoku et al.'s (2019: 58) study on digital preservation practices in institutional repositories in Africa affirm the lack of necessary technical staff with required skills needed to initiate or manage digital preservation activities.

The NLN lacked staff members with technical expertise in the area of digitisation and preservation. This calls for the staffing structure of the NLN to be reviewed and to make provision for a position of librarian with technical expertise who could be the focal person for digital preservation activities at the NLN. This call for technical expertise was emphasised by one of the NLN management participants (as reflected in Section 5.5.6 of Chapter Five).

This finding suggests that a skills audit may be required to determine the required staff complement for the future digital preservation programme envisaged by the NLN. This finding of the study resonates with the Balogun and Adjei study (2019: 617) which established that the management of digitised collections was handled by the ICT personnel of the organisation but was facing problems due to a shortage of ICT personnel. Lack of technical staff and communication technology skills were also found to be a challenge by Anyaoku et al. (2019: 56).

Technical expertise is one of the selected components in the DPCMM Model used to guide this study. If the NLN is to have a viable digital preservation capability, it is required to have sufficient expertise in electronic resources management. This technical expertise may exist within the internal or contracted service provider (Dollar & Ashley, 2015: 20). In the context of the DPCMM Model, Dollar and Ashley (2015: 20) explained that a viable digital preservation capability requires organisations to have sufficient expertise in digital

preservation to support all of the infrastructure and requisite key processes, including on-going professional development for personnel and certification of the repository. It is evident from the findings of this study that in terms of technical expertise, the staffing structure at the NLN are contrary to the DPCMM model. When the NLN staff structure is reviewed and vacant positions are reviewed and filled, the National Library would need to have a dedicated staff member responsible for digital preservation of Namibian documentary heritage. Furthermore, the NLN would need to make provision for professional development of those entrusted with the digital preservation of documentary heritage.

6.3.1.2 Digital preservation infrastructure

With regard to infrastructure appropriate for digital preservation activities, the directorate of Library and Archives Services (NLAS) purchased two servers to ensure optimal preservation of the national documentary heritage of Namibia (see Section 5.5.6 in Chapter Five). Of these two servers, one was to be shared by the National Archives of Namibia and the NLN for storage purposes and another to be used as a backup server. The NLN was in the process of migrating to an open-source library management system (Koha library management system). Furthermore, NLN staff received basic training on the use of Koha library management system and the IT Librarian received training for setting up the system. Although the Koha library management system software was acquired, this system has yet to be set up and installed. The infrastructure that the NLN had invested in thus far was not adequate to qualify the NLN to be adequately prepared for the digital preservation of documentary heritage. As evidenced in Section 5.4.4 of Chapter Five, the NLN did not have appropriate scanners, computers and any other equipment or software for digital preservation purposes. The National Library does not have adequate budgetary provision from the government, to enable it to acquire equipment for digitisation and further preservation of documentary heritage.

The limited budgetary provision to the NLN means that the National Library cannot realise the digital preservation of documentary heritage with its current infrastructure. Hence the National Library of Namibia decided to approach an external organisation, the Turkish Cooperation and Coordination Agency (TIKA) for possible funding for equipment to be used for digital preservation. Even though it was not clear from the interviews with the NLN management what the nature of the proposal is, the funding proposal, if approved and when equipment is acquired, could go a long way in the quest for digitally preserving Namibian documentary heritage. One

of the National Library and Information Council (NLIC) member interviewees enlightened the researcher to the fact that there were some investments which were done in the same fashion as the TIKa proposal. The NLN secured funding for a digitisation project over ten years ago through the Education and Training Sector Improvement Programme (ETSIP) programme. A server and computers were acquired, however, there were implementation challenges when it came to practical usage of this server and several deficiencies in the project. There were no adequate human resources and IT skills to operate and implement and manage the project, no proper planning and preparations, and no preservation guidelines to execute the project. Hence, this equipment was not used successfully for the intended digitisation project and became obsolete.

Hence one could conclude that investments made over ten years ago were a wasted investment and that the NLN should be cautious when TIKa funding is approved to ensure successful implementation of the envisaged project and to proactively address similar current-day deficiencies as those experienced ten years ago with the ETSIP project. These findings confirm Matlala et al. (2022) who found a shortage of equipment, underdeveloped infrastructure, inadequate ICT facilities, lack of purposely built infrastructure, and absence of technical infrastructure while digitising and preserving cultural and heritage resources. In the context of the OAIS Reference Model and DPCMM, the Consultative Committee for Space Data Systems (2012: 2-9) explains that the management of an institution entrusted with the digital preservation of electronic resources should often be the source of funding for an Open Archival Information System (OAIS) and may also provide guidelines for resource utilisation (personnel, equipment, facilities). Given the limited financial resources availed to the NLN by the government, the National Library should be commended for the effort made in writing funding proposals to potential funders for NLN preservation activities.

On the basis of the nature of investment made by the NLN discussed above and as reflected in Section 5.5.2 in Chapter Five, the researcher proposed a data centre (see Section 7.4 in Chapter Seven). The researcher believes that a central storage (data centre) will provide more adequate storage than the local server. The proposed data centre could address a storage challenge. A study by Bhat (2018: 539) found that the current storage technologies used for digital preservation in India not viable for long-term preservation, and recommend emerging storage technologies in digital libraries as a long-term viable solution. In the case of the NLN the servers envisaged to store documentary heritage will be shared with the National Archives of

Namibia as reflected in Section 5.5.2 in Chapter Five, but in the long run the space may not be adequate, hence the proposed data centre.

6.3.2 Cooperation for digital preservation activities

It is evident from the findings of this study that the NLN does not have any formal or official partners with which they were cooperating for their preservation of Namibian documentary heritage activities. These findings confirm Ngulube's (2012: 131) conclusion that one of the challenges with digital preservation is the failure of national libraries and national archival institutions to closely collaborate to keep electronic resources safe for users presently and in the future. The study findings also concur with the findings of Nakale's (2023: 88) study which concluded that the office of the Prime Minister in Namibia did not have any framework to allow it to collaborate with standing partners on issues of digital preservation.

While the NLN had no standing collaborations with any institutions at the moment, this practice seems to be different from current trends and best practices of other libraries elsewhere. For instance, a study by Masenya and Ngulube (2020) found that academic libraries in South Africa were fully involved in collaborations with other institutions for digital preservation activities although these efforts are limited.

The NLN was planning to establish partnership agreements with other libraries and organisations to enable them to carry out digital preservation activities. Some of the institutions the NLN wishes to partner with include the National Archives of Namibia, the Ministry of Home Affairs and Immigration, the Namibian University of Science and Technology, the University of Namibia, and the National Library of South Africa. This planned digital preservation cooperation is in the area of training and skills transfer, sharing of equipment and digital preservation infrastructure (see Section 5.5.3 of Chapter Five for evidence of this).

The planned collaboration seems to be the trend/best practice for institutions engaged in digital preservation activities. A study by Mabe and Potgieter (2021: 4) which explores the benefits and challenges of collaboration efforts between libraries, archives and museum in South Africa, recommended that instead of having multiple digitisation projects using similar technology, it would be better for all institutions to have one digitisation project. One of the benefits of such

a planned collaboration approach is that the adoption of a collaborative approach enables or helps libraries benefit from each other's experience (Ahmad & Rafiq, 2022: 7). The study by Masenya and Ngulube (2020) recommends that institutions build partnerships with other institutions nationally and internationally. In the context of the DPCMM model, Dollar and Ashley (2015:19) recommend that an institution with a mandate to preserve electronic documents should maintain and promote collaboration with its stakeholders. The findings of the study could be interpreted to mean that the NLN planned initiation of collaborating with other institutions for digital preservation (see Section 5.5.3 of Chapter Five) is in-line with the DPCMM model. Collaboration in digital preservation activities seeks to leverage financial, human and technical resources, promote stewardship, and exchange knowledge about the current and future state of digital initiatives (Dollar and Ashley (2015: 19). The envisaged collaboration by the NLN can be interpreted to mean that the National Library of Namibia, as a custodian of Namibian documentary heritage, would like to save costs and optimally use equipment and human resources available in the Namibia library and information sector and amongst its stakeholders, to advance its digital preservation aspirations. As reflected in Section 5.5.3 in Chapter Five, a study by Kay et al. (2014: 39) which examined the digital preservation efforts with restricted resources in the USA concluded that seeking collaborations helps overcome challenges of minimum funds and lack of training. These types of cooperation can lead to successful digital archiving (Galyani, 2010: 69).

