

**INTEGRATION AND USE OF INSTITUTIONAL REPOSITORIES
IN PUBLIC UNIVERSITIES: THE CASE OF THE UNIVERSITY OF
NAIROBI**

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DECLARATION

This is my original work and has not been presented for an award of a degree or certificate in any other university or institution.

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LIST OF ABBREVIATIONS AND ACRONYMS

AAU	Association of African Universities
ARL	Association of Research Libraries
BOAI	Budapest Open Access Initiative
DKU	Dedan Kimathi University
ETD	Electronic Thesis and Dissertation
ICT	Information Communication Technology
IDIS	Institute of Diplomacy and International Studies.
IFLA	International Federation of Library Associations
ILRI	International Livestock Research Institute,
IR	Institutional Repository
IT	Information Technology
ICT	Information Communication Technology
JKUAT	Jomo Kenyatta University of Agriculture and Technology
JKML	Jomo Kenyatta Memorial Library
KHRC	Kenya Human Rights Commission
KRIS	Kiwi Research Information Service
KU	Kenyatta University
LVBC	Lake Victoria Basin Commission
MIT	Massachusetts Institute of Technology
NIH	National Institutes of Health
OA	Open Access
PLoS	Public Library of Science
PU	Pwani University
RVTI	Rift Valley Technical Institute
SCOAP	Sponsoring Consortium for Open Access Publishing
SU	Strathmore University
UoN	University of Nairobi

ABSTRACT

The aim of this study was to assess the integration and use of institutional repositories in public universities with special reference to the University of Nairobi. Objectives of the study were to; assess the development and implementation process of institutional repositories in institutions of higher learning, identify institutional factors that influence integration and use of institutional repositories, examine the perception of institutional repositories by users, assess the extent to which the university is creating awareness and popularizing the use of institutional repositories among the clients and identify challenges faced by users including possible solutions. The study used cross sectional descriptive survey research design to gather and analyze data which was both qualitative and quantitative in nature. The study used questionnaires, the interview schedule and observation guide to collect data. A set of two questionnaires were administered to students and staff of the Jomo Kenyatta Memorial Library while the researcher interacted with students and staff for direct observation. Data collected was analyzed using both qualitative and quantitative analysis, and quantitative data was presented using arithmetic mean, frequency distributions and percentages while qualitative data was collected by use of open ended questions in the questionnaire, interview schedule and observation guide. Qualitative data was presented in prose and by verbatim discussion. The study established that, the institutional repository has not been well integrated to mainstream information resources of the library while it is pertinent that the institutional repository is a fundamental source of information, knowledge and communication. The results also demonstrate that, there is lack of awareness on the part of students and staff, and thus, the study recommends the need for serious marketing and promotion of the institutional repository. For further research, the study suggests the integration of different forms of presentation as it was established that, institutional repositories do not integrate different forms of presentation such as; graphics, video and sound within the repository to cater for the whole population of users including those with disabilities.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter presents the background information to the study, statement of the problem, objectives of the study and the research questions. In addition, it gives the justification for the study together with the scope and limitations and operational definition of the terms used.

1.2 Background to the Study

Knowledge is considered as strategic resource that has to be created, stored, shared and transferred in continuous flow for the advancement of the society. Technological advancement has made it is easy to create and access digital materials that provide the potential for instant use but are not usually made accessible to many users and remain isolated in the authors' computers (Jain and Bentley 2008).The authors add that, for more than a decade, academic institutions have struggled with how to manage the collective, digital intellectual output that is produced in the knowledge age. In addition, the increasing costs of electronic and print subscriptions from commercial publisher's don't allow subscription and its becoming increasingly impractical and challenging for academic institutions to subscribe to all or even most of the online academic journals (Jain, 2010). In particular, Jain points out that, scholarly communication crisis has come up owing to these high serial subscription costs and database licenses, which has limited access to research outputs for university students and academics. This result has prompted researchers and university and research center administrators to come up with alternative forms of scholarly communication like the institutional repositories (IRs) (Daly & Organ, 2009 p.149).

International studies indicate that, the development of IRs at academic institutions has greatly increased with the growth of open source initiatives in scholarly communication and software development (Campbell, 2011 p.152). The establishment of IRs has currently become common activity within academic institutions motivated by the ready availability and relatively simple implementation of the number of open source software

platforms and operating systems (Robinson, 2009 p. 133). In addition, a growing number of universities are beginning to require the digital deposit of thesis and dissertation output in IRs (Harnad, 2009 p. 27). Funders' deposit mandates seem particularly important because it targets high-quality research output, thus setting the example for scientific communities as well as academic institutions (Romary&Armbruster, 2010 p.46).

The start of IRs can be traced back to the mid-1980s when the popularization of personal computers in organizations such as archives, libraries and documentation Centre's meant that there was a change process characterized above all by transition from paper to electronic format. This assisted the development of institutional databases in general which led to significant growth in both the number of IRs and the quantity of digital objects deposited in them (Bonilla-Calero, 2013). Calero argues that there was great achievement when arXiv (subject repository) was created in the United States of America (USA) to collect pre-prints in the fields of physics and mathematics. The author further notes that, this repository has been a landmark in the open access movement, accelerating the entire scientific cycle. The momentum of the open access movement increased early 1999 when National Institutes of Health in USA launched the e-biomed proposal, the digital archive of post-prints and pre-prints in biomedical sciences. The goal was to publish articles while making them available immediately without subscription fees or other restrictions, and where the costs of publishing were assumed by the author or their institution (Sánchez-Torrado, 2007).

In 2000, a group of scientists founded the Public Library of Science (PLoS) for making journals available through open initiative (Bonilla-Calero, 2013). In 2001, the Open Society Institute hosted a meeting which led to the Budapest Open Access Initiative (BOAI). This was followed in 2003 by Berlin Declaration on Open Access ("Open Access to knowledge in the sciences and humanities") and the Bethesda statement on scientific research and its objectives. From the above background, the movement for open access has gained followers and support, both at institutional level and members of the scientific and research community. The International Federation of Library Associations

(IFLA) has committed itself to providing access to academic publications and research from the past, present and future to ensure preservation and access (Hanard, 2009).

Institutions in America have developed and implemented IRs. (Xu, 2008). One of the first institutional policies in USA requiring self-archiving (mandate) was that of the National Institutes of Health (NIH). In May 2005, there was a call to all researchers to submit electronic versions of the final manuscripts after acceptance for publication in PubMed central (Sánchez-Torrago, 2007). Similarly in Europe, there was an initial agreement between the British Research Councils to include the publications of their projects in IRs (Robertson & Dawson, 2006). More recently, the Finch Report (Finch Group, 2012) in the UK recommended that funding agencies provide money to successful applicants for research funds for paying the article processing charges that gold open access journals require. It recommended that from April 2013, science papers must be made free to access within six months of publication if they come from work paid for by one of the United Kingdom's seven government-funded grant agencies and research councils (Van Noorden, 2012). Some further examples of recent initiatives in open access since October 2012 include; Sponsoring Consortium for Open Access Publishing (SCOAP) which allowed open access to articles published in particle physics, Nature Publishing Group which announced a new open access journal, *Scientific Data* in April 2013 (Scheer, 2013), and in May 2013, OpenAIRE which created Zenodo, a new generation online repository supported by the European Commission that expands the linking of research outputs to datasets and funding information in European countries (Newman, 2013).

New Zealand is one of the countries which have implemented IRs and tertiary libraries are involved in a wide variety of institutional repository projects most of which began as part of four consortia in the country through which, national funding grants, expertise, and software infrastructure were shared. These are all linked to the umbrella metadata resource discovery system hosted by the National Library of New Zealand, Kiwi Research Information Service (KRIS). In general, New Zealand tertiary institutions have embraced the concept of institutional repositories with enthusiasm and felt the need to

show some benefits from the venture. In multi-part study of IRs in New Zealand, Cullen and Chawner (2008) identified factors that influence New Zealand academics' decisions to contribute to and use IRs. The study reported that, while New Zealand academic library managers were very positive about the value of IRs, academics failed to recognize the potential benefits of IRs and were reluctant to contribute to output (Cullen &Chawner, 2010).

In Asia, India leads with 16 functional institutional repositories developed by research and academic institutions of national and international importance such as Indian Institute of Science and Indian Institute of Management. Additionally, apart from institutional repositories, subject-specific repositories also exist. These store and provide access to subject-specific collections of documents. These repositories accept scholarly publications from any professional or researcher whose interest is in that respective field (Sawant, 2012).In Japan, the Ministry of Education, Culture, Sports, Science and Technology has encouraged Japanese university libraries to develop institutional repositories to promote sharing of knowledge throughout Japan and internationally (Cullen and Nagata, 2008). In Pakistan, librarians were not prepared to embrace changes forced by new technologies because of little knowledge of benefits it would bring forth thus the country lags behind in the use of technological inventions .

Different studies in Africa show that IRs are being integrated and used in institutions of higher learning. In particular, Chiware (2010) argues that first and foremost, local content housed in special collections throughout universities have not been utilized in the ways that published materials have been. Secondly, the geographic distribution of these collections has always been barrier to research therefore, only those scholars able to travel to the individual repositories have been able to utilize all the resources relevant to research, and local content have typically been unavailable to younger students and members of the general public. Finally, many African university libraries have embarked on building IRs to show case research outputs and as a result, many of the IRs are populated with theses and dissertations. Mutula (2012) points out that in recent times, universities in Africa have embarked on integrating information and communication

technology (ICT) in their operational environment in such areas as digitization and preservation of content, and increasingly, the trend now in automation of university libraries in Africa is toward the implementation of institutional repositories for capturing and preserving the intellectual output of universities such as PhD theses; preprints, post prints, working papers, technical reports, public archives, and graphic material among others. Mutula emphasizes that most university libraries in sub Saharan Africa are digitizing grey literature with the support of Association of African Universities (AAU).

Mapulanga (2012) posits that Africa cannot ignore digitization because of the continent's resources and the Knowledge-based economies of the world, and in this case, many university libraries have engaged in digitization projects to preserve heritage materials. Despite all the efforts to create digitization programs, roadblocks such as copyright issues, funding, institutional support, technical drawbacks and conservation of originals have always hampered meaningful progress in building digital libraries and institutional repositories. Despite the many problems there are success stories. South African Universities are currently leading among African Universities in terms of the development of institutional repositories growing from the total of 14 registered and active repositories in 2009 to the current 54 repositories out of 100 repositories in Africa (OpenDOAR, 2014). Botswana is another country leading in Africa in the adoption and use of open source systems in both public and private organizations. Mutula (2012) found out that, successful implementation of library automation and IRs in Botswana can be attributed to extensive involvement of staff at all levels in the automation process, capacity building, understanding of benefits that automation could create and assuring staff of job securities. In the context of Nigeria, Adekunle et al. (2007) observe that librarians in Nigerian universities have positive attitude towards the use and implementation of ICT because they have skills, knowledge and understand advantages of ICT. Mutula (2012) observes that librarians in developed countries moved quickly to learn new information technologies while in developing countries the situation was different.

Studies conducted in Kenya indicate that, development and implementation of IRs is increasingly gaining momentum in institutions of higher learning. Milimo (2012) points out that, research output should be available, accessible and applicable as the only way to impact on the lives of the millions of Kenyans, and contribute to global innovation systems. In particular, one of the pathways being used to enhance the visibility and accessibility of content from Kenya is through open access to information resources stored in digital institutional repositories adds Milimo. Similarly, Makori (2009) points out that, academic libraries in Kenya need to integrate technological solutions into mainstream information products and services such as integrated information systems, digital information systems, computing, and local area and wide area networks. Several initiatives are underway in universities and research organizations although institutions face several challenges such as lack of motivation and incentives, absence of institutional policies and strategies to support open sharing of information resources. Several institutions have established or are in the initial stage of developing IRs as exemplified through; 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).

The past studies while empirical have not been compared to any particular institutions of higher learning or organizations in Kenya. The studies do not present information regarding integration and use of institutional repositories in the country, particularly as far as institutions of higher learning are concerned. Secondly, past studies were done at least two to three years ago. With the subject being of a technological nature, the time span is long and with technology, many things could have changed within that period. Finally, most of the baseline studies centered on development and implementation rather than the clients and information resources found in the repository and thus the present research is justified in these respect. Against the above background, many institutions of higher learning have not integrated IRs into mainstream information systems as expected in spite of the importance of the vital content found in this information resource. In

addition, baseline studies have concentrated more in the development and implementation of IRs rather than on finding out whether IRs are adopted and used. IR studies in Africa and by extension Kenya also reveal that researchers deal with mainly issues related to development and implementation while crucial aspects of integration and use have not been included, and therefore the focus of this study.

1.2.1 Higher Education in Kenya

Kenya places much importance on the role of education in promoting economic and social development. In the last two decades, Kenya has experienced tremendous growth in university education leading to increased number of public and private universities. Kenya has adopted new body to manage education and training in universities and colleges –the Commission for University Education – established through the Act of Parliament Commission for University Act 2012. The number of chartered universities in Kenya is almost 50, including both public and private universities. Public universities include; University of Nairobi, Moi University, Kenyatta University, Egerton University, Jomo Kenyatta University of Agriculture and Technology, Maseno University, Masinde Muliro University of Science and Technology, Technical University of Kenya, Technical University of Mombasa, Kisii University, Multimedia University, University of Kabianga and University of Eldoret among others. Private universities are; University of Eastern Africa – Baraton, Catholic University of Eastern Africa, Daystar University, United States International University-Africa, Africa Nazarene University, Kenya Methodist University, Adventist University of Africa, Aga Khan University and Mount Kenya University among others. These universities also have affiliate campuses or colleges in major towns in the country (Commission for University Education, 2013).

