ANALYZING ACCESS AND USE OF INFORMATION RESOURCES BY USERS AT THE NATIONAL MUSEUMS OF KENYA

BY

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DECLARATION

DECLALATION BY THE CANDIADATE:

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DEDICATION

This thesis is dedicated to the loving memory of my late mother, Susan Nakitare, whose encouragement and guidance enabled me to fulfil my potential; my wife, Mercy Gakii, who has been a continuous source of inspiration and whose charisma, charm and wisdom have been very encouraging; and to my three boys, Charles Nakitare, Hillary Kimathi and Maxwell Baraka, who form the basis of my life and the reason for living.

ABSTRACT

There is an increase of access and use of information resources in most of our research institutions in Kenya, yet this study has revealed that there is low access and use of the Information Resources by users at the National Museums of Kenya. The National Museums of Kenya was created to facilitate the generation, preservation and dissemination of information on historical, cultural and natural heritage of the country. National Museums of Kenya and external researchers have over the years continued to generate information in print, audio-visual and electronic formats. However, due to the proliferation of information, and its haphazard management, accessing this vast reservoir of data has become a major challenge. Hence the study tried to analyse access and use of information resources by users at the National Museums of Kenya and to suggest ways in which it can be enhanced. Objectives of this study were: to identify institutional-generated information available; to find out how the institutional-generated information was organised; to examine how information users access the institutional-generated information; to determine challenges inhibiting access of institutional-generated information; and to suggest strategies that would enhance access to institutional-generated information by research staff of the National Museums of Kenya. The researcher used a case study research design. The researcher employed both qualitative and quantitative approaches. The study adopted Social Exchange theory; while the Data collection methods relied upon were administration of questionnaires and interviews. Data collection instruments included questionnaires and interview schedules. Stratified and simple random sampling was used to select respondents from three stations. The study population was 600 people, which comprised of researchers, management staff and external users. The study sample size involved 226 information users of the National Museums of Kenya. Data collected was analysed using Statistical Package for the Social Sciences. Tables, graphs and descriptive charts were used to present the data. In pursuance of the research objectives, the research found out that the National Museums of had information touching on scientific, technical and other types of information including advertisements. The research found out that the organization of institutional-generated information was in bad state. Most of the respondents disagreed that information users had ease of access to information generated by the institution. The study revealed that the most challenge inhibiting access of information resources is lack of trained personnel. However, there were other challenges in relation to access of information resources including; lack of policy on Institutional repositories, inadequate ICT infrastructure, inadequate funds and inadequate trained personnel. The researcher concluded that the National Museums of Kenya need to be part of the global movement towards providing open access to information generated by the institution. More people are likely to benefit from this as it will provide access to appropriate scientific, technical and other types of information produced by institution's research staff. The study recommends the need for policy formulation on institutional repositories in order to establish an institutional repository at the National Museums of Kenya, improved ICT infrastructure in place to help NMK in enhancing access to institutional-generated information, allocation of enough funds to uplift the state of ICT at National Museums of Kenya, and National Museums of Kenya should organize trainings to help the managements and researchers understand the importance and use of institutional repositories in accessing institutional-generated information. In view of this, there is need for a coherent informatics structure that will enhance efficiency and effectiveness of information outreach as a way of easing access to information by use of open access institutional repository.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

DRM   -   Digital Rights Management

EANH   -   East African Natural History

ICT   -   Information and Communications Technology

IR   -   Institutional Repository

KARI   -   Kenya Agricultural Research Institute (Now KARLO)

KMS   -   Kenya Museums Society

KENRIK   -   Kenya Resource Centre for Indigenous Knowledge

KNUST   -   Kwame Nkrumah University of Science and Technology

NMK   -   National Museums of Kenya

OCLC   -   Online Computer Library Centre

OCR   -   Optical Character Recognition

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The success of this work is due to the commitment and goodwill of many people. First and foremost, I appreciate the assistance from my two supervisors, Dr. Andrew Chege and Dr. Alice Wafula, who painstakingly guided me throughout the study. Secondly, I appreciate the management of the National Museums of Kenya for approving my training to enable me fulfil the course. Finally, I am grateful to my loving wife, Mercy Gakii, whose constant encouragement stood out as a source of inspiration throughout the research.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Access and use of information resources by users is very essential in our daily life. It is generally known that having access to information increases insight on knowledge of person receiving it. When information resources is not accessed and utilized properly, this could lead to information poverty hence, cause hindrance to development of our country in terms of social-economic growth. The demand for information access and use in recent times has tremendously risen giving rise to information explosion that tries to surface this demand. In order to access these useful information resources, there is need for the institution to have control that brings together all this information resources at the service of the users. In this case, research institutions like National museums of Kenya have an interest in the collection and preservation of their research output and in making such output accessible to users from within and outside the institution. Traditionally, much of the information at NMK is in published form. However, access to these published information resources is limited for an institution as they are not available in a way that is required by intended users. Nowadays, developments in the field of technology are revolutionising the way to provide access to digital information via technology. This will provide access to appropriate scientific and technical information generated by research staff of the institutions through the use of open access institutional repositories. It will also assist in finding solutions to most of the problems facing our research institutions in terms of information accessibility.

1.2   Background to the Study

The National Museums of Kenya has its own way of making information available to their potential users. A lot of information being generated at NMK relates to life of ornithology, biodiversity, cultural heritage and natural heritage. This information is in print and audio-visual format which can only be available within the information centre. However, the NMK has decentralised museums by increasing the availability of the resources to citizens of Kenya and other interested parties. This rich information is not readily available to the public as people do not know its existence. The NMK, as a research institution, is under pressure as there is serious demand by information users to access and use information generated by the institution.

1.2.1 Profile of the National Museums of Kenya

The National Museums of Kenya is a state corporation established by an Act of Parliament, the Museums and Heritage Act, 2006. It is a multidisciplinary state corporation and centre of excellence in research, heritage conservation and management whose role is to collect, preserve, study, document and present Kenya's past and present cultural and natural heritage. This is for the purposes of enhancing knowledge, appreciation, respect and sustainable utilisation of these resources for the benefit of Kenya and the world for posterity. Its research mandate is vested with the directorate of research and collections whose core function is to conduct research on the cultural and natural heritage as well as to collect and manage the national and scientific reference collection. Through its research and collection activities, NMK has accumulated millions of natural and cultural materials in its reference collection. Some of the collections represent rare and endemic biological species that demonstrate Kenya's unique

biodiversity. NMK's mutual concern for the welfare of mankind and the conservation of the biological diversity of the East African region and that of the entire planet demands success in such efforts.

In addition, NMK manages many regional museums, sites and monuments of national and international importance, alongside priceless collections of Kenya's living cultural and natural heritage. As an institution that must respond to the growing needs of the society, NMK strives to contribute in a unique way to the task of national development.

The NMK was established in 1910 by then newly-formed East Africa Natural History Society (EANHS) on a small site near the present Provincial Commissioner's office in Nairobi. In 1922 a larger building was put up on the site where Serena Hotel now stands. The construction of the present Nairobi Museum began in 1929 after the government set aside the land for a museum. The museum was officially opened in 1930 by Sir Edward Gregg and named in memory of Robert Coryndon. The museum was constructed by money raised from the Coryndon Memorial Fund. The present National Museums of Kenya has a very special relationship with the EANHS and members of the society enjoy certain rights and privileges. One of the more important areas of close co-operation has been the large library. The Society moved its library into the museum in 1930 and has maintained it there ever since. In 1964 the museum changed its name and has since been known as the National Museums of Kenya.

Another major phase of development was marked by the extension of the museum services and assets beyond Nairobi to make them accessible to more people in Kenya. Regional museums were established at Kitale, Meru, Karen, Lamu, Kisumu and

Mombasa. They are now important components of the national organisation, each having its own identity and programmes. In addition to their own curators, each of the regional museums manages their affairs and fundraising, which is a potent factor in their success.

In 1969 the government requested NMK to take over the responsibility of managing ancient monuments and pre-historic sites. In January of the same year, Fort Jesus, Gedi, Olorgesaille and Kariandusi were formally handed over to NMK. Subsequently, several additional monuments and sites along the Kenya's coast and inland were placed under NMK's responsibility. In 1969, the museum took over the administration of IPR which subsequently developed into a major research centre concerned with living African primates.

The NMK is a complex organisation with a wide range of activities from the traditional museum activities to the preservation of Kenya's antiquities, sites and monuments. The NMK is responsible for providing resource materials to support researchers and for sharing information so collected and disseminating it locally and internationally. It also acts as a repository for the country's biological, cultural and historical materials; spearheads research, documentation and conservation of modern and prehistoric flora and fauna as well as contemporary and modern cultural artifacts. NMK is a knowledge, information and technology-generating institution that contributes significantly to the attainment of research innovation and technology sector's objective of being a global leader in heritage research and management.

1.2.1.1 Mission and Vision of the National Museums of Kenya

The National Museums of Kenya has national and international obligations as a scholarly institution to support the work of researchers. Equally important is its obligation to make its generated information more accessible to all users from within and outside the museum. NMK has a vision and a mission statement that express its fundamental purposes.

Vision

The vision of NMK is to be a global leader in heritage research and management.

Mission

The mission statement of NMK is to promote the conservation and sustainable utilisation of national heritage through collection, documentation and dissemination of research and collection management knowledge, information and innovations.

1.2.1.2 Core Functions of the National Museums of Kenya

a) To serve as a national repository for things of scientific, cultural, technological and human interest.

b) To serve as a place where research and dissemination of knowledge in all fields of scientific, cultural, technological and human interest may be undertaken.

c) To identify, protect, conserve and transmit the cultural and natural heritage of Kenya.

d) To promote cultural resources in the context of social and economic development.

1.2.1.3 Organizational Structure of the National Museums of Kenya

 The National Museums of Kenya is guided by the National Museums and Heritage Act, 2006 and other appropriate directions issued by the government from time to time through the Ministry of Sports, Culture and the Arts. The board of directors supervises the operations and management of NMK and ensures the interest of the organisation and all stakeholders are promoted and protected. As illustrated in Figure 1.1, NMK employs its staff. The director-general is responsible for the overall administration of the organisation, including regional and coastal museums, monuments, sites and research institutes. Each component has its own administrative arrangements. NMK's organisational structure has been responsible for the dynamic growth witnessed in the past years. The organisational structure is as shown below.

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                    ┌─────────────────────────────────┐
                    │      BOARD OF DIRECTORS           │
                    └─────────────────────────────────┘
                                   │
                    ┌─────────────────────────────────┐
                    │      DIRECTOR GENERAL             │
                    └─────────────────────────────────┘
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DIRECTOR OF REGIONAL MUSEUMS, SITES AND MONUMENTS	DIRECTORATE OF RESEARCH AND COLLECTIONS	DIRECTORATE OF DEVELOPMENT AND CORPORATE AFFAIRS	DIRECTORATE OF HUMAN RESOURCE AND ADMINISTRATION

AUDIT OFFICE	RISSEA	LEGAL OFFICE	FINANCE

DIRECTORATE OF INSTITUTE OF PRIMATE RESEARCH
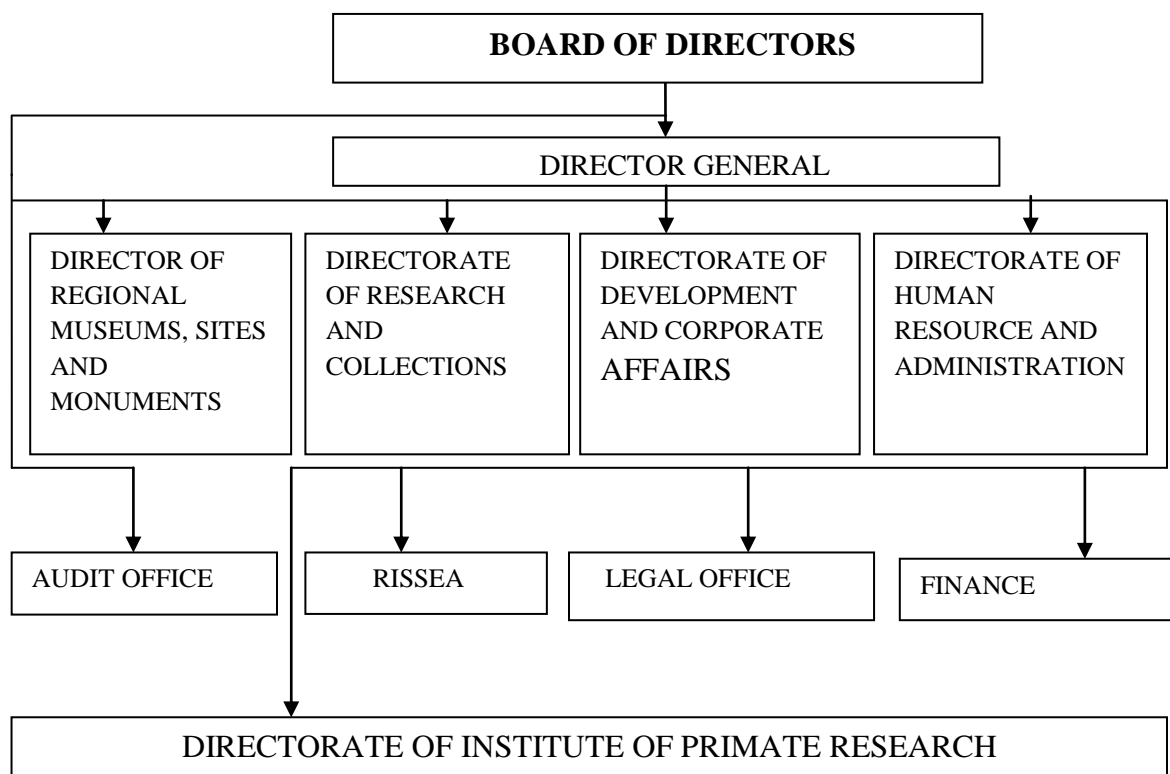
Figure 1.1: Organizational Structure of the National Museums of Kenya

1.2.1.4 Use of Information at National Museums of Kenya

The National Museums of Kenya has information collections whose mandate is to facilitate access to relevant information by the management staff, research staff, research students, NMK affiliates, Nature Kenya and Kenya Museums Society. Users can only access information materials within their reach and cannot, therefore, benefit from the well-known information that NMK has generated. For example, when one is in the regional museums, he or she can only access the information within that region. This means they cannot even access information in other satellite museums or the headquarters unless he or she goes there physically. The institution does not have a coherent informatics structure that would enhance efficiency and effectiveness of information outreach as a way of easing access to information.

1.2.1.5 Impact of Institutional Repositories

Open access institutional repositories make it possible to create an immediate impact on sharing of information output within the continent. Researchers generating these information materials stand to benefit from open access because other institutions can also have access to their research outputs. The digital documents uploaded on institutional repository have the potential of being accessed and used by all interested users that have access to the Internet. This increases the profile of the researchers, their institutions and their countries. The researchers are rewarded for their work not financially but through the impact of such research output.

Studies have shown that open access documents are read more widely and cited more frequently than those materials which are not housed in repositories. The consequence of this is that such works have greater impact. The impact is based on an average number of times that these materials of a given title are cited by other papers. Citation data are not meant to replace informed peer review. Careful attention should be paid to the many conditions that can influence citation rates such as format. A growing number of open access documents now exist, which means that they are published free on the web, with the cost of publication met by authors paying to publish. The suggested ways in which impact can be measured on information deposited in open access repositories is to get realistic estimate of its effects. It is not enough to compare only 2% of materials that are open access with 98% that are not and conclude that their impact is the same. Researchers must be able to draw on a sophisticated understanding of the scholarly communication practices of individual disciplines and use these research materials for citation purposes.

1.2.1.6 Challenges Facing NMK in Establishing Institutional Resources to Access Institutional-generated Information

The establishment of institutional repositories has been a challenge due to issues relating to acceptance of electronic information, absence of information management policies, copyright and intellectual property rights, inadequate technical infrastructure, inadequate funds, and lack of awareness and understanding of the concept. NMK has rich resources that exist in isolation and scattered throughout the country with no measures in place to make sure that they are well controlled or repackaged in a way that can easily be accessed by potential customers. There is no control of Institutional Repository (IR) that brings together all this information resources at the service of the users. In spite of all this, there is a serious need or demand by information users to access and use information materials scattered at various branches of NMK across the country.

