PRESERVATION OF AUDIO-VISUAL RECORDS AT THE SOUTH AFRICAN BROADCASTING CORPORATION RADIO IN LIMPOPO REGIONAL OFFICES

by

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ABSTRACT

Audio-visual records produced by public broadcasters play a role in preserving the history, culture, and language of the country. The records are used by broadcasters to repeat programmes and as snippets to support programmes on the air. Audio-visual records are also used by external people such as researchers. The formats that carry these records such as tapes and compact discs (CDs) are fragile and have a short life span which of 10 to 15 years. This is compounded by evolving technologies which result with obsolete playback equipment and possibly in records not being accessible.

Broadcasters must ensure that audio-visual records are preserved for use over a long period. This qualitative study utilised the Open Archival Information System (OAIS) model to explore the preservation of audio-visual records at the South African Broadcasting Corporation radio in the Limpopo regional offices. The study triangulated interviews, document analysis and archive surveys as data collection tools. Interviews were conducted with purposively selected participants in three radio stations of the SABC in the Limpopo province, which are Munghana Lonene FM, Phalaphala FM and Thobela FM. The findings revealed that the SABC radio archive was preserving audio-visual records in obsolete formats such as long plays (LPs) and cassettes, which also lacked playback equipment. These formats were not properly arranged and were further kept in a storage area, which was not monitored for decay and security. The audio-visual records were also managed by librarians who did not have archival qualifications or skills. It was further established that the radio stations were using IONA technology for retrieval and access of records while the news divisions of the radio stations were relying on ENPS. As audio-visual materials were not catalogued, which made it difficult for users to access these records.

This study offers a framework that can help the SABC radio and other organisations to preserve audio-visual records. Implementation of the framework can also assist the radio stations to ensure continued access of audio-visual records that are becoming obsolete. This study adds value to the existing theoretical and conceptual issues that form the ongoing discourse on the preservation of and access to audio-visual records, which is often a neglected area in the developing countries. A further study on the migration of content from analogue to digital for the purpose of continuous preservation is recommended.

Keywords: Audio-visual records, South African Broadcasting Corporation, Limpopo province, archives, archivists, digital technology, analogue technology, preservation.

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DEDICATION

This study is dedicated to my late father, Matsobane Matlake Justus Ngoasheng; my mother, Ramaseka Mmanthiba Ngoasheng; my wife Phuthego Rebecca Ngoasheng and my children, Matlhalefetsa Desiree and Matubeng Jacob Ngoasheng.

DECLARATION

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PRESERVATION OF AUDIO-VISUAL RECORDS AT THE SOUTH AFRICAN BROADCASTING CORPORATION IN LIMPOPO REGIONAL OFFICES

I declare that the above thesis is my own work and all the sources I have used or quoted have been indicated and acknowledged using complete references.

I further declare that I submitted the dissertation to originality checking and that it falls within the accepted requirement for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any higher education institution.

September 2020

Mr Cyril Patrick Maribolla Ngoasheng Date

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LIST OF ABBREVIATIONS

AIP	Archive Information Package
BCCSA	Broadcasting Complaints Commission of South Africa
BLER	Block error rate
BRICS	Brazil, Russia, India, China, South Africa
BWF	Broadcast WAVE Format
CCV	Contemporary Community Values
CD	Compact Disc
CDR	Compact Disc recordable
CD-ROM	Compact disc read-only memory
CD-RW	Compact Disc Rewritable
DAW	Digital audio workstation
DIP	Dissemination Information Package
Dspace	Digital Signal Processing and Control Engineering
DVD	Digital Video Discs
DVDR	Digital Video Disc Recordable
DVD-RW	Digital Video Disc Rewritable
ENPS	Electronic News Production System
EUB	European Broadcasting Unipon
FEDORA	Flexible Extensible Digital Object Repository
HDTV	High definition television
IASA	International Association of Sound and Audio-visual Archives
IEC	International Electro-technical Committee
IRMT	International Records Management Trust
ISO	International Standard Organisation
IT	Information technologies
LP	Long Play
MPEG	Moving Picture Expert Group
NAB	National Association of Broadcasters
NARSSA	National Archives and Records Service of South Africa
NASA	National Aeronautics and Space Administration
NASA	National Archives of South Africa
OAIS	Open Archival Information System

PREMIS	Preservation Metadata Implementation Strategy working Group
PREMIS	Preservation Metadata Implementation Strategies Working
PVC	Polymerising vinyl chloride
RBF	Radio Broadcast Facility
RODA	Repositioning of Authentic Digital Objects
RODA	Repository for Authentic Digital Objects
RTVE	Radio Television Espanola
SABC	South African Broadcasting Corporation
SD	Standard Definition
SIP	Submission Information Package
TDR	Trusted Digital Repository
TV2	Television Two
UNISA	University of South Africa
UV	Ultraviolet
UVC	Universal virtual computer

CHAPTER ONE
INTRODUCTION: SETTING THE SCENE

1.1 INTRODUCTION AND BACKGROUND TO THE STUDY

In South Africa, the public broadcaster, which is the South African Broadcasting Corporation (SABC), is mandated to provide programmes that inform, educate, and entertain the nation (Schuller 2016). This mandate is embedded in the South African Broadcasting Act (Act No. 4 of 1999), which further requires the public broadcaster to establish and maintain libraries and archives. This is because in executing its mandate, the SABC produces lots of records, especially in the audio-visual medium. These records need to be preserved as they are re-used for further broadcasting by both radio and television channels of the SABC. The broadcasting organisations, in general, provide the public with programmes that provide information, education and entertainment. The information is provided in many forms like news and current affairs. This information is also provided during live programmes when, for example, there are warnings of floods, electricity failure or accidents on the roads. The educational programmes are conducted in the form of book reviews or discussions of previous examination papers of specific subjects like mathematics and economics. The entertainment programmes are rendered in the form of sport, drama, music, or live comedy programmes. Records that are produced or created in audio-visual form from the programmes are of high value to the broadcasting organisations and the listeners. Some of these records are born digital and are kept on CDs and DVDs. However, broadcasting organisations still have audio-visual records in analogue media such as reel tapes, long plays (LPs), cassettes, minidisks, and CDs (Casey 2015; Schuller 2016).

Broadcasting organisations have a huge backlog of analogue records in decaying media, which puts the records at risk of being unused and of losing information forever (Sarikakis, Kolokytha, Korbiel, Rozgonyi & Baforfy 2016). According to Tabah (2017), analogue media are fragile and deteriorate quickly. These types of media rely on playback equipment to access information and the playback equipment is scarce in the market (Kramer 2016). For example, this was the case with audio-visual records of the Rivonia trial stored in Dictabelt format. The Rivonia trial was a case against 11 members of the African National Congress (ANC), a liberation movement in South Africa. The members, who included Nelson Mandela, Walter Sisulu, Govan Mbeki, Elias Motsoaledi, Raymond Mhlaba, Ahmed

Kathrada, Andrew Mlangeni, Denis Goldberg, Lionel Bernstein, James Kantor and Alexander Hepple, were charged with high treason in 1964. They were all sentenced to life imprisonment, except James Kantor and Alexander Hepple, charges against whom were withdrawn. Owing to technological obsolescence, the records were unreadable and the South African government had to resort to the assistance of the French government to provide technology to read Dictabelt records (Ngoepe 2017). Instead, Duranti (2012) would attest that archivists should identify the records to be preserved at the moment of their creation, assess the authenticity of the records, monitor them throughout their existence, and determine the feasibility of preservation based on the archives' technological capacity. The Rivonia trial records have since been digitised and are accessible through the website of the National Archives and Records Services of South Africa (NARSSA). A further challenge to the preservation of audio-visual records is a shortage of staff with skill and expertise (Hagedoorn & Agterberg 2016). This study utilised the Open Archival Information System (OAIS) model to explore the preservation of audio-visual records at the South African Broadcasting Corporation in the Limpopo regional offices with a view to developing a framework for preservation to ensure continuous access. This chapter specifically puts things into perspective by providing the context of the study, problem statement objectives as well as the definition of key concepts.

1.1.1 Contextual setting

The SABC was established in terms of the South African Broadcasting Act of 1999). According to the SABC Year Report (2015), radio broadcasting in South Africa started in 1923 through wireless broadcasting. In 1923, the then Prime Minister of South Africa, JBM Hertzog, initiated an investigation into the introduction of a full radio broadcasting which resulted in the establishment of the SABC in 1950 with two radio stations broadcasting in Afrikaans and English. Broadcasting was initially limited to Johannesburg but was later extended to other parts of South Africa. After the establishment of the Republic of South Africa and the withdrawal of South Africa from the commonwealth countries in 1961, the Afrikaner's goal was to promote their own culture and the SABC was an ideal vehicle for them to do that. They used the broadcasting corporation to make their language, music and drama popular. The influence of the Afrikaners saw the establishment of the SABC Symphony Orchestra with studios in Johannesburg, Cape Town and Durban. The popularising of the Afrikaner's culture resulted in censorship on other types of music

especially pop music. In 1966, the SABC banned the British pop group the Beatles from their airwaves until 1971. The censorship also affected the news when the SABC replaced the programme of the British Broadcasting Corporation's news and current affairs in 1950 because it was felt that the contents were not reflecting the viewpoints of the Afrikaner's community. The SABC started to promote its journalists and already had 100 full-time reporters by 1968.

The SABC grew in the 1960s with the introduction of commercial regional FM radio stations as well as black radio stations operating under the name Radio Bantu. The regional commercial radio stations were Radio Highveld in 1964 which was later named 947 FM, Radio Good Hope was established in 1965 and was later named Good Hope FM. Radio Port Natal was established in 1967 and it is currently named East Cost Radio, Radio Jacaranda was established in 1986 and it is currently named Jacaranda FM. In 1986, the SABC introduced Radio Orange, which is today named OFM, and Radio Algoa started broadcasting in 1986 and is currently named Algoa FM. The Radio Bantu stations were divided into African languages, which were Northern Sotho, Setswana, Sesotho, isiZulu, isiXhosa, Tshivenda and Xitsonga. Radio Ndebele and SiSwati were introduced later in the 1980s. During the early 1970s, these black radio stations changed from Radio Bantu and were named according to their languages. The Radio Bantu stations started to operate under the names Radio Lebowa, Radio Venda, Radio Tsonga, Radio Sesotho, Radio Setswana, Radio Zulu, and Radio Xhosa. In 1996, the SABC restructured its radio stations focusing mainly on Afrikaans and English services. The main Afrikaans radio station was Radio Sonder Grense and the English Channel was SAFM, and these two developed a huge listenership because they were regarded as flagships of democracy.

Furthermore, from 1994, with the African National Congress governing South Africa, the radio stations changed their names. Radio Lebowa changed to Thobela FM, Radio Venda changed to Phalaphala FM, and Radio Tsonga changed to Munghana Lonene FM. Radio Setswana was named Motsweding FM, Radio Sesotho became Lesedi FM, and Radio Zulu changed to Ukhosi FM, Radio Xhosa to Umhlobo we Nene FM, Radio Ndebele to Ikwekwesi FM and Radio Swati to Ligwalagwala FM (SABC Year Report 2016/17). Apart from radio stations, the SABC introduced television broadcasting in 1975 and, like radio stations, the television channels were funded mainly through licence fees. Today, both radio stations and television channels are partly funded by licence fees and advertising. Initially, television

programmes were in Afrikaans and English, which was in line with the Nationalist Party Government's policy of promoting the Afrikaans culture. In June 1982, the SABC introduced an additional two television channels named TV2, which broadcast in Zulu and Xhosa and TV3 which broadcast in Sesotho, North Sotho and Setswana. In 1984, a new television channel was added, TV4, which was mainly for news services. Still, with television channels in 1992, TV2, TV3 and TV4 were combined and named Contemporary Community Values (CCV). Later, a third channel was introduced, TSS or Top Sport, which was responsible for sports broadcasts. In 1996, the SABC restructured the television channels into language groups SABC1 SABC2 and SABC3 due to stiff competition from the subscription-based services. Furthermore, in 2005, the SABC created two complementary television channels, which emphasised indigenous languages: SABC4 in Mafikeng for Setswana, North Sotho, Sesotho, and Xitsonga; and SABC5 which was based in Cape Town and was for isiXhosa, isiZulu, isiNdebele and isiSwati. The following were the factors considered by the SABC regarding how much time should be allocated to a language group on a television channel.

- How many home language speakers are there in the coverage area of the channel?
- The geographical spread of the language.
- The extent to which members of the language community understand other languages.
- The extent of marginalisation of the language.
- The extent to which the language is understood by other South Africans.
- Whether there is available content that uses the language.

According to the SABC Year Report (2016/17), the SABC has introduced the regional offices within the nine provinces of the Republic of South Africa, which are Gauteng, Mpumalanga, Limpopo, Free State, North West, KwaZulu-Natal, Eastern Cape, Northern Cape and Western Cape. Regional managers were appointed to be in charge of the regional offices. These regional offices include finances, human capital, sales and marketing, logistics and technology for the regional radio stations and television channels. The purpose of the regional offices was to be located in places where the listeners of the radio stations mostly resided. The public was allowed to visit and use the services of the radio stations, like physically requesting the archive material. In this regard, due to the location of the radio stations, it was possible for the public to request and pay for the recordings at the regional offices. Thobela FM, Munghana Lonene FM and Phalaphala FM

are the Limpopo regional offices and this study investigated the preservation of their audio-visual records. Thobela FM started broadcasting in 1960 using the name Radio Bantu with two presenters, Justus Tshungu and Jack Rasebotsa (SABC Year Report 2009/2010; Thobela FM 2018). In 1967, this station was called Tirelo ya Sesotho sa Lebowa and Radio Lebowa in 1981 (Thobela FM 2018). The word Lebowa was used as a reference to the homeland in the Northern Transvaal which the Nationalist government demarcated as an area for North Sotho-speaking people (SABC Year Report 2009/2010). The station prides itself in being a custodian of the Northern Sotho language representing its cultural diversity through information, education and entertainment (Thobela FM 2018). Thobela FM currently broadcasts for 24 hours a day with programmes covering news, sports, drama, religion, music, documentary and youth programmes (Thobela FM 2018). The programme format is 60% music and 40% talk (Thobela FM 2018). One of the highlights of the station was when the presenter Maxwell Thamagana Mojapelo won an Astra Award (SABC Year Report 1989/90). The archives records for the station are available online (SABC Year Report FM 2018/19).

Munghana Lonene FM started broadcasting in 1965 from Johannesburg also under the name Radio Bantu (SABC Year Report 2009/2010). Later in the 1970s, this station was called Radio Tsonga because the station was targeting the Tsonga-speaking people (SABC Year Report 2009/2010). In 1984, the transmissions of the station were extended to also cover listeners in more areas within South Africa (Munghana Lonene FM 2018). Currently, the station broadcasts for 24 hours a day with news, documentaries, sport, feature, dramas, religion, youth programme and music charts as part of their programmes (Munghana Lonene 2018). The format of their programming is 50% music and 50% talk, and the archives material for the station is accessible online (Munghana Lonene FM 2018).

Phalaphala FM started broadcasting under the name Radio Bantu in 1965 and late in the 1960s, it changed its name to Radio Venda (SABC Year Report 2009/2010). The station was specifically targeting the Venda-speaking people and the name Radio Venda was in line with the homeland of Venda (SABC Year Report 2009/2010). The station is currently broadcasting 24 hours a day, covering news, sports, dramas, documentaries, religion, music and youth programmes (Phalaphala FM 2018). The programme format is 50% music and 50% talk. The archives records for the station are available online (SABC Year Report 2018/19).

The three radio stations in the Limpopo regional offices of the SABC are served by one archive. According to the SABC Year Report (2018/19), radio archives receive all recorded materials, which are then catalogued and preserved. The radio archive in the SABC Limpopo regional offices is responsible for the appraisal of the records. Furthermore, the SABC Library Website (2018) avers that a small part of the material in the SABC archives is a donation from former staff members of the SABC. The donations are in the formats of 78 rpm, disks, tapes, CDs, and cassettes. The radio archives have also initiated a history project, which supplements the existing interviews. Radio station archives of the SABC preserve records to fulfil certain requirements which are:

- to preserve SABC broadcasts and raw material as a corporate function
- to be of service as a well-organised source of the broadcast to the SABC
- to permanently preserve highlights in the history of the development and broadcast patterns of broadcasting in South Africa
- to bequeath to future generations an audio-image of South Africa at certain periods as it was portrayed by the SABC
- to provide researchers with information and facts on sound carriers that are not available in any other format
- to preserve as part of the national broadcaster's functions and, as far as possible, complete recordings of the South African culture legends and oral tradition, including a comprehensive set of nature and habitant sounds of South Africa (SABC Library Website 2018).

1.2 PROBLEM STATEMENT

Broadcasters such as the SABC face irretrievable audio-visual records due to deteriorating formats and obsolete playback equipment. This is because the SABC is not consistent with maintenance for playback equipment, which is done once in a year (Assmann & Mearns 2015). The irregular maintenance for recording equipment at the SABC will result in deteriorating playback equipment, which will not be usable to retrieve information from the records. The irretrievable audio-visual records will have the following negative impacts:

- The SABC will not be able to re-use the audio-visual records, while most broadcasters,

like the Dutch, use past programmes to produce new programmes (Hagedoorn & Agterberg 2016).

- The archival knowledge and heritage may cease to transfer from generation to generation, and this will go against the assertion made by Komba, Nawe and Manda (2015) that audio-visual records contain information of the collective national memory, which is critical to the history of the nation.
- Researchers will fail to retrieve the rich oral recordings from the irretrievable audio-visual records that would be used to shape the thinking of the living generation.

According to Mutsagondo and Ngulube (2017:17), the current infrastructure and skills in Zimbabwe are themselves a threat to the future of electronic information. Furthermore, Mutsagondo and Ngulube (2017) argue for the development of staff skills in records management in general and electronic records in particular. This assertion by the authors indicates that infrastructure and skills are often reported as factors contributing to poor preservation of audio-visual records, especially in Africa.

1.3 PURPOSE AND OBJECTIVES OF THE STUDY

The purpose of the study was to explore the preservation of audio-visual records at the Limpopo regional office of the South African Broadcasting Corporation with a view to developing a framework. The specific objectives of the study were to:

1) assess preservation strategies for audio-visual records applied by the SABC in the Limpopo regional offices
2) identify the types of audio-visual formats that are kept by the SABC in the Limpopo regional offices
3) determine the technologies used for audio-visual preservation by the SABC in the Limpopo regional office
4) determine the staff skills and competencies for the preservation of audio-visual records in the SABC Limpopo regional office
5) assess the appropriateness of the storage facilities for audio-visual records in the SABC Limpopo regional office
6) determine the accessibility of audio-visual records in the SABC Limpopo regional office

7) propose a framework for the preservation of audio-visual records at the SABC in Limpopo regional office.

1.4 RESEARCH QUESTIONS

Research questions assist the researcher to define the nature and the scope of the research project and are grouped into three main types, which are “what”, “why” and “how” (Blaikie 20007:56). Research questions assist the researcher to provide new knowledge by finding answers to the problem (Blaikie 2007:57). According to Punch (2014:74), a research question indicates what data is required for the research and enables the researcher to be focused. Punch (2014:76) also states that research questions should be empirical and relevant. Research questions are important for research and this study provides this section for the study. Research questions should be clear so that the study would be able to seek research answers to them (Bryman 2016:75). Research questions should also have connections and should be linked to each other (Bryman 2016:75).

1.5 JUSTIFICATION OF THE STUDY

According to Newsome (2016:47), justification of the research is shown when the outcome of the research contributes to the solution of the problem, helps the organisation to achieve its goal, and assists the organisation in the development of policies. The outcome of the research will help the SABC to find a solution to the challenges of irretrievable audio-visual records due to obsolete technologies and unavailable playback equipment as stated in the problem statement. The SABC will be able to find adequate professional archivists, engineering technologies, project managers and financial specialists who collectively will effectively improve the running of the SABC archives. The collective leadership will result in the renovation and maintenance of studios, buying new equipment and training staff. The safety of audio-visual records at the SABC is in danger; however, the archives had the potential to avoid the risks, grow fully and continue to protect the national history, culture and heritage for posterity. The study will specifically assist with the development of a theoretical framework, which suggests a journey for the SABC archives to move away from the rudimentary archival practices to the contemporary archival practices and principles.

1.6 THE ORIGINALITY OF THE STUDY

According to Newsome (2016:66), the originality of the study is shown when the research provides new facts to the study using the population that will provide unique results. Originality is the ability of the researcher to introduce a new way of thinking about the topic or to come up with new ideas to the topic that were missing from the previous studies of the topic (Sheffield Hallan University 2014:20). Furthermore, Sheffield Hallan University (2014:22) describes originality in research as an intellectual piece that makes a valuable contribution to knowledge and understanding. The contribution covers substantive empirical findings, new arguments, interpretations, insights, assembling of knowledge in an innovative way, development of the new theoretical framework, innovative methodologies and new formats of expression. Many studies have been conducted on the preservation of audio-visual records of the broadcasting corporations but with less emphasis on digital preservation. For this study, a sample of participants included engineers and technicians because of their insightful knowledge of the technologies and not only archivists. It is important that throughout the process of preservation audio-visual records are not corrupted and that surety can be given by technical experts.

Answers provided by the engineers and technicians will bring new ideas that will be of benefit to the broadcasting archives. There have been several studies on the SABC as context, but fewer on its archives and their preservation. Lambrechts (2012) conducted a study of power and politics at the five music archives for a dissertation. The study was done on archives of the SABC, Gallo Records, International, and Library of African Music, Hidden Years Music archives and Documentation and Centre for Music archives and did not focus on the preservation of audio-visual records at the SABC. Assmann and Mearns (2015) studied the state of broadcasting archives in Southern African countries and they were not focusing specifically on the preservation of audio-visual records. Meyer (2015) wrote an article on classical music in the SABC bulletins but the issue of the preservation of audio-visual records was not included. Lefowa (2016) studied how social media could enhance the experience for the audience of an SABC television drama. Again, there was mention of the preservation of audio-visual records at the SABC. Masekwameng (2018) explored the integration of social media content into the enterprise management system in the SABC at the Limpopo regional offices. Here the focus was on social media rather than the preservation of audio-visual records. Muswede (2016) presented a paper on the editorial

policy of the SABC which did not touch on the archives. This current study focuses on the preservation of audio-visual records with the intention to ensure their accessibility.

1.7 THEORETICAL FRAMEWORK

This study used the Open Archival Information System (OAIS) reference model as indicated in Figure 1.1 as a theoretical framework to explore the preservation of audio-visual records at the SABC in Limpopo regional offices. Theories assist in interpreting and understanding events in the world, and the theory that is selected should be made explicit in the study and should not be left to the imagination of the reader (Ngulube, Mathipa & Gumbo 2015:5). Theories have the power to explain and predict and are tested through preposition or hypothesis (Ngulube et al., 2015:5). According to Ngulube et al. (2015:5), theories should address the following three questions:

- Where is the research coming from?
- How can a theory's preposition be used in the conduct and design of the study?
- How valid is the theory's proposition in the problem that is being investigated, or which theory is more robust than the others in explaining the phenomenon?

Ngulube et al. (2015:14) assert that the choice of the theory should be linked to the discussion of the effects of the theoretical framework on the study, and the placement of the framework should be critically considered. The theoretical framework enables the researcher to monitor the progress of the study because it links with all the aspects of the study. In this case, the theoretical framework becomes a yardstick that the researcher uses for checking the mistakes, thus avoiding deviations from the intention of the study. It serves as a watchdog to ensure that there is consistency in the study.

According to Lavoie (2014), the OAIS reference model was developed by the Consultative Committee for Space Data System and approved by the International Standard Organisation 14721 and is used as a framework for the long-term preservation of digital records. The OAIS functional model provides advantages to the archives because Cruz-Mundet and Diez-Carrera (2016:229) aver that it defines the processes that are involved in the preservation and access of records over a long period and describes a common language for preservation. The SABC archives are preserving audio-visual records over a

long period; therefore, this study proposes the OAIS as a framework for the digital preservation of audio-visual records by the SABC at the Limpopo regional offices. According to Cruz-Mundet and Diez-Carrera (2015:232), the OAIS reference model was developed and intended for engineers, physicians and computer scientists. This study engaged engineers and technicians as participants because of their understanding of the technical aspects of digital preservation. Furthermore, Cruz-Mundet and Diez-Carrera (2015:233) posit that the OAIS reference model is helpful for digital preservation as it provides a framework that describes and compares different long-term preservation strategies and techniques. The study has two objectives which are in line with the above statement, and they are: to determine preservation strategies for audio-visual records by the SABC in the Limpopo regional offices and to determine the technologies used for audio-visual preservation by the SABC in Limpopo regional offices. The study also has the objective of identifying the types of audio-visual formats that are kept by the SABC in Limpopo regional offices. This is in line with the statement by Cruz-Mundet and Diez-Carrera (2015:233) that the OAIS reference model deals with the migration of digital records from one format to the other. Figure 1.1 illustrates the six components of the OAIS functional model which are key to the effective management of the archive.

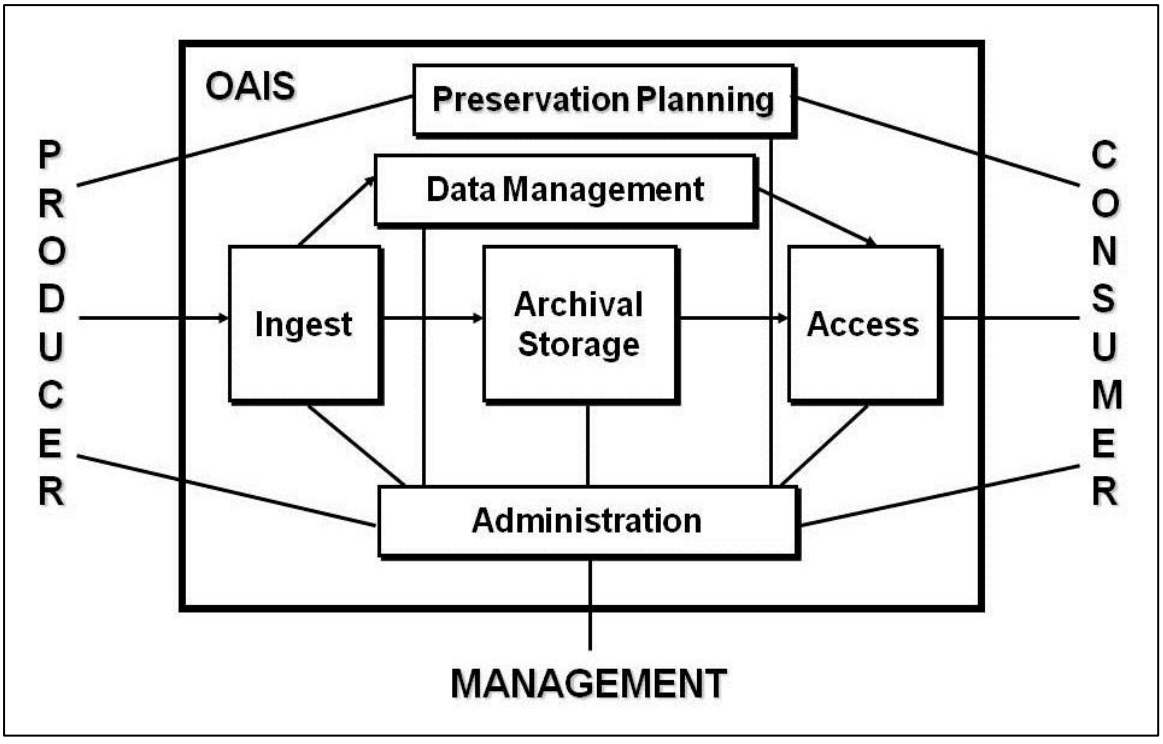


Figure 1.1: OAIS Model (Dighe 2015:759)

The OAIS reference model is important for the long-term digital preservation because it identifies and explains the six functions that are involved in the core processes of digital preservation (Resendiz, 2015). Furthermore, Lavoie (2014) asserts that the model also provides a high volume of information on audio-visual records, which is the focus of long-term digital preservation. Magara (2009) asserts that the little attention given to the preservation of records leads to a future lack of provision of records. Magara (2009) further argues that a strategy is required to ensure sustainability in the capture, storage and access of records. All broadcasting material in the Southern African Broadcasting Corporation from the beginning of broadcast until 1980 are at risk of not being accessible in future (Assmann & Mearns 2015). Furthermore, storage technologies are very old and break down every three to six months (Mudzaki 2013). The OAIS' functional model by Lavoie (2014) and Resendiz (2015) has the following six elements: ingest function, archival storage function, data management function, administrative function, preservation planning function and access function.

Ingest function: This function informed the second objective of this study of identifying the type of audio-visual records that are kept at the SABC in Limpopo regional offices. According to Cruz-Mundet and Diez-Carrera (2016:237) and Lavoie (2014:12), at ingestion, services and functions are provided that accept the records from the producers through a submission information package (SIP) and prepare the contents for their management and storage in the archives. For each SIP, the input applies a string that begins with the reception of the records, whose quality is assured. From there, an archive information package (AIP) is generated, described and transferred to the functional entity facility. Ingestion is the point where the archivist meets the people from outside the archives and share information about the contents of the record with them. The archivist then validates the records and converts them into a suitable format. Ultimately, the archivist develops and implements metadata for the record received.

Archival storage function: This function informed the fifth objective which assesses the appropriateness of the storage facilities at the SABC in Limpopo regional offices. This function deals with the storage, maintenance and retrieval of AIP, which receives the storage request and ensures permanent storage for records in the required format (Cruz-Mundet & Diez-Carrera 2016:237). This is the area where records are managed to ensure that they are suitable for long-term preservation. According to the OAIS reference model,

the archivist should ensure that the digital records are in the right storage format. The preservation storage should be suitable for the bitstreams and the archivist should have a plan for disaster recovery (Cruz-Mundet & Diez-Carrera 2016:237; Lavoie 2014:12).

Data management function: The data management function addresses the third objective of the study, which is to assess the management of the preservation process and the description of the records in Limpopo regional offices. Cruz-Mundet and Diez-Carrera (2016:237) aver that the administrative functional entity deals with the provision of services and functions that are required for the maintenance and accessing of descriptive information which identifies and documents the records in the archives. It also deals with the administrative function that is used to manage the archives. This is the function of describing the contents of the record. The function is also instrumental in maintaining metadata that provides finding aids. This area is responsible for managing the database of the archives by conducting updates as new information regarding the technologies as they emerge (Lavoie 2014:13).

Administrative function: The administrative function is responsible for the daily operations of the OAIS and it coordinates the activities of other functions. It interacts with the producers and consumers with a view to monitoring the changes from the external environment. It also coordinates the activities of the other high-level functional entities and oversees access systems, monitors performance and coordinates updates to the system (Cruz-Mundet & Diez-Carrera 2016:237; Lavoie 2014:12).

Preservation planning function: The preservation function informed the first objective of this study, which is to focus on the strategies that are used for audio-visual records at the SABC in Limpopo regional offices. This function provides strategic plans and ensures that the stored records remain accessible to users over a long period. This function covers technology monitoring, preservation developments and standards and migration plans (Cruz-Mundet & Diez-Carrera 2016:237). For this function, the archivist provides strategies to ensure appropriate long-term digital preservation of the record. The function ensures that the right staff with the right expertise are available for the preservation work and it monitors the external environment through engagement with the producers and the consumers. The function also develops policies and procedures to accommodate changes from the external environment (Lavoie 2014:13).

Access function: This function addresses the sixth objective of the study which is to determine the access of audio-visual records at the SABC in Limpopo regional offices. The access function enables the users to determine the existence, description and location of the records. The function also coordinates access activities through the generation of information dissemination packages (Cruz-Mundet & Diez-Carrera 2016:237). The access function ensures that consumers receive the right information at the right point at the right time. The OAIS reference model provides conditions that ensure easy access points and provides points where consumers can locate, request and receive information. This function processes queries and coordinates the retrieval and delivery of the information to the consumer through the implementation of security and access control measures (Lavoie 2014:13).

1.8 DEFINITION OF TERMS

In this section, the researcher defined terms that form the basis of the study to give the reader a clear understanding when reading the research. According to Pearce-Moses (2005:XV), many terms have a meaning that differs from one community to another and even among archivist, in the case of archival terms. A single definition of a term could confuse the readers who are confronted with a text which uses that term with a different meaning (Pearce-Moses 2005:XV). It is for this reason that the study provides more than one meaning to the terms that are defined. These terms are used in the study to simplify the understanding of their value to the preservation of audio-visual records. The study will define the following terms: digital preservation, audio-visual records, analogue recording and digitisation.

1.8.1 Digital preservation

According to Moseti (2016:138), digital preservation is the set of processes and activities that ensures long-term sustained storage of information, access to digital information and the interpretation thereof. Reiger (2018:3) defines digital preservation as a process that involves the management and maintenance of digital objects to ensure authenticity, accuracy and functionality of content over time in the face of technological and administrative changes. Digital preservation is concerned with ensuring that records that are created electronically using the current computer systems and applications remain

available, usable and authentic in future. Furthermore, digital preservation means taking steps to ensure the longevity of the electronic documents in terms of data, index to data, links to other data and metadata. Conway (2010:65) opines that digital preservation is the suite of tools, operations, standards and policies that helps the archives to ensure that the records are not wasted. For this study, digital preservation refers to the preservation of electronic records so that they remain retrievable and usable over a long period while, at the same time, maintain their authenticity.

1.8.2 Audio-visual records

According to Edmondson (2016:27), audio-visual records are works comprising reproducible images and sounds in a carrier whose recording, transmission, perception and comprehension always require technology. Mnjama (2010) posits that audio-visual records are non-print records because equipment is required to access and use them, and they include sound recordings, film and video, graphic materials, electronic resources, three-dimensional objects, maps and microforms. Audio-visual records are all records, irrespective of their physical form and their recordings such as film, filmstrips, microfilms, slides, magnetic tapes, kinescopes, videograms and optically readable laserdiscs that are intended for public reception either by television or by any other means (Harrison 1997). For this study, audio-visual records refer to records that depend on a machine to be created, preserved, accessed and used, and whose formats change according to technologies.

1.8.3 Analogue recording

Analogue recording is an objective measurement of the quality of recording obtained by multiplying the frequency ranger by the number of decibels between the power of the loudest undistorted signal and the power of the background noise (Copeland 2008). Resendiz (2015) posits that analogue recordings are the mechanical support that allows the mechanical recording and reproduction exploiting groove to be carved into the surface with a needle or sharp instrument with cylinder wax, celluloid and embroils, discs or shellac gum. The view of this study is that analogue recording refers to outdated recordings which do not guarantee the long-term safety of the records.

1.8.4 Digitisation

It is the process of transforming analogue material into binary (digital) form, especially for storage and use on a computer. It can also be defined as the conversion of material that can be read by people to a digital format that can only be read by the machine (Peace-Moses 2005:XV). Khan, Khan and Aftob (2015:120) define digitisation as the process of converting the diverse forms of information like sound, image and voice into digital formats. According to Resendiz (2015:205), digitisation is the process by which analogue signals are replaced by digital signals. Furthermore, Resendiz (2015:205) asserts that in the process, contents recorded on various obsolete analogue media are transferred to digital platforms because the equipment and other technical maintenance to reproduce analogue signals no longer exists. For this study, digitisation is the process of compressing records into miniature substances so that a huge volume of such records can be preserved in a single format that would normally require more formats.

1.9 LITERATURE REVIEW

A literature review is a tool that enables the researcher to find gaps for the topic and to assist in the formulation and development of a framework for the study (O'Leary 2014:83). This study conducted a literature review focusing on the topics that are in line with the preservation of audio-visual records at broadcasting centres. The topics are strategies for the preservation of audio-visual records, the type of formats that are used for the preservation of audio-visual records, technologies that are used for audio-visual records, staff skills and competencies necessary for audio-visual records, appropriateness of the storage for audio-visual records, the access of audio-visual records and the development of a framework for the audio-visual records.

1.10 RESEARCH METHODOLOGY

This study used the qualitative research approach to explore the preservation of audio-visual records by the SABC at the Limpopo regional offices because the qualitative approach was found to be appropriate for this study. The qualitative was chosen because it enables the researcher to develop a deeper understanding of the participants because more time is spent with them (Kiyimba & O'Reilly 2015). The method used was case study

which has the advantage that the researcher is able to find full details of the topic and understand why a particular thing happened (Thomas 2014).

Purposive sampling was appropriate for the study because it enabled the researcher to select the participants based on their understanding of audio-visual records (Sharma 2017). Nineteen participants were selected based on their involvement in the creation and handling of the audio-visual records as follows: three radio presenters who are responsible for presenting programmes which are archived as records, three radio producers who are responsible for the creation of programmes, one programme manager who manage the creation and presentation of programmes, two news editors who are responsible for editing news for broadcast, one journalist who collected news bulletins, one engineer responsible for technologies, two technicians who are recording programmes and maintaining the machines, one manager of technology who is responsible for acquiring technologies and training of staff, two digital content specialists who work with IONA to preserve recordings for the radio stations, one librarian working in the library and seconded to the archive, one regional management member, and one logistics staff member responsible for the buildings and infrastructure. Based on their position, the assumption was that these participants would provide reliable information regarding the movement of audio-visual records from creation to access to the users.

The study used interviews, survey and document analysis as data collection tools, which were in line with the research problem, purpose and objectives of the study (Ritchie & Lewis 2005). The study applied unstructured interviews which are common in qualitative research (Marshall & Rossman 2016) and was conducted physically at the SABC Limpopo regional offices. The study also used a structured survey which is helpful when looking at an issue from a particular point of view. The audio-visual records were surveyed in their different formats. Some of them were in decaying analogue formats while others were in the current digital formats. Document analysis was done on the inventory register to check the intake of records to the archives from radio stations and news divisions. The studio register was also analysed to check the acquisition of new equipment and maintenance schedule. The request register was analysed to understand how the users were accessing the records. The collected data were analysed thematically and presented according to the objectives of the study. For a comprehensive research methodology discussion, the reader is referred to Chapter Three.

1.11 ETHICAL CONSIDERATION

According to Punch (2014:36), researchers have to comply with research ethics when collecting data. This study complied with the University of South Africa's (Unisa) ethics policy while collecting data from participants of the SABC and this matter is discussed fully in Chapter Three of the study. Punch (2014:36) asserts that the research ethics signal the areas of consensus within the communities of research about what is acceptable to do and under which conditions. The University of South Africa Policy on Research Ethics (2007) provides clear guidelines of the research activities and covers, among others, integrity, transparency and accountability. This study collected data from participants belonging to different sections of the SABC in the Limpopo regional offices. Participants were provided with an ethical clearance letter a letter of the study issued by Unisa and an approval letter from the SABC. Furthermore, the participants were given a consent form to sign, which ensured their free participation and freedom to opt out the research at any stage of the study if they felt uncomfortable. The participants were assured of the protection of their identity, and that the information they provide would remain confidential.

1.12 CHAPTER OUTLINE

The thesis is structured into six chapters as follows:

Chapter One: Introduction to the study

The chapter discussed the background, problem statement, purpose and objectives of the study, research questions, theoretical framework, conceptual framework, justification of the study, importance of the study, originality of the study, scope and delimitations, definition of terms, research methodology and ethical considerations and summary of the chapter.

Chapter Two: A literature review

The chapter reviews the literature based on the themes that are formulated from the objectives of the study. The themes included strategies for the preservation of audio-visual records, the types of content that are preserved on audio-visual records, the use of technologies for the preservation of audio-visual records, the skills, competencies and

training of the archivists, the appropriateness of the storage for the preservation of audio-visual records, the finding aids for access of the audio-visual records and the usage of these audio-visual records, and summary of the chapter.

Chapter Three: Research methodology

The chapter addresses the research paradigm, the key social paradigms in research and the selected paradigm for the study. It also discusses the research approach, research design, population, data collection methods, data collection instruments, data analysis, validity and reliability, and ethical considerations.

Chapter Four: Presentation and analysis of data

The chapter deals with the data presentation and interpretation of the results.

Chapter Five: Interpretation and discussion of the findings

This chapter focuses on the presentation of the findings.

Chapter Six: Summary, conclusion and recommendations of the study

The chapter deals with the summary, recommendations and conclusion of the study.

1.13 SUMMARY

Chapter One provided the background of the study. Details were provided about the preservation of audio-visual records at different organisations, particularly the broadcasting corporations. The chapter also discussed the problem statement which relayed the importance of the study to the reader. The objective focused on how a broadcaster like the SABC is facing the challenge of having irretrievable audio-visual records due to deteriorating formats and obsolete equipment.

The chapter also provided the reader with the objectives of the study. The objectives of the study covered how the SABC in Limpopo regional offices determined the following: the

strategies for audio-visual records, technologies for audio-visual records, staff skills and competencies for audio-visual records and accessibility of audio-visual records, identified the formats that are used to preserve audio-visual records, assessed the storage appropriateness of audio-visual records and proposed a framework for the preservation of audio-visual records in the SABC regional offices in Limpopo regional offices. The chapter also defined key terms that were used in the study which covered digital preservation, audio-visual records, analogue recording and digitisation.

Chapter One also provided detail of the justification of the study which indicates how the study would assist the SABC to avoid the challenge of having irretrievable audio-visual records. The originality of the study was discussed, which is an indication of its importance and relevance to the current situation. The originality indicated how audio-visual records become irretrievable and how such situations can be avoided. The study also outlined the Open Archival Information System reference model as a guiding framework for the investigation. The study also introduced the research methodology which covered paradigm, the research design, population, sampling, and data collection tools and data analysis. The chapter also provided a chapter outline of the thesis.

The next chapter reviews the literature of the study. The main themes in the chapter were formulated based on the objectives of the study, which include strategies for the preservation of audio-visual records, formats that are used for the preservation of audio-visual records, technologies that are used for preservation of audio-visual records, staff skills and competencies, appropriateness of the storage and access to the audio-visual records.

CHAPTER TWO
LITERATURE REVIEW: PRESERVATION OF AUDIO-VISUAL RECORDS

2.1 INTRODUCTION

Chapter One puts the study into perspective by providing the background and identifying the gaps. This chapter reviews the literature concerning the preservation of the audio-visual records, particularly at broadcasting corporations. The review of the literature pays attention to the strategies for the preservation of audio-visual records, the type of formats used for audio-visual records, audio-visual records preservation technologies, staff skills and competencies for audio-visual records management, appropriateness of the audio-visual records storage facilities and audio-visual records access. All six these themes for the literature review emanating from the objectives were formulated in line with the OAIS reference model. A literature review is a tool that enables the researcher to find gaps in the topic and further assist in the formulation and development of a framework for the study (O'Leary 2014:85).

This study used the descriptive approach which is appropriate to literature review (Newsome 2016:80). This approach indicated the sources that were used, making it easier for the readers to understand what was being reviewed and why the source was chosen. This approach will be applied in line with the literature map as depicted in Figure 2.1, which outlines the concepts that are to be discussed and which are part of the objectives of this study. These are the concepts strategies, formats, technologies, staff skills and competencies, storage appropriateness, accessibility and the OAIS reference model, which is the proposed framework for the study. Figure 2.1 indicates the direction the literature has taken by showing the main themes that form part of the discussion. These themes are discussed and their relevance to the OAIS reference model is indicated. The OAIS reference model is used as the framework for this study.