1.2.2 University of Nairobi

University of Nairobi was established in 1956 as Royal Technical College which was transformed into the second university college in East Africa known as Royal College Nairobi. Royal College Nairobi was renamed University College Nairobi as the constituent college of the inter-territorial Federal University of East Africa. In 1970, the University College Nairobi transformed into the first national university in Kenya and was renamed the University of Nairobi (Annual Report, 2013/2014). University of

Nairobi has grown tremendously since then and has established various colleges and campuses within Kenya with over 300 training programs at PhD, Master's, Bachelor's, Diploma and Certificate levels. The university student population has grown with 84,000 students at present; 70,000 in undergraduate and 14,000 in postgraduate level. In 2011, the University had some 61,912 students, of whom 49,488 were undergraduates and 12,424 postgraduates. The university has launched several policy frameworks which include the research policy, plagiarism policy, open access policy and the intellectual property policy. The university has also introduced module 2 and module 3 degrees to cope with the demand of higher education in Kenya. Owing to this structures, the university has rapidly evolved into world class institution, and was ranked number 1 in Kenya and East and Central Africa, 9th among the top 1000 universities in Africa and 907 among the top 22,000 universities worldwide (Webometrics, 2014).

The university is committed to open and free access to information and takes responsibility for dissemination for research outputs owing to the fact that it has the largest annual research kitty of Ksh.3 billion. This commitment is rooted in the universities mission and is undergirded by the core values of innovativeness, professionalism and cooperate social responsibility. The university through the library has established the digital repository that provides long term preservation and showcases scholarly outputs in relation to teaching, learning, research, community service and consultancy. The library promotes access to information, provides information literacy training and collects and maintains relevant and balanced stock of information resources. The library system comprises of the main library and 13 college and branch libraries spread across various campuses of the university. Access to electronic resources is enhanced through expansion of computer laboratories and other access points throughout the university. In addition, the university through the library has continuously shown mutual support to the open access concept by holding successful open day/open access week every year since 2011. The aim of the open day is to create awareness on library resources and promote access to free global information resources including the institutional repository (UoN Library portal, 2014).

1.3 Statement of the Research Problem

Universities in Kenya generate plenty of scholarly information from research conducted by the faculty, staff and students but unfortunately, most of the scholarly production is only accessible by university community and authorized members. Most researchers in other institutions, as well as the general public, cannot reach or use information generated by the universities for research purposes due to complex organizational policies, timing, and geographical barriers. For any university or institution of higher learning to achieve academic mission and vision, research is one of the major pillars of development and growth. Most institutions of higher learning have put research as the key driving pillar after teaching but research investment remains irrelevant if the results are not disseminated to the public both nationally and internationally. UoN has therefore put in place the digital repository to showcase research and academic outputs to the world so as not to remain redundant and rated useless at the end of many years (UoN Library Portal 2014).

It has been recognized that end-users are vital to the ultimate success of IRs and integration and use (or lack thereof) can affect sustainability (Jean et al, 2011). Various baseline studies in the world, Africa and Kenya indicate that not much is known about the needs of the clients (McKay, 2007). Despite the general recognition of the importance of end-users to the ultimate success of the IR, not much is known about integration and use of the repository by the end users.

1.4 Purpose of the Study

The purpose of the study was to assess the extent of integration and use of institutional repositories in public universities with particular reference to the University of Nairobi.

1.4.1 Objectives

Objectives of the study included to:

1. Assess the development and implementation process of institutional repositories at the University of Nairobi.
2. Identify institutional factors that influence integration of institutional repositories at the University of Nairobi.
3. Examine the perceptions of users towards institutional repositories at the University of Nairobi
4. Assess the extent to which the University of Nairobi is creating awareness and popularizing the use of institutional repositories among the clients.
5. Establish challenges to the integration and use of the institutional repository at the University of Nairobi.
6. Suggest possible solutions to the identified challenges.

1.5 Research Questions

This research focused on answering the following:

1. What is the development and implementation process of the institutional repositories in institutions of higher learning?
2. What are the institutional factors that influence integration and use of institutional repositories at the university?
3. How do the users perceive the institutional repository as an information resource at the university?
4. To what extent has the university gone to create awareness and popularize the use of institutional repositories among the clients?
5. What are the challenges encountered in the integration and use of the institutional repositories?
6. Which are the possible solutions for the identified challenges?

1.6 Scope of the Study

The study is a cross sectional descriptive survey which focused on the University of Nairobi digital repository users and developers. The respondent's included 6 library staff drawn from the total 62 staff members of JKML and 94 students drawn from the total 943

2014/ 2015 admissions of the Institute of Diplomacy and International Studies. The study also included key informants drawn from the top library management; director of library services and the three deputies.

1.7 Limitations of the Study

The study was conducted at the University of Nairobi only due to the exemplary performance of the university as rated by webometrics which uses the institutional repository among other measures to rank institutions.

Findings may not necessarily reflect the true situations in other institutions of higher learning in other parts of the country especially those in semi urban and rural areas as University of Nairobi is an urban based institution.

1.8 Significance of the Study

The findings of this study contribute new knowledge on the existing research outputs that have been conducted in this field. This will benefit universities in improving on the quality of institutional repositories. This study will also benefit planners and developers of repositories. Understanding the attitudes and perceptions of the university community will go a long way to help the planners to create and manage institutional repositories. The study identifies practical and theoretical challenges encountered thus benefiting developers and users by consequently recommending solutions to the challenges. Finally, the university community benefits from this study as it gets to understand the importance of depositing research and teaching materials in institutional repositories hence remain supportive of the resource.

1.9 Operational Definition of Terms and Concepts

Integration

The process of linking together the institutional repository with different information resources to act as harmonized whole and thus works together effectively.

Institutional Repositories

This is a digital library for collecting, preserving, and disseminating digital copies of the intellectual output of the University, particularly academic journal articles, both before

and after undergoing peer review as well as electronic theses and dissertations .Also included are administrative documents, course notes and conference proceedings and presentations.

Development

The complete process of bringing a new technology in this case the institutional repository to use over a period of time

Implementation

This refers to the process of putting the repository into use from the time of installation. The process includes; requirements analysis, scope analysis, customizations, systems integrations, user policies, user training and delivery.

Scholarly Communication

The formal and informal processes by which the research and scholarship of faculty, researchers, and independent scholars are created, evaluated, edited, formatted, distributed, organized, made accessible, archived, used and transformed.

1.10 Summary

This chapter discussed the background of the study. This included an over view of baseline studies internationally, regionally and in Kenya, higher education in Kenya and the University of Nairobi. The chapter also illustrated the problem that led to the researcher undertaking this study. With regard to the stated problem, the study formulated objectives and research questions that were used to guide the researcher. Also discussed in this chapter is the significance of the study and definition of operational terms which lead the study to chapter two which discusses empirical studies on the institutional repositories.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents insights into empirical studies previously done in the area of institutional repositories. The chapter outlines the global status of institutional repositories showing the knowledge gap between the past and present study.

2.2 Institutional Repositories in Higher Education

The ability to disseminate research electronically has opened institutions of higher learning to new practices of open access publication, which is defined as digital, free of charge, and free of most copyright and licensing restrictions (Suber, 2010). Institutional repositories that provide the means to digitize and disseminate scholarly communications are part of the open access movement. IRs are digital collections that capture and preserve the intellectual output of a single academic community and provide the method of dissemination, stewardship, and long-term preservation of the intellectual work created by that institution (Casey, 2012 p.2). IRs also offer the means to safeguard the creative works of faculty and students as well as the records of institutional life and to disseminate them to the larger scholarly community. The role of universities in higher education is to advance knowledge through teaching, research and service (Casey, 2012). Scholarship is disseminated to the scholarly community globally through the process known as scholarly communications, which is one way of sharing research, theories and concepts for the purpose of maintaining dialogue that advances knowledge and understanding in a given topical or subject area. Traditional means of scholarly communications has been through publication in print books, journals, and conference proceedings but with the advent of the internet and other digital technologies, disseminating faculty work electronically has gained prominence (Casey, 2012).

Majority of tertiary institutions in developed and developing countries have established institutional repositories under the support of academic libraries (Cullen & Chawner 2010). Institutions encouraged researchers to deposit full-text copies of published outputs in the repositories in order to make research more readily available, preserve and

organize the institution's research output, and enhance the reputation of the institution. The OpenDOAR database at the University of Nottingham, which attempts to list all repositories worldwide, records spectacular growth in the number of repositories over the past three years, from just over 300 in mid-2006 to over 2730 currently. Of these, over 1,155 (81%) are institutional repositories, compared with 187 (13%) disciplinary, or cross-institutional subject repositories. The remaining 6 per cent comprise governmental and aggregating repositories. Over three-quarters of these repositories are found in North America 542 (19.9%) and Europe 1244 (45.6%), with Asia accounting for 503 (18.4%), Australia 64 (2.3%), South America 15 (0.5%) and Africa 103 (3.8%). Only 92% of repositories identified are fully operational, with most of the others being in trial mode only, and 2% having ceased operation. A total of 58% are multidisciplinary, 62% include journal articles, 50% theses and dissertations, 42% include unpublished working papers, and 35% conference papers (OpenDOAR, 2014).

From the above background, it seems superficial to suggest that institutional repositories have been successfully introduced and may indeed provide solutions to concerns about systems of scholarly publishing identified. More detailed analysis of data available through OpenDOAR database, and review of numbers and nature of items deposited suggests otherwise (Callen & Chawner, 2010). Most institutional databases maintained by UK universities do not appear to contain or reflect the extent of the scholarly output of the academic communities. Apart from the massive DSpace repository at Cambridge, which includes nearly 200,000 items, the bulk of which are digitized images and research data as well as smaller collections of research articles and theses, typical universities will have between 1,500-6,000 items. Some have fewer than 100 items deposited. Only some of the items listed in the repositories are available in full-text and not all have been through any form of peer review or other quality assurance process. This is true of the most of the institutional repositories listed on OpenDOAR for all countries.

Studies by University of California that involved staff managing repositories reveal that, academics have little awareness of opportunities for open access publishing, continue to publish in traditional venues and identified a major obstacle to change as "existing

reward systems of tenure/promotion (even grant making) which favor traditional publishing forms and venues” (University of California, 2007, p.3). This well-established reward system is currently being reinforced by the international focus on the use of research outputs to evaluate tertiary institutions, a focus which emphasizes publication in the most prestigious journals and conference proceedings in various disciplines. In addition, the lack of alignment of the deposit process with the routine daily activities of academics may also contribute to the lack of interest shown by academics in depositing their output. Findings from the survey further show that, arts and humanities researchers differ in a number of ways in relation to use of library services from colleagues in the sciences and social sciences. These differences are evident in the way academics view institutional repositories.

Survey of British academics found peer review to be as important to British as to US academics (Bonilla-Calero, 2014). The study showed that humanities scholars had low awareness of repositories and their value to the research community; they perceived the value of repositories to be to the reader rather than the scholar depositing and had ongoing concerns about repositories such as peer review, plagiarism, and intellectual property ownership. More recent research in the UK about the impact of e-publishing and open access for researchers in the arts and humanities suggests that they continue to be less aware and make significantly less use of electronic publications and open access services than their counterparts in the sciences (Heath et al., 2008). This may be partly because the advance of knowledge in the arts and humanities is typically slower than in other disciplines and researchers are more likely to be interested in the final versions of articles or post-prints rather than pre-prints (Heath et al., 2008).

Similarly in Australia, work practices differ in different academic disciplines, as exemplified by the publishing behavior and willingness to deposit research in, and make use of IRs as information resources (Kingsley, 2008). The found that, differences in culture between academic disciplines do appear to extend beyond the known patterns of scholarly communication and do affect the likelihood of individuals voluntarily embracing repositories. In general terms, the study shows that an academic is most likely

to seek deposit for work in forums they would likely use to find the work of peers and colleagues. There is an inherent conflict between the needs of the institution and those of an academic's interest. Kingsley observes that, repositories exist to serve institutions and funding bodies rather than individuals.

2.3 Institutional Repositories in Kenyan Higher Education

Freedom to access and use of information is a human right as enshrined in the Berlin Declaration (2003) on open access to knowledge which states that, authors should allow all users 'free, irrevocable, worldwide, right of access to information'. The United Nation General Assembly in Resolution 59 (1) recognized the importance of this right and resolved that 'freedom of information is a fundamental human right', which is an implication that people have right to access information. In Kenya, the right to information is enshrined in the Kenya Constitution of 2010 Bill of Rights Article 35 where the State has the duty and responsibility to publish and publicize any important information affecting the nation. Baseline studies from government and the private sector indicate that, due to the need to meet donor-funding requirements, the private sector is found to be pre-occupied with meeting certain performance standards. In this endeavor, non-governmental organizations (NGO) and other privately owned organizations publicize research through various means including repositories. The government on the other hand initially was not proactive in advocating for the use of electronic resources for dissemination of information to the masses but lately, with the current government which is referred to as the "digital government" there seems to be change. Lack of urgency on the part of government entities might explain why the public sector lags behind private sector counterparts in all the research constructs.

IRs have been developed in academic institutions in Kenya as means of providing information generated locally through research to the population and the international community. Several institutions have established or are in the initial stage of establishing institutional repositories with eleven IRs registered in OpenDOAR as indicated elsewhere. Despite the arguments for significant benefits of institutional repositories for both the clients and the institution, the evidence shown by OpenDOAR suggests that academic institutions in Kenya have been slow to respond. With considerable investment

of resources and strong initial advocacy from libraries, institutional repositories have not been as successful as expected. The focus of this study is therefore to identify the factors that may have contributed to this, and understand more about the perceptions of the users, awareness and attitudes towards institutional repositories.