1.3 Statement of the Problem

Enhancement of information Access to information resources has been a subject of discussion for many years, yet National Museums of Kenya is charged with the responsibility of making sure that information generated by the institution is well disseminated. However, this has not been the case because National Museums of Kenya has rich information resources that exist in isolation and scattered at various branches of NMK across the country with no measures in place to make sure that they are well repackaged in a way that can easily be accessed by users. Users can only access institutional-generated information within their rich, they cannot therefore, benefit from the well-known that NMK has generated. This means that they cannot even access information from other satellite museums unless the users go there physically. NMK and

external researchers have, over the years, continued to generate information in paper, print and audio visual and electronic formats. However, due to the proliferation of information, and its haphazard management, access to this vast reservoir of data has become a major challenge. This challenge has negatively impacted on open access to information by users. In view of this perception, the research sought to analyse access and use of information resources by users at the National Museums of Kenya and to suggest ways in which it can be enhanced.

1.4 Aim of the Study

The study aimed at analysing access and use of information resources by users at the National Museums of Kenya and to suggest ways in which it can be enhanced.

1.5 Objectives of the Study

i)   To identify institutional-generated information available at the National Museums of Kenya.

ii) To find out how the institutional-generated information is organized at the National Museums of Kenya.

iii) To examine how information users access the institutional-generated information at the National Museums of Kenya.

iv) To determine challenges inhibiting access of institutional-generated information at the National Museums of Kenya.

v)   To suggest strategies that would enhance access to institutional-generated information at the National Museums of Kenya.

1.6 Research Questions

The following are the research questions that guided the research:

i) What types of institutional-generated information are available at the National Museums of Kenya?

ii) How is the institutional-generated information organised at the National Museums of Kenya?

iii) How is the institutional-generated information at the National Museums of Kenya accessed by users of information?

iv) What are the challenges inhibiting access to institutional-generated information at the National Museums of Kenya?

v) What strategies can be used to enhance access to institutional-generated information at the National Museums of Kenya?

1.7 Significance of the Study

1.7.1 Theoretical Significance

The study will be a new addition to the existing body of knowledge on open access to information and use of information resources.

1.7.2 Practical Significance

The study will provide practical solutions to challenges associated with open access to information and the use of information resources.

1.7.3 Policy-Related Significance

The research intends to form a basis of policy formulation on the use of open access institutional repositories to access generated information at the National Museums of Kenya.

1.8 Scope and Limitation of Study

1.8.1 Scope of the Study

Information resources generated by the National Museums of Kenya, headquarter and in other two regional museums of Kenya.

1.8.2 Limitations of the Study

The researcher experienced a number of problems. Most staff members appeared not to be committed and some thought that their bosses would hold them accountable for any information provided without their prior consent. The respondents took long to give feedback. The researcher overcame these challenges by writing an official letter to the management of the National Museums of Kenya requesting to carry out the study. This made respondents to have confidence in answering the queries.

1.9 Chapter Summary

This chapter gives brief background information on the National Museums of Kenya and how institutional repositories can be used in enhancing open access to information. In order to access information resources by users, the chapter identifies the information generated at the National Museums of Kenya, examines the organisation of generated information, examines access of institutional-generated information, determines challenges of accessing information and suggests strategies that would enhance access to institutional-generated information at the National Museums of Kenya.

1.10   Operational Definition of Terms

Information Access: A means through which information or an entire range of possibilities for making information services is made available to users.

Information and Communications Technology: The convergence of audio-visual with computer networks through a single unified system of cabling, signal, distribution and management.

Institutional Repository: The digital archives of intellectual products created by research staff of an institution and accessible to end users both within and outside of the institution.

Internet: A global system of interconnected computer networks that use protocol suite to link billions of devices worldwide.

Open Access: Making publicly-funded research freely available to all at the point of use.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focuses on the review of the literature that is available based on Analysing access and use of information resources by users at the National Museums of Kenya. The researcher consulted various sources such as books, journals, academic papers and other previous study materials in order to pin point on various issues; identifying institutional-generated information available, finding out how the institutional-generated information was organized and determining challenges inhibiting access to institutional-generated information. The purpose of the literature was to analyse access and use of information resources by users and to suggest ways in which it can be enhanced. The review of the literature will reveal what strategies that would be used to enhance access and use of information resources by users in other organizations.

2.2 Theoretical Framework

According to Kombo and Tromp (2006), theoretical framework is as a collection of interrelated ideas based on theories and derived from and supported by data or evidence. The theoretical framework of the study is drawn from Social Exchange theory and intention to conduct Master of Science research. This provided an opportunity to suggest ways that would enhance access and use of information resources generated by institutions.

2.2.1 Social Exchange Theory

Social exchange theory is a process where individuals engage in social exchange that is sharing of knowledge. Homans (1958) and Thibaut and Kelley (1959) put forward related theories explaining social behaviour as a process of exchange between two or more individuals within a community who are in a position to influence each other. Social exchange theorists propose that individuals engage in social exchange – that is, sharing of knowledge. Social exchange theory is used to explain open information sharing behaviour in professional environments working with the wider community through an institutional repository.

2.2.2 The Green Open Access Model

Open access refers to a variety of approaches for making intellectual output freely available for others to access and, in some, cases for reuse. In this study, the Green Open Access model has typically been considered to be the most effective as a result of an increasing number of repositories that allow authors to archive their work. Authors can self-archive their work by uploading them onto the institutional repositories. The open access model was developed and maintained by communities of researchers in several science fields who use them. The open access model is rooted in the assumption that it inherently enhances accessibility of the materials they house and as a result, help to increase citation counts, increase visibility of the institution and facilitate scholarly communication. The use of open access model, as explained by Crow (2002), is a way to reduce costs and increase access. Jones et al. (2006) argue that IRs have a greater potential than other types of information resources for disseminating research.

The other theory relevant to the study is the Gold Open Access Model in which papers are published in open access journals often, though not always, with associated article charges paid by authors. This has not been used in the study because it is not considered to be the most effective as compared to the Green Open Access Model.

2.3 Review of Related Literature

2.3.1 Overview of Institutional Repositories

Institutional repositories play a critical role in an organisation to collect, organise and provide access to a wide range of intellectual output generated by the institution that was previously scattered and inaccessible to the public. Institutional repositories are envisaged to collate the intellectual life and scholarship of an institution with the primary commitment to preserve them for distribution and dissemination on a long-term basis.

a) Benefits of Institutional Repository

The benefits of repositories to institutions and individuals are numerous and can be grouped into the following categories (Pickon and Barwick, 2006):

i. Increasing visibility and prestige. A high profile IR may be used to support marketing activities to attract high quality staff and funding.

ii. Centralisation and storage of all types of institutional output, including unpublished literature.

iii. Supporting for learning and teaching. Links may be made with the virtual teaching environment and library catalogues.

iv. Standardisation of institutional records. The compilation of an institutional CV and individual online dossiers linked to the full text of articles becomes possible.

Ability to keep track of and analyse research performance and breaking down of publishers costs and permissions barriers.

Once an institutional repository is established, it will pave way for better access to scientific and technical information generated by the research staff of the institution to be freely available both internally and to the general public. This is because the institutional repository is responsible to serve as tangible indicators of an institution's quality, thus increasing its visibility, prestige and public value. These will ensure that there is a reduction of time and cost in acquiring these materials for the researchers because of local availability of the content.

A consortium of repositories can be formed to provide literature at a lesser cost, which can be a major boost for cash-strapped libraries. This will not only serve for better research capabilities, but it will also open the visibility of African scholarship to the international stage and stand a suitable response to the existing digital divide. Institutional repositories are good indicators of an institution's collective intellectual capital because it collects, preserves and disseminates the entire institution's intellectual output. Repositories use open standards to ensure that the content they contain is accessible immediately or later. Apart from easy and open access to scholarly information, IRs are good marketing tools to communicate capabilities and quality of the institution by showcasing the output of researchers and other intellectual activities of the institution. Hence, there is need to implement institutional repository at the National Museums of Kenya as this will enhance access to and use of information resources. It

will support the National Museums of Kenya research and administrative process in order to manage and preserve it and, therefore, derive maximum value from it.

b)   Origin and Development of Institutional Repositories

The history of institutional repository can be traced back to the 1960s. But it gathered momentum in 1990s with the growth of modern information and communication technology, especially the Internet and the ability to copy and distribute electronic data at little or no cost. The disappointment and inability created by closed access to scholarly literature and the anomalies in journal publishing paradigm in the areas of pricing, access, copyright and host of other monopolies paved the way for open access initiatives in order to make research articles freely available on the Internet. These initiatives were directed to rescue the obliterated research with the sole aim to provide a complimentary role by reforming the current scholarly communication impasse and to re-assert control over scholarship by the academia and to provide increased and uniform visibility of its researchers. While open access journal models were experimented in the publishing and organisational level, institutional repositories were experimented by various institutions with a mandate to bring together and preserve the intellectual output of individual institutions. While the academia feared the uncertainty of intellectual scarcity or intellectual theft with its resistance from the conservatives, slowly the academia learnt the benefits of open access and many came forward to publish their works in their institution's servers. This marked the significant success of the institutional repository model of scholarly publishing towards creating a world of free and open access scholarship society.

Institutional repositories have changed the way we communicate and work. Institutional repositories and the Internet have an enormous impact by promoting knowledge in society. They have made it easy for people to gain access to same information at the same time once they are connected.

Research institutions such as NMK must adopt and change with the pace of the society and store their information materials in digital form to facilitate access. This involves converting large quantities of documents from one format to another. In modern societies, this scientific and technical information is rich information that needs to be accessed by potential users online. Without such a service, the society cannot be open and transparent. Therefore, there is need for institutional repositories to be in place in order to enhance access of the information generated by research staff of NMK.

c)   Elements of Institutional Repository

The common essential elements of institutional repository in this research include the following elements:

i)   Institutionally defined

An institutional repository is an online database service for collecting, preserving and disseminating the intellectual research output of an institution, particularly a research institution. Institutional repositories represent a historical and tangible embodiment of intellectual life and output of an institution. To the extent that institutional affiliation itself serves as the primary qualitative filter, this repository becomes a significant indicator of the institution's quality.

Institutional Repositories do not require that each institution acts entirely on its own, for many institutions may prefer a consortium which might well prove the fastest path to proliferating institutional repositories and attaining a critical mass of open access content. Such cooperation could deliver economies of scale and help institutions avoid the needless replication of technical systems.

ii)   Scholarly in nature

Institutional repository could contain information generated by the research staff of the institution. These materials might include the institution's annual reports, video recordings, photographs and artworks and virtually any digital format the institution wishes to preserve. The contents may include pre-prints and other works in progress, peer-reviewed articles, monographs, conference papers, thesis and dissertations and other literature. To control and manage the access of this content requires appropriate policies and mechanism, including the content management and document version control systems. The repository policy framework and technical infrastructure must provide institutional managers the flexibility to control who can contribute, approve and update the digital content coming from a variety of institutional centres. The nature and extent of this review will reflect the policies and needs of each individual institution, possibly of each participating institutional community.

iii)   Cumulative and perpetual

This has two implications: First, whatever the content submission criteria for a repository, items once submitted cannot be withdrawn except in presumably rare

cases involving allegations of libel, plagiarism, copyright infringement, or bad science. This removal would be the functional equivalent of revoking the registration initially granted to contribution on access to the repository. This does not necessarily mean that all content will be universally accessible in perpetuity.

Second, institutional repositories aim to preserve and make accessible digital content on a long-term basis. Digital preservation and long-term access are inextricably linked: each being largely meaningless without the other. Providing long-term access to digital objects in the repository requires considerable planning and resource commitments. The institution needs to balance the desire to accept the farrago of file formats popular with various disciplines in order to simplify the content submission and encourage research participation, with the complications that migrating some of those formats that might present new standards evolve.

iv) **Open access and interoperable**

Providing access to the intellectual product generated by the institution increases awareness of research contributions. This motivates an institution to create and maintain digital repository. It requires that users beyond the institution's community gain access to the content. For the repository to provide access to the broader research community, users outside the area under study must be able to find and retrieve information from the repository. Therefore, institutional repository must be able to support interoperability in order to provide access via multiple search engines and other discovery tools. An institution does not necessarily need to implement searching and indexing to satisfy this demand; it

could simply maintain and expose metadata, allowing other services to harvest and search the content. IRs typically do not permit content to be removed once submitted. However, a variety of legitimate circumstances might require an institution to limit access to particular content to a specific set of users. This might include copyright restrictions and policy established by a particular research community.

d)   Components of Institutional Repositories

Institutional Repository is based on open source software DSpace used to build the IR in order to capture and preserve the intellectual output of the institution and make them available online for the global research community. This is used to support the learning, research and staff to build bridges among their knowledge processes. The essential components of an institutional repository include:

i)   Interface of adding content to the system

This software provides an interface for managing, submitting, searching or browsing and downloading documents.

ii)   Interface of searching, browsing and retrieving the content

The repository has a clear user interface and simple enough for non-experienced users. The majority of its contents are categorised according to the user community whereby users can browse the articles by titles, authors, subjects and publication date. The repository is designed in such a way that it has its own branding or web interface design. The site functions are fairly simple and intuitive to use. The repository has browsing facilities in well organised forms.

iii)   Content database for storing content.

The full metadata records can be featured in form of subject, author and collection listings, besides listing by title. The date of issue and date of submission can also be generated and the item recommended be sent via email to individuals.

iv)   Administrative interface to support collection management and preservation activities

Institutional repository is a database with a set of services to capture, store, index, preserve and redistribute scholarly research in digital formats.

e)   Other key components include:

   i)   **Registration:** This allows claims of precedence for a scholar finding.

   ii) **Certification:** It establishes the validity of the scholarly claim.

   iii) **Awareness:** It allows actors in the scholarly claim to remain aware of new claims and findings.

   iv) **Archiving:** It is used to preserve the scholarly records over time.

   v)   **Rewarding:** Deals with rewarding actors for their performance in communication system based on matrix derived from the system. Rewarding is done by a variety of actors, both institutional and at national and international levels, through rewards such as increased funding for research and invitation to contribute to scholarly works and conferences.

   f)   Institutional Repository Services

There are many services that an institutional repository can offer, which are supported by available current technologies. Open access repositories are more

than just places to store the content; their value lies in the services they provide to the community. There are a variety of services aimed at enhancing access to information generated by research staff of the research institutions.

They include but are not limited to the following:

i) Researcher Profiles

Researcher profiles are personalised web pages that showcase all of a researcher's work. They often include a biography, description of research, awards and so on as well as a bibliography of the researcher's publications which can be linked to full text in the repository for easy access.

ii) Search and browse

If users need to find the content through a number of options, this will enable them to find what they want more easily. These services can include full text and metadata searching, as well as multiple browsing functionalities such as by date, author, community and subject.

iii) Preservation

This is a way of making a commitment towards the stewardship of the content within the institution to have their documents digitized in electronic format.

iv) Usage statistics

Researchers want their papers to be read and usually as widely as possible. Repositories that offer usage statistics provide valuable services to authors, many of whom like to keep track of how many users are accessing their papers.

v) Marketing services

Repositories play a critical role in marketing products. Usage of information is also very valuable when marketing the repository with the researchers and administrators of the institution.

vi) Metadata Export:

This is whereby an OAI protocol for metadata harvesting is used to allow repository metadata records to be aggregated through OAI harvesting services.

vii) Content harvesting

Some repositories are adding content to their store by collecting the materials themselves. Although resource-intensive, this can be a good way of initially seeding the repository.

viii) Alert services

Searching for new materials requires a lot of time and has to be done regularly. Repositories can make things easier for users by enabling them to set up automatic alerts when material matching their profile is added to the repository.

ix) Mediated deposit services

This is when authors have time to deposit their papers into local repositories. Repositories can offer services that deposit content and supply metadata on behalf of authors. The service allows authors to simply email their content to the institution and staff will deposit the material on their behalf.