6.3.3 Digital preservation policies

The NLN does not have any guideline or policy guiding its current preservation activities nor does it have a draft or planned digital preservation policy (see Section 5.5.4 in Chapter Five). Although the NLN had a collection development policy, this policy did not have any section on digital preservation. Two reasons were provided for not having a digital preservation policy at the NLN: (1) a digital preservation policy was not thought of and considered, and (2) The National Library is waiting for a revision of the Namibia Library and Information Service Act 4 of 2000. Brown (2013: 24) recommends that an organisation with a desire for digital preservation, like the NLN, should develop a digital preservation policy as soon as possible. A digital preservation policy is critical for providing a basis from which detailed requirements can be identified and for a consistent intellectual foundation for practical digital preservation solutions (Brown, 2013: 24).

These findings confirm the findings of other studies conducted in Namibia. A study by Kauraisa (2019: 52) concluded that the NLN had commenced a digitisation project, however, there was a lack of guiding policies and digitisation standards. Another Namibian study by Umana (2019: 132) revealed that the aspects of digital preservation policies and guidelines did not receive comprehensive attention from academic institutions in Namibia. Similarly, Nakale (2023: 88) revealed the unavailability of a digital preservation policy in Namibia. The lack of published digital preservation policies is not unique to the NLN but it is common in many libraries in the Southern African region and elsewhere (da Silva Júnior & Manuel Borges, 2017: 311; Masenya & Ngulube, 2020; Awamleh & Hamad, 2022: 187). The current study's findings relating to policies and guidelines further concur with findings of other studies (Dorner, 2009; Kalusopa & Zulu, 2009; Gbaje & Mohammen, 2013; Boamah, 2014; Mutula, 2014; Nsibirwa et al. 2014; Balogun & Kalusopa, 2022; Matlala et al., 2022; Ndegwa et al., 2022). These studies too found the absence of, inadequate and lack of digital preservation policies and guidelines; lack of clearly defined policies; lack of preservation standards; and non-availability of digital preservation policies and guidelines. However, a literature review study by Barrueco and Termens (2021: 170) found that interest in developing preservation policies and plans has increased in North America more than elsewhere.

The lack of digital preservation policy at the NLN affirms a literature review study by Pandey and Kumar (2020: 26) on challenges experienced by library professionals and archivists with regard to the digital preservation of cultural heritage resources, which concluded that most digitisation projects are faced with challenges of lack of national-level digital preservation policy on preserving cultural and heritage resources. Furthermore, Oehlerts and Liu (2013: 93) concluded long-term digital preservation policy is an ongoing process evolving over time as needs change.

While the NLN is awaiting the revision of the Namibia Library and Information Service Act which is a process that could take some time, it is advisable for the NLN to develop a digital preservation guideline or policy to guide its digital preservation activities. Brown (2013: 28) advises that implementation of a digital preservation policy can only be achievable given the resources and expertise available to the organisation. In the context of the NLN, with its limited resources and expertise, one needs to caution that developing a digital preservation policy and implementing it might be a challenge. The finding presented in Section 5.5.4 of Chapter Five, shows that the NLN does not have a written digital preservation policy. These findings could

be interpreted as the NLN not conforming to the DPCMM model. According to Dollar and Ashley (2015:16), an organisation charged with ensuring preservation of documents should have a written digital preservation policy.

6.3.4 Preservation strategies

It was evident from the engagement with the management of the NLN that it had no digital preservation strategies for different types of documentary heritage held at the NLN (see Section 5.5.5 of Chapter Five). Furthermore, the NLN did not digitally preserve documentary heritage resources it digitised, or those resources which it received in electronic format through legal deposit and harvesting. Similarly, there was no ongoing discussion on implementing digital preservation strategies for physical documentary heritage.

The NLN had started receiving electronic documents as part of legal deposit. The NLN had no plans and had not begun the process or a discussion relating to monitoring documentary heritage sources for the obsolescence of physical resources in its custody. This is evident from a response by an NLM management participant (see Section 5.5.5 of Chapter Five).

These findings suggest that documentary heritage at the National Library was in danger of physical deterioration and those that were digitised could be in a format that would soon be obsolete. National Library of Namibia management explained that the National Library is not doing any updates on the formats yet and that the National Library has no budget provision for this exercise. These findings of the study relate to Balogun and Adjei's (2019: 620) study in Nigeria which found that libraries lack digital preservation strategy. Furthermore, the findings are similar to Dorner's (2009: 344), albeit older and global north, study which found that 77% of the institutions in New Zealand did not have a digital preservation strategy.

Regarding the OAIS Reference Model and DPCMM Model, these models advocate for institutions with a mandate of long-term preservation of documents to monitor continuously and proactively to address risks associated with technology obsolescence (Dollar & Ashley, 2015: 17). The Consultative Committee for Space Data Systems (2012: 5) recommended that regardless of how well-maintained information sources are in their current holdings, they eventually need to be migrated into different hardware or software environments to keep them

accessible for posterity. It can be said that the NLN did not comply with DPMCM model because the NLN did not have a formal preservation strategy to address deteriorating physical resources and technology obsolescence. The NLN would need to start considering devising strategies to digitally preserve Namibian documentary heritage which they have digitised since 2017.

In summary, the NLN has been understaffed and in its current staff establishment, there is a lack of technical skills and competencies relating to digital preservation activities. With regards to infrastructure appropriate for digital preservation, the NLN did not have adequate infrastructures appropriate or purposely built for digital preservation. Furthermore, the NLN is planning of establishing collaboration with other institutions in Namibia for its digital preservation aspirations. This collaboration will see the NLN overcoming challenges such as shortage of skills, equipment, etc. for digital preservation activities. With regards to digital preservation policy, the NLN did not have guidelines or policies to guide and regulate its preservation activities. The NLN did not have a digital preservation strategy guideline for preserving both physical and electronic documents in its custody.

6.4 Views on digital preservation of national documentary heritage

The discussion in this section focuses on the views of the study's participants and respondents on the digital preservation of national documentary heritage at the NLN.

6.4.1 Perception of national library users on digital preservation

It was observed in this study, as shown in Figure 5.8 (Chapter Five), that 82% of the respondents in the study would like the National Library to digitally preserve every Namibian publication. Of the 82%, the majority of respondents (28 participants) were, as reflected in Table 5.15, postgraduate students. In terms of category of users who preferred Namibian publications to be digitally preserved, as reflected in Table 5.13, the majority were researchers. The reason for postgraduate students being the majority who prefer Namibia's documentary heritage to be digitally preserved could be because of their academic research on topics related to Namibian history, social issues, etc. It should also be noted that among the researcher user category are international researchers who may wish to access Namibia's documentary heritage at their convenience and comfort from wherever they might be.

As reflected in findings in Section 5.6.2 of Chapter Five, when Namibian publications are digitally preserved, they save users time, save space in the library, the resources become remotely accessible, resources are easily and better accessible and it is good for posterity. The management of the NLN shared the same sentiments when interviewed and as a result discussions are ongoing at the level of the NLN management to make documentary heritage accessible through the library database and NLN website.

The findings of this study regarding access to information sources are somewhat similar to the findings of a study by Marshall and Faulkner (2020: 183) which found that electronic deposited resources were restricted to use on a limited number of computer terminals, and that users must access materials at a specific terminal alone. Marshall and Faulkner's (2020: 183) study further found that library technology ensures that only one reader may, at any one time, access e-resource materials at a deposit library. In terms of the OAI Reference Model, user communities, also referred to as designated communities have value and has important place in digital preservation (Moles, 2021: 628). Wilson (2017: 133) explained that when the OAI Reference Model is interpreted at a lower abstraction level than intended, a solution for digital preservation that does not address dissemination to consumers, would be deemed in violation of the model and can be considered untrustworthy. In the context of the OAI Reference Model, if a user community cannot access the repository and find what they want, the repository is not serving the needs of its users (Wilson, 2017: 133).

NLN users should be able to interact with documentary heritage in various ways including access, queries for assistance, and searches (Digital Preservation Coalition & Lavoie, 2014: 10). Furthermore, since the purpose of digital preservation is to ensure usability and accessibility of documentary heritage (Dollar & Ashley, 2015: 34), the NLN would need to finalise their discussion with regards to making Namibia documentary heritage accessible to library users. Provision of access to documentary heritage would require the NLN to develop access guidelines/policies which, amongst others, would include protection of user's privacy, confidentiality, etc.

6.4.2 Importance and benefit of digitally preserving the Namibiana collection

It was evident in this study, as reflected in Figure 5.9 in Chapter Five, that 95% of respondents indicated that it is important to digitally preserve documentary heritage. Digital preservation of documentary heritage is important because of posterity, for wide access to information and to save the documentary heritage of Namibia. The management of the NLN expressed that digital preservation of national documentary heritage is important as most of the people in Namibia do not come to Windhoek (where the NLN is physically located) to access materials in-person; hence digital preservation will serve researchers and scholarly needs, and safeguard documentary heritage sources from physical damage through handling of such documents and from disasters.