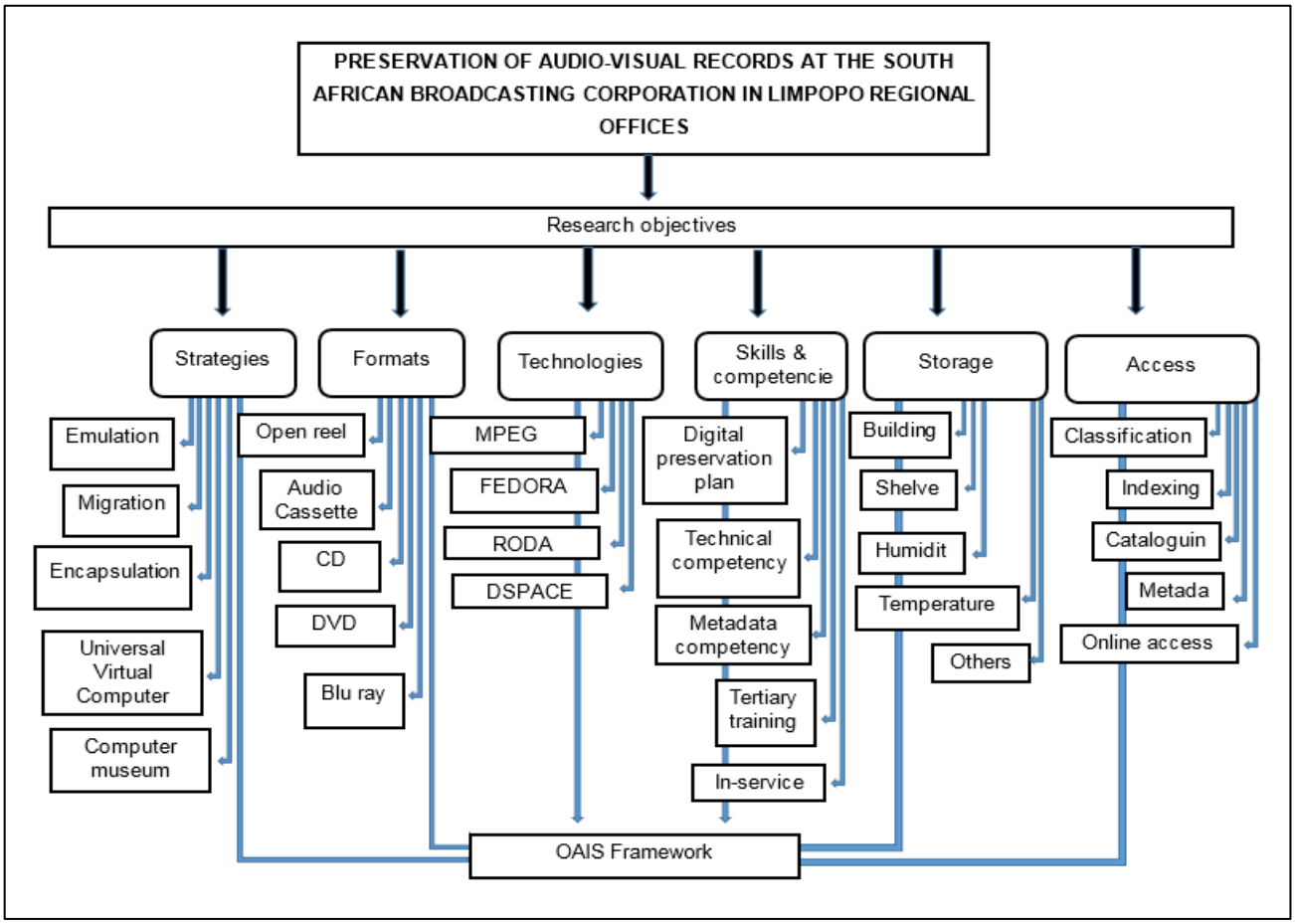


Figure 2.1: Literature review map (Researcher 2019)

2.2 STRATEGIES FOR DIGITAL PRESERVATION

Following the emergence of digital records, many concerns have been raised regarding the authenticity of the records over a long period. As was stated in Chapter One, the SABC faces a threat of losing audio-visual records due to obsolescence and degradation. It is therefore important to discuss strategies for digital preservation which form part of the objectives of the study and refer to the OAIS reference model. More organisations have used the OAIS reference model as a foundation and starting point for more focused work in digital preservation (Lavoie 2014:3) The reason for this is because the OAIS model specifically outlines the processes required for the long-term preservation and dissemination of data (Green, Niven & Field 2016:3). The use of the OAIS model as a framework for the study is essential for the strategies for digital preservation. According to Lavoie (2014:3), despite the attendant ambiguity, the OAIS reference has been beneficial to the extent that it helps to consolidate understanding of the fundamental requirements for

securing the long-term persistence of digital material.

Digital preservation strategy involves the manipulation and interpretation of computer software, because of its dependence on the computer. The reason for this is that digital records are dependent on technology. Van der Hoeven, Lohman and Verdegen (2007:124) aver that long-term preservation of digital objects requires the development of strategies to secure sustained accessibility of records. The strategies should ensure that audio-visual records are saved and accessible for a long period. According to Shimray and Ramaiah (2018:46), the planning for digital preservation strategies should be carefully done because of the heavy costs that might be involved. The digital preservation strategy must outline the workflows within preservation which clarifies business components that are involved and the tasks that are performed (De Jong 2016:6). This section discusses the following strategies for digital preservation: emulation, migration, encapsulation, universal virtual computer and computer museum.

2.2.1 Emulation

According to Sigauke and Chabikwa (2012:12), emulation is a programme that translates code and instructions from one computing environment to another, which enables the records to be properly executed. Sigauke and Chabikwa (2012:12) further elaborate that emulator software is vulnerable to obsolescence with time and, therefore, requires strong system documentation to guarantee the reproduction of the authentic and reliable records in future. This means that emulation should ensure that there is proper involvement of hardware and software environments required to access a source (Whitt 2017:50). This should be achieved when emulation mimics obsolete hardware and software and ultimately offers functionality like those from the original record (Castagne 2013:157). Emulation is useful in complex digital environments as it can execute the old software without the real hardware component. Emulation is capable of running complete operating systems like Microsoft Windows, Apple and MacOs and GLU/Linuz (Van der Hoeven et al. 2007:124). A Charon emulator allowed the user to run various digital equipment and corporation platforms as virtual machines on a modern personal computer and to facilitate migration and viewing of data from an old system. Digital documents are stored in their original forms along with the original software in which they were created while at the same time, additional software and hardware are created to permit a more advanced computer to mimic at some

time (Whitt 2017:157-158). This calls on broadcasters to focus on changing technologies throughout their planning of digital preservation strategies for audio-visual records. The broadcaster should establish research advisory units, which should include engineers, technicians and financial experts to report on the development of technologies and propose necessary interventions.

Emulation has the following advantages: it aims to reproduce the functionality of the original targets as closely as possible. It is focused on changing the environment instead of the digital object. It is economical for the preservation of large collections and it involves one-time investment. It can be used as a standby mechanism to offer admittance to the digital origins of the relevant record. It can be used for the abstraction of digital objects from old technologies (Shimray & Ramaiah 2018:52). Broadcasters should consider these advantages because through these advantages, emulation involves small maintenance while at the same time protecting the authenticity of the record (Whitt 2017:158). Boss and Broussard (2016:3) state that starting emulation from scratch is expensive and time-consuming and is less successful in preserving dynamic digital objects. According to Shimray and Ramaiah (2018:52), emulation has the following disadvantages: It is costly to define a hardware description language, which specifies a spectrum of hardware components with a sufficient degree of precision; most emulation applications involve commercial applications and systems software which involves copyright issues; users are expected to understand technology to apprehend the archival records; and it requires resources and skilled computer programmers to write the emulator. Boss and Broussard (2016:3) argue that emulation is expensive to start from scratch and therefore not suitable for archives that are under-resourced. The advantages and the disadvantages of an emulation strategy provide the broadcasters with the opportunity to avoid total wreckage of records and enable them to build the most reliable repository for audio-visual records. The conditions are therefore probably ripe for the broadcaster to realign their digital preservation strategies to fit into the processes as defined by the OAIS reference model. Emulation was applied as a preservation strategy to save the Rivonia court recordings which was explained in Chapter One. According to Tuddenham, Copeland and Bewley (2001:10), the recordings were made using the dictabelt machine. The format of this machine was invented by the United States of America (USA) and it is now obsolete. The recordings were retained by NARSSA and after a long time, were unplayable. To make the recordings retrievable, the authors (who were sound archive engineers) used analogue-to-digital converter sampling

which resulted in improved speech without removing any of the original sounds (Tuddenham et al. (2001:15).

2.2.2 Migration

The OAIS reference model is a representative of the management framework for receiving, managing, and making available digital records that require to be retained over a long period; and this needs continued oversight and active management of the digital records (International Records Management Trust (IRMT) 2016:25). The oversight management of the digital records are determined by the strategies developed by the organisations. The broadcaster will benefit through migration as part of the strategy for the preservation of audio-visual records. Migration is copying of bitstreams from one media to the other and in the process, the configuration of the underlying data changes but the intellectual content remains (Sigauke & Chabikwa 2012:14; Castagne 2013:6; Whitt 2017:156) and the main purpose is to preserve the integrity of digital objects and to retain the ability for clients to retrieve and display the objects (Sigauke & Chabikwa 2012:14). Migration is a key component for preserving and disseminating data because of its stability and resistance to frequent changes in technologies (Green et al. 2016:4). Migration is the transformation of data from an obsolete format to the new format. It is concentrated on the digital object in such a way that even hardware and software improvements will not disturb its ease of access (Shimray & Ramaiah 2018:51).

Data migration consists of a transfer and update of a discrete set of data, where an older version is replaced comprehensively by a newer version. When a new version emerges that is suitable for both data service and the new community, it triggers the need for digital migration. Data migration implementation signifies a carefully planned and fundamental change in how a depository ingests, stores and preserves any type of data (Green et al. 2016:5). Data migration also involves a corresponding update which is important for authenticity because updates are key components of an ongoing data lifecycle and include documentation of what processes have been undertaken and on which dates (Green et al. 2016:6-7). The writers identify stages of migration as follows: migration of data to new formats, which involves the creation and verification of files in the new preservation format; migration of data to new dissemination formats, which involves the creation of dissemination versions, creation of format files for users who do not have access to formats; and an update

of corresponding metadata, which takes into account various sections, including details of the process carried out on the data. Green et al. (2016:12) aver that these steps ensure the long-term preservation of data. The changing technologies are essentially forcing the broadcaster to a more advanced route of satisfying the customer's demands and choices. It is therefore important for broadcasters to migrate, but in the process also ensure the provenance of the audio-visual records.

Like other digital preservation strategies, migration has advantages and disadvantages which have to be taken into consideration to make the best choice of the digital preservation strategy. According to Shimray and Ramaiah (2018:51), migration is a dependable strategy to preserve the content of the digital object because conversion software is easily available. Castagne (2013:6) states that migration allows for the rewrite range from a small tweak to a complete overhaul of the code in new programming. Green et al. (2016:12) posit that migration allows for the additional increase in dissemination formats, which enables users to have more access points. Whitt (2017:156) postulates that migration allows for the transfer of digital information from a less stable medium to a more stable medium, from more complex to simplest possible formats and from a multiplicity of formats to a smaller number of common formats migration. Green et al. (2016:11) state that the disadvantage of migration is that the ideal migration activity depicted in the OAIS model is not always achieved or appropriate and that decisions regarding strategies must be made on a case-by-case basis to achieve the best possible results. According to Sigauke and Chadikwa (2012:14), the disadvantage of migration is that the backward compatibility is highly dependent on the interoperability of systems software and due to rapid changes in technology, migration has to be carried out recurrently. Broadcasters would do better to invest in a migration strategy to modernise its preservation process, which will permit facilitation of records to users over a long period.

2.2.3 Encapsulation

The strategy of encapsulation groups together digital objects along with metadata that describes the objects for which to provide access of information to. This process lowers the risks of loss to digital objects (Arora 2009:129; Shimray & Ramaiah 2018:48). The encapsulation strategy also bundles together metadata that describes or provides a link to software application or platform that is used for original content (Arora 2009:129). According

to Sigauke and Chadikwe (2012:15), encapsulation is suitable to organisations because it keeps the authenticity of the records intact. Encapsulation is also applicable to organisations that adopted the OAIS as a reference model because it describes the incorporation of data objects and their metadata into Archival Information Packages (AIPs) (Arora 2009:129). Shamray and Ramaiah (2018:49) aver that encapsulation defines the capacity of the information package which is being transformed, and this simplifies the process of saving digital records. Furthermore, encapsulation provides easy modification and maintenance but requires standards to retain readability (Shamray & Ramaiah 2018:49).

2.2.4 Universal virtual computer

A universal virtual computer is a computer with no physical existence, but it is part of the behaviour of a physical computer which mimics the instruction set and the hardware configuration of some physical machine (Rosenthal 2015:2). Furthermore, Rosenthal 2015:2) asserts that virtualisation refers to a technique for implementing a virtual machine on a host computer. According to Shimray and Ramaiah (2018:49), a universal virtual computer is an intermediary platform which is on an accessible platform and it can establish a data type for an object during archiving. On top of that, it decodes programs that are proficient in reading the item according to the schema, and this strategy is implemented for writing, decoding and decoding programme for execution (Shimray & Ramaiah 2018:49). At the time of resting the object, an emulator is used to access the platform. The universal virtual computer performs the decoder program to read the archival contents and output the result into a restored program (Shimray & Ramaiah 2018:49). UVC is a general-purpose computer that specifies a process to be executed on an unknown machine of the future (Whitt 2017:160). Whitt (2017:16) identifies the provision of essential functions for an unlimited variety of data types as the advantage of a universal virtual computer. Shimray and Ramaiah (2018:50) state the following advantages: it offers choices for preserving document type resources and software programmes, it decreases the development essential to keep diverse software and platforms unions, and it is intended to read the original object data streams. The writers state the disadvantages as follows: UVC is not tested fully to be seriously considered as a strategy for digital preservation, and investment is essential at the time of archiving in the process of encoding approaches for every data type. The researcher is not convinced that this strategy could be used successfully by the

SABC. In an organisation like broadcasting where technologies are constantly changing, broadcasters need to ask themselves whether using this strategy will necessarily lead to a guarantee of the safety of and access to audio-visual records over a long time. However, the broadcaster must rely on expert advice from the engineers on whether to use it or not.

2.2.5 Computer museum

Computer museum, also called technology preservation, is the strategy that offers the potential to cope with media obsolescence, assuming that the media has not decayed beyond readability (Sigauke & Chadikwa 2012:11). It is viewed as a short-term solution because space, maintenance and other costs tend to rise over time (Sigauke & Chadikwa 2012:11). According to Shimray and Ramaiah (2018:50), computer museum puts more emphasis on the technological setting than on digital objects and preserves the digital object along with the software and the hardware essentials to access the digital objects. It is more of a disaster recovery approach for digital objects where the proper digital preservation approach was not implemented. It is mainly a short-term strategy (Shimray & Ramaiah 2018:50). Shimray and Ramaiah (2018:50) state that computer museum can cope with media obsolescence, if the medium has not disintegrated beyond readability, by sustaining an old operating system and application software which do not function on the present platform. According to Shimray and Ramaiah (2018:50), the advantages of computer museums are: it guarantees the presence of a full range of proposed elements and functions in digital objects and it offers a provision to develop alternative methods and implementation. However, Shimray and Ramaiah (2018:50) assert that the system has the following disadvantages: the long-term care of equipment and the space required to keep this equipment, expert knowledge on obsolete programs is a problem, and it is expensive because it requires proper maintenance of all equipment and software which is not an easy task. The strategy is more focused on technical competency and can offer a respite to the organisation for the long- term preservation of audio-visual records. However, it is not a simple strategy to develop and implement. Broadcasters need to holistically assess the staff skill and competency as well as the budget for buying and maintaining equipment.

2.3 FORMATS FOR AUDIO-VISUAL PRESERVATION

The OAIS reference model is used for this study as a theoretical framework to assess the

preservation across formats in the SABC. The OAIS reference model provides a framework for establishing a common vocabulary for describing roles, processes and functional components that are required for long-term preservation (Reiger 2018:5). In addition to the general models, some organisations are active in the development of preservation standards that are tailored for specific formats (Reiger 2018:5). According to IASA (2017:7), all formats, both carrier based or file based, will not be playable forever. There has been a clear shift from carrier-based formats that store content towards file-based formats where file formats store records in a computer environment (IASA 2017:7). Furthermore, IASA (2017:7) states that it has been envisaged that by 2016, the audio-visual global community archives will be left with 10 to 15 years to digitise all their records. It is also speculated that by 2030, common magnetic media will be beyond the reach of most archives (IASA 2017:8). The organisation should be cautious when transitioning from analogue to digital preservation because the process requires careful investment. The push into full digitalisation is demanding and organisations must seriously consider the evolving technologies and choose those that are relevant for the long-term preservation of audio-visual records. This section discusses magnetic tapes and optical discs as the formats for audio-visual preservation, which is part of the objectives of this study. These formats are discussed because they are the most common types of audio-visual formats and also because they are used specifically by the SABC to preserve records (except Blu-rays).

2.3.1 Magnetic tapes

in the 1950s, the use of magnetic technology was restricted to broadcasters and recording industries and from 1956, the magnetic tape was used for video-recording. Audio-specific tape formats have become part of the computer formats (Schuller 2008:5). Magnetic tapes play an important role as a computer backup medium and there the use of hard-disc drives in professional applications has increased (Schuller 2008:5). Schuller (2008:5) posits that magnetic tape is also spreading to portable recording and replay of audio and video equipment. Cassidy and Breitung (2015:20) posit that open reel tapes are part of the magnetic tape, which was part of the dominant audio-visual recording medium for several years before the digital era. Many institutions have been migrating analogue recordings from unstable tapes to digital media through a process involving playback on vintage equipment and transfer to a new medium (Cassidy & Breitung 2015:20).

2.3.2 Open reel tapes

Open reel tape comes in widths between ¼ inch and 2 inches and the playing standard thickness is 38 microns (Brylawski, Lerman, Pike & Smith 2015:24; Casey 2007:4) and its material is composed of ferromagnetic particles which are suspended in a binder substrate (Brylawski et al. 2015:24). According to Casey (2007:4) and Hess (2008:243), open reel tape contains a base film that provides structural integrity to the tape. The open reel tape has been used for analogue audio recording, especially for field recording (Casey 2007:4; Hess 2008:243). The open reel tape can record at different speeds, described in inches per second (ips) (Hess 2008:243). The three most common speeds are 15 ips, 7.5 ips and 3.75 ips (Brylawski et al. (2015:24). Regarding the playback process, the container that holds the reel, or sometimes the reel itself, has helpful notes left behind by the engineer indicating track configuration, recording speed, and noise reduction implementation. Tape reels should be handled by the edges and the middle hub should be supported, and if the tape reel has been stored as a pancake, the flanges should be stalled (Brylawski et al. 2015:53). In reel tape, a track is a section or bind running along the length that carries an audio-stream and a full track tape machine records one band of the recorded signal carrying nearly the full width of the tape (Casey 2007:16). A ½ track tape machine divides the tape into two tracks, with a guard band in between. A ½ track recording may be mono, with a track running in one direction and another running in the opposite direction; however, a ½ track tape may also be stereo with two recorded tracks running in the same direction (Casey 2007:16).

According to Hess, Irac and Flack (2012:11), some machines have been used all along to record reel tapes and these machines are important for the archives as they are later needed to make the records available to the users. In this study, they are referred to as playback equipment. Hess et al. (2012:11) aver that once a machine for recording in the archives is acquired, it must be tested with non-critical tapes before using it on valuables archival tapes as a malfunctioning machine can significantly damage the magnetic record on the tape. According to Kimizuka (2011:194) and Collopy (2019:5), the first recording machine for the reel tape Magnetophon was introduced in Germany and was used by broadcasters, which resulted in high-quality products. Collopy (2019:5) posits that Magnetophon was the recording medium for broadcasters in the 20th century and was later replaced by PVC and Mylare recorders. The United States of America used the experience

from Magnetophon reel tape recorder and developed their own AB bias recording machine which did not last long, because of the low-quality production (Kimizuka 2012:194). Furthermore, Kimizuka (2011:195) states that Japan introduced the Sendal Metal recording machine which was made of 40% steel, 40% nickel and 20% copper and was later followed by AC bias and DC bias recording machines. Hess et al. (2012:31-35) report on the development of reel tape recording machines and provide hints on their quality. 3M Mincon was used mainly in the 1960s and 1970s, and the parts were available at the time of publication. The Akai is good quality reel tape recorders. The Ampex 300/350 are older type machines and are a bit rough on the tapes and require constant maintenance. Ampex 600 was introduced in 1960 and is hard to restore. The Crown was good in the 1960s but its parts are no longer available. Nagra III can no longer be relied on while Nagra IV is good quality for field recordings. Otai MTR-10 was designed for radio stations, but its quality is poor. Brylawski et al. (2015:24) assert that most reel tape machines for playback are no longer in production.

Reel tapes are fragile and require constant monitoring and better handling to avoid damage. Reel tapes can become stretched, warped and bent when pack tension is too tight and bent flags may cause scrapping of the tape edge during playback (Brylawski et al. 2015:55; Casey 2007:21). Paper-based tapes are prone to damage to the paper itself and the effects are swelling, disintegration and growth of the fungi (Brylawski et al. 2015:55). According to Casey (2007:11), playback can result in twisting or folding along the tape's width if the tape machines do not handle the tape well or are simply out of adjustment. The tape can frill or lose chips of oxide or base because of excessive heat during playback (Hess 2008:245). Playback should be stopped if during the process pieces are flaking off or if a heavy deposit is being left on the playback head or along the tape path (Brylawski et al. 2015:53). Playback is the only system to identify degrading tapes that are unplayable but may result in permanent loss of data (Cassidy & Breitung 2015:29). However, Cassidy and Breitung (2015:29) aver that tapes that are degraded may be restored by baking them at an elevated temperature although the process takes a long time. According to Brylawski et al. (2015:53), an open reel will stretch or break and give malfunctioning playback, especially during fast winds or rewinds. When a tape is suddenly stopped, it causes the outer tape layer to slip past the inner layer which in turn causes a buckling of the tape in the region of the slip (Casey 2007:21). Broadcasters must place reel tape carriers under increasingly more scrutiny because of their fragility, which might result with the permanent loss of valuable

audio-visual records. Such carriers should be digitised.

2.3.3 Audiocassettes

According to Casey (2007:36), analogue audio cassettes were introduced into the market in 1963. Casey (2007:36) asserts that the cassettes are polyester-based and have a speed of 4.76 centimetres, with a width of 3.18 mm. The cassette has two mono tracks, each in a different direction. There are also cassettes with four tracks as two stereo pairs, each in a different direction (Casey 2007:36). Casey (2007:36) states that the tracks from the cassettes are as follows: two pairs of stereo tracks, one on each side. This provides a total of four tracks on the tape (Casey 2007:36). The left and right channels of each stereo pair are located adjacent to each other on the tape, which enables the stereo tape to be compatible with a mono tape; they are also two half mono tracks one on each side (Casey 2007:36). Side A contains one mono track with one programme, while side B contains a mono track with a different programme (Casey 2007:36). Stereo configuration places the two channels of the stereo pair next to each other so that a mono cassette player can successfully play a stereo tape and four mono tracks covering the entire tape, each with discrete content (Casey 2007:36). Casey (2007:44) posits that degradation is more noticeable on the stereo recording because of image shift between the channels.

Cassettes often produce an unwanted sound called “hiss” and the Dolby technique is used to reduce it (Casey 2007:44). For Dolby to be effective, the same level of high- frequency information is required from the day the information was recorded on the cassette for Dolby to clear the track correctly (Casey 2007:44). The instability of cassettes as carriers of audio-visual records threatens the existing valuable records, and broadcasters should find a way to replace them with digital carriers.

According to Casey (2007:37), each cassette has its equalisation requirement that must be provided by a particular playback machine. Cassettes have decks that sense the tape type by reading the holes or notches on the top of the cassette housing or shell; however, some decks are unable to read the shell (Casey 2007:37). Cassettes that have decks that cannot read the shell have a switch that operators use to select the appropriate equalisation (Casey 2007:37). The alignment of the read and record heads must match those of the heads at the point of recording to ensure that information can be retrieved (Casey 2007:38). Casey

(2007:38) posits that the pure pigment that is used in magnetic data is susceptible to oxidation which causes hydrolysis in the polyester urethane binder and this has proven to cause complete loss of information. The high speed produced by the rotating head passing by the moving tape exacerbates damage to the information layer (Casey 2007:38). After the threshold is crossed, information becomes irretrievable and this renders an audiotape a high-risk format for audio-visual records (Brylawski et al. 2015:28).

2.3.3.1 Optical carriers

Optical carriers are the oldest carriers of audio-visual records in the form of photographs and have been in analogue form for almost 160 years. However, for the storage of electronic audio-visual signals, they are the youngest group of carriers (Schuller 2008:7). CDs depend on a laser to read, write and access information, and data appears as marks or pits (Beyers 2003:3). Optical discs are used by many institutions because of the unique features such as authenticity and long-lifetime expectancy (Ito 2015:30). However, Ito (2015:30) argues that attention regarding optical discs was given to materials that are used such as gold or the engraving technologies, but not the characteristics of the optical discs. The aim is to achieve a good level of quality writing where the disc runs at a very high speed, but at the same time must secure compatibility with the written data (Ito 2015:30).

2.3.3.2 Compact discs and digital video discs

According to Kumar and Krishnaiah (2013:158), the standards for 12 cm CDs and digital video discs (DVDs) were established in 1982 and 1996, respectively, at which time the recording capacity required by the applications was the most important issues. Though manufactured differently, CDs and DVDs contain billions of bits and rely on a laser to read and write information (Huisman & Robson 2015:11). France (2015:14) states that CDs are more convenient media for temporary storage and accessing of information; however, they are subjected to deterioration. The deterioration of the CDs might result in the layers undergoing oxidation, hydrolysis and mechanical stress which lead to rot damage (France 2015:14). CD laser reads and writes information from one side while DVD laser reads and writes information from both sides because the bits and lands on the CDs are narrower than those of the DVDs (Huisman & Robson 2015:11). According to Huisman and Robson (2015:11) and Kumar and Krishnaiah (2013:158), DVDs can hold 4.7 billion bytes of

information which is seven times the capacity of CDs. France (2015:14) posits that CDs are more stable and reliable than DVDs. The body of optical discs is composed of polycarbonate which is a transparent polymer and aluminium alloys which are made of gold and silver and are used as the reflective layers (Schuller 2008:9; Finch & Webster 2008:5). Finch and Webster (2008:5) aver that a CD has a protective lacquer layer on its top and sites that protect the data-reading layer. According to Finch and Webster (2008:5) and France (2015:12), the CD reading layer is located below the top surface and the data is read through the bottom surface only. The DVD has no lacquer layer and its data-reading layer is located in the middle of the polycarbonate (Finch & Webster 2008:5).

Optical discs have various formats like read-only memory, and recordable and rewritable (France 2015:12). The design of the CD-ROM (read-only memory) includes a polycarbonate substrate, a metal reflective layer and a lacquer coating. The second layer in the design is a metabolic coating that reflects the laser to read the data in the pits. (France 2015:14). The data-reading layer in the CD-ROM read-only memory is impressed in the polycarbonate during manufacturing as a series of pits and lands which are counted with a reflective metal layer (Finch & Webster 2008:14). According to Finch and Webster (2008:2), both the CD-R and the DVD-R consist of a photosensitive organic dye which is sandwiched between a polycarbonate and a reflective metal layer. A laser writes the information into this layer by effecting a chemical change in the dye causing an irreversible change in the polycarbonate layer (Finch & Webster 2008:2). France (2015:14) states that both the CD-R and the DVD-R contain an organic dye, which is under located the metal reflective layer. Finch and Webster (2008:2) opine that CD-RW and DVD-RW are made of a phase-changing metal which is a place between the polycarbonate and the metal reflective layer. When the phase-changing metal is heated, it reverts to its original state to allow rewriting to take place. Rewritable discs are not recommended for archival use (Finch & Webster 2008:2).

The CD-writable and the DVD-writable are reliable because of the sophisticated error-detection system, which allows the information to be fully reconstructed even if small parts of the medium have become unreadable through damage (Schuller 2008:5). However, France (2015:12) states that these formats are at risk due to a lack of attention from manufacturers to ensure longevity. The damage of CDs and DVDs may lead to error in signal playback but there are measures to assess the damage to CDs, which includes

birefringence, optical skew, transparency and BLER (block error rate) (France 2015:16)

2.3.3.3 Blu-ray discs

Lakshmi, Spandana and Reddy (2012:134) and Kumar and Krishnaiah (2013:157) assert that Blu-ray is part of the optical disc format that was jointly developed by the Blu-ray Disc Association and the leading computer companies. It was established to record, rewrite and play back high-definition video (Lakshmi et al. 2012:134; Patel & Patel 2013:675). It can store sound and video while maintaining a high quality of data, provide proper storage and best access and easy-to-use way (Lakshmi et al. (2012:134). Blu-ray discs are associated with a set of multimedia formats which allow video and audio to be stored with a greater definition (Patel & Patel 2013:675). According to Lakshmi et al. (2012:135), Blu-ray discs have the same physical format as CDs and DVDs and a single Blu-ray disc can store 27 GB while a double disc can store 54 GB (Lakshmi et al. 2012:135; Kumar & Krishnaiah 2013:157). Data is placed on top of a thick polycarbonate layer, which prevents data from birefringence and other readability problems, and the recording layer that is placed closer to the objective lens eliminates the problem of disc tilt (Lakshmi et al. 2012:135). Data is placed closer to the surface with a hard coat that is placed on the outside of the disc to protect the disc from scratches and fingerprints (Lakshmi et al. 2012:136). Blu-rays are designed to store digitally encoded video and audio information in pits with spiral grooves that run from the centre of the disc to the edges (Lakshmi et al. 2012:136). Furthermore, Lakshmi et al. (2012:136) and Patel and Patel (2013:675) aver that the disc contains more information with smaller and more closely packed pits, which results in precise reading. The smaller pits, beam and shorter track pitches together enable a single-layer disc to hold more than 25 GB of data, which is about five times the amount of data on a DVD (Lakshmi et al. 2012:136).

According to Lakshmi et al. (2012:137) and Kumar and Krishnaiah (2013:158), Blu-ray discs have characteristics that include the following: more than two hours of HDTV can be placed on a single layer BD, which correlates with more than 13 hours of standard television; the transfer rate is 36 megabytes per second; it uses a blue laser for recording which has a shorter wavelength of 405 nanometres than the red laser with 650 nanometres. According to Kumar and Krashnaiah (2013:163) and Patel and Patel (2013:678), Blu-ray disc has some advantages, which are: provision of random access because it can jump from any

spot on the disc; provision of good searching due to the ability of quick browsing; it creates playlists by changing the order of the recorded programmes and editing of recorded video; it automatically finds an open space to avoid recording over a programme; it records and playback video simultaneously; it enhances interactivity which provides space for more programmes and games; it improves the picture and sound and enables broadband, web content and the downloading of subtitles. The CD and DVD players cannot use Blu-ray disc; however, Blu-ray disc with infra-red, red and blue laser can play all kinds of CDs and DVDs (Kumar & Krishnaiah 2013:165). According to Patel and Patel (2013:681), Blu-ray discs require proper handling, which includes: they should be handled by the outer edges, by the centre hole or by the centre hub clamping area; they should not be dropped or exposed to direct sunlight, excessive cold, heat or humidity; they should be handled only when they are used; and they should be stored in jewel cases or video boxes.

2.3.4 Digitisation of audio-visual formats

Digitisation of audio-visual formats can be defined as conversion of archival records from formats that can be read by people to a format that can be read with the help of technology (Asogwa 2011:3). Digital formats are suitable for improving access to and usability of original records (Asogwa 2011:4). Archivists should ensure that during the process of digitising, the formats of records are not tampered with and this could be qualified through the application of format standards which ensure easy access to records (De la Porte & Higgs 2019:11). According to Asogwa (2011:4), digital formats are good for archives because the digital files may be read, reformatted, compressed, transferred and retrieved over network computers. The digital formats should be broadly accessible across platforms and based on standards because they depend on software to read and play digital records (Groenewald & Klapwijk 2010:22). Authors are of the view that archivists should be abreast of international digital formatting standards and the best practice is to standardise digital formats for specific kinds of digital objects (Groenewald & Klapwijk 2010:22).

2.4 TECHNOLOGIES USED FORM AUDIO-VISUAL RECORDS

This study uses the OAIS reference model as a framework. The OAIS model is centred on the information package, which contains the metadata needed for long-term preservation, access permission and how all the data should be interpreted when it is accessed (Rosa,

Craveiro & Domingues 2017:24). This section discusses the technologies that are used for the preservation of audio-visual records.

2.4.1 MPEG technologies

According to Day (2010:25), MPEG-7 provides an important, comprehensive audio-visual description. Day (2010:24) posits that the description is based on catalogues, semantics and structure. However, Day (2010:24) also states that MPEG-7 does not have standards that are required for the automation of the extraction of audio-visual description features. It is also unable to specify the search engines or other programmes that make use of the description (Day 2010:24). The Moving Picture Expert Group (MPEG) is part of a group that resorts under the International Standard Organisation (ISO) and International Standard Organisation and International Electro-Technical Committee (IEC) and that is in charge of the international standards for compression, decompression, processing and coded representation of moving pictures, audio and a combination of the two (Dighe 2015:757). MPEG formats are grouped into different types according to their functions (Dighe 2015:757). The MPEG-2 system is used for digital broadcast and optical disc storage because it defines the multiplexing and synchronization of video and audio compressed data (Schierl 2011:4). The other advantage of MPEG-2 is that it can take several formats and it addresses the combination of elementary streams of audio, video and other data into multiple streams which are suitable for storage (Schierl 2011:4).

MPEG-2 also provides information that enables synchronised decoding of multimedia information over a wide range of retrieval and receipt conditions (Schierl 2011:4). According to Schierl (2011:4), MPEG-2 has a programme system of coding which has streams that are used to retrieve data from almost lossless media such as CDs and DVDs. Ponlatha and Sabee (2013:550) aver that MPEG-2 provides specifications for how to combine multiple audio, video and private data streams into a single multiplexed stream and support a wide range of broadcast and storage applications. According to Day (2010:25), MPEG-7 is helpful in audio-visual preservation because it supports and facilitates various applications, including content broadcasting, making it possible to quickly and efficiently search for various types of multimedia material. MPEG7 enables television users to search for programmes stored in thousands of hours of audio-visual records (Dighe 2015:757). It also provides content description standard that addresses how users can interact with computer

systems by providing a rich description (Dighe 2015:757). According to Dighe (2015:757), MPEG-7 has the following elements (Figure 2.2), the first three of which contain the information that is related to the management of the content:

- Creation and production that contain metadata information describing the creation and production of the content and have title, creator, and purpose as features.
- The usage element contains metadata information about the usage of the content with features like rights of access and publication.
- The media element contains the description of the storage media with features like storage format, the encoding of the content and elements of the identification of the media.
- The element of the structural aspect describes the content as perceived by its structure.
- The last element is the conceptual aspect, which is about the conceptual notions.

Figure 2.2 indicates the value of MPEG-7 for broadcasting archives. As shown in the picture, different types of descriptions can be created with the description tools in MPEG-7. Broadcasters could use the following tools to ease the process of preservation of audio-visual records. These tools could be effective for broadcasting archives: the media tool, which describes the storage media, coding, format and quality; the creation tool, which describes the process of identification like title, producer, presenter and these items would be ideal for developing a file plan; and the usage tool, which describes the conditions of using archival products.

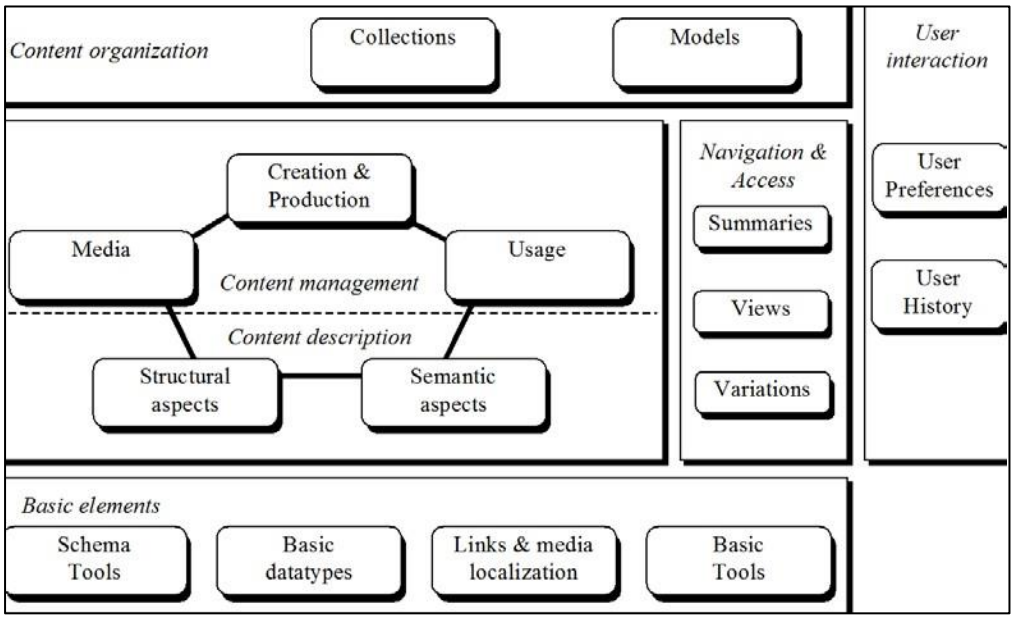


Figure 2.2: Overview of MPEG7 multimedia description scheme (Dighe 2015:759)

2.4.2 Archivematica

Archivematica is an open-source digital system that was developed by Artefactual Systems (Rowe 2016:43). In 2007, Kevin Bradley, Junran Lei and Chris Blackall came with the suggestion of building a sustainable system instead of expecting some permanent storage to solve the challenges of digital preservation (Garderen, Jordan, Hooten, Mumma & McLellan 2012). At the same time, Artefactual Systems was busy developing their generic Qubit information toolkit software which resulted in the establishment of Archivematica (Garderen et al. 2012; Rowe 2016:43). Archivematica is in line with the OAIS reference model which is the proposed framework for this study and, according to Rowe (2016:43), the services of Archivematica are modelled on OAIS functional requirements as outlined in the International Standard Organisation (ISO 20126). Archivematica allows digital preservation professionals to process digital transfers, arrange them into Submission Information Packages (SIPs), apply media-type preservation plans and create high-quality repository-independent Archival Information Packages (AIPs) (Garderen et al. 2012). Archivematica is also designed to upload Dissemination Information Packages (DIPs) containing descriptive metadata and website ready access to any access system (Garderen et al. 2012). Garderen et al. (2012) assert that Archivematica applies media-type preservation plans that are based on an analysis of the significant characteristics of file

formats. According to Goodchild and Hurley (2019:5), Archivematica creates preservation-friendly packages for long-term storage and management. According to Thomas (2015), Archivematica has benefits such as: it uses open software that contributes to the larger community, it uses open-source tools to normalise into preservation formats, it is cheaper, it is easy to customise workflow for digital preservation, and it is easy to use.

2.4.3 Preservica

Cochrane, Tilbury and Stobbe (2015:1) describe Preservica as a digital preservation system that combines all the elements of the OAIS reference model into a single system and its inclusion fits well into this study, as this study uses the OAIS reference model as framework. Preservica includes tools that ingest simple and complex data objects and store them in multiple data stores with full fixity checking (Cochrane et al. 2015:1). It has flexible data management capability with an access module that enables the information to be searched, browsed and downloaded (Cochrane et al. 2015:3). Preservica is a full file format preservation suite that identifies and characterise content and has the ability to migrate it to another format (Cochrane et al. 2015:1). Thomas (2015) states that the community benefits from Preservica because there are no special project payments, its developed features contribute to future release enhancement, there is customisation of workflows, preservation copies can be made at any time after initial ingest, there is an integrated public access piece that automatically pushes records to external user. However, Thomas (2015) asserts that Preservica is costly to maintain and has propriety challenges as it does not contribute to global community. According to Digital Preservation Coalition (2018:99), Preservica provides fully automated ingest procedures and the benefits are that it includes steps such as virus scanning, checksum calculations, file characterisation, technical metadata extraction, and file format normalisation. It also assists with packaging content and storing it in a repository.

2.4.4 Broadcast Wave Format

The Broadcast Wave Format (BWF) is an extension of the WAV audio format consisting of few metadata elements that are necessary for broadcasting and archiving (Melvin 2014:5). The BWF consists of chunks and sub-chunks and because BWF is inoperable with legacy systems, if the system does not understand the chunk, it ignores the chunk and forward it

(Melvin 2014:5). The European Broadcasting Union (EBU) has a standard for WAVE format which allows additional metadata to serve the needs of the broadcaster (Federal Agencies Audio-visual Working Group 2011:3). The importance of the standard is to be compliant with loudness for digital audio materials because data management toolsets must be loudness aware in order to properly read and manage such files (Federal Agencies Audio-visual Working Group 2011:13). The broadcaster produces born-digital records and if they consist of Broadcast WAVE files with embedded loudness metadata, it becomes easy for the archives to retain that metadata and this would be beneficial to the SABC (Federal Agencies Audio-Visual Working Group 2011:13). The file consists of three chunks: the format chunk which describes the format of the sound information in the data bus-chunk, the data chunk which stores the size of the sound information and contains raw audio data, and the broadcast audio-extension chunk which provides additional fields to enable exchange of content between broadcaster (Melvin 2014:5).

2.5 STAFF SKILLS AND COMPETENCIES FOR AUDIO-VISUAL PRESERVATION

This section discusses the staff skills and competencies for audio-visual preservation. This study is constructed along with the OAIS reference model which is also relevant for this section. According to Rowe (2016:43), the OAIS framework establishes a minimum requirement for a digital preservation repository along with a set of archives concepts that address all the major activities of an information preservation repository. Gallinger (2017:13) avers that the OAIS enables the digital archivists to understand what workflows should be adopted to maintain the authenticity of increasingly complex forms of digital audio and video files. According to Kim (2015:284), there is a shift from credit hours to a competency that is demonstrated by institutions like Indiana University Purdue. These universities and other institutions are currently offering competency-based professional degrees (Kim 2015:284). According to Kim (2015:284), this might have an impact on the area of library and information science. However, there is one area of concern which is how to systematically link competencies to student learning outcomes or assessment of student learning. However, Ngoepe, Maluleke and Onyancha (2015:119) argue that the findings by Kim (2015) could be challenged if Africa and other developing countries had researchers in archives and records management. Digital records offer the opportunities of multiple access, instant transmission and efficient retrieval (Katuu & Ngoepe 2015:1). This assertion calls on employers to ensure that their staff receive training. This study will discuss the

following aspects of the skills requirements for digital preservation, tertiary training and in-service training.

2.5.1 Skills requirements for digital preservation

According to Mason and Halvarsson (2017:1), organisations need trained and expert staff who provide good services and advice to the user. Yusof and Eusoff (2011:23) argue that since the emergence of information technology, the archive is forced to respond to technology through automation. Mason and Halvarsson (2017:2) assert that the following skills are important for digital preservation: technical, metadata, communication, domain and digital preservation knowledge, preservation planning designated community, access and searching skills, and legal requirements. Gallinger (2017:12) posits that digital preservation requires ongoing efforts to learn and stay current with new practices, formats, concerns and standards. Resources should provide learning in a way that guides practitioners to be lifelong experts (Gallinger 2017:12). According to Gallinger (2017:12), the following skills are important for digital preservation: strategy and planning preservation, storage system management, audio-visual content preservation, digital forensics, scheduled fixity checks, provision of access, emulation and virtualisation, and developing and communicating preservation priorities. While Mason and Halvarsson (2017) and Gallinger (2017) emphasise the focus on critical and specific skills for digital preservation, Edmondson (2016) argues for more general skills as long as they have relevance on digital preservation. Edmondson (2016:14) avers that the following digital preservation skills are important: history of audio-visual media; a history of audio-visual archiving; an understanding of contemporary history; knowledge of the recording technologies of the various media; basic understanding of digital concepts and technology; a technological basis for preservation and access; collection management, strategies and policies; understanding of intellectual property law and concepts and understanding of advocacy and concepts. This section will further discuss the following competencies that are viewed as important for the digital preservation of audio-visual records: digital preservation plan, technical, metadata and communication.

2.5.2 DIGITAL PRESERVATION PLAN

According to the IRMT (2016:64), the skill of digital preservation is the design of a trusted

digital repository (TDR) because it provides the trusted environment for preserving digital records generated throughout and organisation. This skill is needed to design TDR that is modelled on OAIS standards because they support the functionality needed to preserve the integrity and authenticity of records (IRMT (2016:64). The skill in TDR design includes organisational structure and regulatory framework. Organisational structure dictates the configuration of digital repository software and its rollout while the regulatory framework ensures that records are regularly transferred to TDR for preservation. Competencies in TDR require knowledge of the formats that are being produced in the organisation; knowledge of OAIS standards, TDR audits and certification standards; as well as an understanding of records normalisation, metadata, and technical infrastructure to support TDR, type of management structure, migration periods and access points (IRMT 2016:65).

2.5.3 Technical competency

This competency requires the person to be trained in technical infrastructure to implement, support and maintain digital records (IRMT 2016:57). Furthermore, the IRMT (2016:57) asserts that the person must have the ability to access the technological infrastructure and analyse the server space. According to Ndhlovu and Matingwina (2018:12), technical competency for digital preservation includes management of the database, the use of scanning machines, the use of firewalls to protect digital records as well as knowledge of hardware and software.

2.5.4 Metadata competency

The person should be able to identify the generation of metadata that is associated with digital records (IRMT 2016:54). Skill in how metadata are migrated about the changing technologies is required and it is important for the person to find out if metadata is linked, wrapped or embedded (IRMT 2016:54). Linked and wrapped metadata is stored separately from the records using a unique identifier while embedded metadata cannot be disassociated from the digital records (IRMT 2016:54). The person is required to know the metadata standards like ISO Standard 23081 and metadata encoding and transmission standards (IRMT 2016:54).

2.5.5 Communication competency

According to Ndhlovu and Matingwina (2018:9), communication competency enables the person to present the case about the importance of digital preservation. The person will be able to solve problems amicably and advocate the importance of digital records. Ndhlovu and Matingwina (2018:9) state that communication competency enables the staff to present the best and most persuasive proposal to the senior management.

2.5.6 Tertiary education

Tsvuura and Mutsangondo (2015:468) state that Zimbabwe, as part of the developing countries in Africa, has tertiary institutions that have enabled record management to be recognised regionally and internationally by producing graduates who operate at all levels of records management. Furthermore, Tsvuura and Mutsangondo (2015:465) argue that institutions of higher learning should produce record managers who contribute to the continuity of the organisation through efficiency and effectiveness. Higher institutions of learning like universities and colleges are also offering courses for archives and records management. Noko and Ngulube (2015:272) state that the aim of the courses at higher institutions of learning is to equip students with practical skills that are relevant to the work situation. There is a growing demand for highly skilled and academically trained students and this forced the higher education institutions to shift from the custodial approach to the one of promoting access to and use of information (Noko & Ngulube 2015:276). In their study of the archives and records management courses offered at higher institutions of learning in Zimbabwe, Noko and Ngulube (2015:27) established that some students are not comfortable with the curriculum because it is too theoretical. The importance of training for archives and records management is emphasised by Ngoepe, Katuu, Crocker, Spelay and Willmott (2018:7) stating that records management programmes in Africa lack standardisation which result in different programme structures. The Higher Education Qualification Framework (HEFQ 207) in South Africa is good in addressing the skewed standards in archives and records management courses; however, a section of the society is not happy with the changes (Ngoepe et al. 2018:10).

