

**DEVELOPMENT AND MANAGEMENT OF INSTITUTIONAL
REPOSITORIES IN SELECTED UNIVERSITY LIBRARIES IN
KENYA**

BY

MARY N. KARANJA

E65/OL/CTY/24113/2014

**A RESEARCH PROJECT SUBMITTED IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF
THE DEGREE OF MASTERS OF LIBRARY AND INFORMATION
SCIENCE OF KENYATTA UNIVERSITY**

NOVEMBER 2017

DECLARATION

I confirm that this research project is my original work and has not been presented in any other university/institution for certification. The project has been complemented by referenced works duly acknowledged. Where text, data, graphics, pictures or tables have been borrowed from other works -including the internet, the sources are specifically accredited through referencing in accordance with anti-plagiarism regulations.

Signature: _____

_____ Date

Mary N. Karanja

Reg. No. E65/OL/CTY/24113/2014

I confirm that the work reported in this project was carried out by the candidate under my supervision as University supervisor.

Signature: _____

_____ Date

Dr. Milkah N. Mathu

Department of Library and Information Science

Kenyatta University

DEDICATION

This project is dedicated to my beloved late father Peter Karanja Kimani and my dear mother Jane Wairimu Karanja, who taught me the value of education; and to my dear brothers and sisters who have always been there for me.

ACKNOWLEDGEMENT

First and foremost I would like to thank the Almighty God for His grace and strength that kept me going throughout my academic period. Secondly, my gratitude goes to my supervisor Dr. M. Mathu for her thorough and sincere guidance without which this work would not have taken shape. My sincere gratitude also goes to all my lecturers in the department of Library and Information Science for their guidance and support throughout my academic period.

I would also like to thank JKUAT and USIU-A libraries' management as well as the entire institutions for allowing me to collect data from their libraries in order to meet the objectives of this study. I extend my gratitude to the library staff as well for their co-operation in completing the questionnaires.

I am also indebted to my family members whom without their co-operation, assistance and sacrifice I would not have been able to pursue this course. I extend my thanks to them for their contribution in one way or another towards the completion of this work. Last and not the least, I wish to thank my classmates and friends for their support and love that made my academic life an interesting experience.

TABLE OF CONTENTS

DECLARATION.....	i
DEDICATION	ii
ACKNOWLEDGEMENT.....	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	viii
LIST OF FIGURES	viii
ABBREVIATIONS AND ACRONYMS.....	ix
ABSTRACT	x
CHAPTER ONE.....	1
INTRODUCTION AND BACKGROUND TO THE STUDY.....	1
1.1 Introduction.....	1
1.2 Background to the Study.....	1
1.3 Statement of the Problem.....	6
1.4 General Objective	7
1.5 Specific Objectives of the Study.....	7
1.6 Research Questions.....	8
1.7 Significance of the Study.....	8
1.8 Scope and Limitations of the Study.....	9
1.9 Theoretical and Conceptual Framework.....	10
1.9.1 Theoretical Framework	10
1.9.2 Conceptual Framework	10
1.10 Operational Definition of Terms.....	15
CHAPTER TWO.....	16
REVIEW OF RELATED LITERATURE.....	16
2.1 Introduction.....	16

2.2	Resources for Development and Management of IRs	16
2.3	Strategies for Development and Management of IRs	19
2.4	Challenges in Development and Management of IRs	22
2.5	Summary of the Literature Review and the Research Gap.....	28
CHAPTER THREE		29
RESEARCH DESIGN AND METHODOLOGY		29
3.1	Introduction.....	29
3.2	Research Design	29
3.3	Study Locale	30
3.4	Target Population.....	30
3.5	Sampling Method/Procedures.....	30
3.6	Sample Size.....	31
3.7	Research Instruments	32
3.7.1	Questionnaire for Library Staff (Appendix II).....	32
3.7.2	Interview Schedule for Chief Librarians (Appendix III)	33
3.8	Validity and Reliability.....	33
3.8.1	Pilot Study	33
3.8.2	Validity.....	34
3.8.3	Reliability.....	34
3.9	Data Collection Procedure	35
3.10	Data Analysis and Presentation	36
3.11	Logistical and Ethical Considerations	36
CHAPTER FOUR		38
PRESENTATION OF FINDINGS, INTERPRETATION AND DISCUSSION		38
4.1	Introduction.....	38
4.2	General and Demographic Information	38
4.2.1	Response Rate	38
4.2.2	Demographic Information.....	39
4.3	Resources for Development and Management of an IR	43
4.4	Strategies for Development and Management of an IR.....	56

4.5 Challenges in Development and Management of an IR	72
4.6 Conclusion	77
CHAPTER FIVE	78
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	78
5.1 Introduction.....	78
5.2 Summary of the Findings.....	78
5.3 Conclusions.....	81
5.4 Recommendations.....	82
5.4.1 Policy Recommendations.....	92
5.4.2 Suggestions for Further Research	93
REFERENCES	94
APPENDICES	100
APPENDIX I: INTRODUCTORY LETTER.....	100
APPENDIX II: QUESTIONNAIRE FOR LIBRARY STAFF	101
APPENDIX III: INTERVIEW SCHEDULE FOR CHIEF LIBRARIANS	109
APPENDIX IV: TIME SCHEDULE.....	111
APPENDIX V: BUDGET	112
APPENDIX VI: RESEARCH PERMIT	113

LIST OF TABLES

Table 3.1 Target Population and Sample Size.....	32
Table 4.1 Response Rate.....	39
Table 4.2 Gender of the Respondents.....	40
Table 4.3 Age Category of the Respondents.....	41
Table 4.4 Resources for Development and Management of an IR.....	44
Table 4.5 Challenges in the Availability of Resources Necessary for Development and Management of an IR.....	54
Table 4.6 Ways of Gathering Research Outputs From Researchers.....	65
Table 4.7 Ways of Ensuring Self-Archiving was Successful.....	67
Table 4.8 Academic and Research Support Services Provided by an IR.....	68
Table 4.9 Strategies for Development and Management of an IR.....	70
Table 4.10 Challenges in Development and Management of an IR.....	74

LIST OF FIGURES

Figure 1.1 Conceptual Framework Model.....	11
Figure 4.1 Educational Level of the Respondents.....	42
Figure 4.2 Availability of all Research Outputs in the IRs.....	57
Figure 4.3 Format of Research Outputs.....	58
Figure 4.4 Frequency of Research Outputs Upload.....	60
Figure 4.5 People Mandated to Deposit Research Outputs.....	63
Figure 4.6 Challenges in Development and Management of an IR.....	72

ABBREVIATIONS AND ACRONYMS

CUE	Commission for University Education
DKU	Dedan Kimathi University
DOI	Diffusion of Innovation theory
ICT	Information Communication Technology
ILRI	International Livestock Research Institute
IR	Institutional Repository
IT	Information Technology
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KHRC	Kenya Human Rights Commission
KU	Kenyatta University
LVBC	Lake Victoria Basin Commission
NACOSTI	National Commission for Science, Technology and Innovation
OpenDOAR	Directory of Open Access Repositories
PU	Pwani University
RVTI	Rift Valley Technical Institute
SPSS	Statistical Package for Social Sciences
SU	Strathmore University
UoN	University of Nairobi
USIU-A	United States International University-Africa

ABSTRACT

University libraries should consider institutional repositories as ongoing projects in order to cater for the changing needs of modern scholarly communication. Many universities have not made all research outputs from their scholarly communities available in their IRs. A number of research outputs available in IRs of universities in Kenya are not available in full-text and only available in abstract form thus making such resources less useful to the users they are meant for. University libraries in Kenya have also not incorporated a full range of services in their IRs to support academic and research work. The repositories lack tools and services that are necessary in meeting the changing needs of modern scholarly communication. The objectives of the study were to establish what resources and strategies for development and management of IRs are available in university libraries in Kenya as well as challenges affecting development and management of their IRs. The study used a cross-sectional, descriptive survey research design. The study was carried out in two selected university libraries in Kenya. These included JKUAT and USIU-A libraries. The target population for this study was JKUAT and USIU-A library staff and their chief librarians. JKUAT library had 34 library staff and the chief librarian while USIU-A library had 25 library staff and the chief librarian. The total targeted population was therefore 61. For the sampling technique, the two chief librarians from the selected libraries were purposively selected (non-probability sampling). The study used census method for the library staff from the two selected libraries whereby all staff who are trained librarians were involved in the study. As a result, the total sample size was 61 subjects. The study used a questionnaire and interview schedule as the research instruments to collect data. Quantitative data collected using the questionnaire was analyzed using descriptive statistics such as frequency and percentage so as to provide answers to the research questions. The researcher also used SPSS software to help in data analysis. This data was then presented in textual form, tables, bar graphs and pie charts. In the analysis of qualitative data collected using the interviews, all responses were organized and classified in order to generate themes and categories from the responses. This data was then presented in textual form. From this study, the researcher found out that the selected university libraries had resources for development and management of their IRs although majority of them were not adequate. The study also found out that the libraries were using a number of strategies to ensure continuous development and management of their IRs although they had not incorporated all the available strategies necessary to meet the changing needs in the modern scholarly communication. The study finally found out that these libraries were facing various challenges in development and management of their IRs such as problems in gathering research outputs for the IRs. This study concluded that: there were no adequate resources and strategies for development and management of IRs in university libraries in Kenya and they faced a number of challenges. This study recommended that university libraries in Kenya should come up with strategies such as allocation of adequate funds for their IRs in order to ensure adequate resources for development and management of the IRs, explore all available strategies for development and management of IRs and come up with ways of curbing or minimizing the challenges affecting them.

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

This chapter contains the introduction to the study. It contains various sub-topics that make up the whole chapter. These sub-topics include background to the study, statement of the problem, objectives of the study, research questions, significance of the study, scope and limitations of the study, theoretical and conceptual framework, and operational definition of terms.

1.2 Background to the Study

According to Jain & Bentley (2008), knowledge is regarded as a strategic resource that has to be created, stored, shared and transferred in constant flow for the continuous growth of the society. Technological development has made creation and accessibility of digital information materials easy and fast thus making instant use possible. However, these information resources are normally not readily available to majority of users and always remain isolated in the computers of the authors.

According to these authors, academic institutions have struggled for more than a decade with ways of managing collective and digital intellectual output that is produced in the 21st century. Subscribing to electronic and print resources from commercial publishers is also becoming increasingly impossible due to the high costs of subscribing to these resources. This is making it impossible and difficult for academic institutions to

subscribe to majority or all the electronic resources required in meeting the information needs of their user communities. Scholarly communication crisis in particular has come up as a result of these high costs of subscribing to serial and database licenses. This has made users of academic libraries have limited access to scholarly materials. According to Daly & Organ (2009), this has forced researchers, university, and administrators to introduce other ways of scholarly communication like IRs. Institutional repositories (IRs) are digital archives of the intellectual output of an institution and are accessible to end-users within and outside the institution with few or no barriers to access (Zhao, Yao & Wei, 2012).

There have been various IR initiatives, successes and failures. From these initiatives, successes and failures there emerge two schools of thought. One school believes that IRs can be used to showcase scholarly outputs of an institution and have so far functioned quite well in disseminating scholarly outputs of their institutions (Xia, 2009). According to this author, the second school has already lacked trust in IRs and believes that only a small number of IRs have so far grown into fairly large scholarly databases enough to demonstrate to their administrators the worth of investing in an IR. However, according to Bankier & Perciali (2008), some institutions are very active because they want to create a good image in the global village by publishing their scholarly outputs online using an IR as well as have control and continue maintaining ownership over their online presence. These institutions also want their IRs to look attractive. While these seem average ambitions, for many existing IRs, it is not the case. Some universities have given up on the IRs perhaps as a result of discouragement by

researchers' uptake or they mostly use their IRs to store digitized archives of their libraries, or simply resign to the "drip drip" speed of authors' self-archiving.

According to Romary & Armbruster (2010), having a repository infrastructure that is robust is necessary for academic work. IRs ought to function as full-fledged electronic libraries and as a result carry out the duty of collecting, disseminating, analysing and sharing helpful digital information for academic purposes. IRs should also be coupled with the full range of academic and research support services that are permitted by the new technological developments. In this age of social networking, university libraries should be moving fast to develop an academic research service which is in form of a social platform that can help in boosting the capacity of librarians, IT specialists and libraries (Basefsky, 2009).

According to Bankier & Perciali (2008), universities of late have a good chance to improve and reinvigorate the IR model. According to Albanese (2009), the next generation of IRs should therefore be re-imagined around particular services that are of importance to faculty members. This will make marketing of IRs to the scholars easy and will gain more and continued support from their institutions. Universities need to explore a new path for larger repositories that have a more robust infrastructure in order to create better services that meets the scholarly needs of the academic community.

International studies show that development of IRs in developed countries has greatly increased at academic institutions as a result of the growth of open-source initiatives in

scholarly communication as well as the advancements in terms of software (Campbell-Meier, 2011). In academic institutions, the establishment of IRs has currently become common activity which has been made possible by the readily available open source software platforms and operating systems and their fairly simple implementation (Robinson, 2009). Additionally, the number of universities that are starting to realize the need to have thesis and dissertation outputs deposited in IRs is increasing (Harnad, 2009). However, empirical studies show that Africa is yet to fully integrate the use of new information technologies. Africa as a whole has not completely embraced new information technologies, although developments in the recent past show that researchers in the continent are starting to accept the new technological developments in their daily operations (Ezema, 2013).

Studies conducted in Kenya show that IRs' development and implementation in institutions of higher learning are gaining momentum more and more. Milimo (2012) points out the need to make research output available, accessible and applicable in order to impact on the lives of the millions of Kenyans and contribute to global innovation systems. In particular, open access to information resources stored in digital IRs is one of the pathways being used to enhance the visibility and accessibility of research content from Kenya.

Similarly, Makori (2009) highlights the need for integration of technological solutions into mainstream information products and services such as integrated information systems, digital information systems, social computing and networking in Kenyan

university libraries. Several initiatives are underway in universities and research organizations although the institutions face several challenges such as lack of motivation and incentives as well as lack of policies and strategies to support open sharing of information resources in these institutions. For instance, several institutions have established or are in the initial stage of developing IRs as demonstrated through the University of Nairobi (UoN), Strathmore University (SU), International Livestock Research Institute (ILRI), Kenyatta University (KU), Pwani University (PU), Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya Human Rights Commission (KHRC), Lake Victoria Basin Commission (LVBC), Rift Valley Technical Institute (RVTI), and Dedan Kimathi University (DKU) (OpenDOAR, 2014).

Mutwiri (2014) carried out a study on adoption of IRs as open access outlets in selected university libraries in Kenya which included JKUAT and USIU-A libraries. In this study the researcher revealed that faculty members in university libraries in Kenya mostly use traditional publishing outlets such as books and print journals to disseminate their research outputs. These findings imply that adoption of open access outlets such as IRs will greatly depend on the willingness of these scholars to change their ways of scholarly communication. This practice by faculty members in university libraries in Kenya have led to low contribution of research outputs to the open access outlets thus the possibility of these outlets remaining empty. Studies conducted in university libraries in Kenya on IRs have not adequately covered development and management of IRs in these institutions. This has therefore made it necessary for the researcher to carry out this study in order to provide more knowledge on this area

1.3 Statement of the Problem

University libraries should consider IRs as ongoing projects. University libraries should continue developing their IRs in order to cater for the changing needs of university scholarly community as well as their entire institutions. Many universities are gathering content produced by research faculty and students, making it searchable and maintaining it within digital repositories. They have however not made all their research outputs available in their IRs. For instance, theses and dissertations which are some of the research outputs in university libraries are completed and shelved in individual university libraries to the extent that it is only very few researchers in the university community that are aware of the existence of the materials (Ezema, 2013). A number of research outputs available in IRs of universities in Kenya are not available in full-text and only available in abstract form thus making such resources less useful to the users they are meant for.

University libraries in Kenya have also not incorporated a full range of services in their IRs to support academic and research work. For instance, DSpace which JKUAT and USIU-A libraries are using for their IRs is a free open source software platform that allows research organizations to offer a professionally managed and searchable archive to their faculty and researchers for archiving their scholarly outputs. The main focus of DSpace is providing simple access to these assets and their long-term preservation. But university libraries in Kenya should no longer be talking about a repository as only an archive for preservation and access. Instead, they should be talking about a repository as a full-featured scholarly research and publishing system. The repository should have

tools and services that each university can provide to their faculty members to facilitate communications and publications that are digitally native and open access from the start. In short, a repository should be an archive as well as a showcase and a platform (Basefsky, 2009).

IRs in university libraries in Kenya are therefore not adequate in terms of information resources available and technological features necessary to meet the information needs of scholars. The available research outputs are not adequate and comprehensive as they should in order to meet the information needs of scholars. The IRs also lack features that can support scholars in their academic as well as scholarly publishing activities. The purpose of the study was therefore to find out what university libraries in Kenya are doing to ensure continuous development and management of their IRs in order to meet the changing needs of modern scholarly communication.

1.4 General Objective

To analyse what university libraries in Kenya are doing to ensure continuous development and management of their IRs.

1.5 Specific Objectives of the Study

1. Establish what resources are available in university libraries in Kenya for development and management of IRs.
2. Determine the strategies that university libraries in Kenya are using to ensure well developed and managed IRs.