It may be deduced from the findings presented in Sections 5.6.2, 5.6.3 and 5.6.4 in Chapter Five that digital preservation of documentary heritage is important and that the NLN needs to safeguard Namibia's documentary heritage. The two categories of National Library users that would benefit from digitally preserved documentary heritage are: (1) local users and (2) international users. These user groups would benefit in terms of study purposes, research purposes, decision-making, ease of access and equal access to quality information.

These study findings are affirmed by Awamleh and Hamad's (2022: 183) study at Jordanian academic libraries, which found that respondents emphasised that digital preservation helps to protect information material from content modification, loss and damage, offers easy access, and preserves intellectual and cultural resources. Similarly, a study by Mkuwira (2015: 63) revealed that the preservation of documentary heritage was important as it contributes to

people's enjoyment and inspiration, cultural values, learning potential, economic prosperity and social equity. Furthermore, when documentary heritage is digital preserved, future generation of researchers, students, scholars, etc. will be relying on digital materials through the years (Knight, 2010: 97). Since the Namibian documentary heritage at the NLN still has limited access, the NLN needs to take note that its users' interests with regard to the nature and format of information sources have changed and that the National Library needs to embrace the changing needs and preferences of its users. In summary, digital documentary heritage is important for posterity use and for wide access to information. Digitally preserved documentary heritage is preferred by both local and international NLN users, however, the Namibia documentary heritage has not been digitally preserved and is not accessible remotely.

6.5 Namibian legal deposit framework and electronic information sources

The discussion in this section focuses on findings relating to the legal deposit framework and provision for electronic sources deposit. The study's fourth research question sought to establish the extent to which the Namibian legal deposit framework makes provision for electronic information sources deposit to the NLN. This section discusses the harvesting of electronic information sources and e-deposit at the NLN. The NLN receives electronic documents as legal deposit (see Section 5.7.1 in Chapter Five). These findings correspond with the findings of Nsibirwa et al. (2014: 63) which found that six (55%) depository libraries in South Africa accepted or acquired electronic materials. The process of e-legal deposit and harvesting is facilitated by a librarian who is also the head of the Bibliographic section at the NLN.

The practice of harvesting was presented with several challenges including a lack of human capacity to carry out this task and constant changing of websites where resources were harvested. As a consequence of these challenges, the NLN is lagging behind in the harvesting of documentary heritage. Furthermore, the National Library of Namibia had no capacity (human resources) to process metadata and upload these data on the library management system and lacked the necessary infrastructure to handle and harvest Namibian documentary heritage on government websites as well as other materials published electronically. For the National Library of Namibia to harvest and process e-legal deposit effectively, the NLN would need to establish a unit/office responsible for e-deposit and harvesting of documentary heritage.

These findings confirm the findings of Senzanje (2014: 113) who concluded that the staff complement of the NLN was inadequate to support the functions of legal deposit. These functions could be harvesting and processing of documentary heritage. The study by Nsibirwa et al. (2014: 62) concluded that there is an urgent need for an able institution with enough human and financial resources to implement legal deposit legislation. Furthermore, the limited initiative of national libraries to identify, collect, store and preserve online publications is identified as a challenge for most national libraries (Ngulube, 2012: 132).

The practice of e-deposit and document harvesting, which is also referred to as web archiving has changed in the library fraternity globally. For instance, Stirling et al. (2012: 19) explain that the Bibliothèque nationale de France (BnF) has put in place a system of web archiving involving technical solutions, both hardware and software, but also organisational elements, as this mission requires the expertise of digital curators. Similarly, a study by Cadavid (2017: 379) found that e-deposit and web harvesting are two mechanisms for collecting New Zealand publications. Another study by Alexandrov (2018: 149) found that digital deposit has not been fully built in all European Union (EU) member states and the number of countries which have implemented it is still limited.

As captured in Section 5.7.3 of Chapter Five, the NLN did not have a framework in place to facilitate the e-legal deposit or to legally compel publishers to deposit electronic publications. The existing legal framework did not mention electronic legal deposit and harvesting of electronic documents. The Namibia Library and Information Service Act 4 of 2000, which was the legal basis and framework for legal deposit in Namibia, is outdated and it is not clear what prescribed format of resources should be deposited at the NLN. The NLN has been experiencing challenges with some publishers which were hesitant to deposit their e-publication to the NLN. This could be because of a lack of legislation to compel these publishers. Similarly, the study by Senzanje (2014: 108) concluded that publishers are failing to honour their promises to deliver legal deposit at the NLN. With the Namibia Library and Information Service Act 4 of 2000 outdated, it made it difficult for the NLN to compel publishers to deposit their e-publications. It is prudent that when this Act is revised, it should harmonise other legal and regulatory framework in Namibia such as the Archives Act 12 of 1992; the Access to Information Act 8 of 2022; and the ICT Policy which embraces the access and provision of information services in Namibia.

The researcher believes that without the updated legal framework, the NLN cannot force publishers to deposit electronic publications as it has no legal basis to do so. These findings suggest the need for a legal deposit policy which is inclusive of online publications. The need for laws on deposit for online publications was also recommended in study by Neshat and Ghasemi (2022: 76). The findings of this study confirm Ngulube's (2012: 132) findings that one of the challenges experienced by national libraries in digital preservation is that legal legislation does not include electronic publications. A similar conclusion was made by a study by Masekoameng (2022: 93) at the National Library of South Africa which found that legislation did not mention anything about the handling and management of digital collections. These findings also relate to Tsvuura's (2022: 10) study which found that the National Archives of Zimbabwe Act of 1986 does not adequately cover the management of digitised records and archives. The findings further confirm De Beer et al.'s (2016: 99) study which found that national libraries embarking on legal deposit of electronic publications are faced with multiple challenges such as legal deposit legislation and institutional policies.

In terms of the OAIS Reference Model and DPCMM Model, the process of harvesting and receiving e-deposit by the NLN is captured as 'Ingest' (see Section 2.4 in Chapter Two). The findings of the study (see Section 5.7.2 of Chapter Five) suggest that the NLN conformed to the OAIS Reference Model and DPCMM model by virtue of receiving and harvesting Namibian documentary heritage in an electronic format. However, the NLN needs to set standards and have a policy to facilitate the e-deposit and harvesting process. It could be argued that because of the shortage of staff at the NLN in the Bibliographic section and the challenges discussed above and as reflected in Section 5.7.3 in Chapter Five, the NLN cannot perform the following critical functions relating to handling electronic information sources and their digital preservation: extraction and/or creation of descriptive metadata to support searches by library users; creating finding aids; performing quality assurance; setting format for accepting resources through e-deposit and generating information sources which are compliant with set standards (Strodl et al., 2007: 32; Consultative Committee for Space Data Systems, 2012: 4; Digital Preservation Coalition & Lavoie, 2014:12). As concluded in a study by Spence (2006: 521) organisations like NLN with different priorities and limited resources, will struggle to implement the OAIS Reference Model. It could be said that the NLN may have challenges with harvesting receiving e-deposit. Cadavid (2017: 388) explained that that legal deposit is no longer just about collecting publications but a set of actions, tools and policies that facilitate

and promote use of documentary heritage. As reflected in section 5.7.3 in Chapter Five, the NLN was experiencing a number of challenges with harvesting electronic publications.

At the time of collecting data for this study, the researcher noted that discussions on the revision of the Namibia Library and Information Service Act 4 of 2000 had been started by the NLIC Board. The NLIC Board should be commended for beginning the revision process of the Namibia Library and Information Service Act 4 of 2000 which is long overdue. Though it is uncertain how long the process of the revision of the Act will take to be finalised, when revised, this Act will empower the NLN with legal instruments to compel publishers and government institutions producing documentary heritage to deposit them with the NLN and for these documentary heritages to be digitally preserved for posterity. However, for NLN to be able to carry out the ingest process, the NLN needs to have adequate financial resources and human resources. The NLN of Namibia could learn from institutions such as, the National Library of New Zealand, amongst others, which is harvesting digital publications according to set criteria (Cadavid, 2017: 387). Criteria for harvesting are set in the law, and collection policy. In summary, it can be said the NLN has been conforming to the best practices of receiving e-deposits and harvesting electronic documents. However, the NLN has been presented with several challenges including a lack of human resources to keep up with the e-deposit and harvesting of documents.

6.6 Preservation framework for the National Library of Namibia

The discussion in this section focuses on the findings relating to the fifth research question which sought to determine a preservation framework appropriate for the National Library of Namibia. As demonstrated in Section 5.8.1 in Chapter Five, the NLN and the entire Namibia library and information sector did not have a digital preservation framework. Although there could be several libraries engaged in the digital preservation of Namibian documentary heritage, digital preservation activities in Namibia have been fragmented and not coordinated.