2.3.2 Establishment of Institutional-Generated Information

The National museums of Kenya has the most unique and diverse collections in the world, which have been generated over the past 60 years. These collections are not adequately shared with the public because of the format in which they exist, that is print and audio-visual. There is need for NMK to demonstrate its relevance in safeguarding and providing this cultural heritage to the public. NMK is committed to delivering information to its potential users through scientific expertise. These scientists offer specialised services to many clients every year in various disciplines ranging from entomology to molecular technology. Therefore, they contribute towards formal education and training in Kenya. In general, this rich information touches on exhibited dioramas, memorabilia and material culture of the people of Kenya. Preserved research collections include mammals, birds, insects, plants, reptiles, pre-history, ethnographic collections. Living research collections are botanic garden with live succulent and orchid. Information collections continue to be useful to researchers and the public as a whole and play a very important role of supportive tool to research and education. The scientific sources of the NMK are unique in the sense that they are valuable to science teaching schools and colleges. Besides, NMK has information collections whose major source of information resources are divided into various sections. The sections are:

a) Book collection with over 24,000 books.

b) Reprints collection with over 40,000 reprints.

c) Periodicals collection with over 2,000 journals titles.

d) Audio-visual collection with over 200 audio-visual materials.

The library receives books in form of donations, some of which are distributed to the regional museum libraries. The library is a major information sub-system in as it is the starter of virtually any activity in research development.

In this case, research scientists have valuable information which is produced within the institution but are underused as research resources. Doctoral theses and dissertations can be used many times if in digital format than if in print. The need for access to digital content cannot be overemphasised. This is valuable information yet not easily accessible. However, few research institutions are already taking advantage of the opportunities presented by ICT and are using open access institutional repositories to increase accessibility of these research outputs.

In recent years, technical and scientific literature has continued to grow and grey literature reports now come from many different avenues. The research generated in developing and emerging countries is missing from the international knowledge bases because of financial restrictions affecting its publication and distribution (Gibbs, 1995; Arunachalam, 1994), and Africa is the most affected continent. Much of the scientific research output from Africa is in form of grey literature such as research reports, thesis and dissertations, seminar and conference papers. Very little research output finds its way into the world's well established international scientific journals due to various problems, one of which is that publication in mainstream journals faces the problems of over-subscription. In addition to this, very few local journals are published and these journals have in general poor distribution and visibility (Cetto, 2002).

2.3.3 Organisation of Institutional-generated Information

According to Christian (2008), the emergence of open access initiatives as well as information and communication technologies provides a veritable medium to address the problem of poor visibility. The shift from conventional print publication to the use of digital sources and Internet media have provided research institutions with an opportunity to make their grey literature and research output accessible to the outside world. However, it may be surprising to observe that research institutions in the country are yet to take advantage of the benefits provided by open access institutional repositories.

In the light of emerging trends in digital scholarly communication, open access institutional repositories play an important role in the preservation and dissemination of institutional research outputs, which in turn becomes a constituent part of a global research output (Ng'etich, 2004). In Nigeria universities and research libraries were encouraged to organise their scholarly output into institutional repositories in order to make their research works available both nationally and internationally through open access (Bozimo, 2008).

2.3.4 Access to Institutional-Generated Information

Gaining access to institutional generated information has always been devastating due to the long process that one has to follow. NMK information users have to register with either the Kenya Museums Society or Nature Kenya to be allowed to access these information resources. Upon registration, the users are issued with an access card. NMK affiliates are always provided with a card by the NMK management showing that they are bona fide affiliates free to use the institutional-generated information. Research students

are provided with a letter prepared by the NMK administration to allow them use the information resources available.

The NMK is recognised for rich natural and cultural materials. It is charged with responsibility of making sure that information generated by the institution is well disseminated. However, access to institutional-generated information has been devastating because of the way in which the information is packaged. Generally NMK should serve to enhance access to this information. NMK needs appropriate technology as part of its informatics technology structure that will be critical to the realization of NMK's goals for the exploitation of its information resources. It is important for this research study to take place in order to realize the importance of this new technology that would be able integrate information in diverse formats to facilitate the enhancement of access to institutional-generated information.

Open access provides an opportunity to make an immediate impact on the sharing of scientific outputs within the organisation and outside world. Researchers who generate the documents also stand to benefit from the open access institutional repositories in that instead of their research outputs being seen and accessed only by users in their institution, other institutions will also be lucky enough to have access to them. The digital document placed in an open archive has the potential of being accessed and used by all interested users that have access to the Internet. This increases the profile of the researchers, their institutions as well as their countries.

Manjunatha and Shivalingaiah (2003) define information access as the modes or means through which information is made available, or to an entire range of possibilities for making information services available to the users. Libraries are repositories of information sources and play an important role in the academic world by furthering research among academics and researchers. The current information landscape has offered a plethora of options for accessing the various formats and types of information. The traditional way has been to publish research work in their institutional publications and to display bound theses on the library shelves for limited or no access. However, this can cause serious plagiarism in research institutions. An alternative could be to deposit them onto an online data base of an institution which can be accessed by all members of the institution as well as outsiders.

With the introduction of modern information and communication technology (ICT), access to information is a pre-condition for becoming a knowledge society. The right of access to information has become the dominant right in the information and knowledge era. Because of this, many researchers can now be allowed to access ideas of others. This presents an opportunity to participate in the global information-based, socio-economic and political activities (Musakali and Moli, 2011).

According to Altbach (1999), although publication by faculty members in scholarly journals could add impact to prestige of the institutions they are associated with, an institutional repository stands to generate greater impact by centralising research outputs generated by the institution's researchers, thus serving as much better and simpler metrics for gauging the quality of the institution's academic scholarship, productivity and

prestige. In case of research and academic institutions in developing countries, development of institutional repository will not only boost the global visibility and utility of their research, but will also introduce a novel research culture focused on meeting international standards and values. Research that is openly accessible by a global audience will have an impact on the researcher's focus and standard (Eqwunyenga, 2010).

A study by Stranger and McGregor (2006) revealed that an institutional repository could have a positive impact on visibility and accessibility to an institution's intellectual output. The opportunities presented by institutional repositories and open access archives to the development of Africa as well as the challenges hindering the development of digital information repositories on the continent have been examined by Chisenga (2006). He acknowledges the fact that several of the region's repository exist in the form of grey literature and very little research outputs find their way into the world's well established international scientific journals due to various problems in developing countries.

Additionally, local journals in general have poor distribution and visibility. This situation results in research from developing countries not being indexed in major international databases which have the capacity to increase visibility of these research outputs. Chisenga further notes that much of research generated in research institutions are not being shared or developed beyond field and laboratory research. Very useful and valuable technological and scientific information and knowledge remain unexploited and in some cases is lost.

Open access to scientific information can greatly benefit all players in the scientific communication system – scientists, authors, institutions, libraries, publishers, funders and society as a whole. It avoids duplication of scientific efforts, which saves time and money. This is one of the main advantages of open access. In particular, open access can help authors and institutions reach a much bigger audience than that provided by subscription journals, even the most prestigious and popular ones. Various surveys have revealed an increase in the visibility and impact of papers based on the amount of citations received (Swan and Brown, 2007; Durrant, 2004).

According to Christian (2011), the emergence of open access initiatives as well as information and communication technologies provide a veritable medium to address the problem of poor visibility. The shift from the conventional print publication to the use of digital sources and the Internet have provided research institutions with an opportunity to make their grey literature and research output accessible to the outside world.

2.3.5 Challenges Facing National Museums of Kenya in Accessing Information

The National Museums of Kenya, like any other organisation, is still grappling with challenges in an attempt to implement their institutional repository and share it with the world. Policy issues, staffing, infrastructure, promotion and sustainability issues are some of the challenges facing the institution. Institutional repositories provide access to wealth of scientific and technological information and knowledge, which are very essential for development. The opportunities and challenges presented by the development of institutional repositories have been examined by Chisenga (2006). He acknowledges the fact that several of the research output from the region exist in the form of grey literature

such as research reports, thesis and dissertations, seminar and conference papers. There is very little research outputs that find their way into the outside world due to various problems that affect institutions in accessing information.

Reasonably, research output addressing issues endemic to the region should be given wide circulation so that the results of such research can be applied in addressing the issues that they seek to tackle. Unfortunately, these outputs gather dust in various departmental offices and institutional libraries without getting published in local journals that have minimal circulation due to poor distributorship, marketing or prestige. Thus, after so much painstaking commitment of efforts and resources in undertaking research, the outcomes are not widely disseminated. In consequences, these research findings die at the institutional level as those who need to apply the knowledge are unable to access them. This situation highlights the need for effective process of knowledge dissemination from research institutions in developing countries like Kenya.

There are some challenges in pushing for the establishment of open access repositories. For instance, Asamoah-Hassan (2009) argues that it is difficult to convince the management of research institutions that it is necessary to have institutional repository and get them to agree to plan and support it on a long-term basis. Funding, reliable electricity supply and reliable Internet connectivity are major issue. Other challenges include getting permission for licensing, copyright issues and resistance as a result of computer phobia in some faculties and researchers. Major challenges in developing repositories are recruiting qualified staff, finding appropriate content and obtaining

faculty buy-in for the programme, adequate funding developing workflows and resolving copyright issues (Bailey et al., 2006).

Lynch (2003) states that most individuals lack the time, resources or expertise to ensure preservation of their own scholarly work even in the short term and clearly cannot do it in the long term which extends beyond their careers; the long term can only be addressed by an organisational strategy. Institutional repositories can address the short-term questions about continuity of access by providing an environment in which such new works of scholarship can be managed and disseminated.

2.3.6 Lack of Institutional Repository Policy

The institutional repository is supposed to be governed by a policy which has to be approved by the research institution and managed by the IR team consisting of the institution's librarian, system librarian and institutional repository librarian. The policy approved by the institution should allow researchers to deposit research work, including conference papers, into the institutional repository. This will help populate the repository with the full text of their research work.

There are different arguments with regard to which unit within the institutional set-up is appropriate to manage the institutional archive. According to De Beer (2005) and Kaur and Ping (2009), libraries should own and manage the institutional repositories. Pelizzari (2003) singles out the library as the establishment to be given the mandate of managing an institutional archive. Based on the above studies, institutional library seems to be the most acceptable unit set-up for the establishment and management of institutional repositories (Christian, 2011)

Therefore, there is need for research institutions to provide necessary confidence in the IR policy to enable members to contribute their research works to the repository and to ensure long-term administrative attention span and commitment to the preservation and maintenance of the repository.

2.3.7 Creating Awareness of Institutional Repositories

Kenya plays a key role as far as Institutional repositories development in Africa is concerned. Despite the benefits of self-archiving the awareness and self-practices of academic researchers in African countries and particularly Kenya is not known. Chiplimo, W. L. (2016).

In Kenya, institutions are doing little in terms creating awareness about implementation of IR to enable staff members to mandatorily deposit their papers into the institutional repository. This hinders the progress of the repository. Ignorance and lack of knowledge of institutional repository seems to be one of the major issues affecting the development of institutional repositories in Kenya. Some of the issues identified by existing literature as being responsible for the slow uptake of institutional repositories in Africa include lack of knowledge or awareness of open access institutional repository, poor state of information and communication technology and inadequate advocacy for open access repositories (Christian, 2011).

This lack of knowledge or awareness of IR is not peculiar to our country alone but the whole of continent of Africa, except South Africa. Open software and issues related to the establishment of institutional repository such as copyright, metadata, policies, populating and marketing of institutional repositories, among others, still persist. It is

only when this ignorance is tackled that meaningful progress can be made for people to understand the importance of IR.

2.3.8 Adequacy of ICT Connectivity and Infrastructure

Institutional repositories require a reasonably fast and reliable Internet connection for maximum benefit. Unfortunately, this is not the case in Kenya. The bandwidth in most academic and research institutions is inadequate, notwithstanding the growth in Internet usage in Kenya. Low Internet bandwidth availability poses an obstacle to the development of institutional repository. The high cost of Internet bandwidth in Kenya makes it much difficult for research institutions in the region to afford adequate bandwidth to host digital repositories. IRs ideally require dedicated Internet connections and the cost of such dedicated services are beyond the reach of many institutions.

According to Jensen (2006), "bandwidth is the life-blood of the world's knowledge economy, but it is scarcest where it is most needed in the developing nations of Africa which require low cost communications to accelerate their socio-economic development. Few schools and public libraries on the continent have Internet access." The availability of efficient telecommunication services is the most important prerequisite for electronic networking which affects institutional repositories.

2.3.9 Reliability of Power Supply

Institutional repository should be openly accessible to every user at all times. This, therefore, requires a sustained and regular electricity supply to power the ICT facilities. Frequent power outages affect the daily operations of the institution and this problem makes the development of major projects like an institutional repository in Kenya a

difficult and expensive venture as backup generators have to be enlisted and additional funds required for fuelling them.

The development of open access institutional repositories requires fast and reliable Internet connection as well as deployment of adequate information and communication technology infrastructure. Various other researchers have also confirmed that many institutions in developing countries face an unreliable electricity supply, poor Internet connections as well as lack of adequate computer equipment, appropriate software and even technological expertise (Arunachalam, 2003). Lack of funding is another major problem experienced by institutions in developing countries in their effort to establish digital repositories.

2.3.10 Adequacy of Advocacy

This is one of the best ways to promote the developments of IRs in Kenya. All stakeholders in institutional repositories such as researchers and librarians must be involved in order for such advocacy to be effective. Advocacy attracts contributors as well as stakeholders. Lack of advocacy has created apathy in the scientific or research community.

Development of institutional repositories in developing countries is much a capital intensive project than in developed countries. This is because research institutions in developed countries already have in place well established state-of-the-art ICT infrastructure to build on. This infrastructure is not in place in the developing world (Arunachalam, 2003). One of the best ways to promote the development of open access institutional repositories is through advocacy. For such advocacy to be really effective, it

must be undertaken by stakeholders in the region. These stakeholders include researchers, management staff and students. Effective advocacy presupposes that the advocates or stakeholders are very familiar with the concept.

2.3.11 Copyright and Technical Barriers

a) Copyright

Legal barriers arise from copyright law and licensing agreements that determine how a person can deal with a published work such as a journal article or a research paper, or whether the work shall be available in a closed or open format. Copyright retention is a necessary precondition for libraries to help disseminate their institutional-generated information. Also, some copyright laws ask authors to transfer their copyright to them before their papers are published. In such a case, the publisher's content has to be sought before such research works can be posted into the institutional repository.

Another issue that may affect the development of institutional repository is intellectual property. Intellectual property right is an aspect of law that covers diverse legal rights that exist in creative work. Intellectual property law embraces such exclusive rights in copyright, patent, trademark, industrial designs, trade secret, trade name and many others.

Copyright law determines how a person can deal with a written work such as a journal article or a research paper. Generally, a copyright holder has the exclusive right to authorise the copying, recopying or distribution of the written work. In other words, she or he has the right to determine whether the work shall be available in a closed or open access format (Christian, 2011).

b) Technological Barriers

In the view of Ghosh (2007), other technological barriers like software issues would have to be sorted with the digital rights management (DRM), a software professional, in order not to block access by authorised users. To address this challenge, KNUST library requests for reprints of research works from its researchers and publications that have no embargo placed on them for uploading onto the IR.

2.3.12 Institutional Culture and Politics

The most significant challenge facing research institution undertaking these institutional repository projects is not technical but rather cultural. According to the Online Computer Library Centre (2003), "the technical issues involved in creating institutional repositories are not necessarily difficult, but the developers of a repository will more likely face challenges related to the politics and culture of an institution from the stakeholders, namely, the library staff and instructional designers". In view of this, there is no common position of what an institutional repository is, what it contains and what its governance structure should be.

Most institutions on the continent have not yet addressed issues relating to the generation of digital information resources and the preservation of and access to these resources. They do not have policies and strategies supporting the management of digital information resources. A good example can be seen from libraries and documentation centres that have information resources collection development policies which do not include the collection of information resources in digital format.

2.3.13 Lack of Sustainability

Balancing needs, benefits and resources is essential for the success of these services. Sustainability is about organisational commitment and the ability to build persistent collaborations to address the ongoing needs for repository services and infrastructure. It is also about beneficiaries of investments in repositories and understanding the benefits they receive. Thus, sustainable service programmes need the ability to understand where they are succeeding and the flexibility to adapt as new opportunities emerge.