2.5.7 In-service training

There are several ways in which staff receive training for skill development. Tsvuura and Mutsangondo (2015:465) postulate that staff can use seminars, workshops and conferences to acquire skills. Others are resorting to in-service training, which is a programme that is undertaken by the employer to provide training while employees are on duty. An example of in-service training is the NASA plan that captures the experience of retiring employees through interviews (Noe 2008:16). NASA identifies experts in areas like propulsion and shuttle life support, record them on video-tape and turn these recordings into programmes that are used to train employees internally (Noe 2008:16). The other example of in-service training is the Department of Urban Development in the United States of America which also uses the experience of retiring employees (Noe, 2008:16). The department encourages the experts to offer a presentation at workshops available to all the employees of the Department of Urban Development (Noe, 2008:16).

Organisations like broadcasters can use training manuals from institutions like IASA and the IRMT to implement training for their staff. The organisations should inspire the employees to be drivers of change in the archives by providing them with the opportunities to engage in challenges brought by new technologies in the archives. The interventions should be well meant in improving the knowledge and skill of staff to digitise the audio-visual records. Organisations can use training modules for digital preservation from institutions like IASA and the IRMT to train their staff internally. As outlined by IRMT, the purpose of one of its modules on digital preservation was to provide staff with current digital preservation practices like digital strategies, information technology (IT) environments, databases and desktops (IRTM 2016:6). IASA provides guidelines for the preservation of audio-visual records. The module covers the following: conservation treatment and retention of original physical material, which includes rehousing and cleaning of records; digitising or digitally transferring content into the form of sustainable digital data or acquiring born-digital content already in sustainable form; management of data over the long term, which involves the management of data through digital repositories or asset management systems; and an OAIS model which is very helpful in preservation-oriented repositories (IASA 2017:4). The importance of in-service training can also boost the effective management of digital records.

Katuu (2015:4) asserts that there have been many discussions about digital records, but

organisations have failed to share their experiences among themselves. The sharing of experiences by organisations with employees would have resulted in increased knowledge of digital preservation. This suggests that a similar organisation can also exchange programmes on training their staff. Katuu (2015:7) further states that awareness of both research studies and industry development are critical to ensure that records managers are clear about digital preservation practices. According to Ngoepe (2017:31), public institutions in South Africa have begun the implementation of digital records management but still lack the infrastructure for ingesting a digital repository. The training offered internally will empower the staff and avoid permanent loss of valuable records (Ngoepe 2017:31). The introduction of records management systems by Rand Water in South Africa can be used as an example where staff members are allowed to learn and implement the systems. Rand Water introduced records management in 1991, and in 1996 they migrated to another system which was discontinued. The new system was introduced in 2009 and was still in use in 2016 (Ngoepe 2017:32). The researcher is of the view that in-service training will be suitable to broadcasters as the staff will be sharing experiences of digital preservation among themselves.

2.6 APPROPRIATENESS OF STORAGE FOR AUDIO-VISUAL RECORDS

OAIS is a conceptual model that aims to identify the functional components that should be part of an information system that is dedicated to digital preservation (Costa, Folho & Becker 2017:83). Furthermore, the authors state that the OAIS reference model developed from an initiative that was aimed at developing a set of standards that would regulate the long-term storage of digital information that is produced. This section will discuss the appropriate storage for the preservation of audio-visual records. The study will focus on the building, shelves, humidity, temperature and others things like lights, insects and water. The discussion will be in paragraphs but not according to themes because the themes are more interrelated. The discussion will be guided the by OAIS reference model which is the framework selected for this study.

According to Brylawski et al. (2015:65), dryness, coolness, cleanliness and reliable temperature are important aspects for the storage of audio-visual records. Brylawski et al. (2015:67) postulate that there are no exact guidelines for best temperature and humidity levels for audio-visual records, and archivists are using common practices for the storage.

Humidity has a direct and indirect chemical impact on audio-visual records (Schuller 2008:12). Direct impact happens when the humidity is 70% or higher and this results in the growth of fungus, which causes audio-visual records to not play (Schuller 2008:13). Temperature causes physical harm to audio-visual carriers because the carrier shrinks and expands during falling temperatures (Schuller 2008:12). A cooler room temperature and humidity levels of 68º F (20º C) and 30 – 50% general humidity. The average levels for long-term storage are 46 – 53º F (8 – 12º C) and 25 – 35% general humidity (Brylawski et al, 2015:67).

Furthermore, Brylawski et al. (2015:67) aver that magnetic records should not be stored below 46º F and (8º C), and audio-visual records should not be stored below freezing temperatures. According to IASA (2017:33), storage conditions for the audio-visual records are determined by two conflicting principles: to keep humidity and temperature low and to avoid climate changes. The required levels for audio-visual storage are a maximum humidity of 60% general humidity and a minimum of 25% general humidity. The temperature's maximum should be 35º C and minimum of 8º C, and for magnetic tapes, it should be 35º C (IASA 2017:33). These levels have no negative impact on short-term storage but are important for medium- and long-term storage of audio-visual records. Climatic conditions of the recording studios should be the same as storage conditions and carriers should be adequately acclimatised during the temperature and humidity inspection (IASA 2017:34).

According to IASA (2017:35), mobile shelves are not recommended for shelving of audio-visual records. IASA (2017:35) and Brylawski et al. (2015:65) state that open shelving should be used for the storing of discs with the flat, winding pack only to avoid curled tape edges. Brylawski et al. (2015:66) state that the shelves for audio-visual records should be smooth and without gaps or protruding hardware. The shelves should be on a level flooring and evenly loaded on both sides of the unit to balance weight, while the units should be secured from the floor (Brylawski et al. 2015:13). There must be enough space between the shelves to enable movement of the people and the shelves must be of metal or wood and some records can be put on shelving boxes (Brylawski et al. 2015:66). Shelves for discs and open-reel audio tapes must have additional dividers (Brylawski et al. 2015:66). Wooden shelves must be avoided and the building for storage should be tightly sealed with windows and doors that are enhanced with locks (IASA 2017:38). Carpeted floors are not

required for audio-visual records storage (IASA 2017:38). Floors should be of concrete and covered with chemically inert material or lacquer, or non-abrasive minerals (IASA 2017:38). The colour of the floor should be such that it makes the dust visible and it must prevent insects (IASA 2017:38). The air-conditioners must have air filters that will help to prevent dust from coming into the storage (IASA 2017:38).

Brylawski et al. (2015:67) state that audio-visual records must be stored on the floor and must be protected against sunlight (IASA 2017:40) postulates that light and ultraviolet radiation for audio-visual records must be avoided because they affect audio-visual records negatively. Direct sunlight exposure can render audio-visual records unreadable within weeks (IASA 2014:41). According to IASA (2017:41), it is recommended that archives install an ultraviolet (UV) light system in storage rooms, especially in areas where lights are switched on for a long time. Schuller (20108:13) indicates that tests have shown that audio-visual records are permanently damaged when they are exposed to direct light for a long period of time. It is important to have the audio-visual storage away from pipes and electrical conduits (Brylawski et al. 2015:66). According to Schuller (2010:13) and IASA (2017:41), loudspeakers, dynamic microphones, and moving-coil instruments produce stray magnetic fields which are not good for audio-visual records and must be applied with extreme care in the storage. The use of magnetic board stickers and magnetic door shutters and electrical welding must be avoided in the storage (Schuller 2010:13).

2.7 ACCESSIBILITY OF AUDIO-VISUAL RECORDS

According to IRMT (2009:36), the OAIS model requires digital repositories to meet the requirements set out, which have become standards by which all trusted digital repositories are measured. OAIS is also useful due to the standardisation of the terminology and concepts that are used to describe records as well as the availability of an established and tested model for the capturing of the preserved metadata (IRTM 2009:36). The OAIS reference model is an ISO standard that defines the process for effective long- term preservation of information and, at the same time, ensures proper access to information (Cruz-Mundet & Diez-Carrera 2015:228). This study explored the preservation of audio-visual records by the SABC in the Limpopo regional offices using OAIS as a theoretical framework.

This section discusses access as a part of and the last function in the OAIS reference model. Many archives are moving to digital encodings of their records and this offers several advantages, which include the ability to provide access to records to more people than was the case with physical assets and analogue media. Verbruggen, Schuurman, Kovacs, Markovich, Pekel and Kamenov (2014:15) note that born-digital records are ready for online access, and access copies require constant transcoding and migration; however, some broadcast archives still have difficulty to decide which records to keep for future access. The advantage of online access to records is that audio-visual records are available from many platforms like Wikipedia, mobile applications and educational platforms (Verbruggen et al. 2014:27). The section will cover cataloguing, metadata and indexing of audio-visual records as tools that are used to provide easy access to the audio-visual records.

2.7.1 Classification

Classification is one of the tools that is very helpful in enabling users to access information. Joseph, Debowski and Goldschmidt (2012:64) posit that classification is the identification and arrangement of activities into categories of logically structured methods. Classification is related to systematising information for retrieval and it has similarities with retrieval fields, but differ on the application (Yusof & Mokhtar 2015:2). Classification assists in the efficient guiding of the user to the correct information. Classification evolved from subject based in the library and developed to function based in records management (Yusof & Mokhtar 2015:3). Function-based classification is relevant to this study because the study is involved with the digital preservation of audio-visual records. Yusof and Mokhtar (2015:3) aver that function-based classification maintains the original order of the record by abiding with theories of provenance, which ensures the evidential value of records. It provides information on the structure and the functions of records remain intact. Function-based classification is more stable than subject-based classification because it provides context for the records, rather than content (Yusof & Mokhtar 2015:3).

2.7.2 Indexing

According to Radzuan, Yatin, Junaide and Mazlan (2018:203), indexing is the first step in retrieving and accessing information. It simplifies the recovery process by following the four levels of a process which are: specification, tokenisation of document, processing of

documents and index building. Indexing systems help the users to get the information easy and fast. Joseph et al. (2012:65) state that automation of indexing harms the access to information. It cannot handle user-based errors and omissions but steps have been taken to correct the situation. Radzuan et al. (2018:203) identify the following types of classification: (1) Full text which requires unique words to identify similar documents. It is automatically created in computer software which shows the last list and location of documents that have been saved in the database. Users can find documents using any matching term and text regarding the document. (2) The second type is specialised indexing which is more specific as users find results that are more reliable than the general index. (3) The third type is the electronic indexing. Users can find information by using any keyword, the title of the material once. Electronic indexing provides extra search by locating information with any word in the article, year of author. Concerning electronic indexing, Joseph et al. (2012:66) posit that automated indexing has minimised the complexity of classification in EDMRS because their main purpose is to reduce human error. Current technologies enable automatic capturing of static metadata from structured documents and records into EDRMS using specifically common document templates. Furthermore, Joseph et al. (2012:66) aver that rule-based search engines offer the capacity to automate the classification of structured and unstructured information.

2.7.3 Cataloguing

A catalogue is also a tool that is used to enable users to access information from a variety of formats like audio-visual records (Esse 2013:16). Radzuan et al. (2018:) state that cataloguing is a process that creates metadata and represents information sources such as sound recordings and moving images. The information source resides in audio-visual carriers. Furthermore, Radzuan et al. (2018:204) assert that cataloguing is done through a record bibliography. It provides an easy and simple search by users for items through manual or electronic methods. According to Radzuan et al. (2018:206), the machine-readable catalogue is a computer that can read and interpret data in cataloguing records. Marc is a standard format for cataloguing that uses data format for cataloguing in digitalisation.

2.7.4 Metadata

Metadata is the description and provision of information about data which enable the user to locate and find data easily (Radzuan et al. 2018:211). Diao and Henandez (2014:2) assert that metadata is an intellectual and complex activity that allows users to access information from a network environment through the application of skills such as identification, evaluation and critique. Metadata enables the creation of authentic, reliable and truthful description of data that provides precise access to records based on standards and principles. Melvin (2014:3) asserts that it is better to apply metadata interoperability within an audio preservation framework to ensure accessibility through technical specifications and bibliographic control. Cooper, Sapiro, Anderson and Hall (2016:5) assert that metadata construction requires proper consideration of the potential users so that they can access the record from all types of formats.

2.7.5 Online access

The following is an example of audio-vial records that are accessible to the public through the use of technological access tools. According to Verbruggen et al. (2014:22), the Memorian, which is a heritage preservation network in Switzerland provides access to audio-visual records to the public through online public platforms. These platforms enable users to freely view platforms and retrieve the records. Furthermore, Verbruggen et al. (2014:23-25) establish the following access of audio-visual records to the users. In Denmark, the public broadcaster has a website that offers entrance to digitised recordings. The Spanish broadcaster, Radio Television Espanola (RTVE), uses a platform called Alecerta to provide access to the archive's records. The Norwegian Broadcasting Corporation is legally required to provide access to audio-visual records which are in a linear programme with the aim of making them visible. The Norwegian broadcaster is in the process of improving its access conditions. Bsir and Jamoudi (2014:4) state that the Sultanate Oman public authority for radio and television uses cataloguing, classification and indexing to make their audio-visual records available to the public.

The Jones Archives has about 80 fields of metadata. These fields are broken down into smaller structures to enable proper logging of metadata to different types of items, audio, video, textual documentation and musical notation. Although the structure seems to be complex, it is necessary to ensure that all items of metadata are attached to the relevant artefact at the appropriate level of audio-visual records. (Cooper et al. 2016:7). Greifeneder,

Lund, Larsen and Skov (2014:3) state that the Danish radio archives have a poorly organised metadata for audio-visual records. The only metadata available is title, programme, date, channel, length and name of the broadcaster. However, the broadcaster is researching the seeking behaviour of users. The radio station's archives have a technical infrastructure, which is based on ICT platform called Cultural Heritage Open Access System and the user's interface LARM FM. This provides access to archives' records as well as tools to search, annotate and collaborate with files. Both the platform are open sources. The challenge to Danish radio is the limited records that were preserved for access from 1930 to 1985, and still very few of the audio-visual records are digitised. The other challenge for the Danish archives, according to Cooper et al. (2016:9), is that users are heterogeneous and single metadata that is applied by the station fails to fulfil all the users' needs. This research wanted to establish the following: What metadata is needed for radio material? Do users adopt and understand the chosen metadata scheme? Does collaborative metadata enhance work? The overall answer to the questions is that users want to have more access to the records and rely on tools they are accustomed to.

Cheby (2016):3) states that online access is beneficial to the archives because metadata can easily be used to discover content because interoperability allows metadata to be read by multiple systems. However, Cheby (2016:4) argues that even if this technology is fast, it still requires personal data to monitor the process, implying that the archive would have to employ people with adequate skill and competencies.

Classification is widely used but can be troublesome to assign and is open to subjective interpretation. An indexing system is valid within the local domain, which limits coverage and utility to the global domain. Locally generated identifiers metadata are easy to produce and statistically unique but cannot be used to link related assets and do not have a discovery mechanism that cannot resolve complicated metadata.

2.8 SUMMARY

Chapter two provided the reader with the strategies for review of the literature and then moved to the value and the approach to a literature review. The chapter discussed the following themes which are the objectives of this study which are to determine the preservation strategies by the SABC in the Limpopo regional offices, identify types of

formats of audio-visual records that are kept by the SABC in the Limpopo regional offices, determine the technologies used for the preservation of audio-visual records by the SABC in the Limpopo regional offices, assess the staff skill and competencies in the SABC in the Limpopo regional offices, assess the appropriateness of the storage of audio-visual records in the SABC in the Limpopo regional offices, determine the accessibility of audio-visual records in the SABC in the Limpopo regional offices and propose a framework for the preservation of audio-visual records at the SABC in Limpopo regional offices. The next chapter addresses the research methodology adopted in this study.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter discussed the literature concerning the preservation of audio-visual records and focused on the following topics based on the objectives of this study: strategies for digital preservation of audio-visual records, formats that are used for audio-visual records, techniques that are used for audio-visual records, staff skills and competencies for audio-visual preservation and appropriateness of the storage for audio-visual records. Kothari (2004:80) defines research as a way of systematically solving the research problem which involves steps that are adopted by the researcher who, in the process, provides the logic behind every step that is taken. Furthermore, Kothari (2004:8) states that the researcher must specify what decisions were taken and how such decisions were taken so that the readers can evaluate the study. Igwenagu (2016:5) describes research methodology as a systematic technique used in research to guide the search and how that search is conducted. According to the above authors, research methodology is a roadmap that directs the person to reach the destination without problems. Rajasekar, Philominathan and Chinnathambi (2014:6) provide the following reasons for the research to use research methodology:

- Why is a particular research study taken?
- How does one formulate a research problem?
- What types of data were collected?
- What particular methods were used?
- Why was a particular technique of analysis used?

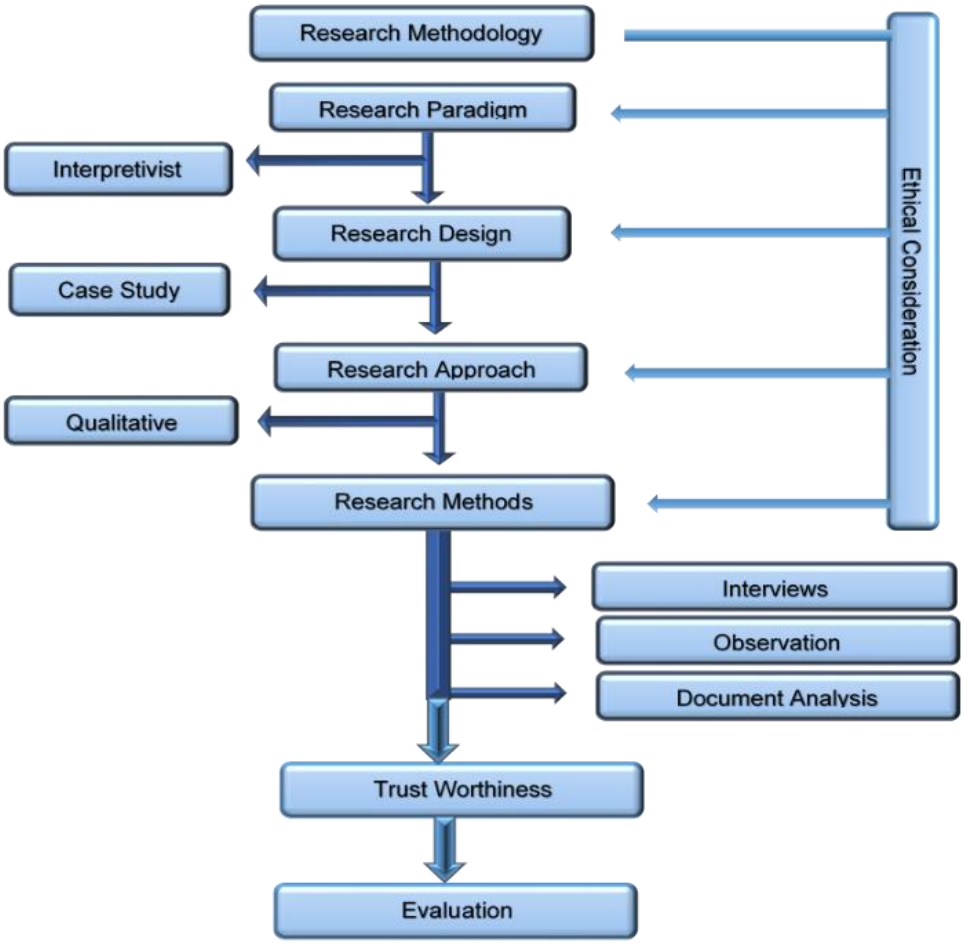
Igwenagu (2016:5) mentions the following advantages of research methodology for the research:

- Advancement of the wealth of human beings.
- Provision of tools for doing the research.
- Development of a critical and scientific attitude, disciplined thinking to survey.
- Assistance to inculcate the ability to evaluate and use research results with

reasonable confidence and in decision-making.

- Inculcation of the ability to read and think critically.

The purpose of this chapter is to discuss and clarify the route that the research is taking in this study. It contains the draft plan for researching with the prospect of providing valuable and usable results to the readers (Rajasekar et al. 2014:6; Igwenagu 2016:5). Figure 3.1 depicts the steps that arise from the methodology for this study.



As reflected in Figure 3.1, this study used a case study design within a qualitative approach to retrieve meaning and understanding from the participants (Tracey 2013:27). The case study design was used to get rich and in-depth information from the participants because of their understanding of the case (Bickman & Rog 2009:255; Mohajan 2018:11). According to Tracey (2013:27), the qualitative approach is important because it begins with an open-ended question and then slowly narrows the focus, which results in the purpose of the study, data collection, data analysis and data interpretation becoming more instinct.

The study employed unstructured interviews, non-participative survey and document analysis as tools to collect data. These data collection tools are flexible and allow for decisions to be changed while engaging in fieldwork (Moser & Korstjens 2018:12). The study applied thematic data analysis which, according to Wang, Wang and Khalil (2018:204), provides the findings that can be used effectively by decisions-makers of the organisations to make interventions to ensure that the study is trustworthy (Nowell, Norris, White & Moules 2017:3). The researcher had already identified the problem and the theoretical framework, and had developed objectives for the study, and all these put the researcher in a better position to select a research methodology that is capable of providing answers to the research question (Kumar 2011:47). This chapter covers research paradigm, research approach, research design, data collection methods, population and sampling, trustworthiness, data analysis as well as evaluation of methodology.

3.2 RESEARCH PARADIGM

Chilisa and Kawulich (2012:51) state that paradigms are philosophical assumptions about the nature of reality, ways of knowing things, ethics and value systems. It is therefore necessary to find answers to what are the ethical considerations for the study and the research (Chilisa & Kawulich 2012:53). A paradigm is the stage where the researcher decides on the types of sources of data and the assumptions guiding the selection of participants, which involves ethics (Chilisa & Kawulich 2012:53). Once the researcher has identified the paradigm in which research questions fit, the aspects of ethics will flow easily, as well as the selected methods and the selected participants (Chilisa & Kawulich 2012:59). According to De Vos, Strydom, Fouche and Delport (2014:41), paradigms have a major impact on the philosophy and methodology of the social sciences research because all scientific research is conducted within a specific paradigm. Paradigms are a set of beliefs

and assumptions that are adopted by a particular community which define the place of the world and the individuals within it, and which influence the community's choice of a general or individual discovery (Kiyimba & O'Reilly 2015:3- 4). Paradigms have implications for the choice of methodologies concerning the questions, participant selection, data collection tools, data collection procedures and data analysis (Kiyinga & Kuyini 2017:33). The choice of methods, approach and design to be used for this study was informed by the believe that the social world is described and explained clearly by the people who live in and have an understanding of that world. Bloomberg and Volpe (2008:7), Kiyimba and O'Reilly (2015:5-7) posit that there are three major claims by people towards the world which are influenced by the history and culture of the particular group. These claims are:

- ***Ontology***: This is the claim about what knowledge is, and in this regard, there is a need from the society to know things about the real world by conceptualising nature and reality (Kiyimba & O'Reilly 2015:6). The reality for ontologists exists independently from the human interpretations, and reality and relativism are two ontological positions (Kiyimba & O'Reilly 2015:6). Bloomberg and Volpe (2008:7) posit that reality has to do with the idea that there is a reality that exists independently from the people's ideas and beliefs. Relativism asserts that reality is fundamentally dependent on the mind, which means that the world is knowable through the human mind (Bloomberg & Volpe 2008:7; Kiyimba & O'Reilly 2015:5-7).
- ***Epistemology***: According to Bloomberg and Volpe (2008:7), epistemology is the discipline of philosophy or thinking by people which is concerned with the theory of knowledge. It is the basis for the fundamental relationship between the knower and what can be known. Epistemology is concerned with theories of knowledge and the production of knowledge (Kiyimba & O'Reilly 2015:5-7). In the research process, there is interaction between the researcher and the participants in the real situation for knowledge production (Kiyimba & O'Reilly 7 2015:5-7).
- ***Axiology***: This has to do with the values of what is good or bad regarding a particular situation (Bloomberg & Volpe 2008:7). Concerning axiology, human beings hold different views of appraising and putting value to things in live (Bloomberg & Volpe 2008:7). Such thinking should be respected by the researchers because, at times, they find themselves being confronted by axiological beliefs (Kiyimba & O'Reilly 2015:5-7). Such beliefs are extremely sensitive in the areas of religion and politics (Kiyimba & O'Reilly 2015:5-7).

According to Perri 6 and Bellamy (2012:32), paradigms are worldviews which are shared by a group of scientists who have the same ideas of what is to be observed or examined. A paradigm is ideal for answering a question that seems important and this assists in finding research solutions (Perri 6 & Bellamy 2012:32). Furthermore, Perri 6 and Bellamy (2012:32) assert that paradigms are helpful in the collection and interpretation of data. Scientific research is conducted within a specific paradigm and the researcher must decide which paradigm is relevant for the specific study (De Vos et al. 2014:41). The research design and research approach are informed by paradigms and the claims of knowledge about the problems are extracted from the rich historical knowledge of the participants (Bloomberg & Volpe 2008:7-8). According to Punch (2014:15), paradigms are knowledge claims by the society that have an impact on its culture and history. Paradigms are important in this study because the researcher used methods that are based on the views and perceptions of the participants who are informed by their culture and history of the setting (Punch 2014:15).

Babbie (2017:33) argues that paradigms are sometimes difficult to understand because, in most cases, they are taken for granted by a certain group within the society. Furthermore, Babbie (2017:33) states that paradigms reside in the human mind and influence the social, spiritual, and social aspects of the people. Babbie (2017:34) indicates that the wars in the world are mostly influenced by the attachment of people to particular political or religious beliefs. Paradigms do not explain, describe or interpret anything, but they do inform people how explanations and interpretations should be developed within the tradition in which the research is taking place (Perri 6 & Bellamy 2012:33).

The choice of the setting and the participants is primarily made based on developing knowledge and understanding of the problem from the participant's view of the situation. Blaikie (2010:99) mentions four paradigms that are viewed as important, and they are positivism, critical rationalism, classical hermeneutics and interpretivism. Furthermore, Babbie (2017:34) asserts that each paradigm looks at human social life differently from the other because each paradigm makes certain assumptions about the nature of social reality. However, paradigms cannot be taken as true or false (Babbie 2017:34). Babbie (2017:34) posits that researchers must try to find out which of the paradigms best suit the study. May (2011:36) avers that paradigms are not confined to a closed system, but are part of a constant process in the practice of social science, which enables the researcher to do a

comparison among them. This assertion by May (2011:36) of the evolving paradigms positioned the researcher to prepare effectively for the changing technologies which affect the preservation of audio-visual records at the SABC. The dynamic social sciences allow empirical inquiries to be explained and understood within the challenges of assumptions about social life (May 2011:36).

Paradigms are philosophies that guide the methods of research and assist the researcher to provide the research results that are authentic and credible (Ryan 2018:1). Therefore, it is important for the researcher to justify the choice of the philosophy because that represents what the researcher perceives to be the truth, reality and knowledge, and in this study, the justification will be more on the choice of the paradigm (Ryan 2018:1). The choice of the philosophies is mainly on whether the process that is taken is objectivism or subjectivity and, in this regard, the researcher has to provide reasons because it will indicate whether the research is based on the quantitative or qualitative approach (Ryan 2018:2). Objectivism is the position of a single version of what is real, regardless of the researcher's perspectives; which means that the only way to get the truth is to measure or observe the world with little intervention from the researcher or the factors around the situation (Ryan 2018:3). On the other hand, subjectivity refers to multiple and varied perspectives of what may be real, and this is the direction that is taken by the study with the choice of qualitative research approach and the use of open-ended interviews (Ryan 2018:3). Furthermore, Ryan (2018:3) asserts that in subjectivity reality is the people's perceptions, experiences, and feelings that explain how they give meaning to the social world and how they explain and understand the results from the findings of the research.

According to Kivimba and Kuyini (2017:33), in subjective epistemology, the researcher makes meaning of the data through his own thinking and cognitive processing of that data, which is the result of the interaction of the researcher with the participants. This study looked for an explanation and understanding of the preservation of audio-visual records at the SABC in the Limpopo regional offices, and therefore the use of paradigm as a view of the world which is influenced by culture and history was relevant (Perri 6 & Bellamy 2012:32). Figure 3.2 by Ryan (2018:2) indicates the philosophical research paradigms which are the pillars of research. These paradigms are positivism, interpretivism and pragmatism which are briefly discussed as follows:

- ***Positivism***. This paradigm is used by quantitative researchers who define worldview in research as grounded in the scientific method of investigation (Kivimba & Kuyini 2017 30). The authors (2017:30) further assert that the paradigm involves a process of experimentation that is used to explore surveys and answer questions because it aims to provide explanations and predictions based on measurable outcomes. This paradigm is used for cause and effect relationships and relies on deductive logic and formulation of a hypothesis to derive at the conclusion (Kivimba & Kuyini 2017:30).
- ***Interpretivism***. The interpretivism paradigm relies on inductive logic and is used by qualitative researchers to understand and interpret what the participants are thinking (Kivimba & Kuyini 2017:33). Interpretivists assumes subjective terminology, relativist ontology, naturalist methodology and balanced axiology (Kivimba & Kuyini 2017:33). Interpretivists believe that realities are multiple and socially constructed and that constructed factors need to be taken into account in any pursuit of understanding (Kivimba & Kuyini 2017:34). The authors (2017:34) assert that interpretivists use trustworthiness to justify the findings of the research.
- ***Pragmatism***. Pragmatists believe that no one approach is good to produce justified research results and prefer the use of positivism and interpretivism paradigms. The strengths of both paradigms are used, allowing a combination that could shed better light on the actual responses from the participants (Kivimba & Kuyini 2017:35). Pragmatists use mixed methods of research.

Ontologies are related to the existence of a social objective world about the study, which is the objective of the investigation. They include realism, constructivism and pluralism which are briefly discussed as follows:

- ***Realism***. According to Della Porte and Keating (2008:22), certain categories in realism must be discovered and people can distinguish between human beings and other animals. The authors further (2008:22) assert that there are much wider differences about the degree to which the world of a social phenomenon is real and objective in the social sciences. For some, the only real object is the person, with all other units being mere artefacts, hence realism is the basis for methodological individualism (Della Porte & Keating 2008:22).
- ***Constructivism***. It does not argue that the physical world is the product of the imagination of the social scientists; rather, it is the product of who puts order into it

(Della Porte & Keating 2008:22). The world is not there to be discovered by empirical research; it is rather a knowledge filtered through the theory that the researcher adopts.

- ***Pluralism***. In terms of culture, pluralism acknowledges that social diversity precludes universal, conclusive, permanent and complete national decisions regarding values, interest or beliefs. Pluralism does not attach ultimate normative authority to cultures because culture does not stand as the final source of appeal for normative assessment (Yumatle 2015:2). The author (2015:2) further says that as a philosophical view, pluralism is an account of incommensurability of cultures rather than values.

For this study, the researcher used the interpretivism epistemology and constructivism ontology which are associated with qualitative study.

3.2.1 Interpretivism

Interpretivism is embedded in epistemology, which is a philosophy that is concerned with the theory of knowledge. This study used the interpretivism approach to find the fundamental relations between the knower and what is to be known (Kiyimba & O'Leary 2015:50). Interpretivism has roots in anthropology which argues that knowledge and truth are culturally and historically studied based on the people's understanding of the world (Ryan 2018:8). Kiyimba and Kuyini (2017:33) assert that interpretivism has to do with the understanding of the social world from the viewpoint of the participants and it assumes the subjective epistemology, relativist ontology, and naturalist methodology with balanced axiology. Interpretivists believe that the subject matter of the social sciences is fundamentally different from that of the natural sciences and therefore a different methodology is required to reach an interpretative understanding, meaning as well as an explanation of the social action (De Vos et al. 2014:309). According to interpretivism, lists should be interpreted according to the meaning that the participants give to their social world (Rossman & Rallis 2012:68). As an ethical researcher, it is important to draw on the moral principle which guides the study (Rossman & Rallis 2012:68). For the best interpretations, the researcher should be ethically reflexive while reasoning and acting according to a code or standard that is based on moral principles (Rossman & Rallis 2012:69).

The use of interpretivism enabled the researcher in this study to establish the truth and obtain a full understanding of how audio-visual records are preserved at the SABC in the Limpopo regional offices. According to Blaikie (2010:99), “Founders of interpretivism followed the branch producing verifiable knowledge of the meaningful social world”. Interpretivism is a naturalistic reality that is socially, culturally and historically constructed which requires understanding from a context-specific perspective with the researcher engaging meaningfully to get meaning from the participants and in this regard, the study adopted a face-to-face interview as a tool of data collection (Bloomberg & Volpe 2008:11). This study used interpretivism as a means to know the world through the understanding of the participants and in that process, discovered how people perceive, feel and experience the environment in which they are employed (Kiyimba & O’Reilly 2015:11). The importance of interpretivism for this study was that it enabled the researcher to understand socially constructed knowledge that changes according to circumstances due to an interaction between human and the world (Babbie 2017:33).

Creswell and Creswell (2018:7) assert that constructivism seen from a qualitative research approach is often combined with interpretivism. In the constructive/interpretative believe, individuals seek understanding from the social world in which they live and work and the study selected participants from the work situation where data was collected (Creswell & Creswell 2018:8). The advantage of the interpretive worldview is that it enables the individual to develop subjective meanings of their experiences toward certain objects or things (Creswell & Creswell 2018:8). The subjective approach enriched the study with multiple types of information regarding the topic (Creswell & Creswell 2018:8). The meanings from the participants are varied and multiple and provide the researcher with the opportunity to look for the complexity of views and have rich findings that are very significant to the study (Creswell & Creswell 2018:8). Participants had the opportunity to construct the meaning of the situation because the researcher asked them an open-ended question (Creswell & Creswell 2018:8). The interpretivist view provided space for their researcher to focus on the specific contexts in which the participants live and work. The interpretive theory assumes emergent multiple realities, facts, values and truths which affect people’s emotions and, therefore, calls on the researcher to apply ethics rules (Charmaz 2014:231).

3.3 RESEARCH DESIGN

Research designs in qualitative research differ according to the purpose of the study, the type of the research questions as well as the resources that are available to conduct the study (De Vos et al. 2014:312). According to Punch (2014:115), research design is an act in research that involves all the processes that cover the execution of research strategies, conceptual framework, participants, tools for data collection and procedures. Research design is a template that provides a broad structure for the thinking about how to work through research (Gibson & Brown 2009:430). In qualitative research design, researchers create the research strategy best suited to their research during the research process, unlike in quantitative research design where the researcher provides a step-by-step plan (De Vos et al. 2014:312). Research design is an integrated statement which justifies all the decisions that are involved in planning a research project, which involves the anticipation of all aspects of the research and then planning for them to occur in an integrated manner (Blaikie 2010:15). During research design, the researcher planned for methodologies that are involved in conducting the research from data collection to data analysis (Bloomberg & Volpe 2008:67). The research design enabled this study to have a clearly defined route that was followed, and the design was used as a yardstick to check deviation from the adopted plan and then correct the mistakes. Research design is an important aspect of the whole research and its main aim is to describe each data collection tool that is going to be used and provide a rationale for each tool (Bloomberg & Volpe 2008:73). In this study, the researcher described and provided detailed information on the following tools that were used: unstructured interviews, unstructured surveys and document analysis.

The study also described how field testing was done, using these tools as well as recording and saving the data (Bloomberg & Volpe 2008:73). De Vos et al. (2014:324) argue that qualitative researchers must think how they are going to sort, organise, index and analyse their collected data which falls within the research design. The ontological and epistemological perspectives allow the researcher to apply flexibility and unstructuredness in the design. Figure 3.1 shows part of the design which is a map decided on by the researcher. In this case, the map provides direction to the readers of the study on what to expect from the contents. This type of design was very useful in this study because it kept the researcher focused and assisted him to not lose the direction of the route. In the absence of a clearly defined research design, the credibility and validity of the findings might

be negatively affected and any recommendations from the study were to be nullified. The design also considered the ethical issues that involve participants during data collection to show how human subjects will be protected (Yin 2014:78). From the design, the researcher should consider words, concepts, and assumptions which will be used during interviews because participants can either be at ease or alienated (O'Leary 2014:57). The ethical issues to protect participants include gaining informed consent, protecting participants against harm or deception, providing protection for their privacy and confidentiality (Yin 2014:78). Ethics should be considered seriously because case study interviews are more challenging due to their flexibility and openness (Yin 2014:78).

3.3.1 Case study

The most important step in selecting a case study involves having quality and relevant data (Bickman & Rog 2009:255). Figure 3.2 indicates the important aspects that are pointed out by Bickman and Rog (2009:255) as the most relevant for the completion of a case study.

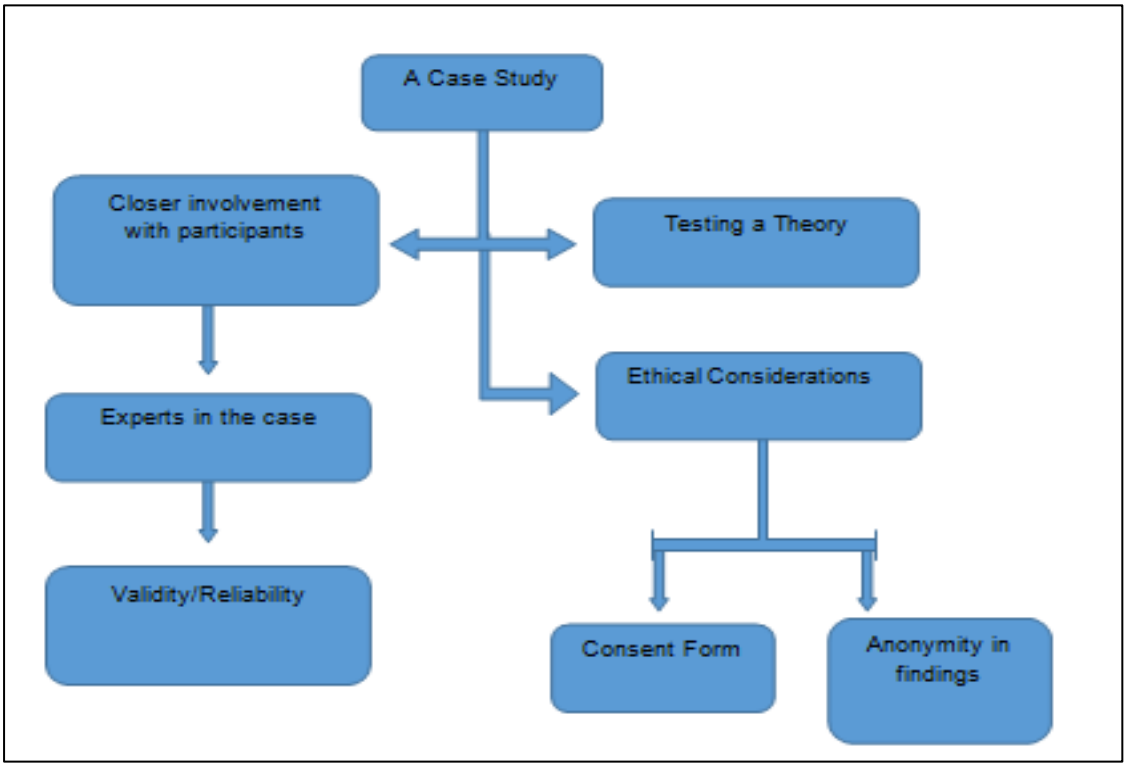


Figure 3.2: Aspects of the case study (Bickman & Rog 2009:255)

According to Alpi and Evans (2019:2), a case study is a qualitative approach which involves exploration of real life through detailed, in-depth data collection, which includes multiple sources of information. A case study is an example of case-centred qualitative research

which focuses on complex social units in their entirety while, at the same time, maintaining the cohesion of the entity throughout the research process rather than reducing outcomes to categorical data (Roller 2017:26). Roller (2017:26) cautions that ethical considerations in the case study are important because of the close contact between the researcher and the participants over some time; hence, it is common for case studies to maintain anonymity in the report findings. De Vos et al. (2014:320) state that qualitative researchers are interested in the meaning that participants give to their life experiences and as such a case study is relevant for the researchers to immerse themselves in the activities of people who have an intimate familiarity with their social world.

The qualitative researcher applying case studies needs access to, and confidence in, the participants because this type of study involves multiple sources of information which include interviews, surveys, and document analysis (De Vos et al. 2014:320). According to Flick (2014:123), in case studies, it is important to identify the research questions and clarify what else belongs to the case, as well as what methodological approaches are required. Intense clarification of the case is important and this study, which explored the preservation of audio-visual records, used interviews, survey and document analysis as tools for data collection (Flick 2014:122). The case study methodology is evolving and regularly reinterpreted and the choice of using a case study in this study is more relevant to this study because the preservation of audio-visual records is much more dependent on evolving technologies, which impacts on the understanding and the meaning attached to it by the participants (Alpi & Evans 2019:2). Yin (2011:130) asserts that single case studies are suitable for critical cases when the researchers are testing the theory, and it is also good for analysing data. According to Riesman (2016:364), the majority of contemporary qualitative researchers are using a case study because it provides detailed and specific statements about the phenomenon under study.

The case study was preferred in this study because interview data was fractured into segments that are coded thematically (Riessman 2016:364). Babbie (2017:310) posits that case studies are an in-depth examination of a single instance of the phenomenon and have the purpose of discovering flaws in the process and modify existing social theories. According to Bloomberg and Volpe (2008:31), a case study involves a detailed description of the individuals, which is followed by the analysis of data from themes and patterns. A case study has a specific purpose and questions (Punch 2014:120). In this study, a case

study was used to get the full meaning of the phenomenon by extracting in-depth information from the participants through an understanding of the complex and context of the phenomenon (Punch 2014:120). Case studies require the employment of multiple methods of data collection to establish validation and reliability (Golafshani 2003:603).

An in-depth case study is required to understand a complex issue and as such needs to be linked to the hypothesis following the well-known hypothetico-deductive model of explanation (Flyvbjerg 2006:219). According to Flyvbjerg (2006:221), there are five misunderstandings or oversimplification about the nature of case study research, which are as follows:

1) General theoretical (context-independent) knowledge is more valuable than concrete, practical (context-dependent) knowledge.
2) One cannot generalise on an individual case; therefore, the case study cannot contribute to scientific development.
3) The case study is most useful for generating hypothesis; that is, in the first stage of a total research process, whereas other methods are more suitable for hypothesis testing and theory building.
4) The case study contains a bias towards verification; that is, a tendency to confirm the researcher's preconceived notions.
5) It is often difficult to summarise and develop general propositions and theories based on specific case studies.

Flyvbjerg (2006:221) asserts that the five misunderstandings indicate that theory, reliability, and validity are important in a case study. Phenomenological studies in human learning show that there is a qualitative leap in the learning of adults from the rule-governed use of analytical rationality to the fluid performance of tacit skills (Flyvbjerg 2006:221). This brings us to the fact that people are experts in various daily activities which include social activities, technical interpretation of images, and more specialised skills in engineering, and this has to be unearthed by the researcher from the participants (Flyvbjerg 2006:221). This assertion by Flyvbjerg (2006:221) assisted the researcher in intensifying the understanding of the participants to align their skills and expert knowledge to the preservation of audio-visual records. This also directed the choice of questions to the participants which were linked to the objectives of the study. The SABC was chosen as a case study because it had

participants from various units: technicians, journalists, presenters, librarians, programme producers, and news editors with valuable information about audio-visual records. This was in line with what was stated by Alpi and Evans (2019:2) indicating that a case study requires detailed in-depth information from multiple sources. The SABC was also chosen because it had various units: radio stations, news units, technology units, media library unit, and the logistics unit which are all focusing on the objective of providing information to the public. The information was preserved in audio-visual records, and the study investigated the preservation of those records.

3.4 RESEARCH APPROACH

The research approach is the direction that is taken by the researcher to investigate and find clear answers from the problem. The choice must be followed, otherwise, the findings of the study would be compromised. The research approach is a type of inquiry that falls within the qualitative, quantitative and mixed method approaches (Creswell & Creswell 2018:11). The research approach provides specific direction for procedures of the research (Creswell & Creswell 2018:11). This study provided a brief discussion of the quantitative and mixed methods approaches. The qualitative research approach was discussed as a subheading because it was the approach that was chosen for this study. The quantitative approach invokes the post-positivist worldview, which includes true experiments (Creswell & Creswell 2018:11). The quantitative approach often employs longitudinal data collection over time to examine the development of ideas and trends (Creswell & Creswell 2018:12). The mixed methods approach involves the combination or integration of qualitative and quantitative approaches (Creswell & Creswell 2018:12). Creswell and Creswell (2018:15) identify three primary mixed methods approaches which are popularly used in the social and health sciences. These are:

- Convergent mixed methods. In this case, the researcher converges or merges quantitative and qualitative data to provide a full analysis of the research problem. Both quantitative and qualitative data are collected at the same time.
- Explanatory sequential mixed methods. The researcher first collects quantitative data, analyses them and then explains them in more detail with qualitative research. This is mostly used in more quantitative orientation.
- Exploratory sequential mixed methods. In this case, the researcher begins with

qualitative research to analyse the information and then builds on the quantitative phase on this.

