INFLUENCE OF LIBRARY CONSORTIA ON RESOURCE SHARING IN ACADEMIC LIBRARIES: CASE OF UNIVERSITY OF NAIROBI LIBRARY
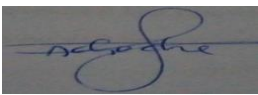
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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF LIBRARY AND INFORMATION SCIENCE, DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE, UNIVERSITY OF NAIROBI

NOVEMBER, 2021

DECLARATION

This research project is my original work and has not been submitted for examination to any other university. All references to authors cited herein have been made using the appropriate style of referencing.

Signature: Date: 17th Nov 2021

Nche Eugene Che

Registration Number: C54/28793/2019

This research project has been submitted for examination with our approval as the university supervisors.

Signature: Date: 4th Nov. 2021

Dr. Dorothy Njiraine

Department of Library and Information Science

Signature: Date: 19th Nov. 2021

Dr. Elisha Ondieki Makori

Department of Library and Information Science

DEDICATION

This research project is dedicated to my father, Michael, and my mother, Grace, who spared no effort to see me through the perils of life; and to my siblings Jude and Imelda who spared no effort and made sacrifices to keep our dreams alive.

ACKNOWLEDGEMENT

ABSTRACT

The purpose of this study was to examine the influence of library consortia on resource sharing in academic libraries in Kenya with reference to the University of Nairobi library. Specific objectives were to: examine the extent of resource sharing in academic libraries; find out the methods of resource sharing adopted in academic libraries; establish library consortia initiatives that improve resource sharing in academic libraries; and propose a framework to enhance library consortia and resource sharing in academic libraries. The research design employed was a case study and both qualitative and quantitative approaches were adopted to collect and analyse data. Questionnaires and interview guides were used to collect information from participants. The study found out that library consortium model was the dominant method of resource sharing in adoption at the University of Nairobi library, and that resource sharing activities were greatly influenced by the consortium (KLISC). The consortium was shown to be very significant in ensuring wider access to shared information resources, institutional repository development and capacity development for resource sharing. However, resource sharing was shown to be limited to the provision of collectively acquired information resources, and there were limited efforts at ensuring information exchange and integration between the University of Nairobi and other libraries in the consortium. There was no exclusive resource sharing policy for resource sharing in adoption, however several other policies were in use even though they were limited in scope, an inadequate in the provision of alternative funding models, and in supporting standardisation. It was recommended that a set of standards be adopted to improve prospects of system integration and increased efforts made to improve the proportion of local content in shared information resources. The prioritisation of local content in the development of shared resources was also recommended and a framework for resource sharing was proposed to help tackle identified gaps in existing policies and frameworks. The originality of the study is that it introduces a new dimension to existing literature on resource sharing in Kenya by identifying gaps in existing policies and suggesting areas of priority for policy review. The practical implication of the study is the provision of a basis for the development of a sustainable resource sharing framework for the University of Nairobi library system.

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LIST OF ABBREVIATIONS

ADLSN – African Digital Library Support Network

AVU – African Virtual University

CARL – Colorado Alliance of Research Libraries

COTUL – Consortium of Tanzanian Universities and Research Libraries

CUE – Commission for University Education

CUUL - Consortium of Ugandan University Libraries

DATAD – Database of African Theses and Dissertations

EIFL – Electronic Information for Libraries

eSAP – Electronic Supply of Academic Publications

GAILEO – Georgia Library Learning Online

ICT – Information and Communication Technology

INASP – Information Network for Advancing Science Policy

JKLM – Jomo Kenyatta Memorial Library

KLISC – Kenya Library and Information Services Consortium

KNLS – Kenya National Library Service

OA – Open Access

OCLC – Online Computer Library Center

RLIN – Research Libraries Information Network

SABINET - South African Bibliographic and Information Network

ISO – International Standards Organisation

SKRS - Strengthening Research and Knowledge Systems

VDX - Virtual Document eXchange

NCIP - NISO Circulation Interchange Protocol

TCP – Transmission Control Protocol

SIP - SIP – Session Information Protocol

SOLINET – South-Eastern Library Network

NELINET – New England Libraries Network

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Rapid developments in information and communication technology (ICT) has driven significant change in the information landscape and resulted in the introduction of innovative ways of handling and sharing information (Kimanga, 2018: 1). The increasing popularity of electronic resources (e-resources) and their preference as a medium of scholarly communication has been a factor of change in academic libraries. The adoption of ICT for the creation of information resources eliminated several existing barriers to the production of knowledge (Saini, 2017). Consequently, there has been a rapid growth of global literature which is often described as the information explosion. As the quantity and diversity of information resources in electronic format increased, libraries became responsible for obtaining access to these resources. Eventually perspectives of librarianship shifted from the pursuit of resource self-sufficiency to ensuring enhanced access. This was mostly due to the acceptance of the reality that no library can single-handedly obtain all the literature globally available to satisfy the needs of their users (Saini, 2017: 120).

The development of new subject areas and the emergence of new academic interests has increased the diversity of information resources. The effect of this has been the scattering of information, and the increasing demand for scholarly information (Saini, 2017: 120-121). Information resources increased in abundance and diversity resulting in challenges with the issue of cost (Elliot, 2020: 2). Furthermore, Kristof (2018: 394) notes that libraries have increasingly struggled to meet their budgetary requirements for acquisition of print and e-resources in recent decades. This pushed libraries to explore possibilities of collaboration with other libraries to tackle issues of cost in the development of their collections. Cooperative collection development is often used to describe collaboration between two or more libraries that involves the sharing of certain areas of collecting responsibility and the exchange of information resources with each other at zero cost. This involves resource sharing, the provision of bibliographic access and collaboration in management (Kimanga, 2018: 26).