2.3.14 No Support for Interoperability

Institutional Repository systems need to be able to support interoperability in order to provide access via multiple search engines. According to Hirwade (2011), "interoperability is the ability of systems, services and organisations to work together and exchange information and use exchanged information without special effort of either system."

Metadata interoperability facilitates the exchange of information between repositories and enables searching on the web. To make items discoverable in the diverse online environment, the database needs to provide standard compliant database servers and expose the fullness of that metadata to meta search client (Dorman, 2008). Dorman goes further to say that no open communication standards can compensate for metadata that lacks content or in-coding standards. In the end, the visibility of digital items in an IR depends on the quality and richness of the descriptive metadata that content providers and digital curators provide. Yasser's (2011) extensive literature review identifies five categories of metadata problems: incorrect values, incorrect elements, missing

information, information loss and inconsistent value representation. Similarly, Alemneh (2008) and Shreeves et al. (2005) explain that metadata problems occur when elements are not applied properly and when values are not consistently or accurately recorded.

2.3.15 Institutional Repository Users

Institutional repository often translates into new roles for librarian's role, which in practice will frequently prove incremental to existing staff duties. It is evident that librarians may welcome these additional responsibilities, as they enhance the quality and frequency of their contact with the institution which in turn informs and improves their collection development decisions. If the library takes lead in establishing and operating an institutional repository, it will also assume the critical institution and administration outreach functions.

Barwick (2007) argues that the development of an institutional repository is a strategic change that shifts the role of the library from an information storehouse to an information provider. The changing natures of scholarly communication, information technology and software development have made this shift possible through the development of Internet publishing tools and software systems (Campbell-Meier, 2008).

The establishment of institutional repository programme indicates that a library seeks to move beyond a custodial role to contribute actively to the evolution of the scholarly communication. As long as traditional scholarly publishers remain part of the competitive landscape, likely foreseeable future libraries will retain responsibility for managing and archiving traditionally published print materials. However, as the volume of high quality web-based open access research expands, the role and value of the library's journals will

decline proportionately. Library programmes and budgets will have to shift to support open access publishing activities in order for the librarians to remain relevant.

2.3.16 Use of Institutional Repositories

Use of information and communication technologies for the management and distribution of digital-based scientific information and knowledge resources will enhance access and sharing of these resources amongst scientists and research institutes on the continent. It will also open up institutional scientific and technological knowledge, which currently is not easily accessible, both to the local and international scientific communities. In this light, coordinated development and use of digital information repositories, such as institutional repositories that are open access via the Internet and intranets, could go a long way in increasing accessibility and usability of scientific research output that could provide materials needed for research.

The new development of information technologies have increased the productivity of scholars and enabled them to manage their own digital content in ways that facilitate interdisciplinary collaboration and accelerate the pace of discovery and innovation. IRs provide long-term sustainable storage, preservation and open access to resources. The system is seen as collaboration among libraries, technologists, administrators and faculties to enhance access to the scholarship of the institution. Lynch (2003) cautions those developing institutional repositories that their efforts may not succeed if institutions use them as a way to exercise control over faculty work, are overburdened with policies meant to limit submissions or serve as gatekeepers for admitting material, or if institutions implement repositories simply because it is fashionable to have a repository

but are not willing to make the administrative commitment needed to support the repository.

Research has demonstrated that, with appropriate indexing and search mechanism in place, open access online articles have appreciably higher citation rates than traditionally published articles. This type of visibility and awareness bodes well for both the individual author and for the author's host institution. Additionally, value added services such as enhanced citation, indexing and name authority control allow a more robust qualitative analysis of institutional performance where impact on one's field is a measurement.

For repositories to survive and become more than just holding places for local, institutional research, systems need to be developed that will help link or network individual repositories. Exchanging information between institutional, subject and funder repositories can lead to a systematic view of an integrated network of research (Darby, Jones, Gilbert and Lambert, 2008).

Lynch (2003) denotes that developing or establishing institutional repositories does require that each institution acts entirely on its own. Consortia could provide a logical infrastructure for implementing institutional repositories via collective development. Such cooperation could deliver economies of scale and help institutions avoid the needless replication of technical systems and information sources. Indeed, consortia might well prove the fastest path to proliferating institutional repositories and attaining a critical mass of open access content.

The estimate costs per year for a repository averages $159,000. If an institution deposited 5,000 articles in a year, the institution would incur an additional $74,500 (Houghton et al., 2009). Although open access institutional repositories are cited as an alternative to purchasing expensive scholarly journals, repositories come with their own costs that are additions rather than substitutions for current costs to the institution. To sustain repositories, institutions need to reallocate funds or identify new funding that can be used to develop and maintain open access database. It is important to have a repository that can help keep faculty profile pages or active reports that are up to date. Harvard (2002) states that it is good to identify articles that may have general public interest, write summaries of them and even post them on the front page of the repository. These methods can encourage visits and deposits.

There are many ways which can be applied in growing the information and knowledge pool and to ensure quick access. Johnston (2002) confirms that providing none or low barrier access to the intellectual product generated by an institution increases awareness of research contributions. This should be the motivating factor for academic and research institutions to create and maintain a digital repository and encourage open access mandate and prepare key decision makers to understand the importance of digital archiving. Regardless of the challenges information professionals face, they should focus on the benefits more than the challenges and seriously advocate for the establishment of IR in their respective institutions. Moreover, knowledge of information professionals immensely helps in advocating for the establishment. Therefore, one needs to be knowledgeable about institutional repositories first. The institutions need to have standby generators as well as increase their Internet bandwidth.

Institution repository will form an important part of the scholarly communication process. This will provide the open access literature. Additional services may be added to repositories to provide extra functionality. For example, a usage-reporting service gives authors and the institution information on how the content of the repository is being used.

There is need for research institutions in Kenya to form a consortium to support each other in resource sharing and capacity building, where all the member institutions have a goal of providing quality scholarly works to their researchers. There is thus need for researcher output to be captured, preserved and disseminated. This can be effective through the implementation of institutional repository so that users can access valuable local content remotely for scholarly enhancement and national development.

Institutional repository has established a role to play in growing the information and knowledge pool and to ensure quick access. Johnson (2002) confirms that providing none or low barriers access to intellectual product generated by an institution increases awareness of research contributions. This is a motivating factor for academic and research institutions in Kenya to create and maintain institutional repositories.

2.3.17   Importance of Institutional Repositories

Institutional repository has been increasingly used and now crops up relentlessly in professional literature. This is not surprising, as the combination of low cost computing and high speed networking now affects all areas of life in the developed world and these are transforming ways in which we transact business in our daily lives. The development of Internet technology has brought enormous opportunity to communicate research results instantaneously to people irrespective of distance. Institutional repositories have

largely been developed in most research institutions and have been of great benefits. Gradually, it is becoming clear that research institutions may in the near future no longer pay the subscription prices charged by publishers of scholarly publications. It is now obvious that most institutions have established repositories in order to collect, preserve and disseminate institutional research outputs which in turn becomes a constituent part of a global research output. These materials will be organised and accessed in digital form. Since institutional repository is an important tool for preserving an organisation's legacy, it will facilitate digital preservation and scholarly communication.

In some measure, repositories constitute a reaction against those publishers that create monopolies, charging for access to publications on research they have not conducted, funded or supported. A study by Stanger and McGregor (2006) reveals that an institutional repository can have a positive impact on the visibility and accessibility of an institution's intellectual output.

Research institutions are the major generators of research-based data, information and knowledge. The scientific and technological information and knowledge which they are generating should be easily accessible and the creation and use of institutional repositories could be the first step in this process (Houghton and Sheehan, 2006).

Institutional repositories promote institutional research output and prestige of the institution. Repositories provide access to wealth of knowledge in the form of scientific and technological information, which are very essential for development. According to Chisenga (2006), much of research outputs from Africa exist in the form of unpublished information and knowledge resources such as research reports, thesis and dissertations,

seminar and conference papers. Very little research outputs find their way into the world's well established international scientific journals. Foster and Gibson (2005) observe that faculty members want to be able to make their own work available to others while at the same time enjoying easy access to other people's work. IRs also serve as tangible indicators of an institution's productivity thereby increasing an institution's visibility, prestige and value.

Another benefit of institutional repository is the increased impact that open access papers enjoy as compared to their offline, fee based counterparts, print or electronic. IR enhances research. The most persuasive reason for 15 institutions to set up inter-operable open access institution repositories both in the developed and developing world is the growing evidence of citation and the impact of papers that are openly accessible. Articles that are made freely available in open access repositories tend to be cited more often than similar articles that can only be viewed by paying subscribers.

2.3.18 Citation and Research Impact

According to Suber (2002), "open access articles are cited significantly more than non-open access articles, even when other variables are taken into account. A growing numbers of institutions and research funding organisations are starting to put in place requirements regarding open access". Lawrence (2001) further states that, "With appropriate indexing and search mechanisms in place, open access online articles enjoy appreciably higher citation rates than the traditionally published articles."

2.3.19 Access to Information

Seibert et.al (2001) argue that "a person seeks information to enhance his competency and skills and greater access to information and information resources would lead to his higher level of motivation." The nature of information seeking may range from trivial information to sensitive research area. Asamoah-Hassan (2009) says that well understood, well managed and easily accessible information can mean the difference between prosperity and destitution.

Tise (2010) argues that reading, which is a tool for growth and development, was alien to Africans and was clearly absent. This has contributed to growing unemployment, widespread poverty and limited availability of social services. Availability of and access to information is a significant contributor to the growth of the country.

Repositories are very important for institutions in helping to manage and capture intellectual assets as part of their information strategy. They provide a link to other repositories and can also provide machine-processable data to support institutions to address the challenges of access to print journals. They serve as tangible indicators of an institution's quality, thus increasing its visibility, prestige and public value. Institutional repository can further provide an immediate and valuable compliment to the existing scholarly publishing model, thereby stimulating innovations in a new disaggregated publishing structure while at the same time building on a growing grassroots faculty practice of self-posting research online. The growth of open access institutional repositories has been very remarkable in developed countries like Brazil, India and South Africa (Christian, 2008).

2.3.20 Funding Institutional Repositories

Financiers provide financial support to institutional projects and programmes to broaden knowledge in particular domains. There is an expectation that the results will be disseminated through public mechanisms so that the full benefits of the research reach the community for which it is intended. It can be difficult for a funder to access the publishing success of a particular programme due to the inherent problems in collecting this information. Institutional repositories are more aware of the funding issues and it may be possible to locate this information as a result. In certain fields, funders require those who receive money to deposit their research output in defined repository as part of the reporting and accountability process. This may result in tension between external funding sources and the institution itself.

2.3.21 Meeting Requirements for Using Institutional Repositories

The use of institutional repositories has emerged as a new strategy that allows research institutions in the developed world to apply serious control measures to accelerate changes taking place in scholarship and scholarly communication. It is, therefore, important for organisations to be involved in institutional repository projects. Institutional repositories fulfil the requirements for an organisation by disseminating the quality of the organisation's work to the world. This requirement is important in setting the remit of the system and subsequently generating explicit knowledge. This statement makes clear what the institutional repository does, who the main stakeholders are and who is responsible for it and the constituent parts. This ensures clear lines of responsibility and a fixed point of reference should any questions arise in future.

2.3.22 Infrastructure Requirement

There must be software to be used and the associated support. Although there may not be a direct cost of the software, there may be costs involved in belonging to user groups or outer support communities. Establishing an institutional repository is not a cost-free exercise. Open source software provides an institution with the ability to customise the programme and develop a system that meets local needs. It means, however, that the institution will need programming and systems staff to run the system. Choosing a commercial software programme can limit the amount of technical staff needed and may limit the amount of customisation that can be done.

According to Lynch (2003), the development of institutional repositories emerged as a new strategy that allows universities to apply serious, systematic leverage to accelerate changes taking place in scholarship and scholarly communication. He further states that many technology trends and development efforts came together to make this strategy possible. Online costs have dropped significantly; repositories are now affordable.

i) Hardware

These are equipment on which the service runs. Hardware depends on what services to offer, and the software to be used impacts greatly on the hardware to acquire. The hardware might be a desktop computer, a scanner and a connection to the Internet. There is need to purchase a server whose specifications would be determined largely by the software. The storage capacity of the server should be determined based on the volume of data to be stored in the repository. Furthermore, there is need to check the power supply

requirements. The server needs to be protected against power fluctuations, virus attacks and hackers. This means UPS, antivirus must be purchased and firewalls built.

ii) Software

DSpace is an open source repository application that allows to capture, store, index, preserve and distribute digital materials including text, video, audio, and data. DSpace provides a way to manage materials and publications in a professionally maintained repository to give them greater visibility and accessibility over time. They have the ability to accept imports and exports and to integrate into or interoperate with existing management programmes, the standard harvesters which would be able to glean information from the software, the type of data, the quantity size can be handled without freezing or hanging are essential considerations. IRs as concepts are very much influenced by IRs as software. The two predominant and original IR software platforms are E-prints and DSpace. In 2000, E-prints was developed by a team led by Stephen Harnad at the University of Southampton (Tansley & Harnad, 2000) and in 2002, DSpace was launched by the Massachusetts Institute of Technology (MIT) with support from Hewlett Packard (Barton and Walker, 2003). Each application represented fundamentally different views about the purpose of IRs with respect to open access and scholarly publishing. Chan (2004) notes that E-prints was designed to host traditional forms of scholarly publishing, including journal and conference articles, book chapters and so forth, while DSpace was intended to host much greater variety of material such as the more formal instances of scholarly communication as well as various types of grey literature.

2.3.23 Technical Requirements for Setting up Institutional Repositories

There are many factors to consider, including cost of hardware and software, staff salaries, Internet connectivity costs and other consumables. There is also need to have reliable and backup power supply. The following basic services should also be considered:

a) **Do It Yourself (DIY)**

   Under this type of service, the institution develops the software in-house and thus has total control over its use. The institution may also customise the software to fit most of its needs.

b) **Standard packages**

   The institution can always upgrade the software to meet new demands as they come up. An IT company could also be contracted to develop the software platform to be used for IR if the institution lacks the required staff capacity to do so. The downside to this type of service is that the institution would need qualified programmers to script the software.

c) **External hosting services**

   Other service providers would provide the institution with some hardware components such as server space. The service providers take care of software maintenance and upgrades. They are also responsible for the safety of the institution's data and make sure access services are always available. Thus, the cost of purchasing and maintaining the server is eliminated. In addition, the cost of power supply and the problem of ensuring that constant power supply are solved.

2.3.24 Improved Services Offered by Institutional Repositories

Repositories are rapidly becoming ubiquitous in research institutions and libraries need to play a very active role in service development. Everyone needs to be developing expertise in this arena to participate in shaping these essential services. Diverse experience with seed collections will deepen understanding the user needs. This can only be realised if research institutions have good repository services. Researchers with access to a wide spectrum of repository services will possess a substantial advantage in conducting cutting edge research, delivering high quality teaching and contributing valuable services to society. There are many services that may be provided by institutional repositories, some of which are currently supported by available technologies. For instance, some types of repository services provided by research institutions include long-term archiving and migration of content, dissemination and access management, metadata and format management, search and discovery tools, pushing data mining, among others. Repository services can also be deployed across nearly an unlimited diversity of content, ranging from preprints of articles to born digital primary source materials, research data or from software to video.

According to Seibert et.al (2001), "A person seeks information to enhance his competency and skills and greater access to information and information resources that would lead to his higher level of motivation." The nature of information seeking may range from trivial information to a sensitive research area. For example, the information access could be to monitor development of well-known topic or subject over the period of time or carrying out stereotyped series of searches to achieve a particular goal or to explore and understand the new subject of interest.

2.3.25 Dissemination of Information Services

Digital is not merely a new mode for collecting and disseminating the kinds of collections traditionally managed by research institutions. The digital age has unleashed a torrent of new kinds of content generated by wide range of activities in which researchers engage. In addition, it requires libraries to play a leading role in converting much of the content in their collections into digital format.

Lynch (2003) sees it as a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its members. Lynch further notes that essential services include "management of technology changes and the migration of digital content from one set of technologies to the next as part of the organisational commitment to providing repository services."