Choosing a research approach is tied to the problem, purpose, and objectives of the research (Bloomberg & Volpe 2008:7). To formulate the best research approach, the research has to undertake the following steps: assessing the knowledge claim that is brought to the study based on theoretical perspectives and identifying strategies of inquiry that inform the procedures of the research (Bloomberg & Volpe 2008:7). This study used the qualitative research approach which is focused on exploring and understanding the meanings that individuals or groups ascribe to a social or human problem (Creswell & Creswell 2018:4).

3.4.1 Qualitative research

Flick (2014:125) avers that qualitative research uses purposive sampling and applies interviews and surveys as data collections tools, and then uses codes and themes to analyse data. Qualitative research is exploratory in that it seeks to learn how people get along in their settings and this approach is associated with techniques that capture the large amount from unstructured information (Engal & Schutt 2014:10). The qualitative approach involves emerging questions and procedures, data extracted from the participants, and data analysed inductively from participants to general themes (Creswell & Creswell 2018:4). The qualitative research approach has characteristics which, according to Creswell and Creswell (2018:181-182), are the following:

- Natural setting: Where the researcher goes to the field and collects data where the participants are stationed. The researcher plays key role in the data collection process through interviews, surveys, document analysis and, ultimately, interpret the data.
- Multiple data: Qualitative researchers collect multiple types of data and the ideas from the participants are not constraint by any instrument; the researcher then organises the data into themes that cut across all data sources.
- Inductive data analysis: This process involves working back and forth between the themes and the database until the researcher has established a set of themes. The focus of the researcher in qualitative research is to understand the relevance of the meanings from the participants regarding the topic, not what the researcher knows or

what the literature says about the topic.

- Emergent: The research process is qualitative emergent, which means that the initial plan might be modified to the situation. The modification and shift might involve the participants, the question, and the settings.
- Reflexivity: In the qualitative research, the researcher is focusing on how personal background, culture, and experiences hold potential for shaping their interpretations such as themes they ascribe to data.
- Holistic account: The qualitative researcher develops a complex picture of the topic under study which involves multiple perspectives, identifying the many factors that are involved in a situation and then sketching the larger picture that emerges.

Qualitative researchers focus on the use of social actors, digging for in-depth and thick information and emphasising the social processes, flexibility and development of theories and concepts; while quantitative researchers focus on measuring the concepts, establishing causality, emphasising generalisation replicating, and putting more emphasis on individuals (Blaikie 2010:215; Yin 2011:136). Qualitative research always emphasises words rather than quantifies numbers and it is inductive, constructivist and interpretivist (Bryman 2016:294). It is an inductive view of the relationship between theory and research, it is interpretivist in that instead of adopting the natural science in quantitative research, it focuses more on understanding the social world through an examination of that world by the participants, which is the reason why it was used in this study (Bryman 2016:294). Qualitative research is also constructive, which implies that social properties are the outcomes of the interaction between individuals rather than the phenomenon (Bryman 2016:294). There are important steps in the process of qualitative research and Bryman (2016:296-298) uses the examples of the following process, which were used by Foster in 1995 for a study of crime in communities. This study used Foster's steps to explore the preservation of audio-visual records at the SABC Limpopo regional offices.

- Step 1 – General research questions: The starting point in this study was the safety of the audio-visual records from the various challenges that were highlighted in the literature, and these audio-visual carriers contain material of historical and cultural value. The study engaged deeply with the participants, who are experts in this field to provide full answers.
- Step 2 – Selection of the relevant site: The research was conducted at the SABC

Limpopo regional offices. The region has three radio stations and a news division that provide services to the listeners, technical department, finance and human resource departments. At the site, the study was able to meet participants who are involved in the production of programmes, their placement to the archives and the ultimate preservation of the records in audio-visual formats.

- Step 3 – Collection of relevant data: The researcher obtained important data from the participants by using interviews, a survey, and document analysis as data collection tools. These tools enabled the researcher to have closer engagement with the participants and the open-ended questions produced rich meaning from the participants.
- Step 4 – Interpretation of data: The study interpreted data to have an understanding of the meaning of the processes of the preservation of audio-visual records as perceived by the participants.
- Step 5 – Conceptual and theoretical work: The study used a theoretical framework that guided its investigation of the preservation of audio-visual records, and this framework proposed the theoretical framework to the SABC Limpopo regional offices. Concepts might emerge as the study continues which were considered by the study.

The choice of qualitative research was based on the advantages and disadvantages as provided by Creswell and Creswell (2018:18) in comparing the qualitative research, the quantitative research, and the mixed-method research. Table 3.1 shows the advantages and disadvantages of research approaches which the researcher considered to decide on the best approach.

Table 3.1: Qualitative, quantitative and mixed methods approaches (Creswell and Creswell 2018:18)

Research approach	**Qualitative research**	**Quantitative research**	**Mixed methods research**
Assumptions	Constructivists/transformative knowledge claims	Positivists knowledge claims	Pragmatic knowledge claims
Strategies of inquiry	Phenomenology, grounded theory, ethnography, case study, and narrative	Surveys and experiments	Sequential, convergent, and transformative

Methods employed	Open-ended questions, emerging approaches, text or image data	Closed-ended questions, predetermined approaches, numeric data may include some open-ended questions	Both open-ended and closed-ended questions, both emerging and predetermined approaches, and both quantitative and qualitative data analysis
Practices used by the researcher	Position him- or herself	Tests or verifies theories and explanations	Collect both quantitative and qualitative data
	Collect participants meanings	Identify variables to study	Develops a rationale for mixing
	Focuses on a single concept	Relates variables in questions of hypothesis	Integrate data at different stages of inquiry
	Studies the context or setting of the participants	Use standards of validity and reliability	Provides visual pictures of the procedures in the study

When pursuing a qualitative research Flick (2014:143) advises that the following should be verified and it should be ensured that answers are provided for each.

Which steps in the research process are appropriate for the kind of study that is planned?

- Clarify the scope of existing knowledge and research in the issue that is to be studied.
- Check if there are gaps in the empirical and theoretical knowledge about the issue of the study and provide the plans on how to fill those gaps.
- Check whether a linear or circular process would be relevant to the study.
- Check if the procedures of the study, its theoretical background, aims of the study and the state of the research are intact.
- Check how compatible the study would be with the issue to be studied and the settings where the research would take place.

3.5 RESEARCH PROCEDURE

These are the steps that are taken to ensure that the information for the study is collected from the right people with the right information. The researcher decided on participants who have shared experiences but different characteristics and individual experiences (Moser & Korstjens 2018:11). Regarding sampling, the researcher thought of an appropriate sampling plan to ensure that selected participants and settings provide sufficient information for a full understanding of the phenomenon (Moser & Korstjens 2018:10). The study had to consider these procedures, otherwise, any mistakes or wrong choices of the procedure would affect the authenticity of the findings.

3.5.1 Population

A population is formed by a group of participants, which is a group of people with common characteristics (Asiamah, Mensah & Otong-Abanyie 2017:1608). The population is very important in any research because it is the main source of data and it is also the members of the population who are involved in the research process as participants who influence the credibility of the findings of the research (Asiamah et al. 2017:1608). During the research design, the researcher tried to draw the most appropriate sample from the population to maximise the credibility of the findings. The population is divided into three groups: the general population, the target population and the accessible population (Asiamah et al. 2017:1608).

- The general population. This consists of all the members of the organisation, and the researcher must identify the population with the most characteristics that would be relevant to the topic and objectives of the study. In this study, the general population consists of all the employees of the SABC in the Limpopo regional offices who share the same characteristics by all being employed by the SABC. This aim limits the population to the employees of the SABC who are in the Limpopo regional offices.
- The target groups. This is the part of the population that has the attributes of what the researcher is hoping to get from them during data collection. When a researcher chooses the target population, they leave out those who do not have the required attributes. The target group for this the study was the participants who are working with audio-visual records or who have a say in the production, management and use

of the audio-visual records.

- The accessible group. This is the group that is taken from the target group who possesses all the requirements to be selected as participants. Their selection is based on their availability during the data collection process. These participants ensured the researcher of their availability for the research.

Figure 3.3 illustrates the way the population is categorised by the researcher to obtain the best results from the research. It indicates clearly that the researcher starts with the general population, proceeds to the target population and ends with the accessible population. In this study, the accessible population were identified due to the tasks they perform which are relevant to the audio-visual records. Accessibility requires that the researcher should obtain permission from the organisation as well as the permission of the participants.

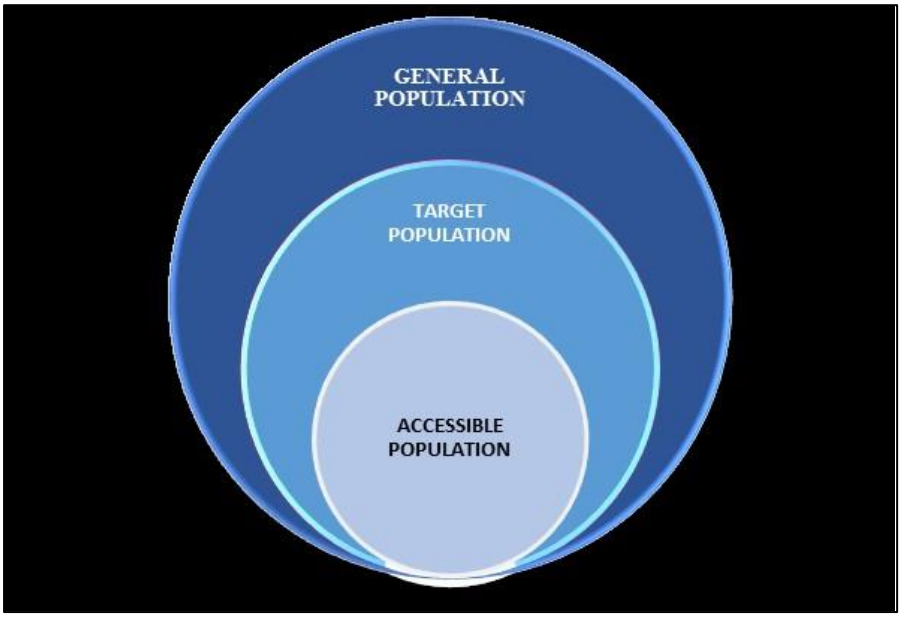


Figure 3.3: Population conceptualisation of the relationship between general, target and accessible population (Asiamah et al. 2017:1611)

Figure 3.4 indicates the stages of how the researcher does the real identification of the relevant population for the study. The researcher has to consider all these stages carefully so that nobody in the general population could complain of not being part of the participating group. The figure also illustrates that the researcher has to be clear about the characteristics of the general population which will inform the final selection. The participants for this study must have attributes that are needed to answer the questions that have arisen from the topic, as well as the objectives. The study used in-depth interviews

which could not accommodate all the participants, but the focus was on the potential group.

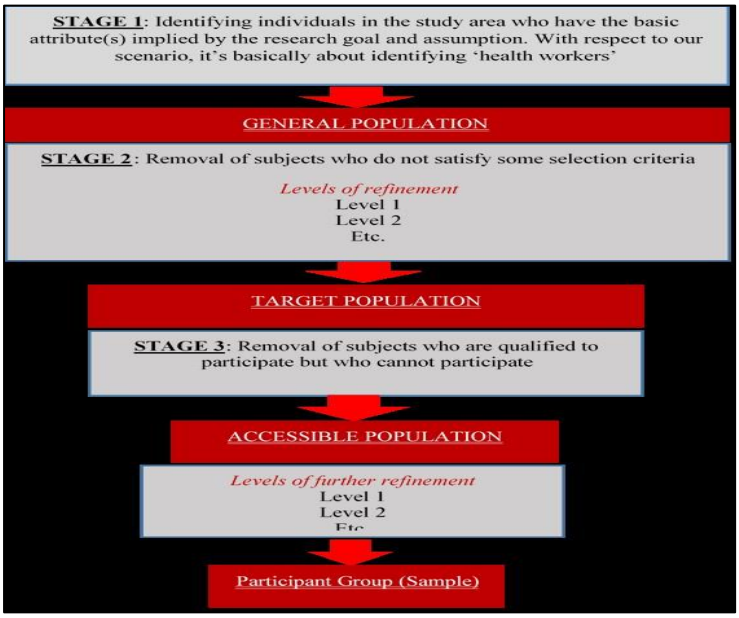


Figure 3.4: Framework of population refinement for sampling in qualitative studies (Asiamah et al. 2017:1615)

3.5.2 Sampling

In qualitative research sampling size and sampling design are important and dictate the direction that the data collection will follow; therefore, they have to be clearly defined by the researcher for the readers to understand and believe the findings (Omona 2013:169). The choice of sampling is informed by the context, method of data collection and the type of generalisation that is needed (Omona 2013:174). Sampling decisions in qualitative research are guided in such a way that researchers tend to limit their focus to one or a few sites; however, the sample must be appropriate and adequate even if it is not representative (Engal & Schutt 2014:212). Qualitative researchers may select one or more critical cases and use purposive sampling to identify participants with more information regarding the case and this study used participants who provided full knowledge of the topic (Engal & Schutt 2014:212). This study used the non-probability sampling method for the collection of data because there was a need for the study to have rich information from relevant people (Engal & Schutt 2014:103). Non-probability sampling is effective in qualitative research because the focus on a small setting or very small sample allows a more intensive portrait of activities (Engal & Schutt 2014:103). According to De Vos et al. (2014:391), the overall purpose of sampling in qualitative research is to collect the richest data. Sampling aims to

select participants from the population in such a manner that the results do not represent the individual participants, but it is a statement that applies to all members of the population (Flick 2014:167). The qualitative research applies the substantial criteria that are different from the formal criteria that is used in quantitative research (Flick 2014:167). In the formal criteria, every member of the population has the same chance of being selected for the research while in substantial criteria, strategies such as theoretical and purposive sampling are used for deciding which individual to include in the research (Flick 2014:167). This study applied the qualitative approach and the sample structure was organised around sampling dimensions that have been defined beforehand where the criteria started at the topic and the objectives of the study (Flick 2014:168). In qualitative research where samples are defined beforehand, a sample is drawn from the homogeneous group which, in this study, was the group that was directly or indirectly involved with the preservation of audio-visual records (Flick 2014:168). Flick (2014:169), in his study of technological change in everyday life, was of the view that perceptions and evaluations of technological change in everyday life are dependent on the profession of the interviewee. The following are the examples that Flick used in the decision to select a relevant sample for the study on technological change in everyday life (Flick 2014:169). The study defined several dimensions of the sample (Flick 2014:169): The profession of information engineers was selected on the basis as developers of technology, social scientists as professional users of technology, teachers in a human discipline as everyday users of technology, and all these groups were represented in the sample by cases with certain professional experience (Flick 2014:169). This indicates that a qualitative researcher can work with comparative groups that have been defined in advance (Flick 2014:169).

Flick (2014:54) asserts that when the researcher selects participants, ethical issues of how participants are informed about the research, its purpose and the expectations should be addressed. The researcher should prepare the necessary ethical documents because the study is about how participants live and cope with the preservation of audio-visual records (Flick 2014:57). This study identified participants based on their profession and their understanding of the audio-visual records and their preservation. Programme producers from radio stations and news editors from news divisions are involved with the production of the records. Radio presenters and journalists are handling the records when airing them. Engineers and technicians are involved with the technologies that are used for the production of records as well as their preservation. The archivists are involved with the

handling and preservation of audio-visual records. These participants were selected purposively based on their profession at the SABC in the Limpopo regional offices. According to Flick (2014:175), a step-by-step selection in sampling is employed by qualitative researchers who use purposive sampling. Flick (2014:175) suggests the following for the followers of purposive sampling:

a) Integration of purposively extreme or deviant cases. Examples of successful cases are chosen and analysed as well as cases of failures, and provision is made for the reasons for success or failure. In this case, a suggestion was made to select participants with long service in the field as well as those who have recently joined the organisation.
b) Another suggestion is to select extreme cases of success or failure. There must be an indication of how such occurrences took place. Find out from the participants how long they have been personally involved with the case and what were their inputs.
c) To have a maximal variation in the sample. This involves the integration of a few cases, with participants who are as different as possible to disclose the range of variation and differentiation in the field. It is important to vary the professional backgrounds.
d) Cases may be selected based on the intensity with which the interesting features, processes and experiences are given or assumed in them. It is important to choose cases based on their intensity or to systematically integrate the cases and compare them. Identify those participants who are daily involved in the actual task under study or those who are randomly involved.
e) It is also important to get into sensitive areas, but this should be done with care because the aim is to obtain positive results. If, in the opinion of the researcher, the views might endanger the relationship between the researcher and the participants, they should be dropped.
f) There is also the criterion of convenience, where the researcher selects the cases that are easy to access under given conditions. This should be considered when there is a limited resource of costs and time.

Flick (2014:177) asserts that the above should be taken into consideration in obtaining rich and relevant information from the participants. The appropriate choice of the sample can only be assessed in line with the research question of the study and based on the number

of the participants (Flick 2014:170). In qualitative interviews, sampling decisions are taken based on the interviews and the surveys that will be used as data collection tools for the study (Flick 2014:178). These decisions are defined in Table 3.2.

Table 3.2: Sampling decisions in the research process (Flick 2014:179)

Stage in research	Sampling decisions	Examples of interviews	Examples of surveys
While collecting data	Case sampling Samplings group of cases	Selecting an interview. Selecting a professional group whose members are to	Selecting a situation to observe. Selecting types of situations to observe.
While interpreting data	Material sampling within the material	Selecting an interview to begin the analysis with. Selecting statements or experts from the interview(s) to analyse in more detail.	Selecting a survey to begin the analysis with. Selecting experts from protocols to analyse (in more detail).
While preparing the findings	Presentational sampling	Selecting statements and interpreting for illustrating or evidence.	Selecting surveys and interpretations for illustrating or evidence.

The important aspect of sampling in qualitative research is to purposefully select participants or sites that will assist the researcher to understand the problem and the research question (Creswell & Creswell 2018:185). When applying purposive sampling, a particular case is chosen on the basis that it illustrates some features or process that is of interest for a particular study and this sampling is based entirely on the judgement of the researcher (De Vos et al. 2014:392). In purposive sampling, participants are selected based on relevance to the research question and this might be added as the interview progresses. It is appropriate in qualitative research to select a sample based on the knowledge the researcher has of the population and this is purposive or judgemental sampling (Babbie 2017:196). It is always difficult in a qualitative study to establish the right size of the sample which is important to support convincing conclusions to the study and qualitative researchers must find the right balance for the research, whether small or big (Bryman 2016:331).

Users of purposive sampling must find ways to find the best participants for each question (Tongco 2007:154). When choosing purposive sampling it is important to think of the participant and the expert that is relevant to the study and because that is the place where the researcher can find reliable and robust data. According to Omona (2013:181), researchers must critically analyse the various purposive methods and decide on what will be suitable for the study. The choice must be made from the following types:

- Non-random purposive sampling: Its purpose is not to make generalisations but to get insights into the phenomenon, participants and, especially, in qualitative research where the researcher purposively selects individuals who had an understanding of the phenomenon.
- Random purposive sampling: Researchers choose cases at random from the sampling frame that consists of a purposively selected sample. It enables the researcher to compile a list of individuals who have an interest in the study and is selected from that list.
- Multi-stage purposeful random sampling: This deals with the selection of a sample in two or more stages. The first stage is a random stage and the subsequent stage is purposive.
- Multi-stage purposeful sampling: This deals with the selection of a sample in two or more stages, but all the stages incorporate purposive sampling.

3.6 DATA COLLECTION TOOLS

Roller (2017:6) asserts that the highly contextual and social interpretivist/constructivist nature of the qualitative research renders the data collected to be not completely truthful, instead it remains the researcher's subjective interpretation. The issues of contextuality, social constructionism and subjectivity make the qualitative researcher question their data, scrutinise and implement other steps towards verification and try to maximise the accuracy of the data (Roller 2017:10). Trustworthiness goes along with a participant's sensitivities and, therefore, the researcher must take ethical issues into consideration (Marshall & Rossman 2016:40). Issues of access to the participants and their cooperation require intense ethical consideration (Marshall & Rossman 2016:50). This study used triangulation for the collection of data to achieve multiple results rather than looking from a single perspective only (Neuman 2011:164). Triangulation is possible when different methods are

applied to measure the same thing thereby increasing trustworthiness (Nieuwenhuis & Smit 2012:138). For triangulation, the researcher interviewed participants and applied document analysis to further strengthen the results. Document analysis of the register for incoming records, which revealed fewer registered records coming into the archive, fortified what the participants mentioned about their reluctance to take the records to the archives. The archive survey revealing records in cardboard boxes with parts of broken machines ascertained what was stated in the interviews about records that proved difficult to access. According to Marshall and Rossman (2016:50), triangulation in data collection addresses some questions that arise from trustworthiness in qualitative research and are the following:

- On what grounds are readers going to judge the claims as credible?
- Is there enough evidence to support the claims?
- Are the claims helpful for the problem that the research is confronted with?
- How is evidence going to be evaluated?

Yin (2014:119) asserts that the use of one data collection tool in a qualitative case study is not enough, because the strength of the case study research is based on triangulation. The researcher must modify data collection methods to create hybrid strategies in which multiple sources of evidence are likely to be relevant (Yin 2014:119). Triangulation in case studies allows the researcher to address many historical and behavioural issues (Yin 2014:120). Flick (2014:189) asserts that triangulation for data collection is more fruitful as a strategy to get a comprehensive understanding and it challenges the researcher to look for more and better explanations. However, Flick (2014:189) observe that triangulation of data collection provides results from different tools, which might be difficult to link as they contain data that overly address heterogeneous aspects of the phenomenon. However, triangulation might raise additional ethical issues or increase their relevance as compared to a single data collection tool (Flick 2014:190). The use of the triangulation approach is often narrow and does not always produce the full potential of one data collection method (Flick 2014:190).

3.6.1 Interviews

An interview builds a relationship between the researcher and the participants and the researcher must be ready to understand the participants' response to questions in the wider context of the interview (De Vos 2014:342). The relationship develops into aspects that

have to be dealt with ethically because there are ethical dilemmas that derive from interviews (Patton 2015:495). It is ethical for researchers to provide a simple, straightforward and understandable statement of the purpose of the research to the participants (Patton 2015:497). According to Flick (2014:117), qualitative studies are connected with a high degree of precision and investment of time from expert's participants who are always under considerable pressure and this requires researchers to plan interviews adequately. For the interview process to run smoothly, the qualitative researcher must be familiar with the question that is asked, which should be in line with the topic and the objectives of the study (Babbie 2017:319). The researcher must give the participants more time and must ensure that the time does not exceed five per cent of the time and must avoid putting pressure on the participants (Babbie 2017:319). During the interview, the researcher should record the context of the interview because the outcome of the interview has the potential to influence the quality of the final product (May 2011:105).

The study used interviews as the major tool of data collection because interviews produce rich insights into the people's experiences, opinions, values aspirations, attitudes and values which provide insight into meaning and understanding of the phenomenon (May 2011:130). According to Strydom and Bezuidenhout (2018:189), the researcher should consider the following aspects of qualitative interviews:

- The question should move from a broad aspect to a narrower aspect.
- Allow the interview to progress and flow in a natural, conversational manner.
- Formulate a clear and simple question and ensure that the participants know exactly what is expected from them.
- Avoid asking leading questions but allow participants to express how they feel and not communicate what you want to hear.
- Avoid double-barrelled questions but instead, address one aspect at a time.
- Ask real open-ended questions that would enable the participants to give varied opinions and responses that are not influenced by predetermined cues provided by the researcher.

In the process of research interviews, the researcher must ensure that the participants are aware of the research ethics (Neuman 2011:142). The researcher is obligated to ensure that the participants have full information to avoid deceptions, misleading information and

inaccuracies (Floyd & Fowler 2009:168). Steps should be taken before interviews take place to avoid and reduce risks either to the participants or to the image and integrity of the research (Floyd & Fowler 2009:168). In this regard, participants should be fully informed about the intention of the research and the protection of their privacy and sensitivities.

Furthermore, the researcher is accountable for the ethical quality of the inquiry and should take care that all ethical issues are applied (Henning 2018:73). Patton (2015:495) states that ethics are important in interviews because interviews evoke thoughts, feelings, knowledge and experience of both the participants and the researcher. The two parties stay together for a long time and, at times, participants reveal things that they thought they would never divulge and which require confidentiality from the researcher (Patton 2015:495). An interview establishes rapport between the researcher and the participants which, at times, result in painful reports that require cover from the research ethics (Patton 2015:495). However, researchers must be careful not to turn interviews into confessions because participants are promised confidentiality and anonymity (Patton 2015:495). Nothing can capture the real things said by the participants, except to record them verbatim, which also requires their ethical consent (Patton 2015:471).

The choice of interviews was also influenced by their advantages and disadvantages. The following are the advantages, according to Denscombe (2010:192-193).

- Depth of information. They produce data that deals with topics in depth and in detail by probing subjects and pursuing issues.
- Insights. The researcher is sure to get valuable insight based on information gathered from experienced participants.
- Equipment. Simple is required like equipment like a tape recorder and a notebook.
- Informant's priorities. They produce information that is based on the participant's priorities, opinions and ideas which expand the ides and views of the researcher.
- Flexibility. Interviews are very flexible and allow space for adjustments to the line of inquiry.
- High response rate. Interviews are pre-arranged and scheduled for a convenient time, which ensures a high response rate.
- Validity. Data can be checked for validity because of the closeness the researcher has with the participants. The researcher can check for accuracy and relevancy as data is

collected.

- Therapeutic. Interviews are rewarding to the informant because there is more of a personal element to the method and people tend to enjoy the time of engagement.

The following are the disadvantages according to Denscombe (2010:193-194):

- Time-consuming. Analysis of data can be difficult and time-consuming because of the transcribing and coding of data.
- Data analysis. Qualitative interviews produce non-standard responses with a relatively open format.
- Reliability. It is often difficult to achieve consistency and objectivity due to the impact of the interviewer and the context.
- Interviewer effect. The data is always based on what people say and normally not on what they do, and the two do not tally.
- Inhibitions. The recording of the interview can inhibit the participant.
- Invasion of privacy. The fact that qualitative interviews are open, such situations expose the participants to several risks.
- Resources. The time and travelling necessary for the interviews are in most cases costly.

3.6.1.1 Structured interviews

Structured interviews have predetermined questions, are in a predetermined order and have a particular standard of application (O'Leary 2014:218). Structured interviews are often associated with a social survey where researchers are looking for a high volume of a quantity of information (Denscombe 2010:175). There is tight control over the wording of the questions and in this respect, a structured interview lends itself to the collection of quantitative data (Denscombe 2010:175). Consequently, the structured interview is not suitable for this study because the idea is to collect in-depth information.

3.6.1.2 Unstructured interviews

It is a way of exploring the participants' perspectives regarding their personal experience with the topic (Charmaz 2014:56). The topic might be broad, like the preservation of audio-visual records which, according to Charmaz (2014:56), should align with the following

characteristics:

- Selecting participants who have first-hand information that fits the research topic
- Doing an in-depth exploration of participants' experience and situations
- Reliance on open-ended questions
- The objective of obtaining detailed responses
- Emphasis on understanding the research participants' perspectives, meanings and experiences
- The practice of following up on unanticipated areas of inquiry, hints and implicit views and accounts of actions

Unstructured interviews are very intensive and Charmaz (2014:69) asserts that they allow the researcher to do the following:

- Ask for the in-depth description of the studied experience.
- Request more detail or explanation.
- Ask about the participant's thoughts, feelings and actions.
- Keep the participants on the subject.
- Come back to an earlier point.
- Restate the participant's point to check for accuracy.
- Slow down or quicken the pace.
- Shift the immediate topic.
- Validate the participant's humanity, perspective or action.
- Use survey and social skills to further the discussion.
- Respect the participants and express appreciation for their participation.

According to Charmaz (2014:71), researchers have to immediately think of the research ethics and ensure that they are well understood when they encounter vulnerability from the participants during the interview process. There might be a discomfort when participants are asked about skills requirements for an expert for the preservation of audio-visual records at the SABC and such participants might opt out of the interviews. In the context of an unstructured interview, the challenge for the researcher is to maintain flexibility and, at the same time, obtain information with consistency (De Vos et al. 2014:348). This study adopted unstructured interviews as a method for data collection.

The researcher chose the participants based on their understanding of the functions they were performing which had to do with audio-visual records, and this information was obtained from the Human Resources Department. For further clarity on their skills and experience, the researcher collected information from their line managers. During interviews, open-ended questions were asked and participants were given time to talk and provided detailed information on the subject matter. As they continued talking, the researcher was able to pick up new ideas and requested further clarity. There was a mutual respect and this was realised after data collection when the researcher realised there were some gaps and it was easy to go back and finish the research. The only challenge was from one participant who had full knowledge of the functions but was reluctant to answer and continued only after persuasion from the researcher.

3.7 DOCUMENT ANALYSIS

According to De Vos et al. (2014:377), a range of documents such as minutes, agendas, newsletters, memos and reports are written with a view to find information on the day-to-day functioning of the organisation and can be used as tools for data collection. Formal documents are not easy to access, and the researcher has to request permission for their access long before the data collection commences (De Vos et al. 2014:379). Documents provide first-hand information of the activities of an institution and they are used in qualitative research as tools of data collection because they provide information on the purpose of the tasks and the people who were responsible for such tasks (Flick 2014:355). Flick (2014:355) avers that documents should be viewed by researchers as a means of communication and the researcher has to find out who produced the documents, for whom were they produced and for what purpose were they produced. Documents reflect routines and legitimise how things are done in institutions, which include successes, failures and mistakes and these provide effective information for the research (Flick 2014:357). From such information, the researcher will be able to ask more information on causes of success and failure, what has been left out for particular mistakes to take place and by whom (Flick 2014:358). When using documents as data collection tools, the primary is constructing a corpus of the document which entails the decision either to have a representative sample of all the documents or to purposively select documents to reconstruct a case (Flick 2014:356). Documents represent a specific version of realities constructed for specific

purposes and this study purposively selected documents because it used the qualitative research approach (Flick 2014:357). The disadvantage of using documents is when the researcher is unable to understand their meaning due to the problem of language, abbreviations and references that are used (Flick 2014:357).

Organisational documents like policies, procedures, minutes and memos are representative of the activities of the organisation and include documents wherein decisions had been taken on the use of documents as tools of data collection must be considered (Cardno, Rosales-Anderson & McDonald 2017:149). Cardno et al. (2017:1490) advise users of the document used for data collection to carefully study the wording in all documents because that is where the meaning of the intention might be lost. The researcher must evaluate the authenticity, credibility, and representativeness of the documents before using them as tools for data collection (De Vos 2014:380). The researcher used a register for incoming records, the file for records, reports from recording studios, reports from editing in the archives, reports from the news section and radio section and minutes.

During the research the documents were available and it was easy for the researcher to use them because the officials were free to provide them. The information in the documents corroborated what the participants mentioned; for example, with neglect of maintenance for machinery, the researcher found that the register had not been used for nine months. The other proof was the near empty request form for records from the archive because participants indicated that they were getting records either through IONA or ENPS.

According to De Vos et al. (2014:382-383), there are several advantages and disadvantages in using documents as a tool for data collection.

Advantages:

- The cost is low because the researcher visits one setting to get all the documents for the study.
- There is a great possibility of openness in documents that provides the full story. Documents are not responsive unlike where participants are aware of the research process.
- The researcher can get full information without getting into contact with the participants.

Disadvantages:

- There are always gaps in documents and this incompleteness might result in the wrong information.
- There might be bias in documents since they were not produced with the intention for research outputs.
- In some organisations, some documents might not be available due to classification, while it might be difficult to get an idea from other documents due to poor spelling.
- At times it becomes difficult to trace the origin of the documents.

3.8 PRESERVATION SURVEY

According to the Oxford South African School Dictionary (2014), surveying refers to inspecting, taking a view of the situation with attention, and it is also referred to as a measurable description of an object. This study surveyed the conditions of audio-visual records, to examine and ascertain the tools used to record, carry and preserve those records. This included determination of the value of the archive storage as well as its exposure to risks of damage through fire or water and theft. According to Ezeomedo (2019:103), in built environments surveys are used to describe the interdisciplinary field that addresses the design construction, their use as well as their relationship with human activity. This study will survey all the processes where employees in various units of the SABC are involved in the creation, use and preservation of audio-visual records. Furthermore, Ezeomedo (2019:103) asserts that the survey requires a systematic data collection phase because the results of survey depend on data being of a reasonable degree of exactness and completeness. The survey method was chosen as the ideal tool for investigating preservation of audio-visual records because it enabled the researcher to obtain exact information about the condition of the objects under study.

3.9 TRUSTWORTHINESS

Trustworthiness enables the researcher's work to be recognised and understood as legitimate by other researchers and practitioners (Nowell et al. 2017:3). Furthermore, these authors posit that there is a criterion to demonstrate trustworthiness, which includes credibility, transferability, dependability and confirmability (Nowell et al. 2017:3). Credibility

ensures trustworthiness through evaluation of categories that concern data; it is also about identifying the similarities within and the difference between categories (Elo Kaariainen, Kanste, Polkki, Uttriainen & Kyngäs 2014:7). Transferability refers to the extent to which findings can be transferred to other settings. This is important for the researcher to produce high-quality results and reporting of the analysis process (Elo, et al. 2014:6). Dependability uses audit trail as a strategy to ensure a set of notes on decision-making, sampling, research material adopted and information about data management kept (Korstjens & Moser 2018:122). Conformity is about the neutrality of the researcher, meaning that the interpretation should not be based on the researcher's viewpoints, but requires directs inputs from the participants (Korstjens & Moser 2018:122). The choice of the best data collection methods is key to ensure the trustworthiness of content analysis (Elo et al. 2014:9). The trustworthiness of data collection can be verified through the provision of precise details of sampling methods and the description of participants. This was provided for in 3.5.2. While reporting on the results, the researcher must be careful and systematic and must pay attention to the connection between data collection and the results, which must be linked to transferability, confirmability and credibility (Elo et al. 2014:6).

Trustworthiness is also realised when the researcher provides an accurate description of the analysis (Elo et al. 2014:7). For the results to be trusted, the researcher must provide rich appropriate data and ensure that data collection, data analysis and data reporting go hand in hand (Elo et al. 2014:9). Triangulation is used in qualitative research to enhance the process of data collection (Korstjen & Moser 2018:122). To achieve trustworthiness, the study applied triangulation for data collection through the use of in-depth interviews, survey and document analysis.

3.10 ETHICAL CONSIDERATION

Unisa requires the researcher to comply with ethical issues (Unisa Policy on Research Ethics 2007). According to Neuman (2011:142), ethical issues are the concerns, dilemmas and conflicts that arise over the proper way to conduct research. Ethics are a moral or professional code of conduct that sets standards for attitudes and behaviour of the researcher and affect all stakeholders in research (Louw 2018:263). Ethical issues in research require more attention because they are reflected through the research process (Creswell & Creswell 2018:90). It is very important to address ethical issues as they relate

to different aspects of the research (Creswell & Creswell 2018:90). Ethics requires the researcher to balance the pursuit of scientific knowledge and the rights of those who are being studied (Neuman 2011:143). The researcher has to consider the benefits of understanding social life, improving decision-making as against a loss of dignity, privacy, self-esteem and rights by the participants (Neuman 2011:143). The reward for being ethical in research is accepted credible findings, while unethical research ruins the researcher's career and puts the researcher into possible legal action (Neuman 2011:143). The following are the important points to consider ethically when the researcher interacts with the participants:

3.10.1 Informed consent

Informed consent not only empowers the participants, but it is a full right of the participant to agree with a clear understanding of the consequences of the research (Ogletree & Kawulich 2012:68). Informed consent should adhere to three principles of voluntary participation, the right to withdraw at any time and an understanding that the research might impact on their emotional or physical welfare (Ogletree & Kawulich 2012:68-69). The process of obtaining informed consent begins at the start of the research and continues until the end of the research (Ogletree & Kawulich 2012:69). Participants should formally acknowledge that they are willing to take part in the study by signing the consent form (Louw 2018:264). The consent form indicates what they are required to do during participation and that their involvement is protected (Louw 2018:264). The participants are supposed to sign informed consent forms agreeing to the provisions of the research before they provide data (Creswell & Creswell 2018:91). The consent forms contain a standard set of elements that acknowledge the protection of human rights (Creswell & Creswell 2018:91). The participation of the individual should be given freely, and researchers should respect the right of individuals to either accept or refuse to participate or to change their mind (Unisa Policy on Research Ethics 2007:12). This consent should be in writing and should be accompanied by the signature of the participants or may be recorded verbally (Unisa Policy on Research Ethics 2007:12). Consent of the participant should be given without direct or indirect inducement or cohesion, participants should be provided with the full information, and participants must indicate in writing that they understand the consent (Unisa Policy on Research Ethics 2007:12). The information for consent should include the following according to Unisa Policy on Research Ethics (2007:13).

- Purpose of the research. This should cover the aim of the research and the anticipated impact of the research findings.
- Risks and benefits. It should cover the possible benefits and risks, and participants should be informed of the nature of questions posed.
- Participants should be aware of the methods that are going to be used. If interviews will be used, they need to know the duration of and the place where interviews will take place.
- Identity of the researchers. The name of the researcher must be provided, together with the contact details.
- Identity of those who are associated with research. Their names, together with their contact details should be provided.
- Privacy, anonymity and confidentiality. There must be measures to ensure the protection against any risks against the participants through the application of privacy, anonymity and confidentiality. If any of these are not going to be applied, it should be disclosed in the consent.
- Future use of information. Participants should be made aware of any future use of the information, including publication of the research findings, use a database or recordings for educational purposes.
- Right to participate or withdraw. Participants must be aware of their right to withdraw from the research without any penalty.

3.10.2 Privacy, anonymity and confidentiality

Neuman (2011:152) posits that at times, researchers transgress the privacy of the subjects. In order to get the results, they must take measures to protect the participants. Privacy is when researchers invade a participant's beliefs, backgrounds and behaviours to get intimate private details. According to Unisa Policy on Research Ethics (2007:15), privacy includes autonomy over personal information, especially if the research is dealing with sensitive or damaging information. Anonymity is when participants are kept anonymous and nameless, and their identity is protected (Newman 2011:153). Anonymity might be achieved by assigning a number to each participant to ensure that the participants are not identified (Ogletree & Kawulich 2012:70). Confidentiality is applied when the researcher protects each participant's identity, places and the location of the research (Ryen 2016:33). Confidentiality

is when the names of the participants are attached to the study, but the participants are given the assurance that their names will remain secret (Neuman 2011:153). Confidentiality is when the researcher uses pseudonyms to protect the identity of the participants (Ogletree & Kawulich 2012:70). However, there are times when participants want their names to be openly mentioned so that the information shared could be attributed to them, and the researcher has to emphasise the importance of ethics to them (Ogletree & Kawulich 2012:70).

3.11 Evaluation of research methodology

Review and criticism must be determined by what is considered to be a helpful background to the researcher as well as the readers because it assists in sorting out deficiencies (Blaikie 2007:178). The study adopted the interpretivism assumption which uses the qualitative research method to obtain a real understanding of the meaning of the social world. The tools for collecting data were interviews, document analysis and survey of the archive. The approach resulted in some problems of other participants who were chosen purposively, thinking that they have no role to play concerning audio-visual preservation. They did not see themselves as contributing anything to the archive. They understood their role as the creation of the records in the studios only. This study used pictures and tables to present the findings. The qualitative data were collected using in-depth interviews, survey and document analysis.

After clarification, particularly of the value of the content, they realised that their inputs were important. The good thing was that doing a study at a place where one was once an employee had the advantage that the researcher was familiar with the setting and the people.

Interviews were good because the participants knew about the activities. They were consistent in their expression of ideas. Concerning surveying, it went well because it was easy to observe the recordings, the handling, and the conditions under which the audio-visual records are preserved. It was also easy to observe the temperature and humidity in the storage areas of the files. The most important documents were reports and reports of recordings were kept only for a short time. There were reports on aggregation that would have indicated the levels and conditions of the aggregated recordings.

There was a challenge with some participants who, at times, were hesitant to respond to the questions as they feared that the management would not be happy with some of the responses. The researcher referred them to the letter of consent and ensured them that there will be anonymity during the findings. The major limitation was document analysis. It was difficult to obtain minutes because it was mentioned that minutes were classified and were only for SABC employees.

3.12 SUMMARY

This chapter described methodology concepts from the literature. This was done to ensure that the findings of the research remain credible. The discussion started with paradigms which influenced the thinking towards the choice of the method, then followed the research design, research approach, and research methods, which clarified the population, the sampling and the tools for data collections. The chapter also discussed the validity and credibility of the tools and compliance with ethics in this research. The next chapter focuses on the presentation of the results obtained through interviews, surveys, and documents analysis at the SABC Limpopo regional offices, based on the objectives of the study.

CHAPTER FOUR
DATA ANALYSIS AND PRESENTATION OF THE FINDINGS

4.1 INTRODUCTION

The previous chapter provided the methodology that was applied in this study. The methodology covered research paradigm, research design, research approach, data collection tools, research procedures, trustworthiness, ethical considerations, evaluation and summary of the chapter. This chapter provides data analysis and presents the findings of the study. In this regard, data is analysed in line with the objectives of the study. During data analysis, the researcher must provide a proper description of how data was analysed to maintain transparency and credibility (Tracey 2013:227). Data analysis is crucial to the research because it allows the study to improve understanding, expand its theory and advance knowledge for the readers (Neuman 2014:485). Neuman (2014:485) further explains that data analysis ensures that theories and concepts become explicit by organising specific details into a coherent picture or model. Ngulube (2015:5) highlights two issues that data analysis is dependent on, which are: the framework within which qualitative research was adopted and research questions which are used as a guide for conducting the analysis. Archer (2018:2) avers that qualitative data analysis is a tool used by the researcher to make sense of the huge amount of data so that data can be presented to the readers systematically. The researcher used multiple methods to collect data and the same methods of triangulation will be applied to the same phenomenon to enhance the depth of the findings (Lemon 2020:606). The chapter will do so using pictures that may convey results clearer than words (Elo et al. 2014:7). As Mosako and Ngoepe (2020) reckon that a picture speaks louder than words as it provides more information.

This chapter used thematic analysis to analyse data and present the findings. According to Tracey (2013:227), thematic analysis enables the researcher to describe and analyse data clearly which results in transparency and credibility of the research findings. Wang, Wang and Khalil (2018:204) state that thematic analysis is an iterative process and the results from this enable organisations to better understand the research findings and use them in decision-making and other interventions. Herzog, Hittas and Handke (2019:3) assert that thematic analysis is suitable for data collected through various methods and this study applied triangulation in collecting data. Thematic analysis strives for transparency as it

ensures a better understanding of the trustworthiness and limitations of the results (Herzog et al. 2019:5). The study applied thematic analysis because it is a very flexible tool that provides a rich, detailed and complex account of data (Ashfag, Salamon, Hussin, Rosman, Ruskam, Mohamed & Husin (2019:396). Thematic analysis is a good qualitative data analysis method because it allows the researcher to apply all data collection methods in a unified manner (Wipulanusat, Panuwatwanich, Steward & Sunkpho 2019:12). Furthermore, (Wipulanusat et al. 2019:12) assert that thematic analysis goes beyond counting explicit words or phrases and focuses on identifying and describing both implicit and explicit ideas within data. According to Ashfag et al. (2019:396), the process of thematic analysis goes through the following steps: raw data, search for themes, refining and grouping themes and then reporting themes. Figure 4.1 shows the steps in thematic analysis.

