GHANA INSTITUTE OF JOURNALISM

SCHOOL OF GRADUATE STUDIES AND RESEARCH (SOGSAR)

AUDIOVISUAL PRESERVATION AND CONSERVATION IN GHANA BROADCASTING CORPORATION

BY

FRANK PAA KWESI EDU

MADC20030

THESIS SUBMITTED TO THE GRADUATE SCHOOL OF GHANA INSTITUTE OF JOURNALISM IN IMPARTIAL FULFILMENT OF THE AWARD OF MASTER'S DEGREE IN DEVELOPMENT COMMUNICATION.

NOVEMBER, 2021

DECLARATION

I Edu Frank Paa Kwesi hereby declare that this is the end product of my research and all references made, have been duly and formally acknowledged in the reference section of this work and that no part of or entire thesis has been submitted to this university or any other academic and non-academic institution for such an award.

Signature …… Date: …..…/ ……../……..…… Edu Frank Paa Kwesi (Student)

Signature …… Date: …..….. / ……../……..…… Dr. Albert-James Tayman (Supervisor)

DEDICATION

To God Almighty and all who believed in my God given talent and wished me well and gave me the opportunity to prove my merit.

ACKNOWLEDGEMENT

I thank God Almighty for this milestone. I am humbled Dr. Modestus Fosu for the audience and your super intellectual craftsmanship that is evident and unparalleled in making this dissertation a success.

I am humbled Dr. Albert-James Tayman for the supervision and the dispassionate observations that tickled out the fluid of my intellect.

Mr. Derrick of Ghana Broadcasting Corporation library, I am grateful for the support.

I must acknowledge, those who never believed in me, my intellectual capacity and tested my tenacity are the launching pad for this great feat.

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LIST OF ABBREVIATIONS

AV:	Audiovisuals
LC:	Library of Congress
GBC:	Ghana Broadcasting Corporation
RCM:	Records Continuum Model
RLM:	Records Life-cycle Model
NAUS:	National Archives of the United States
FIAF:	Fédération Internationale des Archives du Film
IASA:	International Association of Sound and Audiovisual Archives
FIAT / IFTA:	International Federation of Television Archives
CCAAA:	Coordinating Council of the Audiovisual Archives Associations
UNESCO:	United Nations Education Scientific and Cultural Organization
BBC:	British Broadcasting Corporation
GC:	Gold Coast
BH2:	Broadcasting house 2
PRD:	Public Relations Department
ISD:	Information Service Department
GCBS:	Gold Coast Broadcasting System
GBCT:	Ghana Broadcasting Corporation Television
SB:	Sound Broadcasting
IAC:	International Advisory Committee
ICOMOS:	International Council on Monument Sites
PRAAD:	Public Records and Archives Administration
RH:	Relative Humidity
IFLA:	International Federation of Library Associations
ISDR:	International Strategy for Disaster Reduction
SD card:	Secure Digital card
DV tape:	Digital Video tape
MAT:	Magnetic audio tape
MD:	Mini Disc
CD:	Compact Disc
DVD:	Digital Video Disc
VHS:	Video Home System

ABSTRACT

The research investigated audiovisual (AV) preservation and conservation in Ghana Broadcasting Corporation. This phenomenon is challenging and complex but many aspects around storage, care, and access of these collections must be considered before any preservation and conservation methods. The research approached issues surrounding preserving and conserving of AV formats from GBC's heritage point of view. The objectives of the research were to: what were the storage carrier formats used for preserving and conserving of AVs in the film/video repository; what were the challenges in preserving and conserving of AVs in the film/video repository; and to determine what will be the future possibilities of digitizing AVs. To meet the set objectives and find answers, qualitative analytic method termed content analysis was used in analyzing data with ten (10) members of staff as the target population. As a qualitative research, unstructured interviews and observations methods were used and the data collected analyzed qualitatively, using content analytic techniques stemming from the nature of data collected with thematic subject identification from the field notes. The challenges confronting GBC's repository were enormous with data evidence pointing to lack of funding, lack of awareness of the relevance, lack of training, management and research opportunities, lack of expertise in preventing deterioration, temperature and humidness. Others challenges discovered were the standards of preserving and conserving, no playback machines, technological obsolescence. Data based analysis established that GBC's management and board of governance had incubated the idea of digitization but not executed. As of now the repository is experiencing losses through deterioration, obsolescence of equipment playback, as well as other possible means such as handling, playback damage, high temperature and mould infestation amongst others. The research concluded based on the evidence of findings that digitization is an armament. Recommendations made include funding, training of staff, collaboration with professional associations, digitization, and proper storage system.

CHAPTER ONE
INTRODUCTION

1.1 Background to the study

Audiovisuals (AVs) has many definitions. (Ray Edmondson, 2004) assumptions which are variously seen to include moving images, both film and electronic, audio-slide presentations, moving images and recorded sounds in various formats, radio and television, still photographs and graphics, video games, CD ROM multimedia, anything projected on a screen. Based on the various forms of definitions, audiovisual content productions is seen as a combination of images and sound synchronization. This may linked to the compilation of cultural, educational, historical events of people, an artistic work of a nation beyond the limits of memory.

This concept of depository of historical records and documents started around 1789 with the objective of fundamentally documenting, managing and preservation of collections with the natural intention of making it accessible to posterity. Hence the significance of this study is focused on audiovisual preservation and conservation of television materials, otherwise known as audiovisuals. This is considered as epitome for all media types, shapes, sizes and format of originality. Television was a dominant medium and one of the components of the fourth estate and has been the source of entertainment, information and education that complement formal education. Around 1949 the Library of Congress (LC) started compiling copies of television materials for copyright purposes, but preservation and conservation of materials was not identified as a separate entity (Thomas, 1997).

This has created the gap of not establishing a sturdy and strong television preservation and conservation units in Africa and Ghana. Ghana Broadcasting Corporation the state broadcaster is abstracted by the gap of a sturdy and a perpetual preservation and conservation system. Resultant to huge irreparable, irretrievable losses of television materials due to technological limitation, financial, operational and technical insufficiency. This discovery is the motivation for this timeous research. Preservation and Conservation are two different expression used in this study to showcase the processes of handling audiovisual life cycle. The evidence of these processes are visible in the repositories where audiovisuals are kept during its life cycle. These expressions will be explain in the subsequent literature of the study for better understanding.

This study is considered timeous to help to address the aforementioned challenges and ensure a consistent accessibility of materials to the field of television, researchers, academia and the public. In furtherance the study will help policy makers, stakeholders make informed decisions in the field of audiovisual preservation and conservation and other related fields with GBC being a major benefactor in the 21st contemporary digital world and beyond.

1.1.1 Acronym

The term Audiovisual will be used severally as compared to the abbreviation AV in this study. Thus, the term material and documents are used interchangeably in this study to complement audiovisual. In the literature of most international audiovisual organizations and associations, in their articles and journals have adopted preferably the use of audiovisual and abbreviation AV interchangeably. Within the field of television production, there are equivalent terms like AV footage, AV records, AV content, and AV media which are preferably used, thus basically referring to audiovisual. (F.I.A.T, 1996) in their report stated that all material created for television would be preserved to the highest possible technical standards and properly documented. (Thomas, 1997), referred to AV as materials in his report on the current state of American television and video preservation. He further avers scholars and educators to use television and video materials in their research, writing, and teaching. (Ray Edmondson, 2004) generally preferred the terms audiovisual media or audiovisual material. This is captured in the commemorating of the 25th anniversary of UNESCO's recommendation for the "Safeguarding and Preservation of Moving Images" in Paris, 2004. In a workshop co-organized by the Institute for Information Law of the University of Amsterdam and the European Audiovisual Observatory, referred to audiovisual as content (Susanne Nikoltchev, 2008).

1.1.2 Life span of AV material

All television materials are radically distinctive and have a comprehensive life cycle. This organic phenomenon starts with the creation, purpose, storage and retrieval, time to archive, and finally time to dispose of it which varies significantly.

1.1.3 Material Creation

Just like the life cycle of any living organism, audiovisual can be considered to have a life cycle. Audiovisual in other words has the concept of birth and death. There are two well acknowledged

principles to this theory and practice of records management, that is the records continuum model (RCM) and the records life-cycle model (RLM). The Life Cycle Model (LCM) effused from North America and was invented and developed by the National Archives of the United States (NAUS) in the 1930s as a response to the exponentially growing amounts of records it had to deal with (Svärd, 2017). It is considered a theory that is so relevant in the discourse of audiovisual life cycle and record management. According to (Hoke, 2011) in the article "Records Life Cycle, A Cradle-to-Grave Metaphor" records are birthed, developed into maturity, longevity and finally dies. Records brought into existence by individuals, organizations may include but not limited to following, typing of document, minutes from meetings, audiovisuals, documentations of business transaction, court proceedings, emails, receipt of document amongst others is the creation phase of the records' life cycle.

1.1.4 Material Purpose

The next phase of the life cycle after creation is usage and apportionment. The material is oftentimes used at this stage for various purposes and benefits. The usages at this phase could vary based on time, purpose and type of material. Usage of short-lived records may last for some few hours, days, weeks and months whiles short and long term records may last for some years. According to (UNESCO, 2003b) resources of information and creative expression are increasingly produced, distributed and accessed, this offer broaden sharing of knowledge among all people, policy makers and stakeholders.

1.1.5 Material Storage.

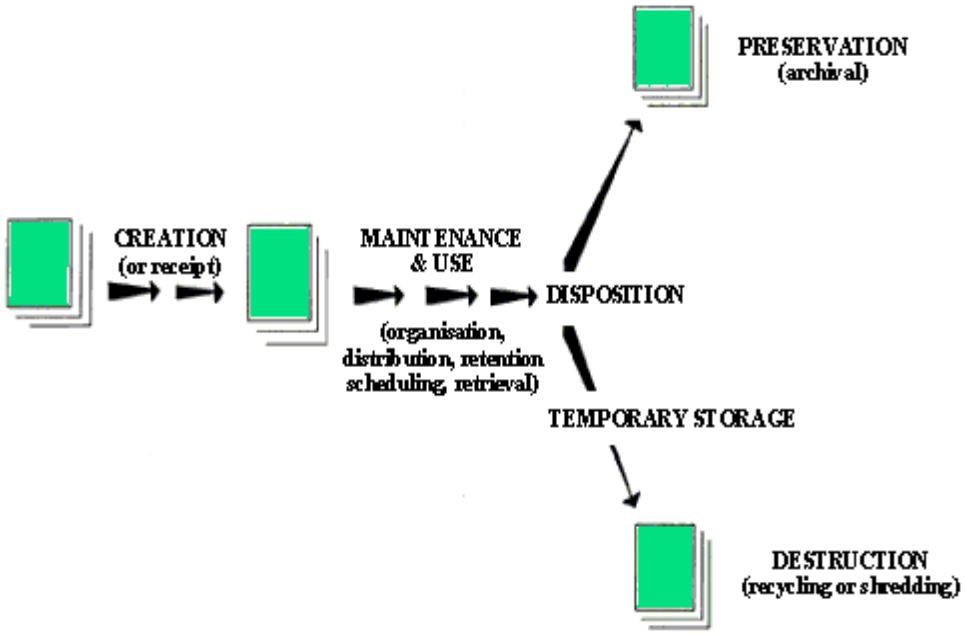
Many records may be disposed of partially or permanently after their initial use, whiles others are kept for a longer period of time for various reasons. Since immediate access to these records is no longer required during this phase, they are typically stored offline so as not to burden the storage capacity and the efficiency of the operating system, whiles materials in the analogue format are kept on the shelves in the archives. Regardless of image sources, storage is an archival practice that ensures the aliveness in perpetuity of audiovisual material in the highest technical standards reasonably available (Thomas, 1997). Storage at times becomes a medium used to provide for proper restoration and periodic transfer of materials to modern formats before the original copy is no longer technologically supportable with next generations' technology. (Schüller, 2008) the time frame for transfer of materials from analogue to digital successfully is estimated not to exceed 20 years.