3. Establish challenges affecting development and management of IRs in university libraries in Kenya.

1.6 Research Questions

1. What resources are available in university libraries in Kenya for development and management of IRs?
2. What strategies are university libraries in Kenya using to ensure well developed and managed IRs?
3. What challenges are affecting development and management of IRs in university libraries in Kenya?

1.7 Significance of the Study

The findings of this study have contributed new knowledge on the existing research outputs that have been conducted in this field. This may benefit the selected libraries in improving the quality of their institutional repositories so as to meet the changing needs in scholarly communication. This study may also benefit planners and developers of IRs at the selected libraries as the study has provided various strategies that can be used to ensure continuous development and management of IRs. The study has also identified challenges encountered in development and management of IRs at the selected libraries thus benefiting developers and users by consequently recommending solutions to the challenges.

The scholarly community which includes students, faculty and researchers may also benefit because implementation of the recommendations on this study would ensure well developed and managed IRs at the selected libraries. This would help in ensuring improved scholarly communication thus keeping the scholarly community updated in their areas of interest. Other university libraries in Kenya may also benefit from the study because they can also adopt the recommendations on how to ensure well developed and managed IRs. This would ensure improved development and management of IRs in university libraries in Kenya thus ensuring more publication of local work. This would in turn ensure increased accessibility of research work which is very crucial in development.

1.8 Scope and Limitations of the Study

Although the selected libraries have many other activities that take place, the study only focused on development and management of their IRs. The study also focused on main campus libraries only although the selected libraries may have other libraries in their satellite campuses. The study focused only on library staff who were trained librarians who were crucial in providing adequate information required for this study. Some of the limitations that the researcher encountered included lack of cooperation from the respondents. The researcher also had no control over the way the respondents completed the questionnaires after they were administered to them.

1.9 Theoretical and Conceptual Framework

1.9.1 Theoretical Framework

The study used Rogers' (2003) Diffusion of Innovations (DOI) theory for theoretical framework. The main focus of DOI theory is the innovation adoption process as well as factors that affect the rate at which an innovation is adopted. IR as an information resource is in this study perceived as an innovation. An innovation should be continuously developed and managed to cater for needs that are ever changing. It is therefore crucial for university libraries in Kenya to continuously develop and manage their IRs. This is in order to meet the changing needs of modern scholarly communication. This will in turn ensure that IR is appreciated more by scholars as an innovative information resource. It is therefore crucial for university libraries in Kenya to understand about resources and strategies necessary in development and management of IRs as an innovation. They also need to know about challenges encountered in development and management of IRs. With this knowledge, it will be possible for university libraries in Kenya to continuously develop and manage their IRs as an innovation in order to meet the changing needs of modern scholarly communication. This will in turn ensure an increase in the adoption rate of IRs among scholars thus making this innovation in scholarly communication successful.

1.9.2 Conceptual Framework

The central research question of this study was on development and management of IRs in selected university libraries in Kenya. The study focused on resources and strategies in development and management of IRs, and challenges encountered in development

and management of IRs as independent variables while development and management of IRs was the dependent variable. The conceptual framework is as shown in Figure 1.1

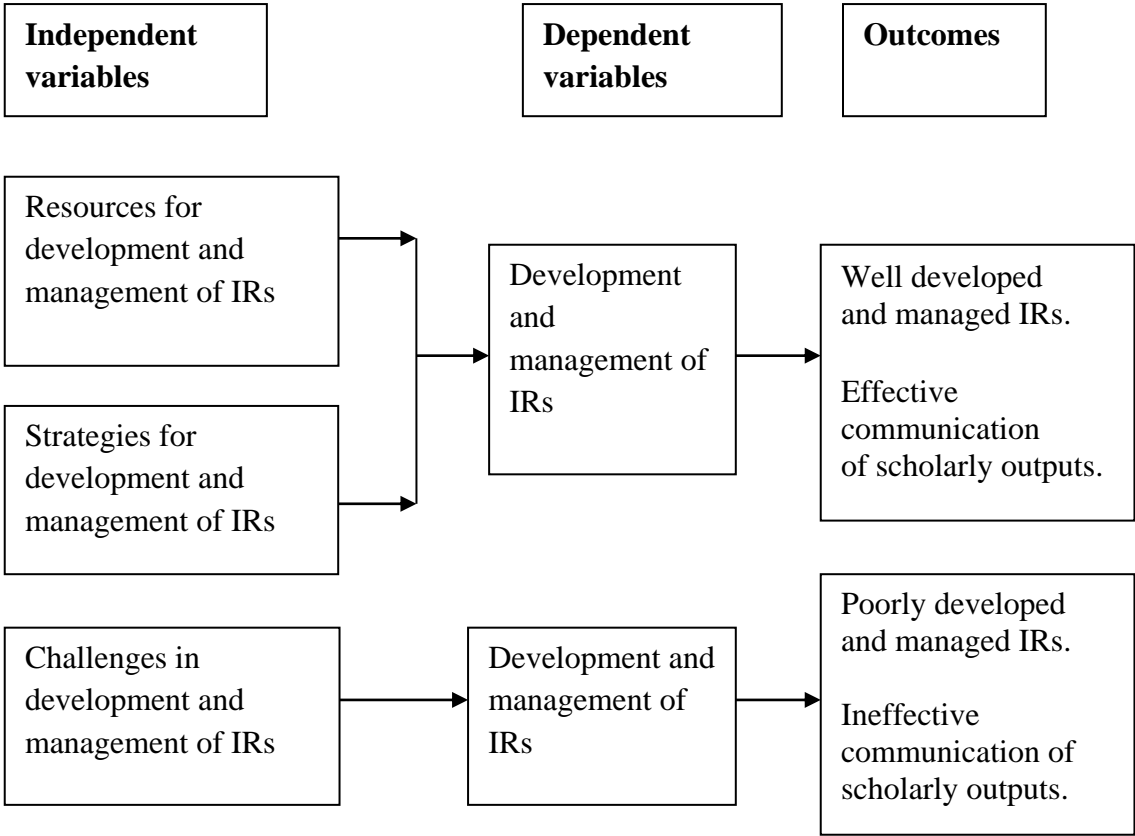


Figure 1.1: Conceptual Framework Model
Source: Researcher (2016).

The relationship between independent and dependent variables resulting to some outcomes is as discussed below;

(i) Resources for development and management of IRs

Resources in development and management of IRs may refer to money, materials, staff, space and other technological facilities provided by an institution to ensure effectiveness and success of these processes. In development and management of IRs, university libraries should have adequate resources which are necessary in ensuring that these processes are successful. Availability of resources will ensure that IRs in university libraries are well developed and managed thus meeting the changing needs of scholarly communication. On the other hand, unavailability of resources necessary in development and management of IRs will lead to slowed development and management of IRs thus hindering effective communication of scholarly outputs.

(ii) Strategies for development and management of IRs

A strategy is a plan of action designed to assist in achieving individual or institutional goals. Development and management of an IR requires appropriate strategies. This is to ensure well developed and managed IRs that are able to meet information needs of users as well as help an institution in disseminating their research work to a wide audience without or with minimal barriers. Setting good strategies in development and management of an IR will ensure institutions are successful in disseminating their research outputs to their scholarly communities in order to meet their research and academic needs. Lack of strategies or poor strategies in development and management of an IR will on the other hand lead to failure in development and management of IRs in

academic institutions leading to low publication of research work generated in these institutions.

(iii) Challenges in development and management of IRs

Challenges in development and management of IRs lead to slow or lack of development of IRs. This is because they act as hindrances to any plans meant to come up with an effective and efficient IR. This in turn affects publication of research output being created in any particular institution. It leads to low or lack of dissemination of research work to the scholarly community who are meant to use these materials.

(iv) Dependent variable

Successful development and management of IRs will greatly depend on strategies and resources put in place by the university libraries. Challenges encountered will also affect the success of these processes. Appropriate strategies and adequate resources will ensure successful development and management of IRs in the university libraries. On the other hand, lack of appropriate strategies and inadequate resources will lead to lack or slowed development and management of IRs. Challenges in development and management of IRs will hinder effectiveness and success of these processes. However, curbing of challenges encountered in development and management of IRs will help in ensuring successful and continuous development and management of IRs. Successful development and management of IRs will in turn ensure effective communication of scholarly outputs. Lack or slowed development and management of IRs will on the other hand lead to ineffectiveness in communication of scholarly outputs.

Outcomes

Availability of adequate resources and appropriate strategies for development and management of IRs will lead to well developed and managed IRs that are effective in communication of scholarly outputs of any given university. Curbing of challenges that hinder development and management of IRs through various ways will also lead to improved development and management of IRs in universities thus ensuring that they meet the changing needs of scholarly communication. On the contrary, unavailability of adequate resources, inappropriate strategies, and failure to provide solutions to the challenges that hinder development and management of IRs will lead to slowed development and management of IRs. This will in turn affect scholarly communication negatively because existing IRs will not be adequate in addressing the changing needs of scholarly communication.

1.10 Operational Definition of Terms

Development in this study refers to the process of continuously improving IRs in order to meet the changing needs of scholarly communication.

Dspace is an open source software used to create IRs that are open access for scholarly and other published digital content.

Institutional repository (IR) is an online archive that helps in collecting, preserving and communication of scholarly outputs of an institution.

Management in this study refers to organization and coordination of activities such as gathering and uploading of research materials aimed at ensuring that IRs meets scholarly communication needs.

Scholarly communication is the process of publishing of research outputs by academics, scholars and researchers so that the wider academic community can have access to them.

Scholarly community in this study refers to persons involved in research and other academic work in order to gain knowledge in their areas of interest.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter contains an overview of the relevant literature on development and management of IRs in university libraries. The chapter has explored development and management of IRs in university libraries as per the objectives of this study as follows: resources for development and management of IRs, strategies for development and management of IRs, and challenges in development and management of IRs. This chapter also contains the summary of the literature review and the research gap.

2.2 Resources for Development and Management of IRs

Development and management of IRs calls for investment in terms of digitization equipment, computer servers, well developed information retrieval capabilities through the use of well developed network infrastructure. These processes also calls for acquisition of electronic information resources and retraining of library staff on skills required for development and management of IRs. With the continuous development in technology, regular funds will also be necessary for upgrading the digital infrastructure (Mutula, 2002; Jain, 2006).

Digitization of materials and setting up IRs in many African countries has faced serious challenges in terms of availability of resources necessary in development and management of IRs. These challenges ranges from low internet connectivity, software and hardware problems, unavailability of highly skilled personnel, inadequate supply of

power, low bandwidth and funding among others (Ezeani & Ezema, 2011; Mbambo-Thata, 2007; Rosenberg, 2006; Sibanda, 2007). Chiware (2007) also identified training of librarians for digital era as another challenge in building of IRs in Africa. According to Chiware, most librarians who are crucial in the digitization of local contents have not yet acquired the necessary training in order to obtain the required skills for IR development and management.

Training on these librarians should focus on awareness of digital projects, the tools and resources for creating digital collections, development and management of collection and the marketing of digital resources. For instance, a study by Christian (2008), found out that the major problems facing development and management of IRs in Nigerian universities in terms of resources are poor funding, poor ICT infrastructure, irregular supply of power in the country, lack of adequate software for IR and low bandwidth in these universities. All these are slowing the continuous development and management of IRs in universities in the country as well as other developing countries.

Development and management of IRs also calls for adequate space for the facilities and staff required for these processes. There is need for information service providers to seriously consider the nature of space required to support research and publishing of scholarly outputs. Good and well planned space in libraries and other information centres enables information providers fulfill their mission of providing information services and supporting dissemination of research work (McDonald, 2003). Commission for University Education (2012) has also emphasized that university

libraries should have adequate space for computers, equipments necessary in provision of information services as well as staff working space.

However, despite the need to have adequate space for the success of development and management of IRs, this has not been the case in developing countries. For instance, a study conducted in Nigerian university libraries by Iwhiwhu & Eyekpegaha (2009), shows that inadequate space to accommodate ICT facilities is one of the problems hindering digitization which is crucial for preservation and dissemination of scholarly outputs.

Literature on resources necessary for development and management of IRs is important to this study because it has shown how availability of resources necessary for development and management of IRs affect these processes. This is of importance to university libraries in Kenya in their continuous development and management of their IRs. This is because they are able to learn on what resources to put in place in order to ensure successful development and management of their IRs to meet the changing needs of scholarly communication. However, this literature has not covered on availability of resources necessary for development and management of IRs in university libraries in Kenya hence the need for further investigation through this study.

2.3 Strategies for Development and Management of IRs

a) Soliciting for management support

IR development successes have long been perceived to be dependent upon the commitment of management. Senior management commitment and support are considered to be the most important factors in planning, development, implementation and adoption of IR projects. In addition, commitment and support of IR projects impact on the institutions' effectiveness in transforming information technology investments into useful outputs. First and foremost, senior management has to ensure that the constant flow of resources is adequate and timely. Finally, senior management creates positive attitudes among other managers and users towards any IR project (Nabe, 2010). These two ensure sustainability of the IR and inspire users to adopt the new innovation. Lack of management commitment and support, on the other hand, could result in deliberate resistance by the developers and users, which might result in the abandonment of the IR project.

b) Ensuring effective communication

For successful development and management of IRs, institutions have to play a great role in fostering excellent communication among all individuals involved in the development and management process, particularly among staff, analysts, and users. The only way to ensure successful implementation of the eventual system is through meaningful communication among analysts, users and managers due to different interests and expectations from the system. Effective channels of communication should

exist to overcome any differences. Negotiation clearly recognizes the durability of the differences and achieves solutions through bargaining. Organizations should encourage effective communication between stakeholders that is managers, IR developers, and users throughout the systems development and management process (Makori, Njiraine & Talam, 2015).

c) Ensuring continuous education and training

Digital projects in African higher education have been facing major challenges which are the readiness in terms of skills and knowledge to implement the digital and electronic services (Chiwere, 2007). According to Rosenberg (2006), African university libraries are lacking skills in areas such as e-resources management, e-services development, full text digitization as well as teaching skills. African institutions of higher learning need to train on design, implementation and management of digital projects and electronic library services (Bawden, Vilar & Zabukovec, 2005). According to Chiwera (2007), training must cover nearly all aspect ranging from understanding the current state of affairs in Africa, to the skills and techniques required for implementing and managing digital collections. The author further points out that, processes of collection development and management as well as making digital collections accessible to the academic and research communities should be covered in the training. It is important that management in African university libraries come up with sustainable solutions to training given the pace of developments in digital library projects and provision of electronic information services on the African continent.

d) Allocation of responsibilities

Most IR projects today are the result of collective action, and the problem of identifying responsibilities for each person can be challenging. When technical problems concerning the system arise, the identification of who is responsible is obscured. Moreover, how and where the problems or errors within the IR in case of any, is often very difficult to identify. To be able to openly address all issues concerning development and management of IRs, management of institutions need to allocate and assign tasks and assignment of responsibilities among the members of the IR project team. Institutions should also be in charge of restructuring roles and responsibilities according to skills and performance. For instance, Macha & De Jager (2011) found out that, in order for the University of Cape Town to accommodate the change brought about by the IR, the library management restructured roles and responsibilities of the staff. Institutions should also hire new staff for new roles in case the existing staff lack the required skills in order to ensure continuous development and management of their IRs.

e) Marketing and promotion

Marketing and promotion are also essential activities for IR development that librarians must carry out (Horwood, Sullivan, Young & Garner, 2004; Bailey, 2005; Bell, Foster & Gibbons, 2005; Jenkins, Breakstone & Hixson, 2005; Phillips, Carr & Teal, 2005). It is the responsibility of librarians to develop IRs, both by recruiting content and by making IRs as attractive as possible to faculty members (Bell, Foster & Gibbons, 2005). Marketing and promotion strategies lead to continued development, growth and usage

of the repository. Marketing and promotion for IRs is also a solution for recruitment of content although there is no much information on how to effectively market IRs (Gierveld, 2006). Informational brochures and flyers, presentations to faculty groups and use of personal academic connections are some of the common marketing activities (Fortier & Laws, 2014).

Literature on strategies for development and management of IRs is of great importance to this study as it has clearly shown how the various strategies positively impact on development and management of IRs. This is useful to university libraries in Kenya because they are able to know what strategies are used in order to ensure successful and continuous development and management of their IRs. However, the literature has not covered on strategies used in university libraries in Kenya hence the need for this study.

2.4 Challenges in Development and Management of IRs

a) Cost

According to Pickton & Barwick (2006), the initial financial cost of acquiring IR open source software preferred by most institutions is not high but the costs for ongoing development and management may be high and may in turn hinder an IR project from going beyond the proposal stage. These costs in many cases hinder the continuous development and management of IRs in institutions. As a result, university libraries have remained slow in upholding the continuous development and management of IRs which is necessary due to the changing needs in scholarly communication.

b) Problems in content generation

There can be undisputable problems in generation of content. Often, there is unwillingness or laziness among academics to deposit their research outputs in the IR. The frustration caused by reluctance of researchers in depositing their research outputs in IRs made ePrints pioneer Stephen Harnad a dedicated promoter for the establishment of self-archiving mandates. Through experiences, it has been realized that the only way IRs will function to their maximum capacity is by putting in place a mandate to populate it. However, the truth is that there is a likelihood of negative reaction among researchers towards any suggestion of compulsion. There is resistance among most faculties to respond to the invitations to deposit their research outputs in the IR (Bankier & Perciali, 2008; Harnad, 2009).