The study by Nakale (2023: 88) confirmed that there was no framework for preservation activities in Namibia. The absence of a preservation framework is not unique to Namibia but also observed elsewhere, for example, by Netshakhuma (2021: 421) who assesses the preservation of cultural heritage materials in selected universities in South Africa and

concludes that there was a lack of preservation frameworks in universities' records management. NLAS management members and NLIC Board members, in the current study, believe that although a digital preservation framework is important to have, there are institutional challenges as well as the digital divide that will hinder some users from accessing digitally preserved resources. Interview participants in this study believed that the Namibia library and information sector needs to strike a balance between print and electronic resources. While these views cannot be ignored, the NLN needs to develop strategies and plans on how to strike a balance between providing electronic documentary heritage and preserving it digitally for access and posterity, and providing access to physical resources for library users affected by the digital divide.

As highlighted in Section 5.8.1 of Chapter Five, the desired digital preservation for Namibia should include the following components: collaboration between institutions preserving documentary heritage in Namibia; sharing of equipment and human resources; financial investment; guidelines for digital preservation of documentary heritage; and policy development. Based on the findings of this study, it is evident that there has been a lack of a digital preservation framework at the NLN and in the Namibia library and information sector. The researcher, based on these findings and their related discussion, proposes a digital preservation framework for the NLN and Namibia library and information sector, as a recommendation from this study. This framework is presented in the next chapter (see Section 7.6 of Chapter Seven).

6.7 Summary of the chapter

Chapter Six provided interpretation and discussion of the main findings of this study. The current preservation practices for information resources, policies and strategies, and e-deposit and electronic harvesting of documentary heritage at the National Library of Namibia, were discussed in this chapter. The next chapter provides a summary of the study, conclusions of the research, and makes recommendations for further research based on the findings presented in Chapter Five and interpretation thereof in Chapter Six. The next chapter further proposes a digital preservation framework for the NLN and the Namibia library and information sector.

Chapter 7 : Summary of Findings, Conclusions and Recommendations

7.1 Introduction

This final chapter is presented in three parts: summary of findings, conclusions and recommendations. These three aspects are drawn from the findings of the study presented in Chapter Five and the interpretation and discussion of main findings in Chapter Six. The summary of findings and conclusions of the study are presented according to the following research questions that guided the study:

- What are the current preservation practices for information resources at the National Library of Namibia?
- What long-term preservation policies and strategies are in place or needed to provide digital access to Namibia's documentary heritage?
- What are the views of National Library users, National Library of Namibia staff, NLAS staff, Legal Deposit Committee members and NLIC members on digital preservation of national documentary heritage?
- To what extent does the Namibian legal deposit framework make provision for electronic information sources deposit to the National Library of Namibia?
- What digital preservation framework is appropriate for the National Library of Namibia?

7.2 Summary of findings

The study sought to establish the preparedness of the National Library of Namibia to preserve Namibia's documentary heritage through digital preservation and based on the findings of the study, to develop a digital preservation framework for the National Library of Namibia. In terms of preservation practices, the National Library of Namibia had made deliberate efforts to digitise newspapers, rare publications, fragile documents (which are in a state of being easily damaged) and information sources which are in high demand by users. With regards to long-term digital preservation policies and strategies, the National Library Namibia does not have a digital preservation policy, digital preservation strategies and digital preservation programme to safeguard Namibia's documentary heritage for posterity access. The overall view of the

study's interview participants and questionnaire respondents was that it is important to digitally preserve Namibia's documentary heritage because when these information sources are digitally preserved and accessible remotely, they are convenient to access and beneficial to international researchers and local users. Furthermore, digitally preserved documents are safe and protected against loss and disaster. On the question of e-legal deposit, the National Library Namibia received documentary heritage resources through e-deposit and harvesting electronic resources (that is, collecting documents from information producer's websites). With regards to a digital preservation framework, although several libraries in Namibia were engaged in the digital preservation of Namibian documentary heritage, digital preservation activities in Namibia were fragmented and not coordinated.

7.3 Conclusions of the study

Based on the discussions in Chapter Six, the study draws the following conclusions:

- 7.3.1 The National Library of Namibia engaged in critical digitisation (that is, scanning) of Namibia documentary heritage specifically of those that were in demand by researchers as well as those that are identified as seemingly fragile. However, the National Library of Namibia did not go further to digitally preserve these documentary heritage resources and these resources were not accessible by the public remotely;
- 7.3.2 The National Library of Namibia has no written or documented long-term preservation policies, strategies and digital preservation programme. Furthermore, the National Library of Namibia did not periodically monitor, and upgrade storage devices and file formats for obsolescence purposes;
- 7.3.3 Digital preservation of Namibian documentary heritage is important and would benefit local and international users. These user groups would benefit in terms of study purposes, research purposes, ease of access and equal access to quality information;
- 7.3.4 The outdated Namibia Library and Information Service Act 4 of 2000 did not make provision for e-deposit. Furthermore, the National Library of Namibia did not have an internal policy to regulate the handling of e-deposit and the harvesting of electronic resources;

- 7.3.5 The National Library of Namibia and the entire Namibia library and information sector did not have a digital preservation framework; and
- 7.3.6 The National Library of Namibia is at stage one of digital preservation preparedness, which is the nominal digital preservation capability stage (that is, the National Library of Namibia understands digital preservation issues and concerns). Hence this study concludes that the National Library of Namibia was not prepared to and capable of digitally preserving Namibian documentary heritage due to the following reasons: a lack of appropriate technological infrastructure; limited human resources and lack of knowledge and skills for digital preservation; and challenges experienced with regards to e-deposits.

7.4 Recommendations

The following recommendations are based on the discussion of main findings in Chapter Six and conclusions drawn by the study:

- 7.4.1 The Namibia Library and Archives Services (NLAS) needs to re-visit the staffing structure of the National Library of Namibia and to consider employing professionally trained staff to manage digital preservation activities;
- 7.4.2 The National Library of Namibia should develop a digital preservation policy and digital preservation strategies;
- 7.4.3 The National Library of Namibia should develop and implement a digitisation and digital preservation programme; and
- 7.4.4 Based on the main findings, discussions and conclusions of the study, this study proposes a digital preservation framework for the National Library of Namibia as well as for the Namibia library and information sector (see Figure 7.1).