2.4 Rationale for Institutional Repositories

Repositories serve a variety of purposes. For the institution, the repository can raise the visibility of faculty research, help preserve the intellectual output of the institution, and, particularly for public institutions, can be an effective way to share research with their constituencies. For the producers of the research, the faculty, the repository is a way to disseminate their research within their peer community and to increase citations to their work. These two major stakeholders, the institution that supports the IR and the researchers who create the works, have therefore different viewpoints and needs for how the repository should be structured. In the information environment, repositories are seen as one way to address some of the economic challenges of obtaining access to scholarly works. As subscription costs increase at rates higher than inflation, and libraries and information systems face continuing budget reductions and challenges, open access repositories help provide access to research findings. The challenge, however, is still how to identify articles that are available full-text from the institutional repository.

Reasons for setting up repositories vary from one institution of higher learning to another, and wide range of projected benefits have been suggested (Sawant, 2012). These include benefits to the researcher, institution and individual disciplines. Academic libraries benefit from being involved in institutional repository initiatives, and there are implications for scholarly communication. Overall, institutional repositories include more open scholarship and demonstrate cultural diversity of organizations through the collections. IRs ensure the availability of open content to the wider audience. This was previously not possible, and helps end the monopolization by vendors. The invention minimizes huge disparities, leading to a more equitable information economy. The IR breaks free the traditional boundaries of scholarly information access, which is common in universities, provides easy access to information, enhances visibility and the ability to cite publications and also underscores organizations' research growth (Nabe 2010). In the

University of Nairobi, the major benefit of the IR as observed is to the institution. The IR has made the university's intellectual output visible both nationally and internationally and as a result, the institution has been ranked as one of the best performing universities in Africa and the best in Kenya. (Webometrics Ranking, 2014). The other implication is the use or non-use of the IR as the information resource. Use is identified as a success factor and can be divided into three sub-categories of number of users, type of content used and nature of use (Harnad & McGovern, 2009). The most widely used method to measure the use of a repository is by webometrics. Webometrics show how many hits have been made from the repository and the number of articles downloaded. The more the downloads, the clearer it becomes that the IR is being used. To the researchers whose papers are downloaded, it may mean that they are likely to receive more citations.

Despite the lack of studies of IR end-users, several studies have investigated potential end-use of open access materials and strongly advocate for use of IRs. Many of these studies purport a great deal of interest on the part of potential IR end-users. Bringing together input data, usage and citation analysis from various studies is helpful in giving the picture of how effective the repository is to the stakeholders. These data gives evidence that the IR is being used by a variety of users and provides a benchmark of use and growth over time for institutional repository funders and administrators of institutions of higher learning.

2.5 Development and Implementation Process

Setting up the repository is a major undertaking for any institution due to financial limitations and other affiliated issues. It requires commitment of financial and staff resources establishment and maintenance, well-developed process for establishing the authority and value in the institution, and an overt public relations campaign in the academic community to persuade individual academics to deposit research outputs (Cullen & Chawner, 2011). There are a number of evidence based factors which influence successful development and implementation of IRs. Gieceske (2011) points out that, the best practice approach can be viewed as the process or action for dealing with or overcoming any organizational problem which might occur during the development process. There are a number of organizational oriented best practices from literature that

are perceived to have important roles in facilitating the treatment of human and institutional issues in the development process. More specifically, Gieseske avers the importance of the following eight best practices that have been widely applied: undertaking realistic project proposals, assembling a well-balanced project team, encouraging senior management support, encouraging user participation, Instituting comprehensive training, ensuring effective communication, marketing and promotion and identifying who is responsible for the treatment of organizational issues.

A number of authors have identified and proposed irreducible and minimum requirements for development and implementation of IRs. When planning and deciding to establish institutional repositories, certain decisions and minimum requirements need to be taken into account (Nabe, 2010 p.13). These include; repository staff and funding, management issues, platforms to be used, and what marketing techniques. Empirical studies done in South Africa identified various factors to be considered when setting up institutional repositories such as identifying important role players, addressing issues of resources, evaluating software, formulating policies for the institutional repository, restructuring the library to accommodate change and licensing (Macha&De Jager, 2011). Campbell (2011) asserts that, repository implementers in various case studies mainly involved librarians, although the best approach is to include all other equal stakeholders across the institution and follow the process as shown in figure 1 pg.20.

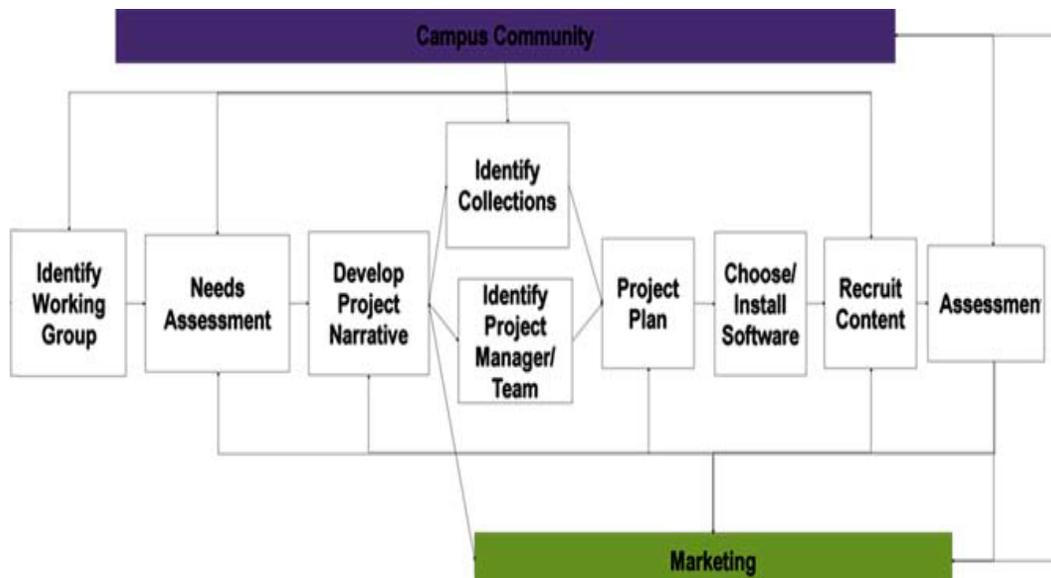


Figure 1. Innovation-decision Process for Repository Implementers, Librarians and Faculty (Campbell 2011)

2.6 Institutional Factors Influencing Integration and Use of Institutional Repositories

The institution planning for the development and implementation of IR must fundamentally ensure successful implementation, adoption, accessibility, visibility and sustainability. Factors critical in influencing integration and use of institutional repositories include; senior management commitment and support, effective communication, comprehensive user education and training, and identifying responsibilities for IR management to ensure sustainability.

2.6.1 Management and Support

IR development successes have long been believed 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 (IT) 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 the new IR project

(Nabe, 2010). These two points 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.

2.6.2 Effective Communication

For the new IR to come into being and actually be used, the institution has to play the lead in fostering excellent communication among all individuals involved in the development process, particularly between analysts and users. The success of the eventual system implementation rests on the capability of analysts, users, and managers to communicate in meaningful ways due to different interests and expectations from the system (Kounoudes & Zervas, 2012). Effective channels of communication should exist to overcome any differences. Negotiation more explicitly recognizes the durability of the differences and achieves solutions through bargaining. Organizations should encourage effective communication between stakeholders (managers, IR developers, and users) throughout the systems development process.

2.6.3 Education and Training

Adequate training needs sufficient financial and time support in addition to being the responsibility of the institution to ensure clients and staff are educated on the new technology to enhance its adoption and use. Lynch (2003) expressed fear that without commitment from tertiary institutions to teach staff and students to use IRs, the repository will not achieve sufficient usage to warrant existence. Regarding the role of reference librarians in IRs, Bailey (2005) pointed out that, the amount of support required for IRs is often underestimated and the need to provide user education, promotion, metadata creation and preservation is often overlooked. Similarly, Bell et al, (2005) commented that on its own the open archives initiative protocol for metadata harvesting would not create sufficient usage of IRs, and that librarians will be required to teach staff and students how to access the content of repositories. Allard et al (2005) believed that even though librarians are not necessary for the IR to function, they are needed to educate users about how to access the material in IRs. Gray (2009) suggests that, subject

librarians are in a prime position to educate users about the value of IRs, and promote the information resource.

Makori (2009) suggests that, information professionals in academic libraries in Kenya can master the use of ICT systems and other competencies through motivation, encouragement and additional training. Good training program before and after the IR is put into operation is therefore important as this will educate users in articulating information requirements and needs. Jean et al, (2011) also suggest that, apart from skills, team-building exercises to help members of staff work in the new structures and adapt to the new working practices are important.

2.6.4 Identifying 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 the case of any, is often very difficult to identify. To be able to openly address all issues and find justification for any ignored problem during the system development process, allocation of tasks and assignment of responsibilities among the members of the IR project team should be the preserve of the management of the institution. The institution will also be in charge of restructuring roles and responsibilities according to skills and performance. Macha and De Jager(2011) found out that, the University of Cape Town library management restructured roles and responsibilities of the staff in order to accommodate the change that had been brought about by the establishment of the IR. Existing staff members were offered new roles and new staff were hired for new roles.

2.7 User Perception of Institutional Repositories

The understanding of the term “institutional repository” by the user community is quite diverse. Many are confused about whether library databases such as Emerald and JSTOR, faculty and departmental web pages, open courseware sites, and/or space on university servers would count as IRs (Jean et al, 2011). The user community varies according to various characteristics. Chandra and Halder (2012) in investigations done on Indian IRs

identified that, the humanities and social science researchers are found to have low levels of awareness of the institutional repository but are interested in contributing research work to university institutional repositories and have positive attitudes towards providing free access to scholarly research results of their universities. This observation demonstrates that it is need to study the users' awareness of institutional repositories so as to measure local scenarios. In previous research, Chandra and Halder point out that, interviewees described many different ways they first learned about the IR including; library workshops, suggestions from advisors, professors, colleagues, or university administrators, and notices from the university regarding the requirement that students deposit theses/ dissertations in the IR. To encourage broader support and generate awareness both inside and outside the library, developing countries have adopted marketing strategies including; branding and then promoting internally and externally. It has been suggested that, repository developers should hold meetings within the library and alert the campus community through press releases about the IR. Library administrators should perform further outreach through presentations to department heads, while developers should enter into extensive discussions with multidisciplinary departments to investigate how to use the repository to solve information problems encountered in the units.

2.8 Marketing and Promotion Strategies

The marketing of new library resources or services is always essential to spread the word of value added tools to enrich the academic lives of the university community. Faculty involvement is critical to ensure that the system meets the scholarly needs of dissemination and visibility of the present and future generations. Additionally, it is imperative for reference librarians to engage faculty in a change agent role by garnering IR buy-in. Massachusetts Institute of Technology (MIT) DSpace study showed that faculty needed to see information regarding an IR at least five times and according to the California Digital Library study, seven times before the IR registers as a technology worthwhile to pursue (Branschovsky, 2004). Given these baseline studies and anecdotal evidence, librarians must realize that perseverance in pursuing contact with faculty within the IR context is essential to populate the archive.

The biggest challenge of the IR appears to be garnering content. Librarians have to become marketing specialists embarking on a mission of advocacy for the IR. For faculty who are used to the traditional journal peer review process, there are questions raised about the benefits of submitting materials to the IR regarding required time and effort. Reference librarians who have been assigned to promote the IR and train potential users will encounter resistance in the guise of, “There is no reward or incentive, it is not a priority, I have already published my papers where my professional peers have immediate access to my scholarship or I don't have the time”. This are often the remarks received from faculty and staff. To counter these concerns, issues about copyright may be voiced at IR presentations. Faculty and students can be enticed to add scholarship into the IR by targeting graduate students working on theses and projects while preparing to graduate, and on proactive faculty that tends to gravitate to using new technologies is one promising strategy.

Continued marketing leads to continued growth of the IR” (Madsen & Oleen, 2013). Solid marketing framework should start as soon as possible, with Kocken and Wical (2013) stating that “before content recruitment can become a focal point of any marketing strategy, librarians and institutional repository managers must build awareness”. The importance of marketing for IRs is commonly repeated as the solution for content recruitment, though there exists much less literature on effective marketing for IRs. Gierveld (2006) points out that IRs are not developed in response to market demand, making the recruitment of content challenging. Common marketing activities found in the literature include the creation of informational brochures and flyers, presentations to faculty groups and using personal academic connections (Laws & Fortier 2014).

2.9 Challenges of Developing and Using Institutional Repositories

In many African countries, the digitization of materials and setting up of institutional repositories have faced serious problems ranging from low internet connectivity; software and hardware challenges; lack of highly skilled personnel; inadequate power supply; low bandwidth; legal copyright laws; poor funding; lack of organizational infrastructure and policies; project sustainability and many others (Mapulanga 2012). In general, major problems that affect integration and use of IRs are explained as follows;

2.9.1 Copyright Issues

Campbell (2011) in comparative study of various IRs found out that copyright is one of the biggest challenges facing the IR developers in Canada. After digitization of paper based content, developers are mandated to seek for permission from individual authors before the projects are moved to the repository. Not only is the author's permission needed for submission, but also in some cases, theses require the permission of the authors quoted within the materials. Campbell further notes that first, Canadian copyright law does not allow for the "fair use" of materials for study and criticism and limits the amount of text that can be cited. Second, there are quantitative guidelines in the copyright law, and the librarian working with the theses often requires students to ask for permission to use the content in print format and electronic format. Finally, while the librarians figure out how to populate and run the repository more efficiently, there is still need for financial support from the university. Additional resources are needed for marketing and securing copyright permissions.