1.1.6 Material Disposal

No matter how long an audiovisual material lives it definitely will be obsolete and be discarded with a variation in longevity. The terminal phase of most organizational and institutional records is destruction. Destruction of materials are in various modalities which comprises but not limited to disposal in to the trash bin, shredding, incineration, deleting and formatting of electronic file that is no longer accessible. The concept of creating to disposal is liken to biological birth to death (Mceachreon & Network, 2018). However, the litmus test for AV is seen in its life cycle which serves as the parameter for custodians to take a careful and concrete decision before a material is disposed of. Any attempts to preserve an original audiovisual at the point of its death would be in vain since deterioration sometimes cannot allow retrieval.

Thus rapid pace of technological development systems makes content carrier formats obsolete and consequently useless. International cooperation of audiovisual organizations which includes the Fédération Internationale des Archives du Film (FIAF), the International Association of Sound and Audiovisual Archives (IASA), and the International Federation of Television Archives (FIAT / IFTA) are international non-government organizations and a few others that form the CCAAA (Coordinating Council of the Audiovisual Archives Associations) in consultation with UNESCO determine how audiovisual are to be disposed of when they are no longer useful.

Figure 1 Diagram of Records Life Cycle



1.2 Preservation

Records of historical value with endurable features have their terminal disposition in an archives, where preservation takes place for posterity, future use and for research purposes. There exist a clear difference between records and archiving. According to (Walsham, 2016) records are documents made, received and maintained by individuals, institutions, organizations as active evidence, whiles an archive is a depository containing historical records and documents preserved permanently because of the value of information they contain. An example of an archive in the sixteenth and seventeenth centuries described a place where ancient records, charters, deeds, evidences and rolls, especially those belonging to a Crown or a kingdom were kept. Audiovisual archiving originated in a variety of institutional environments with various disciplines that include formal training in librarianship, museology, archival science, history, physics and chemistry, administration, technical skills in the broadcasting, film and sound recording fields (Ray Edmondson, 2004). Archiving is a distinctive field of study on its own and not a prime focus of this study.

According to (Merriam-Webster, 2019) preservation is the activity or process of keeping something valued alive, intact, or free from damage or decay. This preempts the argument of reconstructive memories on audiovisuals, that if not properly preserved can wear out physically and become very difficult to access and finally lost (Tabah & Specialist, 2017). Repositories are set to accomplish two specialties, firstly to preserve and secondly to make the contents available for researchers, academia, education and other purposes that goes beyond the scope of this study. Mass media has become the

medium that bridges the gap between the past and the present and allows the current generation to learn about ideas and activities of people around the world. With the advent of photography, sound transmission and image recording, most creative artist of the world were witnessed through radio, cinema, television and media. The new audiovisual cultural heritage has the tendency to cheer up when one is sad or stressed and keep one company when alone. This brings to consciousness the United Nations Education Scientific and Cultural Organization's (UNESCO) "Preserving and sharing access to our documentary heritage". Memory of the World Programme (MoW) that had two main agenda, that is to preserve documentary heritage of the world and improve its accessibility.

1.3 Conservation

(Merriam-Webster, 2017) defined conservation as a careful protection of something, especially planned management of a natural resource to prevent exploitation, destruction, or neglect. (ISO 18913, 2012) defined conservation as examination and analysis, documentation and treatment of library or archive materials, artwork or objects to stabilize them chemically or strengthen them physically, prolonging their life in the original form. Audiovisual content is currently the opium of the masses and gaining grounds and being embraced as part of the new cultural heritage of the world. This has helped in digital technology and web based information management. Cultural value of audiovisual collections have gained legitimacy and widening acceptance globally with growing awareness of the "Singapore Declaration" that adopted the 2000 IASA/SEAPAVAA joint conference principle that supports the adequate and equitable development of audiovisual skills and infrastructure in all countries of the world.

The reconstruction of audiovisual of the 21st century is a true and reflective fiber of all national cultures that can no longer be neglected but rather exploited for the greater good of national development. Due to this, the relevance and instinct of audiovisual content production to possess the past, present, future cannot be easily compromised. The Constitution of UNESCO provides that the organization will maintain, increase and diffuse knowledge, by assuring the conservation and protection of the world's inheritance of literature, monuments of history and science, that is "Information for All" Programme (UNESCO, 2003b).

1.4 Brief History of first Radio and Television Broadcasting

A Scottish Physicist James Clerk Maxwell in 1876 prefigured radio waves gradually coming into being. Other scientist were inspired to conduct further research and studies on this feat. Guglielmo Marconi an Italian is one of the few engineers who in 1894 embarked on a study, intensified and combined the works of Heinrich Rudolf Hertz, Edouard Branly and Oliver Lodge to windup the telegraph system. Marconi then became the "father of radio" by dint of his hard work (Ghartey-Tagoe, 2015). By 1901 Guglielmo Marconi had been successful by sending signals across the Atlantic Ocean. One of the earliest benefit of this great invention was those who owed their survival to Marconi's wireless equipment on board the "Titanic" ship that struck an iceberg and sank on April 14, 1912, not forgetting wireless telephony in public broadcasting (Moore & Murray, 2007). By 1920 after World War 1, many broadcasting networks had started in Europe and America. One such example is Britain's first advertised public broadcast programme that had taken over with a song by Dame Nellie Melba using Marconi 15 kW telephone transmitter which was heard across many countries (Austin, 1966)

Intercontinental communication through the power of radio and television, sending of SOS messages from sea and from air are all taken as part of day-to-day's normal communication. Without any iota of doubt radio and television have been intriguingly effective in their impact. Content consumption by the masses has been key to this phenomenal process, which explains "content of any medium is always another medium"(Mcluhan,1967) hence speech is the content of writing, writing is the content of print, and print the content of the telegraph. Television has transformed dramatically but remained true to its original utility and purpose that is telecasting images with the synchronization of sound. In 1884 the first patented electromechanical television scanning disk was by Paul Nipkow a German student engineer. This was a know-how of breaking pictures into small molecule that could be tacked together at a receiving point far away from the transmission point (Ghartey-Tagoe, 2015). Television was used for the first major broadcast of the Berlin Summer Olympic Games, broadcasts of the coronation of King George VI in the late 30's by BBC (Austin, 1966).

1.5 Brief History of Radio and Television Broadcasting in Africa

The trend analysis of broadcasting seems to be the same, radio preceded television. Researchers', scholars and students of Africa and for that matter Ghana had tap into the available methods of technology to catch up with the rest of the worldwide. By 1953 the first African broadcasting

services network in radio had been established with programs in Swahili, Luo, Kikuyu, Nandi, Luhya, Kipsigis, Kamba and Arabic(Lauren Mwanga, 2020). This buttresses the assertion that speech is content writing, writing is the content of print, and print itself is the content of telegraph (Mcluhan, 1967). This renaissance had seen a proportionate growth in the establishment of local African broadcasting corporations' in both radio and television to create space and liberate the economies of the continent. 1959 recorded great strides in the experimentation of television broadcast by countries like Nigeria, Zanzibar and Pemba in the eastern part of Africa. This was a universal currency for the social development of the continent.

1.6 Brief History of Broadcasting in Ghana

July 31st 1935 saw the break in monotony by a relay station of the British Broadcasting Corporation (BBC) in a small bungalow in Gold Coast (GC) now Ghana near the state house in the capital Accra. This was an initiative by Sir Arnold Hudson a British governor and assisted by F.A.W Byron an electrical engineer (GBC, 1965, 1985, 1995). "Station ZOY" was the maiden name until 1939 when the British Government allocated funding for an edifice befitting a Broadcasting house. The new Broadcasting house 2 (BH2), housed transmitting station, stores, transport, offices and was commissioned in 1940 (GBC, 1995).

The advent of the Second World War in 1939 tickled the British Government (BG) to expand the activities of the station which began transmission originally in four indigenous Ghanaian languages namely Twi, Fanti, Ga and Ewe with Hausa being added later. Between 1943 and 1953 a skeletal part-time staff were engaged, with their activities being handled by the Public Relations Department (PRD) of now Information Service Department (ISD). Upon another recommendation in 1953, the Gold Coast Broadcasting System (GCBS) service was established and gain autonomy as a Department by 1958.

Ghana Broadcasting Corporation Television (GBCT) was inaugurated on the 31st of July, 1965 which commemorated the 30th anniversary of Sound Broadcasting (SB) in Ghana. This was after some countries had started the experimentations of television transmission on the continent. The inaugural ceremony for television service of GBC was graced by the first President of the nation, Dr. Kwame Nkrumah. He saw television as a medium for education (GBC, 1965, 1995).This date also marked the setting up of a national audiovisual Library/repository, the first of its kind to serve as a repository for television materials.

1.7 Problem Statement

Audiovisual content has become so important due to its historical relevance to religion, politics, intellectual and cultural development. This allows modern day generation to catch up with ideas and activities of people around the world. Significantly the impact of audiovisuals on the cultural heritage of Africa cannot be overemphasized. The complexion of Life style, cultural practices, tradition, custom and norms of the continent and Ghana are made accessible by preservation and conservation of collection in the repositories. The International Advisory Committee (IAC) recommended that documentary heritage be extended to include manuscripts and other rare and valuable documents in libraries. This depicts documents in any medium, be it audiovisual documents which varies amongst countries of the world, which must be protected as a matter of urgency (Abid, 2011).