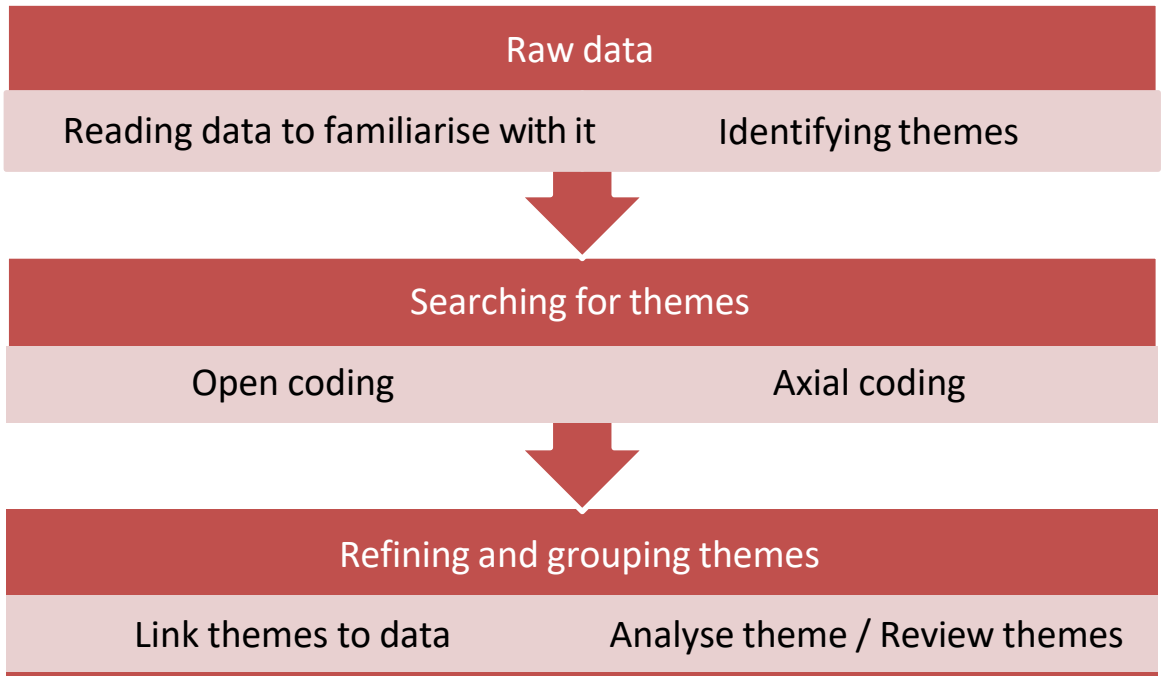


Figure 4.1: Thematic analysis steps (Ashfag et al. 2019:396)

4.2 PARTICIPANTS' PROFILE

As reflected in Table 4.1, the researcher interviewed 19 participants during data collection. They were all either involved in the management, creation, processing, preservation and use of the audio-visual records. This section was responsible for budget allocation, training facilitation and infrastructure provision for the region, which includes the archive section. One participant was from the logistics division and this division was responsible for providing, maintaining and monitoring equipment like fire-fighting, air conditions, doors for

the offices, and all the equipment mentioned are important for the safety of audio-visual records in the archive. One participant was from the media library division. The media library had three sections: the music section, the book section and the archive. The media library had no archivists when the researcher was collecting data. There were two participants from the digital content section which section was responsible for collecting audio-visual records from the studios, preserving them and making them available to the listeners.

The Radio Broadcast Facility (RBF) division had four participants. One participant was from the management of the RBF, one from the engineering section of the RBF and two from the technical section of the RBF. The division was responsible for the allocation of technical equipment, which was used for audio-visual recordings, the recordings of programmes and the maintenance of the studios where recordings and broadcasting of programmes took place. Recorded programmes were taken to the archive in audio-visual formats. There were three participants from the news division. One was from the current affairs section, one was from the news bulletin section and the third participant was from television news. After the broadcast, the news was taken to the archives in audio-visual formats. The researcher also interviewed seven participants from radio stations. Radio stations were responsible for creating and broadcasting programmes to the listeners. After the broadcast, the programmes were taken to the archives. There were three participants from Thobela FM, two participants from Munghana Lonene FM and two participants from Phalaphala FM. Table 4.1 illustrates the number of participants and their tasks in their respective units.

Table 4.1: The participant profile detailing their units and functions

Unit	Function	Participants
Munghana Lonene FM	Creating and broadcasting programmes	1 radio presenter; 1 programme manager
Phalaphala FM	Creating and broadcasting programmes	2 programme producers
Thobela FM	Creating and broadcasting programmes	1 programme producer; 2 radio presenters

News	Collecting, editing and broadcasting news on radio and television	2 news editors; 1 television journalist
Radio broadcast facility	Allocation, maintenance of al technical equipment	1 engineer; 2 technicians; 1 manager: RBF
Digital content specialists	Preserving and making programmes available to listeners via websites	2 digital content specialists
Media library	Responsible for music,	1 librarian
Logistics	Maintenance for the	1 logistic manager
Management	Managing the SABC	1 regional manager

4.3 DATA PRESERVATION

Participants were selected to cover all the processes that the records perform, from creation to access and use. Radio producers and presenters were interviewed because they create programmes that were ultimately taken to the archives or IONA platforms as records. News editors and journalists collect news bulletins and after the broadcast, they were taken to the archive of ENPS as records. The researcher surveyed the studios where programmes and news are created and broadcast, as well as the archival storage. Documents were analysed from the studios, the archives and offices of digital content specialist. This process was performed to ensure that the research covers all the areas of the record movement from creation to use. Presenter, producers, editors, and journalists were also asked questions on access and use. This was consistent with the objectives of the study and in line with the OAIS reference model which was adopted as the framework for this study. The presentations are in themes, which are in line with the objectives of the study.

4.3.1 Strategies to preserve audio-visual records

This objective aimed to assess the strategies that were used for the preservation of audio-

visual records at the SABC in the Limpopo regional offices. This study applied the OAIS reference model. Lavoie (2014:13) avers that the OAIS reference model's preservation planning ensures the availability of preservation strategies to update policies and procedures to accommodate changes in the digital environment. According to Cruz- Mundet and Diez-Carrera (2015:237), the OAIS reference model provides preservation plans which include preservation strategies to ensure that the information that is stored, remains accessible and understandable for the users in the long term, even when the technologies are becoming obsolete. Kosa (2019:6) states that the OAIS reference model provides a framework that may be expanded by other efforts to cover long-term preservation strategies that are not in digital form as a physical medium.

4.3.1.1 Strategies applied to preserve audio-visual records

Participants were asked which strategies were applied to preserve audio-visual records by the regional archive. They mentioned other things which were not strategies for audio-visual preservation. Participants felt that the SABC should be industrious and come up with new ideas to store the records and felt there was a need to transform the archive, even though they lacked proper ideas. Dome mentioned that the fact that the news division was preparing a special hard drive was an indication that the archive was static in its approach to new technologies. They could not understand how to migrate music from analogue LPs to Wave and still the archive was sitting with analogue formats from the 1960s. Participants responded according to the following sub-themes: innovations, creativity and change.

Participant 1 stated that: "There is a need for innovative ways to create a space and save time. Things like MP3, which will compress the material and create large storage as it is to save time and space."

Participant 2 explained that: "The important thing is to be transformational, change with the times, be able to listen to concerns, and ensure that whatever change you introduce with the people, you engage them you have the buy-in so that even if there is a change, those people feel like we are the ones who are bringing about this change. They should not feel like you are imposing things on them. Have a listening ear, get to understand their challenges and work with them"

Participant 5 put it this way: “But I think SABC news management is coming up with the provision of a hard drive for various regions. The Sotho languages were to share a hard drive, and have a dedicated archivist to take care of the content that is produced inland by Sotho stream radio stations and Sotho stream TV news.”

Participant 6 provided clarity by saying: “He is getting a licence from music and can adapt from LPs and I remember music from mamma Abigail Kubeka’s song Sebakanyana is playing on air with the new technologies. With that CD, we can copy it into the new system and make it wave or MP3. So, the same we are doing we can do with reel to reel. If we still have the reel to reel player, we can do the same thing in the studio. We record it like a wave on dalet and we will be able to archive it into the new system.”

Participant 11 emphasised that: “Currently they are busy with the digital format of which I am not sure what kind of format, because I am not part of the team, task team that is assigned to do the digital archives. So I don’t know what kind of archives they are busy with, but we are told that they are busy with the digital archives.”

Participant 13 stated that: “We were just told that no, things have changed now; we are no longer using these reels we are using cassettes. They don’t consult us, they just told us that the equipment that is here they are no suitable for reels, but cassettes**.”**
Participant 19 confirmed that: “Like this pilot project that I am talking about revamping the whole archive system in the media library in the SABC. The cloud is you save everything, not on the machine but a network on a cloud. The SABC plans to go that route so that everyone anywhere can access the material.”

The researcher analysed information from the training manual on digital technology and paged through it. The training manual corroborated what the participants mentioned during interviews. The manual was about a new playout system called ‘dira’ that would be installed in the SABC studios. The researcher established by studying the contents that the dira playout system had units which cover editing, playout elements, content management system and a unit for creating and editing the broadcast schedule. The information indicated that the system could do mixing and mastering of the recordings without moving the records to another software. The researcher also saw parts of the dirty playout system where the archivists would upload their material. According to the information from the manual, once

the archival information is uploaded it becomes available through the dira playout system to all the regions of the SABC. The researcher saw the picture of the dira playout system from the training manual as is shown in Figure 4.2.

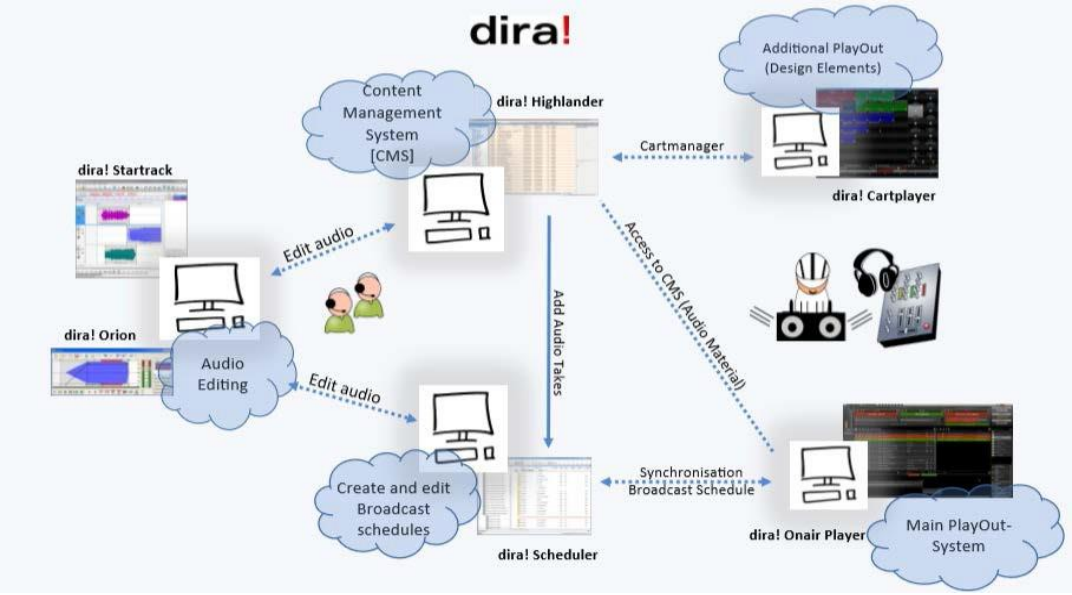


Figure 4.2: SABC dira play system

The researcher also analysed information from the labels on the cassettes. The information established that preservation was a poor and required strategy to provide an effective service to the users. During the assessment, the researcher came across a presenter who failed to retrieve the correct information. This presenter was preparing for the 60th anniversary of Thobela FM and wanted to air a cultural programme by presenter Mogobo Boy Nokaneng. However, he found out that, according to previous anniversary records of the radio station, Mogobo Boy Nokaneng left the SABC in 1974. This presenter had a notebook that contains the names of the presenters indicating the time they joined and left the SABC. But when the presenter was given the cassette, the recording and broadcasting dates on the cassettes indicated that the programme was recorded in 1984. The researcher surveyed cardboard boxes with cassettes, mini-discs and reel tapes in the shelves which were not catalogued. Picture 4.1 shows materials in the archive that could not be accessed because they were not properly filed. This poses a serious risk to the safety of records.

Picture 4.1: Reel tapes, cassettes and mini discs in the archive (Researcher 2020)

4.3.2 The formats that are used for the preservation of audio-visual records

The purpose of this objective was to identify the types of audio-visual formats that were kept and used by the SABC in the Limpopo regional offices. The study of the formats for the preservation of audio-visual records was done in line with the OAIS reference model. According to Lavoie (2014:8), the OAIS reference model allows the archivists to preserve records in a format that is independently understandable to the users. The OAIS reference model ensures that the archival storage function has the archival storage which refreshes the media on which holdings are stores (Kosa 2019:8). The objective was divided into the following sub-themes: types of formats, risks from obsolete formats, how to salvage records from obsolete formats and importance of using the latest formats.

4.3.2.1 Types of formats at the SABC archives

When participants were requested to state the types of formats that were kept at the SABC regional archive, they listed reel tapes, cassette tapes, mini-discs and CDs. The participants provided the answers based on their experiences at the SABC and the functions that they were performing. For example:

Participant 3 indicated that the following: “Let me just say, from the cassettes we went to

the CDs and from the CDs we went to the mini-discs where we would record staff from the mini-discs. And those mini-discs, they just stayed for a short time, maybe two to three years down the line and they were faded out."

Participant 4 highlighted that: "We were recording on reel tapes, cassettes, minidiscs, then CDs and then dalet was introduced. The actual content of the program is recorded on CD by the library."

Participant 6 explained that: "When we were recording our drama back, then we were using reel to reel; and we moved from that era of reel to reel to minidisc and from mini disc and then that is why they started using dalet."

Participant 11 indicated that: "We used various formats. We used reel to reel, cassettes, mini-discs and CDs. Currently, the most that we use is the cassettes and CDs. I mean, we currently not having the problem because we have our backup DVDs that have the whole day."

Participant 14 asserted that: "If you remember we used to have reels, we moved from reels to cassettes; somehow reels and cassettes were in the same period. Then we went to the minidisc, then from a minidisc, they said we can have information on CDs."

The researcher found notebooks in the storage that were used to register the incoming records. They have been used from 2013 to 2019. There were three notebooks each representing the language group in the region, that is North Sotho, Tshivhenda and Xitsonga. The notebooks contained information on programmes from the news division. All the programmes were in CD format, which confirmed what the participants said about the formats for the preservation of audio-visual records, that they were used to register incoming programmes. There was a section for the name of the programme, the date of broadcast, the producer and presenter of the programme, the language group and a place for the signature of the person who brought the programme to the archive. Further document analysis also confirmed what the participants said about the format except for the LPs. According to further document analysis by the researcher, the SABC archive used LPs, reel-to-reel tapes, cassettes, mini-discs and CDs as formats for preserving audio-visual records. The first formats were LPs and were used from 1960 to 1966. According to

the recording dates, the reels started in the mid-60s and were used until the late 1990s. Cassettes were used concurrently with the reel-to-reel tapes from the late 1970s until 2000. Minidiscs were used in 2000 but were not used for long, because from 2000, CDs were in use as formats in the SABC archive. Undocumented formats have to be refreshed to enable archivists to retrieve records from the archive (Kosa 2019:8). Picture 4.2 indicates undocumented formats in the regional archive. These undocumented formats are a huge risk to audio-visual records as they might not be used in the far off future.

Picture 4.2: Reel tapes in filing cabinets

4.3.2.2 Risks of obsolete formats

Participants were asked to provide the risks of obsolete formats. These responses were based on their experiences. From the responses, the researcher identified the following important aspects: lack of playback equipment, loss of information, and change in formats.

Participant 1 stressed that: “I can tell you now one good example is that we still have material from television colleagues who were using normal cassettes to record. We still have that material here, but we cannot use it because we don’t have playout mechanisms. In our archive for radio, for example, we still have cassettes and I don’t know how many of us still save cassettes today. You know one of the sad things which we recently experienced now, we were celebrating the 30th year of the release of Mandela, but you cannot salvage

that anywhere. I remember at some point that day we even salvaged the speech from that day in hard copy form, but there is nothing from audio.

How are you going to play it out? What should be taken into account is what do you do then with the pre-recorded material that is still in the old technology? If you are going to need the materials from the days past how are you going to salvage it? We are going to lose a big way the material that is in existence ok. This is the tragedy of it all, I think the problem is much wider than we see."

Participant 3 indicated that: "Even before that we never had equipment where our drama was recorded in cassettes that are available now in the studio. We don't even have the CD equipment where you could say now that we have dramas that were recorded in CD format that you can find presently. Now the challenge that we have been experiencing ever since is that as I speak now I can say that if you want or if you go to the archives and say I need a short drama of 1994 or 1992 you are unlikely to find that drama. Because those dramas have been in cassette form the cassettes have been faded out through technology. We do not have any resources or equipment as we speak now in 2020. As the equipment fades out, the cassette formats which were reliable which we used to have them, they are no longer there but leaving it at the cassettes where we are going to have a problem shortly."

Participant 6 provided more insight by saying that: "And I remember most of the dramas that I played I am told they were archived then. But the kind of systems that were archived on are not accessible to the new technology. Thobela is celebrating 60 years, you would understand that there were a lot of presenters who came before me. Their materials are still relevant to today's lives. Some of them are still on reel to reel, some are on cassettes and we're not playing them."

Participant 9 stated: "I remember when we were doing station montage but we were trying to look back at those tapes when there was this kind of presenters. You know, when we went to Johannesburg to get archives from there, it was hullaballoo."

Participant 13 explained that: "For instance, we have moved from reel to cassette and there were lots and lots of reels that were scattered around at that time and then I know in those reels, there was some important information. I fear that if they were not able to transfer that

data from those reels to the cassettes, which means much of the information is being lost."

Participant 14 remarked that: "Let us say for instance there is information on reel; how are you going to get that because the reel machine may be broken or phased out as we speak now in the SABC."

Participant 15 reiterated that: "So, how many cassette players do you have now? So, in the building, you find that you only have one and if it is malfunctioning that day you are doomed. We are stagnated because what needs to happen now is that everything that was archived using reel to reel needs to be converted into digital form. That has not been done yet. Some of the manufacturers don't exist anymore. So that material becomes of no use to you because it will sit there and you won't be able to access it. The challenge is in the change in the medium of access. You remember that in the past, material was recorded using reel to reel, so if you have got material that is in reel to reel now you struggle with the machine that can play it back and record it in the dalet system. From reel to reel we moved to minidisc. You will struggle to find a system that will read the minidisc so that you can play it back and record it on the dalet."

Participant 19 put it clearly that: "Like, for instance, we still have material that is stored in the cassette tapes that were using reel-to-reel machines. Some are still stored in floppy and the tape drive. Now the companies that were making those machines are no longer manufacturing; those machines are no longer there. Now we are left with the material but we don't have a way to convert those materials to the latest technology that is in the market. Now that gives us a problem as the SABC. So, when we try to convert the tape and the cassettes to the CDs, the CDs are no longer in the market as they were before.

The researcher observed formats in the storage that did not have labels attached to it. The survey confirmed what the participants said about reel tapes left all over the storage.

4.3.2.3 How to salvage records from obsolete formats?

The study also checked if something could be done to save the valuable records from permanent loss. Participants indicated that it was possible to save records from permanent loss but this would need staff, strategies to preserve the records, provision of an archive

folder and new technologies. They responded as follows:

Participant 1 emphasised that: “However, we still have the old material, the backlog which should be done in real-time. I mean for one-hour cassette you must take one hour recording it. So, you need someone who will sit its outplays out and convert it and integrate it into a new system or digital in a manner that it can be usable.”

Participant 6 stated that: “It will need a serious human resource to do that because they will have to play according to real time. If it is three hours’ show, they will need three hours to record that because the old technology will not allow to speed it up; so you have to convert it according to record. It is doable, but it will need the commitment of teams to do that part.”

Participant 4 highlighted that: “When they are phased out and moved from the mini-discs, they should be transferred to CDs and then saved in the archive folder. Sometimes you find that the mini-discs that we have in the machines are obsolete to playback. Those which were in tapes are no longer there and it becomes a problem because materials will always be important as long as it went on air it will help people.”

Participant 7 gave more clarity: “The process is simple and much quicker than the olden days. Let us say I have an old recording on CD, I have an option. There are many ways. It is either I transfer the CD to the computer rather than on protool. I will clean out, especially, let us say, for instance, you have your vinyl noise. All vinyl has that noise, now with new technology, I can transfer that recording and put it in computer with my ‘daw’. I can remove that noise. I can take a recording that was done in 1960, I can take it to the desk and remake and remaster it and it will sound clearer than before using a protool. It is only available in the studios. Right here in Polokwane, we have one in the advert studio and the drama studio when they were recording dramas, we were using the same desk.”

Participant 11 explained that: “Another thing is they are dissatisfied with our recording, usually what I do if I can hear that the sound quality is not right, we take the LPs for here we don’t have the system for cleaning the LPs and rerecording the LPs so we take the content to Johannesburg where they clean and bring it back so that is why we do not have customer dissatisfaction.”

Participant 19 asserted that: “The company that was hired to go to Auckland Park to take the material and convert it into soon to be phased out CDs and DVDs, the contract has expired and they were busy negotiating with them. We try by all means like we still have those reel-to-reel machines in the archive’s studios. We try to get the freelancers. The temporary people to come and do that but now come to the problem because the technicians who are to fix those machines, they are no longer here in the SABC. Those we are having are the latest technicians; they don’t know how to fix those machines.”

The researcher found the training manual on dira, as shown in Picture 4.1. This is a new playout system that had to be installed in the studios. According to the information from the training manual, the dira playout system could assist in salvaging records at risk because it provides room for the archivists to upload and download the records. According to the manual, the dira playout system has a section dedicated only for the archives. The researcher also surveyed recordings in the drama studios which confirmed that records could indeed be salvaged by using the CR24 protool desk as shown in Picture 4.3. This is a useful digital technology for producing high-quality sound.

Picture 4.3: C24 protool desk (Researcher 2020)

The researcher surveyed the technicians transferring analogue recordings into digital recordings using the CR24. There were old analogue recordings in CDs. The technician transferred the analogue recordings to a protool server and cleaned the vinyl noise. The

outcome was a clear sound without vinyl and that confirmed what the participants mentioned about salvaging valuable records from obsolete formats.

4.3.2.4 The importance of using the latest formats

The study also checked if something could be done to save records from permanent loss and some indicated that the SABC had tried to save the records. The views revolved around the digital library, current technologies, online access and contemporary users of the archive. They put their views as follows:

Participant 2 indicated that: “We are saying we want our library to complement that feature, the digital feature because we have both digital to respond to ever-changing times.”

Participant 3 said: “Let us have the material in the current equipment that will be used then.”

Participant 4 explained that: “But the archive needs to have a folder that can be accessed by everybody. If there is a new technology the archives the archive must move the material there.”

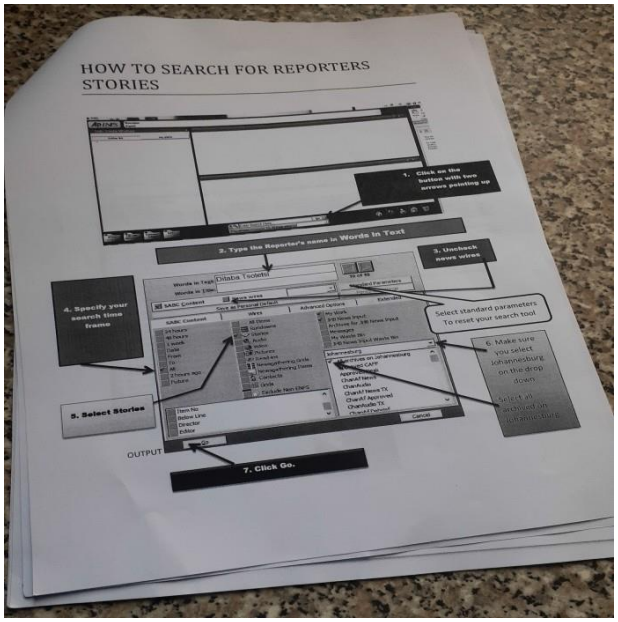
Participant 5 stated explicitly that: “With ENPS it can record the scripts, for example of current affairs, one can access what Hlokwa la tsela did for the month from the scripting perspective.”

Participant 11 mentioned that: “Certain clients are young people who have learned, about cassettes or any other prior format. So, for those kinds of clients they want to see things online you know they have been sending their assignments online, they have studied online.”

Participant 14 indicated that: “I think with the current technological developments we should be having reliable systems.”

The researcher found a document from the news division called ENPS, which provided training on the preservation and retrieval of news items from the archive. According to the manual, the news division was going to use the new format of preserving their news items.

On the manual, the researcher established the following items which made retrieval of news items easy. There is a click button that directs the journalist to the news item and then from there, the journalist presses the specified news item. From that position, the journalist specifies search time and time frame and thereafter select all items. The last section is where the journalist selects the archive which is centralised in Johannesburg and then clicks to get the news items. After going through the ENPS document, the researcher corroborated what the participants said about the importance of using the latest formats. Picture 4.4 is an example of the SABC, ENPS retrieval system. This system enables users to access information easily and fast.



Picture 4.4: ENPS electronic retrieval system (Researcher 2020)

4.3.3 Technologies that are used to preserve audio-visual records

The purpose of the objective was to establish the type of technologies that were used for the preservation of audio-visual records. This section is built from the OAIS reference model as a theoretical framework which is applicable to the preservation technologies. According to Lavoie (2014:7), the OAIS reference model must create a new version of the archival item so that it can be rendered by the current technologies. The OAIS reference model is suitable for this theme because the model facilitates adaptation to new technologies and prevents deterioration of the media (Cruz-Mundet & Diez-Carrera 2015:240). This theme was divided into the sub-themes analogue technology, digital technology, technologies in the archives and transferring records from analogue to digital technologies.

4.3.3.1 Analogue technology

The study also looked at the challenges of using analogue technologies for the preservation of audio-visual records. The participants indicated that the archive could not function effectively with analogue technology because of constant changes in technologies. Their focus was on a lack of playback equipment, traditional archiving, unused records, and slow access to records. They respondent this way:

Participant 1 contended that: “I failed to get myself a player marans, which I had to ransack through these storerooms to make a play-out because it was not going to be possible to play that out. One thing for sure is we will be using the current technology or the available technology as provided to us by the corporation at the time. But obviously whatever technology we switch to means that older technology would have to be phased out. Find a way to integrate our things into new technologies, we are stuck in the past we don’t want to move.”

Participant 2 pointed that: “The only challenge is our library because it is not yet digitised. We need a system in the library that will complement what we have in the studios so that we do not continue to use the traditional archiving system and so what happened is that the employees identify their training needs.

Participant 8 argued that: “I cannot just blame technology, yes, we are in the 4th industrial revolution, but it is a personal issue. Laziness. As humans we are lazy and we evade our laziness through technology. It always takes us time to get records in time, especially in emergencies; hence we have to respond to the Broadcasting Complaints Commission of South Africa.”

Participant 19 had a concern that: “We have got a challenge because we have got a lot of material that still uses the technology of which some is no longer in the market. Now the companies that were making those machines are no longer manufacturing those machines. When we need a tape machine or the cassette machine. It is difficult to get that equipment because no supplier is having this kind of equipment. We are wishing and waiting; maybe tomorrow a company will come and help. They are going to say we will help you and we

will be forced because that material is rich and is the foundation of this democracy is the foundation of radio."

The researcher surveyed the workstations in the archives and found that all the machines were analogue technology.

4.3.3.1 Digital technology

The study further sought to find the value of using digital technologies. Participants listed the following digital technologies available at the SABC: computer, netlog, dalet, protool, ENPS, dira and IONA. Participants also mentioned that they worked effectively when using digital technologies. This is how they responded:

Participant 1 pointed out that: "In that instance, I think technology has empowered a lot of our journalists and presenters because there are many tools that you can use. You know a while ago we were talking about photojournalists. A journalist would take a photographer with him to the story but very soon you have a photojournalist who is a reporter doing both. Now technology has narrowed things down in terms of the easiest ways of doing things. Now a journalist can have his or her phone to go out and do a story using the phone to record, or might need your computer and laptop simply because there are programmes that are integrated in such a way that they will be unable to make our sound able to play in the studio. If it wasn't for that, then I guess that having a phone and doing everything that you like to do over the phone."

Participant 2 posited that: "There are quite a few things that we can do in the studios to respond to the ever-changing world of technology.

Computer technology

Participant 1 explained that: "We also have systems that are integrated to do, that, I mean, your ordinary computer now can do between you and your phone. So, sound can be transferred from one unit to another in such a simplistic manner our journalists now do not have to cover a long-distance running back to the station, to their office to come and file their material"

Participant 7 indicated that: “Since technology is moving to a digital stage, we don’t rely much on the desk. Most of the things we can do on the computer. Currently, I prefer using digital because digital has improved over the years and you can manipulate it in such a way that sound that comes from analogue you can do it easily on digital nowadays.”

Netlog technology

Participant 4 affirmed that: “Right now, there is a system called netlog. Netlog enables us to access material from the archives. But netlog stays for two months and thereafter it is deleted.”

Participant 15 indicated that: “But the programs automatically recorded via a system that we call netlog, which is server-based. Now, this is the latest technology. In the past, you wouldn’t have such sophisticated software. Now, when the material goes to the netlog it goes to a server for a month. Then, from the month the library service will drag the whole file and keep it in the mainframe archive for future use. What I am saying is only a certain number of people per station will have access to the netlog. Those are the programme manager, probably the guy who does sound and the person who monitors adverts, because they will have to listen back should a presenter should have skipped an advert.”

Participant 19 shed more light that: “The netlog is a machine that is connected to all the studios whatever is going on air, news, adverts, speeches everything that goes on air is recorded. So, every archivist has access to the netlog. Whatever is played on the netlog, they catalogue it and put it on the DVD so that in future when someone needs it they go and take out that piece and pick up whatever is needed and give it to the relevant people. The machine automatically records to the internal hard drive and they got access to that machine.”

Dalet technology

Participant 3 emphasised that: “And you also have a little equipment there that is called a dalet. That is from a protool, the material is transferred to dalet and then from the dalet is then that it is transferred to broadcast.”

Participant 9 stated that: “Basically, what happens in a show, there is a system called dalet. It keeps on recording the whole show. But I don’t have access to it because it is limited to the studios.”

Participant 13 pointed out that: “And you also have little equipment there that is called dalet, the material is transferred from dalet and then from dalet, is then that is transferred to broadcast. But if it is information that happened this week, last week, I just get it here. In the library, we can go for older, older material.”

Participant 18 asserted that: “The process is simple, the presenter comes with own content; we only do what the presenter wants. After recording, it goes on air; thereafter it is archived.” Participant 19 indicated that: “The dalet is phasing out, In the next 12 months the dalet will be out; we will be using the dira.”

Protool technology

Participant 3 put it this way: “And now we have something that is called a protool. A protool is like your dalet system is like your laptop or a computer where you find that as the producer you record your dramas on that protool. You need people to do the editing for you as a producer.”

Participant 7 explained that: “Protool is hardware and also a digital work station. With it, you have the best of both worlds: digital and analogue.”

Participant 18 indicated that: “We cannot use the same studios which are there with the protool because they are not connected, there is no connectivity with the main control whereby the studio can go on air.”

ENPS technology

Participant 5 clearly explained that: “First I want to say that the SABC is using Associated Press ENPS software. This is a software for packaging software for the diary, for developing the diary of stories. And it is also a software for editing the diary, also for organising content.

For every region in terms of this software can generate its diary and that regional diary can be escalated to the national diary. So that during diary meetings, we can have a common national diary that we can talk to and interrogate."

Iona technology

Participant 9 explained that: "SABC has an agreement with a company called IONA there I take those studios recordings and preserve them there so that I can link them with my website. So, IONA has created a platform for us, so we take our information and put it there and then we can link it to the Website. We put them via our website so that people can download and that is the safest way people can retrieve information. It works like this, there is this thing called cloud. I think when using because you always hear cloud, cloud but the space you do not have a problem. We can keep much material or more material because we are not hindered about space. I use a laptop, I log into the website, I log into the server first, I go to the netlog server, then from the netlog server I take that information start to clean it up to make it sound nicer than after that I take it to IONO There is another studio software that I can use to enhance it so that it can be louder. Hence, I'm saying that the quality is fine and we are doing a better job to put it nicely to pack it nicely."

Participant 10 indicated that: "IONA is our service provider. They host the material we want to archive or turn into a podcast. We have to cut adverts to make sure that it was listenable to the listener. But then in, between there, there is another tool we use called adobe audition. Adobe audition is for cutting and mixing the sound or the clips that are ready to be taken to IONA package for the listeners.

Dira technology

Participant 7 mentioned that: "Now we have this new software coming next month called dira. It is rolled at the SABC commercial stations. The software allows us to integrate some of the things I am talking about. So, with the new system dira it is new and more advanced than dalet. It is on par with most of the work stations that are available like your protool, your cue base, your wave lab. So, with this playout system, you can virtually do anything with it. That is the new player system that the SABC has commissioned and I think it will be for the next coming 15 years because dira has more updates that are coming out monthly

unlike dalet. It shows that the system will be around for a very long time."

Participant 15 highlighted that: "Now we have this new software coming next month called dira. It is rolled at the SABC commercial stations already."

Participant 18 stated that: "Now recently they are talking about a new thing dira. Dira is coming. I think within the next few months, it will be installed in Durban."

Participant 19 explained that: "The technology that we will be utilising like the dira. The material will be stored temporarily in the system and archivists will be able to go and save it on a hardcopy or in the format that will be accessed after a long time."

Document analysis confirmed the great use and importance of digital technology for the preservation of audio-visual records. The researcher found a request book in the netlog room. Netlog is a system that records everything that was broadcast by the radio stations and the recordings remain in netlog for two weeks. The book was full of requests from the three radio stations Munghana Lonene FM, Phalaphala FM and Thobela FM and the digital content specialists who were using IONA had a list of listeners who requested records from the radio stations through the website. The researcher found a huge number of listeners who requested records. The digital content specialists also provide records to the staff members and this was established by the request signatures in the request book.

4.3.3.3 Technologies in live and recording studios

The study checked the type of technologies in the studios. Participants were satisfied with the latest technologies in the studios; however, some indicated that the situation was bad as old technologies were still in use. Other participants felt that the SABC was not investing in latest technologies. They listed integrated recording systems, digital technologies producing high-quality sound, new technologies in the studios and old technology. Participants presented their views as follows:

Participant 1stated that: "There are programmes that are integrated in such a way that they will be used to make our sound able to play in the studio."

Participant 2 remarked that: “Recently the two radio stations in the province had new studios installed. These are the state-of-the-art studios and we are told they are one of the best five studios in Africa. This shows the commitment that the SABC has shown in terms of moving up changes and ever-changing technologies. The ability of the presenter to interact with the listeners through social media is much easier because of these studios.”

Participant 7 explained that: “The desk that we use for current affairs is a server by Lawu, it is a digital desk. We have a small studio where we are using a protool, the C24 desk, which is where we record our adverts.”

Participant 12 asserted that: “Studios, especially with digital studios, because our studios are digital, they are very sensitive to heat. Once they go over a certain temperature they just switch off. You just find in the studio that the desk is not working, nothing is responding. In the last two to three years we have not been adhering to our maintenance schedule in the studios, we would if and when there is a need. But as of this month, we started schedule maintenance for our studios.”

Participant 15 pointed that: “One of the things that I implemented was for listeners to send WhatsApp messages to the radio stations where we would download a voice note and play it on the radio. It is cheaper to send a WhatsApp message because you can buy bundles or go to a place where there is a free connection. We are moving to a time where the only person to go to the studio is the presenter.”

Participant 18 put it differently that: “But with the trend of equipment that is used at the national level, I think the SABC, we are still lagging behind concerning technology. I mean there is nothing new for twenty-five years with the SABC, we never acquired new equipment we are still using the old ones. We cannot use the studios which are there with the protool because they are not connected. There is no connectivity with the main control whereby the studio can go on air.”

The researcher found a maintenance schedule in the studios. Inside the book were indications of the dates and signatures for maintenance that was done. The researcher surveyed the live studio for Thobela FM. Picture 4.5 shows the studios which are called Studer Glarcia 2. The technology enables the radio listeners to participate in broadcasting

through social media systems.

Picture 4.5: Studer Glarcia2 Live studio (Researcher 2020)

4.3.3.4 Technologies in the archive

The study studied what the condition of the archive studios was. Participants listed analogue technologies, poor recording, loss of records, poor studio maintenance, and emerging new technologies as problems. Participants provided a picture of a poor state of affairs saying the archive was neglected. However, others indicated that the SABC was planning something to improve the archive condition. They responded like this:

Participant 2 emphasised that: “The only challenge that we have now is our library, because it is not digitised. We have just received a business plan from a senior librarian to say they want training because they believe that it is time that the SABC need to digitise the library to avoid instances where information could be lost due to using of your traditional archiving system, so we are moving towards that. And this is driven by the RBF manager who knows the requirements needed to ensure that the library is digital.”

Participant 11 was hopeful that: “I am crossing fingers that next whether is cloud or whether it is a type of system, but they say is a digitised library. So, we are ready to use Bluetooth. We are ready we are just waiting for the SABC to say now it is done. Another thing is that they are dissatisfied with the quality of our recording. Usually what I do if I can hear that the

quality of the recording is not right, we take the LPs, for here we don't have the systems for cleaning the LPs and rerecording the LPs so we take the content to Johannesburg where they clean and bring it back. If we are not comfortable with the system that we are using to records, there are multiple types of systems that we are using to record material is not one system."

Participant 12 shed more light: "That is what we understand by the archive, we don't even know what archiving means in itself. For me what is important is the live studios. So, when it comes to the archives, there are certain things when we get there and I find that there is something wrong I won't be as strict as I would be in the live studios. The archive is neglected especially with equipment. It might take three months for those spare to come because for me is just archive. For me the understanding why do we have the archive. I would argue that we go and get a podcast from the internet of all those shows, so why do we exactly need those things to be archived."

Participant 15 explained that: "So, who needs archives when I can just download a show like that? So, the area where we are lacking is a public broadcaster."

Participant 18 put it this way: "After recording, it goes to the archive. It loses original quality and now you ask yourself is it the server that we are using or what could be the problem in this regard because once it loses its original quality it affects for tomorrow usage it won't be used again. I cannot guarantee that as the situation is like now there are machines in the archive, in the library that are not working due to leakage of rain affected the whole machine. The thing is we are not using the same equipment as the library is using. What is it that they are using in comparison to us because they should maintain the same level of quality? You put it today even after three months you go there you can just hear or feel the discrepancies that this is not the same as when it was recorded."

Participant 19 explained that: "So each archive has access to the netlog. Whatever was played on the netlog, they catalogue it and put it on the DVDs so that in the future when somebody needs it, they go and pick out that piece. So that technology trend that we are having now we are no longer installing the tape drive, the cassette machine we are installing the latest technology."

Documents in the archive contained the list of people who requested the records from the archive. Most of the requests contained in the requested file were from the radio stations while preparing for their anniversary. There were also files of external users who bought records from the archives. The information contained the name and signature of the client as well as the name of the programme, broadcasting date, broadcasting time, producer and presenter. Their researcher also saw an analogue recording machine as depicted in Picture 4.6. The analogue technology produces poor quality sound when compared to the sounds from the live and recording studios.

Picture 4.6: The archive studio (Researcher 2020)

4.3.3.5 Transferring records from analogue into digital

The study then focused on how to transfer records from analogue to digital platforms. Participants provided systems that could be applied and indicated that it was possible to achieve the objective. They further indicated that the SABC was in the process of moving away from analogue archiving to digital archiving. The following were listed by the participants' business plan for digitalisation: MPEG 3 and MPEG 4, memory card, online archiving, latest technologies, manufactures of technologies. Participants responded in this manner:

Participant 1 explained that: **"**Find a way to integrate our things into the new technologies, we are stuck in the past we don't want to move."

Participant 2 indicated that: “However there are plans we have just received a business plan from a senior librarian to say they want training because they believe that it is time that the SABC need to digitise the library to avoid instances where information could be lost due to using of your traditional archiving system, so we are moving towards there.”

Participant 6 highlighted that: “Even the radio is using wave so with the wave you can convert from wave to MP3. You can also convert it from MP3 if it is audio-visual to MP4. So, it depends on what you want to do with the material.”

Participant 7 put more light that: “With this new system when we were trying it out, it can take wave, it can take MP3. So, you can move it via CD or memory card or USB. If you move from analogue to digital if it is from CD you will rip that CD and transfer it to the computer where it will be changed into an MP3. Or you can take the other route. Your playback the recording on a CD which is connected to the computer and it will play back and the quality does not depreciate; it comes exactly the way it was. That analogue will come as it was and it will be far much controlled because you can play around it then you know the quality is at your standard. With the recorded CD it will still have the same quality. A lot of things that the people don’t understand, anything that moves and goes to analogue will always have that quality. To get the greatest quality in mastering when you are transferring information from mastering recording you have to sit down and playback whatever you want to transfer and record it on an analogue system. The more the bit rate goes down the more the quality goes. For archiving the benefits are it will improve the quality of the recording. If you move audio from analogue to digital if it from CD you will rip that CD and take it to the computer where it will be changed into MP3. Or you can take the other route and play back the recording on a CD which is connected to the computer and it will playback the quality does not depreciate. The analogue will come back as it was and it will be far much controlled. Whenever I pick a problem in the recording, I use different plugins, there is a disc which removes the vinyl noise. I will put that plugin now put it in certain places where I can detect that there is too much noise there then I can reduce the noise.”

Participant 11 emphasised that: “If it means starting to transfer, we are ready to transfer those materials. I am ready to take it to our clients to say now we are cordless; now this is how we are going to work, even at home. The SABC has cell phones for that then I will be

checking while I am at home then within the blink of an eye the client will be having what they are looking for."

Participant 19 explained that: "Now we are left with the material but we don't have a way to convert those materials to the latest media technology that is in the market. Now that gives us a problem at the SABC. They do that and while they are backing up a tape machine if it is three-hour tape it is going to take you three hours to convert."

The researcher found two training manuals, dira for the technicians, presenters and archivists and the ENPS for journalists.

4.3.4 The required staff and skill competencies for the preservation of audio-visual records

The purpose of this theme was to establish the skill and competencies needed for the preservation of audio-visual records. The study followed the OAIS reference model as a theoretical framework. According to Ngoepe (2017:34), the OAIS reference model is an approved ISO standard and it is considered the benchmark for digital preservation. The OAIS reference model defines the base functional components of a long-term preservation system (Ngoepe 2017:34). Cruz-Mundet and Diez-Carrera (2015:238) state that the OAIS reference model defines the types of information objects, which are: information content, packaging information and description. All the above objects require skill and knowledge, hence the study focused on the staff and skill competencies for the preservation of audio-visual records.

4.3.4.1 Skills requirements for archivists

The study also wanted to establish the requirements for archivists. There were no archivists as participants as they lacked information about archival skills. However, they listed the skills required as technical skills, computer literacy, and engineering skills. This is how they responded,

Participant 3 explained that: "The ideal situation will be about training people with the incoming technology, the new things and the inconsistency".

Participant 4 posited that: “When they train technicians and presenters with the new system, like I say there is dira. They should also train a person from the library who will also train other librarians so that they know how to migrate materials from one system to the other to maintain the same quality.”

Participant 7 explained that: “In Auckland Park, you will have to have engineering that is the requirement. I remember I once applied for the post in archive and I went for some interview. We were all engineers. But if you get someone who is trained and understand what is supposed to happen, how the material is supposed to sound you will get the best quality with that person.”

Participant 10 mentioned that: “You have to be computer literate, that is the first and foremost thing.”

Participant 15 indicated that: “First investing in human capital is key in any industry and change, so invest in training your people. There is what is called the 4th industrial revolution which people think is a threat to people’s jobs. It is not a threat to people’s jobs; what 4th industrial revolution is doing is rendering other people’s jobs useless and creating a vacuum for new kind of jobs. As a professional person, what do you need to do? You need to get futuristic skills. I think the bigger thing that we have is the reskilling of the archive staff to go with the time. It is one of the divisions that are neglected in the organisation. People must be trained constantly because these systems that I am showing you now might not be relevant next week. Changing technologies, these are the skills that people who are dealing with the preserving of content should be able to know that the world has moved from this.”

The researcher found a document that was used to advertise the post of a junior archivist, which is the entry-level for archivist at the SABC. The SABC had a criterion for skills that are required for the position of the archivist and this is indicated in the document from the Human Resource Department advertising the post of an archivist. The criteria included the purpose, accountability and requirements.

(See Appendix A for the purpose, accountability and requirements of a junior archivist at the SABC).

4.3.4.1 Skills audit

The study wanted to establish if the SABC had a skills audit. Participants explained that it was the function of Training and Development and Human Resources. Others indicated that it was dependent on the individual. However, they stated that the process has always been impacted by a lack of budget. This is how they expressed their views:

Participant 2 she more light that: “Yes the only challenge is that when it comes to training is facilitated by Learning and Development which is based in Johannesburg. We identify all our training needs and then we collate them and then we submit to Learning and Development. Now Learning and Development will have a programme to say for this fiscal year this is the amount of training that we will offer and that will be determined by the availability of the budget. Look it is a challenge is an open secret the SABC at this point is facing financial challenges. You will find that maybe the priority is on cost-saving so that maybe you respond to the treasury’s requirements but then you find that business suffers at the end of the day.”

Participant 10 explained that: “Sometimes it’s down to my project if I need, if I feel we need something new. But most of the time the SABC do plan and feel for us but, you see, if there is a particular need we do research and initiate with our managers that we need this.”

Participant 11 posited that: “But if someone has a problem, I will plan it to say for 2021, I will need training for this sort for so and so, and give the reasons. And if it is an emergency, I will call HR to say so and so, and give the reasons.”

4.3.4.2 Internal training

The study further checked the internal training taking place at the SABC. Participants stated that more training was offered internally and that expert employees were offering such training. They also mentioned inter-regional training where experts from other regions of the SABC offer training to other colleagues. Experts who training other employees were called superusers. However, some participants stated that internal training was not adequate while others stated that librarians and archivists were never trained. Participants

presented their views in this way:

Participant 2 clarified that: “Yes we do on-the-job training those who have skills or knowledge of some technologies assist from time to time. And we do in-house training and even above the planned training which is facilitated by training and development. We prioritise to say this is urgent if learning and development cannot schedule these people at a particular period it means specifically, they are given priority to say because we want this one should be preferred.”

Participant 5 explained: “We have the system of a chief trainer who is trained extensively, and that chief trainer turns to train other people in the newsroom.”