2.9.2 Document Submission

As academic institutions implement IRs, faculty members are they reluctant to contribute. In a survey of directors at the Association of Research Libraries (ARL), two-thirds responded that the majority of faculty members at the institutions were not contributing (Casey, 2012). Furthermore, Schonfeld and Houseright (2010) discovered that less than 30 percent of faculty in U.S. colleges and universities were contributing to IRs. In addition, studies of IRs in several institutions such as New Zealand's eight universities (Cullen & Chawner, 2011) also reveal some reluctance on the part of faculty to contribute. The other challenge on the part of document submission as argued by Giesecke, (2011) is that faculty and other researchers may post files that don't meet quality standards. These files need to be corrected and improved if the institution has to ensure quality repository that others will use. In addition, as identified by Giesecke, the faculty may not know how to describe work in a way that will increase the chances of the article being discovered by search engines such as Google. Providing correct key words and expressive abstract can increase the chances of users identifying and then citing or using the faculty research. Faculty cites a variety of reasons for hesitation to contribute to IRs (Casey, 2012 p.3). These include learning curve for new technology, copyright

issues, concerns over whether contributing to the IR is equated with publishing, fear that low quality of some material in the repository would taint the research, and worries about plagiarism.

2.9.3 Costs of Institutional Repositories

Establishing the institutional repository is not cost free. Factors that impact costs include the number and type of staff, type of technology chosen for the repository, services provided, and cost of preservation of data. One of the first decisions for an institution is to choose the type of hardware and software for the project. Open source software systems provide the institution with the ability to customize the program and develop facilities that meet local needs. To the contrary, it does mean that the institution needs programming and systems staff to run the system. Choosing the commercial software program limits the amount of technical staff needed and may limit the amount of customization to be done. Other technology costs include digitizing content or hardware and software needed for such services, charges for backup systems, and digital storage (McKay, 2008). Once the software platform is solved, the institution can determine the staffing needed to run the repository.

2.10 Conceptual Framework

Conceptual model was developed to illustrate the relationships between the variables, which the study identified as being of importance to the research problem. Developing such a conceptual framework helped to suggest and test certain relationships thus improved the understanding of the dynamics of the situation. Figure. 2 pg.27 helped this study to visualize the relationship between key concepts and variables that were relevant to the research. The conceptual framework for this study was based on dependent variables such as ; development process, possible implications of IR, perceptions of the users, marketing and promotion strategies and institutional factors that influence integration and use of IR; independent variable which was; integration and use of institutional repositories and outcome variables; high rate of adoption and use of institutional repositories and poor adoption and use of institutional repositories

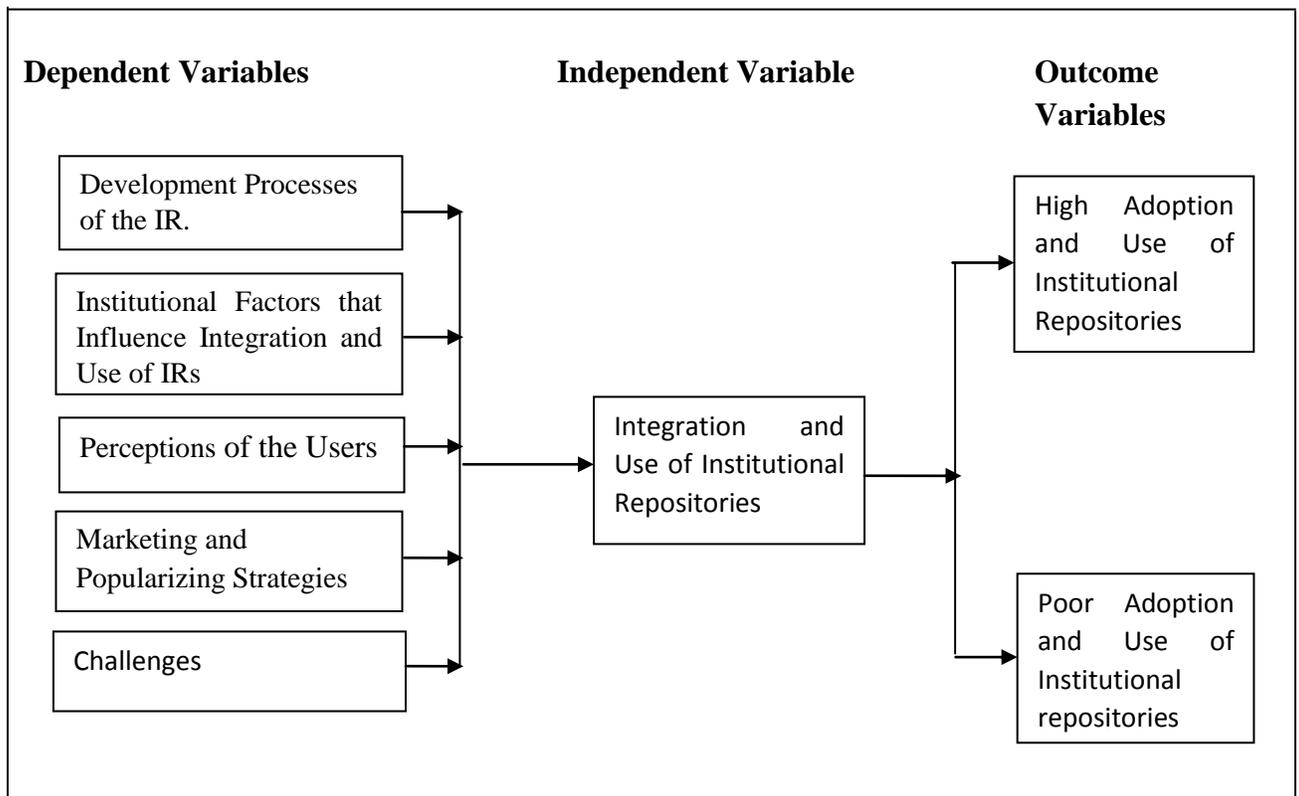


Figure 2: Conceptual Framework (researcher, 2014)

2.11 Operational Framework

The operational framework for this study was based on the operationalized dependent variables such as; development process, perceptions of the users, marketing and promotion strategies, institutional factors that influence integration and use of IR and perceived challenges; independent variable which was; integration and use of institutional repositories. The study illustrates that, positive relationship between the independent variable and the dependent variables yields positive outcome. In this study, the expected outcome is high rate of adoption and use of institutional repositories as illustrated in Figure 3 pg. 28

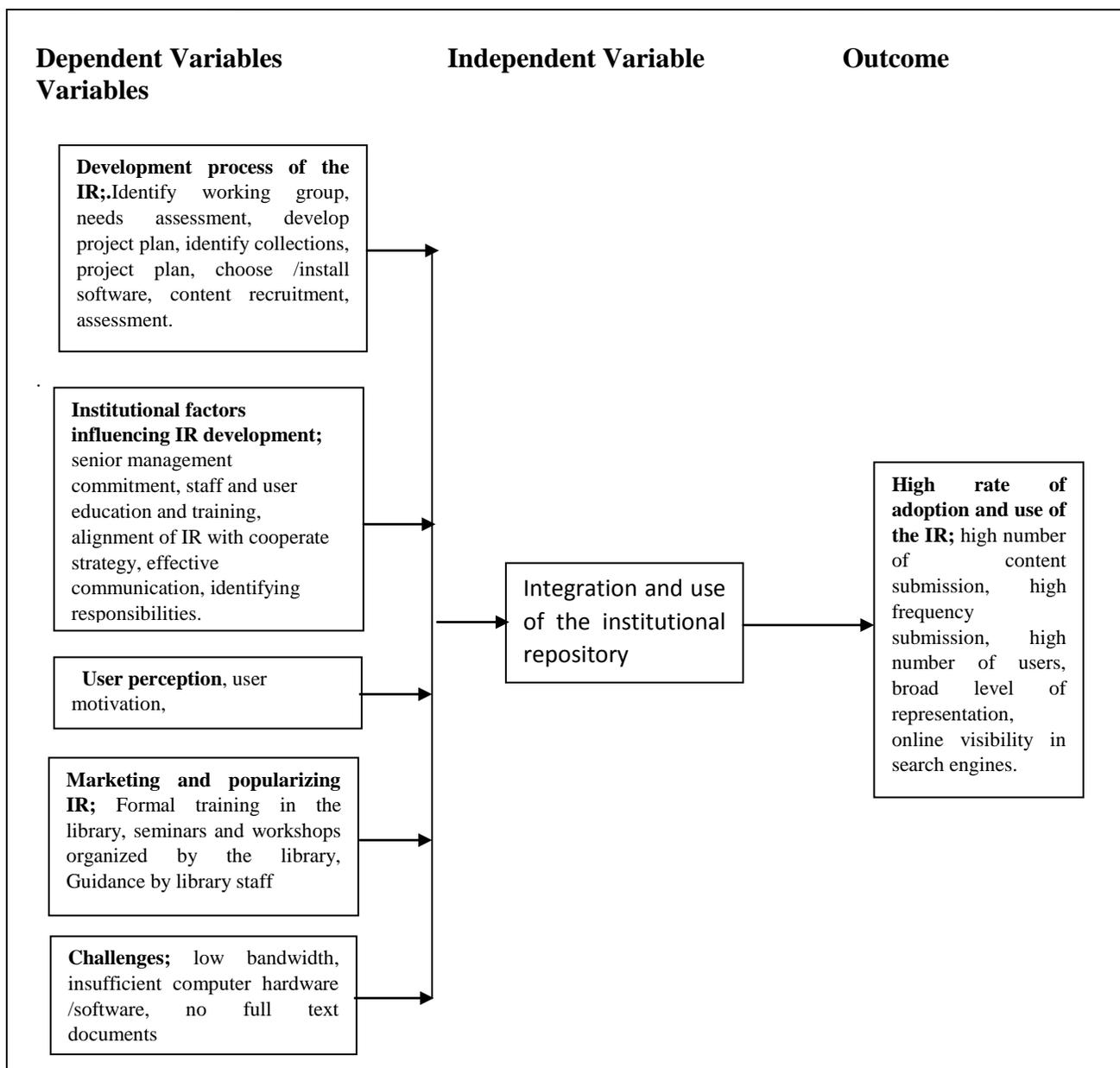


Figure 2: Operational Framework (Researcher, 2014)

2.12 Summary

From the literature review and case studies, it can be concluded that IRs have immense benefits to institutions and by extension the whole country. It is evident that various benefits such as visibility of faculty research, preservation of intellectual output and avenue for sharing research therefore makes marketing and sensitization strategic too for ensuring IR awareness. This will enable early adoption and use of the IR. Further, objectives discussed enumerate issues which allow movement to the next chapter where methodology used to carry out the research is presented.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter discussed issues related to empirical studies which enabled this study to identify the knowledge gap. This chapter introduces and describes the methodology that was used in carrying out the study. Specifically, the chapter focuses on the research design, the target population and sampling design. Highlighted are the methods and instruments of data collection and procedures that were administered in the field. The methods that were used for analyzing the data as related to the research questions have also been discussed

3.2 Research Design

This study adopted a cross sectional descriptive survey of the institutional repository and the users which aimed at establishing information on the integration and use of the institutional repository among information seekers. This study design was suitable for this research as it measured phenomenon across the sample representation of the targeted population. Mugenda (2003) contends that, cross sectional studies are appropriate where the overall objective is to establish whether significant associations among variables exist at some point in time. In view of this approach, cross sectional survey method was used to obtain the empirical data to determine the linkages between variables.

Qualitative and quantitative research designs were also used in this study. Quantitative research refers to the systematic empirical investigation of social phenomena via statistical, mathematical or numerical data or computational techniques. The objective of quantitative research is to develop and employ mathematical models, theories and hypotheses pertaining to phenomena (Mugenda and Mugenda 2012). The process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships. Quantitative data was collected by administering close ended questions through the questionnaires. The questionnaires were issued out to staff and student's after which data collected was analyzed using excel computer spread sheets and SPSS. The numbers generated results that were generalized to the larger population.

Qualitative method was preferred as qualitative research is used to explore and understand people's beliefs, experiences, attitudes, behavior and interactions. Qualitative researchers aim to gather an in-depth understanding of human behavior and reasons that govern such behavior (Stern, 2003). Qualitative research includes designs, techniques, and measures that do not produce discrete numerical data. More often, the data is in the form of words rather than numbers and are often grouped into categories (Mugenda and Mugenda 2012). The researcher chose to include qualitative method as it permitted the study to go beyond the statistical results that is usually reported in quantitative research. It was also possible for the researcher to study human behavior such as attitude and perception of the users. The study also used observation and interview schedules to collect qualitative data. Mugenda and Mugenda (2012) point out that there are two methods of observation. These include; direct observation where the required behavior is observed in a particular setting and participant observation where the observer is a participant in the activities being observed. The researcher used participant observation to assess the library environment and information seeking behavior of library users. This study also employed the use of the interview schedule where there was face to face interaction between the researcher and the subjects to probe the library executive management. The results from the qualitative data was presented by use of verbatim narrative by quoting respondents "voices" .Presentation of results was guided by the study objectives as illustrated in figure 3.1 pg. 32.

Table 3.1 Objectives and Mode of Measurement

NO.	OBJECTIVES	INDEPENDENT VARIABLE	DEPENDENT VARIABLE	MEASUREMENT
1.	Assess the development and implementation process of institutional repositories in institutions of higher learning.	Development and implementation process	Integration and use of institutional repositories	Questionnaire
2.	Identify institutional factors that influence integration of institutional repositories at the University of Nairobi.	Institutional factors	Integration and use of institutional repositories	Questionnaire/ Interview
3.	Examine the perceptions of institutional repositories by users at the university of Nairobi	User perception	Integration and use of institutional repositories	Questionnaire
4.	Assess the extent to which the University of Nairobi is creating awareness and popularizing the use of institutional repositories among the clients.	Marketing and promotion	Integration and use of institutional repositories	Questionnaire/ Interview/ Observation
5.	To identify challenges and preferred solutions to the integration and use of the institutional repository at the University of Nairobi.	Challenges and preferred solutions	Integration and use of institutional repositories	Questionnaire/ Interview/ Observation

Researcher (2014)

3.3 Study Area

The study was conducted at the University of Nairobi Main campus in Kenya’s capital city Nairobi. The Jomo Kenyatta Memorial Library (JKML) was specifically selected since it houses the hub of the development of the university digital repository and also houses the library management who represented the universities top management.