Further, Lynch observes that IR can provide users with online access to various research articles produced within and outside their institutions. Ease and speed of use to a great amount of information sources just at the touch of a few keys is encouraging. Such information can be accessed by multiple users at the same time, any time and any day once the host server is on and with uninterrupted power supply for the user. This saves shelf space and labour cost in institutions.

Institutional repository is a set of services that an institution offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organisational

commitment to the stewardship of these digital materials, including long-term preservation (Bailey 2005).

2.3.26 Information Management Service

Furlough (2009) notes that repositories are services that can help an institution manage content and preserve its intellectual work. Repositories are the means by which an institution can distribute information in an open access mode that makes that research accessible throughout the world.

2.3.27 Reference Services

Bell, Foster and Gibbins (2005) state that "the recruitment of content for the IR offers a wonderful new opportunity for reference librarians." They go ahead to say that, "Indeed, IR content recruitment puts the librarian into the role of reference librarians outlining possible activities that reference librarians can engage in. Jenkins, Breakstone and Hixson (2005) conclude that the skills of reference librarians uniquely position them for a dual role in the IR community: as facilitators in getting the content into the repository and out to users.

2.3.28 Technical Services

There is need for technical services staff to learn new procedures and technologies. There is also need for realigning responsibilities of technical services staff so that the work of the institutional repository can be performed without increase in the number of staff (Cohen and Schmidle, 2007; Hudgins and Macklin, 2000).

Walter (2007) discusses the advantages of having institutional repository as technical services. It acts as a conduit through which collecting, disseminating, preserving and collaborating with other organisations occur. This can develop the single voice and vision needed to articulate the myriad possibilities for scholarly communications, promoting new services and developing and explaining new processes. They also may act as conduits for other departments within the library, exploring the contributions these areas can make to IR development. It is composed of librarians, archivists, technologists and other staff who make the case for overall changes in scholarly communications.

There will be some staff costs involved with the technical running of the service such as installation of software upgrades and ensuring that the security patches of the software are up to date. Irrespective of the scope, all institutional repository projects have so far proved that the effort and organisational costs required in developing repository policy, content management and marketing issues dwarf the technical implementation effort. These tasks may include:

a) Development of content management policies.

b) Deciding on what metadata to store and present.

c) Creating digital document identifiers (DOIs).

d) Crafting author permission and licensing agreements to disseminate work indefinitely.

e) Developing document creation and input guidelines suitable to long-term archiving and proper presentation.

f) Training staff and authors in using the chosen software to submit content.

g) Creating document submission instructions and marketing the repository concept to prospective depositors.

2.3.29 Digitising Information Resources

Other technology costs include costs for digitising content or hardware and software needed for such services, costs for backup systems and costs for digital storage (Blythe and Chachra, 2005; Houghton et al., 2010; Mc-Govern and McKay, 2008). With these costs in mind, an institution can determine the additional costs it will incur by adding an institutional repository to its set of services. Libraries may also need to determine the cost to scan materials for the repository, particularly if the institution decides to digitise materials for the repository. Institutions may decide to outsource this work or may see this as an opportunity to develop in-house skills. University of Massachusetts Medical School chose to digitise dissertations as a way to gain experience and to begin to build an institutional repository. They provide extensive breakdown of the costs and time needed to digitise 320 dissertations. They found that it costs approximately $28 per page to digitise and process the dissertations. They also noted that it took approximately 170 minutes to do the work. The report provides data which others can use in determining how to approach the question of in-house production versus outsourcing digitisation of documents for a repository (Piorun and Palmer, 2008).

2.3.30 Training of Staff

In this changing information age, library staff have to gain extensive knowledge about developing technologies and improve their skills required for the development and management of a successful institutional repository. Rapid developments in information

communication technologies have given a solid foundation for revolutionary changes in the information handling capabilities of information centres all over the world. According to Katz and Macklin (2007), technology is the portal through which we interact with information, but people's ability to handle information to solve problems and think critically about information tells us more about their future success than their knowledge of specific hardware and software. According to Biddiscombe (2001), Internet and IT skills are required by information professionals for learning, teaching and research. Hence, it is hoped that this study will help research institutions to take necessary steps to improve their skills and strive towards providing better services to both local and international users.

2.3.31 Use of Information Mediators

These are organisations or individuals that contribute to the provision of content by providing alternative location methods. They are not actually for the creation or contribution of the content, but only provide the locations.

2.4 Chapter Summary

This chapter is divided into two parts, one dealing with theoretical framework and the other dealing with literature review of the study. Various sources of literature on access to information by users of institutional repositories have been reviewed to help in laying down an overview of the study in question.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the methodological aspects of the study. It provides a detailed description of the research methodology that was used to answer questions described in chapter one. The methodologies that were used in the research study include: research design, target population, data collection methods, data presentation analysis and interpretation.

3.2 Research Approach

These are ways in which research is conducted. Quantitative research is statistic-based. It involves questions that can be answered in numbers. Quantitative research methods deal with the measurement of concepts with scales that either directly or indirectly provides numeric values (Zikmund, Babin, Carr and Griffin, 2010). These numeric values are then used for statistical computation. This type of research generates statistical data through use of fairly large scale survey research collected through questionnaires or structured interviews. Qualitative research, on the other hand is description-based, involves the interpretation of phenomena without depending on numerical measurements or statistical methods. It is mainly concerned with observing, listening and interpreting phenomena (Zikmund *etal*., 2010). The study used both quantitative and qualitative approaches because they encourage greater interaction between the researcher and the respondents. They are action research oriented because they can be used to obtain data to solve problems immediately. Research methods used were questionnaires and personal

interview. These two methods were used because the researcher wanted to avoid biasness by limiting the amount of personal contact with the respondents.

3.3 Research Design

Research design is the plan and structure of investigation that enables the researcher to obtain answers to the research questions (Kerlinger, 1986). The choice of a research design is guided by the purpose of the study. Since the study population was scattered all over, the study adopted a case study research design. This enhanced access and sharing of information and brought out deeper understanding of the development of repositories in Kenya and in developing countries in general. This could help the researcher to be in a position to place the findings in a general context to reflect the actual realities on the ground.

3.4 Study Area

The study population of interest was the information users of National Museums of Kenya where the research was conducted totalling to six hundred information users but a sample size of 226 was used. There was a selection of respondents from various stations. The stations cut across Kenya and the respondents would help to understand the need for open access to information by use of institutional repository in the museums.

3.5 Study Population

A study population is a group of individuals taken from general population who share a common characteristic. NMK has more than seven stations but not all stations have the required information in respect to the objectives of the study. However, respondents were selected in these stations since they contained suitable demographics for analysing access

and use of information resources by users at the National Museums of Kenya. Mugenda and Mugenda (1999) define to study population as the total number of subjects or interests to a researcher. Study population is a group of individuals, objects or items from which samples are taken for measurement. It is an entire group of persons or elements that have at least one thing in common.

The information available from the human resource section showed that the population of the National Museums of Kenya were stratified in three levels. The category of respondents comprised of researchers, management staff and external information users. Table 3.1 shows that the population comprised of 16% researchers, 32% management staff and 52% external information users, totalling to a population of 100%.

Table 3.1: Study Population

TYPE OF USERS	POPULATION	PERCENTAGE
Researchers	98	16
Management staff	192	32
External	310	52
TOTAL	**600**	**100**

The population of the study included 600 information users of NMK, with 11% from Kisumu Museum, 14% from Kitale Museum and 75% from the headquarters. The breakdown of the numbers is shown in Table 3.2.

Table 3.2: Study Population by NMK Stations

STATION	POPULATION	PERCENTAGE
Kisumu	67	11
Kitale	83	14
NMK Headquarter	450	75
TOTAL	**600**	**100**

3.6 Study Sample

In this study the sample size was 226 respondents out of total of 600 people. The researcher used stratified and simple random sampling. The National Museums of Kenya was divided into three groups. The technique ensured that different groups were adequately represented in the sample results. The method was simple and cost-effective as it consumed less time as compared to other sampling designs. As indicated in Table 3.3, the study sample size consisted of 16% researchers, 32% management staff and 52% external information users. According to Mugenda and Mugenda (2003), 10% of a large study population can constitute an adequate representative study sample size.

Table 3.3: Study Sample Size

STATION	PERCENTAGE	STUDY POPULATION	SAMPLE SIZE
Researchers	16	98	45
Management	32	192	56
External	52	310	125
TOTAL	**100**	**600**	**226**

The researcher divided the respondents into three group strata to ensure that different stations were adequately represented in the sample results. The study used stations to represent group strata as shown in the Table 3.4.

Table 3.4: Representation by Sample Size

STATION	PERCENTAGE	TARGET POPULATION	SAMPLE SIZE
Kisumu	11	67	45
Kitale	14	83	56
NMK Headquarter	75	450	125
TOTAL	**100**	**600**	**226**

3.7 Sampling Methods

A sampling method is a procedure for selecting sample members from a population. Sampling methods are used to select a sample from within a general population. There are two types of sampling methods, probability sampling and non-probability sampling. Probability sampling is where each sample has an equal opportunity of being selected. Non-probability sampling is where the researcher is not interested in the sample that is representative of the population.

3.8 Sampling Techniques

In this sample method the researcher purposely targets a group of people believed to be reliable for the study. In this study, the NMK Headquarter and other two branches were purposively selected because of their relatively high concentration of users who regularly use the information resources produced by National Museums of Kenya.

3.8.1 Purposive Sampling Techniques

Purposive sampling technique is where a researcher selects a sample based on their knowledge about the study and population. In this study the researcher used purposive sampling techniques because it gives the researcher the opportunity to use cases that would have the required information with respect to objectives of the study. It was also useful where the researcher needed to conduct a quick sampling. It was not easy to conduct the research by being in contact with the entire population of the National Museums of Kenya.

3.9 Data Collection Methods

This is an important aspect of any type of research. Data collection methods vary depending on the design a researcher chooses to use. Data collection methods include use of questionnaires, interviews, observations and focus group discussions. However, in this study, the researcher mostly employed interviews and questionnaires for the purpose of enabling respondents to express their feelings about the issues under study.

3.9.1 Administration of Questionnaires

The researcher employed administration of questionnaires as the main instrument for collecting data for the study. It helped to collect accurate and reliable descriptive information from the respondents. The questions were designed to address specific objectives of the study and constructed using simple words to avoid confusing respondents. The study used both closed and open ended questions. Closed questions gave the respondents a set of choice or options while open ended questions are free type

of questions that permitted greater depth of response and gave the respondent an opportunity to give insight feeling about the study.

Questionnaires helped in saving time since the researcher prepared questions and distributed them to the selected sample group in time. In some cases respondents were approached in NMK-hall and hence helped capture large number of respondents at once. This helped them have confidence in giving information being sought without bias. The researcher preferred this method because there was more likelihood of providing real facts about the research study. Questions were easy to administer to the sample population and get the required information.

3.9.2 Interviews

Data collection involved face to face interviews a mong the users of information resources generated by National museums of Kenya. The purpose of these interviews was to get details about the current status of National Museums in respect to the objectives of the study. The interviews were carried out at the NMK Headquarter and in other two satellite museums. Each interview was conducted in the respective stations lasted between 45 minutes and one hour prior to the commencement of the interviews, the interviewer sought permission from each participant to take notes of interviews. The interview items were mainly derived from the questionnaires. The interviews used transcribed and were relevant, questions to support the results from the statistical analysis.

The researcher used interviews as a data collection method because it could produce more satisfactory results. It also gave the researcher an opportunity to observe the interviewee's non-verbal communication to determine the veracity of the responses. The method was flexible since the questions could be clarified when not well understood by the respondents.

3.9.3 Observation

This allowed the researcher to get involved in the research so as to gather factual information about the items being researched on without their knowledge. The researcher used observation data collection method which included direct access to research phenomena, and which showed high level of flexibility in terms of application and generating a permanent record of phenomena that was to be referred to later.

3.10 Data Collection Instruments

Research data was collected from multiple sources of information, including primary and secondary sources. The research used questionnaires and interview methods of data collection. The researcher prepared open-ended or unstructured interview questions and questionnaires based on the variables of the study. The key informants were interviewed to provide in-depth information on the study subject. The interview questions and questionnaires were administered and analysed qualitatively since the population at the National Museums of Kenya was not too big as compared with other organisations in Kenya.

3.10.1 Questionnaires

Questionnaire was the main tool for this study. It was divided into sections; section A was about General Information concerning the respondent. Section B consisted of Specific information about the study. Section C to G consisted of items that address the research questions. The researcher preferred this method as it would give respondents time to consult with the colleagues for more reliable information.

3.10.2 Interview Schedule

The researcher used interview schedule because it produces more satisfactory results. It gives the researcher an opportunity to observe the interviewee's verbal communication hence enabling the interviewee to respond freely to questions. The method was flexible since the questions could be clarified when not understood by the respondents.

3.10.3 Observation Checklist

This method was used to find out what was currently taking place at the National Museums of Kenya. The observation checklist was used by the researcher to ensure that the questions raised are clear and of simple language that would be understood to answer research questions on analysing access and use of information resources by users at the National Museums of Kenya. All the items of the observation checklist were placed on either to indicate in the questionnaire and providing suggestions.

3.10.4 Documentary Review

The researcher employed documentary review to assist in gathering information about the topic of study. The annual reports of NMK were some of the documents reviewed.

3.11 Validity and Reliability of Data Collection Instruments

These are the key indicators of the quality of the measuring instruments. The researcher ascertained whether data collection instruments were valid by pre-testing the instruments through a pilot study.

3.11.1 Validity of Instruments

According to Cole (2002), validity refers to the degree to which a test measures what it is supposed to measure. It was through this that the researcher was able to know whether the questionnaires would accurately serve the main study. Thus the researcher pre-tested the instruments.

3.11.2 Reliability of Instruments

According to Cole (2002), reliability refers to the degree to which research instruments yields same results on repeat trials. Although unreliability can always be manifested to a certain extent, there is a generally good deal of consistency in the results of a quality instrument gathered at different times. The tendency towards consistency found in repeated measurement is referred to as reliability. In this study, the researcher piloted questionnaires using a pre-test checklist.

3.11.3 Pretesting Data Collection Instruments

The researcher used a pre-test checklist in testing for validity and reliability of the data collection instruments. The purpose of the pre-test was to sensitise the subject by ensuring that it works well in the main study. Pilot study was undertaken using a pre-test checklist for questionnaires made to reveal whether the results obtained in the case of the study would give an answer to research questions. The purpose of pre-test was to help the

researcher to ensure that questions were clear and in simple language that would be understood by the participants and that there were no typographic errors, misspelt words, and that questions are relevant to the respondent, are direct and printed in systematic and logical manner, and that questions were easily understood and not too long.

3.12 Ethics

The research gave an assurance to all the participants of the study that any information they would provide be treated as confidential and would not be used anywhere for any other reason other than the initial reason it was sought. Care has also been taken to ensure that all works referred to are acknowledged to avoid cases of plagiarism.

3.13 Data Presentation, Analysis and Interpretation

The data collected were organised, analysed, interpreted and presented in an attempt to give answers to research questions. Descriptive analysis was used to discuss the findings in relation to research questions and objectives of the study. The information collected qualitatively would be edited and cleaned up to ensure adherence of data collection and this would enable the researcher to interpret the results quite easily. The data was converted to a form that permitted efficiency and accurate statistical analysis. Statistical Package for the Social Sciences (SPSS) version 22.0 software was used to manage, analyse and display the data. The analysed data was presented in form of tables, graphs and charts and percentages. The researcher analysed data collected and an effort was made to identify common themes related to the purpose of the study.

3.14 Data Collection Procedures

Questionnaires were distributed using different approaches within the month of May and June, 2016. Respondents were issued with the questionnaires at the NMK Headquarter and the researcher also visited the two other satellite museums and was able to distribute the questionnaires after introducing the subject to the respondents who filled the questionnaire and handed over to the Curators of stations who were part of the respondents of this study.