Participant 7 emphasised that: “And after that training me and one of my colleagues we were asked to draft a manual, training manual for the staff here. And we drafted that manual for us drafting that manual we have to sit down go through the machine left and right and now we have a better understanding and we can use it far better than before. So, it would be wise to have someone with knowledge from Limpopo so when training comes we can speed up the process because there is some in the house who understands the system. As superusers, we have got specific manuals for us only. A superuser is a guy who has access to everything because I am the one who is supposed to fix when things are broken so they will call me when there is a problem.”

Participant 11 explained that: “If I know that someone in Mpumalanga understands the system, I can also drive to Mpumalanga. It is then to be trained by that particular person in Mpumalanga. So, I utilise other people in other regions to say please I am coming I need assistance on 123. I can train anyone within the team to do extra work. So, with the knowledge that I have been trained in RAB1, that knowledge is assisting because now I do understand the sound quality and I understand the systems that are used and all types of recording systems.

Participant 14 stated: “To be honest with you I don’t remember. I don’t remember a day or time where library people or archive were taken to training or we see people here, coming to the SABC to train them.”

Participant 15 stated that: “I am one of those called superusers in this province. These are the people who are going to train others. So I am trained to train others.”

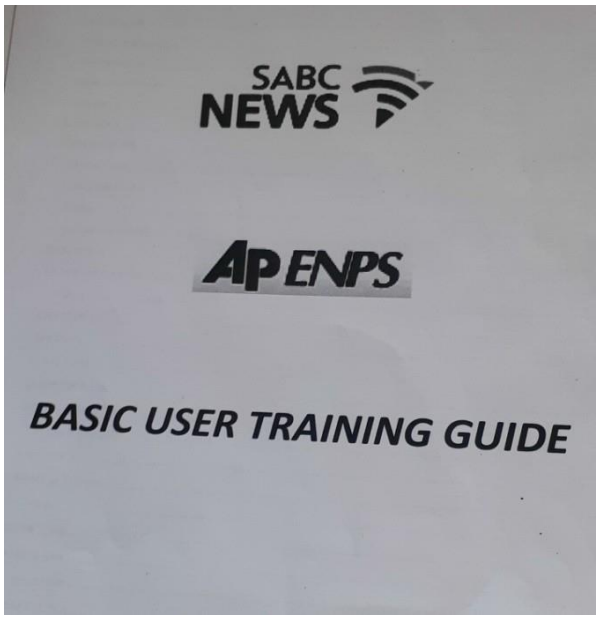
Participant 17 put more clarity that: “I must commend the SABC, we are trained and thoroughly, so we get training from time to time. For instance, we are moving to digital HD so, whatever we shoot now is a high definition you might have seen when you go to store either Game or Makro when you see TV sets are in HD. That has to do with the quality that we must produce. We are trained to show we are moving from SD to HD.”

Participant 18 contended that: “You know what is happening in our region I don’t know this acquiring of new equipment. They will come along with manuals where most of us will go along the manuals on how to operate, but we never get inducted how this thing in a mechanical way how does it work. Because you go through the manual you only apply the common knowledge that you have. Ok, as the process of working this is how it works but sometimes you get the challenge. I can give an example now we have the thing that is called a protool. I for one went for an induction course that was theory theoretical part of it before it was even installed in the studio. Then when it was installed you no longer have access to it. It is there; it is not user-friendly. There is a thing called dira that is on the oncoming position as I said it is going to be installed in Durban. When we have an operational meeting with our acting manager, he mentioned something like immediately they start there in Durban we have to get one technician to go there and observe. Immediately, they start there in Durban we have to get one technician to go there and observe. What is it? So that he can come back and teach others? They come and do induction to us; do you think that thing will work?”

Participant 19 affirmed that: “As of now the SABC has started training people that will train other people. Like now if they are coming to Limpopo or they are going to Durban, they take people from Limpopo to go and work in Durban. So that when they come back to Limpopo, they already know the system and they will assist other guys in Limpopo to apply the system. So, if there are people who are not satisfied with that training, we have got internal training in the SABC.”

The researcher found a document indicating internal training that was given to the news journalists. According to the information in the guide, the ENPS covers the basics of

electronic information retrieval. ENPS was designed by the broadcaster for broadcasters. It contains maximum screen space, small monitors and search functions. The system has instant indexing of every word from the news stories, together with scripting with integrated spelling checking, thesaurus and pronunciation guide for various languages. The ENPS electronic system also has private work areas for each user and a public area for each group and a built-in web browser. Picture 4.7 shows the cover of the training manual for the training that is given to the news division. The training is effective for the news unit to upload and access information easily and fast.



Picture 4.7: ENPS training manual (SABC 2020)

4.3.4.3 External training

The study also wanted to establish external training programmes for SABC employees. Participants indicated that providers of new products to the SABC provide training to employees on the use of such products. They also mentioned that manufacturers are bound by contract to offer training about the new product they sell to the SABC. Other participants indicated that training from manufacturers was not adequate. None of the participants mentioned training from institutions of higher learning. This is how participants expressed their views:

Participant 5 stated that: “When new software is introduced, there is training that is why we are having this basic guideline manual for the new system. Not only do they distribute the

manual, but people are taken through the software how it works."

Participant 7 indicated that: "So, we were fortunate the guys from Germany and Wild and Mavy came and they gave us training. And I remember there were seven of us with guys from Gauteng and Nelspruit. Fortunately, the manuals were already designed they were there for our training we got them last year. There is a manual that is dedicated to us superusers and there is manual for on-air presenters, a manual for music compilers, and a manual for the people in the archives. That system is so versatile because it has different sections, different layers. There is a section that is for archives only, music compilers, air presenters and newsreaders."

Participant 18 explained that: "They will come along with manuals where most of us will go along the manuals on how to operate but we never get inducted how this thing in a mechanical way does work. Because you go through the manual you only apply the common knowledge that you have. Ok, as the process of working, this is how it works but sometimes you get the challenge. This is the reason why we don't apply because the company that installed this it was in a passing phase."

Participant 19 mentioned that: "In the SABC, each project that comes to the people who are awarded that project to come and improve our systems in the costing of that project there is a cost for training that is available. Those people after installing the project they are forced to train our personnel because they are paid. They make sure that our people understand the system and after training they give us guarantee maybe 12 or 24 months."

4.3.4.4 Skills retention

The study also checked how the SABC was retaining skills. According to participants, the SABC was not retaining skills. They gave an example of the archivist post which was still vacant and retired fire marshals who were not replaced. They responded as follows:

Participant 14 indicated that: "We only see old or those people who have worked for the organisation for many years moving out, sometimes not being replaced. Very few are hired. For example, if an archivist goes and you spent more than two to three years without him/her being replaced and a new person comes and does not find a person who was

working there. Of course, there would be certain skills that may be the person who is gone would have transferred, but that is not happening, that transition is not happening."

Participant 16 explained that: "We have fire marshals that have been trained but, unfortunately, as it is now three of them have gone on retirement and we have not been able to train others that have been appointed."

Participant 19 posited that: "We try to get freelancers for the temporary people, to come and do that but now come to the problem because the technicians who are to fix those machines they are no longer here in the SABC. The ones we are having are the latest technicians they don't know how to fix those machines."

4.3.5 Storage for the preservation of audio-visual records

The purpose of this objective was to assess the appropriateness of the storage facilities for the preservation of audio-visual records by the SABC in Limpopo regional offices. The study applied the OAIS reference model for this theme. According to Kosa (2019:7-8), the OAIS reference model has an environment comprising the archival storage entity. The archival storage entity is responsible for the storage, maintenance and retrieval of the information package stored by the archive called Archive Information Packages (AIP) (Kosa 2019:7-8). The OAIS reference model requires preservation events to be logged and included as components of the AIP's preservation description information (Schweikert & Rice 2019:69). The logs are helpful for storage as they provide details regarding preservation events which are key in AIP audit (Schweikert & Rice 2019:69) This was divided into two areas: the physical storage and the cloud storage.

4.3.5.1 Physical storage of audio-visual records

When participants were requested to give conditions of the archive storage, they listed space, air-conditioning, fire-detection system, gas-suppression bottle, lockable doors, filing cabinets and back-up external storage. They mentioned the shortage of space and poor air-conditions due to a lack of maintenance. However, participants indicated that the storage was well equipped to mitigate any risk. This is how the participants responded to the questions.

Participant 1 explained: “I am not even sure if we need all the space in the library to keep all these things. Why do weed such a space when these things can simply be put in a hard drive? Here we are talking about saving space operationally, manpower, we can do our things ourselves.”

Participant 12 asserted that: “We tell them, in that regard, I would not say that we do. We enforce it, there is no enforcement. I think for us maybe I don’t know whether its ignorance on our part but they should know, I think it is an attitude of saying they should know they work with these things. You should know that when something is not responding to what is happening, so I don’t think we, we don’t do that, we don’t inform these people even as to why. When we get in there we start complaining that your place is so hot is not supposed to be so hot but we are not explaining to them why we are saying what we are saying.”

Participant 15 stated: “Now the files becomes bigger. So, you need to buy a cloud space and put them in a cloud.”

Participant 16 affirmed that: “What we did a year ago we had to ensure that more than the storage facility that we have the lockable cabinets we also install the fire detection system which is called fire suppression system. In that, we have installed the gas suppression system in the archive storage. You have got a big bottle of gas that is triggered by the cloud of smoke after a certain period. If the fire alarm is not activated within a certified time, then suppression system the gas suppression system will release the gas and distinguish the fire. Those are the measures that we have put in place of late. We have fire marshals who have been trained but, unfortunately, as it is now about three of them have gone on retirement and we have not been able to train others that have been appointed. The aluminium windows that have been installed in the archive store have been tinted to obscure the light that might come in so that is so far had been effective.”

Participant 18 explained that: “We have the equipment that is not being used in the library. You look at the volume of the work that all these three services want the material from the library. They cannot access them because of that, the equipment is there they are damaged by water, what do we do. I cannot guarantee that as the situation is like now there are machines in the archives, in the library that are not working due to leakage of rain affected

the whole machines."

Participant 19 emphasised that: "We cannot rely on the system for storage. Something can happen to the system. But it does not mean that we are going to overwrite the physical storage. We know something can happen to the system. If a virus comes, it can wipe out all our systems. We need to backup external storage."

The researcher realised that the doors to the storage were always open. There were no personnel to check the movement of the people to the storage. During the survey, the researcher went in and out of the storage without being searched at all. In the storage, there were filing cabinets that were not closed. Furthermore, filing cabinets had records, some of which were not labelled. The air-conditioners were not functioning. The aluminium windows were tainted to obscure light. The researcher also observed the available firefighting equipment. The storage housed the media for music and book library. During the study, the researcher established that the librarians were bringing food to their offices. After eating they threw the disposable packet in the dustbin. The other survey was done during tea time where remnants of bread fell on the ground. The cleaners did one round per day which means that some remnants of food would remain in the dustbins for the night. There was dust on the filing cabinets. Picture 4.8 shows cardboard boxes in the storage. These cardboard boxes add to lost records because they contain undocumented records which are irretrievable.

Picture 4.8: Records in card boxes (Researcher 2020)

Picture 4.9 shows the open shelves. The archive did have quality filing cabinets, but they were not used appropriately.

Picture 4.9: CDs in open filing cabinets Researcher 2020)

4.3.5.2 Online/cloud storage of audio-visual records

The study checked if the archive could go online. The participant stated that online archiving would benefit the region by avoiding backlogs, thereby reducing the space problem They stated that the regional archive should subscribe to companies like what the radio stations are doing with IONA. Some participants indicated that the SABC was working on a plan to develop online archiving. This is how they responded to the questions:

Participant 1 indicated that: “Taking into account that things are changing it is easier to can store the information online to can put it in platforms like cloud and things like that. You can download materials if they make it a point that we subscribe as company ratified, give a green light that we take such an approach to save our material online where it can be accessed. There is a need for innovative ways to create space and save time. I do not know how if they can give us green light to can utilise all available network systems for us to store our material look into something like YouTube.”

Participant 4 stated: “Yes, it should go concurrently, because if they don’t do that there will be a backlog.”

Participant 5 explained that: “But I think the SABC news management is coming with a provision of a hard drive for various regions. The Sotho languages were to share a hard drive and have a dedicated archivist to take care of the content that is produced inland by Sotho stream radio stations and television news.”

Participant 7 emphasised: “Yes, with the IT specialists that we have, they have to design a special cloud that is special for the SABC and is not open for the outsiders. I don’t see the archive struggling for more space because now technology is moving fast. That is why different companies are developing systems they call storage facility online. We call it cloud where you can just store your things there or you drop box. I see also with the company we are moving to the cloud and other different spaces.”

Participant 9 clarified the situation as follows: “The advantage is that we keep much material, or any materials or a lot of material as we can because we are not hindered about space. For instance, if you look at the library, the shelves, the archive there is no space. It works like this, there is a thing called cloud. So, IONA has created a platform for us so we take our information and put it there and we can link it to the website.”

Participant 13 explained that: “But not so, we also have the digital department here that stores very valuable information for the station. Not necessarily for the SABC, but for the station and specific programmes.”

Participant 14 stated that: “Or maybe there might be systems as we speak that can store content better than then systems that we were using before.”

Participant 15 emphasised that: “The archive needs to digitise things. That is the direction we are to follow, digital is not the future, it’s a must. If you call it the future, you are lagging behind. In a nutshell, that is how we deal with recordkeeping of the material that was broadcast on air.”

Participant 17 opined that: “For the voice, our camera has its storage in the form of memory

card. That is how it is stored – both visual and audio goes to this memory card."

Participant 19 emphasised that: "Luckily now the SABC is working on a business plan that will make the system, all the media library system, they are trying to get rid of all the shelves and everything. They are making electronic media library whereby each one across South Africa, we are going to have a central server whereby everything is going to be stored there. From my IT knowledge servers are reliable and that is why they are mostly used because each server has a backup."

4.3.6 The accessibility of audio-visual records for use

It is important for archives to ensure that preserved information is accessed and used. The archive that applies the OAIS reference model produces the Dissemination Information Packages (DIPs) that assist the user in locating information from the Archive Information Packages (AIPs) (International Records Management Trust 2016:26). The users access information from the archives through queries and orders (International Records Management Trust 2016:26). The study applied the OAIS reference model in analysing this data. To probe this access of audio-visual records better, the study interviewed participants on the following sub-themes: classification of audio-visual records and online access of audio-visual records.

4.3.6.1 Classification of audio-visual records

When questioned about the classification system participants provided information on their understanding of how records should be filed. They lacked knowledge and experience of archiving and they focused mainly on easy and fast access to records without providing reasons for why this should be achieved. They mentioned the loss of records, misfiling, absence of archivists and negative impact on radio programming and news broadcast. However, some indicated that a new cataloguing system was introduced. Participants voiced their views as follows:

Participant 1 explained that: "But it is no use to keep a unit that is dysfunctional and as is in our case, we are still taking our recordings to that unit hoping that they will be looked after. We are hoping because we know there are no colleagues there. We are fully aware that we

are just taking our recordings there as we should. We are handing it over but we are not confident of an area where we are handing it over, come tomorrow we will be able to get the same material. The biggest problem will be in terms of documentation in terms of what is available, you cannot just get into the archives looking for whatever. So how do you use that reference? To us, is a blow because the opportunity comes once-off."

Participants 3 emphasised that: "If you don't find them; if you are lucky, if you find them you are going to find that they are not consistent like you have episode 1 maybe up to 10 then you miss 12, 13 and 14. So, I cannot say with a definite answer that this is through our archive personnel or it is through whatever maybe."

Participant 4 stated that: *"You find people come and looking for material of five years back or seven years, back and if the archiving system is not in the order, you will find missing material."*

Participant 5 posited that: "But for other current affairs, Tiko a xi etleli of Munghana Lonene and Ndevhetshini; the recordings on the CDs take place but I am told that there is no archiving so there is no further processing from what content has been produced for that programme. So that is the basic problem of the regional and provincial level; we don't have any archival capacity because every time they record their programme but that content is not catalogued. Only Hlokwa la tsela is catalogued because we don't have people in the library dedicated to catalogue that. It is an acknowledgement that most of the content just get lost, it just gets deleted because it is not archived. But with radio news and television news in the region, much of the content just fizzles out. And if the SABC is not able to properly archive the content that was recorded or produced then we lose out on revenue, because various researchers and filmmakers they would come to the SABC to buy archival material and archival footage. Yes, the consequences are that you will be faced with content that is recorded which is like a maize field and it will be difficult to process that kind of content if you are looking for a specific topic or subject the best is you must know the exact date when a specific incident was recorded then that would serve as a guideline. But otherwise, it is not catalogued you cannot go into the computer do a search based on the subject name of the matter and for that material to be called up and give you the details where exactly to get that whether on a CD or a hard drive."

Participant 8 indicated that: “It means Phalaphala started somewhere. We are 55 years and when we were celebrating the 56th anniversary in February, we went to the library and we did not get any information to indicate where we come from and where we are going because the archives are not there. It got lost we can’t even trace it and we don’t know who was supposed to be doing what.”

Participant 10 asserted that: “We are archiving per programme. Then we give each episode, I am going to call it an episode a name and a server description, the date of the broadcast and the time of the broadcast. And in that sense, it makes it easy then how the outside users access the material.”

Participant 11 stressed that: “Because, in the past, I will find that maybe the label, it will be label 1, and I have realised that 1, 2, 3 numbers are infinite. When numbers are infinite, it means that certain people cannot go up there. When I arrived, I started to say if it is 2012, I say 2012 number 1, so I know that in 2012 how many documents the person has done. As a catalogue as a manager, I want to do the job but I catalogue because I want to see history of the people being preserved and placed there for my children in future to say I want to listen to so a so.”

Participant 14 noted that: “We could not find them. Or maybe the people who are working in the archive don’t have a system to extract or retrieve them.”

Participant 15 stated that: “Let us say you are looking for audio for the 3rd of March and a person who was archiving changed it to the 4th of March, you have lost the whole day. It would be difficult to trace if you look for that. Your expectation in the best filling from the archive, accuracy from the highest order.”

4.3.6.1 Online access to audio-visual records

The study asked whether online access to audio-visual records would provide easy and fast access to audio-visual records. Participants responded based on their daily experiences and indicated that it would be possible to work from home in line with the 4th industrial revolution. Participants further stated that the archive should be compatible with live studios, enabling free access to records. This is how they expressed their views:

Participant 1 noted that: “Look, one was looking at the possibility of working from home, and you still be productive and this is one of the ways. Do I still need one to take the recordings? Make sure that it is recorded on paper, that it is delivered.”

Participant 2 stated that: “We need systems in the library that will complement what we have in the studios so that we do no continue to use traditional archiving. So, what happened is that the employees identify their training needs.”

Participant 7 emphasised that: “They can do it online and the nice thing about it is when you are doing your archiving instead of just loading for the archiving of Limpopo, it will automatically also transfer to Johannesburg. Whoever is in Johannesburg will be able to access the material from Limpopo.”

Participant 9 posited that: “The users can access that any time anywhere. They don’t have to go to a certain building, they just sit down and say, ok, I am looking for this.”

Participant 13 noted that: “But with this digital, you don’t have to go physically to the shelves; you just access the sound anywhere anyhow, and put it in your computer and put it there.”

Participant 14 felt that: “Like I said, as I was talking before, we are delivering content that has to do with 4th industrial revolution. We should be talking about archiving systems that are in line with the systems that we are talking about.”

Participant 15 explained that: “The person in China should be able to buy my archive material sitting wherever in the world. They can just log in and pay money go through the FET and pay to direct into the SABC bank account the material goes straight to the computer.”

Participant 19: noted that: “Nowadays people release single and put it online. They just release files and share it across media houses, no one is bringing the physical copies of music they are relying on electronic copies.”

The researcher found evidence of online access from a manual for training journalists to

access records from the archive online. Figure 4.3.12 shows the ENPS, which is the new system that was implemented by the news division to enable the archivists to access their records online from the archives.

4.4 SUMMARY

This chapter presented data that was collected through interviews and was triangulated with data collected based on document analysis and surveys. The collected data assisted to establish the function of the archive which is to preserve audio-visual records. The collection was based on the objectives of the study. The findings from the study highlighted the following: the importance of preservation strategies, salvaging records from obsolete formats, using digital technologies, training of archivists and retaining the skills, provision of proper storage for records, cloud storage and use of online access to records. The next chapter interprets the research findings.

CHAPTER FIVE
INTERPRETATION OF RESEARCH FINDINGS

5.1 INTRODUCTION

The previous chapter analysed and presented findings which were based on the objectives of the study and this Chapter interpret the findings as presented in Chapter 4. Interpretation of research findings is important for the study because its goal is to develops a comprehensive interpretation while on the other hand encompassing the specific data (Yin 2011:208). The good interpretation moves the researcher from being self-centred and instead concentrate on the people, events and actions within their locally meaningful context (Yin 2011:213). Interpretation of the findings involves linking the emergent meanings together or to other frameworks and it occurs in creative analytic processes (Tracy 2013:204). This chapter interprets and discusses the findings based on the following objectives:

- Asses preservation strategies for the audio-visual records applied by the SABC in the Limpopo regional offices.
- Identify the types of audio-visual formats kept by the SABC in the Limpopo regional offices.
- Determine the technologies used for audio-visual preservation by the SABC in the Limpopo regional offices.
- Determine the staff skills and competencies for the preservation of audio-visual records at the SABC in the Limpopo regional offices.
- Assess the appropriateness of the storage facilities for audio-visual records by the SABC in the Limpopo regional offices.
- Determine the accessibility of audio-visual records at the SABC in the Limpopo regional offices.

5.2 PRESERVATION STRATEGIES FOR AUDIO-VISUAL RECORDS

For the benefit of the stakeholders and the users, and in support of the survival of preserved audio-visual records over a long time, the archive is required to develop a plan for preservation strategies of audio-visual records. In practice, the preservation strategies for

audio-visual records allow audio-visual records at the worst risk of loss to return to normal use. However, the ability by the archive to salvage records from loss remains limited in the absence of preservation strategies for audio-visual records. The OAIS reference model represents a management framework for receiving, managing and making available digital assets that need to be retained for a long term (International Records Management Trust 2016:25). Furthermore, International Records Management Trust (2016:25) avers that the OAIS reference model management framework requires continuous oversight and active management through time. This study regards preservation strategies for audio-visual records as an integral part of the continual oversight and active management of records within the OAIS reference model.

5.2.1 Preservation strategies applied to preserve audio-visual records

Continual changes to software and hardware and the rapid obsolescence of digital technologies have critical consequences for the archive (IRMT 2016:17). This implies that the archive must have a management and dedicated archivists to manage the records effectively when faced with constant technological change. Management would be responsible for designing preservation strategies for audio-visual records while the archivists on the ground implement the strategies for long-term preservation of the audio-visual records. There will be many preservation strategies for audio-visual records to be studied and implemented as the crisis of obsolescence of technologies increase (IRMT 2016:17). The result indicates that the regional archive did not have archivists. The regional archive was a division of the regional media library. The media library reported to Radio Broadcast Facility, a unit of the SABC that was responsible for technology in the region. None of the participants showed an understanding of the preservation strategies for audio-visual records. The participants have heard about information about revamping and digitalisation of the archive, but did not know what was going to happen. This was a clear indication that the regional archive was isolated and nobody knew what its future was. One participant indicated that the staff members were involved in all the changes, but that was disputed by others who indicated that they were just told about the plans. There was a need for sensible strategies that are communicated by management to the archivists and the stakeholders to boost the confidence of the archive services. The situation does not suit the audio-visual records, the creators of the records and the users of the records. Users might decide not to use the archive as this trend was already evident with the radio stations

receiving services from their digital content specialists. These are the units that were established by the radio stations to preserve their broadcast material on a system called IONA as discovered and discussed in Chapter Four. The digital content specialists also provided records direct to the listeners through the website. The news division also decided to obtain their material from a centralised online retrieval system called Electronic News Production System (ENPS).

The participants showed ideas of what could be done to preserve the records over a long time. They mentioned things like wave and MP3 as some of the strategies that could be used by the archive to salvage audio-visual records from loss. According to literature reviewed in Chapter Two, those strategies are emulation, migration, encapsulation, universal virtual computer and computer museum. Any preservation strategy that was reviewed on Chapter Two could be used because the OAIS reference model does not prescribe a specific preservation strategy for the preservation of specific data within the Archive Information Package (AIP) (Green et al. 2016:4). Participants indicated that staff from the radio stations have started to adapt music from analogue to digital format. The presenters were transferring music from analogue LP into digital formats. Participants indicated that this was a sign that the archive could do something to transfer all the analogue material into digital format. The archive had more records in analogue format and could move to digital because of a lack of preservation strategies.

One participant also mentioned that the news division was implementing a new hard drive that was going to be managed by an archivist responsible for the news. The question is, “How was that going to impact on the archivist posts in the regional archive?” The consequences of leaving things as they were in the regional archive could be severe as there would be inadequate records in future to serve the needs of the stakeholders and the general users. The regional archive must take the preservation strategies seriously when software for retrieval and appropriate hardware are lacking because electronic records cannot be accessed and retrieved, even if the formats they are recorded in are preserved in CDs or DVDs (Ngoepe & Van der Walt 2009:5). The majority of the audio-visual records in the regional archive were in CDs and DVDs. Without drastic interventions, the national history and culture preserved at the regional archive will be compromised.

When the archive fails to implement preservation strategies it runs the risk of failing to meet

the reason for its establishment because such records will be dealt with haphazardly and clumsily (Chigariro & Khumalo 2018:161). An example of the dire situation was when presenters failed to find records regarding the anniversary of the radio stations. The anniversary is an important highlight for the station as it provides the listeners with the opportunity to listen to the history of the station. Due to a lack of strategy, records were left undocumented in the storage and some of those records did not have labels. This left the presenter frustrated because in some cases they found the records but could not play them because the playback equipment was not available. The researcher established the wrong labelling on the cassettes. When the archive transfers audio-visual records from one format to another, they did not combine the information. In one example, a programme recorded in 1974 was indicated as 1984. The reason was that the same programme was rebroadcast in 1984 and the archive deleted the original broadcasting date. The information was retrieved due to the experience of the presenter who identified the contents of the programme. To avoid such a crisis, the SABC must ensure that the archive does employ archivists.

Participants heard about the revamping of the archive but could not provide a clue as to how and when that was going to take place. It was also not clear who was going to be responsible for the revamping of the archive. One participant talked about the archive moving to the cloud, but could not tell when that was going to be implemented. It was, however, remarkable to find ingenuity from the technical division of the SABC which started rolling out a play system called dira. The archive should focus on evolving ways of working, especially leveraging technologies to preserve records over a long time. The dira playout system training manual, which the researcher analysed, could provide answers to the absence of preservation strategies in the archive. The dira playout system has a dedicated area for the technicians, presenters and archivists. Participants mentioned MP3 and wave as part of the preservation strategy. Indeed, the researcher discovered from the training manual that with the dira playout system one could take a recording from wave and MP3 and move such recordings to CD or USB. The question is whether archivists will be appointed and trained to use dira? The archive might go the route of cloud and get the benefits of scalability, cost savings and enhanced security (Ngoepe & Katuu 2015:5). Participants indicated that the archive should be innovative and think of saving time. Participants were not keen to see their valuable records being lost because of the absence of preservation strategies. Despite the emergence of common frameworks like OAIS as

adopted by this study, no single implementation strategy is expected to emerge from the regional archive (IRMT 2016:24). The archive must study various preservation strategies and choose the one that is suitable for the region.

5.3 FORMATS USED FOR THE PRESERVATION OF AUDIO-VISUAL RECORDS

The SABC archive stores digital records in different formats like LPs, reel tapes, cassettes, mini-discs, CDs and DVDs. According to the IRMT (2016:16-17), the common factor is that all audio-visual records are at risk of being lost due to destruction for the following reasons:

- The fragility of the digital media. The life span of floppy disks is three to five years, hard disk two to eight years and magnetic tape 10 to 30 years.
- Poor environmental storage conditions. Storage media are sensitive to extremes and changes in temperature and humidity.
- Lack of available technology. Some diskettes can only be read by obsolete equipment.
- Quality of media. Some brands of storage are of lower quality than others and may be more of a risk.

Radio and television at the SABC are producing records at a massive pace. The archive must adapt quickly to the constraints of fragile formats and obsolete technology by either applying preservation strategies of moving to cloud archiving. This section will discuss and interpret formats used for the preservation of audio-visual records under the following sub-themes: types of formats at the SABC archive, risks from obsolete formats, how to salvage records from obsolete formats and the importance of using the latest formats.

5.3.1 Types of formats at the SABC archive

Archivists are supposed to adjust to changes in the preservation environment to save the records from loss. This is critical because audio-visual records are by nature fragile and, as such, should be transferred to new systems when technologies evolve. The SABC archive in Limpopo has recorded in the archive from 1960. The reason is that the archive is dedicated to black radio stations, which started broadcasting as Radio Bantu in 1960. The researcher established from the participants that the archive had used different formats

since 1960. They mentioned reel tapes, cassettes, mini-discs and CDs. The mentioned formats were still in the archive. Participants indicated that they found reel tapes and cassettes in use and then later mini-discs were introduced. However mini-discs did not last long. At the time of the research, the latest format was CD. The researcher also observed the storage archive and found the formats mentioned by the participants, except for the LPs. Most of these formats were on the shelves while others were on card board boxes. The survey further revealed some torn labels on the formats. Because the researcher was busy, a presenter came looking for materials to prepare for the anniversary of the station as Thobela FM would be turning 60 in June. The presenter was looking for soccer games and found a CD with a label indicating that the South African Black Eleven played the British Eleven in 2010. The presenter who was broadcasting the game was the first presenter of Thobela FM in 1960. It was then realised that by 2010, the first presenter of Thobela FM had already retired. Upon further enquiry from the sports section, the presenter found that the South African Black Eleven was a team from the National Professional Soccer League in the 70s and the particular game was played in 1973.

The torn off labels prompted the researcher to investigate the documents further. The researcher established that the first formats were LPs and the participants did not mention it. The reason was that when they joined the SABC, the LPs were no longer used as preservation format; however, there were some records in LPs in the storage. The fact could be that participants were not aware of the existence of the LPs. Documents on the labels indicated that the LPs had been in used from 1960 to 1966. The reality was that some of the records were in formats that could not be accessed. Ngoepe (2017:34) contends that the storage in public agencies cannot be considered to be storage because many did not have the capability to retrieve records. Because of misfiles the users failed to get some previous records from the archive. The archive was failing to provide services to the users because the records were undocumented. The reason could be that the archive was operating without dedicated archivists and those who were delegated to the archive lacked the skills to work in the archive. This is supported by Ngoepe (2017:33) who argues that government agencies in South Africa do not have enough skill to preserve digital records. This was probably the case at the SABC archive.

Figure 5.1 illustrates the types of formats for the preservation of audio-visual records at the SABC.

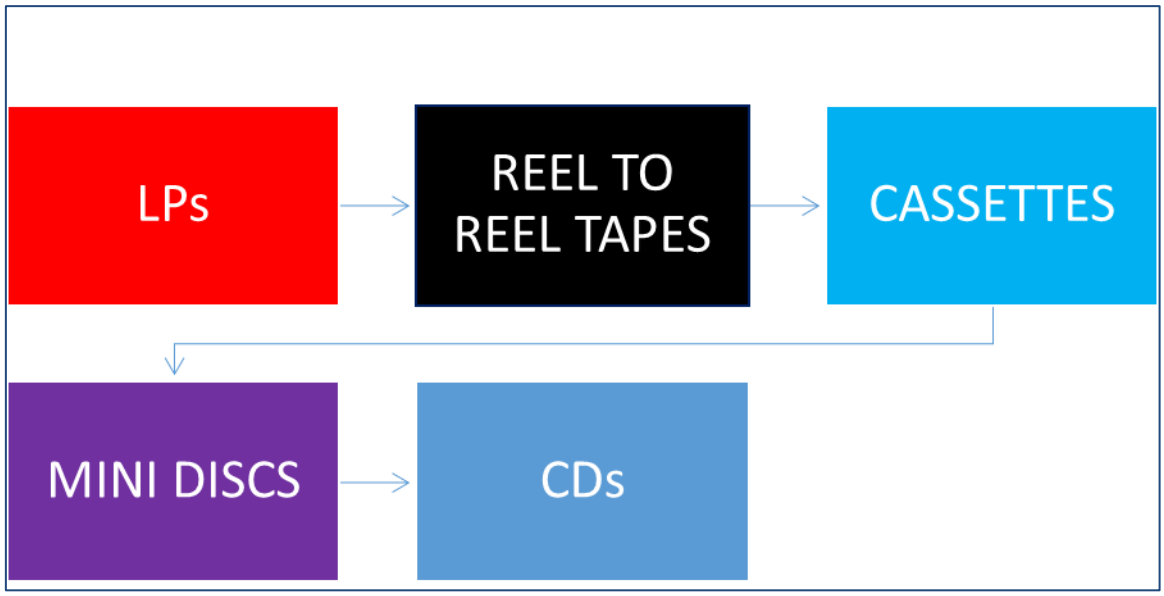


Figure 5.1: Formats in the archive (Researcher 2020)

5.3.2 Risks from obsolete formats

The archive was facing a challenging future because its valuable records were at risk of permanent loss due to obsolete formats. The regional archive was floundering while the formats were becoming destroyed, while broadcasting industries required records for reuse (Costa et al. 2017:80). The bottom line was that the archive was no longer adding value to the radio stations and the news divisions. Participants indicated that they missed valuable information due to the obsolete formats. They indicated that the situation was chaotic and frustrating because the recordings were available but could not be retrieved. This was a clear indication that records preservation systems were not in place. Successful electronic content management system implementation brings about records that are easy to access and retrieve and this was a burning problem for the regional archive (Marutha & Ngulube 2018:13). One example was the information about the 30th anniversary of the release of Nelson Mandela from prison. As a former political prisoner and former president of South Africa, the recordings were important for the rich history of the country. Even though other SABC regions had the recordings of the 30th anniversary of the release of Nelson Mandela, participants indicated that their recordings were unique as they had specific references to the province. Other participants mentioned missing drama and saying it was difficult to get those actors, even if they were available it would mean another cost to the radio stations. The loss was also echoed by the participants who were preparing the yearly anniversary of

the radio stations. They indicated that the rich language, culture and history were lost in those records. Participants also indicated that in the past they could not repeat dramas that were on cassettes as there was no playback equipment then and they were currently having difficulty to repeat dramas due to a lack of playback equipment for CDs.

Participants expressed their frustration with having the records but being unable to retrieve and use them. To them, it was like a house built on ice, which melts away when the sun shines. The contributing factor to the situation was the absence of dedicated archivists. Marutha and Ngulube (2018:13) assert that records management professionals are needed to ensure that preservation is done in a manner that ensures that records are retrievable and accessed over a long time despite technological changes. Participants indicated that the information was in the archive, but it lacked playback equipment to retrieve it. The researcher observed old reel tape machines and cassette machines which, according to the participants, were broken. One participant called it the real stagnation of the archive. It was clear from the responses that the people have lost confidence from the archive. Compounding to the problem was the fact that the companies that were manufacturing the machines were no longer manufacturing those machines. They have moved on with the new technologies. The archive is forced to adapt to the format because the fragile nature of the audio-visual records requires that they be stored in special equipment (Abankwah 2008:101). The author further avers that age renders both radio and television records obsolete. The archive must consider transferring records that are at risk to new formats. The archive must do that because the increase in computerisation and automation have forced governments and organisations to embrace modern techniques for capturing, storing and providing access to reliable information (Dina, Mwai, Wasike & Cyprian 2019:73). This will be a good recipe for the archive because the SABC relies on technology to produce, broadcast, preserve and retrieve its programmes.

5.3.2 Salvaging records from obsolete formats

Searching for records of the 60s from the SABC regional archive is as trying as fishing in the desert. Unlike in the desert where there is no fish, the regional archive has records that cannot be retrieved due to obsolete formats. This situation requires a developed structure to deal with the issue of obsolescence (Dina et al. 2019:74). The archive must develop a strategy to salvage records from an obsolete and decaying format to avoid a situation of

records being near, yet so far. Near in the sense that they are available, but far because they cannot be retrieved. Participants were of the view that steps should be taken to have the records for reuse. They realised that the archive had a huge backlog which requires serious intervention from management. The backlog had to be addressed in real time. The backlog was on all formats starting from 1960. The biggest fragile format were LPs which contained the history of the radio stations that was missing. For example, the one-hour programme might need an extra 25 minutes. That is why participants indicated that it was doable but required commitment from management as well as more staff. Apart from the extra staff, there was a serious need for equipment because the archive was still using analogue technology. The reality was that the archive was operating without archivists and it was going to be a mammoth task to get extra staff for the backlog. Their views concurred with the survey by the researcher. Even though a headcount of the obsolete formats was not done, huge formats remained in the shelves and some were stacked in cardboard boxes.

The survey and document analysis done by the researcher confirmed what the participants said about real-time and more resources. The researcher observed some of the formats without documentation. This would require staff to listen to the content and appraise the records. The process from appraisal to provision of retrieval points needs the skill and knowledge of a professional archivist. The archive must fill the vacant posts and get other archivists for the completion of the project. One participant indicated that the SABC was thinking of appointing freelancers to work on the backlog. The task for addressing the backlog requires management to do a feasibility study. That would need to have an idea of the total number of hours for all the non-digitised records from all the formats. During document analysis, the researcher found more than one programme in a format. For example, the one-hour LP could have five programmes, three for 15 minutes each and two for 10 minutes each. The reality is that when the person works on that particular LP, there will be five programmes to appraise and catalogue. That needs time, skill and knowledge. It is for this reason that the process of addressing the backlog is doable but exhausting. As the process of converting to a new format is taking place, the archivists must apply mechanisms for ensuring that the content of the record is not corrupted (Costa et al. 2017:79).

Some participants indicated that the new technology in the live and recording studios was

able to convert recordings from analogue to digital with ease. From their explanation, it seemed possible to convert analogue from the sixties, convert its digital format and get the best quality. The process was doable with speed but there were challenges for the regional archive to achieve that. To transfer records, the region had a C24 desk, which allows for the transfer from analogue to digital. The obstacle was that the machine was only available in the studios and not in the archive. The first impediment was the unavailability of digital technology in the archive. The second problem was that even though recordings would be done at a faster speed, archivists would still be needed to appraise and catalogue the recordings. One participant mentioned that the archive at the head office of the SABC in Johannesburg had contracted the services of a company to deal with the backlog in the archive. At the time of this research, the contract was terminated and the SABC was renegotiating the new contract. It was not clear from the participants whether the contract would include the regional archives. Another issue which was not clear was whether record appraisal and cataloguing were part of the terms in the contract. The risk of contracting conversion of archival records from one medium to the other was that valuable information might be lost. Records must be appraised and catalogued because produced and used audio-visual records need to be preserved and made accessible when needed (Komba et al. 2017:30). Therefore, the archive must implement preservation practices in place to ensure that archival materials are properly arranged and described for easy retrieval (Abankwah 2008:95).

5.3.3 The importance of using the latest formats

The ability of the archive to salvage records from obsolete formats is dependent on the available resources, namely: human, financial and technical. The situation will also be easy when responsibility and accountability are strong (IRMT 2016:19). The OAIS reference model was adopted as a framework for this study because it enables the archive to manage the records from ingestion until access. The regional archive has no framework as it operates without archivists and, as such, finds itself handicapped to salvage records from decaying formats. As such, there remains little interaction, if any, between the archive and the management. Participants showed interest in salvaging records from decaying formats. One way to do this was to make sure that the archive should complement the digital feature like those in the live and recording studios. The archive must have the leadership to voice its aspirations to manage as alluded to by (IRMT 2016:19). Participants also indicated that

records could be salvaged if there was a folder for the archive. As explained in chapter 4, the new playout system, dira, has a specific folder for the archive where archivists could upload and download records. However, it was not as clear how that was going to happen. Garaba (2015:3) argues that the archive should control and manage the rate and nature of technological innovations that impact on their records by ensuring access to the records at all times. The author further asserts that many archives are failing to keep the pace because of the lack of resources. The participants might have good intentions, but the reality on the ground was that the chances were high that the records could not be retrieved mainly due to a lack of resources, as argued by Garaba (2015:3).

Participants further indicated that due to the advent of 4th industrial revolution, users were no longer tolerant to outdated technologies. Contemporary users want to retrieve and access information wherever they are, and with much easy. The regional archive is forced to meet the needs of the current users by adopting the latest technology. The researcher analysed a training manual on online retrieval from the news division. This confirmed what one participant mentioned about the new system that was introduced to retrieve records online from the news division called Electronic News Production System (ENPS). Record managers must embrace the changes from technology and recognise the merits and demerits of the changes otherwise they will remain irrelevant (Ngulube 2011:4). Participants also mentioned that the archive must move to the new formats when technologies change. True to what the author said, the regional archive failed to embrace changes in technology and was out of touch with reality. There were cases where standards in formats have been superseded by other standards, thus threatening the continued accessibility and integrity of the records (IRMT 2016:18). The archive must move with speed to study and understand the standards applicable to many of its formats. The archive must have professional archivists to be able to study the advantages and disadvantages of the various formats to make the right decision. Otherwise, the move to new latest formats will always remain a mirage for the archive, and in the process, valuable information will continue to be lost.

5.4 TECHNOLOGIES USED TO PRESERVE AUDIO-VISUAL RECORDS

Engineers are constantly inventing new technologies that pose a huge challenge for the archive. The archive finds itself in a conundrum as it has to adapt to the new technologies of preservation while having to function with limited infrastructure. On top of new

technologies and lack of resource, age is rendering radio and television programmes obsolete resulting in loss of sound and image (Abankwah 2008:93). Garaba (2015:4) argues that a lack of resources is arguably the biggest obstacle to solving the problem of preservation. This section discusses the technologies used for the preservation of audio-visual records. The following sub-themes are discussed: analogue technology, digital technology, technologies in live and recording studios, technologies in archives and transferring analogue records to digital records. The regional archive was applying technologies that were outdated and not compatible with those in live and drama studios. The irony was that after recordings were made from the latest technologies, the records were taken to the archive which used obsolete technologies. Resendiz (2015:187) opines that any decision regarding digital preservation should include technical flexibility. Figure 5.2 illustrates the incompatibility between the archive and the live and recording studios. The live and recording studios were digital, whereas the archive was mainly analogue.

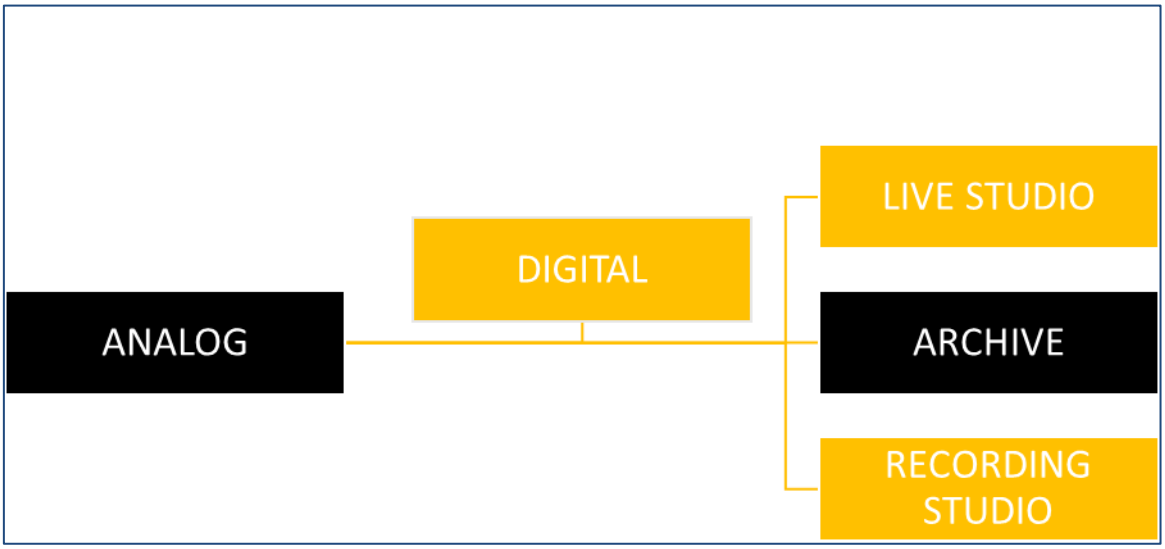


Figure 5.2: Regional equipment (Researcher 2020)

5.4.1 Analogue technologies

Technologies are drivers in the preservation of records. The speed at which technologies moved from analogue to digital puta pressure on the manufactures to abandon the old production of analogue technology. The archive that uses analogue technology will not satisfy the needs of users. The recordings from such an archive will be of poor quality. The continuing use of analogue technologies puts the records at risk of loss. Therefore, it was important for the archive to move from analogue technologies to new technologies. Ngulube

(2011:3) opines that the basis of records management is economy, efficiency and effectiveness, and the regional archive must use the mentioned basis to measure its performance. Lavoie (2014:7) states that the OAIS reference model emphasises two primary functions of the OAIS-type archival repository. According to the researcher, the functions are: to preserve information to secure its long-term preservation and to provide access to the archive in a manner that there will be easy access. The participants confirmed the disintegration of the OAIS preservation processes because of the use of analogue technologies. They indicated that they could not find the required machine called 'Marans' to access the recordings. The machine was no longer used by the SABC. Another participant confirmed that the regional archive was not digitised and, as such, was not compatible with the technology in the studios. The result of incompatibility is inefficiency and ineffectiveness. The big challenge was that the radio stations and the news divisions produced quality programmes, but when the programmes were taken to the archive the quality was compromised.