3.4 Target Population

The population consisted of the library executive management, Jomo Kenyatta Memorial library staff and students of the University of Nairobi. Sampling frame was used to define the target population. Sampling frame is the list or other devices used to define researchers population of interest. Sampling frames could be divided into two types; lists and non-list. Sampling frames used in this study include lists of sections in the library and employees records and list of student admission of the Institute of Diplomacy and International Studies (IDIS). From this sample, those admitted in the 2014/2015 academic year were selected. In total 4 executive library managers and 62 staff members were included. 943 students were selected as the target population.

Table 3.1: Target Population

CATEGORY	POPULATION	PERCENT %
Executive Management	4	0.40
Library Staff	62	6.14
Students	943	93.46
TOTAL	1009	100

Source: Departmental Lists

3.5 Sample and Sampling Techniques

3.5.1 Sample Size

Sample size is a predetermined part of a numerical population whose properties are studied to gain information about the whole. Sample is the smaller group obtained from the accessible population. Size of the sample is determined by the optimum number necessary to enable valid inferences to be made about the population. In this study, the samples selected were representative of the whole population with salient characteristics. 62 staff members and 4 executive management of the JKML constituted the sample frame of the target population while 943 constituted the targeted students population. The sample size for this study is illustrated in Table 3.2 pg.33.

Table 3.2: Distribution of Sample Size

CATEGORY	POPULATION SIZE	SAMPLE SIZE
Executive Management	4	2
Library Staff	62	6
Students	943	94
TOTAL	1009	102

3.5.2 Sampling Techniques

The sampling techniques defines the list of all population units from which the sample were selected (Cooper & Schindler, 2003). The technique is used so as to acquire a representative sample where the population does not constitute a homogeneous group. In this study a target population totaling 1009 respondents was examined. Of the total population 4 comprised of the executive library management, 62 library staff while the remaining 943 comprised admitted students of the Institute of Diplomacy and International Studies in the 2014/2015 academic year .

Stanley and Gregory (2001) posit that, at least 10% sample of the population should be considered as the generally acceptable method of selecting samples in cross sectional surveys. 10% of the total population of JKML staff members (10% of 62) will be approximately 6 members of staff. Purposive sampling procedure was used to select the executive library management. The sample size for executive library management included all the 4 management staff members. Students of UoN vary according to areas of specialization and study. Since there were no given records of number of students who patronized the Jomo Kenyatta Memorial library at a given time, cluster sampling was used to select students of the Institute of Diplomacy and International Studies. From this sample, those admitted in the 2014/2015 academic year were selected. The total population of students admitted for various programs at the Institute of Diplomacy and International Studies in the 2014/ 2015 academic year were 943. 10 % of the total population of the selected students (10% of 943) will be approximately 94 students.

3.6 Data Collection Methods and Approaches

Data for this study was collected from primary sources which entailed responses on all the study variables as illustrated in Table 3.1 pg.31 and discussed below.

3.6.1 Questionnaire

The questionnaire is guided by the study objectives as demonstrated in Appendix II. The researcher administered questionnaires personally after attaining research permit from the Department of Library and Information Science to collect data from the library users and staff. A brief introduction letter (Appendix I) was made to the respondents before administering the questionnaires with the aim of explaining the nature and importance of the study during pilot and main study. The questionnaire included both open ended and close ended questions that enabled the researcher to gather qualitative and quantitative data. Quantitative data was collected by administering closed ended questions through the questionnaires. The questionnaires were issued out to staff and student's after which quantitative data collected was analyzed using excel computer spread sheets and SPSS. The numbers generated results that were generalized to the larger population. Qualitative data on the other hand was collected by administering open ended questions through the questionnaire. Results from the qualitative data were presented by use of verbatim narrative by quoting respondents "voices".

3.6.2 Interview Schedule

This study employed the use of the interview schedule to probe the library executive management where 2 executive members from the total population of 4 were interviewed. The researcher first notified the interviewees of the intent where appointments were made. Interviews involved oral administration of research questions against interview schedule (Appendix V) which guided the proceedings. This facilitated face to face interaction with the respondents. The results from the qualitative data was coded, analyzed and presented by use of verbatim narrative by quoting respondents "voices".

3.6.3 Observation Guide

Observation method entailed the researcher observing natural settings of JKML library within the period of study guided by the observation guide (Appendix IV). This method involved monitoring and recording behaviors and other patterns of information searching within the e-resources library and the entire library as a whole. The study purposed to establish the availability of resources to access the IR at JKML, determine the channels of information that users interact with, establish the extent of use of the IR and identify challenges and future of the IR. Vital information was recorded as per the observation guide and analyzed by content and document analysis. Observations made it possible for the study to test the truth of statements which were made by respondents in the questionnaires and interviews. The results from the data were presented verbatim.

3.7 Research Instruments

Research instruments are used by researchers and practitioners to help in the assessment or evaluation of subjects, clients or patients. The instruments are used to measure or collect data on a variety of variables ranging from physical functioning to psychosocial wellbeing. Types of measurement tools include scales, indexes, surveys, interviews, questionnaires and informal observations. The researcher made sure that the instruments chosen for the study were valid and reliable. The validity and reliability of a research project depends largely on the type of the research instruments chosen. Before the study was executed the researcher ensured that the instruments chosen would give the desired results.

3.7.1 Pilot study

To ensure the questionnaires are tested freely, a pretest was done. The area of study was Strathmore University Library situated at Madaraka area in Nairobi. The population for the pretest was identified using stratified random sampling where any consenting 5th number of patron who walked into the library was selected. A total of 15 students and 4 members of staff were selected. A cover letter requesting the director of library services of Strathmore University requesting for help in pre-testing the research project data collection tools was included. Out of the 15 students who were sampled for the pilot study, only 8 responded while all the sampled library staff responded. The results were

analyzed and evaluated through both qualitative and quantitative tools of analysis. The researcher gathered as much insight as possible especially on issues such as flow of questions, level of difficulties and interpretation of questions. Results of the pilot study found that there was need for refinements, modifications and revision of the questionnaire.

3.7.2 Validity

Content validity was done by engaging an experienced researcher who assisted to improve the instruments. A pre-test on the sample population for the pilot study was also done to ascertain the validity of the research instruments.

3.7.3 Reliability

For a test to be valid, it must be reliable. Reliability is the extent to which results are consistent over time. If the results of a study can be reproduced under a similar methodology, then the research instrument is considered reliable. To obtain this a pilot study was undertaken. Triangulation was also used to ensure consistency and reliability of research findings. The researcher's idea of employing multiple methods; questionnaire, interviews, observation and literature review led to more valid and reliable realities for strengthening the study.

3.7.4 Ethical Considerations

Permission was sought from the university library (Appendix VI) and information users (Appendix I). The principal of voluntary participation was strictly adhered to and no participant was coerced to participate in the research. The study also guaranteed the participants confidentiality by not capturing names and other means of personal identification. Intellectual honesty was also respected in this research by avoiding any form of plagiarism.

3.8 Data Collection Procedures

Questionnaires were distributed using different approaches within the months of August and September 2014. Respondents were issued with questionnaires while using the library through direct approach, which involved engaging the respondents within the precincts of the site locations. Library staff at JKML administered questionnaires on

behalf of the researcher and where it was not possible to have questionnaires filled on the spot, respondents were requested to drop them at the circulation-desk in the library. In the case of the interview, respondents were consulted in advance regarding the preferred date and convenient time for the interview process.

3.9 Data Analysis and Presentation

The study generated both qualitative and quantitative data. Quantitative data was analyzed using analytical tools such as arithmetic mean, frequency distributions and percentages. After data collection, preparatory work commenced which involved data editing, cleaning and coding. The data was edited to check for completeness, accuracy and uniformity and subjected to series of manual checks for cleaning purposes. The data was coded using excel computer code sheets to aid in computer data entry while Statistical Package for Social Sciences (SPSS) was used to manage, analyze and display data keenly addressing the aim, objectives and research questions of the study. Qualitative data was analyzed using various methods such as content analysis, which was used to analyze, and audit checklists of the secondary data collected through observation. The results from the qualitative data was also presented by use of discussion through verbatim narrative by quoting respondents “voices”. Regression model was adopted to study the relationship among the various study variables. This was used to determine the effect of the independent variables on the dependent variable.

3.10 Summary

In this chapter, the philosophical substructures of research methodology have been discussed. The chapter has illustrated how the study was carried out from research design, population sampling to data collection, analysis and presentation. After analysis, the researcher has revealed that the data was cleaned to ensure high levels of reliability of the analyzed results. This leads to the next chapter that will deal with research findings and presentation of attributes of the major factors and variables as per the conceptual framework.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND PRESENTATION

4.1 Introduction

This chapter introduces and describes data presentation, analysis, results and discussions based on the objectives and research questions. The chapter presents the data that was found on the integration and use of institutional repositories in public universities with reference to the University of Nairobi. The research was conducted on sample size of 102 respondents out of which 75 respondents completed and returned the questionnaires making a response rate of 75%. Mugenda and Mugenda (2012) states that a response rate of 50% and above is a good for statistical reporting. The study used Likert scale in collecting and analyzing the quantitative data on multiple response questions whereby the scale of points was used in computing the means and percentages. The results were then presented in tables and charts as appropriate with explanations given in prose. Open ended questions, interviews and participant observation were used to collect qualitative data which was analyzed and presented in prose.

4.2 Response Rate of Respondents

The study targeted a total population of 1009 respondents of whom 943 were students, 62 staff and 4 top library management. From the population sampled, the study used questionnaires on 102 respondents, while 2 top managers were interviewed using an interview schedule. From 136 questionnaires, 102 questionnaires were responded to and returned, 8 were not responded to while 26 were not returned as students went on holiday. From the 4 interview schedules planned, 2 were successfully carried out while 2 interviews were not carried out since two top managers were away on official duty. The overall response rate was 75% which was adequate for analysis. The response rate is demonstrated in figure 4.1 pg.40

Table 4.1 Response Rates of Respondents

RESPONDENTS	DISTRIBUTED	RETURNED	PERCENT
Staff	42	34	80.95
Students	94	68	72.34
TOTAL	136	102	75.00

4.3 Background Information

It's important in the study to find out the respondents background information. The study generated general information on respondent's gender, highest education level and age. This was necessary to validate the responses which helped the researcher to understand from which level of experience the respondents answered questions.

4.3.1 Gender Distribution

Majority of the respondents in the study were male. From the total number of respondents, male respondents were 54% while female respondents were 46% as shown in figure 4.1 below. The results illustrated that the ratio of male to female clients of Jomo Kenyatta Memorial Library is almost equal.

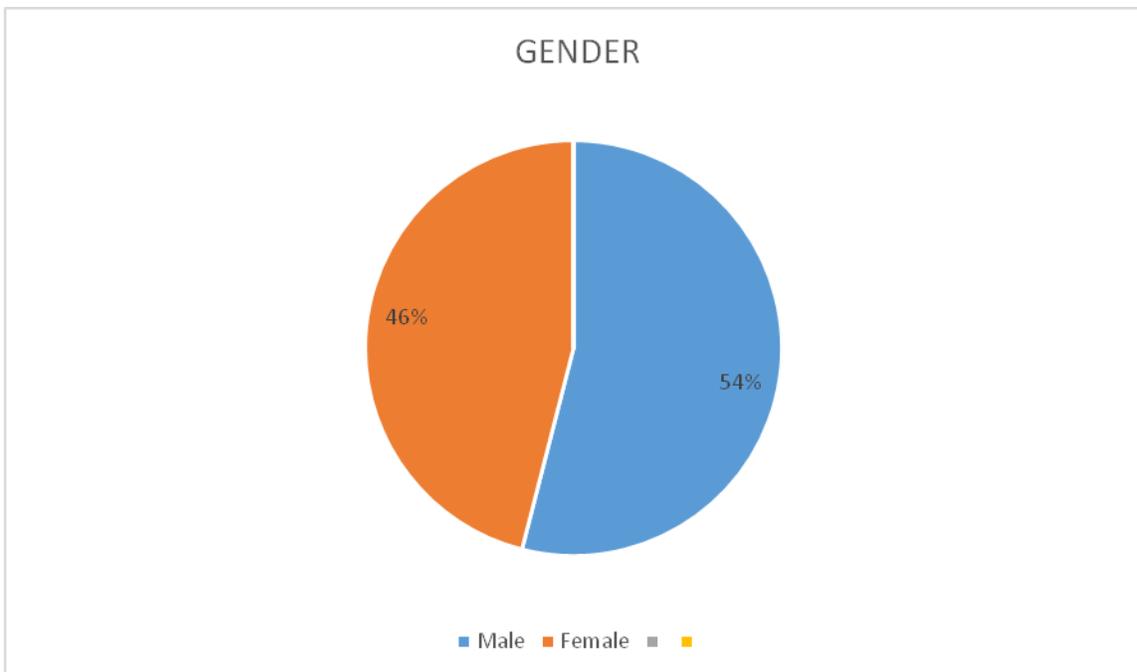


Figure 4.1 Respondents Gender Distribution

4.3.2 Highest Level of Education

The largest number of respondents had a basic degree (41.17% of the total). The next largest percentage was of respondents holding masters degrees which was 35.29%, while respondents with diplomas were 17.66%. The smallest percentage was PhD holders which was at 5.88% of the total respectively as shown in Table 4.2 below.