1.1.1 Library Consortia

One of the most effective means of cooperation among libraries has been the development of library consortia. Kimanga (2018: 7) uses the term consortia to describe collaborative efforts between libraries and states that library consortia are collection of two or more libraries that agree to pool together available resources to accomplish shared needs including building their collections. Library consortia are also called cooperatives or information networks and often involve two or more libraries working together to pool resources to meet collective objectives (Liu & Fu, 2018: 53). Similarly, Badiger and Uplaonkar (2017: 134) defined library consortium as a group of libraries or library systems that work together to realise common objectives that require cooperation and the sharing of resources. Library consortia reflect a paradigm shift in the conceptualisation of libraries, from being storage areas for information resources, to being institutions that provides access to information (Coates, 2019: 4). Therefore, consortia play the role of a mediator between users of information and creators of information (Sweet & Clarage, 2020: 434). The need for library automation in the 1960s facilitated early consortium development and led to the creation of the Online Computer Library Center in 1967. Today, OCLC is the largest library network connecting over 16,000 libraries and information centres in 113 countries (OCLC, 2020). OCLC pioneered concepts such as shared cataloguing and copy cataloguing, first as print and then in digital format. Eventually, other library consortia emerged Research Libraries Information Network (RLIN), Colorado's Alliance of Research Libraries (CARL) and the Georgia Library Learning Online (GALILEO) (Kimanga, 2018). By the 1980s resource sharing among libraries had become main stream. Subsequently, several other consortia emerged across the world (Badiger & Uplaonkar, 2017: 136).

1.1.2 Resource Sharing

The term resource sharing describes a range of collaborative activities among libraries to collectively develop and share information resources so as to optimise user satisfaction and reduce collection development costs. The Illinois Administrative Code defines resource sharing as the process of making collections of one library available to patrons of another library efficiently and effectively' (Robinson, 2019). Therefore resource sharing is not only limited to the sharing of information resources,

but also the technical infrastructure, policies and expertise required to ensure enhanced access. Wakeling, Rutter, Birdi and Pinefield (2018: 169) describes resource sharing as the most appropriate response to a wide array of challenges libraries face including technological and budgetary challenges, and considers resource sharing as the most viable strategy to ensure that libraries continue to provide access to information that meets the needs of a wide range of users. Resource sharing has been enhanced by the emergence of open access (OA) which has increased the speed and ease of access to shared resources (Kristof, 2018: 395). Today, the open access model has become the dominant model for the communication of scholarly information. In addition to this, the networked information environment has enhanced opportunities for collaboration between libraries and the formation of larger supra-national initiatives such as arXive e-Prints archives, Hathi Trust Digital Library and Google Book Project (Armstrong & Teper, 2017: 29). Today, resource sharing has become a core activity for library consortia. Resource sharing has become an objective for most academic libraries in Africa, and this is attested by the formation of consortia, the development of institutional repositories and the adoption of open access in academic libraries (UNESCO, 2018).

1.1.3   Resource Sharing in Academic Libraries

Resource sharing involves the common use of information and technological resources by a group of libraries and information centers with emphasis on enhancing access to information and ensuring mutual benefit (Antwi & Ankrah, 2020: 3). North America currently leads existing resource sharing efforts on the globe. In the United States current focus in resource sharing is on ensuring system interoperability and standardization, ensuring enhanced patron choice and supporting the development of unified patron interfaces (Michalka & Thompson, 2017: 7). World Share Interlibrary Loan Connect (World Share ILL) was developed by OCLC and has become the largest resource sharing platform in the world, connecting several thousand libraries in North America and the rest of the world. World Share ILL enables millions of users from libraries across the globe to gain access to a pool of information resources, and maintains an online catalog of available resources on World Cat to facilitate access and usage (SABINET, 2020). Resource sharing activities were not only limited to country level. In Colorado for example, CARL developed the Networking and

Resource Sharing (NRS) initiative to provide technology-based services to libraries and support the development and use of shared information resources. Some resource sharing initiatives of CARL are the Colorado Virtual Library, Colorado Library Directory and the SWIFT Inter Library Loan program. To enable resource sharing with libraries in the rest of the United States, CARL joined the Plain to Peaks Collective of the Digital Public Library of America (CDE, 2019: 1).

Outside North America, in Australia resource sharing efforts are being spearheaded by the Australian Inter Library Resource Sharing Directory (ILRS). ILRS supports resource sharing through the provision of a National Union Catalogue, and the provision of document delivery and interlibrary lending services (UWA, 2020). Other platforms also exist such as Libraries Australia Document Delivery (LADD) which focuses exclusively on document delivery and facilitates the sending and receipt of document requests. In the Arab world several consortia were leading resource sharing effort such as CONSIRAN in Iran and the Saudi Arabia's Saudi Digital Library. In Lebanon, Chalchoub (2017: 76) opines that academic libraries are increasingly joining consortia to enable them have access to information networks. Apart from joining consortia, academic libraries also engage in the signing of reciprocal agreements with other academic libraries in addition to subscribing to OCLC's World Share ILL. The adoption of technology to facilitate interlibrary lending, together with the contribution of World Share ILL has reduced overall cost of interlibrary lending and challenges with increasing demand for document delivery (Chalchoub, 2017: 76-77).