According to Chan (2009), lack of policies for institutional repositories and mandatory requirements, failure to motivate faculty members and researchers and having low priority for them are some of the challenges that have contributed to the low deposit rates. Some universities and institutes such as Hong Kong and Harvard universities have implemented systems for mandatory research depository. Major research universities may be ahead in populating their IRs but for many others, IRs continue to be deserted (Gardner, 2008). This is the greatest hindrance to successful development of IRs. This problem can however be solved through mandatory self-archiving policies. However, a comprehensive implementation of these kinds of policies is also a big challenge (Xia, 2009; Pickton & Barwick, 2006).

c) Challenges in getting sustainable support and commitment

According to Pickton & Barwick (2006), it is often very challenging to gain sustainable support and commitment from the faculty members and management. This acts as a hindrance to the required continuous development and management of IRs to ensure that they meet the changing needs of scholarly communication all over institutions.

d) Copyright management issues

In many cases, scholars are worried of violating publishers' copyright and have inadequate knowledge of their own rights on intellectual properties. Publishers see IRs as potential barriers and threats to their businesses and misunderstand them which have led to introduction of policies that lead to evasion if not opposition towards IRs. As a result, researchers may be hesitant to make online availability of their pre-published work before or even after a traditional publisher has published it (Pickton & Barwick, 2006; Doctor & Ramachandran, 2007; Davis & Connolly, 2007). Fear of infringing publisher copyright has therefore made researchers slow in making their research work available in IRs. Publication of Scholarly work using an IR is a paradigm shift from traditional methods of publishing and therefore, management of issues regarding intellectual properties must evolve as well.

e) Working culture and policy issues

Hard pressed academics can perceive content contribution to sites that are user-generated or self-service as too taxing and time consuming. They may be willing to make their research content available in the IR but reluctant to do it themselves.

According to Pickton & Barwick (2006), this calls for mediated deposit services. However, for self-archiving to become a routine and part of the academic normal behavior, it is likely to take some time, continuous encouragement and policies mandating scholars to deposit their research outputs in IRs. To establish a mediated deposit service that is permanent and reliable and perhaps based at the library is also likely to take some time. This is especially if the mandate is given to existing staff in addition to their other duties. Also, policies established to ensure submissions of high quality constrain the success of IR but to some administrators, quality assurance is of great importance (Pickton & Barwick, 2006; Harnad, 2009).

f) Lack of incentives

Academics can lack enough motivation which is likely to hinder them from providing even bibliographic information of their research outputs especially when there is no any specific financial incentive. This is more likely to happen when they realize that scholars in other institutions receive incentives for their scholarly outputs. The argument by academic may be that the main and core mission of the university is to promote research and scholarship. Therefore, it is of less importance to most academic to make their scholarly outputs publicly available by archiving them in the IRs. The behavior of faculty members and motivation are in line with the main and core mission as opposed to the secondary one. The argument by faculties is that they should be given incentives for depositing their research outputs in IRs (Bankier & Perciali, 2008; Davis & Connolly, 2007). Therefore, this calls for incentives to encourage faculty members in institutions of higher learning to publish their research work in the IRs.

g) Respectability issues

Studies have found out that scholars believe that their research outputs may fail to achieve the kind of recognition they merit if they are published through an IR (Davis & Connolly, 2007; Royster, 2008). This perception has made researchers slow in making their research outputs available for IRs. Therefore, this calls for clarification and reassurance concerning the term “publishing”. For instance, the main aim of an E-print repository is to ensure that findings from researches are made available to serve as supplement to journal articles appearing in peer reviewed quality publications.

h) Time and labor factors

According to Robinson (2009) and Chan (2009), in-house development and management of IRs requires a lot of time and intensive labor which calls for long term and sustainable efforts. These factors hinder successful development and management of IRs in institutions of higher learning.

i) Benefits of IRs are not marketed and appreciated

Previous studies note that benefits of IRs are not well appreciated by majority of institutions of higher learning and faculty members because these benefits are not properly marketed (Chan, 2009). This has led to slowed development and management of IRs in institutions of higher learning. Therefore, this call for awareness creation on the benefits that accrue from a well developed and managed IR.

j) Technical challenge

Development and management of IRs faces many technical challenges. This is especially when ICT expertise is inadequate or sourced from a local (IT) department that is already stretched. These challenges may include issues of redesigning open-source systems, software compatibility, formatting of documents into the most appropriate and long-term formats and providing adequate and appropriate training to authors and all other stakeholders among other issues. It is also a challenge for some to move to electronic format which requires an investment in terms of training in order to be able to move from the traditional print format to electronic format (Jain, 2011).

k) Promotional challenge

Most of the academic particularly in developing countries are comparatively new to IRs. Promoting the benefits that IRs offer is therefore a challenge. However, for successful development and management of IRs, continuous promotion and marketing is crucial. Winning academia and senior management support is specifically of great importance. Scholars and administrators are yet to come to terms with the idea of making the university's scholarly outputs accessible and available to the entire university community (Westell, 2006). Technical implementation of the IR is therefore not the real challenge but rather the change of culture to help in ensuring that the IR is embraced and appreciated by the researchers (Chan, Kwok & Yip, 2005).

Literature on challenges encountered in development and management of IRs is important to this study as it has shown how the various challenges negatively affect the success of continuous development and management of IRs. This knowledge is useful to university libraries in Kenya as they are able to put these challenges into consideration while planning for continuous development and management of their IRs. This is in order to come up with solutions that can help in curbing these challenges and ensure successful development and management of IRs. However, this literature has not covered on challenges experienced in development and management of IRs in university libraries in Kenya and hence the need for this study.

2.5 Summary of the Literature Review and the Research Gap

This chapter has highlighted studies on development and management of IRs. The available literature has mostly provided a general overview on resources for development and management of IRs, strategies for development and management of IRs and challenges in development and management of IRs. The available literature however has not adequately covered development and management of IRs in university libraries in Kenya. This study is therefore crucial in order to provide adequate information on development and management of IRs in university libraries in Kenya with reference to the selected libraries guided by the various objectives of this study.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter presents the research methods that were used to collect and analyze data in accordance to the objectives of the study on development and management of IRs in selected university libraries in Kenya. The sections in this chapter are in the following order: research design, study locale, target population, sampling method/procedures, sample size, research instruments, validity and reliability, data collection procedure, data analysis and presentation and ethical considerations.

3.2 Research Design

The researcher used a cross-sectional, descriptive survey research design. This research design is suitable because it makes it possible to collect data from several individuals at one point in time. Using this method, the researcher was able to collect data from the library staff of the selected university libraries on the agreed day and time. This research design enabled the researcher to collect original data that was crucial in providing answers to the questions in this study. Descriptive survey design is useful in describing a situation, problem, phenomenon, service or programme as well as providing information about a population. This design was therefore suitable for this study as it helped in describing the current status of development and management of IRs in the selected university libraries. Quantitative and qualitative approaches were applied to collect data relevant to the study.

3.3 Study Locale

The research was carried out in two selected university libraries in Kenya. These were JKUAT and USIU-A libraries. JKUAT is situated in Juja, 36 kilometres North East of Nairobi, along Nairobi-Thika highway. USIU-A is located in the Kasarani area, off Thika road in the suburb of Nairobi. The reason for choosing JKUAT and USIU-A libraries as a representative of both public and private university libraries in Kenya was because JKUAT and USIU-A are among the oldest and well established universities in the republic. Another reason for choosing the two institutions was because they had already started IRs.

3.4 Target Population

The target population for this study was JKUAT and USIU-A library staff and their chief librarians. These were people who were trained librarians and were knowledgeable in areas relating to library services and operations. JKUAT library had 34 members of staff and the chief librarian. The researcher got this information from the library website. USIU-A library had 25 members of staff and the chief librarian. This information was gathered from the library website. The total targeted population was therefore 61 respondents.

3.5 Sampling Method/Procedures

The chief librarians from the two selected libraries were purposively selected (non-probability sampling). The two were considered to be key informants in this study who possessed special and crucial information and knowledge regarding the area under study

since they were the chief librarians in their institutions. They were also professionally trained and had adequate experience in library environments. Being part of their universities' management, they were also involved in policy and decision making regarding the running of their universities. As a result, the chief librarians were therefore better positioned to provide relevant and adequate information regarding development and management of IRs in their libraries.

For the library staff from the selected libraries, the researcher used census method. This method occurs where the entire population is too small or for some reasons it is reasonable to include the entire population. In this method, data is collected from every member of a population. This method was therefore suitable for this study as the target population from both libraries was small. It was therefore reasonable to involve all library staff at the two selected libraries who were trained librarians in order to gather adequate information necessary for this study. They were also likely to provide useful information regarding development and management of IRs in their libraries in order to meet the objectives of this study.

3.6 Sample Size

JKUAT library had 35 members of staff including the chief librarian while USIU-A library had 26 members of staff including the chief librarian. The researcher involved all the library staff in order to gather adequate data to help in answering the research questions. The size of the study sample was therefore 59 library staff and the 2 chief librarians. Therefore, the total sample size was 61 subjects as shown in Table 3.1.

Table 3.1: Target Population and Sample Size

University	Library Staff	Chief Librarian	Total	%
JKUAT	34	1	35	57.4
USIU-A	25	1	26	42.6
Total	59	2	61	100

Source: Field Data (2017).

3.7 Research Instruments

Data collection was done using two instruments, namely questionnaire for the library staff and interview guide for the chief librarians in order to achieve the objectives of this study.

3.7.1 Questionnaire for Library Staff (Appendix II)

The questionnaire was designed according to the objectives of this study. The questionnaire included both open and closed ended questions to ensure adequate data was gathered. The questionnaire for library staff from the two selected libraries had similar questions. This was to ensure data was provided in the same format for better analysis. Some questions were in Likert scale format in which the respondents were limited to the stated alternatives. At the end of some questions, there were open ended questions stating ‘others’ to invite more information from respondents regarding the areas covered by these questions. The reason for choosing a questionnaire was because it was ideal for collecting data from a large number of respondents. It was also

economical in terms of cost and time required for administration. Data collected through questionnaires was also easy and quick to analyze using a software package.

3.7.2 Interview Schedule for Chief Librarians (Appendix III)

The researcher also developed an interview guide based on a set of pre-determined questions that was used to collect data from the two chief librarians. The interview schedule had questions that had been consistently set according to the research objectives. The interview schedule contained open-ended questions. This was in order to gather more information from the chief librarians regarding development and management of IRs in their libraries. This instrument was important in this study because it had a set of questions which ensured that the interviewer did not deviate from the main study. This ensured consistency in collecting data from the two chief librarians. The interview guide was useful in this study as it gave informants the freedom to express their views and opinions in their own terms. This instrument was also able to provide adequate and reliable qualitative data.

3.8 Validity and Reliability

3.8.1 Pilot Study

For pretesting of the research instruments, a pilot study was conducted at Kenyatta University Postmodern Library which is one of the university libraries in Kenya that has developed IR. This made it similar in many ways with the selected libraries in this study thus making it suitable for the pilot study. The researcher targeted 11 respondents for the pilot study. These included the chief librarian and 10 library staff. The reason for

targeting 11 respondents for the pilot study was because the minimum number of respondents for a pilot study that Saunders, Lewis & Thornhill (2003) have suggested is 10 thus making 11 respondents justified for this study.

The pilot study helped the researcher in identifying any necessary changes and improvements on the research instruments. This was to ensure that all questions contained in the instruments were clear to all respondents. This in turn ensured that the respondents gave the right responses as per the instructions in order to gather relevant and adequate data.

3.8.2 Validity

Validity can be defined as the accuracy and meaningfulness of conclusions based on the research results derived from a research. It can also be said to be the extent to which results obtained from analysis of the data collected actually represent the case under study. The pilot study helped in ensuring the validity of the research results. Before administering the instruments to the respondents, the researcher gave them to the supervisor for verification. This helped in making any necessary corrections on the instruments in order to ensure the validity of data collected. The questionnaire was also given to the experts in the area of study to verify its content validity.

3.8.3 Reliability

Reliability is the measure of extent to which the research instrument yield consistent results over time or repeated trials. Reliability of data collected is very important and

the researcher therefore ensured this by carrying out a pilot study. To ensure reliability of the data collection instruments, the researcher used test retest method. The researcher carried out a pilot study and after one week administered the same research instruments to the same respondents involved in the initial pilot study. The correlation coefficient between the two sets of data was then calculated using Spearman's rank order coefficient formula. Using this formula, the coefficient attained was 0.78. According to Orodho (2009), an instrument is considered reliable if the calculated correlation coefficient is 0.75 or above. The reliability coefficient obtained from the pilot study was therefore accepted as it attained a coefficient which the researcher considered reasonable based on Orodho (2009).

3.9 Data Collection Procedure

To ensure convenient time for all the library staff, the researcher booked an appointment with the library staff through the chief librarians. The researcher also booked an appointment with the chief librarians for the interviews. An introductory letter was attached to the questionnaire requesting for the respondents' participation in the study and also explained the nature of the study. The questionnaires were then hand delivered by the researcher to the library staff at the selected libraries on the agreed day and time. The respondents were given time to complete the questionnaires. The researcher however set a date for collection of the questionnaires from the library staff in both libraries.

The researcher conducted the interview face to face with the two chief librarians in their respective libraries on the agreed day and time. Interview schedule was used to guide the researcher in asking the questions. To ensure consistency in the answers from the two chief librarians the researcher asked the questions systematically as they appeared on the interview schedule. This ensured better and easy analysis of the data as well as comparison. The researcher also recorded responses from the respondents in a note book exactly as expressed by them.

3.10 Data Analysis and Presentation

Quantitative data collected using questionnaires was analyzed using descriptive statistics such as frequency and percentage so as to provide answers to the research questions. The researcher used SPSS software to facilitate analysis of data. Quantitative data was then presented in textual form, tables, bar graphs, and pie charts. In the analysis of qualitative data collected using the interviews, all responses were organized and classified in order to generate themes and categories from the responses. The data was then presented in textual form.

3.11 Logistical and Ethical Considerations

The researcher first of all acquired a research permit from the National Commission for Science, Technology and Innovation (NACOSTI). The researcher then sought permission from the library management of the selected libraries to be allowed to collect data from the library staff. To take care of research ethics, the researcher assured the respondents that their responses to the research questions would be treated with total

confidentiality and would be used solely for the purpose of this study. The respondents were treated with a lot of integrity to avoid hurting any of them. The researcher did her best to understand these respondents and their varying personalities. To ensure competency in the study, the researcher conducted the study with utmost care to facilitate adequate and up to date results. The researcher also ensured that data was carefully analyzed and presented to avoid careless errors and negligence. Honesty was also vital in this study. The researcher honestly analyzed data as received from the respondents without any alteration unless there were any careless mistakes.

CHAPTER FOUR

PRESENTATION OF FINDINGS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter contains the findings, interpretation and discussion in accordance to the objectives of this study. Presentation of the findings was done using tables, bar graphs, pie charts and text guided by the research objectives. Analysis of quantitative data was done using descriptive statistics which included percentages and frequencies while qualitative data was analyzed in textual form.

4.2 General and Demographic Information

4.2.1 Response Rate

The sample size for this study as explained in chapter three was 59 library staff and 2 chief librarians from the selected university libraries. This is as shown in Table 4.1.

Table 4.1: Response Rate

Name of university library	Target sample size	Actual response	Response rate in %
JKUAT	34	34	57.6
USIU-A	25	25	42.4
Total	59	59	100

Source: Field Data (2017).

The researcher had distributed 59 questionnaires to library staff. All the questionnaires were filled and collected on the agreed day. This provided a 100 percent response rate thus making it suitable for making informed conclusions and generalizations. However, the researcher faced challenges on the areas with open-ended questions where majority of the respondents opted to leave the sections blank. Some respondents were also uncooperative.

In addition, the researcher was able to reach the two targeted chief librarians for interviews thus providing a 100 percent response rate. This made it possible for the researcher to gather more accurate and reliable data necessary in meeting the objectives of this study.

4.2.2 Demographic Information

The researcher found it necessary to gather data on the demographic details of the respondents. This is because such data could bring some new insight regarding this

study when analyzed and interpreted. Demographic information is also crucial as it saves the researcher from making unnecessary assumptions regarding the respondents when carrying out the study. The demographic information that the researcher obtained during data collection is as follows:

a) Gender of the Respondents

The researcher found it necessary to include gender of the respondents. This is because gender is a key characteristic in describing the respondents. The results are presented in Table 4.2.

Table 4.2: Gender of the Respondents

Gender	Frequency	Percentage
Male	33	55.9
Female	26	44.1
Total	59	100

Source: Field Data (2017).

From Table 4.2, it is clear that majority of the respondents were male. They specifically comprised a total of 55.9 percent while female respondents were only 44.1 percent. This could be attributed to the issue of gender inequality which has always been a challenge in many sectors in Kenya. A study by USAID (2017), found out that Kenyan women are still under represented in decision making positions. When we come to education, land and employment, they have less access as compared to men. It is therefore not

surprising to find male respondents constituting the highest percentage of the respondents in this study.

b) Age Category of the Respondents

The researcher also found it necessary to include age category of the respondents. This is because it is also a key characteristic in describing the respondents. Table 4.3 shows the results.