Table 4.2 Highest Level of Education

EDUCATION LEVEL	FREQUENCY	PERCENT	CUMULATIVE PERCENT
Diploma Level	18	17.66	17.66
Degree Level	42	41.17	58.83
Masters	36	35.29	94.12
PhD	6	5.88	100.0
Total	102	100.0	

4.3.3 Age of the Respondents

The study found that most of the respondents were of older age. The analysis found that those of below 25 years were 13% those of the age between 26-30 years were 29%, those of the age between 31-40 were 31%, and those of the age between 41-50 years were 10%, those aged between 51-60 years were aged between 9% same as those aged above 61 years as shown in Figure 4.2 pg. 41. The study found that some of the staff although few in number were approaching or were at the retirement age.

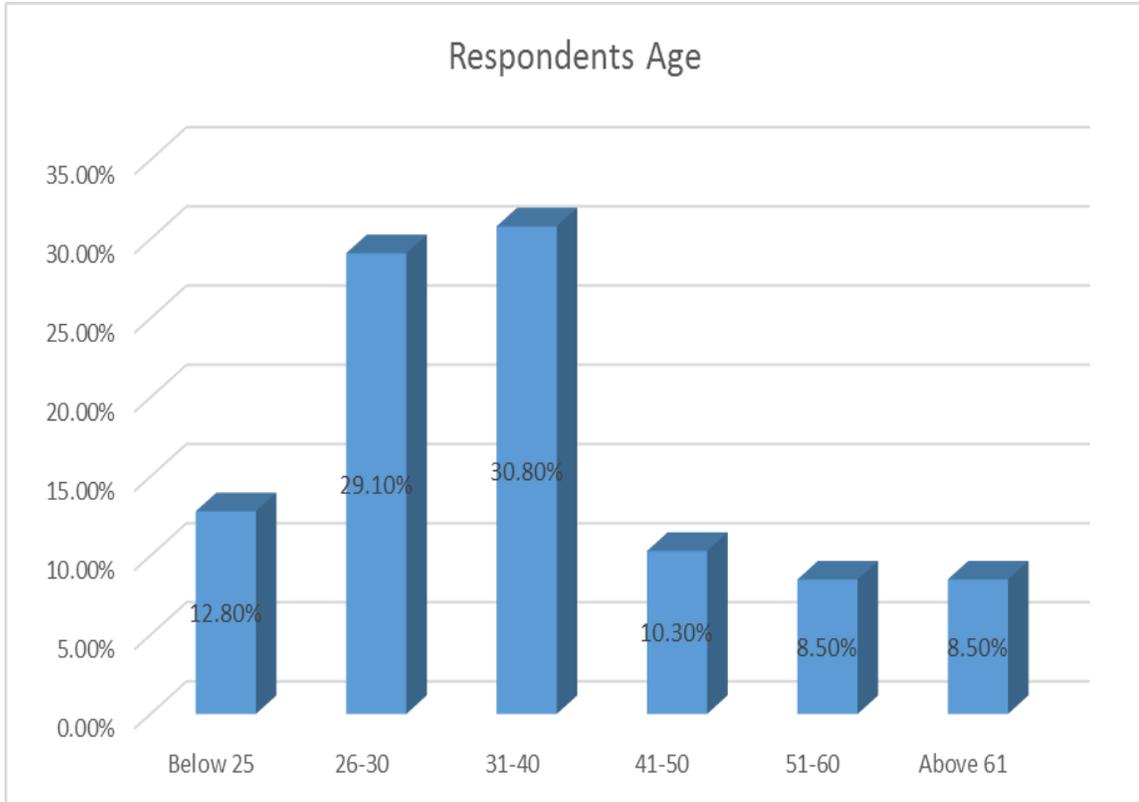


Figure 4.2. Age of the Respondents

4.4 Development and Implementation Process

The study aimed to find out if the respondents felt that the development of the institutional repository was important to the university and to the users. From the results, it's evident that all the respondents were in agreement that development and implementation of the institutional repository is important to the university but gave varied reasons for answers as analyzed in Table 4.3 pg. 42 and another 17.65% did not give any reasons. By interviewing library management involved with IR development, noticeable patterns and regularities of IR development became apparent. Preliminary interviews revealed several factors influencing IR development. These included: stakeholders involved in the IR process, planning, assessment, content recruitment, policy development, marketing, costs, sustainability, motivation and perceived IR benefits.

Table 4.3 Support of Development and Implementation of UoN Repository

No.	REASONS	FREQUENCY	PERCENT	VALID PERCENT
1.	Enhances institutions visibility	20	19.60	19.6
2.	Aids in management of information resources e.g. theses and dissertations	24	23.53	23.53
3.	Supplements other information resources	12	11.76	11.76
4.	Promotes local content	22	21.57	21.57
5.	Develops university capacity in terms of research	18	17.65	17.65
6.	No reasons given	6	5.88	5.88
	TOTAL	102	100	100

4.5 Institutional Factors Influencing Integration and Use of the Institutional Repository

The study sought to find out the extent to which management supported the IR in terms of various facilities and services. The results are presented in Table 4.4 pg.43.

Table 4.4 Facilities and Services Rendered by Management

NO.	FACILITIES AND SERVICES	MEAN	PERCENT	VALID PERCENT
1.	Adequate computer software	2.15	71.66	72
2.	Adequate computer hardware	1.82	60.67	61
3.	Personnel for digitization and submission	2.23	74.33	74
4.	Education and training of users and staff	1.33	44.33	44
5.	Promotion and marketing	1.21	40.33	40
6.	Funding	2.05	68.33	68
7.	Licensing and copyright issues	2.11	70.33	70

The study also sought to find out various roles management played in supporting integration and use of repositories at the University of Nairobi. In this respect, respondents were given a series of seven items depicting the roles and were asked to respond on a five point scale ranging from 5= Strongly Agree to 1= Strongly Disagree. Results illustrated that the respondents strongly agree or agree with the statements given. The findings are summarized as indicated in Table 4.5 pg.45.

Key informants interviewed noted that, the organizational setting in the area of facilities and services could influence individual's ability to adopt new information technologies. This is in the case where the ICT infrastructure is poor and the institutional structures are weak and unsupportive. When probed of the avenues of assistance pursued to encourage participation and deposit in the university institutional repository, one executive member reported that,

“The capabilities of ICTs keep changing requiring library staff to regularly update skills and know-how in order to cope with ICT driven work and new technologies like the IR. We regularly train the staff through workshops and in house training. In turn, they are in a position to assist users who are interested in the IR and at the same time encourage those who do not use it. ”

On the same issue, the other executive manager had the following to say;

“The changing information environment warrants for improvement on knowledge and skills for proper dissemination of information to the users. The university embraces changing technologies and for this reason, we usually send some of our staff out to attend international workshops convened by bodies like IFLA. On their return, they are mandated to share the new knowledge they acquired to the other staff members”.

This implies that staff who are in charge of the repository must be formally trained and possess specialized skills.

In terms of abilities and skills, the researcher guided by the observation guide (Appendix IV) observed that some of the library staff lacks the skills in offering assistance to users specifically of the IR. This was noted when the researcher was referred to the IR staff when assistance was sought from a different section. When probed on the necessary factors for success of institutional repository initiatives at the university and throughout the country, the respondents had the following comments;

“Although workers are occasionally trained within the institution on various ICT areas including the repository, there are no clear laid out policies on communicating and sharing local content. Many times, each institution is left to its own decision on how to handle such data and formulate its own policies”.

Another executive member reported that;

“There are no well-established processes for content collection and storage which could make interaction between staff and users more effective. There is need for national standards for universities to gain a level playing field and thus create an opportunity for any institution in the country to successfully implement IRs”.

Table 4.5: Role of Management in Providing Support

NO.	ROLE OF MANAGEMENT	MEAN	PERCENT	VALID PERCENT
1.	Workshops/ training to sensitize staff on the institutional repository concept	4.79	95.8	96
2.	Facilitation of Institutional Repository software training for staff	4.51	90.2	90.2
3.	Providing leadership role in the setting up of Institutional Repository	4.61	92.2	92.2
4.	Provide forum for local discussion group to promote common interest in the development and sharing of skills in matters concerning Institutional Repository	4.01	80.2	80.2
5.	Facilitate cooperative purchasing of relevant equipment to share costs	2.51	50.2	50.2
6.	Provide leadership role in Facilitating education and training of users.	2.53	51.2	51.2
7.	Facilitate in promotion of the institutional repository in University of Nairobi and Kenya to enhance awareness.	2.25	45.0	45.0

4.6 User Perception Towards Institutional Repositories

The study sought to find out how respondents perceived the extent to which the library management supported the institutional repository by providing various services. Results indicated that 40.05% of respondents felt the services provided were satisfactory, 32.4% not satisfactory and 20.6% did not give any opinion. The services rendered were recorded on a four point likert scale ranging from 4= excellent to 1= poor. The respondents felt that the services were good, fair or poor as shown by the mean scores in Figure 4.3 pg. 46. The study established that facilitating conditions followed by effort expectancy (ease

of use) were influential factors in the individual decision to accept and use repositories or reject the repository. One executive manager when probed on the opinion of major issues that affected institutional repository with staff and student’s willingness to participate in its population reported that;

“For staff and students to participate freely and willingly in the population of the repository, it is up to the university administration to provide a conducive environment for IR use including proper training and simple user interface for users to create a good perception of IR. This will enable users to engage in realistic knowledge sharing practices.”

This implies that there is need for education and training of the users on the importance of the IR.

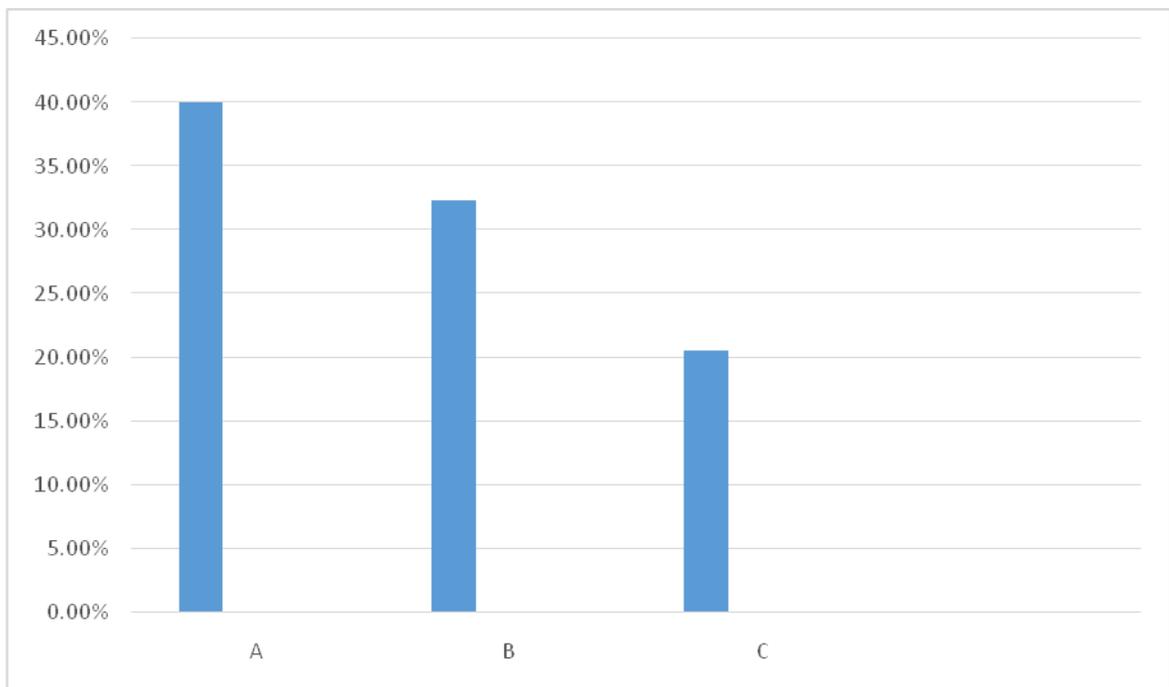


Figure 4.3: Users Perception Towards Repository Services Provided by Management

KEY

A = Satisfactory

B = Not Satisfactory

C = No Opinion

4.7 Marketing and Promotion Strategies

The study sought to find out how the students and staff got to find out about the university digital repository. The study indicated that majority of the respondents (51.96%) learnt about the existence of the repository through the library website while few of the respondents (1.96%, 2.94%, 1.96%) learnt through bulletin boards, lecturers and university mandate respectively as portrayed in Table 4.6 pg. 48. The study found that the university did not do much to market the repository to faculty for content recruitment. Using the observation guide (Appendix IV), the researcher observed that there were no banners or flyers in the e-resource library to market and create awareness of the IR amongst the users. On walking around JKML building, the researcher could not identify any promotional banners in September 2014. This implied that the library management did not put much effort in marketing the IR. Key informants interviewed were also probed on the methods used to foster successful integration and use of the university institutional repository. One interviewee mentioned that;

“Mails regarding the institutional repository are circulated to departmental heads in the university.”

Another interviewee reported that;

“Personal requests are made to faculty asking for post prints of new papers. There were also efforts to encourage current members to use and to contribute to the IR.”

Promotion and advocacy activities regarding IR were also cited. The first interviewee noted that;

“Presentations about the IR at faculty meetings and administrative meetings are held. The IR is also promoted by conducting open access seminar and symposiums and we also use promotional brochures.”

One executive manager had this to say about targeting the youth in popularization and marketing the IR;

“When you want to innovate, you have to stay connected to the young minds that are today the leaders in information and knowledge industry. These young people are found in universities and other organizations and if we could try to reach out to them and to the knowledge creation and sharing systems, then we can go great miles in marketing and popularizing the IR.”