Traditionally repositories are the preservation safety net for materials which has no substitute to information seekers and scholars. This deepens the adopted recommendation of UNESCO's General Conference in 1980 for the Safeguarding and Preservation of Moving Images. According to (Ray Edmondson, 2004),this has been a major international advancement in cultural and legal recognition of audiovisual archiving. Institutions and individuals invest substantially in procuring and processing collections that can be accessible to patrons in the present and future. However, this whole process will be a waste of time, energy and resources if designed repositories cannot make this collections accessible due to deterioration. According (V Matangira, 2011) the developed and the developing world dichotomy has not spared the process of audiovisual archiving, thus whiles Africa is plagued with challenges, the developed world is using digital technology and web based information management to make their system better. (Ray Edmondson, 2004) agrees that some of these challenges are as a result of neglect for a very long time and practicing traditionally the European and American ways of preservation which has little attention to realities in developing countries in terms of facility standards and skills availability.

Audiovisual content preservation and conservation in GBC has been cardinal in television production (GBC, 1965). This repository holds important historical audiovisual programs which include but not limited to important traditions, customs and practices of Ghanaians and beyond which were preserved to enable broadcast transmissions, access to researchers, academia and the public. However the formerly well-structured repository, has now a checked history with scanty but

scattered bits and pieces of information due to negligence, improper and lackadaisical ways of record keeping. What is more, some audiovisual recordings can no longer be accessed due to obsolete technology and equipment. Play back equipment to help preview are longer in the system coupled with a high cost in rapid technological advancement. This has resulted to high risk of lost and shorter life span of content. Most of the audiovisual have lost their sound qualities due to the effects of the harsh climatic conditions and the internal chemical composition of the materials. This has given room for melting, decay and mould infestation, denying accessibility to transmission, research and other purposes. Intermittent visits to GBC's repository, it was discovered that, the air conditions were broken down, no firefighting extinguishers, except smoke sensor detector fixed on the walls to alert in the event of fire outbreak.

All these goes to support (V Matangira, 2011; Ray Edmondson, 2004) argument of Africa being plagued with challenges and archiving traditionally in the western style which has no clue to realities regarding facility standards and skills. The aforementioned calls for some investigative studies into these particular areas of challenges and help suggest workable solutions to these challenges.

1.8 The Scope of study

This research covers the activities, and investigate the extent to which repository practices were used to preserve and conserve audiovisual collections in GBC's film and video repository. The research project was conducted in GBC within the greater Accra metropolis. Some selected staff of the institution were consulted in the research process. This is to justify the adequacy of AV collections available in the repository.

1.9 The specific objectives of this study were:

1. To identify storage carrier formats used for preserving and conserving of AVs in the film/video repository.
2. To identify the challenges in preserving and conserving of AVs in the film/video repository.
3. To ascertain the future possibilities of digitizing of AVs in the film/video repository.

1.10 Research questions

From the objectives, and rationale of the research problem, the research questions are as follows:

1. What were the storage carrier formats used for preserving and conserving of AVs in the film/video repository?

2. What were the challenges in preserving and conserving of AVs in the film/video repository?
3. What will be the future possibilities of digitizing AVs?

1.11 Significance of the study

This study will add to the existing knowledge in the field of television material repository, and would be beneficial to academia, researchers, policy makers and other related areas of study. According to (Walsham,2016) the principal task of librarians, curators and archivists is to help deploy good preservation and conservation practices in libraries, museums, mausoleum etcetera. The study makes prominent the imperative requirement for librarians, curators and archivists to preserve and conserve their collections for sustainable future usage. Nonetheless it makes salient the activities and system of audiovisual repositories that use outdated preservation and conservation practices as well as accessibility methods. The study will serve as a guide to inform policy formulators and implementers to administer proper policies standards for preserving and conserving AVs. This will make more bearable the problems encountered with audiovisual materials and repository practice as whole.

1.12 Organization of the study

The study is organized into five chapters.

Chapter one covered the background of the study, problem statement, objectives of the study, research questions, scope of the study, significance of the study and chapter organization.

Chapter two will deals with related literature review of the study; organized in relation to the various research objectives.

Chapter three highlighted the methodology of the study made up of the research design, selection of subject, population of the study, data collection instruments, data analysis and ethical consideration.

Chapter four will deal with the analysis and presentation of data. This chapter will further emphasize on the discussion on data results and outline major findings.

Chapter five will focus on the summary of findings, recommendations and conclusion.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter's review will focus on the gathering AV content, AV repository, plan of action for preserving and conserving. In furtherance it will considers the storage carrier formats for preservation and conservation of AVs, the challenges and prospects of future digitization.

2.2 Audiovisual content

Gathering audiovisual is one cardinal assignment that is indispensable in this field of moving images and recorded sounds in various formats, radio and television. As one of the fundamental elements, it serve as the guiding principle and building blocks upon which the conceptual framework of this study is based. Primarily all these documents that are gathered are sources of knowledge on linguistic and cultural diversity of humanity. Most justifiably, audiovisual documents have been called the media of the modernity, no adequate understanding of the past 100 years would ever be possible without them (Jimerson, 2020; Schüller, 2008). According to (Kipfer, 2021; UNESCO, 1980, 2003a, 2017) general principles of all moving images of national production should be considered by Member States as an integral part of their moving image heritage.

Moving images of original foreign production may also form part of the cultural heritage of a country when they are of particular national importance from the point of view of the culture or history of the country concerned. (Royan & Cremer, 2004) considers audiovisual are to be understood as visual recordings with or without soundtrack irrespective of their physical base and recording process used, such as films, filmstrips, microfilms, slides, magnetic tapes, kinescopes, videograms (videotapes, videodiscs), optically readable laser discs; intended for public reception either by television or by means of projection on screens or by any other means. Justifiably it is worth noting that audiovisuals are integral part of humanity and are heavily dependent on technology and equipment for their accessibility.

2.3 Audiovisual repository

According to (Ray Edmondson,2004) audiovisual repository or archiving is a field which embraces all aspects of the guardianship and retrieval of audiovisual documents, the administration of the places in which they are contained, and of the organizations responsible for carrying our these

functions. It has gained its own particular nuances as the field has developed, and as the terms preservation and access have taken on particular meanings within it. This fit into Article 4, primary statute (Kipfer, 2021) that (ICOMOS) International Council on Monument Sites shall be the international organization concerned with furthering the conservation, protection, rehabilitation and enhancement of monuments, groups of buildings and sites, on the international level. Repositories are so relevant in promotion and projection of human rights. For example families, organization and nations have largely benefited from archival collections that has family and national stories to tell. This is not far-fetched, the continent of African and Ghana had a lot of stories told about the transcontinental slave trade through archival collection.

The western continent as well had this historical profiling by (Mceachreon & Network, 2018). According to (Archivists, 2016) archival records serve to strengthen collective memory and protect people's rights, property, and identity. Historians and genealogists rely on archival sources to analyze past events and reconstruct family histories. Businesses use the records to improve their public relations and promote new products. While medical researchers utilize records to study patterns of diseases. This study classifies audiovisual repository as an embodiment of identity.

2.4 Plan of action for preservation and conservation

Archives are the factories and laboratories of the historian. Along with private studies and public libraries, they are the loci of our apprenticeship as scholars and the warehouses from which we acquire the materials to build the history we write (Walsham, 2016). In Ghana (PRAAD, 1997) Public Records and Archives Administration Act, 535 of 1997 is, therefore, the fundamental law that regulates how records created in public organizations should be managed. It further avers in subsection I, section (1) of the Act, PRAAD is "responsible for the proper and effective management of records in public institutions of government". The perpetual keeping of collections requires suitable storage accommodation to protect against physical and chemical decay. Factors such as the structure, size, format, scarcity and value of collections comes to bolster these relevance. As published by (Conway, 1989) John Baker writes conservation seems more specific and object oriented, whereas preservation is a broader concept that embraces conservation as well as protection, maintenance, and restoration in its meaning. It also carries the connotation of official policy and perhaps for that reason is the preferred term to describe the entire constellation of administrative and technical activities that bear on collection management in libraries and archives.

Howard Lowell defined the issue in similar terms for archivists in his major study of preservation needs in state archives. Preservation is considered broadly to encompass any action that arrests deterioration or damage to state archives holdings through controlling the environment, proper housing, and preventive care. "Preservation" includes program planning, surveying and improving storage and collection conditions; conservation treatments; and transferring information from a deteriorating physical medium to one that is more stable. "Conservation" is defined to mean laboratory treatments that stabilize an item to maintain it in an unchanging and usable condition, or actions taken to return a deteriorated or damaged document as nearly as possible to its original form or function with minimum further sacrifice of aesthetic and historic integrity. In a lecture to British archivists as captured by (Conway, 1989) David Vaisey notes that as they have all come to the realization and having accepted that they are all in the conservation business, and are set about trying to make it a central part of their activities as collectors and providers of historical information, what they are all engaged in is, in fact, preservation.

2.5 Storage carrier format for preservation and conservation of AVs

Storage of audiovisual are approached in terms of the dexterity of the media and the way it is stored. This has no loci for it being a home movie, professional or amateur films, filmstrips, microfilms, slides, magnetic tapes, kinescopes, videotapes, videodiscs, and optically readable laser discs but how the format is stored so that its content can be accessed. There are international standards that are applied in ensuring an efficient management system. According to (Ray Edmondson, 2004) a wide range of terms are used to describe the physical items which contain the moving images and recorded sound in the collections or holdings of audiovisual archives. Physical items whether discs, rolls of tape or film, cassettes and so on are generically referred to as carriers.

The knowledge to identify formats and deterioration types and levels in collections, is very critical to demonstrate intellectual control over the media in terms of determining risk of the media. With analogue media, access is through playback equipment which is critical in determining the archival value of the media be it open tape and cassette audio and video formats, as well as phonograph discs, and wire recordings, among others. Best practices in housing, storage methods and climatic conditions are other important factors that comes handy in conservation of AV. In terms of preservation, risk of content through carrier loss, either through deterioration of the media or the unavailability of playback equipment, is a clear and present danger within these media formats. According to (Tabah & Specialist, 2017) focus on media at the highest risk is very vital especially

those showing serious signs of chemical deterioration and those at risk due to obsolescence of play back equipment that is no longer available.