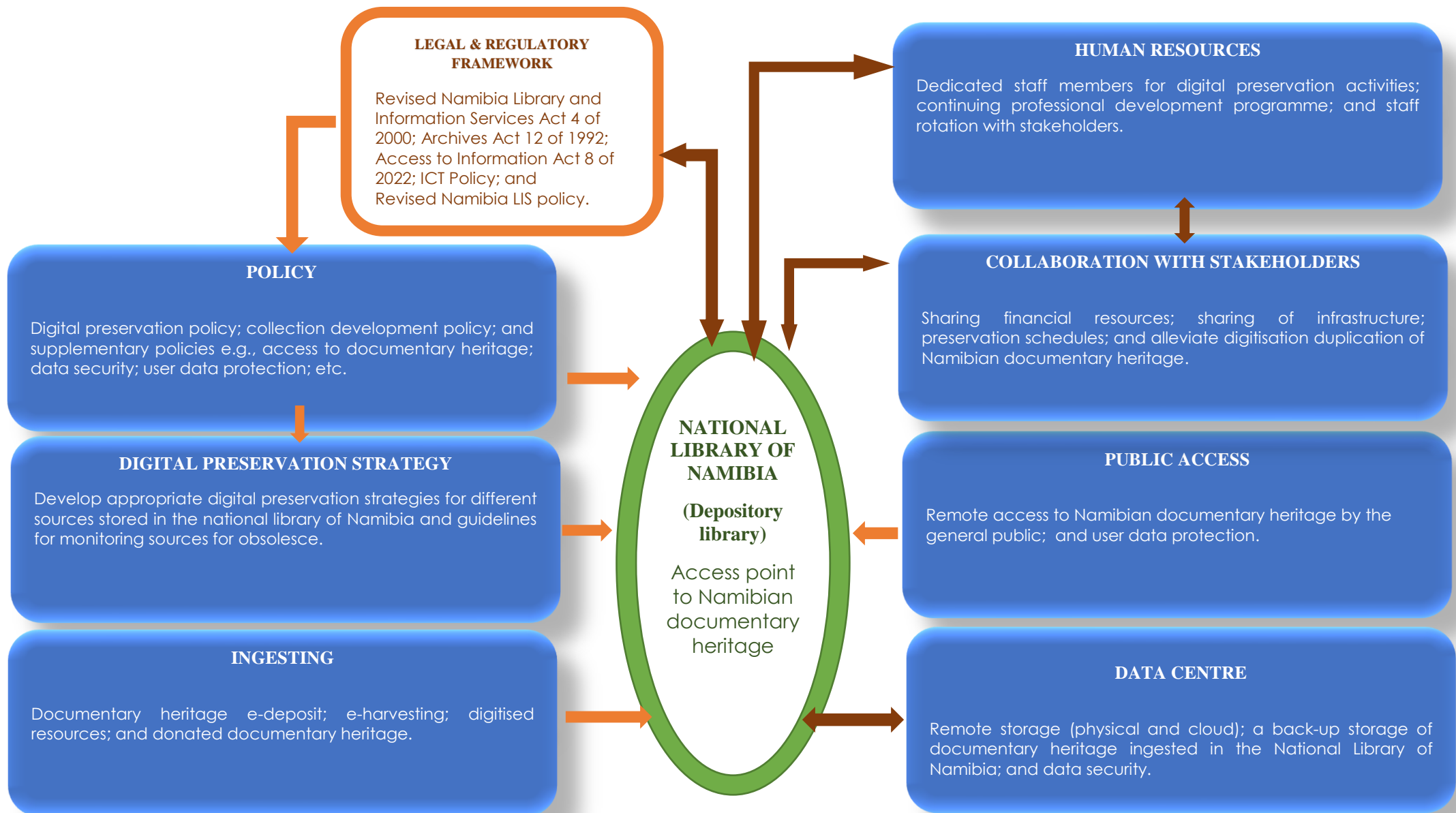


Figure 7.1: Proposed digital preservation framework for the National Library as well as Namibia library and information sector

7.5 Recommendations for further research

- 7.5.1 The study's scope was limited to digital preservation practices and excluded other pertinent issues of managing digital documentary heritage. Hence it would be prudent for further research to inquire into aspects such as metadata management of Namibian documentary heritage held by the National Library of Namibia; and
- 7.5.2 It is critical that the conclusions and recommendations of this study are followed up by further study to ascertain improvement in the National Library of Namibia's digital preservation capability and preparedness to safeguard Namibian documentary heritage. Therefore, further research could inquire into implementation and aspects highlighted in the proposed digital preservation framework (see Figure 7.1) for the National Library of Namibia, as well as for establishing their effectiveness.

7.6 Implications for theory, policy, practice and methodology

The study inquired into the preparedness of the National Library of Namibia to preserve Namibia's documentary heritage through digital preservation. The two models used as frameworks in this study, the Open Archival Information System (OAIS) Reference Model and the Digital Preservation Capability Maturity Model (DPCMM) served as a conceptual blueprint explaining the fundamental components of a preservation repository and were used to ascertain the capability and preparedness of the National Library of Namibia to digitally preserve Namibian documentary heritage. The OAIS Reference Model is widely accepted as a key standard reference model for archival systems and archival institutions. This study demonstrated that the OAIS Reference Model could be applied and is relevant to a library setting. The study hence contributed to the understanding and implementation of the OAIS Reference and the DPCMM models in the context of national libraries or any other library that is entrusted with a mandate of preserving documentary heritage.

In terms of policy and practice, the study empirically shed light on the current state of practices of digital preservation of documentary heritage at the National Library of Namibia in particular, and the broader Namibia library and information sector. This is important in that it could assist

the Namibia library and information sector to develop policies and guidelines to regulate the digital preservation of Namibian documentary heritage for posterity. Furthermore, in addressing the objective of the study and in responding to the study's fifth research question, "What digital preservation framework is appropriate for the National Library of Namibia?", the study's proposed digital preservation framework (see Section 7.4), it is hoped, would contribute to updating and revising the Namibia Library and Information Service Act 4 of 2000, which in turn could improve standards, policies and good practices in digital preservation in Namibia. The researcher believes that the proposed digital preservation framework could strengthen a digital preservation environment and harness into cohesiveness the currently practised fragmented preservation activities of documentary heritage by several libraries in Namibia.

With regards to methodological implications, the study embraced a pragmatic paradigm and a convergent parallel mixed methods approach in a case study design. As demonstrated by literature (Denzin, 2012; Adu & Ngulube, 2016), consensus is expressed through methodical triangulation as was consistently used in this study to gain in-depth understanding on issues of digital preservation of documentary heritage at the National Library of Namibia from the perspective of different stakeholders. The study therefore adds to the existing and ongoing discourse on the use of mixed methods research in the Namibia library and information sector.

7.7 Summary of the chapter and general conclusion

Chapter Seven provided a summary of findings which reflects highlights of the study's findings presented in Chapter Five. The chapter also provided conclusions of the study. The conclusions related to the five research questions that guided the study. In addition, the chapter made recommendations to mitigate some of the challenges identified by the study as well as for further research. Importantly, the chapter proposed a digital preservation framework for the National Library of Namibia as well as for the Namibia library and information sector.

The critical and overarching 'question' posed by this study was to establish if the National Library of Namibia is prepared to digitally preserve Namibia's documentary heritage. To achieve the study's objective, the researcher triangulated the Open Archives Information System Reference Model and the Digital Preservation Capability Maturity Model which aided

to unpack concepts of digital preservation and formed a basis for the study. The two models were an appropriate choice for this study because they are renowned for digital preservation, and complementary in assessing digital preservation preparedness for long-term preservation and access to digital materials. With regards to literature, the researcher acknowledges use of a fair balance and rich literature on digital preservation issues emanating from both the global south, including the Sub-Saharan region where Namibia is located, and the global north. The comprehensive literature on digital preservation enlightened and provided an understanding of the findings of the study. The researcher is satisfied that the five research questions generated to guide the study, together with the overall methodology adopted for the study (the pragmatic paradigm, convergent parallel mixed methods approach, case study design and the use of methodical triangulation (interviews, questionnaire, and document search and review), elicited the required information to adequately respond to the study's overall objective and bring the study to a logical conclusion.

This study is timely and can serve as a reference point to assist the Namibia library and information sector to revise the outdated Namibia Library and Information Service Act 4 of 2000, especially regarding places of deposits with the advent of e-publishing and electronic deposit, by documentary heritage producers, to the National Library of Namibia. The study could also guide the National Library of Namibia to develop policies geared towards digital preservation. The findings from this study and its proposed digital preservation framework for the National Library of Namibia, as well as for the Namibia library and information sector, could also benefit other depository libraries in similar circumstances in Sub-Saharan Africa, in other parts of Africa and even elsewhere in the world.

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Appendices

Appendix A: Ethical clearance from UCT



Department of Knowledge & Information Stewardship
University of Cape Town
Upper Campus

Private Bag X1, RONDEBOSCH, 7701 South Africa
Level 6 Hlanganani, The Chancellor Oppenheimer Library
Tel: +27 (0) 21 650 4546 Fax: +27 (0) 21 650 2529
E-mail: dkis@uct.ac.za
Internet: www.dkis.uct.ac.za

Ref No.: UCTDKIS2022-03-02

28 March 2022

Dear Wilhelm Uutoni,

Re: Ethics approval for PhD research

I am pleased to inform you that ethics clearance has been granted by an Ethics Review Committee of the Department of Knowledge and Information Stewardship on behalf of the Faculty of Humanities, University of Cape Town, for you to proceed with collecting data for your Doctoral study on 'Digital preservation preparedness of the National Library of Namibia for digital preservation of documentary heritage: a case study'.

We wish you well with your data collection and the completion of your research.


Yours faithfully,

A handwritten signature in black ink, appearing to read 'Mzwandile Shongwe', written over a horizontal line.

Dr Mzwandile Shongwe

Chair: Department (DKIS) Research Ethics Committee

Appendix B: Permission to conduct academic research from Ministry of Education, Arts and Culture


REPUBLIC OF NAMIBIA

MINISTRY OF EDUCATION, ARTS AND CULTURE

<p><i>Enquiries: Mr. G. Munene</i> Tel: +264 61 -293 3202 Fax: +264 61- 293 3922 Email: Gibson.Munene@moe.gov.na File no: 13/2/9/1</p>	<p><i>Luther Street, Govt. Office Park Private Bag 13186 Windhoek Namibia</i></p>
--	---

Mr. Wilhelm Elinatse Uutoni
wuutoni@unam.na
0812968918

Dear Mr. Wilhelm E Uutoni

SUBJECT: PERMISSION TO CONDUCT ACADEMIC RESEARCH AT THE NATIONAL LIBRARIES AND ARCHIVES SERVICES (NLAS)

The Ministry wishes to acknowledge receipt of your letter dated, 30 March 2022 seeking for permission to conduct academic research at the National Library and Archives Services for your PHD Degree studies which is focusing on: "*Digital Preservation Preparedness of the National Library of Namibia for Digital Preservation of Documentary Heritage: a Case Study.*"

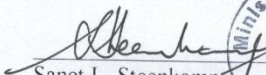
Permission has been granted to you. However, you have to seek for further clearance from the Director National Library and Archives Services to ensure that:


- staff members' normal work is not disrupted during your interviews;
- participation is voluntary;

Furthermore, you are kindly requested to share your research findings with the Ministry after completion of the research project. You may contact Mr G. Munene on the above provided contacts at the Directorate: Programmes and Quality Assurance (PQA) for submission of your research findings at the above indicated details.