Table 4.6: Source of Knowledge about Institutional Repositories

SOURCE	FREQUENCY	PERCENT	VALID PERCENT
Colleague/friend	18	17.64	17.64
Bulletin board	2	1.96	1.96
Lecturer	3	2.94	2.94
Library Website	53	51.96	51.96
Media	19	18.62	18.62
University mandate	2	1.96	1.96
TOTAL	102	100.00	100.00

The study also sought to find whether the respondents used the repository as an information resource and the findings illustrated that only 36 % of the respondents used the repository while 64 % did not use the repository as indicated in Table 4.7 below. Similarly, the researcher using the observation guide sought to establish the extent of use of the IR. The researcher observed and analyzed the recorded hits of repository users with permission from library ICT department in charge of the IR. It was observed that, majority of the users are the international community and users outside the library. The results demonstrated that most library users do not use the IR. The ICT department also illustrated that the most accessed content are the theses and dissertations.

Table 4.7: Institutional Repository Use

USE	FREQUENCY	PERCENTAGE	VALID PERCENT	CUMULATIVE PERCENT
Yes	37	36.27	36	36
No	65	63.73	64	100
TOTAL	102	100.00	100	

The study further sought to find out whether the respondents had deposited any research work to the repository. From the findings 13.73% of the respondents indicated having deposited work to the repository while 86.27% had not deposited any work as illustrated in Table 4.8 below. This implies that awareness about the existence of the repository at the university was indeed very low.

Table 4.8: Users with Work Deposited in the Repository

WORK IN IR	FREQUENCY	PERCENTAGE	VALID PERCENT	CUMULATIVE PERCENT
Yes	14	13.73	14	14
No	88	86.27	86	100
TOTAL	102	100.00	100	

4.8 Challenges of Developing and Using Institutional Repositories

The respondents were asked in open-ended questions to state various implications of institutional repositories. Unanimously all the respondents who responded to the question were of the opinion that repositories increase alternatives of information resources. Respondents further stated that the repository enhances other library resources. When further probed, respondents indicated benefits of institutional repositories to include; stewardship, efficiencies, scholarly showcase, wider distribution and response to the crises in scholarly communication. Other identified implications were visibility and increased dissemination of the institution's scholarship; free, open and timely access to information and preservation of digital content. In addition, other respondents cited benefits to students and education in terms of teaching and learning resources by enhancing lecture notes and research Capabilities. These benefits relate to core functionalities and to IR's management and funding within the institution as sighted by one interviewee. Respondents were also asked in open-ended questions to enumerate challenges encountered regarding use of repositories. The major challenges cited included; poor internet connectivity, lack of access to computers and poorly uploaded documents. The most cited problem by respondents was the unavailability of the full text

of documents. Respondents gave possible solutions for the identified problems. The key points mentioned were, to avail resources in full text, encourage depositors to give soft copies of deposited content, increase funds for computer software and hardware and to improve internet connectivity in the library to cater for the population of users.

The study conducted interviews with key informants on the significant successes and obstacles encountered in communicating the goals of the institutional repository to the staff and students in the University. The first interviewee reported that;

“Good ICT infrastructure and tools make a big difference in attitudes and perception of users for knowledge communication and sharing. Many staff members consider ICT to be complex areas of work and a lot of them shy away from job descriptions that require handling of ICT for knowledge sharing purposes. The informant further notes that only those that are highly trained in ICT feel comfortable enough to undertake the tasks.”

The interviewee also noted that;

“There were no special colleges that trained workers on how to handle information and knowledge creation processes in the past though some colleges are introducing courses, thus workers seek employment with no idea of how to handle knowledge processes.”

Regarding the same issue, the second interviewee reported that;

“It is usually up to the employer to ensure that there is in-house training for staff on new information technologies or staff will have to find their way around the jungle of information as they try to convert it to knowledge before sharing it”.

Following the observation guide (Appendix IV) the researcher participated as a user and was able to make some observations. The researcher observed that there were only 14 computers available for all undergraduate students who patronized the library in the e-resources section of JKML. It was also observed that the graduate research library had inadequate number of computers and students and staff had to wait for turns. Observably,

this is a challenge as not all users have personal computers or tablets for use in the library. Another challenge observed by the researcher by way of participation as user was poor bandwidth. The researcher was also able to observe that the wireless service provided by the library could not be accessed in all locations within the library. This implied that one had to move around the library in search for strategic points and thus waste of time.

4.9 Analysis of the Regression Model

From Table 4.9 pg. 51, the significance of F (.000) is below .05, which illustrates that the model is within the 95% significance level. The whole model has a coefficient of correlation (R) as 0.890, which is positive correlation. This indicates that changes in the predictor variable would be closely associated with changes in integration and use of the institutional repository at the University of Nairobi. 40.36% of the variation in Y is explained by X (IR user perception). The remaining 59.64% is explained by other variables not specified in the model e.g. level of education, age, gender, institutional management factors and user challenges.

Calculation of r^2

$$; r_{XY}^2 = 1 - \frac{\sum e^2}{\sum y^2} = 1 - \frac{531.17}{890.61}$$

$$= 1 - 0.5964$$

$$= 0.4036$$

Table 4.9: Analysis of the Regression Model

					Change Statistics				
Model	R	R Square	Adjusted Square	Std. Error of Estimate	R square change	F change	Df2	Df2	Sig. F change
1	.890	.547	.537	.05964	.547	145.43	1.92	18.99	.000
Predictors: Development and implementation process, perception of users, Marketing Strategies, institutional factors and challenges									

4.10 Summary

In this chapter, the results of the data analysed have been presented. To bring a further understanding of the results, the interactions between variables have been analysed. The challenges to integration of institutional repositories have also been presented. This information is used to discuss the findings and inform the summary, conclusion and recommendations that are presented in the next chapter.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides information on the findings and conclusion. In addition, the chapter provides suggestions and recommendations for addressing issues related to institutional repositories in universities based on objectives and research questions. The purpose of the study was to assess the extent of integration and use of institutional repositories in public universities with particular reference to the University of Nairobi.

Objectives of the study were to:

1. Assess the development and implementation process of the digital repository at the University of Nairobi.
2. Identify institutional factors that influence integration of institutional repositories at the University of Nairobi.
3. Examine the perceptions of users towards institutional repositories at the University of Nairobi
4. Assess the extent to which the University of Nairobi is creating awareness and popularizing the use of institutional repositories among the clients.
5. Identify challenges to the integration and use of the institutional repository at the University of Nairobi.
6. Suggest possible solutions to the identified challenges.

5.2 Summary of the Findings

From the study, the following were established:

5.2.1 Demographic Information of the Respondent

The study generated general information on respondent's gender, highest education level and age. This was necessary to validate the responses, which helped the researcher to understand from which level of experience the respondents answered questions. Results indicated that majority of the respondents in the study were male. From the total number of respondents as seen in Figure 4.1 Pg. 35 the ratio of male to female clients of Jomo

Kenyatta Memorial Library are almost equal. Age of the respondents determined the predisposition to integrate and use the institutional repository as majority of the users were in the age range between 26-30 and 31-40 as illustrated in Figure 4.2 pg. 42. This is assumed the age when clients are more involved in research activities. One concludes that the higher the advancement in age as well as professional growth and development, the higher the chances of integration and use of the institutional repository as an information resource in institutions of higher learning. Level of education was important in getting the views and opinions of the students and staff towards the use of repositories in the university. This confirmed the assumption that students and staff in higher levels of education are more interested in research activities that entail the use of current information technologies.

5.2.2 Development and Implementation Process

Objective number one sought to find out the development and implementation process of the institutional repositories in institutions of higher learning. Primarily, all the respondents held that development and implementation of the institutional repository was important to the university giving varied reasons as analyzed in Table 4.3 pg. 42 while 17.65% did not give any reasons.

By interviewing library management involved with IR development, noticeable patterns and regularities of IR development became apparent. Preliminary interviews revealed several factors influencing IR development in this study. These included: stakeholders involved in the IR process, planning, assessment, content recruitment, policy development, marketing, costs, sustainability, motivation and perceived IR benefits. In a similar study, done in South Africa Macha and De Jager (2011) identified various factors to be considered when setting up institutional repositories. This included; identifying important role players, addressing issues of resources, evaluating software, formulating policies for the institutional repository, restructuring the library to accommodate change and licensing. Campbell (2011) pointed out that, repository implementers in various case studies mainly involved librarians. It was observed that, the best approach is to include all other equal stakeholders across the institution and follow the process as illustrated in figure 1 pg.20.

5.2.3 Institutional Factors Influencing Integration and Use of Institutional Repositories

Objective number two sought to identify institutional factors that influence integration of institutional repositories at the University of Nairobi. The study found out that institutional factors are directly connected to integration and use of IRs in terms of availing the needed resources. Some of the results as illustrated in Table 4.4 pg. 43 rate the provision of facilities and services to be poor. One of such service is promotion and marketing of the institutional repository. The results also illustrate that some resources are inadequate. Without adequate resources such as computer hardware and software, it is difficult for the users to access the IR. This then directly ties in with the allocation of funds to the university library for better facilities and service provision.

In similar studies, Nabe (2010) avers that senior management commitment and support are considered 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 (IT) investments into useful outputs. It is therefore paramount that, 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 the new IR project. These two points 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.

5.2.4 User Perception of Institutional Repositories

Objective number three sought to examine the perception of institutional repositories by users at the University of Nairobi. The study first sought to find whether the respondents used the repository as an information resource and the findings showed that 36 % of the respondents used the repository while 64 % did not use the repository as demonstrated in Table 4.7pg.49. This demonstrated that a larger percentage of information seekers had a poor perception of the IR. The study demonstrated that potential users who are aware of IRs show a stronger tendency to answer questionnaires than those who are completely

unaware of the concept. This shows lack of awareness of IRs among members of institutions, thus urgent attention is required to publicize repositories. Research has also illustrated that, those who are aware of IRs have contributed a smaller number of documents. This study demonstrated that only 14% of the respondents had deposited work in the IR while the remaining 86% had not (Table 4.8 pg. 49). Thus it can be concluded that there is a strong need to publicize IRs and to encourage self-archiving practices in the user community. In similar studies, Kim (2006) conducted surveys based on sample of 31 professors whose materials were deposited in the DSpace IR of major research universities in the USA. The researcher found that all 31 professors had their material in the institution's IR. In all cases, the library had deposited this material, in some cases without their knowledge. Institutions of higher learning in Kenya should take the same initiative. IR managers should deposit materials on behalf of faculty as suggested in Kim's (2006) study. If this practice is followed, Kenyan repositories will be successful in terms of content recruitment.

5.2.5 Marketing and Promotion Strategies

Objective number four was to assess the extent to which the University of Nairobi is creating awareness and popularizing the use of institutional repositories among the clients. The study first sought to find out how the students and staff got to find out about the university digital repository. The study indicated that majority of the respondents (51.96%) learnt about the existence of the repository through the library website while few of the respondents (1.96%, 2.94%, 1.96%) learnt through bulletin boards, lecturers and university mandate respectively as shown in Table 4.6 pg. 47. This is in contrast to the study where 128 lecturers and researchers participated. When the question was asked of the participants "How did you learn of the possibility of archiving your publications in institutional open archives?" The highest percentage of respondents (42%) mentioned "colleagues" as the source of learning about the IR. This was followed by 15.60% of respondents who mentioned "information from the library". In this study, "colleagues" as the source of information achieved third position (17.64%).

In terms of marketing and promotion of the IR, respondents interviewed mentioned that mails regarding institutional repository were circulated to department heads in the university. Another respondent mentioned that personal requests are made to faculty asking for post prints of new papers. This suggested that the management puts some effort in promotion of IR to new members and there were efforts to encourage current members to use and to contribute to the IR. Promotion and advocacy activities regarding IR cited in this study included; presentations about the IR at faculty meetings and administrative meetings, conducting open access seminar/symposiums and use of promotional brochures. From these activities, it was evident that the respondents were trying to popularize repositories within the limitations of their financial and labor resources. Developing brochures or handouts is helpful for both librarians and faculty, but larger effort is needed to ensure repository growth. Creating a larger stakeholder group during repository development also creates a larger network for diffusing information about the repository. Laws and Fortier (2014) suggest common marketing activities. These include; creation of informational brochures and flyers, presentations to faculty groups and using personal academic connections.

5.2.6 Challenges of Developing and Using Institutional Repositories

Objective five sought to identify challenges to the integration and use of the institutional repository at the University of Nairobi. The study first identifies benefits. Respondents indicated benefits of institutional repositories to include; stewardship, efficiencies, scholarly showcase, wider distribution and response to the crises in scholarly communication. Other identified implications were visibility and increased dissemination of the institution's scholarship; free, open and timely access to information and preservation of digital content. In addition, other respondents cited benefits to students and education in terms of teaching and learning resources by enhancing lecture notes and research Capabilities. These benefits relate to core functionalities and IR's management and funding within the institution as sighted by one interviewee. Respondents were also asked in open ended questions to enumerate challenges encountered regarding use of repositories. The major challenges cited included; poor internet connectivity, lack of access to computers and poorly uploaded documents. The most cited problem by respondents was the unavailability of the full text of documents. Similarly, Campbell

(2011) in comparative study of various IRs found out that copyright is one of the biggest challenges facing the IR developers in Canada. After digitization of paper based content, developers are mandated to seek for permission from individual authors before the projects are moved to the repository. Another challenge is on document submission. In a survey of directors at the Association of Research Libraries (ARL), two-thirds responded that the majority of faculty members at the institutions were not contributing (Casey, 2012). Furthermore, Schonfeld and Houseright (2010) discovered that less than 30 percent of faculty in U.S. colleges and universities were contributing to IRs. In addition, studies of IRs in several institutions such as New Zealand's eight universities (Cullen & Chawner, 2011) also reveal some reluctance on the part of faculty to contribute. The other challenge on the part of document submission as argued by Giesecke, (2011) is that faculty and other researchers may post files that do not meet quality standards. These files need to be corrected and improved if the institution has to ensure quality repository that others will use.