2.5.1 Decay Characteristic

a. Acetate rayon base decay in the form of what is commonly referred to as "vinegar syndrome"
b. Decay of the organic dyes on film and colour fading
c. Magnetic tape binder hydrolysis

2.5.2 Acetate Rayon

Cellulose acetate was termed rayon or acetate rayon before to 19th century. This was a general name for thermoplastic polymers composed of the acetic acid organic compound of cellulose. Acetate rayon was introduced as safety film material and in variety of consumer products including textiles, and cigarette filters, which has similar properties to cellulose nitrate due to it less flammable nature. This material is susceptible to heat and harsh climatic conditions for a very long time. Their tenacity weakens in diluted acids at high temperatures as well as in concentrated acids at cold temperatures. Many records in archives are composed of materials that are acidic, which means they are inherently fragile and prone to degradation (Roper & Millar, 1999).

2.5.3 Fading of Dye and colour on film

Organic dye and colour fading is caused by self-generated chemical changes in the image dyes of colour films. Many older films have taken on a distinct weak colour intermediate caused by the rapid fading of the cyan and yellow image dyes due to heat or self-generated chemical composition of the material. Earlier colour generation of films fades just in few years when kept at room temperature as compared to today's films which are more stable with significant fading process. Some can last for about 40years under room temperature before fading will occur. (Y & Y, 2018) are in agreement that, all movies suffer from colour fading with time. Reasons are due to high temperature and high relative humidity (RH), air pollution and dirt, light exposure, biological threats such as fungi and insects, residual processing chemicals, base and emulsion deterioration, improper storage.

2.5.4 Magnetic tape binder hydrolysis

Magnetic tape consists of a thin layer filament capable of recording a magnetic signal. The magnetic layer, or top coat, consists of a magnetic pigment suspended within a polymer binder. The binder holds the magnetic particles together and to the tape backing. The structure of the top coat of a magnetic tape pigment or magnetic layer, is responsible for recording and storing the magnetic signals as captured on it. The binder polymers used in magnetic tape constructions are susceptible to a chemical process known as hydrolysis. In this phenomenon, long molecules are broken apart by a reaction with water to produce shorter molecules. Sticky tape and sticky shed are commonly used terms in describing the phenomenon of deterioration of the magnetic tape. According to (Boston, 1990;Edge, 1990) open environment sees very little decrease in viscosity or loss of tensile properties compared to an enclosed environment where acid impurities within the film break down the main polymer chain which loses its viscosity and will also lose its tensile properties.

2.6 Ecological effect on preservation and conservation

It is also very challenging to monitor or balance temperature and relative humidity (RH) in a building that is not designed to house records or archival material. In many instances repositories serving institutions may be in buildings originally designed to be used for other purpose, consequently truncating air circulation. By extension, institutions without the requisite skill of how a repository or records institution should look like has damning effect on preservation.

To avert such scenarios it pays to employ expert knowledge on the awareness of environmental conditions and facility best crafted for repository purposes. According to (Conway, 1989) preservation activities in libraries, archives, and museums must encompass both administrative and technical activities that should be present in any institution with a preservation mandate. (Ray Edmondson, 2004) defined an archive to be:

• A building or part of a building where public records or historical documents are kept and arranged.
• A receptacle or container in which physical documents are kept, such as a filing cabinet or box. A digital location, such as a place in a computer directory, where computer documents are retained.
• The records or documents themselves, which are assumed to be non-current and may relate to the activities, rights, claims etc. of a person, family, corporation, community, nation or other entity.
• The agency or organization responsible for collecting and storing the documents.

(Adcock, 1998) claimed, improving the environment within repositories should be by sealing the structure. This step alone will improve the physical condition of the building by reducing air infiltration, pest access, heating loss or heat gain, and air and particulate pollution. Making the building watertight will also reduce the sources of moisture within the structure and may significantly reduce relative humidity levels.

In an ideal environment repositories may be monitored regularly on daily basis if possible. This should give a fair idea of the outside weather conditions for the day, so that it is possible to compare the external environment with internal conditions. For example this can be plotted on a chart to show the daily, monthly and yearly calibrations of temperature within and without the repository on time checked based. This can be done by the use of thermo-hygrometer an instrument that records the fluctuations in temperature and relative humidity by means of internal sensing instruments. This instrument is widely used based on constantly recalibrated to avert false results. In furtherance, the instrument must be regularly maintained for efficacy.

2.6.1 Temperature and Humidness

Temperature is the level of heat or cold in a substance, body or the environment. In an affirmation (Merriam-Webster, 1828a) defines it as a degree of hotness or coldness measured on a definite scale. With this not far-fetched, the higher a temperature, the more rapid archival materials will deteriorate. This is justified by the fact that higher temperatures speed up the chemical reactions that cause deterioration. In an attestation report from (Tabah & Specialist, 2017) nitrate-base film is highly flammable and can self-ignite at ambient temperatures around 100 degrees, cannot be extinguished once ignited, and is therefore a serious fire hazard. Ideally repositories should be environment with a lower, rather than higher temperatures.

Humidity on the other hand is the ratio of the amount of water vapour in the air to the amount that would be present at the same temperature were the atmosphere to be fully saturated. This is in tandem with(Merriam-Webster, 1828b), the ratio of the amount of water vapor actually present in the air to the greatest amount possible at the same temperature. Changes in relative humidity in repository environment can have a negative effect on collections. High relative humidity, particularly amid high temperatures, speeds up chemical reactions that begets deterioration of materials. Consequently too low relative humidity brings about dryness in air and causes materials to become brittle and may

crack or split. Higher relative humidity might as well cause materials to absorb moisture can also promote mould growth, which is highly dangerous to records and archives. This changes in relative humidity causes material expansion and contraction, causing stress and weakening of the physical and chemical structure of the items. This fluctuations are more damaging. (Adcock, 1998)the point that needs to be understood about temperature and relative humidity is that there is no one ideal level for all types of material. He furthers avers that A temperature or humidity that is acceptable for one object may be disastrous for another. He affirmed an example of photographic film, magnetic recordings, and digital carriers require low storage temperatures and relative humidity levels if their longevity is to be ensured; whereas parchment and vellum items require an RH higher than 50% if they are to retain their flexibility.

2.6.2 Air Pollution

Air pollution can be seriously hazardous to records and repositories, particularly in urbanized and industrialized areas. Pollution from industrial gases, chemicals, exhaust fumes cars, standby generators plants and other toxins are unfriendly to records and repositories. Gases that includes but not limited to sulphur dioxide, nitrogen dioxide and hydrogen sulphide.(Roper & Millar, 1999), Ozone also causes oxidation, which is damaging to materials by promoting their deterioration. Air pollution can also appear within paints, untreated wood and certain plastics and adhesives, tap water, or even sea water for areas close to the ocean. Dirt, dust and other pollutable gases penetrate materials and cause chemical and physical deterioration.

2.6.3 Mould Infestation

Mould or mildew is a type of fungus that is present in the air and on objects; these spores of fungi thrives on awaited proper conditions of moisture and temperature to produce buds, grow, and multiply. This causes staining and weakening of most materials in repository custody.(Adcock, 1998), in general, moisture above 65% RH, darkness, and poor air circulation are ideal conditions. Warmth is a factor, but certain moulds and bacteria will thrive in cold temperatures.(Henderson, 2013; Tabah & Specialist, 2017) are in agreement with the above testament.

2.7 challenges of preservation and conservation of AV content

The task to preserving and conserving analogue moving images and sound media are especially challenging in contemporary changing trend of technology. This challenge is global and has ignited global attention and recommendation for long-term holdings. In addressing some of these issues, articulated and well written policies that covers entire holdings that clarifies organizations, associations and societal mission, collections, acquisition, access, security, preservation and conservation initiatives. (UNESCO, 2017), the first International Advisory Committee (IAC) meeting, held in Pultusk, Poland, on 12-14 September 1993, produced an action plan which affirmed UNESCO's role of General Guidelines for the Programme which was initiated through a contract with IFLA, together with the compilation by IFLA and ICA of lists of irreparably damaged library collections and archive holdings.

With the passage of time appreciable documentary heritage have vanished and still ongoing due to natural or human disaster. Some are displaced or damaged through historical deterioration or have become inaccessible through rapid technological change. According to (Mills, 2017), physical preservation of obsolete AV formats in heritage libraries and archives takes on many guises: storage, temperature and humidity, care and handling, techniques for cleaning, repairing, or halting deterioration, and the acquisition and upkeep of equipment.

The possibility of keeping audiovisual material infinitely is fallacious. To be upfront materials created irrespective of the purpose were not intended to last forever, hence the life cycle model. Problems with preserving and conserving has been old as "Adam", and could have political connotation and constraints in their management, accessibility and commercialization. According to(Forde, 1998) in reference to (Keene, 2002) statement, "we need to construct a means of moving the political consensus in favour of the long-term objectives of preserving the collection as an information and inspiration data-base." It only in few government in developed western countries as compared to Africa are prepared to sponsor or allocate funding to preserve AVs and the operations repositories. Lack of these resources that includes but not limited to; lack of awareness of the relevance of preserving and conserving, lack of funding, lack of training, management and research opportunities, lack of expertise in preventing deterioration.

2.7.1 Lack of awareness of the relevance of preserving and conserving

Knowing the relevance of preserving is very critical since it is one of building blocks on repository thrives. Without any iota of doubt it has become one of the thorniest problems being contended. The reason behind public and private repository is access to information that is dependent on preservation. The nock for value when it comes to archival material to anybody working in the record-keeping environment is very crucial, this helps in planning, ensure proper storage, handling and minimization of conservation repairs.

Awareness of a repository in GBC is palpably low as compared to Public Record Archives and Administration (PRAAD) in Ghana. (UNESCO, 2003b) avers as stated in UNESCO charter recognizing that such resources of information and creative expression are increasingly produced, distributed, accessed and maintained in digital form, creating a new legacy, the digital heritage, aware that access to this heritage will offer broadened opportunities for creation, communication and sharing of knowledge among all peoples. Understanding that this digital heritage is at risk of being lost and that its preservation for the benefit of present and future generations is an urgent issue of worldwide concern. The lack of intellectual control is a very real threat to the preservation of audiovisual materials. If an organization does not know what content and formats it has, it will not know how to plan or prioritize nor know what materials are most at risk.

2.7.2 Lack of funding

Failure to attract funding for the most basic operations such as adequate storage and protection for the collections is very disheartening, for all that it is not uncommon. It demonstrates a lack of understanding on the of government or business, part of the lack of awareness (Forde, 1998). According to Ray Edmondson as captured by (Basset, 2007) stated that the world moves into what appears to be a prolonged economic downturn, resources will be more stretched than ever especially in developing countries. The temptation to regard archiving as an optional extra, rather than as an investment in nation building, will increase. (Matangira, 2004) also had this to say, the division between the two worlds (the developed and the developing world) has not spared the process of audiovisual archiving and the gap is widening bringing in a lot of challenges to Africa as part of the developing world. (Abankwah, 2011) reemphasized by citing Harrison (1997/98) and pointed out that “the budget allocations for national archives do not compare favourably with other government ministries and departments”. For instance, the budget for the National Archives of Malawi was only US$ 4,000 per annum compared to over US$ 3 million for South Africa. A frequently found

stereotype is that audiovisual departments of professional organizations like libraries and museums have to struggle against the leading structures of the institutions for adequate funding (Schüller, 2008). Since the establishment of GBC's repository in 1965 till date there has never been any budgetary allocation set aside for running and maintenance of the repository.