3.15 Chapter Summary

This chapter has dealt with research methods, study populations and study sample, sampling methods and techniques, data collection methods and instruments and their validity and reliability. The study population comprised of the population of the National Museums of Kenya. The researcher employed random sampling method. Questionnaires and interviews were used as data collection methods. The data collected were organised, analysed, interpreted and presented in a way that answers the research questions enumerated in chapter one.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter focuses on data analysis interpretation and presentation of the research findings in the form of frequencies, percentages, tables, bar and pie charts. It entails analysing access and use of information resources by users at the National Museums of as a way of enhancing access and discusses the findings in relation to theories adopted in the literature review. The research targeted 600 respondents but due to sampling dynamics, not all of the respondents managed to fill the questionnaires. Mugenda and Mugenda (2003) states that a response rate of 50% and above is a good statistical reporting. The researcher managed to collect 226 questionnaires.

4.2 Analysis of General Information

4.2.1 Composition of Respondents by Gender

The study grouped the respondents based on their gender in order ascertain whe there was a fair representation of the respondents based on this parameter.
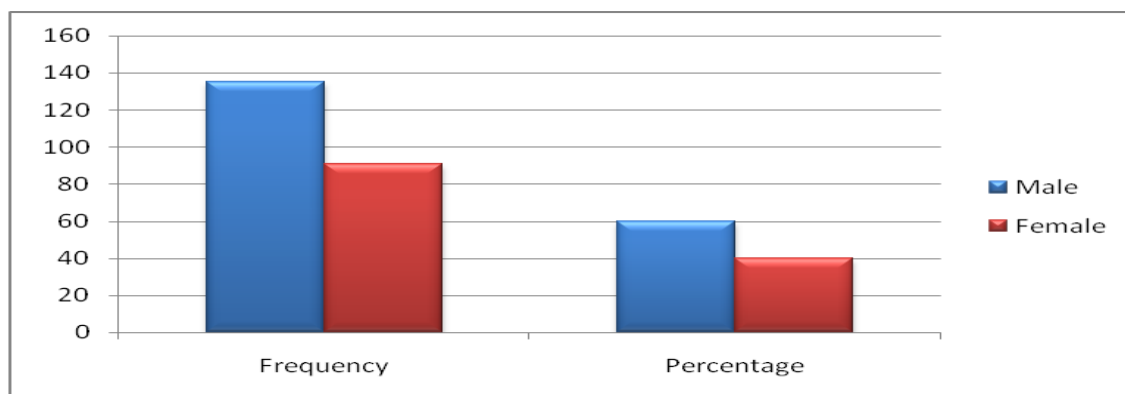
Figure 4.1: Representing Gender

According to Figure 4.1, the male respondents were 60% while 40% were female. This shows that the majority of the respondents who participated in the study were male. Equally, it could be an indication that male workers could be the majority at the National Museums of Kenya.

4.2.2 Composition of Respondents by Age

Respondents were asked to indicate their age group in years. This was done to understand the age distribution of the respondents since an individual's age was not a consideration in the selection of respondents in this study. According to Figure 4.2, age groups were classified into categories: 15% of the respondents aged between 18 and 23 years; 30.5% of the respondents aged between 24 and 29 years; 45.5% of the respondents aged between 30 and 35 years; and 8.8% of the respondents aged above 50 years.
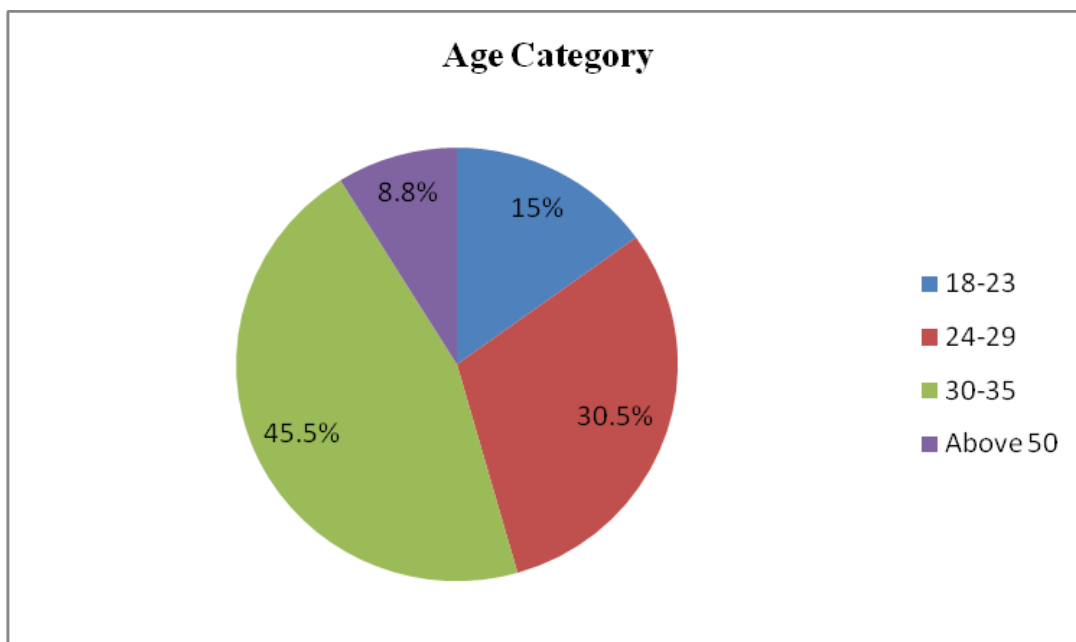
Figure 4.2: Representing Age Categories

4.2.3 Level of Academic Qualification

The respondents were asked to indicate their highest level of education as this was considered important in this study. The options provided were: certificate, diploma, degree, masters and doctorate levels. 9% of the respondents had primary level certificate, 20% had diploma level certificate, 38% had degree level certificate, 27% had master's certificate, 5% had doctorate certificate, and 1% of the respondents didn't respond. The breakdown is shown in Table 4.1.

Table 4.1: Level of Education

Education Level	Frequency	Percentage
Certificate	20	9
Diploma	45	20
Degree	87	38
Masters	60	27
Doctorate	11	5
No response	3	1
Total	**226**	**100**

4.2.4 Job Categories

The respondents were asked to indicate their job category at NMK. As indicated in Table 4.2, the categories provided were researchers, management staff and external users. As per the data received, 20% of the respondents were researchers, 25% were management staff and 55% were external users, comprising of students and affiliates.

Table 4.2: Job Categories

Job categories	Frequency	Percentage
Researchers	45	20
Management	56	25
External	125	55
Total	**226**	**100**

4.2.5 Composition of Respondents by Resource Use

The respondents were asked to indicate how long they have accessed resources at NMK. As mentioned in Table 4.3, the options provided in this item were grouped into four categories. 39% have been accessing the resources for 1-5 years, 25% have been accessing the resources for 5-10 years, 30% of the respondents have been accessing NMK resources for 10-15 years and 6% of the respondents have accessed the resources for 15-20 years.

Table 4.3: Resource Use

Years Categories	Frequency	Percentage
1-5	87	39
5-10	57	25
10-15	68	30
15-20	14	6
Total	**226**	**100**

4.3 Open Access Policy

4.3.1 Policy for Open Access to Information

The study sought to determine if there were policies that supported open access to information in the institution. The options provided in this item were to agree or disagree. 20% of the respondents agreed while 80% of the respondents disagreed as shown in Table 4.4.

Table 4.4: Policy for Open Access to Information

Responses	Frequency	Percentage
Agree	45	20
Disagree	181	80
Total	**226**	**100**

4.3.2 Financial Allocation for Open Access Innovation

The study sought to determine the financial allocation for open access innovation in the institutional repositories. As indicated in Table 4.5, the options provided in this item were Agree and Disagree. 11% of the respondents agreed, 85% of the respondents disagreed while 4% of the respondents didn't respond.

Table 4.5: Financial Allocation

Responses	Frequency	Percentage
Agree	24	11
Disagree	191	85
No Response	10	4
Total	**226**	**100**

4.3.3 Infrastructure to Support Open Access

The study sought to determine if the institution had the infrastructure to support open access. According to Table 4.6, the options provided in this item were Agree and Disagree. 7% of the respondents agreed, 82% of the respondents disagreed while 11% of the respondents didn't respond.

Table 4.6: Infrastructure for Open Access

Responses	Frequency	Percentage
Agree	16	7
Disagree	185	82
No Response	25	11
Total	**226**	**100**

4.3.4   Qualification of Staff

The study sought to determine if the institution had qualified staff to handle open access. The options provided in this item were Agree and Disagree. 7% of the respondents agreed, 89% of the respondents disagreed while 4% of the respondents did not respond as shown in Table 4.7.

Table 4.7: Staff Qualification

Responses	Frequency	Percentage
Agree	15	7
Disagree	201	89
No Response	10	4
Total	**226**	**100**

4.4 Institutional-generated Information

4.4.1 Type of Information Generated by the National Museums of Kenya

The study sought to determine the major types of information generated by NMK staff. As shown in Table 4.8, the options provided in this item were scientific information, technical information and other information. 63% of the respondents selected scientific information as the major type of information generated by NMK; 35% of the respondents selected technical information; 1% selected other type of information (including advertisements) while 1% of the respondents didn't respond.

Table 4.8: Institutional-Generated Information

Responses	Frequency	Percentage
Scientific information	143	63
Technical information	78	35
Other (specify)	2	1
No Response	3	1
Total	**226**	**100**

4.4.2 Status of Information Generated to meet Customer Needs

The study sought to determine the quality of information generated by NMK staff to meet the clients' needs by asking the respondent if they thought NMK provides quality information to its clients. The options provided in this item were Agree and Disagree. 37% of the respondents agreed, 60% of the respondents disagreed while 3% did not respond, as indicated in Table 4.9.

Table 4.9: Quality of Information Generated

Responses	Frequency	Percentage
Agree	84	37
Disagree	136	60
No Response	6	3
Total	**226**	**100**

4.4.3 Information Customer Needs

The study sought to determine the information customer needs by different users. The information was categorised into scientific, technical and advertisement information. As shown in Figure 4.3, researchers' information needs were 80% of scientific, 19% technical and 1% advertisements. Management staff information needs were 3% scientific, 27% technical and 70% advertisements. External users' needs were 92% scientific, 6% technical and 2% advertisements.
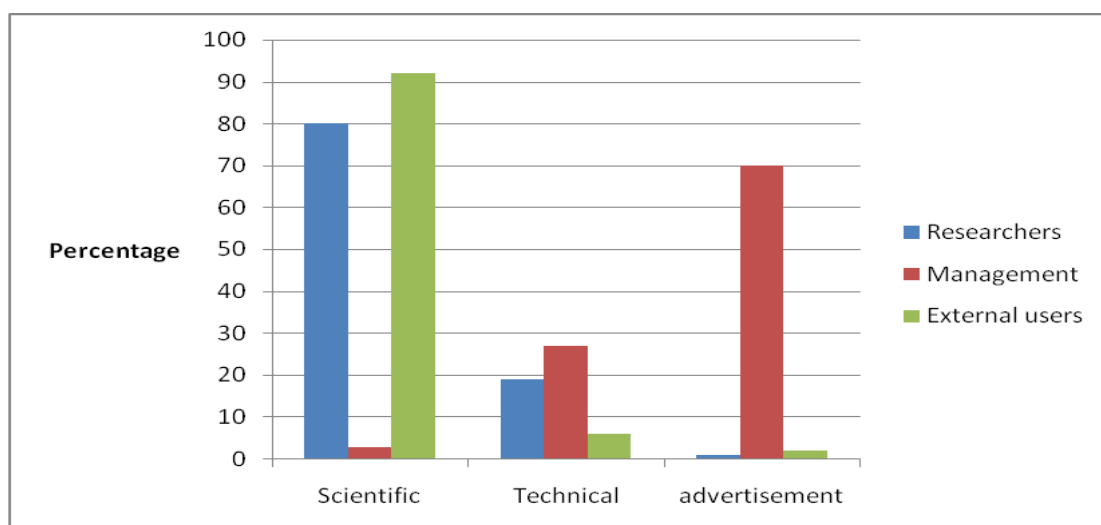
Figure 4.3: Representation of Information Needs by different Users

4.5 Organisation of Institutional-Generated Information

The study sought to determine the organisation of institutional-generated information. The options provided in this item were good, better, bad, worse. 25% of the respondents said the organisation of the information was good, 13% said it was better, 46% chose bad and 16% said it was worse. The summary is shown in Table 4.10.

Table 4.10: Organization of Institutional-Generated Information

Responses	Frequency	Percentage
Good	57	25
Better	30	13
Bad	104	46
Worse	35	16
Total	**226**	**100**

4.5.1 Format of the Information Generated

The study sought to determine the formats of the information generated at NMK. As indicated in Table 4.11, the options provided in this item were print, audio-visual, electronic and others. 5% of the respondents said most of the information was in audio-visual format, 4% said it was in electronic format, 89% said it was in print, and 2% said others.

Table 4.11: Format of the Information Generated

Responses	Frequency	Percentage
Audio visual	12	5
Electronic	9	4
Print	201	89
Others	4	2
Total	**226**	**100**

4.6 Access to Institutional-generated Information

The study sought to determine ease of access to institutional-generated information. As shown in Table 4.12, the options provided in this item were good, better, bad and worse. 16% of the respondents said the organisation of the information was good, 13% said it was better, 55% said it was bad and 16% said it was worse.

Table 4.12: Access to Institutional-Generated Information

Responses	Frequency	Percentage
Good	36	16
Better	30	13
Bad	124	55
Worse	36	16
Total	**226**	**100**

4.6.1 Infrastructure to Access Institution-generated Information

The study sought to determine if the institution had an infrastructure established for open access to the NMK institutional repositories. The options provided in this item were agree and disagree. 25% of the respondents agreed there was infrastructure, 60% said there was no infrastructure while 15% did not respond to this question, as indicated in Table 4.13.

Table 4.13: Infrastructure to Access Institutional-Generated Information

Responses	Frequency	Percentage
Agree	56	25
Disagree	135	60
No response	35	15
Total	**226**	**100**

4.7   Challenges Inhibiting Access to Institutional-generated Information

The study sought to determine challenges inhibiting access to institutional-generated information. As shown in Table 4.14, the options provided in this item were lack of policy, lack of infrastructure, inadequate funding and lack of trained personnel. 13% of the respondents cited lack of infrastructure, 16% identified lack of policy, 21% said it was inadequate funding for the information centre and 50% said it was due to lack of trained personnel to handle access to information.

Table 4.14: Challenges Inhibiting Access to Institutional-Generated Information

Responses	Frequency	Percentage
Lack of infrastructure	29	13
Lack of policy	37	16
Inadequate funding	47	21
Lack of trained personnel	113	50
Total	**226**	**100**

4.8 Strategies to Enhance Access to Institutional-generated Information Strategies

The study sought to determine strategies that may be used to enhance access to institutional-generated information. As shown in Table 4.15, the options provided in this item were to develop policy, to improve infrastructure, to allocate funding and to build capacity and train personnel. 9% of the respondents said improving infrastructure would enhance information access in the institution, 13% identified development of policy, 23% cited allocation of funds, and 55% said capacity and training of personnel would enhance information access in the institution.

Table 4.15: Strategies to Enhance Access Institutional Generated Information

Responses	Frequency	Percentage
Improve infrastructure	20	9
Develop policy	29	13
Allocate funding	52	23
Capacity build and training personnel	125	55
Total	**226**	**100**

4.9 Chapter Summary

This chapter focuses on data analysis, data interpretation and presentation of the findings of the research in the form of frequencies, percentages, tables, bar and pie charts. The research's focus is the analysis of access to information by users of institutional repositories at the National Museums of Kenya. The study targeted 600 respondents but due to sampling dynamics, the researcher managed to collect information from only 226 participants not forgetting that opinion of users were collected by interviews. Statistical Programme for the Social Sciences (SPSS) version 22.0 was used to enter and organise the collected data of the research. Frequency and percentages were used to analyse the questionnaires while bar and pie charts were used for presentation and interpretation of data.

CHAPTER FIVE

FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1   Introduction

This chapter summarises the findings of the study guided by objectives and research questions which were presented and interpreted in chapter 4 and this findings were discussed in the context of Social Exchange theory. It is from these findings that conclusions and recommendations are drawn. The study's contribution to the theory and suggestions for further research are also made. The study aimed at analysing access and use of information resources by users at the National Museums of Kenya and to suggest ways in which it can be enhanced. The study revealed that NMK faces many challenges as far as access to information resources by users is concerned and this threatens the use of institutional-generated information at the National Museums of Kenya.