1.1.4 Information Networks and Resource Sharing in Africa

In Africa, several researchers have conducted studies into the activities of consortia and how they have contributed to increased availability and accessibility of information (Chisita & Chiparausha, 2019; Ejikeme & Ezema, 2019; Enakrire, 2019). In Africa there have also been a number of efforts to develop library consortia and support collaboration between libraries. These efforts dated as far back as 1977 when African Virtual University (AVU) was created with World Bank support (Helga, 2018: 1). The objective of AVU was to enhance access to information in African academic communities through direct support for distance learning initiatives and open access to information resources across 57 learning centres in Africa. Another

early resource sharing project in Africa was the African Digital Library that began in 1999 with the objective of enhancing access to scholarly output of African academic institutions (West, 2018: 1). Similarly, the African Digital Library Support Network (ADLSN) was also developed as another initiative aimed at the dissemination of local digital content and the provision of access to shared information repositories. As at 2020, it had 10 repositories in 14 countries and worked with several international partners to enhance information access to information users in member libraries (ADLSN, 2020). Others are the Database of African Theses and Dissertations (DATAD) which facilitated thesis and article exchange between academic libraries and the Electronic Supply of Academic Publications (eSAP) which sought to increase article exchange between Africa and the developed world (Weng'ua, Rotich & Kogos, 2018: 24).

In South Africa for example, the South African Bibliographic and Information Network (SABINET) was developed in 1983 to support digitisation efforts, collection development and resource sharing in higher education and research institutions in South Africa. SABINET connects over 90 libraries and supports them with several options for resource sharing (SABINET, 2021). It partners with the EIFL and OCLC to provide access to the largest collection of information resources about Africa to users all over the world (Marais, Quaye & Burns, 2017). SABINET also enables access to World Share ILL which allows information users from thousands of libraries across the world to share the same pool of information resources through interlibrary loans and article exchange. Between 2018 and 2019 for example, there was a 67% increase in requests for interlibrary loans on World Share ILL by member libraries (SABINET, 2020). In addition, SABINET also has a local inter lending service known as ReQuest, which enables remote access, borrowing and lending between academic libraries in different institutions in Southern Africa. Article exchange is also facilitated by the Tipasa service, which is an automated information request management that reduces the need for human involvement in managing lending and borrowing user requests. Tipasa employs modern technological tools to optimize service such as selective dissemination of user specific information and user alerts (SABINET, 2021). SABINET's adoption of cloud storage technology has tackled existing barriers to resource sharing and eventually the concept of 'self-ownership' of

resources is becoming a thing of the past. The current focus of SABINET's resource sharing activities is integration and standardization (Hattingh, 2018: 13).

Academic libraries in West Africa have also adopted resource sharing to enhance their user's experience and improve information access. In Ghana, resource sharing was pioneered by the Ghana Inter-Library Lending and Document Delivery Network (GILLDDNET) which connected several academic libraries (Antwi & Ankrah, 2020: 5). The focus of GILLDDNET was limited to document delivery and interlibrary loans among Ghanaian universities. In 2004, the network was replaced by the Consortium of Academic and Research Libraries (CARLIGH) which was created to increase accessibility and use of e-resources. Thereafter, resource sharing activities saw a steady improvement. Under CARLIGH, there has been a general transition in the information landscape from the dominance of document delivery and interlibrary loans to the development of technology based resource sharing platforms for both electronic and physical information resources (Tetteh, 2018). CARLIGH also enables access to World Share ILL, and this has enhanced information provision and access and resulted in an increase in scholarly output from academic communities in Ghana (Antwi & Ankrah, 2020: 5-6).

Within the East African sub-region, various efforts have been made at country level within different countries with respect to library consortia development. In Tanzania Mwilongo et al. (2020) noted that the Consortium for Tanzania Academic and Research Libraries (COTUL) was founded to support academic instruction and research in academic and research institutions through the promotion of collaboration in collection development and the provision of access to information resources (p. 1153). In 2020, COTUL had 50 members including public and private universities, government agencies and research institutions. Most resource sharing activity in Tanzania was led by COTUL which provided access to technology, information and an integrated system. However, Mubofu and Chaula (2020: 2) opined that resource sharing efforts in Tanzanian libraries were not as advanced as in the rest of the region.Similarly in Uganda, the Consortium of Ugandan University Libraries (CUUL) was founded to promote efficient resource sharing among academic libraries (CUUL, 2018). Ponelis and Adoma (2017) added that the activities of CUUL's activities go beyond facilitating access to information resource and also includes supporting libraries with automation and the training of library staff (p. 2). CUUL has adopted an

integrated library system to support resource sharing and enhance access to broad based global and local knowledge (Buwule & Ponelis, 2017: 256). Apart from networks such as CUUL, Ugandan libraries have entered bilateral agreements with other universities to provide mutual access to their institutions collections.

1.1.5 Information Networks and Resource Sharing in Kenya

In Kenya library collaboration has been spearheaded by the Kenyan Education Network (KENET) and the Kenya Information Services Consortium (KLISC). KENET was the first collaborative effort to provide information services to Kenyan academic libraries with support from the Ministry of Higher Education (Kimanga, 2018: 22). However, KENET's emphasis was on technological infrastructure and connectivity rather than the information resources. Currently, several resource sharing activities have been initiated by academic libraries, either as lone projects or under the umbrella of KLISC. Some libraries have joined international networks such as Agha Khan Library which is a member of a ten institution library network across four continents, which enables access to shared collections (Shahid, 2020: 41). KLISC has been promoting the adoption of open access and supporting Kenyan academic libraries with information provision and access by pooling the collective resources of libraries and collaborating with international partners (Weng'ua & Rotich, 2019) such as the Electronic Information for Libraries (EIFL) and other international information networks to facilitate document delivery and inter library loans among members and with academic libraries across the world (Mwaurah & Namande, 2018,: 29). KLISC represents a broad array of universities with different research objectives, academic interests and information needs which often poses a challenge in the development of shared collections and the proportional allocation of resources for various disciplines (Mwaurah & Namande, 2018; Weng'ua & Rotich, 2019).