Participants also expressed their frustration because the manufacturers of the machines have stopped manufacturing analogue machines. Participants mentioned that the region has valuable records in the archive. They indicated that due to changes in technology, access to records was problematic. They did not want the records to be destroyed. The researcher observed huge volumes of records in obsolete technology. If the archive wants to save the records over a long period, it is going to come at a price. The archive will have to pay more because prices will be high, as the need for the machines will exceed the demand. Analogue machines have no room in this era of digitisation because technology has developed to the extent that a day's work in the current technology can equate to the work of over a thousand years (Ngoepe 2017:33). Analogue is no longer an option for archives. The digital machine can produce many records of high quality, thus saving time, while analogue machines are slow and produce poor quality. The regional archive was operating at a loss as it continued with analogue technologies. Participants also mentioned that such machinery was no longer produced and to get hold of it would require a lot of money. The costs would also include paying personnel to work on the backlog.

5.4.2 Digital technologies

Digital technologies are providing users with the option of retrieving and accessing records

fast and easy. Users can perform many functions at the same time and place efficiently and effectively. Radio and television journalists get instant news clips from the archive to support their live broadcasts like changes in world markets, civil war eruptions and emergency information on pandemics. Presenters in live studios are also provided with instant records from the archive regarding sport and information on natural disasters. The clips from the archive assist to support the report in the studios. It is therefore important for the regional archive to implement digital technologies to enable the radio stations and news divisions to operate smoothly. This is the new trend among archivists in the world. Archivists at the Kenya National Archives and Documentation Services are digitising microfilms and audio-visual records, and uploading records and establishing data basis (Dina et al. 2019:74). The Kenyan archivists ensure that records would be available over a long time. Still, on the importance of digital preservation, Bountouri, Gratz and Sanmartin (2018:372) postulate that digital preservation is very important and require constant updating of technologies. Furthermore, the authors argue for compliance with international standards to correctly implement digital preservation with the right technologies.

Participants provided their views on digital technologies and showed great support for it. They indicated that it was offering journalists a new way of working and indicated that journalists were only relying on digital cameras and cellphones to cover the story. Journalists were able to edit their stories in the field and send a full package for broadcasting. They also indicated that presenters in live studios were able to interact easily with the public due to new technologies. The researcher observed that most participants had laptops. They indicated that laptops helped them as journalists to transfer sound from the field of reporting to the studios easily. They also said that laptops enabled presenters to do recordings from offices or their homes. That meant that presenters were no longer forced to go to the studio to do recordings. They were forced to work in the studios for live recordings because of other play systems that were available from the studio desk and not on the laptops. The other reason for using the studios was recording dramas and advertisement as they normally require acoustic environments. The acoustic area allows the producers to avoid unnecessary noise and sound which might damage the quality of the recordings.

The other digital tool that was in use was the netlog. This is software that is connected to the internal hard drive. Participants indicated that the netlog is connected to the internal

hard drive and records all live programmes from the studios. They further indicated that recordings remain in the netlog for two months; thereafter, they are deleted to make space for further recordings. Due to certain policies, recordings from netlog were downloaded on request and employees were forced to go directly to the netlog for requests. The researcher found a file in the netlog office that was manned by the technicians. Upon analysing the files in the netlog the researcher found the following contents: date, name of the person requesting the records, the manager permitting the request, the name of the technician and the reason for the request. The researcher found that most requests were for an advertisement to deal with queries by advertisers. Other reasons for the request were for review of the programmes by the producer or the presenter. The other reason for requests were for recordings to respond to the Broadcasting Complaints Commission of South Africa (BCCSA). The BCCSA is a complaints authority established by the National Association of Broadcasters (NAB) to enforce a code of conduct for television and radio broadcast in South Africa. The list of requests for BCCSA confirmed what was mentioned as part of the frustration of delay in retrieving records from the archive. Participants were satisfied with netlog and said it was one of the best among the latest digital technologies. Dalet was another digital software used by broadcasters to preserve recordings and then transfer the recordings to live studios. The researcher found a working file where technicians reported the recordings and established that most of the recordings on the dalet were dramas and advertisements.

The other digital software used was protool, which is a digital workstation. Participants said it was useful because it allowed them to edit their recordings. The documents in the studios indicated that the protool was used mainly for editing dramas and advertisements. One participant indicated that protools were the most useful tools as it also had an analogue play system. However, some participants indicated that protool was useless because it was not connected to other systems in the region like the netlog was. The software is ideal for broadcasting records as it allows the editing of pre-recorded programmes, which ensures a quality product. ENPS was another digital technology used by the news division to upload news events. According to participants, it was most useful during diary discussions. Diary discussions took place when journalists and news editors brief each other about the stories for the day. The participants indicated that the software was creating a forum where journalists and editors shared news briefs at national level. The national level is comprised of the nine regional offices of the SABC in the nine provinces of South Africa as discussed

in Chapter One: Contextual settings. The participant explained that each region download items on the software and the items were then escalated to all regions for discussion. The researcher found that to be an advanced tool for modern-day recordings. On analysing the training manual for ENPS, the researcher established a very fast and effective system of uploading and downloading records. According to the training manual, the system would enable a journalist to retrieve records from the archive faster. This would be good software to be used by news journalists because they have always required snippets from the archives to supplement their stories.

IONA is another type of digital software used by the radio stations to download live broadcast recording via the netlog. IONA is a company that is contracted by the SABC to upload and download programmes and make them available to listeners via a website. The three radio stations have a website and have acquired the services of digital content specialists to manage the IONA programme. According to the participants, the content digital specialised preserved records from the radio stations and made them available to the listeners via the website. In their responses, participants referred to the section as an archive. However, during the survey, the researcher established that the sections were for record keeping, not an archive. The researcher established that some records were losing their originality, which is against the principle of provenance in archives. This was confirmed by participants when they said IONA allowed them to cut out some sections of the programme. Another issue was that their offices did not have files indicating when and how the records were acquired. There was also no proof of the list of users. The researcher established that IONA could be an ideal answer to the regional archive to respond to digital technologies. The researcher found similarities between the testing of Apache Hadoop technology by Voinov, Drobintsev, Kotloyarov and Nikiforof (2017:491) and IONA, as implemented by the radio stations. Table 5.1 shows the similarities between IONA technologies and Apache Hadoop technology.

Table 5.1: Indication of the direction that the regional archive must take to meet the needs of the users by adopting and implementing the latest technologies for digital preservation (Researcher 2020).

IONA technology	Apache Hadoop technology
Radio stations acquired the services of IONA to secure their records. The research adopted the OAIS reference model and will propose the model to the radio stations for digital preservation.	The authors Voinov et al. (2017) propose Apache Hadoop technology with distributed HDSF Hadoop Distributed File System which would provide a scalable, secure source solution which satisfies the OAIS-standard.
The aim was to deal with the high volume of records created each hour by the radio stations.	To deal with the high volume of structured and unstructured data created.
To serve as an alternative to the poor service they receive from the regional archive.	To provide an alternative solution to the proliferation of data to satisfy business needs.
To cater to the contemporary listeners by creation connections to stations Website.	To cater for the current users with the system that connects to Facebook and Twitter social media.

The information from Table 5.1 indicates the direction that the regional archive must take to meets the needs of the users by adopting and implementing the latest technologies for digital preservation. The last digital preservation software is dira. At the time of the research, it had not yet been implemented in the region, but it had been rolled out in some radio stations in other regions of the SABC. The researcher analysed a training manual and also got inputs from the participants about the software. One participant indicated that dira was an integrated software system. This confirmed what the researcher saw in a training manual on the system. It did have several functions and among those was the archival function. Another participant also mentioned the archival function and said that the archivist would be able to download records from the system and transfer it to another server. The question was whether those technologies in the archive were compatible with the dira system? There was also one participant who showed no interest in dira, unlike the jovial mood from other participants, as this participant had just heard of dira. The tone was of a person who was not interested in the software even though in the daily functions, the participant was involved in programme recordings. One participant mentioned that dira might take another 15 years.

However, looking at the pace at which technology is evolving that wish might be an illusion.

5.4.3 Technologies in live and recording studios

Broadcasting companies depend on advertising for their survival. The scramble for advertisement forces broadcasters to put more pressure on engineers and technicians to produce better quality. Broadcasters want to scoop up all the important events. Scoops require technologies that will allow the journalists and presenters to cover the event and retrieve the records from the archive with ease and speed. Digital technologies are the enablers for the broadcasters to achieve such needs. The technologies in life and recordings studios must meet the evolving requirements. In their daily activities, television broadcasting companies create and produce audio-visual records, use and finally keep them for reference and reproduction (Komba et al 2017:21). The three radio stations and news divisions in the region produce huge volumes of records daily which can only be preserved through the use of digital technologies. The researcher observed the live and recording studios and found them to have the current technologies.

Participants confirmed what the researcher observed by saying that the live studios had integrated technologies which resulted in high quality of sound. They also mentioned that the region had acquired new studios in two of the radio stations and indicated that they were among the best in the world. The Lawu desk and the C24 were also mentioned as the best studio desk. One participant was also happy with studios because the presenters could connect with the listeners through social media like WhatsApp. The interaction with listeners plays a role in increasing the number of listenership. The radio stations benefited from a large number of listeners as it attracts advertisement. This indicates the Limpopo SABC regional office has acquired appropriate technologies. However, one of the participants contrasted the others by saying that the SABC had the worst technologies in all the region. The participant indicated that it had been years since the SABC acquired new technologies. The participant further said that the technologies that were purchased remained ineffective because they were not connected to the live studios. The survey by the researcher confirmed that the region indeed has the best equipment. This was established through the studio reports. The studio reports guide the specific complaints from the presenters from radio stations and journalists from the news division. The complaints were mainly about temperature and humidity and loss of the link to the public which could not be attributed to

poor technologies.

The longevity of digital studios dependents more on proper maintenance. The participants indicated that the maintenance was lacking, which was confirmed when checking the maintenance logbook in the studios. One more problem in the live and recording studios was temperature and humidity. According to Garaba (2015:3), controlling temperature and humidity has always been problematic for archivists. One participant mentioned that those live studios were sensitive to heat and once they reach a particular temperature they switch off. This has always been a battle of survival for people working in studios. The personnel always ask for cold conditions and as they switch to a hot environment, the studios become endangered. One participant cited this as the reason why it has always been difficult to have the correct temperature and humidity in the studios. One impediment to the progress in the studios was poor maintenance of the equipment. Technologies are like a chronic patient who relies on regular medical treatment to sustain their illness. The technology must be maintained to ensure its ability to produce quality products. It was worrisome that most of the participants indicated that the region had not been adhering to maintenance for three years. This could be the reason why another participant indicated that the equipment could not be used effectively. The poor adherence to maintenance schedule shows a lack of monitoring of the studios by management.

5.4.4 Technologies in the archive

The archive plays a significant role in the development of the country by preserving its history and culture. Therefore, it is necessary for the archive to always have the latest technologies for preservation. The technologies used for preservation are a yardstick to judge the effectiveness and efficiency of the archive. Proper allocation of the latest technology is, therefore, a must for the regional archive to satisfy the needs of radio stations, news divisions and the public. This sub-theme will look at the type of technologies at the regional archive. Technologies must be applied in a manner that ensures that the archive is well positioned to ensure that preservation is secure and efficient (Ndemo & Weiss 2017:332). The archive management must be in constant contact with manufactures to be updated with the developments because a digital archive requires quality and security (Elragal & Päivärinta 2017:2). The researcher established that the archive was using old technologies. There were three workstations, all with analogue equipment. Only one

workstation allocated to Thobela FM was functional and a librarian was delegated to do recordings and execute requests. The others were allocated for Munghana Lonene FM and Phalaphala FM. The two work stations were never utilised for the duration of the study and had playout equipment for cassettes and CDs. This was a serious problem for the recordings from the modern studios with all the latest technologies. Under normal circumstances, in the whole process from appraisal to retrieval, the archive must harness the potential of emerging information technology (Elragal & Päivärinta 2017:3). The researcher established serious neglect of technologies in the archive.

Participants also shared their disappointment about the state of technologies in the archive. In the context of this sub-theme, some participants referred to the archive as the library. The reason was that librarians have been delegated to the archive because of the absence of archivists. One participant acknowledged that the archive was still operating traditionally, meaning that the archive was still using outdated equipment. However, the participant indicated that a senior librarian from Johannesburg, the headquarters for the SABC has promised them a business plan to revamp the archive. It was further indicated that the Radio Broadcast Facility (RBF) manager was expected to drive the plan from the region. The researcher established that the reporting line for the regional archive was skewed. If the plan had to come from the senior librarian in Johannesburg, it meant that the regional archive was reporting to the media library in Johannesburg on the straight line. The senior librarian in Johannesburg was probably in charge of the strategic planning for the regional archive. Simply put, this confirmed what participants expressed in Chapter Four, by saying there have been no consultations about the revamping. They indicated that they would take whatever would be given to them. The RBF manager was responsible for the allocation and maintenance of the equipment at the region and it was ideal for RBF to take charge of the revamp. The other reason might be that, according to participants, the RBF was in charge of the regional archive. This would mean that the regional archive had two reporting lines, the straight-line reporting to the media library in Johannesburg and the dotted line reporting to the RBF in the region. This situation puts the archive in a complex and complicated situation and is one of the contributing factors to its failure.

Participants also expressed their frustration with old technologies. They could not do requests from records on LP format because the available machinery produced poor sounds and the users have not been satisfied with the poor quality. To get the best quality

the regional archive sent the LP to Johannesburg for recordings. This is a tedious process as the users expect fast and easy access to the records. Elragal and Päivärinta (2017:4) argue that the speed at which records are produced forces the archives to use the same speed to make records accessible. The other participant indicated that the quality from the studios was compromised when records were taken to the archive. This was a clear indication that technologies in the archive were not compatible with those in the studios. This was confirmed when the researcher saw the machines in the studios and the archive. The researcher analysed the request register from the archive. There has been a slowdown of request, especially the users of the radio stations and the news division. The only time where there was an increase was when the stations were looking for records to commemorate the anniversary of the radio stations. They requested records from the sixties. The researcher established that the current record radio stations have been relying on their content digital specialist to provide them quick access to the records through IONA.

Participants also indicated that the archive was generally neglected to such an extent that some said they could not understand why it still existed. It was mentioned that the when they were called for maintenance to the archive, they did not act swiftly because the archive was generally neglected in the region. The participants further mentioned that if a spare part was needed it would take two to three months waiting for the spare part to fix the problem in the archive. The long wait for the spare could be because the type of technologies in the archive was no longer manufactured. But the question was what management was saying about the delay and this could only confirm the general neglect as alluded to by the participants. The other question was whether RBF had indeed been part of the management of the archive and also responsible for the allocation of equipment then why did the archive find itself without latest equipment? The absence of digital technologies in the archive was acknowledged by management, but seemingly there was red tape which prevented the archive from obtaining proper technologies and delivering records to the users easy and fast.

5.4.5 Transferring records from analogue into digital

The situation in the archive must be changed to accommodate the current needs of the users. Participants showed interest in doing away with the old technologies and showed the need to move analogue records into digital. One mentioned the need to move to digital

technologies with the integrated system. Participants also showed a readiness to implement new systems and do away with the traditional way of archiving although the process was being initiated from Johannesburg. They said that radio was using wave and MP3 and the archive should implement these types of software. Participants were of the view that dira playout system would be the answer to the archive's problems. This was confirmed by the researcher upon analysing the training manual for dira. The concern was that it was not clear how the implementation of dira was going to affect the archives. At the time of the study, only technicians and presenters were trained in the manual. None of the participants mentioned archivists being involved. The problem was that the regional archive was left in limbo as there was no direct input as it operated without permanent archivists. According to the manual analysed by the researcher and the inputs from the participants, dira would make a huge impact as it provides functionalities for the archive. However, the question remained whether the region would appoint a permanent archivist who will take responsibility for transferring analogue records into digital records. One participant indicated that the level of readiness for this situation of revamping the archive remains unclear to the regional archive. The indications were that it was possible to transfer analogue records to digital records, as alluded to by participants and confirmed by the researcher after going through the dira training manual. However, with the unexplained plans from top management about the revamp, the chances of realising this objective was as remote as expecting toddlers to swim across a river in flood.

5.5 SKILLS AND COMPETENCIES FOR THE PRESERVATION OF AUDIO-VISUAL RECORDS

The speed at which technologies are evolving and the huge production of audio-visual records on radio and television calls for the effective management of such records. To add to the responsibility for the management of the records are the expectation from the users. Contemporary users need information that is easily and quickly retrievable. The archive, therefore, must appoint staff with skills and competencies to meet the requirements of contemporary users. For example, if the news journalist is doing a story on regime change in Egypt, all the records should be accessed from the archive without delay. This brings the question of satisfying the needs of contemporary users. If the journalist is in the studio and requires news clips, such information must reach the journalist immediately. This can only happen if the archive has moved with changes to online archiving to satisfy the needs of

journalists who are using an integrated digital system from the studios. Radio presenters also need instant information, particularly in cases of emergency. To achieve these objectives, the archives must have archivists with skill and competencies in the preservation of audio-visual records. Elgaral and Pävärinta (2017:10) posit that information professionals must learn how to preserve data digitally so that it could be maximally retrieved and used. This objective will be discussed under the following sub-themes: skills requirements for archivists, skills audit, internal training, external training and skills retention.

5.5.1 Skills requirements for archivists

Archivists are always confronted with the changing environment from technology, the evolving needs of the users and the markets industries. In the case of broadcasting industries, archives must produce quality products to enable radio and television to attract advertisements. It is therefore important for the archive to appoint people with skills and competencies to preserve and manage their records. Participants provided their views about the requirements for skills and competencies. None of these participants was an archivist; they were only echoing what they felt would be the best solution. They noted that archivists should have skills in technology and when changes arrive, archivists should be trained in the new technologies. One other participant indicated that archivists must be included when technicians, presenters and journalists were trained in the new technologies like the new dira system. Another participant felt that computer literacy would be ideal for the archivist. One participant felt strongly that engineering was the best skill for archivists. The participant stated that at one of the interviews for the archivist post, all interviewees had engineering as a profession. Participants also mentioned reskilling as an option. However, it was indicated that the archive was neglected and as such could not meet the requirements of people with archival skill and competencies. The neglect of the archive was corroborated by the absence of permanent archivists in the region.

The researcher found an advertisement for the post of a junior archivist and used it to benchmark the skills and competencies that were required by the SABC. See Appendix 1. The following were the requirements for the job:

- Matric
- Diploma in information, management and library or equivalent qualification
- Three years of experience in archive or library

- Computer literacy, good working knowledge – Microsoft Office (Word and Outlook)
- Digital archiving/Broadcasting knowledge
- Be conversant with ENPS, News star, MAM, Daletplus

The requirements showed that the entry-level for archivist was matric. It was evident from the requirement that the SABC recognised tertiary training for archivists. Khayundi (2011:64) avers that South Africa offers archive and records management courses at tertiary level. Computer literacy in the requirements confirmed what the participants highlighted. Participants also mentioned that archivists should be trained for any changes that could happen to the archives. This in line with the experience that was expected from the applicants. Applicants were expected to know about digital archiving because as the archive confronts new challenges in digital archiving, archivists must be well positioned to lead the way by creating new well-equipped environments (Buchanan, Gruning, Gursoy & Barker 2017.272). Participants emphasised the importance of being part of the 4th industrial revolution and the SABC requires archivists to be conversant with the latest technologies like ENPS, News star MAM and Daletplus, which were used by journalists.

5.5.2 Skills audit

In the course of their daily activities, employees must show improvement in their performance. Any stagnation should be identified so that the problem could be solved. Even in the case of best performance, both employees and employers must meet and analyse the work from a certain period. Industries are doing this to ensure that planned activities are adhered to. In the event of any deviation, both parties meet, share ideas and decide on the best way forward. If the barrier is a lack of facilities, management will plan to make such facilities available. The participants highlighted that a skills audit was done at the SABC. The SABC has a Department of Learning and Development which was responsible for the training and development of the entire SABC employees. Participants noted that departments collate the names earmarked for training and sent them to Learning and Development. Learning and Development then allocated training as identified by the departments. One participant said that the SABC was experiencing financial difficulties and, as a result, less training was taking place. The issue of reporting line poses a problem to the regional archive. Whose responsibility was it to send names for archival training in the region? The other challenge was that the archive was operating without archivists so it has

been difficult to know the training needs of archivists.

Some participants thought the best option was for employees to identify their shortcomings. The participants further indicated that it was upon to the employee to do research about their needs. If in the process, they establish a need, they must approach management with their options for training. Participants also indicated that it must be the responsibility of line managers to identify training needs of the employees and work with the regional Human Resources Department to facilitate training. This scenario applied to the archive as the response would be received faster than waiting for a response from the head office. However, this option also has challenges of reporting lines. The archive resorts under the media library reports to both the regional RBF and the media library at head office. The senior librarian was mentioned as being responsible for the revamp of the archive by participants in earlier reports. It the budget for the archive was from the regional RBF, it would be an ideal situation to allocate training for the regional archivists.

5.5.3 Internal training

There are times when organisations find it difficult to send employees for training or get suitable candidates from school. An alternative for that is to train staff internally. In 2002, some educators met in South Africa decided to work on a programme to train archivists and record managers and part of their plan was on-the-job introductory education (Katuu 2015:101). The Zimbabwean Public Service Commission has already started to offer basic-level registry training, for its employees (Katuu 2015:101). All of the participants, except for one, showed an interest in internal training. It was mentioned that internal training, which at regional level is referred to as in-house training, was helpful. The region seemed to have plans for emergency training by using their internal experts to train others. The plan seemed to be effective in saving costs for the region and assisting the staff in being multi-skilled. The expert who offered training to other staff members were also developing training skills. The SABC called the staff members who trained others super-users due to their expertise in the field. However, the archive was not involved in this exercise. One respondent wanted to attend internal training for archivists called RAB1, which was training for an archivist to operate machines to produce the best sound from the recordings. However, the researcher established that the person left the archive and was working in the library. This confirmed the notion that the archive was neglected. Management further compounded the archive

problem by letting the archivist leave and could not fill the post.

One participant commended the SABC for the role it played and capacitating its employees with skills. The most important division was the news division, especially when new technologies were introduced. Television has moved from standard definition (SD) to higher definition (HD) and the public was buying a television with HD. The news division has been training its employees to ensure that the standards of the recording meet the requirements of HD and, therefore, satisfy the needs of the users. Unfortunately, the regional archivists were not available to benefit from the training. The archive is missing the opportunity as archivists were supposed to interact with other colleagues to get their feelings about their services. Buchanan et al. (2017:279) aver that archives are supposed to be managed by people with interpersonal and technical skills. In this case, management could have engaged the news division and decided on the process of sharing the skills. The requirements for archivists in the news as discussed in the first sub-themes were ENPS, New star MAM and Daletplus. The researcher saw a training manual for use by the news division which confirmed the requirements for an archivist by the SABC. The importance of employing a permanent archivist is key in that the gap between the archive and the stakeholders' news division and radio stations in the region was widening. Anna (2017:292) argues for the involvement of archive management with these questions: "How will information professionals act in the face of new challenges?", "How are they going to work with others as a team? The answer to the author's questions is for the SABC to have management fully committed to the archive.

Another participant indicated that there was never a time where the regional archivists or librarian went for training. This was confirmed by the fact that the archivist posts were not filled. This added to the point of neglect of the archive which kept on being pointed out by participants and was also observed when the researcher spent time in the archive.

One participant pointed out that internal training was not taking place at the SABC. The participant also indicated that the superusers provided them with theory only during training and it was a struggle to translate that theory into action. The participant indicated that operating systems like protool, which was for editing records before they go on air, was not effective because of poor training. Khayundi (2011:63) points out that most internal training programmes for archivist and records managers took place but failed to provide the required

skill, knowledge and competencies. The archive management should take this matter seriously, otherwise to improve the standard of archiving.

5.5.4 External training

The archive must have staff with skills, knowledge and competencies in archival principle and practices and this could be achieved if the archives attract staff with the required tertiary qualifications. Participants could not provide information on tertiary qualifications as none of them were employed in the archives. The post of archivist at the SABC needed people with a tertiary education. Even though the SABC made requirements for tertiary qualification, Katuu (2015:102) argues that there still exists a lack of standardisation in the types of qualifications between countries, and even countries themselves. The understanding of the tertiary curriculum would help to place the archive in the right space when looking for an archivist. The argument by Katuu (2015:102) is important as organisations and countries have no boundaries in employment. South Africa is part of BRICS (a treaty between Brazil, Russia, India, China and South Africa) and as such archivists from both countries can apply for archival jobs in the two countries. Asuelime (2018:140) argues that given the fact that industrial development and infrastructural development form part of the apex of BRICS and coincidently part of South Africa's National Development Plan, South Africa has a lot to benefit from the BRICS bloc. Given the scenario by Katuu (2015:101) and Asuelime (2018:140), the research looked at the curriculum for archivist courses of the institution from South Africa and Brazil. The University of South Africa offers a certificate in archival study, a course in Practicing Workplace English for proficiency in English and a range of related communication skills (University of South Africa 2018). In Brazil, tertiary schools offer courses in communication skills with related linguistic and textual production such as "writing practice" and "reading and writing" (Anna 2017:301). There is a thin line between the two institutions regarding communication as an important aspect of archival studies. Unisa focuses on English proficiency while Brazilians emphasise linguistics for communication skills. Unfortunately, the regional archive does not have a management and archivists, and as such the archive will remain ineffective like a decaying gun without bullets.

Given their lack of knowledge regarding tertiary education as part of external training, participants provided their inputs based on their experience of the regional situation. They

indicated that external training was offered by manufacturers of equipment. They explained that the SABC had a standing contract with manufactures to offer training to employees. Part of the conditions in the contract was a commitment by the manufacturers to offer training to employees with a guarantee of 24 months. Participants indicated that part of the training was the training given to superusers who were trained to train others. They said that the training manual from the manufacturers of the dira playout system was inclusive. It contained the training section for technicians, presenters and archivists. The archive was missing a lot of knowledge from the manufacturers. The question remained, who was going to ensure that that particular knowledge resides in the archive. The archive serves as a platform for the preservation of memories of organisations, but in this case, the archive is failing to preserve its memory. The training manual would serve as the reference to future archivist to respond to evolving challenges to archives.

5.5.5 Skills retention

Participants provided bleak information of the archives, specifically with its future handling of the audio-visual records. Audio-visual records from radio and television are instrumental in reshaping the future of the country. Radio stations and television in the province broadcast valuable information about the history, culture, politics, education, the economy of the province. Records containing this valuable information is dumped in the archive without anybody taking care of it. The region seemed not to worry about retaining the skills of an archivist. The future archivist in charge of the regional archive was going to find it difficult to adjust to the complex and complicated situation. This person will require more support from the management of the archive to return things to normal and will have to rely more on the advice of archivists from other regions of the SABC. Skills retention is key to the survival of organisations. Bountouri et al. (2018:371) put it clearly that archivists who are involved with digital preservation have all the necessary knowledge and skill regarding the content, structure, rights and technical characteristics of the digital resources to be preserved.

Participants indicated that they always see people leaving the region who are not being replaced. According to them, it was three to four years that archivists left, taking their skills with them, and there has not been any replacement. Nothing was done by the region to retain the skills of the retired archivist. Another participant stated that trained fire marshals

retired and have not been replaced. One other participant mentioned that the SABC tried to use freelancers but the plan did not work because they (freelancers) belong to the younger generation and could not work with old equipment. The regional archive was at the brink of collapse and urgent interventions were needed to rescue it. Firstly, archivists with skills and experience have not been replaced. Secondly, the region was operating without fire marshals who play a big role in ensuring that the audio-visual records are safe. Ngulube (2011:3) mentions the economy as one of the bases for records management and in the case of the regional archive, economists will call for immediate rescue measures.

5.6 STORAGE FOR THE PRESERVATION OF AUDIO-VISUAL RECORDS

The storage of audio-visual records is critical and should be done safely because the records are fragile and vulnerable and are at high risk of damage. Amankwah and Ngulube (2011:75) state that audio-visual records should be prevented from light, heat, humidity, fire, water, biological pests, dust, mould and atmospheric pollution. Archives management must have a plan that prioritises mitigation against disaster (Garaba 2015:10). The regional archive must have a disaster plan to sustain the audio-visual records over a long time. The following sub-themes will be discussed: physical storage of audio-visual records and online/cloud storage of audio-visual records.

5.6.1 Physical storage of audio-visual records

Participants provided information on the physical storage of audio-visual records. Some indicated that it was no longer needed as technology has advanced with more cost-effective systems. The regional storage had doors and the fire extinguishers were next to the entrance. This might be the fact that the storage was within the media library building. One participant gave an overall structure of the storage which confirmed what the researcher observed. The storage had lockable doors that were never closed during data collection. The structure had aluminium windows which, according to the participant, were effective in preventing light penetrating in the storage. Next to the door, but outside the storage, were fire extinguishers. This might have been the fact that the storage was within the media library, which included the book and music library. Inside the storage, there was a bottle of gas. According to the participant, the bottle contained gas and would be triggered by smoke in the event of a fire. If fire alarm was no activated within a certain period of time,

the suppression bottle would release gas to distinguish the fire. The participant further stated that the archive was using steel cabinets which also had locks. The doors to the filing cabinets have always remained open during the duration of the study. The participant also mentioned that the region has been without fire marshals since the retirement of the old fire marshals. The process of training new fire marshals was ongoing. The challenge in this regard was that even though the issue of fire marshals was affecting the whole regional building, the storage was mostly affected as the neglect to it has been mentioned most times by the participants. Figure 5.3 represents the storage which according to survey remained neglected.

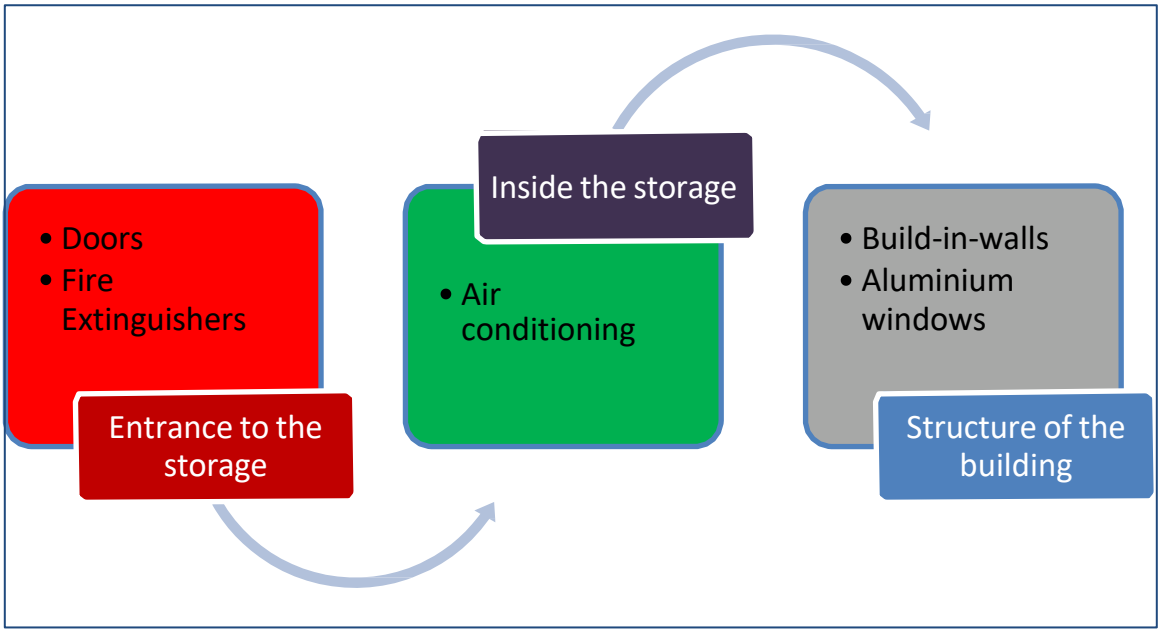


Figure 5.3: Archive Storage (Researcher 2020)

Participants indicated that the storage was not economic, as it took a lot of space. They also indicated that the files were increasing and with the backlog, there was a huge risk of it not being able to accommodate more files in future. In the context of the storage, the participant used the word files to refer to the formats carrying records in the storage. Indeed, the researcher observed more formats in storage. They were in the filing cabinets that were not closed. However, the filing cabinets were not full but some of the formats were kept in cardboard boxes that were placed on the floor. Some of the cardboard boxes were in the filing cabinets carrying mainly minidiscs and cassettes. There was a wooden filing cabinet with cardboard boxes carrying records in various formats while some cardboard boxes contained parts of the old, broken machinery. The presence of wooden filing cabinets was

a serious concern as they are not recommended for storage. The other concern was the broken pieces of machines in the storage. This also indicated a sign of neglect because the archive storage was used as a general storeroom rather than storage for audio-visual records. The reel tapes were not tightened, and they were mingled in cardboard boxes and the filing cabinets. The survey also established that some formats were not documented. It was clear that records in the archive were not catalogued. The major challenge was that the majority of undocumented records were in LP and reel tape formats which were used in the 1960s. The information in those records contained rich information about the history of the formation of radio stations. This confirmed what participants mentioned when they were responding to the risk due to obsolete formats. They indicated that they failed to get records for the anniversaries of the radio stations.

Indeed, as mentioned previously, there were air conditioners in the archives. However, during the research, it was established that the storage was always hot. This was confirmed by the participant who mentioned that humidity and temperature in the archive are not checked and this was due to ignorance on their side. It was mentioned that they had an attitude towards the archives. The participant indicated that they did not explain to the people in the library the importance of humidity and temperature for the records. Disregarding humidity is a great risk to audio-visual records. High levels of humidity cause hydrolysis, a chemical reaction which causes the binder in tapes to shed a gummy stick which prevents playback of tapes (Amankwah & Ngulube 2011:76). The archive had more records on tapes and these risks from humidity compound the problem of a backlog. This implies that even if the SABC succeed in contracting companies to work on the backlog they would still be confronted by damaged tapes. It is a serious problem because the valuable information from those records will never be salvaged. The problem for this study is that broadcasters like the SABC were faced with irretrievable audio-visual records due to deteriorating formats and obsolete playback equipment. It was also in line with the purpose of the study which was to explore the preservation of audio-visual records by the SABC's Limpopo regional offices. This objective of assessing the appropriate storage for audio-visual records is also relevant.

One participant indicated that the equipment in the archive has been damaged by water that leaked into the media library. The leakage had taken place after heavy rain in the region. The participant stated that the damage had impeded people from receiving proper

services from the archive. The archive had three machines, two of which were placed outside the archive storage, but the researcher could not establish whether the machines were functional. The librarians who were delegated to assist in the archive used the third machines. To avoid water damage, the archive must have water-sensing alarms connected to the centrally monitored security (Amankwah & Ngulube 2011:80). The archive could have water alarms because the fire alarm was already installed in the archive. Again, this brings the issue of management neglect of the archive.

The researcher observed that the door to the storage was always open. The researcher did go into the store to check inside, but there was nothing to sign when entering the storage. The librarian who was delegated was working from the library workstation and permitted the researcher to go into the storage. The researcher also observed that the library personnel were bringing food to their offices. After eating, they disposed of the remnants into the dustbins. There was no sign informing people not to bring food to the library. Amankwah and Ngulube (2011:81) state that rodents, beetles, silverfish, and cockroaches are a danger to audio-visual records. Food remnants are a breeding ground for such species that cause huge damage to archival records. The researcher also observed that the cleaner came to the media library once a day. The food remnants would remain in the dustbin for the night and more days, if it was weekend or a public holiday.

5.6.2 Cloud/online storage

This study used unstructured interviews as a tool to collect data from the SABC in the Limpopo regional offices. The advantage of unstructured interviews is its flexibility which allows the researcher greater freedom to ask supplementary questions or omit certain questions if the situation so requires (Kothari 2004:98). The researcher planned to do much on physical storage but had to switch to online/online based on the assessment of the situation. Firstly, there were no archivists among the participants because the region has not filled the posts of an archivist. Secondly, the researcher established that radio stations had acquired the services of digital content specialists to respond to the needs of their listeners through websites. Thirdly, journalists from news divisions were uploading and downloading news items from an online system called ENPS. Based on the above developments, the researcher formulated questions about online/cloud archiving which is now the sub-theme under discussion. This sub-theme would also be effective in Chapter

Six when the summary, discussion and recommendations for the study are given. The idea worked well because participants provided more information about an online platform.

Participants stated that the SABC has to be innovative and come up with ideas to move audio-visual records to the online platform. They indicated that such a move would save the archive from the current mess of having more records that could not be retrieved. One participant indicated that failure to take the archive to a cloud platform would increase the backlog in the storeroom, which was a thorny issue for the region. Participants also stated that the news division was working on a hard drive to upload and download news items online. It was made known that the hard drive would have a section to be managed by archivists. This was a clear indication of the loss of trust in the regional archive. The news division was beginning a process of breaking their services with the regional archive. It was further stated that the news division was using camera memory cards to save their recordings, another indication of a move away from the archive. The question was why was the regional archive not aligning itself with the organisation or with divisions within the SABC that were operating online. The answer came from one participant who indicated that the SABC had an information technology (IT) specialist with the ability to develop cloud platforms. It was also emphasised that the plan to revamp the media library might save the archive from total collapse.

Some participants stated that the regional archive was no longer needed as they could access records quickly and with ease from the digital content specialists. Another participant noted that the radio station’s needs were satisfied by the digital content specialists who provided listeners with records via the website. It was stated that IONA was a good example of how the archive could move to cloud. Participants indicated that IONA had the capacity to preserve more records, unlike the physical archive. Participants also indicated that it would do be better for the archive to move with evolving technologies. According to the participants, the archive was forced to digitise because broadcasters were competing and required fast information. The issue of IT was also emphasised by a participant who was a specialist in IT and said online archiving was doable. According to participants, the SABC was developing a business plan to digitise the media library.

5.7 THE ACCESSIBILITY OF AUDIO-VISUAL RECORDS

Records become valuable when they are accessed and used. The huge volumes of records produced by broadcasters need to be preserved and made accessible when needed (Komba et al. 2017:30). These authors provide clear reasons for the preservation of records. The views from the participants provided a gloom future for audio-visual records in Limpopo regional offices. Dina et al. (2019:80) argue for policy guidance to be imposed for the preservation of records, which highlights records retention, storage requirement and staff capacity. The researcher could not find any policy document regarding the preservation of records. It is, therefore, necessary for the archive to develop a policy guideline on preserved audio-visual records. That would help to solve the complex situation the archive was in during the time of data collection. To achieve that, the archive had to collaborate with the radio stations and news divisions. The researcher established that the archive was used as a storeroom because records were not classified and there was a cardboard box carrying parts of the broken machines. Ngoepe (2017:34) emphasises that such a situation represents storing of records and not preservation, since it could not locate and retrieve records after a long time. Figure 5.4 shows the situation in the archive. One the left side of the storage is the physical accessing of records which was practised during data collection, a laborious system that irritated the users. On the right side of the storage, the online/cloud platform imagined by the participants.

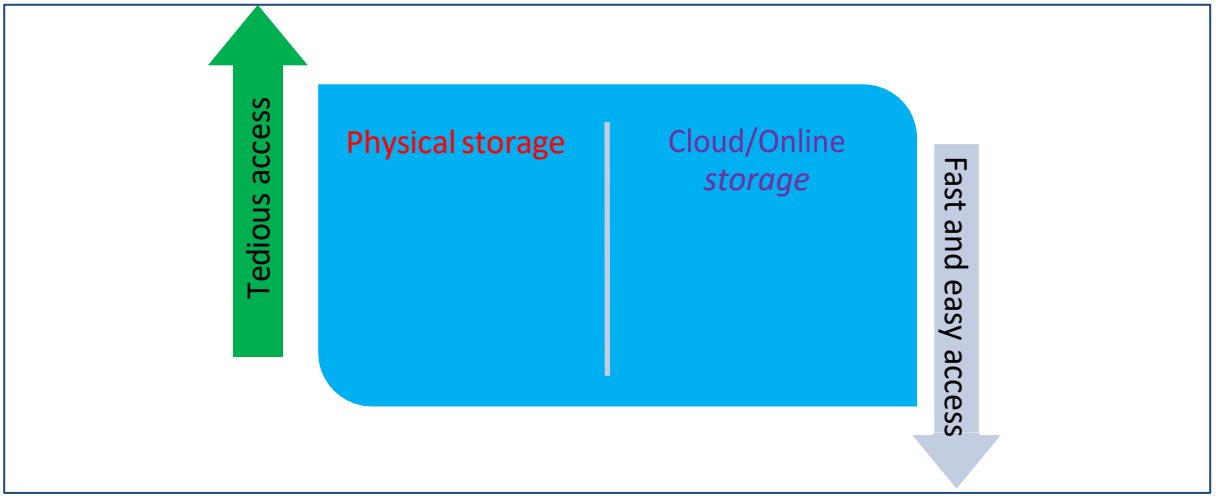


Figure 5.4: Access points for records (Researcher 2020)

5.7.1 Classification of audio-visual records

Classification is one tool that could be used to retrieve records fast and easily. Yusof and Mokhtar (2017:215) assert that classification is a core element in records management because it enables records management to be executed following international standards. The archive must have a clear classification system that can search records easily. In other words, the classification of records assists the archive in managing records effectively and efficiently (Yusof & Mokhtar 2015:217). The archive did not have a classification system and one participant stated this clearly by comparing it to a maize field. Participants showed that it was no use taking records to the archive as it was well known in the region that the archive was operating without archivists. The participant stated that they took records to the archive because there was no other option. To make matters worse the participant indicated that records were not documented. The survey by the researcher confirmed that the researcher found records in various formats and some of them did not have labels while others had torn off labels. Another participant said apart from not being documented, some records have been missing and as such could not be used for rebroadcasting. The participant was referring to serial dramas that were sequential in the broadcast. The researcher analysed the sequence in serial dramas and established four serial dramas from one radio station with missing serials. In analysing the serial dramas, the researcher found that a cassette of 60 minutes was carrying four episodes of 15 minutes each. In the first instance, one cassette was missing, in the second analysis one cassette was missing, in the third analysis three were missing and in the fourth analysis, two were missing. The situation was that the radio station could not repeat four of its dramas as continuity of the story was broken. This was a serious burden for the radio stations because they repeated programmes to save cost or to get clips for other programmes.

Participants also indicated also that records from news, especially current affairs records, have always been missing from the archive. It was clear from the participant that no classification was taking place at the archive. The news division has been taking programmes to the archive but could not find them upon request. It was also evident from the participants that the archive could not operate successfully. A participant mentioned that the news division could not provide researchers and filmmakers with records because they were irretrievable from the archive. The loss of programmes was also felt by radio stations and they failed to deliver on their mandate of broadcasting previous programmes

for the listeners during anniversary celebrations for radio stations. Participants indicated that it was clear that the archive was not classifying records. They further indicated that they expected accuracy of the highest order from the archives.

However, one participant stated that the archive was trying its best to ensure that records were easily retrievable. The participant stated that classification has improved and the archive has initiated a new classification system for the records. It was mentioned that the archive previously used infinite numbering as a method of classification. They have now changed that to a yearly numbering. For instance, instead of infinite numbers, the archive had numbers according to a certain year. For example, the first record to be classified in 2020 would be 2020/1. It was emphasised that the system of numbering per year was to ensure monitoring to see how employees performed for a specific period. The researcher could not establish the numbering from the records in the cabinets. The employees who were classifying records for the archive were delegated from the media library.

5.7.2 Online/CLOUD access of audio-visual records

Regarding the sub-theme of online/cloud storage, this theme was also prompted by the absence of permanent archivists. The researcher used this sub-theme to support the way forward for the regional archive. It was also because the participants stated their frustration due to the stagnation and wanted innovative ideas to access records easily and fast. The archive needs to export and import records and their metadata regardless of changes in technology (IRMT 2016:15). Because of the changes mentioned by participants, the archive must move swiftly to online/cloud archiving. This will require a lot of effort to ensure that the archive meets the requirements of the standards of the online archive, which include digital cataloguing. Digital cataloguing helps determine proper headings for keywords search in order, which enables the users to search the material efficiently and effectively (Radzuan et al. 2018:206). Furthermore, the authors aver that digital cataloguing increases the speed of processing and links easily with the users.

A participant expressed the importance of working from home, which will be made easier by online archiving. They indicated that the SABC would benefit as they will be providing fast services to the listeners. Data was collected in February 2019, before South Africa implemented lockdown restrictions due to the covid-19 pandemic. The virus has forced a

switch over to online communication and data sharing. Participants also stated that is was long overdue in order for the library to complement what was happening in the studios. The term ‘library’ was used to refer to the archive because the archive was housed within the media library. Participants also wanted the archive to be centralised online so that employees could access records from any region of the SABC. This would allow the staff to avoid the obtrusive process of sending an application to access records from other regions. Participants gave examples of content digital specialists who provided the radio stations easy access to records. The researcher established that some of the participants and the employees were referring to the content digital specialists as archivists.