We wish you the best in conducting your research and the Ministry looks forward to hearing from you upon completion of your studies.

Yours sincerely,


Sanet L. Steenkamp
EXECUTIVE DIRECTOR



Tel: 061-2933523/4
Fax: 061-253671
Private Bag 13186, Windhoek, Namibia

All official correspondence must be addressed to the Executive Director

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Appendix C: Permission to conduct academic research at NLAS



REPUBLIC OF NAMIBIA

MINISTRY OF EDUCATION, ARTS AND CULTURE

Tel: +264 61-293 3181 Private Bag 13186 Fax: +264 61-293 3168 Windhoek

Enquires: Ms. A. Olivier

Namibia

E-mail:

nlas@moe.gov.na Ref.:

161

Mr. Wilhelm E. Uutoni

HoD: Social Sciences

School of Humanities, Society & Development

University of Namibia

E-mail: wuutoni@unam.na

Dear Mr. Uutoni,

RE: REQUEST FOR AUTHORIZATION TO CONDUCT RESEARCH AT THE
DIRECTORATE OF NAMIBIA LIBRARY & ARCHIVES SERVICE (NLAS)

Reference is hereby made, as per your letter dated the 26th of April 2022, requesting for the authorisation to conduct research at the Ministry of Education, Arts & Culture, in particular at the Directorate of Namibia Library and Archives Service (NLAS), for academic purposes.

It is noted that your research topic is "Digital preservation preparedness of the National Library for digital preservation of documentary heritage: a case study". Kindly be informed that approval is granted for you to conduct the said research as part of your studies towards a PhD Programme in the Department of Knowledge and Information Stewardship, Faculty of Humanities through the University of Cape Town, South Africa.

You are kindly requested to share with NLAS your research findings, upon on completion of the search project. For further arrangements, please feel free to contact Ms. Astrid Olivier at the above contact details.

We are wishing you all the best with your studies.

Yours Sincerely,



Sarah Negumbo
NLAS DIRECTOR



All official correspondence must be addressed to the Permanent Secretary

Appendix D: Semi-structured questionnaire for National Library of Namibia documentary heritage users

Digital preservation preparedness of the National Library of Namibia for digital preservation of documentary heritage: a case study

Dear Respondent,

I kindly request you to participate in this study. The objective of the study is to investigate the preparedness of the National Library of Namibia to preserve Namibia’s documentary heritage through digital preservation. The study is being undertaken in fulfilment of a PhD at the University of Cape Town, Department of Knowledge and Information Stewardship, in the Faculty of Humanities. The main supervisor for this study is Professor Jaya Raju, University of Cape Town and the co-supervisor is Professor Trywell Kalusopa, University of Namibia.

As part of the study, I need to survey National Library of Namibia documentary heritage users. Participation is voluntary, and all interactions and responses will be treated with utmost **CONFIDENTIALITY AND ANONYMITY** at all times and will be maintained in the reporting of the findings. If you accept to participate in this study, please complete the informed consent below. You may choose not to participate or discontinue at any time even though you may have completed the consent form below. I, however, appeal to you to contribute to the success of this study through your participation. It should take about 30 minutes to complete the questionnaire.

Please read the consent statements below and place a tick (✓) in the right-hand column for each statement if you agree with the statement.

Item no.	Consenting statement	Tick (✓)
1.	I understand the purpose of this study.	
2.	I voluntary participate in this study.	
3.	I understand that confidentiality of the information shared will be respected.	
4.	I understand that my anonymity is guaranteed in my responses and will be maintained in the reporting of the findings of this study.	
5.	I understand that I will not receive any incentive for participating in the study.	
6.	I consent to participate in the study.	
Date:		

For further information please contact the researcher:

Researcher: Wilhelm Uutoni

Phone number: +264 81 2968918

Email: wuutoni@unam.na

Introduction

Digital preservation is a broad, evolving, periodic transformation and important facet of digital asset management (Conway, 2010: 65; Oehlerts & Liu, 2013: 93). The goal of digital preservation in libraries is to maintain the preserved information sources for as long as required, in a form which is authentic and remotely accessible by users (Brown, 2013: 3).

Please note:

- There are no correct or wrong answers.
- All information gathered as part of this study will be treated with utmost confidentiality, and anonymity will be adhered to at all times.
- You have the right to withdraw from participation in this study at any time.
- The **Namibiana collection** refers to information sources published in Namibia, by Namibians or about Namibia.

Instructions: In **Section A** please select a response by ticking (✓) the relevant option from the list provided. In **Sections B** and **C**, where relevant, you may select more than one option from the list provided and for other questions please indicate your responses in the space provided.

Section A: Demographic details

Question no.	Theme	Response
Q1.	Your age group	a) 10- 20 [] b) 21- 30 [] c) 31- 40 [] d) 41- 50 [] e) 51- 60 [] f) 61 & above []
Q2.	Type of National Library user	a) School learner [] b) Tertiary education student [] c) Researcher [] d) Other (please specify)
Q3.	User's current level of education	a) Primary school [] b) Secondary school [] c) Undergraduate [] d) Postgraduate [] e) Other (please specify)

Section B: Type of sources used at the National Library

Question no.	Theme/question	Response
Q4.	Category of information sources you use at the National Library	a) Namibiana collection [] b) General collection []
Q5.	How often do you use these sources?	a) Once a week [] b) Once a month [] c) Once a year [] d) Every time I come to the National Library [] e) Other (please specify)
Q6.	What format do you prefer?	a) Print [] b) Electronic []

Q7. If you have used the Namibiana collection, was it available online?

- a) Yes []
- b) No []

Q8. If the Namibiana collection was not available online, do you wish the National Library to convert it to an electronic format for online access?

- a) Yes []
- b) No []

Q9. If you responded 'yes' to Question 7, how easily accessible is the Namibiana collection online?

Response	Tick (✓) the appropriate answer
a) Always accessible online	
b) Sometimes not accessible online	
c) Difficult to access online	

Q10. How satisfied are you with the process of accessing the Namibiana collection?

Response	Tick (✓) the appropriate answer
a) Very satisfied	
b) Satisfied	
c) Slightly not satisfied	
d) Not satisfied at all	

Q11. What are your reasons for accessing the Namibiana collection? You may select more than one option and provide a comment, if any.

Reason	Tick (✓) the appropriate answer	Comment
a) Research		
b) Study		
c) Leisure		
d) Interest in Namibian history		
e) Other (please specify)		

Q12. Can you access these information sources remotely (that is, online from home, office or from any other place)?

- a) Yes []
- b) No []

Q13. If you responded 'yes' to Question 12, in your view, does this reduce dependency on library staff to access and locate resources in print form? Please elaborate.

.....

Q14. What type of support is provided by the National Library when searching/using documentary heritage remotely? You may select more than one option.

Type of support	Tick (✓) the appropriate answer
a) Manuals/User guides	
b) Interactive services with librarians	
c) Downloading and borrowing resources online	
d) Frequently Asked Questions (FAQ) services	
e) Other (please specify)	

Section C: Views of National Library users on digital preservation of national documentary heritage

Q15. Would you like the National Library to digitally preserve every Namibian publication in the library?

- a) Yes []
- b) No []

Justify your answer.....

Q16. Is it important to digitally preserve Namibian publications?

Response	Tick (✓) the appropriate answer
a) Very important	
b) Important	
c) Of some importance	
d) Not important at all	

Q17. In your view, why is it important to digitally preserve the Namibiana collection? You may select more than one option and provide additional comment, if any.

Reason	Tick (✓) the appropriate answer	Comment
a) For posterity use		
b) To increase access		
c) For remote use		
d) To avoid deterioration of sources		
e) Other reasons (please specify)		

Q18. To what extent is digital preservation of Namibian publications beneficial?

Response	Tick (✓) the appropriate answer
Very beneficial	
Beneficial	
Of some benefit	
Not beneficial at all	

Q19. Please provide any further comments or suggestions you may have regarding digital preservation of documentary heritage at the National Library?

.....

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Thank you for your participation.

Appendix E: Interview schedule for Namibia Libraries and Information Council (NLIC) members

Digital preservation preparedness of the National Library of Namibia for digital preservation of documentary heritage: a case study

Digital preservation is a broad, evolving, periodic transformation and important facet of digital asset management (Conway, 2010: 65; Oehlerts & Liu, 2013: 93). The goal of digital preservation in libraries is to maintain the preserved information sources for as long as required, in a form which is authentic and remotely accessible by users (Brown, 2013: 3).