Despite the importance of resource sharing in mitigating challenges of limited funding and in enhancing access to information in academic communities, several challenges have impeded resource sharing in Kenya and African such as the challenge of funding, personnel competency and ownership (Uwamwezi, 2017: 799), limited consensus within consortia and a lack of broad stakeholder involvement in the decision making (Machimbidza & Mutula, 2019). Igbo & Imo (2017) also opine that resource sharing has been adversely impacted by funding challenges, low

standardization and limited interoperability. Similarly, UNESCO (2018) opines that budgetary limitations in academic libraries in Kenya hinder information provision and impede access to information and makes it challenging to provide the required information systems to support user information needs. To address these issues, the Kenyan Commission for University Education (CUE) issued recommendations that required all public universities to dedicate at least 10% of their overall institutional budget to the funding of library activities, the acquisition of information resources and resource sharing (CUE, 2018). Another challenge to resource sharing in academic libraries in Kenya has been the low level of government prioritisation of library activities, especially with respect to e-resources (Deepa, 2017). Mwaurah and Namande (2018: 29) also highlight that resource sharing in academic libraries in Kenya is often challenged by the lack adequate competency in modern technological tools required to support resource sharing initiatives. In addition to this, there is a lack of a general methodology for communication of data about collections and no existing comprehensive resource sharing policy in the country. It is therefore imperative to examine resource sharing as a concept in the Kenyan context, and examine existing efforts and challenges encountered in developing and enhancing access to shared information resources. This study uses the University of Nairobi Library to provide insight to library consortia and their impact on resource sharing in academic libraries in Kenya.

1.1.6 Context of the Study

The University of Nairobi is the largest and oldest public university in Kenya. The university is served by the University Library System that is made up of twelve libraries spread across eight campuses. The largest of this is the central library, also known as the Jomo Kenyatta Memorial Library (JKML) which serves the College of Humanities and is situated on the main campus. JKML hosts the central administration and centralised services of the university library system, as well as a union catalogue of the library system's entire collection. The library system holds over 750,000 volumes in both print and electronic format, and also provides students and staff with access to information resources in several databases. It is a member of KLISC and several other information networks which allows user to have enhanced access to a wide pool of shared information resources. Currently, the University of

Nairobi hosts the headquarters KLISC secretariat in its JKML library. This study looked at the entire University library system and it's component libraries as a single entity.

1.2 Statement of the Problem

The number of Kenyan public universities has increased from just two public universities to thirty one in just thirty years (CUE, 2020). Similarly, the scope of academic and research interest of higher education institutions continues to expand. This expansion has however not been corroborated by the provision of much needed physical and technological infrastructure and an expansion of library and information services (Kimanga, 2018, Weng'ua & Rotich, 2019). The increase in student enrolment has resulted in an increased demand for library and information services. Rapid advancements in the development of information technology have inspired a transition within the information environment. Librarians are increasingly in need of sophisticated technology and expertise, and users' information requests have become too refined. Research is the primary objective of Kenyan academic institutions and as a result libraries have assumed a critical role of supporting teaching, learning and research, as well as the dissemination of scholarly communication (Wachira & Onyancha, 2017). The technological revolution has inspired a paradigm shift in the provision of information and the development of library collections to support this critical role of libraries (Ramzan, Hussein & Ahmad, 2019: 2). To facilitate the digital transformation of Kenyan academic libraries, several initiatives have been adopted including the provision of technology and critical infrastructure, and the development of resource sharing initiatives to enhance information provision and access.

Previous studies on resource sharing have failed to examine the subject of library cooperation and the emerging issues or challenges in resource sharing (Mwaurah & Namande, 2018: 29-31), and the role of institutions tasked with facilitating library cooperation. In addition, previous studies have been limited to the role of consortia in supporting access to research infrastructure (Weng'ua & Rotich, 2019) without much emphasis on the concept of resource sharing, and the challenges in facilitating access to shared information resources. Most previous studies on resource sharing that adopted a case study approach (Kimanga, 2018; Mwaurah & Namande, 2018) and were inadequate in using their findings to propose a viable and sustainable framework

for resource sharing in academic libraries in Kenya. While others that were surveys (Oyieke & Dick, 2017) focused on comparative evaluation and service assessment, rather than on providing insight to the critical issue of resource sharing. Previous studies have also failed to adequately explore the role of consortia in facilitating the adoption of technology to enhance resource sharing. There is therefore a need to address these gaps in the existing literature on the subject. It is against the backdrop of the contextual and methodological research gaps identified above, and the issues faced by Kenyan libraries in responding to the dynamics of the digital transformation in libraries, and the emerging issues in resource sharing that this study is conducted.

1.3 Purpose of the Study

The purpose of this study was to determine the influence of library consortia on resource sharing in academic libraries with reference to the University of Nairobi library.

1.3.1 Objectives of the Study

Specific objectives of the study were to:

i. Examine the extent of resource sharing in the University of Nairobi library.
ii. Find out the methods of resource sharing adopted at the University of Nairobi library.
iii. Establish consortia initiatives that improve resource sharing at the University of Nairobi library.
iv. Propose a framework to enhance library consortia and resource sharing in the University of Nairobi library

1.4 Research Questions

1. What is the extent of resource sharing in the University of Nairobi Library?
2. What is the level of involvement of consortia in resource sharing at the University of Nairobi Library?
3. What are the current methods of resource sharing in adoption at the University of Nairobi Library?
4. How effective are these methods of resource sharing?