Participants also stated that the archive was to operate in line with the advent of the 4th industrial revolution. They felt that since they broadcast over many countries in the world, broadcasters wanted listeners to access their records with ease. Participants gave an example of the music industry. They indicated that in the past music companies would send representatives to broadcasting centres to promote their products. They stated that, currently, music companies upload the latest music online and the broadcasters downloaded the music and decide on which songs to buy. It was mentioned that the system was fast and save costs. The archive can take the route where users will access records without hassles. The researcher saw a manual for online retrieval ENPS used by the news division. ENPS is a requirement for the post of news archivist as shown in Appendix 1. The application of ENPS must be an eye-opener for the archive to move away from the traditional way of archiving and start operating online.

5.8 SUMMARY

This chapter interpreted and discussed the research findings. The findings were from the data presented in Chapter 4. It has been established that the regional archive was not functional as it has been operating without archivists. Librarians have been delegated to perform some archival tasks. This contributed to a huge backlog resulting in more records that could not be retrieved. It was also established that there has been no management to direct operations in the archive. The next chapter provides conclusions, summary and recommendations of how the archive can effectively manage the preservation of audio-visual records. The chapter will also propose a model which will improve that performance from the archive.

CHAPTER 6
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The previous chapter interpreted and discussed data that was presented in Chapter Four. This chapter provides a summary, conclusion and recommendation for the study. The conclusion will assist to bring together lose ideas from the study to form a strong comprehensible study. The recommendation will provide possible solutions for the regional archive. The chapter also proposes a framework for the preservation of audio-visual records by the SABC at the Limpopo regional offices.

6.2 SUMMARY

This section provides an overview of the findings of the study which are based on the objectives as stated in Chapter One of the study. The summary is an identification of the important points from the discussions.

6.2.1 Preservation strategies for audio-visual

The preservation strategy formed part of the first objective of the study, which was to assess the preservation strategies that were used to preserve records by the SABC in the Limpopo regional office. The summary is as follows:

- The archive was operating without archivists and, as a result, users always missed required records.
- These archives had no direct management, hence nobody decided on the preservation strategies.
- Employees were not consulted on the developments, they just received information that a senior librarian was busy planning to revamp the media library. Employees were not sure if the regional archive was included in the plan. The uncertainty was the result of personnel not taking responsibility for the archives.
- The preservation strategy was doable because radio presenters were working on a project to transfer music from analogue LPs to the digital wave and MP3. The transfer of LPs was possible because radios employed presenters with managers to run the

stations. The archive remained without personnel.

- Most records in the archives were not documented because of a strategy. As a result, records remained inaccessible, while some could not be retrieved because of the lack of playback equipment.
- The SABC has introduced a new play system called dira, which was effective in digital recording and preservation. However, training was only for presenters and technicians; there was no one from the archive to be trained on the archival functions from the system.
- Radio stations decided to use IONA for quick retrieval and access of records, while the news division was relying on ENPS for fast services.
- The archive was ineffective because it lacks strategies to direct preservation of audio-visual records.

6.2.2 Formats kept by archive

The second objective of the study was to identify the formats used by the SABC in the Limpopo regional archive. The following is a summary informing the objective:

- The archive had LPs, reel tapes, cassettes, minidiscs, CDs and DVDs formats in the storage. The LPs were the first formats to be used in the 1960s and were followed by reel tapes around 1966. In the 1980s, the archive was using cassettes.
- As formats changed, the archive did not transfer records to the latest formats and this resulted with a huge backlog. As the technology evolved, the machines became obsolete and there was no playback equipment to access records from such formats.
- In the 1990s, the archive resorted to the minidisc which did not stay for long. The archive was now using CDs and DVDs. The archive has a huge volume of records that could not be accessed. Some of the records were undocumented and were piled in card boxes.
- Radio stations could not use the records from the archives during their anniversary broadcast and listeners missed their best old programmes. The news division also did not have snippets from the past programmes to celebrate the 30th anniversary of the release of Mr Nelson Mandela from prison. The programme was available but could not be used because of obsolete machinery and no playback equipment.
- Owners of the programmes, radio stations and news divisions wanted to protect the records from permanent loss. The process was doable but requires serious

commitment from management. Management has to provide a budget for the project and employ committed and skilled archivists for the job.

- The SABC has signed a contract with a private company to work on the backlog of undocumented records. The contract was cancelled and it was not clear if it would be renewed.
- Users of the archive failed to broadcast important events according to their plans due to obsolete formats.
- The company was contracted for the Gauteng archives and it is not clear whether the contract would cover the Limpopo regional archives.

6.2.3 Technologies used for audio-visual preservation

The third objective was to determine technologies used for the preservation of audio-visual records in the Limpopo regional offices. The following is a summary of the objective:

- The archive was still using analogue technology. It was not compatible with the studio technology and this resulted in the poor quality of recordings from the archive.
- The technical maintenance of the archive was poor. It was established that technology in the archive was obsolete and it was difficult to find spare parts.
- Some of the machines in the archive lacked playback equipment and the result of that was inaccessible records.
- Participants showed their interest in switching to digital technology as it offered them many advantages. Analogue technology was slowing the pace of service to the users.
- Librarians who were delegated to do archival work were not trained in recordings. This compromised the quality of sound. The archive was making duplicates from the master recordings to give it users on request.
- The latest technologies in the studios offered functions for transferring analogue to digital with improved technology.

- It was impossible to transfer from analogue to digital in the archive and this resulted in the huge backlog for the archive.

6.2.4 Staff skills and competencies

The fourth objective was to determine the staff skills and competencies for the preservation of audio-visual records at the SBC in the Limpopo regional offices. A summary of the objective follows:

- The region had no archivists and also no management to drive the development of skills and expertise of archivists. This harmed the services rendered by the archives.
- The following were the requirements for an archivist position at the SABC: matric; diploma in information management and library; computer literacy; digital archiving and systems used by news divisions, ENPS, MAM, New Star and Daletplus. Apart from digital archiving, the requirements lacked archival skills and experience. The requirements were also silent on archival policies and standards.
- The skill and experience in technology were important for archivists because they deal with sound and the transfer of records when they do recordings for the users.
- The region relied on training that was facilitated by their training division, Learning and Development. The archive was not part of the training because the department identified employees who required training. There was no management to do that and there were no archivists to be sent for training.
- The SABC had a contract with manufacturers to train employees on the equipment that the SABC purchased. Much of the training in the operation of the acquired technology is offered by the manufacturer. The regional archive does not benefit from the training. The researcher established from the training manual that a new playback system (dira) had a function specifically for archives.

6.2.5 Appropriateness of the storage facilities

The fifth objective was to assess the appropriateness of the storage facility at the SABC in the Limpopo regional offices. The following are the results:

- The archive storage is inside the media library building. The storage had the specifications for archival storages, for instance, a door. However, the door remained open for the duration of the study. The researcher asked permission to get in the storage from the librarian who was delegated to the archives. The researcher later established that the doors were never closed. Fire extinguishers were placed at the entrance to the storage. The storage had aluminium widows which prevented light from penetrating to the records.
- The storage had air-conditioners, but it was hot inside. This could be the reason why the equipment in the archives was not maintained, as poor maintenance was indicated for the archive.
- Records were placed in unlocked steel cabinets. Most of the records were in cardboard boxes and were not documented. Some cardboard boxes with records were kept in wooden cabinets which were also filled with parts of broken machines. The archive storage was used as a storeroom. There was no control over the storage, and this could be the reason why it was difficult to access records.
- The media library had water leakages, but the archive was still without water-sensing alarms.
- The media library had no sign to warn users not to bring food into the archive. The librarians who are often delegated to work in the archive bring food to the workplace and eat in the library. The result was the presence of biological pests which are a threat to audio-visual records.
- Participants also provided information regarding online storage. They stated that an online archive would save time and space and enable them to operate from anywhere; even at home.
- The feeling was that an online archive would solve the problem of a backlog in the archive. The archive would avoid investing in space for storage and would avoid budgeting for formats.

6.2.6 Accessibility of audio-visual records

The sixth objective for the study was to find out how accessible audio-visual records of the SABC in the Limpopo regional offices were. The summary is as follows:

- It was difficult for users to access records because they were not catalogued. Less filing was done and a huge number of records remained in undocumented formats.
- The archive did not have a system in place to arrange records when they were received from the owners. The result was records that were not appraised and ultimately could not be filed.
- The archive relied on physical tracing of records to access records for the users. It was a long and ineffective approach and results in wrong records being accessed.
- The approach is also lengthened because the archive has to provide the user with a copy that is dubbed from the original master. The disadvantage of this approach is loss of quality from digital recordings in the studios.
- Radio stations and news divisions had the option of using their system to avoid the slow pace of physical access to the archive. Radio stations are resorting to the services provided by their content digital specialists who use a system called IONA. The news division uses ENPS for the provision of fast and easy access to the records.

6.2.7 Framework

The seventh objective of the study was to propose a framework that would be applied by the SABC in the Limpopo regional offices for the preservation of its audio-visual records. The summary is as follows:

- The archive had no framework for the preservation of audio-visual records. This is because there was no archive management to provide vision and archivists to implement the plans.
- Records remained undocumented and irretrievable; they were not properly appraised at ingestion. The whole process of preservation from ingestion to access was chaotic.
- The adoption of a reference model would help to bring the archive to its real position.

6.3 CONCLUSION OF THE STUDY FROM THE RESEARCH FINDINGS

This section provides a conclusion based on the findings from the research. This study was prompted by the problematic situation in which the SABC finds itself with irretrievable audio-visual records due to deteriorating formats and obsolete playback equipment. The purpose of this study was to explore the preservation of audio-visual records at the SABC in Limpopo

regional offices. The study also proposes a framework for the preservation of audio-visual which, if adopted, would be used for the SABC archive. The conclusions will be based on the objectives of the study.

6.3.1 Assessing preservation strategies for audio-visual records

The regional archive has been operating without strategies for the preservation of audio-visual records. The first reason was that the archive lacked management. It was not clear whose responsibility it was to provide direction. The archive in the region falls under the media library which reported to the regional RBF. However, when decisions regarding the archive have to be taken, regional management refers it to the senior librarian in the Johannesburg headquarters of the SABC. That was the major impediment for the effectiveness of the archives. The other reason was that the archive was operating without permanent archivists. Librarians were alternating in serving in the archive. Radio stations and news divisions are the main producers of the records that are taken to the archive for preservation. The stakeholders, radio stations and news divisions were satisfied with the services from the archives. They indicated that it would be better if the archive was placed online. The absence of strategy was evident in the archival storage. Most records were not documented and users found it difficult to get the records fast and easily. The strategy would assist in ensuring that records are monitored from ingestion until they were accessed. Radio stations and news divisions have resorted to the development of the digital system to have easy accession of records. Radio stations were using IONA while the news division was using ENPS. This decision taken was a realisation that their records produced from digital technologies ended up in the archive with analogue technology. The SABC was rolling out a new playout system (dira) in some of the radio stations. With its functions for archive, dira would be of value to the archive. The preservation strategy for audio-visual records would cover some functions from it.

6.3.2 Formats for audio-visual records

The regional analogue has been keeping old formats and never transferred records to new formats. The result was a huge backlog with formats from the 1960s still in the archive. The first formats to be used for archiving were LPs, which have been in the archive for 60 years. The formats are in a state of decay and most of the recordings from the LPs, reel tapes

cassettes and minidiscs were irretrievable. Radio stations and news divisions could not rebroadcast programmes that contained rich records with the history and culture of their listeners. The problem for the study of irretrievable records was starting to show itself. Indeed, users were able to retrieve some records from the archives with documentation, but failed to access them because of unavailability of playback equipment. There are two reasons why records in the archive could not be used. Firstly, records were documented, but there was no playback equipment, and secondly, formats were undocumented and as such it could not be proven whether they were available or not. The other problem was the information on the formats which was changed during migration from one format to the other. If the broadcasting date changes, the records lose its originality. This changing of dates was evident on the move of records from reel tapes to cassettes. There was a need to salvage records from loss, but it was clear that the situation was not conducive for such a project because of the absence of management and archivists. The transfer to new formats could be achieved but it required commitment from management.

6.3.3 Technologies used for preservation of audio-visual records

There is a difference between technologies used in the archive and those used in the live and recording studios. The reality is that both are used to record and produce the same programmes. Technologies in studios were all digital and included some of the latest innovations. They were acquired to produce records of high quality. After the broadcast, the records were taken to the archive and the technology is analogue. When users request records from the archive, they are given a duplicate from the master recording. Due to the incompatibility of technologies, the recordings from the archive produce poor quality. That was the challenge the archive has been facing. RBF is responsible for the allocation and maintenance of technologies in the region. It was not clear how RBF provides the archive with analogue technology knowing very well that users have been served poor quality. The studio technology enables employees to upload and download information easily to their online platform. Employees from the radio stations enjoy digital benefits from IONA and the news use ENPS. The archive, on the other hand, was relying on obsolete machines and often had difficulty in acquiring playback equipment. The maintenance for the archive has been poor, with technicians focusing on maintaining the studios. The region has acquired new technologies in the studios which increased the gap between the facilities in the studios and the archive. This action continues to put the records produced in the region at risk of

being irretrievable old machines fade out. Playback equipment for LPs, reel tapes, cassettes and minidiscs was being phased out and was no longer manufactured. CDs and DVDs were also on the way out but the archive continues to operate those machines. The use of analogue technologies by the archive has resulted in a slow-down of request from users.

6.3.4 Staff skills and competencies for the preservation of audio-visual records

Contemporary users of the archives put pressure on the archive to provide quick access to the records. The regional archive has been operating without skilful archivists who would understand and serve their needs very well. The record library and the book library were under the same management as the archive had personnel, which made it difficult to understand why the archive was in such a situation. Delegated personnel to the archive could not provide better services because they have not been trained in the field of archiving. The requirements for archivist indeed put digital archiving as one of the requirements but the archive continued to use analogue technology. Management in the region conducted a skills audit to identify training needs for employees, and the archive could not benefit from the process. The SABC's Learning and Development division collate the names and provide training for the selected employees. Management could not identify librarians to be trained in archival work because of their job description. In South Africa, archival institutions benefit from tertiary courses offered by institutions like the University of South Africa. In this regard, it could not be that the SABC cannot find archivists with tertiary qualification as was specified as one of the requirements for the post of an archivist. What is not clear was why management continues to provide the budget for other sections but not for the archive. Employees of the SABC were also benefiting from a programme of skills exchange. This took place when Learning and Development could not accommodate all the employees who were earmarked for training. For example, a technical expert could be called to train presenters and journalists on the application of certain equipment. Archivists would be trained in technical recording as part of their function and this involves transferring records from one medium to the other. That was not happening. The librarians who were delegated to the archives were also engaged in moving records from cassettes to CDs. The situation requires management to ensure that well-trained employees with skill are appointed in that position to avoid compromising the quality of the recordings. Employees of the SABC were also benefiting from suppliers of the equipment. The SABC has acquired

a new system called dira, and the contract binds the suppliers to provide training to employees on the system. Dira is digital equipment with a function specifically for the archives. Presenters and technicians were also trained in their specific functions from the system. Experts among the staff have also been identified to train others. The SABC does not retain skills from archivists.

6.3.5 Storage facilities for the preservation of audio-visual

The storage had doors that were never closed. The aluminium windows prevented light from penetrating the storage. There were fire extinguishers and fire suppression gas to prevent fire; however, the region did not have fire marshals. The storage had steel filing cabinets with loose formats. Some of the steel cabinets contained cardboard boxes full of formats. The storage also had wooden cabinets with some cardboard boxes containing formats. Other cardboard boxes on wooden cabinets contained parts of broken equipment. The storage did not have water sensors. It did have air-conditioning but it was always hot inside the storage. The storage had huge undocumented backlog which contributed to the fact that most of the records were missing. The situation stopped radio stations and news divisions from rebroadcasting their programmes. As a result, records in the archives were irretrievable. For reuse of the recordings, radio stations and news, division have adopted other plans to ensure quick access to records. Indeed, they were receiving records from IONA and EPNS. However, they continued to retrieve records which were recorded and brought to the archives for many years previously. The librarians were adding to the challenges of risks to audio-visual records by bringing food in the library. Based on the satisfaction they received from IONA and ENPS, there was a call for the archive to do away with physical storage and operate online.

6.3.6 Accessibility of audio-visual records

The archive had a huge volume of records; however, most of them could not be accessed because the archive did not have mechanisms to ensure that records are traceable, retrieved and accessed. Records were not classified when they were received by the archive. The practice has been continuing because users were still complaining about records that were missing from the archive. Classification and cataloguing are skills that were neglected by the archive management, particularly because they have not been filling

the post of archivist for longer than two years. People continue to request records from previous recordings, but they never get them because of misfiling. The librarians who were delegated to assist lacked the skill of physical searching. The use of physical access is tedious and does not meet the requirements of broadcasters who always require records instantly. The archive was filing to provide users with accessing tools to improve their response time. Requests for current recordings had declined because users were dependent on digital technologies to access their records.

6.4 RECOMMENDATIONS

The audio-visual archive for the SABC in the Limpopo regional office must ensure that audio-visual records remain accessible and used over a long time. To achieve this, the study makes the following recommendations with a framework to be embedded in the preservation of strategies:

6.4.1 Strategies for the preservation of audio-visual records

Strategies in organisations are enablers that guide how tasks should be performed and how monitoring processes should be implemented. Preservation of audio-visual records is very important for the SABC and should be handled properly to ensure their safety. The study established that the regional archive was operating without strategies for the preservation of audio-visual records. The study recommends the establishment of management for the archive whose main responsibility will be to oversee the overall functions of the archive. The management should first appoint archivist with the required skills and expertise to work in the archive. Then management should prepare a budget for the archive to ensure that the archive can operate effectively. Management of the archive should develop strategies for the preservation of records as discussed in Chapter Two. The archivist should be involved because of their skill in archival matters. Furthermore, management should also develop policies and procedures to streamline the archival tasks. While developing these strategies, the management of the archive must consider the views and inputs from the stakeholders, among which the RBF for technology and storage requirements, radio stations and news divisions as creators and providers of records. The archivist should collaborate with the stakeholders to ensure that the implemented strategies are suitable to them.

6.4.2 Formats for audio-visual records

Audio-visual formats are like endangered species. In the absence of proper care, they will be destroyed and the information that they contain would be lost forever. Management of the archive should ensure that all the information contained in various formats is restored. The SABC has been hosting historians, economists, politicians and linguists who provided valuable information to the listeners, and such valuable information should be preserved for posterity. To handle the issue of backlog properly, the management of the archive must develop a budget specifically for the project of wiping out the backlog. It would be ideal for the management to give priority to the project for a certain fiscal year. That budget should cover advertisements for the posts of staff to do the job and the archivist. Management should also engage tertiary institutions that offer the archival course for student practicum. The archivist should be trained in the aspect of training others so that the practicum by students will benefit both the SABC and the students. The budget for backlog should also cover internship programmes. The key point in addressing backlog by broadcasters is to get playback equipment which could be an arduous task because some would be no longer produced in the market. This requires management to have good communication and negotiation skills to get the best offer.

6.4.3 Technologies for audio-visual records

Technologies are drivers in the economy and place a huge role in the creation and transport of information. Then study established that the archive has been ignored when changes in technology took place. There should be a budget for technology from the region as the archive requires digital technology to satisfy the needs of the users. Archive management should study IONA and ENPS from radio stations and news divisions, respectively, and find a way of providing such services to the users. Failure to do that would render the archive redundant. The archive should have a management that will study and understand the changes brought to the broadcasting industries by technology and the management of the archive should work closely with RBF division. The archive should engage radio stations and news divisions to ensure that the archive remains part of satisfying the needs of the clients. Management should ensure that technology in the archive is compatible with that in the studio. The archivist should have basic knowledge of technology because their work

involves recordings. The management should balance the need to have digital technology and the need to retain analogue technology for a backlog. Maintenance of the archive studios should be given priority as is the case in live and recording studios. Management should monitor compliance with the maintenance schedule from RBF.

6.4.4 Skills and expert for archivists

The study established that the archive was operating without personnel. The archive should have a management with full knowledge and understanding of the archive. The management of the archive should develop a plan to fill the position of archivists and this plan should be guided by the developments from the radio stations and news divisions and should ensure that the requirements for archivist are in line with what the client requires. The study established that the requirements for the post of archivist at the SABC did not include all the requirements for the regional needs. The lists should cover technical skills because archivists use that skill to measure the quality of the sound of the recordings. The management of the archive should insist on knowledge, experience and skills in classification, cataloguing and indexing because they are the cornerstone of ensuring easy and fast access to the records. To get the requirements right, management should liaise with professional bodies in archiving like the South African Society of Archivists (SASA). SASA is a body of professionals from archives, records management environment as well as academics who are involved with providing studies to future archivists. SASA provides knowledge to members through conferences and published journals. Management should encourage archivists to be involved with such bodies and should also engage tertiary institutions with a view to developing the requirements for archivists. Management should also ensure that archivists are trained with all recording devices that are used by radio stations and news division. Archivists should also be competent communicators because they are engaged with the users.

6.4.5 Storage for audio-visual records

Storage is a house for fragile audio-visual formats and should be protected against anything that might pose a risk to the records. The study established some risks to the records and there have been no plans in place to remedy the situation. The region should have archive management. Archive management should appoint archivist to ensure that the storage is

safe. The archivist should ensure that doors to the stores remain closed and that users enter the storage on only permission from the archivists. Since the storage is in the medial library, management should ensure that food is not allowed in the premises. There should be a notice at the entrance notifying users about the rules of the archive like silence and no eating and drinking which are al suitable to the media library. The management of the archive should work closely with the RBF management to ensure that temperature and humidity in the storage are kept at the correct levels. The archivists should have a maintenance schedule from to enable them to monitor adherence to the agreement. The storage should be clean and archivist should ensure that cleaners used the necessary equipment because audio-visual formats are fragile and sensitive to water. Management should ensure that only archival records are placed in the storage and shelved only on steel cabinets. The archivist should ensure that records in the storage are documented and accessible. Furthermore, management should develop a plan to move the archives to the online platform to meet the needs of the users.

6.4.6 Accesses of audio-visual records

Records are preserved with the purpose that they will be used in future to meet the needs of users. To fulfil that requirement, archivists should ensure that access tools are readily available to ensure speed and easy access to records. Management of the archive should appoint archivists with the necessary skills to manage the preservation of audio-visual records. The archivist should ensure that records are appraised, classified and filed in a manner that would make retrieval easy. Archivists should have digital archiving skills because they would be required to transfer all the analogue records to digital formats. Therefore, they should provide an access point like preparing and implementing digital cataloguing. Archivists should also study systems like IONA and ENPS and develop similar systems for the archive and make such systems available to all the users. Management should ensure that policies and procedure for the protection of records are developed and ensure that the archivist implements and monitors adherence to such policies. In this regard, management should work with IT specialists in developing policies and procedures.

6.5 A PROPOSED FRAMEWORK FOR THE PRESERVATION OF AUDIO-VISUAL RECORDS

The study proposes a framework for the preservation of audio-visual records as indicated in Figure 6.1 which flows from the OAIS reference model. The reference model is known for its ability to deal with the migration from one format to the other in the process of long-term digital preservation as discussed in Chapter One. The model was used because it enables the archivists to describe the functions in the preservation process. As illustrated in Figure 6.1, the regional archive can adopt this framework and use its guidance to implement online archiving, which has been mooted by participants. This is suggested to simplify access to the records, which has been very difficult to the extent that records were irretrievable and increased backlog. The framework begins with creators and owners of the records, radio stations and news divisions. After the broadcast, they upload the records to the archive. The records are received at ingesting by archivists who perform the filing, classifying, cataloguing and indexing and then transfer them to storage. While the records are in storage, the archivists provide mechanisms to ensure that the records are safe, for example, from unauthorised access through data management. Request for access to the records will be made by the users which request will be received by the archivists. If the request meets the requirements, the archivist will download records to the users on the agreed online platform. The framework provides room for the creators to engage with archive management. This is a platform for entering into service level agreements where the two parties sign a contract for the delivery of services. This will ensure that the archive performs its functions, unlike the situation where records have been neglected. The framework puts RBF within the function because the department will always be needed for procurement of digital resources as well as service maintenance. Archive management will also have to engage RBF for advice on evolving technologies and the impact of such technologies on records.

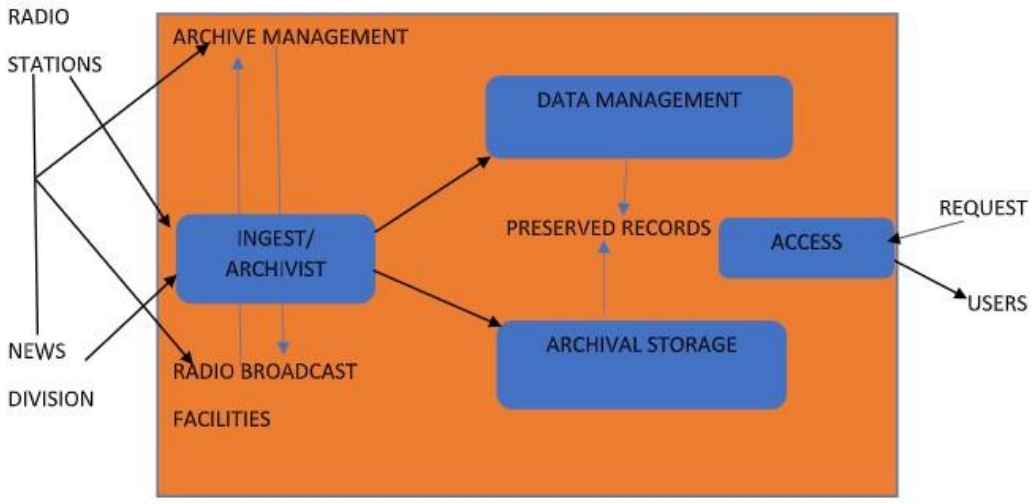


Figure 6.1: Framework for the preservation of audio-visual records (Researcher 2020)

6.6 IMPLICATIONS ON THEORY AND PRACTICE

There is a dichotomy between theory and practice. This section discusses the implications on theory and practice of this study. The implication implies how the results of the studies extend to practical, theoretical and methodological boundaries (Koh, Rubenstein & White 2015). Practical implications refer to those that would enhance practice or have functional implications, referring to the people who would implement the implications and those who are to benefit from the implications (Koh et al. 2015). With regard to this study, the environment was the SABC's Limpopo regional office. This study offers a framework that can help the SABC radio and other organisations to preserve audio-visual records. the implementation of the framework can also assist the radio stations to ensure continued access of audio-visual records that are becoming obsolete. This study adds value to the existing theoretical and conceptual issues that form the ongoing discourse on the preservation and access to audio-visual records, which is often a neglected area in the developing countries.

6.7 FURTHER RESEARCH

This study opened the ground for further investigation of the audio-visual records at broadcasting corporations and specifically at the SABC. This is prompted by the findings which established that valuable information has been lost and continues to be lost due to

poor management of the archive. The important issue for the survival of audio-visual records should be further investigated. All the objectives pointed to the real problem and the following could be further investigated:

- Skill and expert requirements for archivists to preserve digital audio-visual records at broadcasting corporations.
- Budget and facilities for the preservation of audio-visual records.
- The impact of evolving technology and formats in the preservation of audio-visual records.
- The challenge of broadcasting archives facing backlogs.
- Migration of content from analogue to digital.

6.8 CONCLUSION

Evolving technology will lower preservation costs, potentially enabling the SABC to increase its efficiency in preserving audio-visual records. The massive maintenance of the archive storage with equipment and furniture will be overtaken by technology the size of a suitcase, which means the SABC will be doing much more with less. The study established that the regional archives failed to provide adequate services to the users. However, radio stations and news divisions have been meeting the needs of their users by switching to online platforms. The use of online platforms by radio stations and news divisions has increased their capacity to interact with users. This study considered the challenges of incapacity and recommended the appointment of archivists to preserve records and serve the users. The study recommends the realignment of management to play a specific role in developing struggles and providing policies and procedures for the archive. Therefore, the study recommends a framework that will assist the regional archive to revamp its preservation processes.

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APPENDICES

APPENDIX A: ADVERTISEMENT FOR ARCHIVIST POST AT THE SABC

Annexure B

SCOPE OF DUTIES/SERVICES TO BE PERFORMED

Division: News and Current Affairs
Position: Junior Archivist
Salary Scale Code: 404
Reporting Line: Manager TV News Archives
Position ID: 60012580

Main purpose of Position:
Collecting, transferring, shot-listing (indexing), retrieval and preservation of SABC TV News and Current Affairs archive material. Make TV News Archive video material available through processing requests from News clients.

Key Accountabilities:

- Collecting and acquisition of TV News and Actuality content from a variety of sources
- Ensure all relevant material is recorded/collected/acquired and ensure follow up with Line record for material not received or material with quality issues or not recorded or incorrectly recorded
- Perform transferring of material and monitor quality and upheld high standard of quality throughout transferring process
- Ensure specific identified collected/ acquired material is cataloguing timeously and accurate: using correct and applicable descriptive words, apply basic general/news knowledge, with attention to detail and per allocation
- Ensure data integrity with cataloguing process through thorough usage of News metadata systems, research (e.g. Internet) and engaging with journalists/producers
- Completion of all relevant documentation and logging of request e.g. completing request form
- Perform basic requests and retrieve requested content by performing thorough searches and identify correctly requested material.
- Rights management - be informed, manage, apply and adhere to rights management in performing all archival duties

Page 12 of 13

- Refer requests from external clients and internal clients outside News and Sport to the News Agency department
- Accurate shelving of catalogued tapes
- Working closer with storage officer. Drawing and issuing of Archive tapes for clients if and when required.
- Perform basic News Archives technical or operational administration tasks required in line of duty such as labelling, completing tape number lists , diary dairy tasks etc
- Adhere to SABC TV News Archives SOP's , SABC Archive Policy, SLA's, South African Broadcasting Act, South African National Archival Act, Copyright Act and industry best practice.
    - Or any other reasonable instruction given by the SABC Representative

Requirements:

- Matric
- Diploma in Information Management and Library science or equivalent qualification
- 2 years working experience in archives or library
- Computer literate - good working knowledge: Microsoft Office : Word ; Microsoft Outlook
- Digital Archiving/ Broadcasting knowledge
- Be conversant with ENPS; News star; MAM; Daletplus
- Willingness to work long and irregular hours, weekends and public holidays

Or any other reasonable instruction given by the SABC Representative

APPENDIX B: ETHICAL CLEARANCE LETTER FROM UNISA

UNISA university of south africa

DEPARTMENT OF INFORMATION SCIENCE ETHICS REVIEW COMMITTEE

14 February 2020

Dear Mr Cyril Patrick Maribolla Ngoasheng

DIS Registration #: Rec-14012020

References #: 2020-DIS-0003

Name: CPM Ngoasheng

Student #: 3976041

Decision:

Ethics Approval from 14 February 2020 to 14 February 2024

Researcher(s): Mr Cyril Patrick Maribolla Ngoasheng
3976041@mylife.unisa.ac.za
082 361 2207

Supervisor(s): Prof Mpho Ngoepe
ngoepms@unisa.ac.za
012 429 6070

&

Dr Ngoako Marutha
emarutns@unisa.ac.za
012 429 6709

Preservation of audio-visual records at the South African Broadcasting Corporation in Limpopo regional offices.

Qualifications: Doctoral Study

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

Thank you for the application for research ethics clearance by the Unisa Department of Information Science Research Ethics Committee for the above-mentioned research. Ethics approval is granted for five years.

The *low risk application* was reviewed and expedited by the Department of Information Science Research Ethics Committee on 14 February 2020 in compliance with the Unisa Policy on Research Ethics and the Standards Operating Procedure on Research Ethics Risk Assessment. The proposed research may now commence with the provisions that:

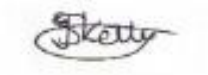
1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy of Research Ethics.
2. Any adverse circumstances arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the Department of Information Science Ethics Review Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards the protection of participants' privacy and the confidentiality of the data should be reported to the Committee in writing, accompanied by a progress report.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no. 4 of 2013; Children's Act no. 38 of 2005 and the National Health Act, no. 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
7. No field work activities may continue after the expiry date of **14 February 2024**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

*The reference number **2020-DIS-0003** should be clearly indicated on all forms of communication with the intended research participants, as well as the Committee.*

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

Yours sincerely



Dr Isabel Schellnack-Kelly
Department of Information Science: Ethics Committee

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

APPENDIX C: NON-DISCLOSURE AGREEMENT BETWEEN THE SABC AND THE STUDENT

NON-DISCLOSURE AGREEMENT (NDA) ENTERED INTO

BY AND BETWEEN

SOUTH AFRICAN BROADCASTING CORPORATION SOC LIMITED

Registration Number: 2003/023915/06 Vat Registration Number: 46000101101
A public company incorporated in accordance with South African Companies Act 61 of 1973 and constituted in terms of the Broadcasting Act 4 of 1999
As amended, having its principal place of business at Henley Road, Radio Park Building
Auckland Park, Johannesburg, 2006, Republic of South Africa

Herein represented by the Group Chief Executive Officer duly authorized thereto by the delegation of authority relating to the SABC's contribution to and participation in this contract

(Hereinafter referred as the "**Disclosing Party"**)

RESEARCH REQUESTING STUDENT

Cyril Patrick Maribolla Ngoasheng

and

UNIVERSITY OF SOUTH AFRICA

(Hereinafter referred as the **"Receiving Party")**

INTRODUCTION

1. The objective of this NDAis to allow external students who are studying towards post-graduate qualifications to use the SABC's company information for research purposes.

2. Where feasible, the external student will use non-restricted company information for the sole purpose of conducting research that is part fulfilment of a qualification.

3. The purpose of this agreement is to regulate the provision of information which is confidential to the SABC.

4. CONFIDENTIAL INFORMATION

"Confidential Information" shall, for the purpose of this agreement include, without limitation, any technical, commercial or scientific information, trade secrets, processes, machinery, designs, drawings, technical specifications, and data in whatever form, disclosed to or assessed by either party during the course of his relationship with the other party.

To this end, the disclosing party will mark all "Confidential Information" to the receiving party as "Confidential", and any oral disclosure at meetings, discussions or workshops will be regarded as confidential, and may be followed up with a communication to confirm this.

5. DISCLOSURE OF CONFIDENTIAL INFORMATION

5.1 The disclosing party shall only disclose the confidential information to the receiving party to the extent deemed necessary or desirable by the disclosing party in its discretion.

5.2 The receiving party acknowledges that the confidential information is a valuable, special and unique asset proprietary to the disclosing party.

5.3 The receiving party agrees that it will not, during or after the course of their relationship and/or the term of this agreement as described in Clause 9, disclose the information to any third party for any reason or purpose whatsoever without the prior written consent of the disclosing party, save in accordance with the provisions of this agreement. For avoidance of doubt, in this agreement "third party" means any party other than **SABC.**

5.4 Notwithstanding anything to the contrary contained in this agreement the parties agree that the confidential information may be disclosed by the receiving party to its professional advisors on a need-to-know basis; provided that that party takes whatever steps are necessary to procure that such professional advisors agree to abide by the terms of this agreement to prevent the unauthorised disclosure of the confidential information to third parties. For purposes of this clause, the receiving party's professional advisers and employees, directors or managers shall be deemed to be acting, in the event of a breach, as that party's duly authorized agents.

5.5 The receiving party agrees:

5.5.1 not to utilise, exploit or in any other manner whatsoever use the confidential information disclosed pursuant to the provisions of this agreement for any purpose whatsoever without the prior written consent of the disclosing party;

5.5.2 that the unauthorised disclosure of the confidential information to a third party may cause irreparable loss, harm and damage to the disclosing party.

6. TITLE

6.1 All confidential information disclosed by the disclosing party to the receiving party is acknowledged by the receiving party:

6.2 to be proprietary to the disclosing party; and

6.3 not to confer any rights to the receiving party of whatever nature in the confidential information.

7. RESTRICTIONS ON DISCLOSURE AND USE OF THE CONFIDENTIAL INFORMATION

The receiving party undertakes not to use the confidential information for any purpose other than:

7.1 that for which it is disclosed; and

7.2 in accordance with the provisions of this agreement.

8. STANDARD OF CARE

The receiving party agrees that it shall protect the confidential information disclosed pursuant to the provisions of this agreement using the same standard of care that the receiving party applies to safeguard its own proprietary, secret or confidential information and that the information shall be stored and handled in such a way as to prevent any unauthorised disclosure thereof.

9. RETURN OF MATERIAL CONTAINING OR PERTAINING TO THE CONFIDENTIAL INFORMATION

9.1 The disclosing party may, at any time, request the receiving party to return any material containing, pertaining to or relating to confidential information disclosed pursuant to the terms of this agreement and may, in addition request the receiving party to furnish a written statement to the effect that, upon such return, the receiving party has not retained in its possession, or under its control, either directly or indirectly, any such material.

9.2 As an alternative to the return of the material contemplated in 9.1 above, the receiving party shall, at the instance of the disclosing party, destroy such material and furnish the disclosing party with a written statement to the effect that all such material has been destroyed.

9.3 The receiving party shall comply with a request in terms of this clause, within 7 (seven) days of receipt of such a request.

10. EXCLUDED CONFIDENTIAL INFORMATION

10.1 The obligations of the receiving party pursuant to the provisions of this agreement shall not apply to any confidential information that:

10.1.1 is known to, or in the possession of the receiving party prior to disclosure thereof by the disclosing party;

10.1.2 is or becomes publicly known, otherwise than as a result of a breach of this agreement by the receiving party;

10.1.3 is developed independently of the disclosing party by the receiving party in circumstances that do not amount to a breach of the provisions of this agreement;

10.1.4 is disclosed by the receiving party to satisfy an order of a court of competent jurisdiction or to comply with the provisions of any law or regulation in force from time to time; provided that in these circumstances, the receiving party shall advise the disclosing party to take whatever steps it deems necessary to protect its interests in this regard and provided further that the receiving party will disclose only that portion of the information which it is legally required to disclose and the receiving party will use its reasonable endeavors to protect the confidentiality of such information to the greatest extent possible in the circumstances;

10.1.5 is disclosed to a third party pursuant to the prior written authorization of the disclosing party;

10.1.6 is receiving from a third party in circumstances that do not result in a breach of the provisions of this agreement.

10.2 The receiving party may, in its business activities, use the ideas, concepts and know

how retained in the memories of the receiving parties' employees who have had access to the disclosing parties' confidential information, but only in a manner that does not amount to a breach of the provisions of this agreement.

11. TERM

This agreement shall be deemed to have commenced on the date upon which any confidential information was disclosed by a disclosing party to a receiving party until the close down of project indicated by the acceptance of **SABC**. During such period, none of the parties shall use any confidential information disclosed by the other for any purpose other than stated in clause of this Agreement.

12. BREACH

In the event that the receiving party should breach the provisions of this agreement and fail to remedy such breach within 7 (seven) days from date of a written notice to do so, then the disclosing party shall be entitled to invoke all remedies available to it in law including the institution of urgent interim proceedings and/or an action for direct damages. In no event shall either party be liable to the other for any indirect or consequential damages arising from performance or non-performance of its obligations in terms of this agreement.

13. AMENDMENTS

No amendment, interpretation or waiver of any of the provisions of this agreement shall be effective unless reduced in writing and signed by both parties.

14. ENFORCEMENT

The failure by the disclosing party to enforce or to require the performance at any time of any of the provisions of this agreement shall not be construed to be a waiver of such provision, and shall not affect either the validity of this agreement or any part hereof or the right of the disclosing party to enforce the provisions of this agreement.

15. HEADINGS

The headings of the clauses of this agreement are used for convenience only and shall not affect the meaning or construction of the contents of this agreement.

16. REPRESENTATIONS & WARRANTIES

Each party represents that it has authority to enter into this agreement and to do all things necessary to procure the fulfilment of its obligations in terms of this agreement.

17. ENTIRE AGREEMENT

This agreement contains the entire agreement of the parties with respect to the subject matter of this agreement and supersedes all prior agreements between the parties, whether written or oral, with respect to the subject matter of this agreement.

18. GOVERNING LAW

This agreement and the relationship of the parties in connection with the subject matter of this agreement and each other shall be governed and determined in accordance with the laws of the Republic of South Africa.

19. SUBMISSION

The parties hereby submit to the non-exclusive jurisdiction of the Witwatersrand Local Division of the High Court of South Africa.

20. SEVERABILITY

In the event of any one or more of the provisions of this agreement being held for any reason to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or

unenforceability shall not affect any other provision of this agreement, and this agreement shall be construed as if such invalid, illegal or unenforceable provision was not a part of this agreement, and the agreement shall be carried out as nearly as possible in accordance with its original terms and intent.

ANNEXURE A

UNDERTAKING BY EXTERNAL STUDENT

I, the undersigned,

CYRIL PATRICK MARIBOLLA NGOASHENG 5703225254089

---

name and surname *ID NUMBER*

Being a requestor of information (external research student) of **The South African Broadcasting Corporation Limited** ("the disclosing party") acknowledge that –

I have read the non-disclosure agreement ("the agreement") between myself and the disclosing party to which this undertaking is Annexure "A". The defined terms in the agreement shall have the same meanings in this undertaking as in the agreement; the confidential information which has or will be supplied by the disclosing party in terms of (fill in details of your intended study and how the sources of information will help you):

_____

_____

_____

_____

21. I undertake to the disclosing party that – I shall keep all the information referred to in 2 above strictly confidential and shall not disclose, or permit, allow or cause to be disclosed, such information to anyone either during or after my studies

22. I shall be bound by all rules of the **SABC** and regulation insofar as they are relevant to me and I am capable of being bound thereby; For the duration of the agreement, I shall make no use, of any nature whatsoever, of the confidential information, other than the use required by the **SABC** to be made thereof.

RESEARCH STUDENT APPLICANT

Full names: CYRIL PATRICK MARIBOLLA NGOASHENG

Signature:

Signed at : POLOKWANE Date_03 FEBRUARY 2020

Institute of higher learning (herein referred to as the “receiving party”):

Institute’s Representative Name: Prof. Mpho Ngoepe

Designation: Professor and Chair of Department of Information Science

Signature:

Signed at: Pretoria Date_6 February 2020

On behalf of SABC (herein referred as the “Disclosing Party”):

Full Name: _____

Designation: _____

Signature:

Signed at: _Johannesburg

Date_11 February 2020

End

APPENDIX D: RESEARCH QUESTIONS

Preservation

- What are the strategies that are used for the preservation for audio-visual records?

FORMATS

- What are the formats that are kept by the SABS archive?
- What are the risks from obsolete formats?
- How can records be salvaged from permanent loss?
- What are the benefits of using the latest formats?

TECHNOLOGY

- What are the challenges posed by analogue technology?
- What are the benefits of using digital technologies?
- State the technologies that are used in live and recording studios?
- What type of technologies are used in the archive?
- What can be used to transfer records from analogue to digital?

SKILL AND EXPERT

- What are the needed requirements for archivists at the SABC archive?
- How is the SABC conducting its skills audit?
- How is internal conducted by the SABC?
- How is external training offered to the SABC?
- How is the SABC retaining skills?

ARCHIVE STORAGE

- What are the safety measures for the physical storage?
- How could cloud storage benefit the region?

ACCESS OF RECORDS

- How are records filed by the archive?
- What could be the benefits of online access?

APPENDIX E: LETTER OF REQUEST TO THE SABC AND APPROVAL LETTER FROM THE SABC

Group Learning & Development

(011) 714-2742

Student Research Request Form (External)

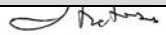
PERSONAL INFORMATION OF REQUESTER:			
Title	Mr	Initials	CPM
Surname	Ngoasheng	ID. No	5 7 0 3 2 2 5 2 5 4 0 8 9
First Name	Cyril Patrick Maribolla	Tel (landline)	N/A
Cell	0823612207	E-Mail	mrcpm.ngoasheng@gmail.com

STUDY INFORMATION:						
Name of Institution	University of South Africa					
Level of study	Masters		PhD	X	Other *(if other please supply name of qualification)*	
Field of Study	Research					
Research Topic	Preservation of audio-visual records at the South African Broadcasting Corporation radio in Limpopo regional offices					
Research Start Date		Research Duration		Anticipated completion date		

Intended research overview (please tick the applicable)					
Methodology	X	Sampling Frame	X	Instruments	X
Design	X	Setting and Participants	X	Procedure	X
Validation	XA	Ethical Considerations	X	Other	

Please outline what the research will entail and the methodology that will be used
The research will apply qualitative approach. Interviews, document analysis and survey will be the data collection tools. Participants will be purposively selected from all employees who are involved with audio-visual records.

STUDENT SIGNATURE:													
Signature											Date	2020.02.04	
OFFICE USE (SABC)													
SUPPORTED BY HOST:													
Name	Freddy Sadiki												
Pers. No	0	0	8	8	3	0	Designation						
Signature							Date	2020.02.05					
Comments	We believe the research will assist the SABC in Limpopo in the area of archive and information preservation												
SUPPORTED BY LEARNING AND DEVELOPMENT - KNOWLEDGE MANAGEMENT MANAGER													
Name										Signature			
Pers. No										Date			
Comments													
SUPPORTED BY LEARNING AND DEVELOPMENT GENERAL MANAGER:													
Name	C. Naidoo									Signature			
Pers. No										Date	2020.02.06		
Comments	The SABC hope to benefit from the research regarding the procedures and standards of preservation of records.												

APPROVAL BY GROUP EXECUTIVE - HUMAN RESOURCES:			
Name	J. Thekiso	Signature	
Pers. No	Date		2020.02.07
Comments	It is our believe that the research will not only assist the SABC archives but other units on how to preserve their records.		