This study investigates the National Library of Namibia's preparedness to digitally preserve national documentary heritage and hopes to suggest a digital preservation framework for the National Library of Namibia which will inform policymakers, and practitioners towards improving methodologies, standards and good practices in digital preservation.

Thank you for agreeing to voluntarily participate in this study by signing the Informed Consent form. Our interactions and your responses will be treated with utmost **confidentiality** and **anonymity** and will be maintained in the reporting of the findings.

Please note:

- There are no correct or wrong answers.
- You have the right to withdraw from participation in this study at any time.

Section A: Demographic details

Q1.	Institution	
	Designation in NLIC	
	Number of years in current NLIC position	

Section B: Long-term preservation policies and strategies

Q2. Please brief me about what NLIC is doing or has done to ensure the long-term accessibility to documentary heritage in Namibia?

Q3. Please share with me the kind of digital preservation preparations or investments the National Library has made or put in place thus far? **[Prompt: Infrastructure, financial resources, human capital, etc.]**

Q4. Reflecting on your knowledge and experience as an NLIC member, what guidelines or policies did NLIC develop/adopt for digital preservation of documentary heritage at the National Library and in the Namibia library and information sector? **[Prompt: Request a copy] If there is no guidelines or policy** what, do you think, are the reasons for not having such a policy?

Section C: Views of NLIC on digital preservation of national documentary heritage

Q5. What are your views on preserving national documentary heritage at the National Library?

Q6. In your view, why is it important for the National Library to digitally preserve national documentary heritage?

Q7. Are you aware of any digital preservation activities at the National Library? If yes, please provide an insight on what you are aware of.

Q8. In your view, what are the benefits of having Namibia's documentary heritage digitally preserved? Who benefits if documentary heritage is digitally preserved?

Section D: Legal deposit framework

Q9. The Namibia Library and Information Service (Act 4 of 2000) does not mention e-legal deposit. Are there any discussions or has a process begun to amend this Act to include e-legal deposit? If yes, at what stage is this process? If not, is NLIC considering initiating such a process?

Q10. As a member of the Council that regulates libraries in Namibia, what kind of digital preservation framework would you want to see in the Namibia library and information sector?

Section E: General

Q11. Is there anything that we did not touch on regarding digital preservation that you wish to add or comment on?

Thank you for your participation.

Interview duration: [] minutes

Appendix F: Interview schedule for Namibia Libraries and Archives Services (NLAS) staff members

Digital preservation preparedness of the National Library of Namibia for digital preservation of documentary heritage: a case study

Digital preservation is a broad, evolving, periodic transformation and important facet of digital asset management (Conway, 2010: 65; Oehlerts & Liu, 2013: 93). The goal of digital preservation in libraries is to maintain the preserved information sources for as long as required, in a form which is authentic and remotely accessible by users (Brown, 2013: 3).

This study investigates the National Library of Namibia's preparedness to digitally preserve national documentary heritage and hopes to suggest a digital preservation framework for the National Library of Namibia which will inform policymakers, and practitioners towards improving methodologies, standards and good practices in digital preservation. Thank you for agreeing to voluntarily participate in this study by signing the Informed Consent form. Our interactions and your responses will be treated with utmost **confidentiality and anonymity** and will be maintained in the reporting of the findings.

Please note:

- There are no correct or wrong answers.
- You have the right to withdraw from participation in this study at any time.

Section A: Demographic details

Q1.	Division of NLAS	
	Designation	
	Number of years in current NLAS position	

Section B: Views of NLAS staff members on digital preservation of national documentary heritage

Q2. What are your views on preserving digitally the national documentary heritage at the National Library?

Q3. In your view, why is it important for the National Library to digitally preserve national documentary heritage?

Q4. Are you aware of any digital preservation activities at the National Library? If yes, please provide an insight on what you are aware of.

Q5. In your view, what are the benefits of having Namibia's documentary heritage digitally preserved? Who benefits if documentary heritage is digitally preserved?

Section C: Preservation framework appropriate for the National Library of Namibia

Q6. Since you are a part of NLAS management, are you aware of a digital preservation policy at the National Library? If yes, do you know the content of this policy?

Q7. What kind of digital preservation framework would you want to see in the Namibia library and information sector?

Section D: General

Q8. Is there anything that we did not touch on regarding digital preservation that you wish to add or comment on?

Thank you for your participation.

Interview duration: [] minutes

Appendix G: Interview schedule for National Library management staff members

Digital preservation preparedness of the National Library of Namibia for digital preservation of documentary heritage: a case study

Digital preservation is a broad, evolving, periodic transformation and important facet of digital asset management (Conway, 2010: 65; Oehlerts & Liu, 2013: 93). The goal of digital preservation in libraries is to maintain the preserved information sources for as long as required, in a form which is authentic and remotely accessible by users (Brown, 2013: 3).

This study investigates the National Library of Namibia's preparedness to digitally preserve national documentary heritage and hopes to suggest a digital preservation framework for the National Library of Namibia which will inform policymakers, and practitioners towards improving methodologies, standards and good practices in digital preservation. Thank you for agreeing to voluntarily participate in this study by signing the Informed Consent form. Our interactions and your responses will be treated with utmost **confidentiality** and **anonymity** and will be maintained in the reporting of the findings.

Please note:

- There are no correct or wrong answers.
- You have the right to withdraw from participation in this study at any time.

Section A: Demographic details

Q1.	Designation	
	Department	
	Number of years in current position	

Section B: Current preservation practices

Q2. Reflecting on your experience at the National Library, what preservation activities is the National Library engaged in currently?

Q3. In view of these preservation activities the National Library is undertaking, what type of information sources is the National Library currently preserving?

Q4. In view of these preservation activities being undertaken at the National Library, what preservation methods/strategies are currently being used?

Section C: Long-term digital preservation plans/programme

Q5. With reference to current preservation practices you explained earlier, what is the National Library doing to ensure long-term accessibility to its documentary heritage?

Q6. Please share with me the kind of digital preservation preparations or investments the National Library has made or put in place thus far. **[Prompt: Infrastructure, resources, human capital, etc.]**

Q7. Does the National Library have a formal digital preservation programme? **[Prompt: Request a copy]** If it does, in your view what is the purpose of this programme? **If there is no programme** what, do you think, are the reasons for not having such a programme?

Q8. To your knowledge, who is responsible for the implementation of this programme?

Q9. In your view, what challenges are experienced by the National Library in implementing the digital preservation programme? **[Prompt: e.g., human resources, skills, financial resources, lack of standards, hardware, software, storage media, technology obsolescence and institutional support]**

Q10. Based on your experience as a member of the management team of the National Library, does the National Library have plans to cooperate with any other institution in digital preservation activities? If it does, which organisation and what is the nature of this cooperation?

Section D: Long-term digital preservation policies

Q11. To your knowledge, what guidelines or policies are guiding the National Library of Namibia in its current digital preservation programme. **[Prompt: Request a copy]**

Q12. Are you aware of a National Library digital preservation policy? **[Prompt: Request a copy]** In your view, is it important for the National Library to have this policy and what is the purpose of this policy? **If there is no policy** what, do you think, are the reasons for not having such a policy?

Q13. In your opinion, is the National Library experiencing any challenges in the implementation of this policy? If so, what kind of challenges are being experienced and what is the National Library doing to address these challenges?

Section E: Long-term digital preservation strategies

Q14. Reflecting on your working experience and preservation activities at the National Library, what is the National Library doing to manage digital preservation activities to ensure access, for posterity, to its documentary heritage.

Q15. Reflecting on your experience and possible involvement in preservation activities at the National Library of Namibia, what digital preservation strategies is the library planning to adopt or currently using to convert the physical sources into electronic format? If there are no plans yet, are there any ongoing discussions to implement digital preservation of physical documentary heritage?

Q16. Given the fact that documentary heritage in the custody of the National Library is in various formats, does it have different strategies to digitally preserve different types of documentary heritage (e.g., currently in print or e-content format)?

Q17. In your view, why are the preservation strategies you mentioned deemed suitable for documentary heritage resources at the National Library?

Q18. Please enlighten me on how often documentary heritage sources storage devices and file formats are or will be updated.

Q19. Please explain how these files/formats/storage devices and media are or will be monitored for obsolescence. And does the National Library of Namibia have a budgetary provision for this?

Q20. From your working experience at the National Library, how often are documentary heritage sources reviewed to establish if they are still in good use condition?

Q21. In your view, does the National Library have the necessary equipment, budget and human resources for preserving documentary heritage sources digitally?

Q22. In your opinion, what are the challenges experienced with the current digital preservation strategies? What measures are in place to address these challenges, if any.

Section F: Views of National Library of Namibia management staff on digital preservation of national documentary heritage

Q23. In your view, why is it important for the National Library to digitally preserve national documentary heritage?