5. Which efforts been made by library consortia to support the development of resource sharing initiatives at the University of Nairobi Library?

6. Which resource sharing activities can be attributed to consortia at the University of Nairobi Library?

7. How do these activities improve resource sharing at the University of Nairobi Library?

8. Which framework can be adopted to enhance resource sharing at the University of Nairobi Library?

1.5 Scope and Limitations

The study looked at the influence of library consortia on resource sharing in academic libraries using the case of the University of Nairobi library. The study covered the University Library System of the University of Nairobi. The study also covered custodians of information (librarians), and consortium representatives within the library.

In conducting the study, the researcher encountered several limitations. Firstly, information about limitations of executing resource sharing initiatives were considered as sensitive information and may have resulted in a reluctance of participants to divulge some information which may have been vital to the study. Secondly, the study was limited to e-resources alone, even though resource sharing as a concept encompasses both physical and electronic resources. Therefore, the findings obtained may not be entirely reflective of issues relating to the broader aspect of resource sharing. Furthermore, even though there were several categories of libraries in the consortium, the study was limited to the context of academic libraries and the results obtained may differ for other categories of libraries. Lastly, the current coronavirus (COVID-19) pandemic impeded the ability of the researcher to easily conduct fact to face administration of data instruments, especially since some access to the library was often restricted for extensive periods. As a result, the researcher had to merge the data instruments, and rely mostly on digital tools to facilitate data administration.

1.6 Significance and Rationale of the Study

The study is very important because it adds to existing literature on the issue of library consortia from a resource sharing perspective and resolves contextual and methodological gaps in existing literature. Secondly, unlike in the rest of the world, library consortia are less prevalent in Africa. The findings provide a benchmark for other sub-Saharan African countries currently grappling with issues of financing e-resource collection development, since it suggested sustainable modes of forming consortia and undertaking resource sharing activities. The study also identified challenges in relation to resource diversity and lack of local content, and made suggestions on how to redress them. Overall, this will improve the current state of resource sharing in public Kenyan academic libraries, and the relevance and usability of shared resources.

Also, by providing further insight to resource sharing and other consortium activities at the University of Nairobi library, the study improves the visibility of the consortium to policy makers, and further advances the case for support both in the form of policy development and resource allocation. Currently, Kenya lacks any comprehensive policy on resource sharing beyond the directives of CUE and external frameworks. The study provides a proposed framework for resource sharing in Kenyan academic libraries. Lastly, by emphasizing on the role of consortium activities in resource sharing, the study highlights the importance of information provision in the pursuit of research. This will help public universities contribute more meaningfully to the realisation of national development objectives, by leveraging on information provision to support pertinent problem-solving research.

1.7 Assumptions of the Study

The study presumed that the responses given by participants are honest and objective, and represent the perspectives of the respective institutions. The language of the researcher in eliciting information from participants was polite and clear, and on the basis of this it was be assumed that no respondents provided misleading information or was coerced into participation. In addition, the study assumed that staff at the University of Nairobi library could adequately provide information about resource sharing activities undertaken by the consortium. KLISC's representatives who participated in the study were considered to be knowledgeable on a broad array of

issues in relation to consortium activities. Lastly, the study assumed that the adoption of electronic means of data collection arrived at the same results as with physical data collection and that merging the research instruments into a single electronic form did not affect the outcome of the study.

1.8 Operational Terms and Concepts

Collection Development: Collection development describes the process by which libraries build their collections and the associated infrastructure required to exploit information.

Electronic resources: e-resources are a short term for electronic resources, and refer to any information resource in digital format that relies on technology to be exploited.

Library consortium: A library consortium (plural is consortia) refers to a group of libraries that either formally or informally work together on the basis of an agreement to realise shared objectives, most often resource sharing.

Resource Sharing: Resource sharing describes the provision of access to a library's information resources to users of other libraries, and being able to access other libraries resources in return on the basis of a mutually beneficial agreement.

Academic Libraries: Academic libraries are libraries that provide information services to support teaching, learning and research in higher education institutions.

Academic libraries: Academic libraries refer to academic libraries in public higher education institutions and which are often funded by the government.

University of Nairobi: University of Nairobi is the oldest public university in Kenya with several campuses in Nairobi city.

University of Nairobi Library: University of Nairobi library refers to the University Library System at the University of Nairobi and its twelve constituent libraries.

1.9 Organisation of the Study

This study was be organised into five main sections. Each of these sections treated a specific aspect of the study as outlined below:

Chapter One is the Introduction, which provides an overall insight to the study and the concepts and issues within. It provides a comprehensive background to the study and discusses the research problem necessitating the study. It also states the research questions and objectives of the study.

Chapter Two provides a Literature Review which discusses the publications of other scholars on related themes and provides a theoretical context for the study. The literature review was be guided by the objectives of the study.

Chapter Three discusses the Methodology, which is the overall framework guiding the study, and includes the specific steps and processes to carry out the study including the research design, sampling techniques and the methods of data collection and analysis and the representation of the findings of the study.

Chapter Four covers the Analysis of Data and Discussion of Findings. This was done in accordance with the methods stipulated in the methodology.

Chapter Five provides a Conclusion for the study. It also makes several recommendations to stakeholders on issues related to the study, on the basis of the findings made in the study, and some suggestions for further investigation.