Table 4.3: Age Category of the Respondents

Age category in years	Frequency	Percentage
21-30	20	33.9
31-40	21	35.6
41-50	12	20.3
51-60	6	10.2
Total	59	100

Source: Field Data (2017).

Results in Table 4.3 show that majority of the respondents fell under the age category of 21-40 making a total of 41 of all the respondents which is 69.5 percent and the least were those in the age category of 41-60 who comprised a total of 30.5 percent. However, it is clear that all the age categories were represented which is a commendable thing since it is good to employ from diverse age categories. This is because people at different age categories have different abilities, experiences and are talented differently thus ensuring that institutions run smoothly.

c) Respondents' Educational Level

The researcher found it important to include the educational level of the respondents. This is because educational level is equally a key aspect in describing the respondents. This information is as shown in Figure 4.1.

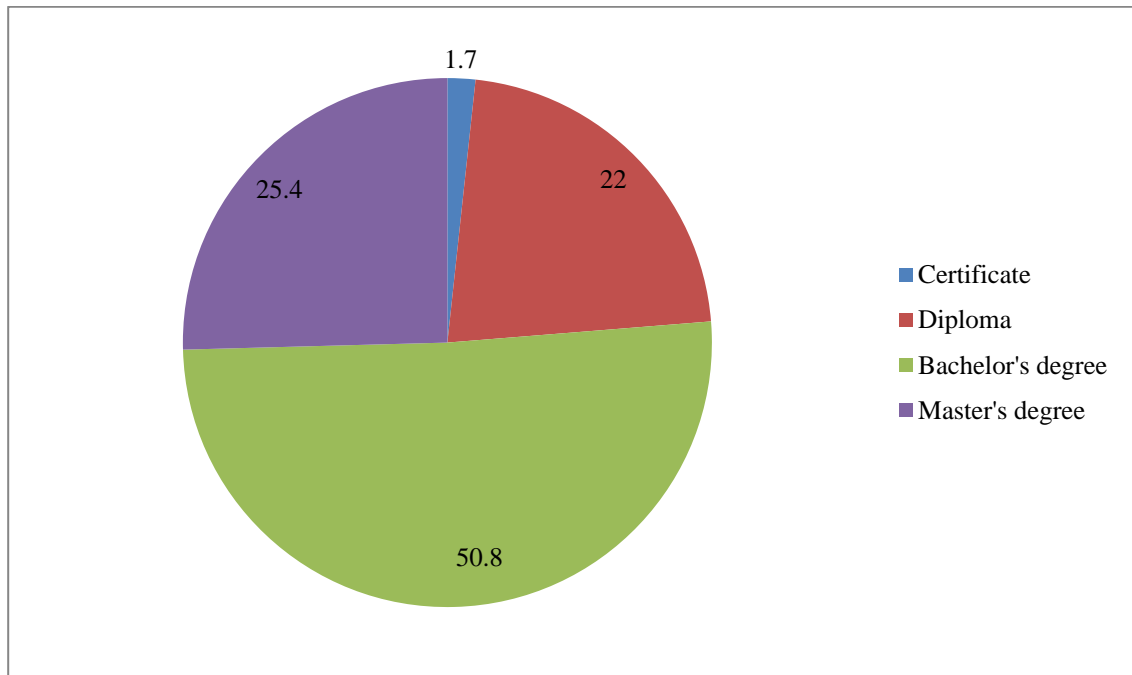


Figure 4.1: Educational Level of the Respondents
Source: Field Data (2017).

From Figure 4.1, it is clear that library staff from the selected university libraries had different educational qualifications. Respondents with bachelor's degree were the majority forming a total of 50.8 percent. Respondents with master's degree accounted for 25.4 percent. Diploma holders constituted 22 percent and the least were those with certificate who comprised 1.7 percent. This is a good move in university libraries in hiring more library staff with high academic qualifications. This is important because for university libraries to be successful in ensuring well developed and managed IRs, they should have staff who are highly qualified. It is therefore important that all

librarians take it upon themselves to advance their academic qualifications in order to be better information providers.

4.3 Resources for Development and Management of an IR

Objective one of the study was to establish what resources were available in university libraries in Kenya for development and management of IRs. Respondents were provided with a number of statements regarding resources for development and management of the IRs in their libraries. The responses are as shown in Table 4.4.

Table 4.4: Resources for Development and Management of an IR

Resources		Strongly disagree 1		Disagree 2		Not sure 3		Agree 4		Strongly agree 5	
		Fr	%	Fr	%	Fr	%	Fr	%	Fr	%
1	Library has adequate staff for development and management of the IR	6	10.2	20	33.9	4	6.8	23	39.0	6	10.2
2	Library staff are adequately trained for development and management of the IR	6	10.2	20	33.9	4	6.8	27	45.8	2	3.4
3	Library has adequate space for technological facilities for development and management of the IR	5	8.5	17	28.8	3	5.1	29	49.2	5	8.5
4	Library has adequate computers and scanners for development and management of the IR	8	13.6	19	32.2	2	3.4	25	42.4	5	8.5
5	Library keeps abreast with the changing technology in terms of hardware and software for development and management of the IR	6	10.2	7	11.9	8	13.6	33	55.9	5	8.5
6	Library has fast and reliable internet connectivity for development and management of the IR	2	3.4	10	16.9	1	1.7	32	54.2	14	23.7
7	Library has reliable power supply for development and management of the IR	3	5.1	2	3.4	2	3.4	37	62.7	15	25.4
8	The university provides adequate funding for development and management of the IR	0.0	0.0	23	39.0	14	23.7	18	30.5	4	6.8

Source: Field Data (2017).

Findings in Table 4.4 show that the number of respondents who agreed and strongly agreed on the adequacy of library staff for development and management of their IRs

combined together were the majority accounting for about 49 percent. Those who either disagreed or strongly disagreed on the adequacy of library staff for development and management of their IRs constituted about 44 percent. The least were those who said they were not sure on the adequacy of library staff for development and management of the IRs in their libraries who constituted about 7 percent. From these findings, it is justified to say that university libraries in Kenya were doing well in terms of ensuring adequate staff for the continuous development and management of their IRs.

However the chief librarians from both universities differed with views from the library staff on the adequacy of staff for development and management of their IRs. Since the chief librarians are the managers in their libraries, it is therefore justified to say that there were no adequate staff for development and management of the IRs in the selected university libraries. This is because the chief librarians are better placed in providing more reliable information regarding development and management of the IRs in their libraries. For successful development and management of IRs, there should be adequate staff. It is therefore necessary for university libraries in Kenya to ensure that they hire adequate staff in order to ensure successful development and management of their IRs.

In addition the study sought to find out if library staff for development and management of the IRs in the selected university libraries were adequately and regularly trained. Table 4.4 shows that the majority who constituted about 49 percent were those who either agreed or strongly agreed that library staff for development and management of the IRs in their libraries were adequately and regularly trained. Those who either

disagreed or strongly disagreed that library staff for development and management of the IRs in their libraries were adequately and regularly trained accounted for about 44 percent. The least number of respondents who constituted about 7 percent were not sure if library staff for development and management of the IRs in their libraries were adequately and regularly trained. It is therefore possible to say that these university libraries were doing well in terms of ensuring that staff for development and management of their IRs were adequately and regularly trained.

On the other hand the chief librarians from the selected university libraries said that library staff were not adequately and regularly trained on development and management of their IRs. This is because they lacked a structured program to handle this. It is therefore justified to say that library staff in the selected university libraries were not adequately and regularly trained on development and management of their IRs. A study by Chiware (2007), found out that training of librarians for digital era in Africa has been a challenge in building of IRs. He says that this has made them lack the required skills for development and management of IRs. It is therefore necessary that university libraries in Kenya come up with structured programs to handle training of staff for development and management of their IRs. This will in turn ensure that development and management of IRs in university libraries in Kenya is successful.

The study further sought to find out if the selected university libraries had adequate space for technological facilities required in development and management of IRs. From Table 4.4, it is clear that the majority who constituted about 58 percent were those

who either agreed or strongly agreed on the adequacy of space for technological facilities required in development and management of IRs in their libraries. Those who either disagreed or strongly disagreed on the adequacy of space for technological facilities required in development and management of IRs in their libraries constituted about 38 percent. The respondents who were not sure on this were the least constituting about 5 percent. It is therefore justified to say that the selected university libraries were doing a commendable job in ensuring that they had adequate space for technological facilities required in development and management of IRs.

In addition the chief librarians from the selected university libraries had different opinions. One of them agreed that they had adequate space while the other said it was not adequate. Going by this information, it is justified to say that some university libraries in Kenya were still having a challenge of space for technological facilities required in development and management of their IRs. According to McDonald (2003), good and well planned space in libraries and other information centres enables information providers fulfill their mission of providing information services and supporting dissemination of research work. Commission for University Education (CUE) (2012), has also emphasized that university libraries should have adequate space for computers, equipments necessary in provision of information services as well as staff working space. For successful development and management of IRs in university libraries in Kenya, it is therefore necessary to ensure that there is adequate space.

This study also sought to find out if the selected university libraries had adequate computers and scanners for development and management of their IRs. Results in Table 4.4 shows that the respondents who either agreed or strongly agreed on adequacy of computers and scanners for development and management of IRs in their libraries were the majority constituting about 51 percent. The respondents who either disagreed or strongly disagreed on adequacy of computers and scanners for development and management of IRs in their libraries accounted for about 46 percent. The least number of respondents who constituted about 3 percent said they were not sure if their libraries had adequate computers and scanners for development and management of their IRs. From this, it is possible to say that these libraries were doing a commendable job in ensuring that they had adequate computers and scanners required in ensuring successful and continuous development and management of their IRs.

The chief librarians from the selected university libraries had different opinions on this. One of them agreed that they had adequate computers and scanners while the other said their library lacked adequate computers and scanners for development and management of their IRs. It is therefore justified to say that some university libraries in Kenya were still suffering from inadequate resources such as computers and scanners which are very crucial in successful development and management of IRs. Previous studies by Mutula (2002) and Jain (2006), acknowledges that development and management of IRs calls for investment in terms of digitization equipment. Therefore, for successful development and management of IRs in university libraries in Kenya, it is necessary

that these libraries acquire adequate technological facilities required in development and management of IRs.

In addition the study sought to find out if the selected university libraries were keeping abreast with the changing technology in terms of hardware and software for development and management of their IRs. The findings in Table 4.4 show that the respondents who either agreed or strongly agreed that their libraries were keeping abreast with the changing technology in terms of hardware and software were the majority constituting about 65 percent. The respondents who either disagreed or strongly disagreed on this constituted about 22 percent. The respondents who said they were not sure if their libraries were keeping abreast with the changing technology in terms of hardware and software for development and management of their IRs were the least who constituted about 14 percent. Going by the majority, it is justified to say that the selected university libraries were doing a good job by ensuring that they were keeping abreast with the changing technology in terms of hardware and software for development and management of their IRs.

The chief librarians from the selected university libraries agreed that their libraries were keeping abreast with the changing technology in terms of hardware and software for development and management of their IRs. They said that their IRs were actually operating on the latest version of Dspace. It is therefore justified to conclude that the selected university libraries were doing a commendable job in ensuring that they kept abreast with the changing technology in terms of hardware and software for

development and management of their IRs. Mutula (2002) and Jain (2006), also concurs that there is continuous development in technology calling for regular upgrading of the digital infrastructure. It is therefore crucial that university libraries in Kenya keep abreast with the changing technology in order to ensure successful and continuous development and management of their IRs.

Development and management of an IR requires fast and reliable internet connectivity. Results in Table 4.4 show that the majority who constituted about 78 percent were those who either agreed or strongly agreed that their libraries had fast and reliable internet connectivity for development and management of their IRs. The respondents who either disagreed or strongly disagreed that their libraries had fast and reliable internet connectivity for development and management of their IRs accounted for about 20 percent. The least number of respondents who comprised about 2 percent said they were not sure if their libraries had fast and reliable internet connectivity. From this information, it is possible to say that the selected university libraries were doing a commendable job in ensuring the success of continuous development and management of their IRs by providing fast and reliable internet connectivity.

The chief librarians from the selected university libraries agreed that their libraries had fast and reliable internet connectivity for development and management of their IRs. This is a good move towards ensuring that development and management of their IRs is successful and continuous. Previous studies by Ezeani & Ezema (2011), Mbambo-Thata (2007), Rosenberg (2006) and Sibanda (2007), had found out that digitization of

materials and setting up of IRs in many African countries has faced serious challenges in terms of availability of resources necessary in development and management of IRs. Low internet connectivity was one of the challenges. It is therefore justified to say that the selected university libraries were doing well since they had fast and reliable internet connectivity for development and management of their IRs. To ensure continuous and successful development and management of their IRs, they should keep up with this which will ensure more and more publication of scholarly outputs.

This study also sought to find out if the selected university libraries had reliable power supply for development and management of their IRs. Table 4.4 shows that the majority who constituted about 88 percent were those who either agreed or strongly agreed that their libraries had reliable power supply for development and management of their IRs. The respondents who either disagreed or strongly disagreed on the reliability of power supply for development and management of their IRs constituted about 8 percent. Those who were not sure if their libraries had reliable power supply for development and management of their IRs were the least constituting about 3 percent. This makes it justified to conclude that these libraries were doing a commendable job by ensuring reliable power supply which is crucial in development and management of IRs.

Information from the chief librarians of the selected university libraries differed on this issue of reliable power supply for development and management of their IRs. One of them said that their library had a reliable power supply while the other said it was not fully reliable and that the library needed a more powerful generator as an alternative

source of power. It is therefore justified to say that some university libraries in Kenya were suffering from unreliable power supply which is a hindrance to successful development and management of IRs. Previous studies by Ezeani and Ezema (2011), Mbambo-Thata (2007), Rosenberg (2006) and Sibanda (2007), had also found out that unreliable power supply in development and management of IRs in university libraries in Africa was a major challenge. Therefore, for successful and continuous development and management of IRs in university libraries in Kenya, there is need to have alternative power supply such as powerful generators in case of failure in the main source of power supply. This will ensure that development and management of IRs in university libraries in Kenya is not interrupted by power failure.

The study further sought to find out if the selected university libraries were adequately funded by their institutions for development and management of their IRs. Findings in Table 4.4 show that the majority who constituted 39 percent disagreed that their libraries were adequately funded by their institutions for development and management of their IRs. The respondents who either agreed or strongly agreed that their libraries were adequately funded by their institutions for development and management of their IRs constituted about 38 percent. The least number of respondents who comprised about 24 percent said they were not sure if their libraries were adequately funded by their institutions for development and management of their IRs. From these findings, it is justified to say that the selected university libraries were not receiving adequate funds from their universities for the continuous development and management of their IRs. This is a setback in the process of ensuring continuous development and management of

IRs in university libraries in Kenya. It is therefore necessary for universities in Kenya to provide adequate funds to their libraries.

The chief librarians from the selected university libraries agreed that their libraries were not receiving adequate funds from their institutions for development and management of their IRs. It is therefore justified to conclude that these university libraries were not adequately funded by their institutions in order to ensure successful and continuous development and management of their IRs. This is a setback because development and management of IRs requires adequate funding. Previous studies by Ezeani and Ezema (2011), Mbambo-Thata (2007), Rosenberg (2006) and Sibanda (2007), had also found inadequate funding as one of the major challenge affecting development and management of IRs in university libraries in Africa. It is therefore important that universities in Kenya offer continuous support to their libraries by providing adequate funds that is a vital resource in successful and continuous development and management of IRs.

The study also sought to find out the challenges that the selected university libraries faced in the availability of resources necessary for development and management of their IRs. The respondents were provided with choices and were allowed to tick more than one. The findings are presented in Table 4.5.

Table 4.5: Challenges in the Availability of Resources Necessary for Development and Management of an IR

Challenges in the availability of resources necessary for development and management of an IR	Frequency	Percentage
Inadequate funding for the necessary resources	30	50.8
Lack of commitment and continued support from university management	18	30.5
Delays in provision of necessary resources	37	62.7
Failure to take development and management of the IR as one of the major priorities	26	44.1
Inadequate planning for development and management of the IR	23	39.0

Source: Field Data (2017).

The results in Table 4.5 show that the most critical challenges that the respondents felt were affecting development and management of IRs in their libraries were delays in provision of necessary resources and inadequate funding for the necessary resources accounting for 62.7 percent and 50.8 percent respectively. The least critical challenges affecting development and management of IRs in the selected university libraries according to these findings were lack of commitment and continued support from their universities' management and inadequate planning for development and management of their IRs which accounted for 30.5 percent and 39 percent respectively.

From the chief librarians, the researcher was able to find out that the selected university libraries faced a number of challenges in the availability of resources for development and management of their IRs. These challenges included inadequate funding for the

necessary resources, lack of appreciation on the importance of the IR by researchers, lack of commitment and continued support from their universities. The other challenge was provision of inadequate resources for development and management of their IRs such as scanners for scanning previous publications in order to be uploaded in the repositories. A study by Jain (2011), acknowledges that challenges act as great obstacles to successful development and management of IRs. It is therefore necessary for university libraries to come up with ways of curbing and minimizing them. This will help in ensuring that development and management of IRs in university libraries in Kenya is successful and continuous.