5.2   Summary of the Findings

This section presents a summary of the findings of the study. The respondents were in three categories, namely, researchers, management staff and external users with different information needs. Based on the above information, most of the respondents came from external information users.

The study's findings are summarised as follows:

5.2.1   Institutional-generated Information

The research found out that the National Museums of Kenya had information touching on scientific information, technical information and other type of information including the advertisements. The researcher discovered that, the most generated information at the

National Museums of Kenya was scientific information. The researcher further discovered that the type of institutional-generated information could only be found in print and Audio-Visual format which has not been converted into digital format. Moreover, the study sought to determine the quality of information generated by NMK staff if it was to meet the customer needs. According to respondents, majority of them disagreed; least of the respondents agreed while others did not respond. Therefore, the study showed that the information generated at the National Museums of Kenya did not meet the needs of their potential customers because of the nature in which the information is packaged. According to National Museums of Kenya-A Museum in change (2006) information generated from research and collections is synthesized and presented to the public for the purpose of creating awareness and learning through exhibitions, education programs and multimedia channels. In recent years, technical and scientific literature has continued to grow and grey literature reports now come from many different avenues. The research generated in developing and emerging countries is missing from the international knowledge bases because of financial restrictions affecting its publication and distribution (Gibbs, 1995; Arunachalam, 1994). However, according to Crow (2002) institutional repositories provide access to a wealth of scientific and technical information and knowledge which are very essential for development.

5.2.2 Organisation of Institutional-generated Information

The research found out that, the organization of the institutional-generated information at NMK was in bad state as it was evident by majority of the respondents interviewed. These could be a result of the information being scattered all over across the country. The study further, confirmed that most of the institutional-generated information at the

National Museums of Kenya was in print format, which has not been converted to digital format. This makes it difficult to organize information so that it can be easily accessed from within the institution and outside world. In the study carried out by Masinga, P. (2014). Found out that Open Access has emerged as a boom to libraries providing solutions to the scholarly phenomena. Wasike (2014) notes that open access has revolutionized the scientific publications free of charge.

5.2.3 Access to Institutional-generated Information

Most of the respondents disagreed that, the information users had ease of access to information generated by the institution. The researcher found out that for this to happen, there is need for the management to develop policy, improve infrastructure, allocate funding; and capacity building and train personnel to support the digital access of information at the National Museums of Kenya. In the study carried out by Okongo (2014) found out that majority of the respondents use institutional repositories to access digital information via internet. According to Moller (2006) institutional repositories enable institutions to offer long term access to digital objects that have persistent value.

5.2.4 Challenges Inhibiting Access of Institutional-Generated Information

The study revealed that the most challenge inhibiting access of institutional repositories at the National Museums of Kenya is lack of trained personnel. However, according to the respondents, there were other challenges including inadequate funding, inadequate technical infrastructure, lack of awareness and understanding of the concept, lack of policy and lack of trained personnel. Chisenge (2006) observes that, ICT infrastructure in

most of the institutions and organizations are not up to the desired level so as to run advanced digital repository to optimum level.

5.2.5 Strategies for Enhancing Access of Institutional-Generated Information

A majority of the respondents suggested the institution should put in place strategies to support the use of open access to institutional-generated information by use of institutional repositories. For this to succeed, NMK must develop a policy, improve infrastructure, allocate enough funds and have capacity building and train personnel to enhance access to information in the institution. The establishment of institutional repositories in research institutions in Africa is a serious development issue that require urgent attention. According to Chisenge (2006) rightly observes that institutional repositories are valuable for research and development because they can offer instant access to information and knowledge generated on the continent.

5.3 Conclusion

In spite of the time given to the institution to acquire new technology, the National Museums of Kenya has been very slow in adopting these new technologies. The National Museums of Kenya need to be part of the global movement towards providing open access to information generated by the institution. More people are likely to benefit from this institutional repository as it provides access to scientific information, technical information and other types of information produced by the institution's research staff. However, for this to happen the institution should put in place strategies that would create an environment to support access to information by users of institutional repositories by placing emphasis on advocacy for institutional repositories and adopting an approach that

takes into account the major concerns. There is need for institutions to use institutional repositories and ensure that management staff and researchers are familiar with various issues concerning digital information, copyright issues and many others.

Generally, results of research show that the National Museums of Kenya does not have policies and strategies to support the management of digital information resources. A good example can be seen from libraries that have information resources collection development policies which do not include collection of information resources in digital format.

5.4 Recommendations

The purpose of this study was to analyse access and use of information resources by users at the National Museums of Kenya and to suggest ways in which it can be enhanced. Therefore, this section will recommend strategies that will be adopted by National Museums of Kenya in order to enhance access to institutional-generated information. Findings from the analysis of data from the respondents of this study have detailed concerns about lack of policy, inadequate funding, inadequate technical infrastructure and lack of capacity building and trained personnel. In view of the study findings, the following recommendations were made to enhance access and use of information resources produced by institution's research staff.

i. There should be policy formulation on the use of open access and use of information resources available at the National Museums of Kenya.

ii. There should be conversion of institutional-generated information into digital format to make it easy to organize information.

iii. There should be improved ICT infrastructure in place to help NMK in enhancing access to institutional-generated information.

iv. The study also recommends that NMK should organise appropriate trainings to help the management and researchers understand the importance and use of institutional repositories in accessing institutional-generated information.

v. The study recommends that there should be establishment of an institutional repository at the National Museums of Kenya to help in addressing issues affecting access to institutional-generated information.

In this way, their knowledge of access to information would be enriched and they would be in a better position to advocate for change in policies within the institution.

5.5 Suggestions for Further Research

Based on the findings of the study, the researcher noted that there was need to undertake research in the following areas:

i. Investigate what factors and conditions are more effective in enhancing information generated in institutions.

ii. Digitise information in all research institutions in order to enhance access to information generated by institutions.

iii. How management practices affects the accessibility of digital information resources to the users.

iv. Explore the role of institutional repositories in enhancing information access generated by institutions.

v.   Explore the critical factors that contribute to the success of institutional repositories worldwide.

vi.   Extent to which an institutional repository makes institutional-generated information accessible to outside world.

vii.   Conduct comparative studies on the link between information access generated by institutions and use of institutional repositories since the research was based on one organization.

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APPENDIX I: LETTER OF INTRODUCTION

Moi University (Nairobi Campus)

P.O. BOX 3900

ELDORET, KENYA

Dear Participant,

SUBJECT: LETTER OF INTRODUCTION

I am a student at Moi University-Nairobi Campus, School of Information Sciences pursuing a Master of Science degree in Library and Information Studies, I am required to carry out research on "Analysing access to and use of institutional repositories at the National Museums of Kenya" as required by Moi University. The information will be used for academic purposes only and will be treated with utmost confidentiality.

Your support will be highly appreciated.

Thanks.

Yours faithfully,

Ben Wanjusi Nakitare
Cell Phone: 0724-117525

APPENDIX II: INTERVIEW SCHEDULE FOR MANAGEMENT STAFF

SECTION A: GENERAL INFORMATION

(Please tick or write in the spaces provided. Where explanation is required, use the spaces provided).

1. Name of your Department: …………………………………..……………………

2. Area of research: ……………………………………………………………………

3. Indicate your Gender: a). Male ( ) b). Female ( ) (c) Transgender ( )

4. What is highest level of qualification?

   a) Certificate ( )   b) Diploma ( )   c) Degree ( )   d) Master ( ) (e) Doctorate ( )

   Other (Please specify): …………………………………..……………….

5. How long have you been using the information resources of this organization?

   (a) 1-3 years ( )   (b) 4 years and above ( )

   Other (Please specify): …………………………………..…………………………

SECTION B: SPECIFIC QUESTIONS

1. Is there a policy in place to support open information access to generated information at the National Museums of Kenya?

   a) yes ( ) b) No ( )

   If yes, what do you think may be hindering the use of institutional repositories to take place.…………...……………………………………………………………

2. Are there financial allocations to carter for new innovations as far as open access institutional repositories are concerned?

a) Yes ( )   b) No ( )

3. Is there infrastructure in place for the establishment of open access institutional repositories at National Museums of Kenya?

   a) Yes ( )   b) No ( )

   If yes, what needs to be done to ensure that open access institutional repositories is used at the National Museums of Kenya?

   ………………………………………………………………………………………

   ………………………………………………………………………………………

4. Does the institution have enough qualified personnel to use open access institutional repositories?

   a) Yes ( )   b) No ( )

5. What type of information resources that are generated by research staff at the National Museums of Kenya? (Please tick as appropriate)

   a)   Scientific information ( ) b) Technical information ( )

   c)   If others (please specify): ……………………………………………..

SECTION C: THE INSTITUTIONAL-GENERATED INFORMATION AVAILABLE AT THE NATIONAL MUSEUMS OF KENYA

1. What types of institutional-generated information available at the National Museums of Kenya? (Please tick as appropriate)

   a) Scientific information ( ) b) Technical information ( )

   If others (please specify): ……………………………………………..

2. Does the National Museums of Kenya generated information meet the needs of its potential customers?

a) Yes ( )   b) No ( )

If no, what needs to be done? ………………………………………………………….

SECTION D: ORGANIZATION OF INSTITUTIONAL-GENERATED INFORMATION

1. How is the institutional-generated information organized at the National Museums of Kenya?

a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. What format do you prefer accessing institutional-generated information?

……………………………………………………………………………………

SECTION E: ACCESS TO INSTITUTIONAL-GENERATED INFORMATION

1. How are the institutional-generated information accessed by information users at the National Museums of Kenya?

a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. What arrangement has National museums of Kenya put in place in order to provide easy Access to institutional-generated information?

3. Is there infrastructure in place for the establishment of open access institutional repositories?

a) Yes ( )   b) No ( )

If yes, what needs to be done to ensure that open access institutional repositories is used at the National Museums of Kenya?...

....

....

SECTION F: CHALLENGES INHIBITING ACCESS OF INSTITUTIONAL-GENERATED INFORMATION

What are the challenges inhibiting access to institutional-generated information at the National Museums of Kenya? ....

....

....

SECTION G: STRATEGIES THAT WOULD ENHANCE ACCESS TO INSTITUTIONAL-GENERATED INFORMATION

1. What strategies can be used to enhance access to institutional-generated information at the National Museums of Kenya?

2. What suggestions can you give to prevent these challenges at the National Museums of Kenya?

   ....

   ....

3. Do you find if there should be need for introducing open access institutional repository as a way enhancing access to institutional repository?

   a) Yes ( )   b) No ( )

   If yes, give reasons why they should introduce open access at the National Museums of Kenya:

   ………….……………………………………………………………………

Thanks for your cooperation

APPENDIX III: QUESTIONNAIRE FOR RESEARCHERS

All information collected will be treated with confidentiality

SECTION A: GENERAL INFORMATION

(Please tick or write in the spaces provided. Where explanation is required, use the spaces provided).

1. Name of your organization: …………………………………………..……………

2. Date of interview: ……………………………………………………………………

3. Indicate your Gender: a). Male ( ) b). Female ( )

4. Age   a).18-28 [ ]   b). 29-39 [ ]

    c). 40-50 [ ]   d). 51 and above

5. Research area: …………………………………………………………… ....

6. What is the highest level of your qualification?

    a) Certificate ( )   b) Diploma ( )   c) Degree ( ) d) Postgraduate ( )

    e)   Other (Please specify): ………………………………..………………….

7. Position: …………………………………………………………………………………

8. Department: ………………………………………………………………………

9. How long have you worked at National Museums of Kenya?

    1-5 years ( ) 5-10 years ( ) 10-15 years ( ) 15-20 years ( )

    Other (Please specify): …………………………………..………………………

SECTION B: SPECIFIC QUESTIONS

1. Is there a policy in place to support open information access to generated information at the National Museums of Kenya?

   a) Yes ( )　　b) No ( )

   If yes, what do you think may be hindering the use of institutional repositories to take place…………………………………………..…………………………………

2. Are there financial allocations to carter for new innovations as far as open access institutional repositories are concerned?

   a) Yes ( )　　b) No ( )

3. Is there infrastructure in place for the establishment of open access institutional repositories at National Museums of Kenya?

   a) Yes ( )　　b) No ( )

   If yes, what needs to be done to ensure that open access institutional repositories is used at the National Museums of Kenya? ………………….………....………..

4. Does the institution have enough qualified personnel to use open access institutional repositories?

   a) Yes ( )　　b) No ( )

5. What type of information resources that are generated by research staff at the National Museums of Kenya? (Please tick as appropriate)

   a) Scientific information ( ) b) Technical information ( )

   b) If others (please specify): ……………………………………………………..

SECTION C: THE INSTITUTIONAL-GENERATED INFORMATION AVAILABLE

1. What types of institutional-generated information available at the National Museums of Kenya? (Please tick as appropriate)

   a) Scientific information ( ) b) Technical information ( )

   If others (please specify): …………………………………………………………..

2. Are users satisfied with the information resources generated by National Museums of Kenya?

   a) Yes ( )   b) No ( )
   If no, what needs to be done? ……………………………………………………

SECTION D: ORGANIZATION OF INSTITUTIONAL-GENERATED INFORMATION

1. How are the institutional-generated information organized at the National Museums of Kenya?
   a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. In what format does your institution use to generate information?

   a) Print   b) Audio Visual c) Electronic e) Other (please specify): ………………

3. What format do you prefer accessing institutional-generated information?

   ………………………………………………………………………………………
   ………………………………………………………………………………………
   ………………………………………………………………………………………
   ………………………………………………………………………………………

SECTION E: ACCESS TO INSTITUTIONAL-GENERATED INFORMATION

1. How are the institutional-generated information accessed by information users at the National Museums of Kenya?

   a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. What arrangement has National museums of Kenya put in place in order to provide easy Access to institutional-generated information?

3. Is there infrastructure in place for the establishment of open access institutional repositories? a) Yes ( )   b) No ( )

   If yes, what needs to be done to ensure that open access institutional repositories is used at the National Museums of Kenya?

   …………………………………………………………………………………………

   …………………………………………………………………………………………

SECTION F: CHALLENGES INHIBITING ACCESS OF INSTITUTIONAL-GENERATED INFORMATION

1. What are the challenges inhibiting access to institutional-generated information at the National Museums of Kenya?

   ……………………………………………………………………………………….

   ……………………………………………………………………………………….

   …………………………………………………………………………………………

SECTION G: STRATEGIES THAT WOULD ENHANCE ACCESS TO INSTITUTIONAL-GENERATEDINFORMATION

1. What strategies can be used to enhance access to institutional-generated information at the National Museums of Kenya?

   …………………………………………………………………………………………

   …………………………………………………………………………………………

2. What do you think can be done to enhance access to institutional-generated information?

3. Do you find if there should be need for introducing open access institutional repository as a way enhancing access to institutional repository?

   a) Yes ( )   b) No ( )

   If yes, give reasons why they should introduce open access at the National Museums of Kenya: ………..………………………………………………………

4. Are you making use of the National Museums of Kenya information resources?

   a) yes ( ) b) No ( )

   If yes, what kind of information does the institution generate? …………………..

   Thanks for your cooperation

APPENDIX IV: INTERVIEW SCHEDULE FOR THE NMK-LIBRARIANS

All information collected will be treated with confidentiality

SECTION A: GENERAL INFORMATION

(Please tick or write in the spaces provided. Where explanation is required, use the spaces provided).

1. Librarian: ……………………………………. ……………………….………….

SECTION B: SPECIFIC QUESTIONS

1. Is there a policy in place to support open information access to generated information at the National Museums of Kenya?

   a) yes ( ) b) No ( )

   If yes, what do you think may be hindering the use of institutional repositories to take place………………………………………..…………………………………

2. Are there financial allocations to carter for new innovations as far as open access institutional repositories are concerned?

   a) Yes ( )   b) No ( )

3. Is there infrastructure in place for the establishment of open access institutional repositories at National Museums of Kenya?

   a) Yes ( )   b) No ( )

   If yes, what needs to be done to ensure that open access institutional repositories is used at the National Museums of Kenya? ……………………………….…………
   ……………………………………………………………………………………

4. Does the institution have enough qualified personnel to use open access institutional repositories?

   a) Yes ( )   b) No ( )

5. What type of information resources that are generated by research staff at the National Museums of Kenya? (Please tick as appropriate)

   a) Scientific information ( ) b) Technical information ( )

   c) If others (please specify): …………………………………………………..