1.10 Chapter One Summary

The chapter begins with a background to the study and a discussion of the terms resource sharing, library consortium and information networks. The chapter also provides the context of the study, and discusses the research problem that makes the study imperative. The chapter also stated the research objectives and research questions. Furthermore, the assumptions to be made in the study were stated, and operational definitions for the terms and concepts in the study were provided. The chapter ends in a discussion of the organisation of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section of the study provides a review of literature on resource sharing and related concepts in line with the objectives of the study. The discussion of the literature review was be arranged into themes for coherency, with each theme relating to an objective of the study. The chapter also presents a conceptual framework that illustrates the concepts, constructs and variables in the study and the tentative relationships between them.

2.1 Modern Information Environment and Academic Libraries

The modern information environment has seen the development of information and communication technology (ICT) which is creating new and different kinds of information systems and new potential in managing, handling and supporting library services (Bhoi, 2017: 448). Generally, the information landscape has evolved significantly, and new innovative ways of handling and sharing information have emerged. The introduction of information technology in the creation, management and dissemination of information has resulted in the transition of libraries to digital platforms and increased the use of electronic resources. Library users have not been left out of this transformation and have increasingly demonstrated emphasis on convenience and the need for enhanced access options (Sandhu, 2018: 293). One of the most significant phases in the evolution of libraries has been the emergence of electronic resources (e-resources). Several definitions have been given by researchers to the term e-resource. One of the most comprehensive definitions appeared in the Anglo-American Cataloguing Rules-2 (AACR2) which used the term e-resources to describe information that is dependent on machines for their creation, processing, transmission and use (Zhang, Niu & Promann, 2017: 78). The popularity of e-resources and their adoption in library collections has had immense impact on libraries and has led to the development of hybrid libraries, which are libraries that collect, organise, manage and provide access to information resources in a variety of formats (Ottonicar, da Silva & Barboza, 2018).

E-resources now account for a sizeable proportion of library's entire holdings, and account for most services as well (Bhoi, 2017: 449). Furthermore, there is increasing collaboration between libraries and the use of computing and advance communication mechanisms has given birth to novel ways of resource sharing and the networking of libraries across vast geographical areas, sometimes traversing national frontiers (Chisita & Fombad, 2019). All these changes have prompted a need for the rethink of issues of training and capacity building for librarians. Academic libraries have not been left out of the digital transition. Academic libraries are central to the success of higher education and research institutions in a variety of ways. They support learning and teaching, and also enhance research and innovation development (Antwi, Ankrah & Frimpong, 2020). In the new information environment, academic libraries support learning through the provision of multi-format information resources and the enhancement of access options including through resource sharing. New paradigms in higher education such as online learning have also brought new responsibilities for librarians in the collection, organisation and provision of easily accessible resources (Nayek & Mallik, 2017: 36). These changes in academic libraries as a result of the evolution within the information environment, has seen the modern library transform from beyond a physical location to become a hybrid community of virtual and physical spaces, users and resources (Sandhu, 2018)

2.1.1 Resource Sharing in Academic Libraries

Resource sharing is increasingly being employed by academic libraries across the world. There are several reasons for this wide adoption of resource sharing in academic libraries. The emergence of efficient means of publishing resulted in an exponential increase in available information and new options for accessing, reproducing and manipulating information emerged (Pina, 2017). Even though information resources became abundant, budgetary limitations resulted in a funding crisis which shifted the focus of academic libraries from the pursuit of resource self-sufficiency to the expansion of access through collaboration, (Kalbande, 2018: 101). In addition, users' information needs have become dynamic and complex, and this has pushed librarians to explore new ways of providing access to information to support teaching, research and learning in academic communities (Chisita & Fombad, 2019). The realisation that resource self-sufficiency is a near impossibility also led libraries

to explore alternative options such as resource sharing (Saini, 2017: 120). Chisita and Fombad (2019: 2) opine that the proliferation of digital technology has enhanced academic libraries' capacity to develop critical resource sharing infrastructure and expertise in resource sharing in response to the issues discussed above. Resource sharing aims at providing information to users within and beyond a library's user community. It is therefore not only limited to the sharing of information resources alone, but also the sharing of technology and expertise required to exploit shared information resources (Posner, 2017). It encompasses all formal and informal efforts made by a group of libraries to share their information resources, expertise, technology and data (Chisita & Fombad, 2018: 2). Resource sharing enables academic libraries to bridge the gap between resource-endowed and deprived libraries. This is done through the integration of library services and the reduction of financial costs of providing access to information resources (Muhonen & Saarti, 2016; Kalbande, 2018).

Yuvaraj (2015: 99) used the phases in the progressive adoption of resource sharing in academic libraries to distinguish resource sharing activities into four categories. In the first phases of development, academic libraries are pushed to cooperate with each other and share their resources in response to rising costs of information resources and dwindling funding. Within the context of resource sharing, the era of library co-operation was dominated by traditional inter library lending. In the next phase, academic libraries took advantage of the development of ICTs to enable the recording, processing and transmission of information and the formation of networks to enable resource sharing (Khiste, 2017: 881). Library consortia emerged as the predominant resource sharing method in the third phase. Library consortia are informal or formal groups of academic libraries that work together to attain common objectives including the sharing of resources and facilitation of access to these resources. In the 21st century, cloud sharing has emerged as the direction of current resource sharing activity and refers to a method of resource sharing that relies on cloud computing to reduce costs associated with storage equipment, increase accessibility and availability of information resources and overcome geographic restrictions in accessing shared information (Yuvaraj, 2015: 10).