2.7.3 Lack of training, management and research opportunities

Perfect training from a trainer makes a trainee better, where the opposite is a disaster. The subject of training is very crucial in both on and off the job to ensure efficiency, planning, documentation, proper storage, handling and minimization of loses of AVs. Ghana's integrated course of academic studies in archival materials is only at the tertiary level and pursued by a few. The tropical environment is very hostile to records and archives often face shortages of funds, trained personnel and training facilities (Teygeler et al., 2001). (Edmondson, 2016), most training courses are in developed countries and come with a hefty price tag. This may be a barrier for candidates from the developing world. While there are programs that try to alleviate this disparity, a profession that is also a vocation needs to have entry points that are cost-effective for the next generation of professionals it aims to develop.

In developing countries, the situation may be exacerbated by lack of demand from the audiovisual industries, the absence of formalized audiovisual departments or units in memory institutions, and a lack of awareness that these skills are needed. Many memory institutions are still trying to establish systems to manage paper records.

The feeling that preservation is part of culture and there is no for tutelage, together with lack of funding for training compounds managerial problems. The nonexistence of research limits and forces AV institutions to lose focus, divert priorities, slow decision making in the fulfillment of institutional mission.

2.7.4 Lack of expertise in preventing deterioration

(Teygeler et al., 2001), in many parts of the world, according to the International Strategy for Disaster Reduction (ISDR), disasters caused by natural hazards such as earthquakes, floods, landslides, drought, wildfires, tropical cyclones and associated storm surges, tsunami and volcanic eruptions have exacted a heavy toll in terms of the loss of human lives and the destruction of economic and social infrastructure, not to mention the negative impact on already fragile

ecosystems. (Schüller, 2008),due to the lack of experts knowledge attempts to preserve the original the classical paradigm of archives and museums would be in vain, as carriers are sooner or later bound to deteriorate so much that their contents cannot be retrieved. Additionally, the rapid pace of technological development makes recording systems and formats obsolete in ever shorter cycles, leaving even carriers in excellent condition without dedicated replay equipment and consequently useless.(Adcock, 1998), also thinks storage methods have a direct effect on the useful life of material. While proper storage can extend life, slovenly, haphazard, overcrowded conditions result in damage to collections. Moreover, poor quality storage enclosures can accelerate the deterioration of the material intended to protect by organizations.

2.8 Digitization

There are various proposed definitions of digital preservation,(Edmondson, 2016) quotes an example, digital preservation combines policies, strategies and actions to ensure access to reformatted and born digital content regardless of the challenges of media failure and technological change. The goal of digital preservation is the accurate rendering of authenticated content over time. Advancement in technology has become the drivers in the activities our contemporary world today, and playing a significant role in preservation and conservation of AVs in repositories**.** According to (Royan & Cremer, 2004) the trend for audiovisual and multimedia works to be created in a digital format only is on the rise and a future where all works are born-digital is expected. As physical audiovisual formats have changed over the generations, the digital format is the dominant content delivery format today.

Accordingly, repository operations need to reflect this change mindful that there are multitudes of digital image, audio, video and film formats available for content creation.

(Altenhöner, 2013) attests to the fact that, preservation itself has been an established field of work in libraries for decades, whereas long-term digital preservation is still relatively new and in its infancy. He further stated, the German National Library's first discussed on digitization **was** in the context of conservation only as an alternative output technology to the production of microfilm, yet it has now increasingly become a primary method of preserving. (Tabah & Specialist, 2017) also argues that, AV media will suffer loss through deterioration and obsolescence of equipment playback, as well as possibly through other means such as handling, playback damage and disasters such as floods or fires.

To safeguard against, and in other cases mitigate this loss, it is recognized among archival and technical research professionals that the media must be reformatted to a digitized surrogate, in order to be preserved for the long-term and made accessible in the short term. As capture by (Ray Edmondson, 2004), he who seems to reiterate the question to archivists "Have you digitized your collection yet?" is a question regularly put to archivists by, it seems, politicians, administrators and other overseers of archival budgets. The question and the underlying assumptions are often ill-informed but the move to digital technology by media organizations is having a profound effect on archiving practice, access demand and strategic planning.

2.8.1 Prospects of Digitization

Taking a cue from the aforementioned discourse on digitization, the foremost idea is the reproduction or the duplication of analogue media into an electronic media through the advancement of technology regardless to prospective challenges in preserving and conserving for a longer period of time. The goal is to slow down deterioration and eliminate possible human contact through computerization and software application to deepen the existing goal of collection, storage and accessibility of AVs. In other words, it is the making use of the economic viability and efficacy digitization has to offer. From (Negroponte, Nicholas, 1995) discourse, a bit has no color, size, or weight, and it can travel at the speed of light. It is the smallest atomic element of the DNA of information, which is considered to be a 1 or a 0. Over the past years more and more types of information have been digitized, like audio and video, rendering them into a similar reduction of 1s and 0s.

In digitizing analog signal for video, the signal needs to be sampled a number of times per second, and quantized into numeric values that can then be represented as bits. Huge volumes of bits are referred to as "metadata". With metadata, thousands of hours of digital video archive is reduced to a terabyte or greater clutter of bits, which becomes a valuable information resource. This permits digital video assets to be simultaneously protected and accessed. In support (Tabah & Specialist, 2017) argues that, it is to safeguard against, and in other cases mitigate this loss, it is recognized among archival and technical research professionals that the media must be reformatted to a digitized surrogate, in order to be preserved for the long term and made accessible in the short term. In (Keene, 2002) testament, digital technology, or information technology, affects conservation and conservators in three main ways. First, there is the computerization of conservation records and information about scientific examination. Secondly there is the acquisition, handling, and analysis

of information about the preservation of the object, such as quality of storage and collections or object condition. Then thirdly there are important issues to do with preserving digital assets themselves, which may come into the domain of conservators; virtual conservation for virtual collections.

Analogue audio and video technology is being phased out and replaced by digital. Film production is increasingly employing digital technology. Are we facing the death of the photographic film strip itself? Are we facing the prospect of digital archiving where everything is kept on computer mass storage systems? If digital-to-digital copying is lossless, are all our preservation problems solved forever? Is this the ultimate? Will we even need audiovisual archives if anything and everything is reduced to digital content which can be called up at will from a computer server?, these and other questions are current according to (Ray Edmondson, 2004) in considering the prospects of digitization.

In support of Ray Edmonds (France, 2015) states categorically that, while there has been a move towards digital storage, the storage media this digital information is on still remains the risk component, and manufacturers will continue to develop new formats as technology advances. Continuing to preserve our modern and historic AV formats and storage will engage researchers for many years to come. Creatively utilizing these new technologies to capture sound and video from historic formats that are machine dependent will assure retrieval of hidden collections and preservation of our cultural heritage. She further avers, these “new” storage formats being cutting-edge at the time and allowing us greater advances in accessing and storing large volumes of information.

Additionally heritage institutions, many archives and businesses use or retrieve information from some formats, so understanding how best to preserve the content assures prevention of loss of content in many areas of social, historic and business enterprises. Great opportunity abound as analog AV resources are digitized into newly produced AV media digitally.
The material is encoded as bits, can be copied without loss in quality and distributed in cheapest manner and broadly over enormous communication channels facilitating transfer of computer data.

(McFadden, 2003), the great opportunity is that these video bits can be described digitally as well, so that producers' identities and rights can be tracked and consumers' information needs can be efficiently, effectively addressed.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1. Introduction

This chapter's synopsis represents the draft in which the research study was conducted to attain the purpose for which it was intentionally meant for. This chapter describes categorically the methods and techniques that were used for the study. This include the research design, population of the study, sources of data, data collection instruments, and data analysis procedure. These procedures were used to and the following research questions:

1. What were the storage carrier formats used for preserving and conserving of AVs in the film/video repository?
2. What were the challenges in preserving and conserving of AVs in the film/video repository?
3. What will be the future possibilities of digitizing AVs?

According to (Dawson, 2002) when one starts to think about research project, the useful way of remembering the important questions to ask is to think of the five 'Ws', which are What?, Why?, Who?, Where?, When?. Once these thoughts are analytically considered, the next move should be about how data is going to be collected. In other words the research methodology. She further avers research methodology is different from research methods. Research methodology is the philosophy or the general principle which will guide your research, whereas research methods are the tools you use to gather data, such as questionnaires or interviews, focus groups, and participant observation. Generally in research projects, there are five methods or approaches involved.

These methods comprises quantitative, qualitative, mixed methods research, arts based research, and community based participatory research (Leavy, 2017). In principle these approaches may overlap depending on the type of research project. According to (Creswell,2009) qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. Whereas quantitative research is a means for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures. Mixed methods research is an approach to inquiry that

combines both qualitative and quantitative forms. (Creswell & Clark, 2018) also defined mixed method as those that include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect words), where neither type of method is inherently linked to any particular inquiry paradigm. In (Djamba&Neuman,2002) perspective, all research strive to collect empirical data systematically and to examine data patterns for better understanding and explanation of social life.

3.2. Research Design

Any research design in principle can use any type of data collection method that is quantitative or qualitative. Research design refers to the structure of an enquiry: it is a logical matter rather than a logistical one (Vaus, 2002). The purpose of a research design is to ensure that information gathered helps in answering the initial questions categorically. According (Creswell&Clark,2018) research designs are procedures for collecting, analyzing, interpreting, and reporting data in research studies. These represent different models for doing research, and these models have distinct names and procedures associated with them. Research designs are useful because they help guide the methods, decisions that researchers must make during their studies and set the logic by which researchers make interpretations at the end of their projects.

3.3 Population

Population refers to the set or group of all the units on which the findings of the research are to be applied. In reference to the definition, population consists of all the units on which the findings of research can be applied. In other words, population is a set of all the units which possess variable characteristic under study and for which findings of research can be generalized (Shukla, 2020). According to (Van et al., 2019) population is defined in a transparent way that corresponds with the specific research question. (Jenkins-Smith et al., 2017) referred to population as the total set of items that we care about. Harmoniously other school of thought agree that population is considered as the total collection of elements about which we wish to make inferences.