Some of the suggestions to help in curbing the challenges that the chief librarians and the library staff provided included: provision of adequate funds by the universities for the necessary resources for development and management of their IRs. Marketing of their IRs for them to receive more appreciation from the researchers and management and to gain commitment and continued support from these stakeholders. The respondents also suggested that their institutions should make sure that they provide adequate and quality resources such as scanners to ensure fast and continued scanning of the previous researches in order to be uploaded in the repositories. The other suggestion was that their libraries should solicit for more support from their universities' top management. Making development and management of the IRs one of the major priorities was another suggestion. Proper and adequate planning for development and management of the IRs was also given as a solution. The other suggestion was for the university libraries to invest in the modern technological

infrastructure. Having a team to manage development and management of the IRs in the selected university libraries was also suggested. Training of staff adequately on development and management of the IRs in the selected university libraries was also given as a solution. The final suggestion was for the selected universities to provide resources necessary for development and management of their IRs in a timely manner.

4.4 Strategies for Development and Management of an IR

Objective two of the study was to determine the strategies that university libraries in Kenya were using to ensure well developed and managed IRs. The study first of all sought to find out if the selected university libraries had deposited all the research outputs available from their scholarly communities in their IRs. The respondents were to choose from yes, no and don't know options. The findings are as shown in Figure 4.2.

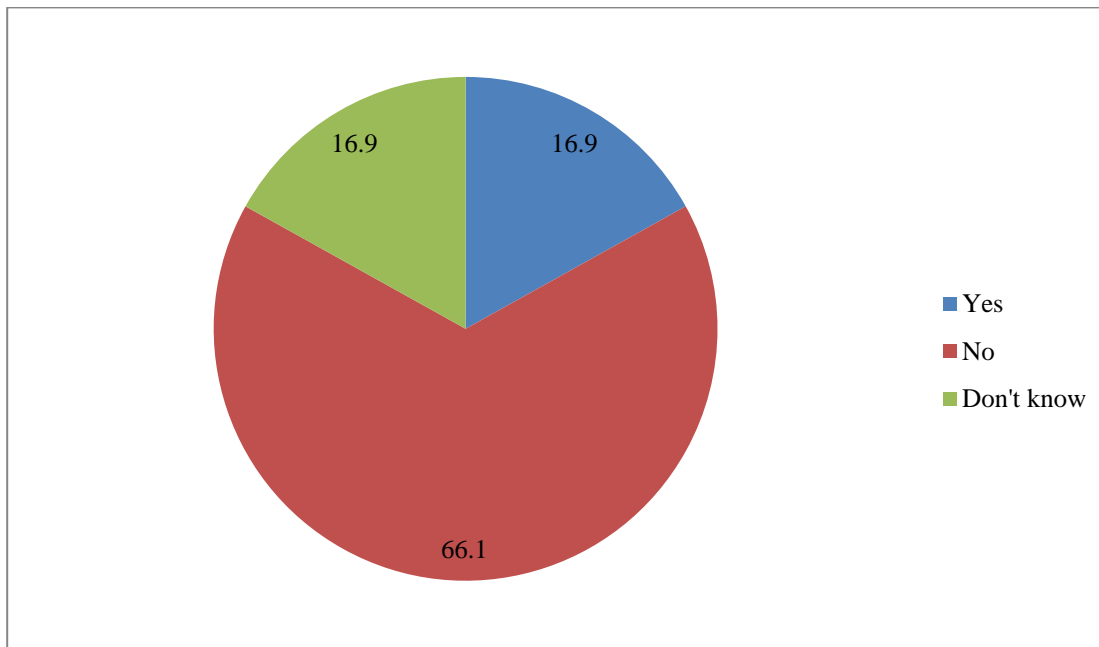


Figure 4.2: Availability of all Research Outputs in the IRs
Source: Field Data (2017).

From Figure 4.2, the percentage of respondents who said that all research outputs from their scholarly communities were available in their IRs was 16.9 percent. Majority which accounted for 66.1 percent said that their libraries had not deposited all research outputs in their IRs. 16.9 percent said they didn't know if their libraries had deposited all the research outputs from their scholarly communities in their IRs.

The chief librarians from the selected university libraries also concurred that their libraries had not deposited all research outputs in their IRs. It is therefore justified to conclude that these university libraries had not deposited all the research outputs from their scholarly communities in their IRs. A study by Ezema (2013), had found out that most of research outputs in university libraries were completed and shelved in their individual university libraries to the extent that it is only very few researchers in the

university community are aware of their existence. This makes these resources less useful to the users they are meant for. For the research outputs to be of great use to the users they are meant for, university libraries in Kenya should therefore make them available by ensuring that they are uploaded in their IRs.

The study also sought to find out the format in which research outputs were uploaded in the IRs of the selected university libraries. The respondents were to choose from full text, abstract, both and others. Majority of the respondents ticked more than one choice.

The findings are as shown in Figure 4.3.

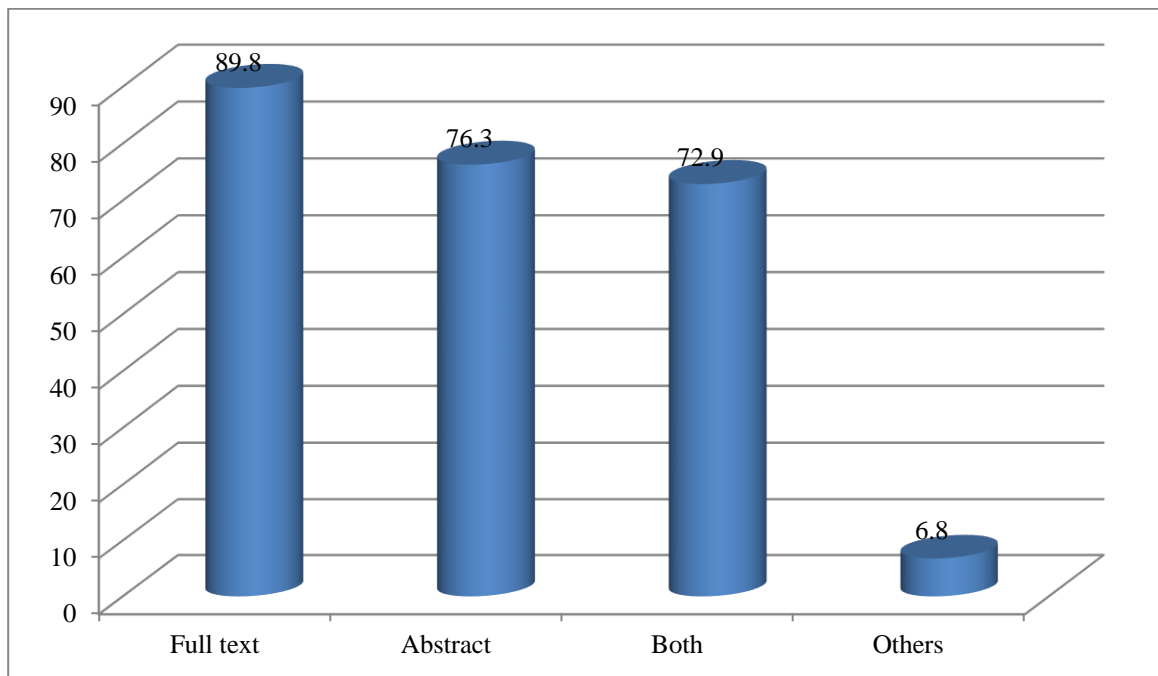


Figure 4.3: Format of Research Outputs
Source: Field Data (2017).

From Figure 4.3, the total percentage of respondents who said that research outputs in their IRs were in full text was 89.8 percent. Those who said that research outputs in their IRs were in abstract form were 76.3 percent, while 72.9 said that they were in both

full text and abstract. Only 6.8 percent said that research outputs in their IRs were in other formats which they failed to name.

From these findings, it is clear that majority of research outputs in the IRs of the selected university libraries were in full text. This is considered to be a very good move in ensuring that IRs provide resources that are useful to the users they are meant for. This is because research outputs that are in full text will provide adequate information to meet the information needs of the intended users. However, a big percentage also said that research outputs in their IRs were in abstract form. Research outputs in abstract form could only be useful to users who are only interested in an overview of a research output. They will however not be useful to those who are interested in accessing the entire document. It is therefore very important for university libraries to have research outputs in full text or in both full text and abstract in order to cater for those who may only be interested in accessing the abstract of a research output. The percentage of those who said that research outputs in their IRs were in both full text and abstract was also high. This is a good move in ensuring that research outputs deposited in IRs of university libraries in Kenya are useful to the users they are meant for. This will ensure that users who may need to access a full document are catered for as well as those who may be interested in accessing only the abstract of a research output.

The chief librarians from the selected university libraries said that majority of the research outputs in their IRs were available in full text but some were still in abstract form. It is therefore justified to say that majority of the research outputs in the selected

university libraries were available in full text but a number of them were still in abstract form. The selected university libraries had therefore done a commendable job by ensuring that majority of the research outputs in their IRs were available in full text. However, to ensure that all research outputs available in IRs of the selected university libraries were useful to the users they were meant for, it is crucial that these libraries ensure that all those in abstract form are put in full text. This will ensure that these resources are comprehensive in order to meet the information needs of the users.

The study also sought to find out the frequency at which research outputs were uploaded in the IRs of the selected university libraries. The respondents were given choices to choose from and tick appropriately. The results are presented in Figure 4.4.

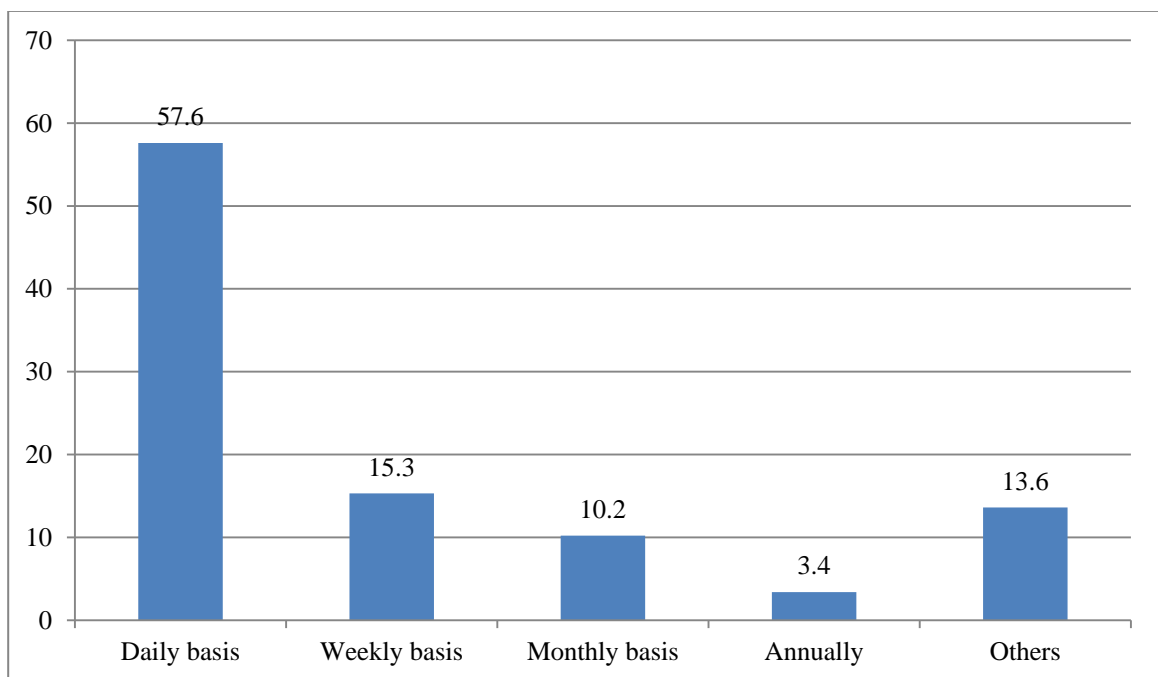


Figure 4.4: Frequency of Research Outputs Upload
Source: Field Data (2017).

The findings in Figure 4.4 show that 57.6 percent of the total respondents said that research outputs were uploaded on daily basis in their IRs, while 15.3 percent said that research outputs were uploaded on weekly basis in their IRs. The respondents who said that research outputs were uploaded on monthly basis in their IRs accounted for 10.2 percent of the total respondents, while those who said that research outputs were uploaded annually in their IRs accounted for 3.4 percent. 13.6 percent of the total respondents chose “others” which was one of the choices. The responses under “others” included; as soon as the research outputs are received, as need arises while others said they were not sure on the frequency at which research outputs were uploaded in their IRs.

From the findings, it is clear that the highest percentage of respondents said that research outputs were uploaded on daily basis in their IRs. This is a commendable job for the selected university libraries as it ensures that their IRs remain up to date thus ensuring that users of the research outputs get relevant and current information to meet their information needs. This also helps in keeping the researchers updated on research areas that have been researched on which helps in avoiding duplication of research. The percentage that said that research outputs were uploaded on weekly basis, monthly basis and annually in their IRs was not high. The findings however cannot be ignored since it could be happening in the selected university libraries as well as in other university libraries in Kenya. It is therefore very important to say that research outputs should be uploaded on daily basis since researchers are publishing regularly. This will help in avoiding a situation whereby research outputs are completed and kept in the individual

libraries as found out in a study by Ezema (2013). When this happens, research outputs which contain useful information to other researchers remain useless instead of being used in the advancement of knowledge.

The chief librarians from the selected university libraries said that research outputs in their libraries were uploaded in their IRs on daily basis and as soon as they were made available. Going by the information from the chief librarians, it is therefore justified to say that the selected university libraries were doing a good job in ensuring that their IRs were well managed by ensuring daily upload of research outputs. This is a good move in ensuring that research outputs are made accessible to all those who need them thus ensuring that they remain updated in their areas of interest. The selected university libraries should therefore continue with this good work as well as the other university libraries in Kenya.

In addition the study sought to find out those who are mandated to deposit research outputs in the IRs of the selected university libraries. The respondents were given choices to select from and the findings are presented in Figure 4.5.

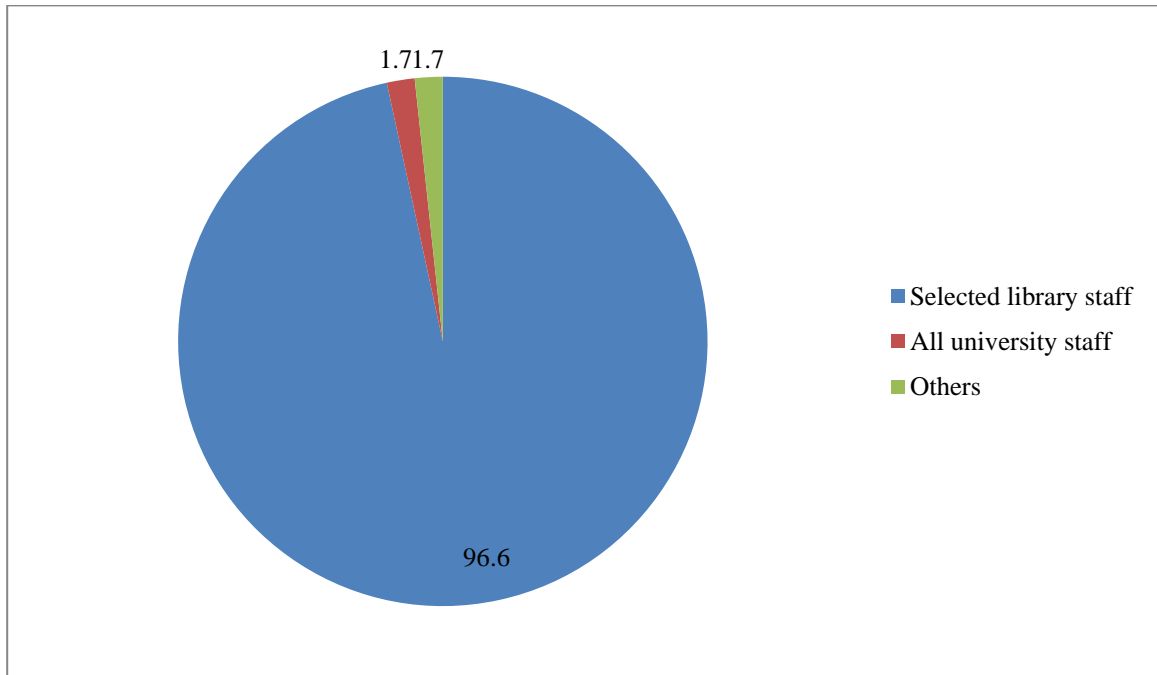


Figure 4.5: People Mandated to Deposit Research Outputs
Source: Field Data (2017).

Figure 4.5 shows that 96.6 percent said that research outputs in their IRs were deposited by selected library staff. 1.7 percent said that research outputs in their IRs were deposited by all university staff while an equal number chose “others” which included repository librarian as the one mandated to deposit research outputs.

The chief librarians from the selected university libraries also said that research outputs were deposited by selected library staff. From these findings it is therefore justified to say that depositing of research outputs in the IRs of the selected university libraries was done by selected library staff. To ensure a well developed and managed IR, there should be allocation of responsibilities. For instance, Macha & De Jager (2011), found out that University of Cape Town allocated responsibilities to their library staff in order to ensure successful development and management of their IR. The selected university

libraries were therefore doing a commendable job of allocating the responsibility of depositing research outputs in their IRs to selected library staff. This will help in ensuring that their IRs are well managed for better results. The selected university libraries should therefore keep up with this as well as the other university libraries in Kenya.