2.2 Resource Sharing Practices and Methods in Academic Libraries

The scope of resource sharing activities in academic libraries is quite broad and includes digitisation, provision of reference and instruction services, development and sharing of union catalogue, enabling circulation of information and ensuring access to shared information (Posner, 2017: 1). Initially, resource sharing was limited to interlibrary loans, document delivery and lending from commercial document suppliers. Recent advancements in technology has enabled the transition of resource sharing from a request and supply service for physical documents, to a service that handles information requests and services for documents in a variety of formats with workflows linked with other core library services (Chisita & Fombad, 2019). Digital technology has greatly influenced progressive change in the prevailing methods of resource sharing across time and the adoption of more efficient technology based resource sharing options. The rapid development of networks enabled the creation of networked information systems while the introduction of cloud computing further revolutionised resource sharing (Yuravaj, 2015: 10). This study examined the various methods of resource sharing in adoption in academic libraries: monolithic interlibrary lending, document delivery services, and library consortia. In addition to this, the study also examined modern aspects of resource sharing which is referred to as digital resource sharing.

2.2.1 Digital Resource Sharing

Digital resource sharing refers to the various means of sharing library resources in digital format and using digital tools with the objective of ensuring that users have access to information materials wherever and whenever (Antwi, Ankrah & Frimpong, 2020: 4). The emphasis in the sharing of digital resources is on access and users; convenience. Modern libraries have undergone a digital transition that has enabled them to acquire technology and systems to maintain non-text information resources such as audio, video and images (Bhoi, 2017: 48). Non-text digital resources have gained utility in the enhancement of learning because of their unique ability to support interactive learning in ways better than the use of text based information alone. In addition, digital resources such as video and audio formats tend to be more inclusive and can be adopted in teaching and learning of persons with cognitive and physical challenges. The use of images, video and audio to complement text based information

resources has also been shown to enhance literacy and critical thinking skills as well as to support the construction of explanations for complex concepts, and the illustration of models (SCLDA, 2017: 3-4). Digital resource sharing also supports e-learning and this has made the library central to the development of instructional technology capacity to support e-learning and the sharing of audio-visual and text information to support learning (Harper, 2018: 414). Digital resource sharing is also referred to as multimedia resource sharing (Munir, 2015).

2.2.2 Monolithic Interlibrary Lending

Monolithic interlibrary loan services are an age-old model of interlibrary loans in which the library makes use of a centralised service to share resources with other libraries (Saarti & Tuominen, 2020). Interlibrary lending refers to costumer centred efforts made by a library to provide information that meets the specific information needs of a user, often made in the form of a formal request (Posner, 2017: 3). Interlibrary lending serves a very important role in libraries because no library has access to information that exhausts its users' needs. In addition, it is a cost-effective mechanism of providing information to users since some academic libraries charge fees for information provided through interlibrary lending platforms (Posner, 2017: 2). Beyond supporting the provision of access to information, interlibrary lending helps the library to improve overall collection development through the determination of existing gaps in collection, and areas of priority upon analysis of interlibrary lending data (Posner, 2017: 3). Evolution in the information landscape have driven change in the manner of interlibrary lending with increasing emphasis being placed on the adoption of technology including the use of automated lending request management systems (Posner, 2017: 4). Despite the opportunities interlibrary lending offer to libraries, it is often not a core service in several academic libraries because it requires heavy commitments in financial costs, time and training (Posner, 2017: 5). Most often interlibrary lending services are poorly funded, underutilised or lack capacity to process so many requests (Posner, 2017: 6). One disadvantage of this model is the relatively high response time and associated costs in the provision of requested information (Classen, 2019: 97). Technology has driven change in interlibrary lending including the use of automated request management systems, the introduction of user notification and the networking of several centralised services

(Posner, 2017: 4). The most widely used monolithic resource sharing platform today is the OCLC's WorldCat Resource Sharing which offers centralised interlibrary loan services and bibliographic services to libraries.

2.2.3 Document Delivery Services

Document delivery is another major method of resource sharing. It is slightly different from interlibrary lending in that it involves the delivery of information directly to the users using technology applications such as facsimile and specialised applications such as Ariel and Odyssey to delivery information (Kristof, 2018: 398-399). Document delivery can also make use of regular emails and secured websites to deliver requested information. Digitisation has greatly affected document delivery in many ways. First, the need to scan documents prior to document delivery has reduced since most new information resources are published in electronic format. Secondly, digital technology has enabled the development of user-centred services and the emergence of new and more efficient tools for document delivery (Braggioli, 2018). However, technology has also introduced several challenges as well. The use of technology to track electronic materials for example has impeded the use of information and has limited document delivery to the use of particular routes or access to only a few sections of a document at a time, in line with license agreements (Classen, 2019: 93; Tshirren & Grossgarten, 2019: 88). OCLC's Article exchange is the best known example of a global document delivery service (Kristof, 2018: 398).

2.2.4 Library Consortia

Pereira & Franco (2020: 1126) defined a library consortium as a group of libraries or library systems that work together on the basis of a formal agreement to facilitate resource sharing among other objectives. The emphasis on resource sharing in academic libraries has been largely attributed to the development of new technology and the funding crisis in academic libraries (Kalbande, 2018: 101). Consortia resource sharing is a more efficient and cost effective than other methods because it establishes a shared pool of resources for member libraries and their users. Technology has a critical role to play in resource sharing and the adoption of technology in library consortia has enabled the management and streamlining of workflows and the reduction of staff intervention through the adoption of information technology.

Babaryka-Amelchanka et al. (2019: 48) categorises library consortia into discipline specific or general. Discipline specific consortia usually collect information resources for academic libraries in the same academic discipline such as the Global Network of Agricultural Libraries (Agilenet) (Babaryka-Amelchanka et al., 2019: 48). Library consortia support resource sharing through cooperative bibliographic services (Konnur, 2019: 108), facilitating collection development, inter library loans, training and the sharing of technology (Saini, 2017). OCLC is the largest library network in the world, and its World Share ILL is used by several thousand libraries across the world to obtain access to a globally shared pool of information resources (Classen, 2019).