The target Population of this research constitutes the staff of Ghana Broadcasting Corporation's repository and the television production unit. There are three members of staff currently at post at the repository and two national service person, helping in running the activities of the repository, whereas the television production unit population comprises of two editors from the news room, two

from video/film converter unit and the director of television. The size of the target population and their connectedness to preservation and conservation was very relevant to the research and there was no sampling.

3.5 Background Research Data

According to (Dawson,2002) the first thing you need to do is your background research, and there are two types of background research; that is the primary and secondary research. According to (Kothari,1990) the task of data collection begins after a research problem has been defined and research design laid out. The primary data was collected in the repository of GBC whiles some secondary data were collected from GBC's reference library and on the internet.

3.5.1 Primary Research Data

(Dawson,2002) affirms primary research involves the study of a subject through firsthand observation and investigation, whiles (Kothari, 1990) backs up in agreement, the primary data are those which are collected afresh and for the first time, and thus happen to be original in character. primary data is collected during the course of doing experiments in an experimental research but in case of descriptive research type surveys are performed, whether sample surveys or census surveys to obtain primary data either through observation or through direct communication with respondents in one form or another or through personal interviews.

There are several methods of collecting primary data, particularly in surveys and descriptive researches. Important ones are: observation method, interview method, through questionnaires and other methods. This research project employed interviews and observation methods. These were the most suitable and preferred medium to solicit data for the research.

3.5.2 Secondary Research Data

Secondary data collection on the other hand, are those that have already been collected by someone else and which had already been passed through the mills of statistical process. (Dawson, 2002; Kothari, 1990), secondary data collection by nature are data collection work merely that of compilation of information from studies that other researchers have made of a subject. The two easiest and most accessible places to find this information are libraries and the internet. These data are collected for some other intention and at various points in time of the past or present. These data may be accessible by hand written, typed or in electronic formats that comprises published materials,

journals and thesis. Data collection could be internal or external. Internal data collection are those information obtained within the organization being researched on. Whereas external data collection are those obtained from outside sources. Secondary data helps researchers gain knowledge into the research problem under study. It is one of the most easiest and accessible data that is fast and cheap. Since it is fast and cheap may not be reliable and accurate.

3.6 Interview Method

As captured (Tracy, 2013), interviews are guided question answer conversations, or an "interchange of views between two persons conversing about a theme of mutual interest" (Kvale & Brinkmann, 2009). Interview vary from other forms of conversations by having a specific structure and purpose. It is common practiced in various situations including but not limited to therapy, police investigations, marketing focus groups, philosophical dialogues, medical exams, and opinion polls. The interview method of collecting data involves presentation of oral-verbal stimuli and reply in terms of oral-verbal responses. This method can be used through personal interviews and, if possible, through telephone interviews(Kothari, 1990). (Tracy, 2013) further avers, although people tend to think of interviews as dyadic face-to-face interactions, interviewing can occur in small groups (such as focus groups) and through various mediated contexts.

The crucial role of interview in this research project demonstrates how interviews complement other types of qualitative research methods in data collection. According to (Dawson, 2002), in social research there are many types of interview. The most common of these are unstructured, semi-structured and structured interviews. Unstructured or in-depth interviews allows the researcher to achieve a holistic understanding of the interviewees' point of view or situation. Interestingly, this research project employed the unstructured interview method. In semi-structured interviewing the researcher wants to know specific information which can be compared and contrasted with information gained in other interviews. Then finally the structured interviews. This method is highly structured, hence the name, questions are predetermined before interview. Although interviews can be time consuming it allows the researcher to collect reliable data for onward analysis. This done by means of a tactful cross examination process of respondents.

3.6.1 Observation Method

The observation method is the most commonly used method especially in studies relating to behavioural sciences. In a way we all observe things around us, but this sort of observation is not scientific observation. Under the observation method, the information is sought by way of investigator's own direct observation without asking from the respondent(Kothari, 1990). (Dawson, 2002) affirms that, there are two main ways in which researchers observe, that is direct observation and participant observation. Direct observation tends to be used in areas such as health and psychology. It involves the observation of a 'subject' in a certain situation and often uses technology such as video cameras or one-way mirrors. In participant observation, however, the researcher becomes much more involved in the lives of the people being observed. Under observational research methods exists overt and covert methods.

Overt research means that it is open, out in the public and that everyone knows who the researcher is and what he/she is doing. On the contrary covert research means the researcher is working under cover, that no one knows what he/she is doing. Observational research method eliminates personal bias if observation is done accurately. Secondly, data collected under this method relates to current happenings; past, present and future behaviour, intentions or attitudes does not compromise the process. Thirdly, the method is independent of respondents' willingness to respond as in the case of interviews or questionnaire methods. This method is appropriate in research projects that handles subjects who are not able communicate their rational motives. This researcher project engaged the participatory observation method under overt means to collect descriptive data for the study.

3.7 Mode of data collection

The researcher interviewed ten respondents in total. The interviews were conducted on the premises of the Ghana Broadcasting Corporation. The interview exercise was successfully carried out within one week. Two respondents were interviewed within a day. Each session of the interviews lasted averagely for about fifteen minutes. Three working days was set aside by the researcher to visit GBC repository for physical observation of the audiovisual collections. The researcher had firsthand experience of the conditions of the materials under custody. This exercise was done with the escort of head of the repository who offered in-depth information while we toured within the repository.

3.8 Data Analysis

The primary data collections for the interviews were exclusively qualitative. Data collection formats were communicative, and recordings with the use of a mobile phone. The data was transcribed and analyzed qualitatively. Qualitative analytic method termed content analysis was used in analyzing, stemming from the nature of data collected; not forgetting the thematic subject identification from the field notes, upon which the was data collected analyzed.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings and discussions of the data collected from Ghana Broadcasting Corporation repository and the television production unit through unstructured interview and participatory observation. The interviews and observations were carried out on different occasions from ten (10) employees of the Corporation. The data collected helped the researcher to address the research objectives as follows:

1. What were the storage carrier formats used for preserving and conserving of AVs in the film/video repository?
2. What were the challenges in preserving and conserving of AVs in the film/video repository?
3. What will be the future possibilities of digitizing AVs?

The interviews and observations data were combined in the discussions to present an analysis on the objectives of the research.

4.2 Demographic Profile

For clear analysis, discussion and presentation free of biases, the data collection on the demographic profile of respondents included gender, age, education and ranks to connect to their level of experience and the relevance of data to addressing the research objectives. The research respondents selected were ten (10) comprising six (6) males and four (4) females. The age range of selected respondents was from thirty (30) to fifty-five (55) years with their level of educational certification starting from diploma to 2nd degree. The selected respondents for the interview process comprised of the director of television, heads of departments and operation officers. For the purpose of confidentiality the identity of the selected respondents were coded to ensure the credibility of the research data collected, analysis and conclusion.

Table 1 Table 1 (Duties of respondents)

Respondent (R)	Rank	Duties
1	Director of TV	*Supervising and reporting to director general on TV affaires *Liaison between top level management and TV division
2	Senior manager	*Head of GBC training school * Responsible for training TV staff
3	Senior manager	*Head of film/video camera department * Overseeing photo and assigning equipment for assignment
4	Senior manager	*Head of studio centers * Responsible for coordinating TV programs in the studios
5	Senior manager	*Head of film/video repository *Overseeing and managing GBC repository
6	Senior editor	* Head of business desk * Responsible for business news bulletin
7	Senior manager	* Head of TV news channels * Overseeing and ensures programs are covered for TV news
8	Senior manager	* Channel manager for Ghana Learning TV * Responsible for content schedule and documentary on TV
9	Senior Op. officer	*Scheduler and transmission coordinator *Prepares program lineups and content for TV sports plus
10	Senior Op. officer	* Assist in cataloguing, retrieving, previewing on content

4.4. How long have you been working with AV content and how did it start?

The research objective sought to investigate how long respondents have been working with AVs and how it stared. AVs materials per their makeup cannot ordinarily be handled by amateurs, it requires some form of specialized training to enhance their proper handling. This information is been analyzed based on the literature review of chapter 2.2 that states, gathering of AVs are very key and indispensable in the field of moving images and recorded sounds in various formats in radio and

television production. This is a justification that the appreciable number of years an employee of GBC might have worked with AVs, might have as well acquired some requisite skill out of experience. The research investigation discovered that almost all of the employees had no working experience with AVs before their appointment, but have been able to gather some experience on the job.

R1 put it this way *"once you work with the creative aspect of television, and those who lead in content production like the producer/director, production assistant or a new person, from day one you deal with AVs".* This reveals the harmful effects on AV content by amateur employees who have no basic skill or training in working with AVs. Standardization is key in preserving and conserving as per ISO standards, so should the basic knowledge in AVs be made a compulsory orientation practice for fresh employees. According to (Häggström, 2004) new basic skills for all, with the objective to guarantee universal and continuing access to learning for gaining and renewing the skills needed for sustained participation in the knowledge society.

R3 recalled an experience said *"before GBC I had my first experience with my Dad at the age of 16 years because my dad was already in the field of photography, he was a producer/director gathering content for today the name we know "Reuters" but by then it was known as International Television News (ITN) and changed to VC news and worldwide television before they sold it out again and then the name now is Reuters, so he was the correspondent gathering content for Reuters as a rep in Ghana or all of the sub region of Africa".*

It is obvious that basic knowledge about AVs signifies a comparative positive effect in working and handling of Avs

4.5 Do you possess any professional qualification or training in handling AVs?

The subject of professional qualification or training in handling AVs is very important in this field and without it can have a dire effect in the preservation and conservation prospects. It pays to develop the mind and eyes for such a vocation since the AV materials have a live cycle just like any living organism. As the researcher sought to find out if respondents had any professional qualification or training in handling AVs from the data collected, it was discovered that none had any such .acumen

R6 indicated *"when it comes to audiovisual I don't have any professional qualification or experience on the ground, I am a trained journalist".*

R7 added *"no, no, no I don't have any professional qualification. Every reporter as soon you return from assignment you are release your material the editing bench for editing and syndication".*

According to (Ray Edmondson, 2004) the lack of formal training standards and courses for practitioners had emerged as a significant issue, and had prompted UNESCO to set up processes resulting in publications on the role and legal situation of audiovisual archives, and the development of training curricula for their staff.

This really exposes the deficiencies in preserving and conserving in handling of AVs leading to lost and other damages and eventually deny posterity from audiovisual heritage. (Ray Edmondson, 2004) confirmed that, the existence of academically accredited training courses is one mark of a profession. The collecting professions have long-established university courses all over the world, and a diploma, bachelors or master's degree is an entry level requirement for a professional post in many institutions.