SECTION C: THE INSTITUTIONAL-GENERATED INFORMATION AVAILABLE

1. What types of institutional-generated information available at the National Museums of Kenya? (Please tick as appropriate)

   a) Scientific information ( ) b) Technical information ( )

   If others (please specify): …………………………………………………..

2. Does the National Museums of Kenya generated information meet the needs of its potential customers?

   a) Yes ( )   b) No ( )

   If No, what needs to be done?

   ………………………………………………………………………………………

   ………………………………………………………………………………………

   ………………………………………………………………………………………

SECTION D: ORGANIZATION OF INSTITUTIONAL-GENERATED INFORMATION

1. How are the institutional-generated information organized at the National Museums of Kenya?

   a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. In what format does your institution use to generate information?

   a) Print   b) Audio Visual c) Electronic e) Other (please specify): ………………

3. What format do you prefer accessing institutional-generated information?

   ……………………………………………………….................………………….

SECTION E: ACCESS TO INSTITUTIONAL-GENERATED INFORMATION

1. How are the institutional-generated information accessed by information users at the National Museums of Kenya?

   a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. What arrangement has National museums of Kenya put in place in order to provide easy Access to institutional-generated information?

3. Is there infrastructure in place for the establishment of open access institutional repositories?

   a) Yes ( )   b) No ( )

   If yes, what needs to be done to ensure that open access institutional repositories is used at the National Museums of Kenya? .....………………………………..…

SECTION F: CHALLENGES INHIBITING ACCESS OF INSTITUTIONAL-GENERATED INFORMATION

1. What are the challenges inhibiting access to institutional-generated information at the National Museums of Kenya?

   …………………………………………………………………………………….

   …………………………………………………………………………………….

SECTION G: STRATEGIES THAT WOULD ENHANCE ACCESS TO INSTITUTIONAL-GENERATED INFORMATION

1. What strategies can be used to enhance access to institutional-generated information at the National Museums of Kenya?

   ………………………………………………….

   …………………………………………………………………………………………

2. Do you find if there should be need for introducing open access institutional repository as a way enhancing access to institutional repository?

   a) Yes ( )   b) No ( )

   If yes, give reasons why they should introduce open access at the National Museums of Kenya:

   ……………..………………………………………………………………………

3. Are you making use of the National Museums of Kenya information resources?

   a) yes ( ) b) No ( )

   If yes, what kind of information does the institution generate?

   …………………………………………………..…………………………………

Thanks for your cooperation

APPENDIX V: INTERVIEW SCHEDULE FOR THE RESOURCE CENTRE MANAGER

All information collected will be treated with confidentiality

SECTION A: GENERAL INFORMATION

(Please tick or write in the spaces provided. Where explanation is required, use the spaces provided).

1. Name (Optional)…………………….…………………......…………………………

2. Date of interview: ……………………………………………………………….……..

3. Position: …………………………………………………………………………………

4. Department: …………………………..……………………………………………………

SECTION B: SPECIFIC QUESTIONS

1. Is there a policy in place to support open information access to generated information at the National Museums of Kenya?

   a) Yes ( ) b) No ( )

   If yes, what do you think may be hindering the use of institutional repositories to take place.………………………………………………………………………………

2. Are there financial allocations to carter for new innovations as far as open access institutional repositories are concerned?

   a) Yes ( )   b) No ( )

3. Is there infrastructure in place for the establishment of open access institutional repositories at National Museums of Kenya?

   a) Yes ( )   b) No ( )

If yes, what needs to be done to ensure that open access institutional repositories is used at the National Museums of Kenya?

……………………………………………………………………………………………

……………………………………………………………………………………………

……………………………………………………………………………………………

4. Does the institution have enough qualified personnel to use open access institutional repositories?

a) Yes ( )   b) No ( )

5. What type of information resources that are generated by research staff at the National Museums of Kenya? (Please tick as appropriate)

a) Scientific information ( ) b) Technical information ( )

c)   If others (please specify): …………………………………….. …………..

SECTION C: THE INSTITUTIONAL-GENERATED INFORMATION AVAILABLE

1. What types of institutional-generated information available at the National Museums of Kenya? (Please tick as appropriate)

a) Scientific information ( ) b) Technical information ( )

If others (please specify): ………………………………………………………..

2. Does the National Museums of Kenya generated information meet the needs of its potential customers?

a) Yes ( )   b) No ( )

If No, what needs to be done? ………………………………..…………………….

SECTION D: ORGANIZATION OF INSTITUTIONAL-GENERATED INFORMATION

1. How are the institutional-generated information organized at the National Museums of Kenya?

    a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. In what format does your institution use to generate information?

    a) Print   b) Audio Visual c) Electronic e) Other (please specify): ………………

3. What format do you prefer accessing institutional-generated information?
    ……………………………………………………..…………..

SECTION E: ACCESS TO INSTITUTIONAL-GENERATED INFORMATION

1. How are the institutional-generated information accessed by information users at the National Museums of Kenya?

    a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. What arrangement has National museums of Kenya put in place in order to provide easy Access to institutional-generated information?

3. Is there infrastructure in place for the establishment of open access institutional repositories?

    a) Yes ( )   b) No ( )

    If yes, what needs to be done to ensure that open access institutional repositories is used at the National Museums of Kenya?………………..……………………

SECTION F: CHALLENGES INHIBITING ACCESS OF INSTITUTIONAL-GENERATED INFORMATION

1. What are the challenges inhibiting access to institutional-generated information at the National Museums of Kenya? Explain

   …………………………………………………………………………….….

   …………………………………………………………………………….….

   …………………………………………………………………………………

SECTION G: STRATEGIES THAT WOULD ENHANCE ACCESS TO INSTITUTIONAL-GENERATED INFORMATION

1. What suggestions can you give to prevent these challenges at the National Museums of Kenya? ....

2. What do you think can be done to enhance access to institutional-generated information?

3. Do you find if there should be need for introducing open access institutional repository as a way enhancing access to institutional repository?

   a) Yes ( )   b) No ( )

   If yes, give reasons why they should introduce open access at the National Museums of Kenya: …………..…………………………………………………

4. Are you making use of the National Museums of Kenya information resources?

   a) Yes ( ) b) No ( )

   If yes, what kind of information does the institution generate?

   …………………………………………………………………………………

Thanks for your cooperation

APPENDIX VI: INTERVIEW SCHEDULE FOR CURATORS

All information collected will be treated with confidentiality

SECTION A: GENERAL INFORMATION

(Please tick or write in the spaces provided. Where explanation is required, use the spaces provided).

1. Curator: …………………………………………………………………………

2. Name of the Regional Museum: …………………………………………...…

SECTION B: SPECIFIC QUESTIONS

1. Is there a policy in place to support open information access to generated information at the National Museums of Kenya?

   a) Yes ( ) b) No ( )

   If yes, what do you think may be hindering the use of institutional repositories to take
   place………………………………………………..……………………………

2. Are there financial allocations to carter for new innovations as far as open access institutional repositories are concerned?

   a) Yes ( )   b) No ( )

3. Is there infrastructure in place for the establishment of open access institutional repositories at National Museums of Kenya?

   a) Yes ( )   b) No ( )

   If yes, what needs to be done to ensure that open access institutional repositories is used at the National Museums of Kenya?..

4. Does the institution have enough qualified personnel to use open access institutional repositories?

a) Yes ( )   b) No ( )

5. What type of information resources that are generated by research staff at the National Museums of Kenya? (Please tick as appropriate)

a) Scientific information ( ) b) Technical information ( )

c) If others (please specify): …………………………………………………….

SECTION C: THE INSTITUTIONAL-GENERATED INFORMATION AVAILABLE

1. What types of institutional-generated information available at the National Museums of Kenya? (Please tick as appropriate)

a) Scientific information ( ) b) Technical information ( )

If others (please specify): …………………………………………………………..

2. Does the National Museums of Kenya generated information meet the needs of its potential customers?

a) Yes ( )   b) No ( )
If no, what needs to be done? ....…………………………….

SECTION D: ORGANIZATION OF INSTITUTIONAL-GENERATED INFORMATION

1. How are the institutional-generated information organized at the National Museums of Kenya?

a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. In what format does your institution use to generate information?

    a) Print   b) Audio Visual c) Electronic e) Other (please specify): ………………

3. What format do you prefer accessing institutional-generated information?

    ……………...

SECTION E: ACCESS TO INSTITUTIONAL-GENERATED INFORMATION

1. How are the institutional-generated information accessed by information users at the National Museums of Kenya?

    a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. What arrangement has National museums of Kenya put in place in order to provide easy Access to institutional-generated information?

3. Is there infrastructure in place for the establishment of open access institutional repositories?

    a) Yes ( )   b) No ( )

    If yes, what needs to be done to ensure that open access institutional repositories is used at the National Museums of Kenya? ....

SECTION F: CHALLENGES INHIBITING ACCESS OF INSTITUTIONAL-GENERATED INFORMATION

1. What are the challenges inhibiting access to institutional-generated information at the National Museums of Kenya? Explain.

    ………………………………………………………………………………….

SECTION G: STRATEGIES THAT WOULD ENHANCE ACCESS
TO INSTITUTIONAL-GENERATED INFORMATION

1. What strategies can be used to enhance access to institutional-generated information at the National Museums of Kenya? ....

2. What do you think can be done to enhance access to institutional-generated information?

3. Do you find if there should be need for introducing open access institutional repository as a way enhancing access to institutional repository?

    a) Yes ( )   b) No ( )

    If yes, give reasons why they should introduce open access at the National Museums of Kenya: ……………..……………................……………………..

4. Are you making use of the National Museums of Kenya information resources?

    a) Yes ( ) b) No ( )

    If yes, what kind of information does the institution generate? …………..……...

Thanks for your cooperation

APPENDIX VII: INTERVIEW SCHEDULE FOR EXTERNAL INFORMATION USERS

All information collected will be treated with confidentiality

SECTION A: GENERAL INFORMATION

(Please tick or write in the spaces provided. Where explanation is required, use the spaces provided).

1. Name of your organisation: ………………………………..……………………

2. Date of interview: …………………………………………………………...…..

3. Indicate your Gender: a). Male ( ) b). Female ( )

4. Age   a).18-28 [ ]   b). 29-39 [ ]

    c). 40-50 [ ]   d). 51 and above

5. What is the highest level of your qualification?

    a) Certificate ( )   b) Diploma ( )   c) Degree ( ) d) Postgraduate ( )

    e) Other (Please specify): ………………………….…………………….…

6. Position: …………………………………………………………………………

7. How long have you been accessing information resources at the National Museums of Kenya?

    1-5 years ( ) 5-10 years ( ) 10-15 years ( ) 15-20 years ( )

    Other (Please specify): ……………………………… …………………………..…

SECTION B: SPECIFIC QUESTIONS

1. Have you ever gained access to NMK policy that could support the use of open access to generated information at the National Museums of Kenya?

   a) Yes ( )   b) No ( )

   If yes, what do you think may be hindering them in establishing the institutional repository ……………………………..…………………………………………

2. Have you ever used open access institutional repositories to access the information resources at NMK?

   a) Yes ( )   b) No ( )

3. Do you find NMK with improved infrastructure that could allow the establishment of open access institutional repositories?

   a) Yes ( )   b) No ( )

   If yes, what do you think can be done to ensure that open access institutional repositories is established at the National Museums of Kenya?

   …………………………………………………………………………………………
   …………………………………………………………………………………………

4. Are you satisfied with the services offered by NMK personnel as far as information access is concerned?

   a) Yes ( )   b) No ( )

5. What type of information resources have you been using at the National Museums of Kenya? (Please tick as appropriate)

   a) Scientific information ( ) b) Technical information ( )

   b) If others (please specify): ………………………………………………..

SECTION C: THE INSTITUTIONAL-GENERATED INFORMATION AVAILABLE

1. What types of institutional-generated information are available at the National Museums of Kenya? (Please tick as appropriate)

    a) Scientific information ( ) b) Technical information ( )

    If others (please specify): …………………………………………………………..

2. Does the National Museums of Kenya generated information that meet users' needs?

    a) Yes ( )   b) No ( )
    If no, what needs to be done? …………………………………….................……….

SECTION D: ORGANIZATION OF INSTITUTIONAL-GENERATED INFORMATION

1. How do you find the organization of information at the National Museums of Kenya for purposes of accessibility?

    a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. In what format does NMK generate information?

    a) Print   b) Audio Visual c) Electronic e) Other (please specify): ………………

3. What format do you find best in accessing information at NMK? …………..…….

SECTION E: ACCESS TO INSTITUTIONAL-GENERATED INFORMATION

1. How do you rate NMK in terms of information access by users?

   a) Bad ( ) b) Good ( ) c) Better ( ) d) Worse ( )

2. What else do you find NMK doing to enhance Access to institutional-generated information?

3. Do you find NMK with improved infrastructure that could allow the establishment of open access institutional repositories?

   a) Yes ( )   b) No ( )

   If yes, what needs to be done to ensure that open access institutional repositories is established at the National Museums of Kenya? ....

SECTION F: CHALLENGES INHIBITING ACCESS OF INSTITUTIONAL-GENERATED INFORMATION

What are these challenges faced by users when accessing the information resources available at the National Museums of Kenya?

   ……………………………………………………………………………….……

SECTION G: STRATEGIES THAT WOULD ENHANCE ACCESS TO INSTITUTIONAL-GENERATED INFORMATION

1. What do you think can be done to have the users enjoy in what National Museums of Kenya can generate?...
2. What do you think can be done to enhance access to institutional-generated information?

3. Do you find it relevant to have open access institutional repository be introduced at the National Museums of Kenya?

   a) Yes ( )   b) No ( )

If yes, give reasons why they should introduce open access at the National Museums of Kenya: ……………..………...……

4. Are you making use of the National Museums of Kenya information resources?

a) yes ( )   b) No ( )

If yes, what kind of information does the institution generate? ....

Thanks for your cooperation

APPENDIX VIII: PRE-TEST CHECKLIST

1. (a) Does the questionnaire have any typographic errors?

     Yes ( )   No ( )

     (b) If yes please indicate them in the questionnaire.

2. (a) Are there any miss pelt words in the questionnaire?

     Yes ( )   No ( )

     (b) If yes, please indicate them in the questionnaire

3. (a) Are the questions relevant to the respondent?

     Yes ( )   No ( )

     (b) If no, please provide suggestions

     ……………………………………………………………………………………
     ……………………………………………………………………………………
     ……………………………………………………………………………………

4. (a) Does the questionnaire contain direct questions?

     Yes ( )   No ( )

     (b) If yes, Provide suggestions below

     ……………………………………………………………………………………
     ……………………………………………………………………………………
     ……………………………………………………………………………………

5. (a) Are questions printed in systematic and logical manner?

     Yes ( )   No ( )

(b) If yes, provide suggestions below

………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………

6. (a) Are the questions easily understood?

Yes ( )   No ( )

(b) If no, please provide suggestions below:

………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………

7. (a) Is the questionnaire too long?

Yes ( )   No ( )

(b) If yes, please provide some suggestions below

………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………

8. Kindly provide any other suggestions which will help improve the quality of the questionnaire:

………………………………………………………………………………………………
………………………………………………………………………………………………

THANK YOU

APPENDIX IX: RESEARCH CLEARANCE PERMIT

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 8693

CONDITIONS: see back page

THIS IS TO CERTIFY THAT:
MR. BEN WANJUSI NAKITARE
of MOI UNIVERSITY, 40658-100
NAIROBI, has been permitted to conduct research in *Nairobi County*

on the topic: *ENHANCING OPEN ACCESS TO INFORMATION BY USE OF INSTITUTIONAL REPOSITORIES AT THE NATIONAL MUSEUMS OF KENYA*

for the period ending:
15th April,2017

Permit No : NACOSTI/P/16/77865/10536
Date Of Issue : 18th April,2016
Fee Recieved :ksh 1000

....
Applicant's Signature

....
Director General
National Commission for Science, Technology & Innovation