Q24. In your view, what are the benefits of having Namibia's documentary heritage digital preserved? Who benefits if documentary heritage is digitally preserved?

Section G: Library user support

Q25. Reflecting on your working experience at the National Library, are the digitally preserved documentary heritage sources accessible remotely to users and potential users? If not, what does the National Library plan to do in this regard?

Q26. Reflecting on your experience with current digital preservation activities, what support is provided to users? **[Prompt: e.g., when users are looking for content, requesting and receiving information stored in the National Library, etc.]**

Q27. In your view, what measures did the National Library put in place to protect users' data and privacy in relation to content searched remotely?

Q28. What measures did the National Library put in place to ascertain that documentary heritage that is digitally preserved, are secure?

Section H: Legal deposit framework

Q29. Does the National Library accept and receive electronic documentary heritage sources via legal deposit? If it does, what kinds of materials does the National Library receive? If it does not, what plans are in place for the National Library to receive e-content via legal deposit and is the National Library ready to receive e-publications in terms of its infrastructure and human resources capacity?

Q30. Besides legal deposit, does the National Library harvest e-publication (e.g., oral history) from elsewhere? If it does, what types of materials does the National Library harvest and what are the selection criteria used to select these materials?

Q31. Does the National Library of Namibia have a unit/department responsible for administering deposit of e-resources?

Q32. What policy guideline guides this process? **[Prompt: Request a copy of the document, digital or hardcopy]** If there is no such policy guideline, is the National Library considering developing such a policy guideline?

Q33. In your view, what challenges (if any) is the National Library experiencing with e-publication deposit?

Section I: General

Q34. Is there anything that we did not touch on regarding digital preservation that you wish to add or comment on?

Thank you for your participation.

Interview duration: [] minutes

Appendix H: Interview schedule for National Library IT staff member

Digital preservation preparedness of the National Library of Namibia for digital preservation of documentary heritage: a case study

Digital preservation is a broad, evolving, periodic transformation and important facet of digital asset management (Conway, 2010: 65; Oehlerts & Liu, 2013: 93). The goal of digital preservation in libraries is to maintain the preserved information sources for as long as required, in a form which is authentic and remotely accessible by users (Brown, 2013: 3).

This study investigates the National Library of Namibia's preparedness to digitally preserve national documentary heritage and hopes to suggest a digital preservation framework for the National Library of Namibia which will inform policymakers, and practitioners towards improving methodologies, standards and good practices in digital preservation.

Thank you for agreeing to voluntarily participate in this study by signing the Informed Consent form. Our interactions and your responses will be treated with utmost **confidentiality** and **anonymity** and will be maintained in the reporting of the findings.

Please note:

- There are no correct or wrong answers.
- You have the right to withdraw from participation in this study at any time.

Section A: Demographic details

Q1.	Designation	
	Department	
	Number of years in current position	

Section B: Long-term digital preservation plans/programme

Q2. Please share with me the kind of digital preservation preparations or investments the National Library has made or put in place thus far. [**Prompt: Infrastructure, financial resources, systems, software, hardware, etc.**]

Q3. In your view, what challenges are experienced by the National Library in implementing the digital preservation programme? [**Prompt: e.g., skills, financial resources, lack of standards, hardware, software, storage media, technology obsolescence and institutional support**]

Section C: Long-term digital preservation strategies

Q4. Reflecting on your working experience and preservation activities at the National Library, what is the National Library doing to manage digital preservation activities to ensure access, for posterity, to its documentary heritage.

Q5. Reflecting on your experience and possible involvement in preservation activities at the National Library of Namibia, what digital preservation strategies is the library planning to adopt or currently using to convert the physical sources into electronic format? If there are no plans yet, are there any ongoing discussions to implement digital preservation of physical documentary heritage?

Q6. Given the fact that documentary heritage in the custody of the National Library is in various formats, does it have different strategies to digitally preserve different types of documentary heritage (e.g., currently in print or e-content format)?

Q7. In your view, why are the preservation strategies you mentioned deemed suitable for documentary heritage resources at the National Library?

Q8. Please enlighten me on how often documentary heritage sources storage devices and file formats are or will be updated.

Q9. Please explain how these files/formats/storage devices and media are or will be monitored for obsolescence. And does the National Library of Namibia have a budgetary provision for this?

Q10. In your opinion, what are the challenges experienced with the current digital preservation strategies? What measures are in place to address these challenges, if any.

Section D: Library user support

Q11. Reflecting on your working experience at the National Library, are the digitally preserved documentary heritage sources accessible remotely to users and potential users? If not, what does the National Library plan to do in this regard?

Q12. Reflecting on your experience with current digital preservation activities, what support is provided to users? **[Prompt: e.g., when users are looking for content, requesting and receiving information stored in the National Library, etc.]**

Q13. In your view, what measures did the National Library put in place to protect users' data and privacy in relation to content searched remotely?

Q14. What measures did the National Library put in place to ascertain that documentary heritage that is digitally preserved, are secure?

Section E: Legal deposit framework

Q15. Does the National Library accept and receive electronic documentary heritage sources via legal deposit? If it does, what kinds of materials does the National Library receive? If it does not, what plans are in place for the National Library to receive e-content via legal deposit and is the National Library ready to receive e-publications in terms of its infrastructure and human resources capacity?

Q16. Besides legal deposit, does the National Library harvest e-publication (e.g., oral history) from elsewhere? If it does, what types of materials does the National Library harvest and what are the selection criteria used to select these materials?

Q17. Does the National Library of Namibia have a unit/department responsible for administering deposit of e-resources?

Q18. What policy guideline guides this process? **[Prompt: Request a copy of the document, digital or hardcopy]** If there is no such policy guideline, is the National Library considering developing such a policy guideline?

Q19. In your view, what challenges (if any) is the National Library experiencing with e-publication deposit?

Section F: General

Q20. Is there anything that we did not touch on regarding digital preservation that you wish to add or comment on?

Thank you for your participation.

Interview duration: [] minutes

Appendix I: Document review guide and data extraction form

Digital preservation preparedness of the National Library of Namibia for digital preservation of documentary heritage: a case study

Document review guide and data extraction form

Note: This form will be converted into an Excel spreadsheet during data analysis.

This study will use document review as a data collection method to complement data collected via semi-structured interviews and questionnaires. The document review guide will be used to review available primary and secondary documents to understand aspects of the OAIS Reference Model and DPCMM (theoretical models used in this study) such as planning and administration and long-term access to Namibia's documentary heritage.

Biographical data					Themes to be investigated				Validity of document	Objectivity & subjectivity of document	Code
Doc. no.	Doc. date	Doc. type	Author/s & source	Doc. title	1. Long-term digital preservation plans/programme	2. Long-term digital preservation policies	3. Long-term digital preservation strategies	4. Legal deposit framework	Purpose for document creation	Is the document objective/subjective?	Key theme to be coded

Appendix J: Informed consent for Participants

Digital preservation preparedness of the National Library of Namibia for digital preservation of documentary heritage: a case study

Dear Participant,

I kindly request you to participate in this study. The objective of the study is to investigate the preparedness of the National Library of Namibia to preserve Namibia's documentary heritage through digital preservation. The study is being undertaken in fulfilment of a PhD at the University of Cape Town, Department of Knowledge and Information Stewardship, in the Faculty of Humanities. The main supervisor for this study is Professor Jaya Raju, University of Cape Town and the co-supervisor is Professor Trywell Kalusopa, University of Namibia.

As part of the study, I need to interview members of NLIC, NLAS, NLAS IT and the National Library of Namibia management staff. Participation is voluntary, and all interactions and responses will be treated with utmost **CONFIDENTIALITY AND ANONYMITY** at all times and will be maintained in the reporting of the findings. If you accept to participate in this study, please sign below. You may choose not to participate or discontinue at any time even though you may have signed this consent form. I, however, appeal to you to contribute to the success of this study through your participation. The Interview should take about 60 minutes.

Given the fact that the study is being conducted during the COVID-19 pandemic, you may opt to be interviewed virtually. Please read the consent statements below and place a tick (✓) in the right-hand column for each statement if you agree with the statement.

Item no.	Consenting statement	Tick (✓)	
1.	I understand the purpose of this study.		
2.	I voluntary participate in this study.		
3.	I understand that confidentiality of the information shared will be respected.		
4.	I understand that my anonymity is guaranteed in my responses and will be maintained in the reporting of the findings of this study.		
5.	The findings of the study will be made available to the National Library of Namibia on completion of the study.		
6.	I understand that I will not receive any incentive for participating in the study.		
7.	I consent to be recorded with a digital recorder during the interview.	Yes	No
8.	I consent to participate in the study...	Virtually	In-person
Name of Participant:		Signature:	
		Date:	

For further information please contact the researcher:

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Email: wuutoni@unam.na