Another question posed to the respondents was how the library staff mandated to deposit research outputs in the IRs of the selected university libraries ensured continuous collection of research outputs from the researchers. This is in order to deposit them in their IRs on a continuous basis. Respondents were given choices and were allowed to tick more than one. The findings are reflected in Table 4.6.

Table 4.6: Ways of Gathering Research Outputs From Researchers

Ways of gathering research outputs from researchers	Frequency	Percentage
Library staff walking from department to department to collect the materials	9	15.5
Liaising with faculty members and other university staff	33	55.9
Liaising with departments' heads	36	61.0
Mandatory policy for all staff and students to make research outputs available in a set central place for easy access by the library staff	37	62.7
Providing incentives to researchers to encourage them to make their research outputs available for the IR	10	16.9
Promotion of IR benefits to the researchers to encourage them to make their research outputs available for the IR	25	42.4

Source: Field Data (2017).

Table 4.6 shows that the most popular ways that the respondents used in their libraries in gathering research outputs from researchers were a mandatory policy for all staff and students to make their research outputs available in a set central place for easy access by the library staff, liaising with the departments' heads and liaising with faculty members and other university staff accounting for 62.7 percent and 61 percent respectively. The least popular ways were library staff walking from department to department to collect the materials at 15.5 percent and provision of incentives to researchers to encourage them to make their research outputs available for the IR at 16.9 percent.

The chief librarians from the selected university libraries provided a number of ways they used to ensure research outputs were always available to be deposited in their IRs. One of the ways was a mandatory requirement for all postgraduate students to bring their research work in a CD to be deposited in their IRs. The other way was an

agreement between the library and the faculty members to bring their research work to be deposited in the IRs of the selected university libraries. The researcher also found out that the other method used was data mining from online sources. Another way according to one of the chief librarians was where any other researcher who is not a faculty member willing to deposit in the IR was allowed to deposit his/her research outputs on agreement to adhere to the university copyright conditions. A study by Russey and Day (2010), acknowledges that research contents are critical to the success of IRs. The selected university libraries were therefore doing a commendable job by ensuring that research outputs were always available for their IRs through the use of various ways.

A question addressing what the selected university libraries were doing to encourage faculty members and other staff to deposit their research outputs in their IRs was also posed. This was applicable only if they had allowed them to archive their research outputs on their own. The respondents were provided with choices and allowed to tick more than one. The findings are reflected in Table 4.7.

Table 4.7: Ways of Ensuring Self-Archiving was Successful

Ways of ensuring self-archiving was successful	Frequency	Percentage
Promotion of IR benefits to the researchers	19	32.2
Provision of incentives for their research outputs	7	11.9
Mandatory policy for the researchers to archive their research outputs in the IR	23	39.0
Training the researchers on how to archive their research outputs in the IR	19	32.2

Source: Field Data (2017).

Results in Table 4.7 indicate that the most popular ways of ensuring the success of self-archiving that the respondents said were used in their libraries were mandatory policy for the researchers to archive their research outputs in their IRs accounting for 39 percent, promotion of IR benefits to the researchers and training the researchers on how to deposit their research outputs in the IR accounting for 32.2 percent each. The least popular way was provision of incentives to the researchers for their research outputs accounting for 11.9 percent.

Through the interviews the researcher learnt from the chief librarians that self-archiving in their libraries was yet to be introduced. The study results do not conform to Lagzian, Abrizah and Wee (2015), advocacy which calls for self-archiving among the users of IRs if IRs are to be successful. Therefore, to ensure that IRs in university libraries in Kenya are more successful it is necessary for them to introduce and encourage self-archiving among the researchers.

There is changing needs in modern scholarly communication thus requiring university libraries in Kenya to provide academic and research support services to their researchers. The study therefore sought to find out what the IRs of the selected university libraries had in place to support the research and academic work of their researchers. The respondents were provided with choices and allowed to tick more than one. The findings are as shown in Table 4.8.

Table 4.8: Academic and Research Support Services Provided by an IR

Academic and research support services provided by an IR	Frequency	Percentage
Closed access deposit	13	22.0
A provision for email e-print request	18	30.5
A provision for researchers to manage their own publishing in the IR	11	18.6
A provision for researchers to create, manage and share their own profiles	19	32.2
A provision for researchers and users to comment on a given research output	16	27.1
A provision for researchers to respond to comments made on their research outputs	15	25.4

Source: Field Data (2017).

The results in Table 4.8 show that 22 percent said that their IRs had a closed access deposit. 30.5 percent said that their IRs had a provision for email e-print request, while 18.6 percent said that their IR had a provision for researchers to manage their own publishing in the IR. The respondents who said that their IRs had a provision for researchers to create, manage and share their own profiles constituted 32.2 percent. The respondents who said that their IRs had a provision for researchers and users to comment on a given research output constituted 27.1 percent. Those who said that their

IRs had a provision for researchers to respond to comments made on their research outputs constituted 25.4 percent. The study results thus showed that the highest percentage of respondents said that their IRs had a provision for researchers to create, manage and share their own profiles and a provision for email e-print request. The least were those who said that their IRs had a provision for researchers to manage their own publishing in the IR and closed access deposit. From these findings, it is possible to say that the selected university libraries were doing a good job in ensuring that they met the researchers changing needs in the modern scholarly communication.

The chief librarians however differed regarding their IRs having research and academic support services for their researchers. They argued that their IRs are so far a means of archiving research outputs from their scholarly communities in order to make them available to majority if not all users they were meant for. It is therefore justified to conclude that IRs in the selected university libraries lacked the necessary tools and services required to meet the changing needs in the modern scholarly communication. The study results do not conform to Basefsky (2009), views that IRs should incorporate all research support services that are permitted by the new technological developments. Therefore, to ensure that IRs in university libraries in Kenya cease from being only an archive for research outputs from researchers and become more robust as well as publishing tools, there is need for these libraries to incorporate the necessary tools and services in their IRs. This is in order to support the researchers in their scholarly communication which will in turn help in making IRs more relevant and useful to the researchers.

On strategies for development and management of an IR, the study sought to find out the strategies that the selected university libraries were using to ensure continuous development and management of their IRs. The respondents were provided with choices and allowed to tick more than one. The findings are as presented in Table 4.9.

Table 4.9: Strategies for Development and Management of an IR

Strategies for development and management of an IR	Frequency	Percentage
Soliciting for top management and academia's continued support	30	50.8
Soliciting for adequate resources	31	52.5
Ensuring effective communication among all stakeholders of the IR	33	55.9
Continuous training for library staff on management of e-resources, e-services and digitization of resources	37	62.7
Allocation of responsibilities for development and management of the IR among library staff	22	37.3
Marketing and promotion of the benefits of the IR to researchers	38	64.4

Source: Field Data (2017).

The study findings in Table 4.9 show that the most popular strategies for development and management of IRs that the respondents said were used in their libraries were marketing and promotion of the benefits of IR to the researchers accounting for 64.4 percent, continuous training for library staff on management of e-resources, e-services and digitization of resources accounting for 62.7 percent, ensuring effective communication among all stakeholders of the IR accounting for 55.9 percent, soliciting for adequate resources accounting for 52.5 percent and soliciting for top management and academia's continued support accounting for 50.8 percent. The least popular strategy was allocation of responsibilities in development and management of their IRs

among the library staff accounting for 37.3 percent. From these findings, it is possible to say that there was a possibility that all these strategies were being used in one way or another in the selected university libraries for ensuring continuous development and management of their IRs. This was a good move towards ensuring well developed and managed IRs in university libraries in Kenya. It is therefore necessary that they keep it up in order to be successful in development and management of their IRs.

The study was also able to gather more information from the chief librarians on strategies that the selected university libraries used to ensure continuous development and management of their IRs. These included liaising with faculty and academic fraternity in order to provide their research outputs to be deposited in the IRs. Training the researchers on the benefit of depositing in the IRs. The chief librarians also emphasized on having adequate resources such as staff as a strategy for ensuring successful development and management of their IRs. The other strategy was ensuring that library staff given the mandate to deposit research outputs in their IRs were adequately trained. A combination of this information and that given by library staff led to the conclusion that the selected university libraries used a number of strategies for ensuring continuous development and management of their IRs. This was a commendable job for the selected university libraries which should continue using these strategies in order to be successful in development and management of their IRs. However, there could be other strategies available for ensuring successful development and management of IRs in university libraries. It is therefore necessary for university libraries in Kenya to explore other possible strategies for development and management

of an IR in order to be more successful in the continuous development and management of their IRs.

4.5 Challenges in Development and Management of an IR

Objective three of the study sought to establish challenges affecting development and management of IRs in Kenya. The study first sought to find out if the selected university libraries faced challenges in the development and management of their IRs. Respondents were given choices and were required to tick appropriately. The findings are as presented in Figure 4.6.

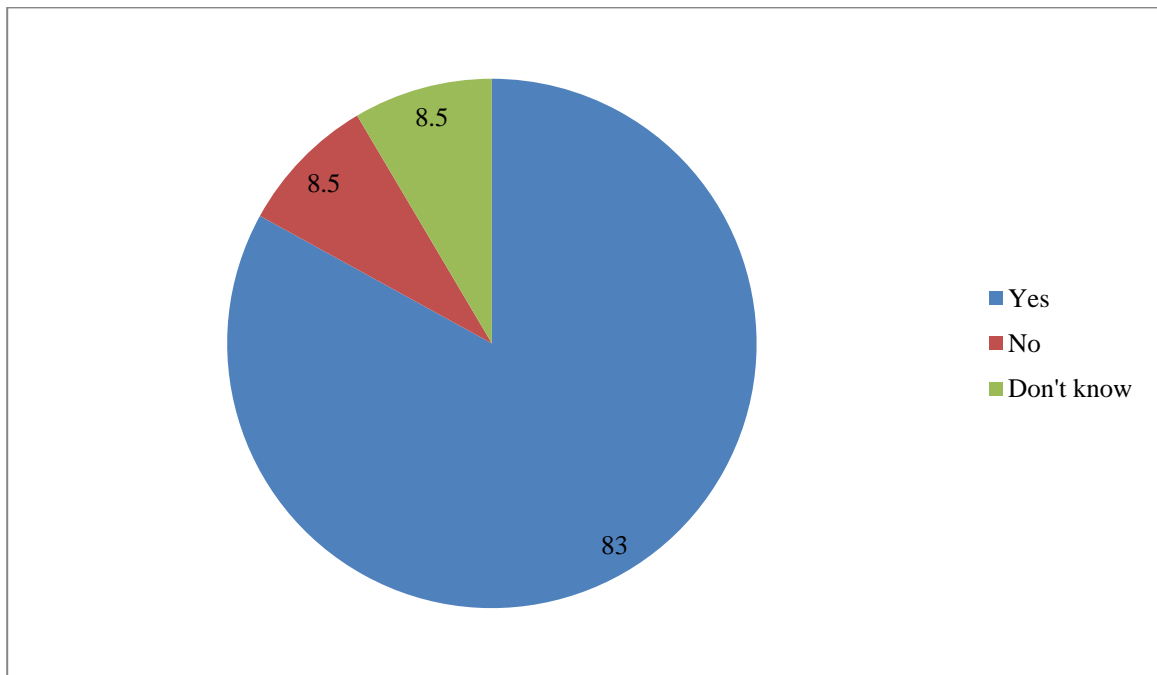


Figure 4.6: Challenges in Development and Management of an IR
Source: Field Data (2017).

From Figure 4.6, majority of the respondents which constituted 83 percent said that their libraries faced challenges in the continuous development and management of their

IRs. 8.5 percent said that their libraries were not facing challenges in development and management of their IRs and an equal number said they were not sure if their libraries were facing challenges in development and management of their IRs.

The chief librarians through the interviews also supported the findings that their libraries faced challenges in the continuous development and management of their IRs. From these findings the study concluded that the selected university libraries faced challenges in the continuous development and management of their IRs which could hinder effective development and management of IRs, hence the need for university libraries in Kenya to come up with solutions to curb or minimize them.

From the respondents who said that their libraries faced challenges in the continuous development and management of their IRs, the study sought to find out what these challenges were. The respondents were given choices and were allowed to tick more than one. The findings are as shown in Table 4.10.

Table 4.10: Challenges in Development and Management of an IR

Challenges in development and management of an IR	Frequency	Percentage
High cost of development and management of the IR	18	30.5
Problems in gathering research outputs for the IR	29	49.2
Problems in gaining sustainable support and commitment from the top management and other staff	28	47.5
Copyright management issues	21	35.6
Policy issues	17	28.8
Lack of incentives for researchers	16	27.1
Perception among researchers that materials deposited in IRs lack recognition	12	20.3
The fact that development and management of IR is time consuming and labor intensive	7	11.9
Lack of appreciation for the need of marketing the benefits of the IR to the researchers	11	18.6
Technical challenges such as redesigning open source systems, compatibility of software etc	18	30.5

Source: Field Data (2017).

The study results in Table 4.10 indicate that the challenges that majority of the respondents said affected development and management of IRs in their libraries were problems in gathering research outputs for their IRs accounting for 49.2 percent, problems in gaining sustainable support and commitment from their top managements and other staff accounting for 47.5 percent, copyright management issues accounting for 35.6 percent, high cost of development and management of their IRs and technical challenges such as redesigning open source systems, compatibility of software etc accounting for 30.5 percent each. The challenges that the least number of respondents said affected development and management of IRs in their libraries were the fact that

development and management of an IR is time consuming and labor intensive accounting for 11.9 percent, lack of appreciation for the need of marketing the benefits of the IR to the researchers accounting for 18.6 percent, perception among researchers that materials deposited in IRs lack recognition accounting for 20.3 percent, lack of incentives for researchers accounting for 27.1 percent and policy issues accounting for 28.8 percent.

Information gathered from chief librarians showed other challenges such as: gathering research outputs for their IRs, gaining support and commitment from their top managements, lack of adequate staff for development and management of their IRs, lack of incentives for researchers, lack of proper policy to govern effective development and management of their IRs and lack of effective information literacy and competence program to ensure high quality research outputs. Challenges hinder effective and continuous development and management of IRs. A study by Jain (2011), acknowledges that challenges act as great obstacles to successful development and management of IRs. It is therefore very crucial for university libraries in Kenya to come up with solutions to these challenges. This is in order to curb or minimize them which will in turn ensure successful and continuous development and management of IRs in university libraries in Kenya.

From the challenges that the library staff and the chief librarians said affected their libraries in development and management of their IRs, the study sought to gather some suggestions that could help in curbing or minimizing on them. The question in this area

was open ended. The responses that the study gathered from the chief librarians and the library staff included training the university communities on the benefits and relevance of an IR. University libraries could have better policies to govern development and management of their IRs. Universities should provide adequate funds for development and management of their IRs. University libraries should also solicit for more support and commitment from their universities' management. Researchers should also be trained to archive research materials on their own. Having better policies to take care of copyright issues was also another suggestion. Provision of incentives to the researchers for their research outputs. Keeping abreast with the changing technology to ensure continuity of the universities' IRs and university libraries to ensure proper communication among all stakeholders of their IRs.

The study further sought to gather suggestions on how to improve the IRs in the selected university libraries. The question in this area was open ended. The responses from the chief librarians and the library staff were varied including; doing more marketing on the IRs and doing it more frequently. University libraries to encourage researchers to make their research work available to be deposited in the IRs. Employment of more staff for development and management of their IRs. Universities to provide more resources such as scanners and computers to aid in digitization of research materials. Training of staff adequately and regularly on development and management of an IR. Training of researchers on how to archive research outputs on their own. Full commitment in collection and archival of research outputs to help in improving development and management of the IRs in the selected university libraries.

Universities to provide adequate funds for development and management of their IRs. Having better policies to govern development, management and access of the IRs in the selected university libraries. University libraries to partner with other university libraries on development and management of their IRs. Keeping abreast with the changing technology as well as ensuring reliable internet and power supply. University libraries to ensure regular maintenance of technological facilities used in development and management of their IRs.

4.6 Conclusion

Guided by the objectives of this study, the researcher was able to achieve the main objective of this study which was to find out what university libraries in Kenya were doing to ensure well developed and managed IRs. This was in order to meet the changing needs in the modern scholarly communication. The study established that university libraries in Kenya lacked adequate resources and strategies for development and management of their IRs. The study also found out that university libraries in Kenya faced a number of challenges in the continuous development and management of their IRs.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter contains a summary of the study findings on development and management of IRs in selected university libraries. It also contains the conclusions drawn from the findings and makes recommendations. Suggestions for further research have also been provided.