5.2.7 Possible solutions

Respondents gave possible solutions for the identified problems. The key points mentioned were; to avail resources in full text, encourage depositors to give soft copies of deposited content, increase funds for computer software and hardware and to improve internet connectivity in the library to cater for the population of users.

5.3 Conclusion

- Based on the results of this study, it can be concluded that, the idea of institutional repositories was taken up with interest by many institutions of higher learning but it was not well followed through after the initial phase of activity as shown by research. As a result, repositories are growing slowly and there is a slow rate of integration and use.
- As repositories move into the area of 'business as usual' and other priorities take precedence, the initial marketing efforts have faded away and knowledge of the repository is not strong among academic communities as depicted in the study. This should be a matter of concern to institutions unless repositories were meant

to manage theses and function as useful to only those who already have knowledge about IRs.

- Data from surveyed respondents that the study considered to represent the views of staff and students of the University of Nairobi indicate low rates of deposit. The analyzed results suggest that, while the concept of the institutional repository and open access to research publications has some appeal, the reality of depositing presents barriers to many people. The academic community despite the fact that, for those who are willing to be early adopters, there are clear advantages that include increased citation and scholarly reputation has, not taken on board the message that publishing in open access forums as well as established peer-reviewed scholarly outlets leads to higher citations rates. The study also found user perception and awareness to be a predictor of integration and use of IRs.
- The importance of education and training to create awareness among the clients was an important finding for the university management. These findings suggest that the academic community is not adamantly lagging in the adoption of institutional repositories, but instead focuses on the most effective communication within disciplines. This therefore calls for serious user education, staff training and better marketing strategies on the part of management.

5.4 Recommendations

From the study findings and conclusion, the following recommendations are made:

5.4.1 Marketing and Promotion Strategies

Information communication technology changed and created the modern information resources that can be accessed through the internet and related agencies. The past generation of information seekers may not be well acquainted with these new technologies while the current generation may not have the technical expertise. Having a new technology like the institutional repository is one thing but ensuring effective integration and use of the same is an uphill task. This indicates the need for aggressive marketing and promotion strategies to inform and create awareness among the students and other stakeholders. Institutional repositories function as electronic scholarly communication forums, digital libraries, and knowledge management systems. For

individuals who choose to use them they ably fulfill all three. This indicates how vital this resource is to the university and information seekers. Subject to this, there is need for serious promotion and marketing of IRs.

5.4.2 Rationale for Open Access Policy

For academic organizations, professionals, academicians, students and other stakeholders to adopt and use institutional repositories, there must be rules and regulations that should be implemented to guide the users. These should include content recruitment guidelines, metadata, copy right issues and nature of content. The Open Access policy should not only be in paper work but also to be implemented in the day-to-day operations and functions of institutional repositories in higher education institutions.

5.4.3 Rethinking the Role and Value of Institutional Repositories

In developing repositories outside existing academic frameworks the university management may have ignored past lessons of dominance of scholarly communication patterns within each discipline and overlooked the need to engage with academic communities. The assessment of institutional repository integration and use can only come from a complete rethinking of the role and value of institutional repositories within the framework of the academic community and known patterns of scholarly communication. The case made in this study therefore is that, to increase the value and use of institutional repositories, critical masses of quality content is key. Expanding the role of the repository, integrating functionality with other resources, and increasing exposure of the repository through collaborative projects are crucial to unlocking the full potential of institutional repositories.

5.4.4 Recognizing the Importance of Clients

It is important to note that users are one of the important factors of the long-term survival of IRs without which repositories will not have any relevance. There is need therefore for cooperative efforts among academics, library professionals and the user community to lower the barriers for the integration and use of IRs in institutions of higher learning in Kenya.

5.4.5 Education and Training Opportunities

In general, there are a number of challenges that institutions face in relation to introduction of new technologies. Education and training of students, faculty and staff is one of those strategies that is indeed very effective in informing and creating long lasting positive impression of repositories and creating interventions for challenges. The study provides relevant information on the need to educate users on the value of institutional repositories and addresses training opportunities.

5.5 Suggestions for Further Research

The study identified some gaps and therefore suggests the following areas for future research:

5.5.1 Integration of Different Forms of Presentation in Institutional Repositories

There is need for integration of different forms of presentation including text, graphics, video and sound within the repository to cater for the whole population of users including those with disabilities. Research addressing issues that promote the use of different forms of presentation is very essential for the growth and development of institutional repositories in institutions of higher learning, which accommodate everybody regardless of any disabilities.

5.5.2 Evaluation of Quantity and Quality of Research Outputs

The university should develop value-added services including statistical functions and citation indexes, that are very useful for evaluating the quantity and quality of research outputs and provide superior visibility of the open access sources. Further research on this area is vital, as it will provide a framework for assessing the quality of content deposited in institutional repositories.

5.5.3 Information Literacy and Learning Skills

Research is necessary on the need for information literacy and learning skills in institutions of higher learning in order to ensure that programs are effective in addressing new information and communication technologies. The importance of this study is to ensure that the lecturers, students and management connect and relate well on research, teaching and learning issues. Information literacy and learning skills should adequately address emerging technologies and other related issues.

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APPENDIX 1
INTRODUCTION LETTER

Peninah Talam
Department of Library and Information Science
University of Nairobi
P.O.Box30917-00100
Nairobi.

Dear Respondent,

RE: INTRODUCTION LETTER FOR RESEARCH

I am a Master of Library and information Science student in the Department of Library and Information Science, University of Nairobi. At present, I am conducting a research titled; *Integration and Use of Institutional Repositories in public Universities in Kenya : The case of University of Nairobi*. The purpose of this study is to collect data and information from students and staff of the University of Nairobi.

You have been selected to participate in this study. The information and opinions you provide are purely for academic purposes of the study and shall remain strictly confidential.

Thank you in advance for your cooperation.

Yours faithfully,

Peninah Talam
Registration Number: C54/65493/2013

APPENDIX II

QUESTIONNAIRE FOR STUDENTS

INSTRUCTIONS

Please indicate your response by ticking the provided boxes. For questions that require suggestions or comments, please use the provided space.

Background Information

- 1. Gender.....
- 2. Highest education level.....
- 3. Age:
 - a) Below 25
 - b) 25-30
 - c) 35-40
 - d) 45-50
 - e) 55-60
 - f) 65-70

Development and Implementation Process

- 4. Do you think the development of the institutional repository is important to University of Nairobi? In either case explain briefly.
.....
.....
- 5. In your opinion, what are the benefits of developing the institutional repository to the university and the users?
 - a) University.....
 - b) Users.....

Marketing and Promotion Strategies

- 6. How did you get to learn about the existence of the Institutional repository?
 - a) Colleague/friend
 - b) Lecturer
 - c) Bulletin board
 - d) Library website
 - e) Internet
 - f) Media
 - g) University mandate
 - h) Any other.....
- 7. Do you use the institutional repository as an information resource? In either case briefly explain.
.....
.....

Institutional Factors Influencing Integration and Use of the Institutional Repositories

8. How did you gain information and learning skills on how to use the institutional repository?
- a) Formal training in the library
 - b) Seminars and workshops organized by the library
 - c) Guidance by other library staff
 - d) Informally
 - e) Self- instruction
9. How do you perceive the institutional repository services provided by the university management?
- a) Satisfactory
 - b) Not satisfactory
 - c) No opinion
10. In your opinion, to what extent has the library management supported the institutional repository in terms of the following facilities and services?

No.	Facilities and Services	Excellent	Good	Fair	Poor
1.	Adequate computer hardware				
2.	Adequate computer software				
3.	Personnel for digitization and submission				
4.	Education and training of users and staff				
5.	Promotion and marketing				
6.	funding				
7.	Licensing and copyright issues				

Challenges of Developing and Using Institutional Repositories

11. Kindly enumerate the major challenges you encounter regarding use of the institutional repository in the university.....

12. Please suggest possible solutions to the identified problems

THANK YOU

APPENDIX III

QUESTIONNAIRE FOR STAFF

INSTRUCTIONS

Please indicate your response by ticking the provided boxes. For questions that require suggestions or comments, please use the provided space.

Background Information

1. Gender.....
2. Highest education level.....
3. Age:
 - a) Below 25
 - b) 26-35
 - c) 36-45
 - d) 46-55
 - e) 56-65
 - f) 66-70

Development and Implementation Process

4. Do you think the development of the institutional repository is important to University of Nairobi? In either case explain briefly.
.....
.....
5. In your opinion what are the benefits of developing an institutional repository to the university and the users?
 - a) University.....
 - b) Users.....

Marketing and Promotion Strategies

6. How did you get to learn about the existence of the Institutional repository?
 - a) Colleague/friend
 - b) Lecturer
 - c) Bulletin board
 - d) Library website
 - e) Internet
 - f) Media
 - g) University mandate
 - h) Any other
7. Do you use the institutional repository as an information resource? In either case explain briefly.
.....
.....
.....

8. Have you deposited any of your research output to the University Digital Repository?
In either case, briefly explain.

.....

9. Statements in this question are related to the information demands that would lead you to use the institutional repository. Please indicate the extent to which the statements apply to the use of the institutional repository using the following scale: 3=Very Demanding, 2=Averagely Demanding, 1=Less Demanding.

NO	Information Demand	3	2	1
1.	Course work and preparation for exams			
2.	Reading to enhance lecture notes			
3.	Class discussions and presentations			
4.	Thesis and writing research proposal			
5.	To be up to date with current information			

Institutional Factors Influencing Integration and Use of Institutional Repositories

10. How did you gain information and skills on the use of the institutional repository?

- a) Formal training in the library
- b) Seminars and workshops organized by the library
- c) Guidance by other library staff
- d) Informally
- e) Self- instruction

11. How do you perceive the institutional repository services provided by the university management?

- a) Satisfactory
- b) Not satisfactory
- c) No opinion

In your opinion, to what extent has the library management supported the institutional repository in terms of the following facilities and services? Use the scale; 4= Excellent, 3= Good, 2= Fair and 1= Poor

No.	Facilities and Services	5	4	2	1
1.	Adequate computer hardware				
2.	Adequate computer software				
3.	Personnel for digitization and submission				
4.	Education and training of users and staff				
5.	Promotion and marketing				
6.	funding				
7.	Licensing and copyright issues				

12. Statements in this question are meant to find out the roles of the management in supporting development and use of the institutional repository. Please indicate the extent to which you agree or disagree with each statement in the following table using the scale provided; 5= Strongly Agree, 4= Agree, 3=Neither Agree nor Disagree, 2= Disagree, 1=Strongly Disagree.

NO	ROLE	5	4	3	2	1
1.	Workshops/ training to sensitize staff on the institutional repository concept					
2.	Facilitation of Institutional Repository software training for staff					
3.	Providing leadership role in the setting up of Institutional Repository					
4.	Provide forum for local discussion group to promote common interest in the development and sharing of skills in matters concerning Institutional Repository					
5.	Facilitate cooperative purchasing of relevant equipment to share costs					
6.	Provide leadership role in Facilitating education and training of users.					
7.	Facilitate in promotion of the institutional repository in University of Nairobi and Kenya to enhance awareness.					

Challenges of Developing and Using Institutional Repositories

13. Kindly enumerate the major challenges you encounter regarding use of the Institutional Repository in the university.....

.....

14. Please suggest possible solutions to the identified problems

.....

THANK YOU

APPENDIX IV
OBSERVATION GUIDE

1. Establish the availability of resources to access the institutional repository in Jomo Kenyatta Memorial Library:
 - Software (local area network and wireless)
 - Hardware
2. Determine the channels of information that users interact with.
3. Establish the extent of use of the institutional repository;
 - Observation of number of hits in the library ICT department
4. Identify challenges and future of the institutional repository in terms of:
 - Number of computers
 - Abilities and skills of librarians in offering assistance to users.
 - How the institutional repository is marketed to envisaged users to facilitate awareness and easy access

APPENDIX V

INTERVIEW SCHEDULE FOR LIBRARY MANAGEMENT

1. What avenues of assistance have you pursued to encourage participation and deposit in the University institutional repository?
2. In your opinion, what are the major issues that affect institutional repository with staff and student's willingness to participate in its population
3. Please describe the significant successes and obstacles you have encountered in communicating the goals of the institutional repository to the staff and students in the University?
4. What should be the role of librarians in encouraging and facilitating staff and student deposit into the institutional repository?
5. What methods do you use to foster successful integration and use of the University institutional repository? (Probe: Ask about how this relates to openness and increased exposure of the items within the institutional repository, and whether these facets are being used to encourage deposit.)
6. In your opinion, what are the necessary factors for success of institutional repository initiatives at the university and throughout the country?

APPENDIX VI
Letter for Data Collection



UNIVERSITY OF NAIROBI

FACULTY OF ARTS

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE

Telephone: +254 20 318262, Ext. 28095
Telegram: Varsity
Fax: +254 20 2245566

P.O. Box 30197- 00100 GPO
Nairobi, Kenya.
dnjiraine@uonbi.ac.ke

Our Ref: UON/CHSS/DLIS/303

5th Sept, 2014

To Director, Library and Information Services
University of Nairobi
P. O. Box 30197-00100
Nairobi.

Dear Madam,

RE: TALAM PENINAH REG NO: C54/65493/2013

The above named is a bonafide student at the University of Nairobi undertaking a Master of Library and Information Science (MLIS). She is currently in the process of collecting data as part of the requirements for the course.

Her topic is "*Integration and use of Institutional Repositories in Institutions of Higher learning in Kenya: with reference to the University of Nairobi.*"

Any assistance accorded to her will highly be appreciated.

Regards,

A handwritten signature in black ink, appearing to read 'D. Njiraine'.

for. Dr. Dorothy Njiraine
Ag. Chairperson
Department of Library & Information Science (DLIS)

UNIVERSITY OF NAIROBI LIBRARY
P. O. Box 30197
NAIROBI