4.6 What was the storage carrier formats used for preservation and conservation of AVs?

As discussed in chapter 2.5 in the literature review, storage of AVs are approached with some form of dexterity irrespective of it being a home movie, professional or amateur films, filmstrips, microfilms, slides, magnetic tapes, kinescopes, videotapes, videodiscs, and optically readable laser discs but how the format is stored so that its content can be accessed.

Table 2 (Carrier formats)

Formats
Vinyl discs
Magnetic audio tape
VHS
U-matic video tape
Betacam
XDcam

Minidisc
DV tapes
Digital Video Disc (DVD)

The typical collection contains a variety of media in various sizes, shapes, configurations or formats(Ray Edmondson, 2004). Based on the findings of the data collected, respondents mentioned some of the carrier formats as presented in figure.2 above.

R8 recalled and said *"in those days we were using the Betacam kind of tapes for storage and they took them to the library, since then technology has changed and we are using SD cards and external drives".*

R3 added that *"here in the office the way the system has been designed is to just record the material that the producers need on the format that they have. As at the time I came to GBC we were recording on U-matic and then we moved to Betacam then to XDcam and now we using the digital system which is using the memory cards. We started with the compact flash cards and now we move on to SD cards that we record on, all these system is what I came to meet in GBC".*

As the researcher sought answers for storage carrier format used, it was discovered that GBC has a lot of it content embedded in analogue storage carriers and accessibility is a challenge due to lack of playback machines and obsolete technology. This is in tandem with (Tabah & Specialist, 2017) focus on media at the highest risk is very vital especially those showing serious signs of chemical deterioration and those at risk due to obsolescence of play back equipment that is no longer available.

With the advent of fast growing technology, the researcher discovered that GBC does not have the capacity and space to house all its content that had been produced either in-house or donated for transmission. The benefit of preserving and conserving is to have enough space and capacity to house all materials. However, analogue storage carrier format occupies much physical space due their bulky nature as compared to digital materials.

This finding was confirmed by R5 *"you know preservation and conservation itself is cost likes wise space creation, you either have the capacity or you fall behind. Keeping a repository is a capital intensive business".*

4.7. What is the total number of collections in the repository?

GBC's repository is filled with collections of AVs for reuse, and for commercialization purposes. From the data collected, GBC has a consulted format of cataloguing for easy identification as kept in their repository. As the researcher sought to know the number of collections in the repository, the answer was not farfetched since it was captured in a quarterly report submitted to management a few week ago which had a quoted figure of over twenty-nine thousand (29,000).

Based on data collection evidence, R5 recalled and stated *"we can talk about over twenty-nine thousand collections in the repository, yes".*

It was also discovered that not all of the over twenty- nine thousand collections are in good condition for accessing, since some the tape are torn and infested by mould.

R10 added by saying *"a large number out of the twenty-nine thousand are analogue materials with some tearing apart as we try to preview at times for content. This is because the tape are old and weak, and sometimes there is this whitish covering on the tape that means it is infested and cannot be previewed".*

This really justifies how large collections are affect by the physical environment in which they are kept. This in furtherance affirms (Teygeler et al., 2001) statement that, the physical environment in which materials are stored will have a significant effect on their life span. Environmental conditions such as temperature, humidity, light and atmospheric pollution can each affect documents of any kind.

4.8. Do you need special skills or training to handle these materials?

Keeping content in an appropriate environment, one that minimizes ageing and other effect requires a keen knowledge. From the data collected it was realized that apart from learning on the job in GBC as an employee majority lack the expertise knowledge in handling AVs. However due to high level of expertise required in this field, it pays to invest in the human resource for such skills and training to avert content deterioration and other preventable situations, which is the only legitimate way to preserve AV. It is thus a pressing matter, since this skill acquisition is very important to ensure the preservation of national heritage.

In data evidence R1 admitted by saying *"education and training are strategies that can be used to improve the management and preservation of AV materials in possession".*

R3 added by stating *"definitely in every field… if you don't train well you do things haphazardly … so definitely the training is key and the sort of materials that we are using are not for amateurs they are professional equipment".*

While R10 also emphasized by saying *"yes because the tapes are very delicate and the thing is if you have to preview you need to know the machines, you have to know certain things".*

The focus of GBC through the lenses of management is how to transmit information to the public and ensuring such a target is met in fulfilment its public mandate. So resources and energy are heavily channeled on transmissions rather than some of the specialized areas like preserving and conserving which is having a dire effect on its repository. It was found out that the corporation was responsible for sponsoring employees to further their education to fill in certain key positions that will help run the corporation, but access remains largely unattainable for a variety of reasons, including lack of funding. According to (Thomas, 1997) public television has always faced financial uncertainty, relegating preservation to a low priority.

4.9 How secured are these collections?

The most devastating losses have already occurred in the newsroom and the main repository due to numerous challenges. Good housekeeping which is a precondition for preservation was lacking simply because of lackadaisical attitude on the part of employees. It was discovered that the newsroom operates on three shift bases, making it was difficult to regulate AV collections properly since every reporter must have access to any content if needed for the day's work. Most of these collections are lost simple because some reporters don't return them to where they picked them, some also deliberately wipe the content off the tapes. So the objective of seeking to know how secured collection were, and as proved by data, it was unfortunately nothing to write home about.

R8 in evidence stated that *"we were not secure against the weather, let's say fire and all those things, and then people could easily access them (tapes)…. some people go to the library pick the tapes and don't return them".*

R1 added by *saying "they were not a 100% secured, we lost some because everybody had access to them, some just disappeared and the circumstances are strange".*

R10 also shared the opinion that *"if I think about the old format, that is the U-matic, Betacam is very secured because the way it is, it very difficult for someone to come into contact with it, but the DVDs are not secured at all because it can break easily".*

4.10 What are some of the challenges in preserving and conserving AVs now?

Findings in the data collected revealed numerous challenges confronting GBC's preservation and conservation standards. There are no requisite standardized physical repository process in place and the lack of awareness of the relevance of preserving and conserving. It was discovered that there were no playback machines, technological obsolescence is now an enigma in the management of the repository. The carrier format within which the content are embedded cannot last for a long time again, thus underlining the need to migrate such collections to new and emerging technologies. According to (Amanda Chambliss, 2019) the fact that technology is so rapidly developing means you also need to continue to migrate digitized content to the latest format."

According R1 *"tapes are meant to be kept under a certain temperature, because we are not professional archivist we didn't address our minds to that, so if someone felt that the room was too cold, he or she will turn off the AC and dust will come in, and dust is not good for such materials".*

Dust is another factor, besides temperature and relative humidity that creates a great risk in tropical areas (Teygeler et al., 2001).

Data collected confirmed in the affirmative that the state of preservation and conservation is below standard. There is a huge technological gap confronting the corporation, since a large number of the content carriers cannot be played back simply because some of the tapes are torn, whiles others are infested with mildew**.**

In R5's testament *"preserving and conserving as of now is not the best, the material are rapidly deteriorating as the days goes as well as the cost of storage, I mean the cost of electricity in powering the air conditioners".*

The researcher sought to know as part of the systemic challenge, if there were any obsolete AV formats and equipment in the system since technology in preserving and conserving were far advanced in such a field.

R1 stated that *"there are obsolete AVs and equipment that cannot be use again, either because the technology is extinct or some of the parts of the playback equipment can no longer be cannibalized and has become an archival piece".*

The researcher compared the situation to another study conducted in Tanzania by Komba et al. (2017) on "Preservation and Accessibility of Audio-visual Records in Tanzania's Television Broadcasting Companies" this revealed that there were several barriers affecting the preservation and accessibility of AV records which amongst others included technological incompatibility, inadequate infrastructure, inadequate skills, environmental factors and unclear policies that hinder access to and use of AV records at Tanzania's Television Broadcasting Companies. It can, therefore, arguably be stated that the management of AVs in many Sub Saharan African countries are hampered by several factors.

R5' concluded by saying *"you can see this huge 1inch player standing there, it has been here for God knows when, it has never been used since I started working in here, well I don't know if it faulty or not".*

4.11 Budgetary allocation

Since major itinerary of repositories hinges on funds, the researcher sought to find out if once upon a time there has ever been any budgetary allocation for preservation and conservation of AVs in GBC. From data evidence, it was clear that thought of allocating funds for GBC's repository had never been conceived let alone implemented.

R1 confirmed and put it this way *"no, no it hasn't happened, we have only have to live from hand to mouth, and for money to be allocated for this kind of task, it hasn't happened".*

R2 added *"to the best of my knowledge I don't remember, but from the top of my head if there has been anything of this nature, I don't know".*

R3' also put it this way *"I have not seen any budget and plans towards such a project for a long time".*

A budget can be defined as a financial statement with a projection of income and expenditure over a period time. It is a way of projecting financial goals by forecasting into future financial resources and needs. This process however, ensures monitoring and controlling of income and expenditures, and evaluating progress towards achieving a financial goals. Any dedicated management of preservation and conservation of AV repository needs to be funded and there should be a budget allocation for such an enterprise. According to (Schüller, 2008) a frequently found stereotype is that audiovisual departments of professional organizations like libraries and museums have to struggle against the leading structures of the institutions for adequate funding.

4.12 Prospects for digitization in the future

The greater part of holders of audio and video material is aware that digitization is necessary for the future safeguarding of audiovisual materials (Schüller, 2008). According to (Wright, 2012) digital preservation is a new field which has been developing its technology and standards only over the last 20 years, and for most people their exposure to digital preservation technology is much more recent. Digital materials are surprisingly fragile. They depend for their continued viability upon technologies that undergo rapid and continual change. All digital materials require rendering software to be useful, and they are generally created in formats specific to a given rendering environment (McFadden, 2003).

One of the objectives of the researcher was to find out if any digitization process has started in GBC. It was reveal that nothing of the sort had stated, but management of GBC and the board are putting thoughts together for such a project to commence.

R1 affirmed *"we haven't started, we have had proposals from companies like Huawei and some others who had made presentation to us on preserving our archive, and the cost sometimes run into millions of dollars. That is what had scared us, so there is no ongoing digitization right now".*

R3 added that *"we had a discussion, yes that there is a plan to do that, but physically it is not on the ground".*

4.13 Possible problems with digitization

Digital chaos, resulting from a lack of skills, knowledge and understanding, can only too easily undermine a digitization project. Unsuitable hardware and software purchases, inadequate infrastructure, use of proprietary software with expensive licensing requirements, inconsistent or inappropriate use of international industry standards and other factors impede successful large scale digitization (UNESCO, 2013).