5.2 Summary of the Findings

a) Resources Available in University Libraries in Kenya for Development and Management of their IRs

Objective one of the study sought to find out the available resources for development and management of IRs in the selected university libraries in Kenya. The findings were as follows: the selected university libraries lacked adequate staff for development and management of their IRs. Staff were not adequately and regularly trained on development and management of their IRs. One of the selected university libraries lacked adequate space for technological facilities and adequate resources such as computers and scanners which are very crucial in successful development and management of IRs. The selected university libraries were keeping abreast with the changing technology in terms of hardware and software for development and management of their IRs. They had fast and reliable internet connectivity for

development and management of their IRs. One of the selected university libraries lacked reliable power supply which is a hindrance to successful development and management of IRs. The selected university libraries were not receiving adequate funds from their institutions for development and management of their IRs and they faced a number of challenges in the availability of resources for development and management of their IRs. These challenges included: inadequate funding for the necessary resources, lack of appreciation on the importance of the IR by researchers, lack of commitment and continued support from their universities and provision of inadequate resources for development and management of their IRs such as scanners for scanning previous publications to be uploaded in the repositories.

b) Strategies that University Libraries in Kenya are Using to Ensure Well Developed and Managed IRs

Objective two of the study sought to find out the strategies that the selected university libraries were using to ensure well developed and managed IRs. The study found out that the selected university libraries had not deposited all the research outputs from their scholarly communities in their IRs. Majority of research outputs in the IRs of the selected university libraries were available in full text but some were still in abstract form. Research outputs in their IRs were uploaded on daily basis and as soon as they were made available. Depositing of research outputs in the IRs of the selected university libraries was done by selected library staff. The selected university libraries were using a number of ways to ensure availability of research outputs to be deposited in their IRs. These included: a mandatory requirement for all postgraduate students to bring their

research work in a CD to be deposited in their IRs. An agreement between the library and the faculty members to bring their research work to be deposited in the IRs. Data mining from online sources and allowing staff who are not faculty members to deposit their research work on condition that they adhere to university copyright conditions. The selected university libraries had not yet introduced self-archiving. Their IRs lacked the necessary tools and services required to meet the changing needs in the modern scholarly communication. These university libraries were using a number of strategies for development and management of their IRs. These included: soliciting for faculty and academic fraternity continued support. Marketing of the IR benefits to the researchers and ensuring that staff for development and management of their IRs were adequately trained.

c) Challenges Affecting Development and Management of IRs in University Libraries in Kenya

Objective three of the study sought to establish the challenges that were affecting the selected university libraries in development and management of their IRs. The study found out that the selected university libraries faced challenges in development and management of their IRs. These challenges included: problems in gathering research outputs for their IRs. Problems in gaining support and commitment from their top managements. Lack of proper policy to govern development and management of their IRs. Lack of incentives to motivate researchers to provide their research outputs to be deposited in the IRs. Inadequate staff for development and management of the IRs and

lack of effective information literacy and competence program to ensure high quality research outputs.

5.3 Conclusions

Based on the findings of this study, a number of conclusions were drawn which were as follows:

The first objective of this study was to establish what resources are available in university libraries in Kenya for development and management of IRs. This study showed that resources for development and management of IRs in university libraries in Kenya were available but majority were not adequate. For successful development and management of IRs, the necessary resources should be adequate. It is therefore very crucial that university libraries in Kenya come up with strategies to ensure that resources necessary for development and management of their IRs are adequate at all times.

The second objective of this study was to determine the strategies that university libraries in Kenya are using to ensure well developed and managed IRs. This study showed that university libraries in Kenya were using a number of strategies to ensure well developed and managed IRs. They had however not made use of all the available strategies necessary in improving the IRs in order to meet the changing needs in the modern scholarly communication. It is therefore necessary for university libraries in Kenya to explore all the available strategies for successful development and

management of their IRs. This is in order to become more relevant in the modern scholarly communication.

The third objective of this study was to establish challenges affecting development and management of IRs in university libraries in Kenya. This study showed that there were a number of challenges affecting development and management of IRs in university libraries in Kenya. Challenges hinder successful development and management of IRs. It is therefore very crucial that university libraries in Kenya come up with ways of curbing or minimizing them. This is in order to be successful in the continuous development and management of their IRs and be in a position to meet the changing needs in the modern scholarly communication.

5.4 Recommendations

From the findings and conclusions drawn from this study, a number of recommendations were made which were as follows:

a) Recommendations Based on Resources Available in University Libraries in Kenya for Development and Management of IRs

This study established that the selected university libraries lacked adequate staff for development and management of their IRs. The recommendation is that university libraries in Kenya in partnership with their universities' managements should hire adequate staff because they are a crucial resource in development and management of IRs. The study also established that staff for development and management of IRs in the selected university libraries were not adequately and regularly trained for development

and management of their IRs. This study recommends that university libraries in Kenya in partnership with their universities' managements should ensure that staff for development and management of their IRs are adequately and regularly trained. This could be done by ensuring that they have a structured program for training of their staff on development and management of IRs.

The study revealed that some university libraries in Kenya lacked adequate space necessary for the accommodation of technological facilities required in development and management of IRs. The recommendation from this study is that university libraries in Kenya in partnership with their universities' managements should ensure that they set aside enough space for all facilities necessary in development and management of their IRs. This is in order to be successful and ensure that development and management of their IRs is continuous. The study also established that some university libraries in Kenya lacked adequate resources such as computers and scanners which are very crucial in development and management of IRs. This study therefore recommends that university libraries in Kenya in partnership with their universities' managements should ensure that they have adequate technological facilities for development and management of their IRs. This can be done by adequate allocation of funds for development and management of IRs in university libraries in Kenya.

The study established that the selected university libraries were keeping abreast with the changing technology in terms of hardware and software. This is very crucial because it ensures the continuity of IRs even in case of new technological advancements. The

recommendation is that university libraries in Kenya in partnership with their universities' managements should continue keeping abreast with the changing technology in order to ensure continuity of their IRs. This study also revealed that the selected university libraries had fast and reliable internet connectivity. For successful development and management of IRs, fast and reliable internet connectivity is very crucial. This study therefore recommends that university libraries in Kenya in partnership with their universities' managements should keep up with this. This in turn will ensure that development and management of their IRs is not interrupted by slow and unreliable internet connectivity thus making these processes successful.

This study established that some university libraries in Kenya lacked reliable power supply. For successful development and management of IRs, reliable power supply is very crucial. This is in order to avoid interruptions which could hinder successful and continuous development and management of IRs. The recommendation on this is that university libraries in Kenya in partnership with their universities' managements should ensure that they have a reliable power supply. This could be done by having an alternative source of power such as powerful generators which will ensure that there is continued power supply even in case the main source of power fails. This in turn will ensure successful and continuous development and management of IRs in university libraries in Kenya. This study established that the selected university libraries were not receiving adequate funds for development and management of their IRs. For successful and continuous development and management of IRs, adequate funding is very crucial. Universities in Kenya should therefore ensure that that their libraries are adequately

funded for development and management of their IRs. This is can be possible if development and management of their IRs is made one of the priorities when they come to budget allocations.

The study further found out that the selected university libraries faced a number of challenges in the availability of resources necessary in development and management of their IRs. Challenges hinder successful and continuous development and management of IRs. It is therefore necessary for university libraries in Kenya to find ways of curbing or minimizing them. This study recommends that universities in Kenya should allocate adequate funds for the acquisition of necessary resources in development and management of IRs. They should make development and management of their IRs one of the major priorities when they come to budget allocations. For successful development and management of IRs, appreciation of the importance of IRs by the researchers is very crucial. This study therefore recommends that university libraries in Kenya should promote and market the benefits of IRs to the researchers. To gain commitment and continued support from universities' managements, university libraries in Kenya should do their best in making their universities' managements see the value and importance of IRs and the need to improve them in this age of modern scholarly communication. This can be done by promoting the benefits of IRs not only to the researchers but to universities' managements as well. To ensure that university libraries in Kenya get adequate resources for development and management of their IRs, universities in Kenya should be made to understand the importance of investing and making development and management of their IRs one of the major priorities. This will

in turn ensure continued financial support to university libraries in Kenya thus ensuring successful and continuous development and management of their IRs.

b) Recommendations Based on Strategies that University Libraries in Kenya are Using to Ensure Well Developed and Managed IRs

This study established that the selected university libraries had not yet deposited all research outputs from the scholarly communities in their IRs. One way of ensuring well developed and managed IRs is by depositing all research outputs available from the scholarly communities. This ensures that IRs are comprehensive and have adequate resources necessary to meet the information needs of the users they are meant for. This in turn ensures that IRs are appreciated more by all their users. The study recommends that university libraries in Kenya should ensure that all research outputs from their scholarly communities are made available in their IRs.

From the study it was revealed that majority of the research outputs in the IRs of the selected university libraries were available in full text but there were some which were still in abstract form. Another way of ensuring well developed and managed IRs is by ensuring that all research outputs are available in full text. This ensures that information needs of users are adequately met thus making IRs more appreciated by their users. University libraries in Kenya should therefore ensure that research outputs available in their IRs are in full text in order to meet the information needs of their users adequately.

The study found out that the selected university libraries were uploading research outputs in their IRs on a daily basis and as soon as they were made available. Uploading research outputs in IRs on a daily basis is also a way of ensuring well developed and managed IRs in universities. This ensures that IRs are up to date which ensures that users of IRs get current and relevant information to meet their information needs. This in turn ensures that IRs are appreciated more by their users which is very crucial for their survival. The study recommends that university libraries in Kenya should keep on updating their IRs on daily basis in order to remain relevant to the users of their IRs and gain more appreciation and support. This study established that the selected university libraries had selected library staff to deposit research outputs in their IRs. For successful development and management of IRs, there is need to allocate responsibilities among the library staff. This ensures that development and management of IRs is done in a well organized and coordinated manner. As a result, IRs become well developed and managed for better results. University libraries in Kenya should therefore keep allocating responsibilities among their library staff in development and management of their IRs.

This study also established that the selected university libraries used a number of ways to ensure availability of research outputs to be deposited in their IRs. These included a mandatory requirement for all postgraduate students to bring their research work in a CD to be deposited in their IRs, an agreement between the library and the faculty members to bring their research work to be deposited in the IRs, data mining from online sources and allowing staff who are not faculty members to deposit their research

work on condition that they adhere to university copyright conditions. For successful development and management of IRs, it is very necessary to make sure that research outputs from researchers are always available to be deposited in the IRs. This can be made successful by use of various ways such as those that the selected university libraries were using. There are however other ways that university libraries in Kenya could explore. University libraries in Kenya should incorporate these other ways which include walking from department to department to collect research outputs, liaising with departments' heads and other staff members who are not faculty members, providing incentives to researchers to encourage them to provide their research outputs for the IRs and promotion of IR benefits to the researchers in order to encourage them to make research outputs available to be deposited in their IRs. This will in turn ensure that research outputs are always available to be deposited in the IRs thus ensuring the success of continuous development and management of IRs in university libraries in Kenya.

The study found out that the selected university libraries had not yet introduced self-archiving whereby researchers are allowed to archive their research outputs in the IRs on their own. For successful development and management of IRs, self-archiving in universities in Kenya should be introduced and encouraged. This will ensure that researchers are able to deposit their research outputs whenever they have them instead of waiting until it is done by the selected library staff. Self-archiving in universities could be made successful through a number of ways. University libraries in Kenya should therefore introduce self-archiving and make use of the available strategies that

could help in ensuring that self-archiving is successful which include training of researchers on how to archive their own research outputs, providing incentives to the researchers for their research outputs, putting a mandatory policy requiring all researchers to archive their research outputs in the IRs and promotion of the benefits of IR to the researchers. This will in turn ensure successful and continuous development and management of IRs in university libraries in Kenya.

From this study, it was revealed that IRs of the selected university libraries lacked the necessary tools and services required to meet the changing needs in the modern scholarly communication. Another way of ensuring well developed and managed IRs is by incorporating tools and services required to meet the changing needs in the modern scholarly communication. This will ensure that IRs become more relevant and appreciated by the researchers as they will be able to meet their scholarly needs more adequately. This study therefore recommends that university libraries in Kenya should incorporate all research support services and tools that are permitted by the new technological developments. These includes closed access deposit, a provision for email e-print request, a provision for researchers to manage their own publishing in the IR, a provision for researchers to create, manage and share their own profiles, a provision for researchers and users to comment on a given research output and a provision for researchers to respond to comments made on their research outputs. This will in turn ensure well developed and managed IRs that are able to meet the scholarly needs of researchers in the modern scholarly communication.

The study further established that the selected university libraries used a number of strategies for development and management of their IRs. These included soliciting for faculty and academic fraternity continued support, marketing of the IR benefits to the researchers and ensuring that staff for development and management of their IRs were adequately trained. For successful development and management of IRs there are a number of strategies that could be used in universities libraries in Kenya such as those that the selected university libraries used. There are however other more strategies that could help in ensuring successful development and management of IRs in university libraries in Kenya. The recommendations include; soliciting for top management and academia's continued support, soliciting for adequate resources, ensuring effective communication among all stakeholders of the IRs and allocation of responsibilities for development and management of the IRs among library staff. Making use of all these available strategies will in turn ensure successful and continuous development and management of IRs in university libraries in Kenya.

c) Recommendations Based on Challenges Affecting Development and Management of IRs in University Libraries in Kenya

From the study it was revealed that the selected university libraries faced a number of challenges in development and management of their IRs. These challenges included problems in gathering research outputs for their IRs, problems in gaining support and commitment from their top managements, lack of proper policy to govern development and management of their IRs, lack of incentives to motivate researchers to provide their research outputs to be deposited in the IRs, inadequate staff for development and

management of the IRs and lack of effective information literacy and competence program to ensure high quality research outputs. Challenges hinder the success of continuous development and management of IRs. This study therefore recommends that university libraries in Kenya should use the available ways of gathering research outputs from their researchers. These include walking from department to department to collect the materials, liaising with faculty members and other university staff, liaising with departments' heads, mandatory policy for all staff and students to make research outputs available in a set central place for easy access by the library staff, providing incentives to researchers to encourage them to make their research outputs available for the IRs, promotion of IR benefits to the researchers to encourage them to make their research outputs available for the IRs and introduction of self-archiving.

The study further recommends that university libraries in Kenya should solicit for more support and commitment from their top managements. Universities in Kenya should support their libraries in development and management of their IRs. University libraries in Kenya should establish policies to govern development and management of their IRs. University libraries in Kenya in collaboration with their universities should hire more staff for development and management of their IRs. Universities in Kenya should provide incentives to researchers to encourage them to make their research outputs available in the IRs and introduce effective information literacy and competence programs for the researchers in order to ensure high quality research outputs. These recommendations if put in place could help in curbing or minimizing the challenges affecting development and management of IRs in university libraries in Kenya. This

will in turn ensure successful development and management of IRs in order to be able to meet the changing needs in the modern scholarly communication.

5.4.1 Policy Recommendations

1. The study found out that one of the major challenge affecting development and management of IRs in the selected university libraries is lack of adequate support from their universities' management. This study recommends that universities in Kenya should consider development and management of their IRs as one of their major priorities in order to ensure well developed and managed IRs.
2. The selected university libraries lacked proper policies to govern development and management of their IRs. To ensure well developed and managed IRs in university libraries in Kenya, this study recommends that universities should formulate comprehensive policies to govern development and management of their IRs.
3. The study found out that there was no self-archiving in the selected university libraries. This study recommends that universities in Kenya should introduce self-archiving in their libraries and have proper policies to govern this process in order to ensure successful and continuous development and management of their IRs.
4. The study established that the selected universities were not providing incentives to the researchers for their research outputs which could help in encouraging them to make their research work available for the IRs. Universities in Kenya

should have a policy on provision of incentives to the researchers for their research outputs which will encourage many to carry out more researches and make their research outputs available for the IRs.

5.4.2 Suggestions for Further Research

This study covered development and management of IRs in selected university libraries in Kenya. Carrying out research on the following areas will be very useful in development and management of IRs in university libraries in Kenya:

1. With the need for more support on IRs from the researchers which is crucial in successful development and management of IRs, a research on perceptions of researchers on IRs in Kenya is crucial.
2. Development and management of IRs require highly qualified staff. A research on training of librarians in Kenya for the digital age is therefore necessary.
3. With the challenge of gathering research outputs in university libraries in Kenya for their IRs, a research on self-archiving in university libraries in Kenya is crucial.
4. For IRs to gain more support and appreciation they should be able to contribute towards national development in Kenya. A research on IRs as tools for national development in Kenya is therefore crucial.
5. Researchers are the key determinants in the success of development and management of IRs. A research on collaboration between researchers and librarians in Kenya on development and management of IRs is therefore crucial.

REFERENCES

- Albanese, A. R. (2009). Institutional repositories: thinking beyond the box. Retrieved from:
www.libraryjournal.com/index.asp?layout=articlePrint&articleID=CA6639327.
- Bailey, C. (2005). The role of reference librarians in institutional repositories. *Reference Services Review*, 33(3), 259–267.
- Bankier, J. G. and Perciali, I. (2008). The institutional repository rediscovered: what can a university do for open access publishing? *Serials Review*, 34(1), 21-26.
- Basefsky, S. (2009). The end of institutional repositories and the beginning of social academic research service: an enhanced role for libraries, available at:
www.llrx.com/node/2177/print.
- Bawden, D., Vilar, P. & Zabukovec, V. (2005). Education and training for digital librarians: a Slovenia/UK comparison. *ASLIB Proceedings: New Information Perspectives*, 57(1), 85-98.
- Bell, S., Foster, N., & Gibbons, S. (2005). Reference librarians and the success of institutional repositories. *Reference Services Review*, 33(3), 283–291.
- Campbell-Meier, J. (2011). A framework for institutional repository development. *Advances in Library Administration and Organization*, 30, 151-185.
- Chan, L. (2004). Supporting and enhancing scholarship in the digital age: the role of open-access institutional repositories. *Canadian Journal of Communication* 29(3), 277–300.
- Chan, L. (2009). An integrative view of the institutional repositories in Hong Kong: strategies and challenges. *Serial Review*, 35(3), 119-124.
- Chan, L., Kwok, C. & Yip, S. (2005). Changing roles of reference librarians: the case of the HKUST institutional repository. *Reference Services Review*, 33(3), 268-282.

- Chiware, E. (2007). Training librarians for the digital age in African university libraries. paper presented at the Pre-IFLA Satellite Meeting on IT and Research in African University Libraries: Present and Future Trends, Durban, August, 2007.
- Christian, G. (2008). Issues and challenges to the development of open access institutional repositories in academic and research institutions in Nigeria. A research paper prepared for the International Development Research Centre (IDRC), Ottawa, 31-36.
- Commission for University Education (2012). Standards and guidelines for university libraries in Kenya.
- Daly, R. & Organ, M. (2009). Research online: digital commons as a publishing platform at the University of Wollongong, Australia. *Serials review*, 35(3), 149-153.
- Davis, P. M. & Connolly, M. J. L. (2007). Institutional repositories: evaluating the reasons for non-use of Cornell University's installation of DSpace. *D-Lib Magazine*, 13(3/4). Retrieved on February 6, 2010, from: www.dlib.org/dlib/march07/davis/03davis.html.
- Doctor, G. & Ramachandran, S. (2007). Enabling knowledge sharing with an institutional repository. Seventh IEEE International Conference on Advanced Learning Technologies, Niigata, 432-433.
- Ezema, J. (2013). Local contents and the development of open access institutional repositories in Nigeria university libraries: challenges, strategies and scholarly implications. *Library Hi Tech*, 31(2), 323-340.
- Ezeani, C. & Ezema, I. (2011). Digitizing institutional research output of University of Nigeria, Nsukka. *Library Philosophy and Practice (e-Journal)*, Paper 565. Retrieved on March 2012 from: <http://digitalcommons.unl.edu/libphilprac/565>.
- Fortier, R. & Laws, E. (2014). Marketing an established institutional repository: Marquette libraries' research stewardship survey. *Library Hi Tech News*, 31(6), 12-15.

- Gardner, J. (2008). Open access and institutional repositories: issues in today's digital libraries. Retrieved from: www.archive.org/details/OpenAccessAndInstitutionalRepositoriesIssuesInTody sDigitalLibraries.
- Gierveld, H. (2006). Considering a marketing and communications approach for an institutional repository. *Ariadne*, (49), 4.
- Harnad, S. (2009). Integrating universities' thesis and research deposit mandates. Paper presented at 12th International Symposium on Electronic Theses and Dissertations, University of Pittsburgh, Pittsburgh, PA, 10-13 June, 2009.
- Harnad, S. (2009). Institutional repository success is dependent on mandate. Retrieved on 7 March 2010 from: www.eprints.ecs.soton.ac.uk.
- Horwood, L., Sullivan, S., Young, E., & Garner, J. (2004). Open Archives Initiative compliant institutional repositories and the role of library staff. *Library Management*, 25(4/5), 170–176.
- Iwhiwhu, B. E. & Eyekpegba E. O. (2009). Digitization of Nigerian university libraries: From technology challenge to effective information delivery. *The Electronic Library*, 27(3), 529 – 536.
- Jain, P. (2006). Empowering Africa's development using ICT in a knowledge management approach. *The Electronic Library*, 24(1), 51-67.
- Jain, P. & Bentley, G. (2008). Institutional repositories as a benchmark for digital scholarship. Botswana Library Association 1st National Conference, University of Botswana Library Auditorium, Gaborone, 26-28 June, 2008.
- Jain, P. (2011). New trends and future applications/directions of institutional repositories in academic institutions. *Library Review*, 60(2), 125-141.
- Jenkins, B., Breakstone, E., & Hixson, C. (2005). Content in, content out: the dual roles of the reference librarian in institutional repositories. *Reference Services Review*, 33(3), 312– 324.

- Lagzian, F., Abrizah, A. & Wee, M. C. (2015). Critical success factors for institutional repositories implementation. *The Electronic Library*, 33(2), 196-209.
- Macha, A. & De Jager, K. (2011). Two South African institutional repositories: a comparative overview. Proceedings of the 14th International Symposium on Electronic Theses and Dissertations, Cape Town, 13-17 September, 2011.
- Makori, E. O. (2009). Reinventing academic libraries in Kenya. *Library Hi Tech News*, (5/6), 10-13.
- Makori, E. O., Njiraine, D., & Talam, P. (2015). Practical aspects of implementation of institutional repositories in Africa with reference to the University of Nairobi. *New Library World*, 116(9/10), 610-640.
- Mbambo-Thata, B. (2007). Building a digital library at the University of Zimbabwe: a celebration of team work and collaboration. Oxford, International Network for the Availability of Scientific Publications (INASP), 1-11.
- McDonald, A. C. (2003). Creating good learning space, in libraries with oomph: PFI for higher education libraries. Paper delivered at a seminar, London, 4-8.
- Milimo, J. (2012). An assessment of the status of open access resources in Kenyan university libraries. *Library Hi Tech News*, 30(6), 17-21.
- Mutula, S. (2002). The digital divide in Sub-Saharan Africa: implications for revitalisation and preservations of indigenous knowledge systems. Paper presented at the SCECSAL-15 conference, Johannesburg, April, 2002.
- Mutwiri, C. (2014). Challenges facing academic staff in adopting open access outlets for disseminating research findings in selected university libraries in Kenya. Kenyatta University, Nairobi, 154.
- Nabe, J. A. (2010). Starting, Strengthening, and Managing Institutional Repositories: A How-to-do-it-Manual. New York: Neal-Schuman Publishers.

OpenDOAR (2014). The Directory of Open Access Repositories. OpenDOAR.

Orodho, J. (2009). Elements of education and social science research methods. *Nairobi/Maseno*, 126-133.

Phillips, H., Carr, R., & Teal, J. (2005). Leading roles for reference librarians in institutional repositories: one library's experience. *Reference Services Review*, 33(3), 301–311.

Pickton, M. & Barwick, J. (2006). A librarian's guide to institutional repositories. Loughborough University, Loughborough. Retrieved on 16th January 2010 from: <http://magpie.lboro.ac.uk/dspace/handle/2134/1122>.

Robinson, M. (2009). Promoting the visibility of educational research through an institutional repository. *Serials Review*, 35(3), 133-137.

Rogers, E. M. (2003). Diffusion of innovations. 5th ed., New York: Free Press.

Romary, L. & Armbruster, C. (2010). Beyond institutional repositories. *International Journal of Digital Library Systems*, 1(1), 44-61.

Rosenberg, D. (2006). Towards the digital library in Africa. *The Electronic Library*, 24(3), 289-293.

Royster, P. (2008). Publishing original content in an institutional repository. *Serials Review*, 34(1), 27-30.

Russell, R. A. & Day, M. (2010). Institutional repository interaction with research users: a review of current practice. *New Review of Academic Librarianship*, 16(1), 116-131.

Saunders, M., Lewis, P. & Thornhill, A. (2003). Research methods for business students. 3rd ed., London: Prentice hall.

Sibanda, M. (2007). Computer-assisted legal information instruction. Oxford, International Network for the Availability of Scientific Publications (INASP), 66-78.

USAID (2017). Gender equality and women's empowerment in Kenya.

Westell, M. (2006). Institutional repositories: proposed indicators of success. *Library Hi Tech*, 24(2), 211-226.

Xia, J. (2009). Library publishing as a new model of scholarly communication. *Journal of Scholarly Publishing*, 40(4), 370-383.

Zhao, Y., Yao, X. & Wei, C. (2012). Academic institutional repositories in china: a survey of CALIS member libraries. *Chinese Journal of Library and Information Science*, 5(2), 18-32.

APPENDICES

APPENDIX I: INTRODUCTORY LETTER

Dear participant,

**RE: A STUDY ON DEVELOPMENT AND MANAGEMENT OF
INSTITUTIONAL REPOSITORIES IN SELECTED UNIVERSITY LIBRARIES
IN KENYA**

I am a student at Kenyatta University pursuing a master degree in Library and Information Science. I am carrying out a research on **development and management of institutional repositories in selected university libraries in Kenya**. It is my hope that the findings of this study will be a major contribution to boosting development and management of IRs in the selected libraries as well as other university libraries in Kenya.

Please answer all the questions honestly and frankly. I would like to assure you that responses to these questions will be treated with total confidentiality and be solely used for the purpose of this study. Your cooperation in answering the questions and returning the questionnaires on the agreed time will be highly appreciated.

Thank you in advance.

For further information you can use the contact below.

Mary N. Karanja,
Kenyatta University,
Department of library and information science
P.O. Box 43844,
Nairobi.

Cell phone 0728625372
Email: marykaranja21@yahoo.com

APPENDIX II: QUESTIONNAIRE FOR LIBRARY STAFF

The reason for this questionnaire is to gather information from you concerning **development and management of your IR**. Your information will be treated with total confidentiality. This questionnaire has been divided into four sections in order to gather information necessary for this study. Kindly answer all the questions openly and honestly.

A. General Information

1. Name of the university.....

2. Gender

1) Male () 2) Female ()

3. Age category in years

1). 21-30 () 2). 31-40 () 3). 41-50 () 4). 51-60 () 5). Above 60 ()

4. Level of education

1). Certificate () 2). Diploma () 3). Bachelor's degree () 4). Master's degree () 5). Phd. () 6). Others (specify).....

B. Resources for Development and Management of an IR

5. On a likert scale of 1-5 indicate the extent to which you agree or disagree with the following statements concerning resources available for development and management of your IR (tick between 1 - 5 as per the scale given).

Resources		Strongly disagree 1	Disagree 2	Not sure 3	Agree 4	Strongly agree 5
1.	Library has adequate staff for development and management of the IR					
2.	Library staff are adequately and regularly trained for development and management of the IR					
3.	Library has adequate space for technological facilities for development and management of the IR					
4.	Library has adequate computers and scanners for development and management of the IR					
5.	Library keeps abreast with the changing technology in terms of hardware and software for development and management of the IR					
6.	Library has fast and reliable internet connectivity for development and management of the IR					
7.	Library has reliable power supply for development and management of the IR					
8.	The university provides adequate funding for development and management of the IR					

6. What challenges does your library face in the availability of resources necessary for development and management of the IR?

- a) Inadequate funding for the necessary resources ()
- b) Lack of commitment and continued support
from university management ()
- c) Delays in provision of necessary resources ()
- d) Failure to take development and management of the IR
as one of the major priorities ()
- e) Inadequate planning for development and management of the IR ()
- f) Others (specify).....

7. Give some suggestions that can help in curbing the challenges you have given.

.....
.....
.....
.....

C. Strategies for Development and Management of an IR

8. Has your library deposited all research outputs available from the scholarly community in the IR?

- 1). Yes () 2). No () 3). Don't know ()

9. In what form are the research outputs available?

- a) Full text
- b) Abstract
- c) Both
- d) Others (specify).....

10. How often does your library upload research outputs in the IR?

- a) Daily basis
- b) Weekly basis
- c) Monthly basis
- d) Annually
- e) Others (specify).....

11. Who has the mandate of depositing materials in your IR?

- a) Selected library staff
- b) All university staff
- c) Others (specify).....

12. How is your library ensuring that research outputs are always available in order to be deposited in your IR? (You can tick more than one)

- a) Library staff walking from department to department to collect the materials
- b) Liaising with faculty members and other university staff

- c) Liaising with departments' heads ()
- d) Mandatory policy for all staff and students to make their research outputs available in a set central place for easy access by the library staff ()
- e) Providing incentives to researchers to encourage them to make their research outputs available for the IR ()
- f) Promotion of IR benefits to the researchers to encourage them to make their research outputs available for the IR ()
- g) Others (specify).....

13. If your library has given researchers the mandate to archive their research outputs on their own in your IR, how does your library ensure that this is successful? (You can tick more than one)

- a) Promotion of IR benefits to the researchers ()
- b) Provision of incentives for their research outputs ()
- c) Mandatory policy for the researchers to archive their research outputs in the IR ()
- d) Training the researchers on how to archive their research outputs in the IR ()
- e) Others (specify).....

14. Due to changing needs in scholarly communication, what academic and research support services does your IR offer to the researchers? (You can tick more than one)

- a) Closed access deposit ()
- b) A provision for email e-print request ()
- c) A provision for scholars to manage their own publishing in the IR ()
- d) A provision for scholars to create, manage and share their own profiles ()
- e) A provision for scholars and users to comment on a given research output ()
- f) A provision for researchers to respond to comments made on their research outputs ()
- g) Others (specify).....

15. What strategies does your library use to ensure continuous development and management of the IR? (You can tick more than one)

- a) Soliciting for top management and academia's continued support ()
- b) Soliciting for adequate resources ()
- c) Ensuring effective communication among all stakeholders of the IR ()
- d) Continuous training for library staff on management of e-resources, e-services, and digitization of resources ()
- e) Allocation of responsibilities in development and management of the IR among library staff ()
- f) Marketing and promotion of the benefits of IRs to researchers ()
- g) Others (specify).....

D. Challenges in Development and Management of an IR

16. Does your library experience challenges in the process of ensuring continuous development and management of the IR?

- 1). Yes () 2). No () 3). Don't know ()

17. If 'yes' what are the challenges? (You can tick more than one)

- a) High cost of development and management of the IR ()
- b) Problems in gathering research outputs for the IR ()
- c) Problems in gaining sustainable support and commitment from the top management and other staff ()
- d) Copyright management issues ()
- e) Policy issues ()
- f) Lack of incentives for researchers ()
- g) Perception among researchers that materials deposited in IRs lack recognition ()
- h) The fact that development and management of IR is time consuming and labor intensive ()
- i) Lack of appreciation for the need of marketing the benefits of the IR to the researchers ()
- j) Technical challenges such as redesigning open source systems, compatibility of software etc ()
- k) Others (specify).....

18. Suggest possible solutions to the challenges you have given

.....
.....
.....
.....

19. Suggest ways in which development and management of the IR in your library can be improved

.....
.....
.....
.....

Thank you for your co-operation

APPENDIX III: INTERVIEW SCHEDULE FOR CHIEF LIBRARIANS

1. Name of the university.....
2. Gender
 - 1) Male () 2) Female ()
3. Age category in years
 - 1). 21-30 () 2). 31-40 () 3). 41-50 () 4). 51-60 () 5). Above 60 ()
4. Level of education
 - 1). Certificate () 2). Diploma () 3). Bachelor's degree () 4). Master's degree () 5). Phd. () 6). Others (specify).....
5. Does your library have adequate number of staff for development and management of the IR?
6. If 'yes' are the staff adequately trained?
7. Do you provide regular training for library staff on development and management of IR due to the ever changing technology?
8. Does your library have adequate space for resources such as computers, staff and scanners which are necessary for development and management of the IR?
9. Does your library have adequate computers and scanners for development and management of the IR?
10. Does your library keep abreast in terms of software and hardware due to the ever changing technology?
11. Is internet connectivity in the library fast and reliable?
12. Do you have a reliable power supply in the library?
13. Does the university provide adequate funding for development and management of the IR?
14. What challenges does your library face in the availability of resources necessary for development and management of the IR?
15. How can the challenges you have highlighted be resolved?
16. Has your library deposited all research outputs available from the scholarly community in the IR?
17. Are the resources available in full text, abstract or both?
18. How often do you upload research outputs in your IR?
19. Who is mandated to deposit materials in your IR?
20. If it is the library staff, what methods do they use to gather research materials from the researchers for depositing in the IR?
21. If you rely on self-archiving by the researchers, what strategies do you use to encourage them to archive their research outputs in the IR?

22. Due to changing needs in scholarly communication, what academic and research support services does your IR offer to the academia and researchers?
23. What strategies does your library use to ensure continuous development and management of the IR?
24. What challenges does your library experience in the process of ensuring continuous development and management of the IR?
25. What solutions do you think can help in solving the challenges you have given?
26. What future plans does your library have in order to improve development and management of your IR?

APPENDIX IV: TIME SCHEDULE

Activity	Time
Proposal writing	February-June 2016
Proposal defense	July 2016
Doing corrections	September-October 2016
Submission for validation	October 2016
Submission of proposal to the graduate school	November 2016
Seeking permission for data collection from NACOSTI	December 2016
Piloting of instruments	January 2017
Reviewing of instruments	January 2017
Collection of data	February 2017
Processing of data, analysis and writing of the final project	March-July 2017

APPENDIX V: BUDGET

Activity	Cost (KSH)
Typing of instruments and report	8,000
Printing of instruments and report	10,000
Photocopying of instruments	3,000
Binding of report	2,000
Travel to the field	1,000
Research permit	1,000
Total	25,000

APPENDIX VI: RESEARCH PERMIT



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: 254-20-22114-71
2241349, 5511971, 2219420
Fax: 254 20-218245, 318249
Email: ng@nacosti.go.ke
Website: www.nacosti.go.ke
when replying please quote

1st floor, Jubilee House
Lauri Highway
P.O. Box 30023-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/17/11818/15583**

Date:

17th February, 2017

Karanja Mary Nduta
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Development and management of institutional repositories in selected University Libraries in Kenya,*" I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **16th February, 2018.**

You are advised to report to **the Vice Chancellors of selected Universities, the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR: STEPHEN K. KIBIRU, PhD.
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The Vice Chancellors
Selected Universities.

The County Commissioner
Nairobi County.

National Commission for Science, Technology and Innovation is ISO 9001:2008 Certified