According to R10 *"a lot of the materials are deteriorating due to chemical reactions and mould infestations and will hinder digitization and also be a root cause of disjointed pieces of collection"*

R9 also stated that *"lack of space for backups and frequent corruption of external and hard drives due to lack of durability".*

4.14 Considering digitization as worthwhile

Digitization has become the conveyor belt of the 21st century and dictating the pace of modernity and technological advancement. For any institution with the intention of preserving and conserving AV heritage, digitization is a matter of pressing importance. Any delay or procrastination only leads to the deterioration of content and makes the content more difficult to be accessed as technologies become obsolete. From the data collected, researcher sought to know by asking if digitization was worthwhile:

R1 stated *"yes there is no other alternative, it is long overdue, and if we should have done it yesterday, and if we don't find the resources to do it posterity will judge some of us who had the opportunity to fix it but didn't".*

According to (Vectracom, 2014) the longer you wait, the more the preservation of your archive data is going to cost you. And technology is not about to come to your aid. Digitization can therefore be used as an important strategy to backup copies of AV materials.

As a matter of urgency and evidence from data collected based, GBC's management and board will have to put in the needed resources for such an enterprise of reformatting all analogue AVs to avert continual deterioration.

R3 added by saying *"yes I mean, it is a whole resource, if we had plan well and continued the way things were going and we had not lagged behind for all this years when it donned on us that we are in the digital age, at least today GBC would have been making so much money".*

This goes a long way to suggest that GBC's ailing resource can be made better according to R3' observations.

4.15 conclusion

Chapter four presented the findings and discussions on the data collected from interviews and observations conducted to address the research objectives. The findings were discussed guided by the literature reviewed in chapter two which provided insights into evaluating the research objectives, as well as giving the results and analysis of the information collected. The first objectives sought to find out; what were the storage carrier formats used for preserving and conserving of AVs in the film/video repository. It was discovered that GBC's huge storage carrier formats were analogue such as U-matic tapes, Betacam, XDcam, VHS, DV tapes, DVD and minidiscs that were deteriorating and need to be digitized. The second objective was to find out what were the challenges in preserving and conserving of AVs in the film/video repository. Data collected revealed that GBC is confronted with numerous challenges pointing to standards preserving and conserving, no playback machines, technological obsolescence which is now an enigma in the management of the repository. Third objective sought to find out what will be the future possibilities of digitizing AVs. Data evidence revealed that digitization is a matter of pressing importance to GBC. As stated by (Vectracom, 2014) the longer you wait, the more the preservation of your archive data is going to cost you. And technology is not about to come to your aid. This suggest that digitization has the ambiance to shore up GBC's ailing human and capital resources and an important strategy to backup copies of AV materials.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter four was guided by the apparent findings from the analysis of the primary data in reference to the literature review. The relative importance of chapter is the major findings in relation to the research objectives that ties-in the conclusion and provide appropriate recommendations. The objectives that lead the research were:

1. What were the storage carrier formats used for preservation and conservation of audiovisuals in the film/video repository?
2. What were the challenges faced in the preservation and conservation of audiovisual in the film/video repository?
3. What will be the future possibilities of digitizing audiovisuals in the future?

5.2 Summary of Findings

5.2.1 Storage carrier format used for preservation and conservation

The research looked into the issues of preservation and conservation of AV materials in Ghana Broadcasting Corporation's repository. Discoveries were based on the evidence of primary data collected from respondents' and observations conducted. The research established that there were numerous analogue carrier storage formats of audiovisual collections. These collections comprised of ¼ open Reel (Reel to reel), U-matic tapes, Betacam, XDcam, VHS, DV tapes, DVD and minidiscs. The repository houses over twenty-nine thousand AV collections in estimation. Some of these collection were those salvaged from the 1989 fire destruction, donated ones and subsequent productions. All these were in various formats as explained by (Ray Edmondson, 2004) that, the typical collection contains a variety of media in various sizes, shapes, configurations or format. According to (Wright, 2012) sound and moving image recordings can be divided into three technical groups, that comprises of analogue recordings, digital recordings on physical carriers and digital recordings on digital storage. General formal skill or training in AV preservation and conservation before employees' appointment was nonexistent, but rather the rudimentary learning on the job amid unsecured custody of AVs. These were the evidence based findings the research used to realize the first specific objective stated in the introduction above.

5.2.2 Challenges of preservation and conservation of AVs

The Second objective of the research was to explore the challenges confronted preservation and conservation of audiovisual collections. The research identified numerous challenges confronting AV preservation and conservation. These challenges were, lack of awareness of the relevance, Lack of funding, Lack of training, management and research opportunities, Lack of expertise in preventing deterioration, temperature and humidness. Others challenges discovered were the standards of preserving and conserving, no playback machines, technological obsolescence which is now an enigma in the management of GBC's repository. According to (Mills, 2017) physical preservation of obsolete AV formats in heritage libraries and archives takes on many guises: storage, temperature and humidity, care and handling, techniques for cleaning, repairing, or halting deterioration, and the acquisition and upkeep of equipment. Based on the numerous evidence of challenges confronting GBC's repository the second objective of the research was realized.

5.2.3 Prospects for digitization in future

The third and final objective of the research was to probe the future prospects of digitization of GBC's repository. The evidence based on data analysis established that GBC's management and board of governance had incubated the idea but had not started any digitization project yet. As of now the repository is experiencing losses through deterioration of AV and obsolescence of equipment playback, as well as other possible means such as handling, playback damage, high temperature and mould infestation amongst others. To mitigate this losses modern archival practice and technical research professionals approves of reformatted into a digitized replacement in order to be preserve and conserve for a long-term and made accessible to posterity.

Reformatting to a digital format presents a number of challenges as well.

These challenges become more acute and multifaceted depending on the purpose of the digitization for preservation or for access, and according to the media type to be digitized into. One aspect of the complexity involved is in the decision making process regarding digitization, that states there is no one correct master file format for all applications, as all format choices involves quality, access and lifecycle management. Another important deciding factor is in the selection of file formats, that is the sustainability of file formats for long term preservation and access (Tabah & Specialist, 2017).

Data evidence established the enthusiasm with the prospects of digitization as a matter of pressing importance. Migration to the digital domain ends the connection with the analogue carrier and the associated technology.

5.3 Conclusion

The research was initiated to investigate the issues of preservation and conservation of AV collections in GBC. The objectives as specified were all achieved as summarized in section 5.2.2 above. The research was well-grounded that digitization is a matter of pressing impotence for preservation and conservation, however the challenges confronting GBC's repository were enormous with data evidence pointing to lack of funding.

5.4 Recommendations

Recommendations were made based on the findings of the research objectives.

5.4.1 Funding

There must be a reliable source of funding for the operational activities of the repository. This is inevitable because the life cycle of AVs are dependent on a consistent budgetary allocation to ensure proper management, right from collection, preserving, conserving and accessibility. This is not a solo undertaking to be handle alone by GBC, but by the government, NGOs, individuals, international associations and organizations. The aforementioned should help by way of financial aids, loans and grants. With a solid financial capacity, digitization, modern equipment and other vital logistics for preservation and conservation will put the operations of the repository on a solid foundation.

5.4.2 Training of staff

Staffs working in the repository have already exhibited the character and resilience to acquire the basic skill on the job, and it is recommended, that the staff should be given an ongoing training and assistance through workshops, seminars and conference attendance to stay abreast with the current good practice of preservation and conservation. There must be proper advanced education and training for staff with basic knowledge, skills and expertise that can help minimize the physical

handling and help reduce further risks of damage and deterioration. GBC must employ and pay for the services of professional archivist for proper preservation and conservation.

5.4.3 Collaboration with professional associations

Collaboration between GBC and other international associations, NGOs and organization such as, United Nations Educational, Scientific and Cultural Organization (UNESCO), Coordinating Council of Audiovisual Archive Associations (CCAAA), International Association of Sound and Audiovisual Archives (IASA), International Federation of Television Archives (FIAT), International Federation of Film Archives (FIAF), Association of Moving Image Archivists (AMIA), International Federation of Library Associations (IFLA) and International Council of Archives (ICA) amongst others. This will help bridle the challenge of lack of expertise, equipment and help in the establishment of standardized digital labs for serious preservation and conservation business.

5.4.4 Digitization

Digitization can be referred to as the conversion into digital form from an existing analogue resources of AVs or born digital, which is a direct format production of a digital media or object. These constitutes rich human knowledge, educational, cultural, administration, medical, technical, science and other valuable information amongst others. GBC must endeavour to embrace a proper and robust digitization regiment for posterity. Referencing (UNESCO, 2003b) digital materials include texts, databases, still and moving images, audio, graphics, software and web pages, among a wide and growing range of formats. They are frequently ephemeral, and require purposeful production, maintenance and management to be retained. Many of these resources have lasting value and significance, and therefore constitute a heritage that should be protected and preserved for current and future generations. This ever-growing heritage may exist in any language, in any part of the world, and in any area of human knowledge or expression.

5.4.5 Proper storage system

Storage of AVs needs to be handled in terms of the facility and the way the collections being stored within it. Storage conditions for AVs carriers are specific to their format and there is the need to adhere to international standards. AV storage standard prescribes the optimal temperature and relative humidity levels required for storage. There must regular cleaning and fumigations to

safeguard collections from mould infestations and other harmful organism. The storage facilities must be appropriately secure to minimize the risk of theft or damage to collection. Fire detection and suppression services need to be in place and systems that control heating, air conditions must be regularly serviced. It is recommended that a digital preservation and conservation specialist with AV technical, metadata and management experience be hired to initiate, guide and provide consultation to GBC management in their decision-making in the digitization of AV analogue to digital surrogates.

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APPENDIX

INTERVIEW GUIDE

Interviewee's name: **Place:** **Dates:**

Interview questions:

A. Background Profile of respondents

1. Gender of respondent □Male □ female
2. Age brackets □ 18 to 30 □ 30 to 50 □ 50 to 60
3. Level of education □ Diploma □ 1st Degree □ 2nd Degree
4. What is your rank?
5. Can you please tell me your duties?
6. How long have you been working with audiovisual content? And how did it start?
7. Do you possess any professional qualification or training in handling audiovisuals?

B. storage carrier formats used for preservation and conservation of AVs

8. What kind of storage facility do you have for preservation and conservation?
9. What is the total number of collections in the repository?
10. What are some of the various content carrier formats used for preservation and conservation?
11. Do you need special skills or training to handle these materials?
12. How secured are these collections?

C. Challenges of preservation and conservation of AVs.

13. What are some of the challenges in preserving and conserving audiovisuals now?
14. What is the state of their preservation and conservation?
15. Are there any obsolete AV formats and equipment?
16. How accessible are these collections?

D. Prospects for digitization in the future

17. Have you started any digitization project yet?
18. If yes, what are the lovely prospects of digitization?
19. What will be the possible problems to be encountered in digitization if any?
20. Do you consider digitization worthwhile?