2.3 Resource Sharing Initiatives in Academic Libraries

Academic libraries have embarked on several initiatives to enhance resource sharing. Traditionally, resource sharing was limited to activities such as inter-library loans, collection development and cooperative cataloguing (Konnur, 2019, p108). However, digitisation has increased the need for cooperation in areas of training and capacity building to enable librarians to acquire and develop the requisite technological capacity to support resource sharing services (Konnur, 2019: 108). In addition to these, academic libraries in the digital era are increasingly involved in the development of cooperative reference services including the development and management of union catalogues (Osterman et al., 2020: 154). Union catalogues are very essential and constitute a comprehensive record of the bibliographic data of all resources within a library network such as Amicus and OCLC's WorldCat (Singh & Singh, 2018: 1). Other resource sharing initiatives undertaken to enhance access to shared resources include the use of shared systems and infrastructure, collaboration in the development of automated storage modules (Tshirren & Grossgarten, 2019: 99), and the development and management of workflow systems for sending and requesting information, managing and scheduling information requests and notification management within library networks (Tshirren & Grossgarten, 2019: 99).

Cooperative storage has also been an avenue of cooperation among academic libraries (Osterman et al., 2020: 154). Academic libraries have focused on the development and management of shared databases including the adoption of cloud storage to enhance access and reduce storage costs (Xiong et al., 2020: 2). To facilitate

information exchange and reciprocal borrowing, academic libraries have focused their recent attention to issues of interoperability and the standardisation of databases and systems (Wilson & Moris, 2020: 142). Standardisation has enabled seamless integration of library systems and horizontal expansion of networks (Li & Yang, 2018: 32). To enhance integration, library networks have adopted common interfaces for all constituent library systems. The adoption of single login platforms or gateways for all libraries in a network is recently becoming a trend and this has resulted in the development of vast virtual networks of libraries, thereby expanding access to information resources (Chisita & Fombad, 2019: 41; Michalka & Thompson, 2017: 7).

One critical activity libraries undertake to enhance resource sharing within library networks or consortia is engaging in collaboration with other information networks to ensure reciprocal access to information. Most libraries in the Africa have joined global information networks to enhance access to a wider pool of shared resources. These include INASP, EIFL and OCLC (Chisita & Fombad, 2019). EIFL and INASP are the most notable partnerships that have enhanced resource sharing initiatives in academic libraries across the world (Chisita & Fombad, 2019: 6). INASP developed the Programme for the Enhancement of Research Information (PERI) to help academic libraries in developing countries develop resource sharing initiatives including the development and funding of consortia. It was replaced by the Strengthening Research and Knowledge Systems (SRKS) in 2013. SRKS assists consortia with the deployment of technology and systems to enhance information exchange (Chisita & Fombad, 2019: 6).

2.4 Resource Sharing Trends in Academic Libraries

Advancements in technology have influenced broad changes in the information landscape with the library being no exception. In resource sharing the adoption of technology has influenced a number of current trends including the adoption of cloud computing, increasing emphasis on open access and efforts to increase integration and standardisation (Xiong et al., 2020: 2). One of these has been the increasing adoption of cloud based storage. Rashid and Chaturvedi (2019: 421) define cloud computing as "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage,

applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction." Cloud computing denotes location independent information resources that are available online as a utility on demand (Wada, 2018: 18). Cloud computing therefore refers to the adoption of centralised internet based architecture to manage information and provide information services which effectively reduces over reliance on physical equipment and the need for individual ownership of technological infrastructure (Wada, 2018: 17). This technology makes the sharing of resources more flexible and cost effective, and enhances access by supporting options such as remote access. Cloud computing also enhances the optimal utilisation of shared resources (Xiong et al., 2020: 6). Two major issues in the use of cloud computing for resource sharing are interoperability and information exchange from one cloud architecture to another (Wada, 2018: 21). The emphasis on these issues has led to increased efforts towards standardisation.

Standardisation ensures compatibility of information networks and efficiency of information exchange and resource sharing across vast information networks (Posner, 2017: 19-20). The introduction of transmission control protocol (TCP) and other internet standards for networks and information resources has reduced these challenges (Park et al., 2020: 3). Continuous efforts are being made by the Cloud Computing Interoperability Forum and the Open Cloud Consortium to enhance standardisation and ensure interoperability (Xiong et al, 2020; Wada, 2018: 18). Current international standards for resource sharing include ISO 10161 (ISO ILL), ISO 10160 (interlibrary loan application service), Virtual Document eXchange (VDX) which was used by OCLC from 2007 to 2018, NISO Circulation Interchange Protocol (NCIP) and Session Information Protocol (SIP) (Wanner, 2019: 38-39). The ISO 10161 specified the protocols for information exchange between information networks or from one consortium to another until its recent replacement by ISO 18026 (Monika, 2018). ex-Libris is an example of a cloud based peer to peer software for resource sharing that uses both ISO 10161 and NCIP, and has been widely employed by library consortia to manage lending, borrowing, request management and information exchange (Monika, 2018)

There has been also general trend in academic libraries across the world to shift to peer to peer resource sharing through the development of platforms that enable collaboration between academics and institutions such as Sci-Hub (Saarti

&Tuominen, 2020: 1). Resource sharing today has also been enhanced by the advent of web-based discovery services such as EBSCO Discovery Service, WorldCat Local and Ex Libris which facilitates access to research articles in shared information pools (Breeding, 2018: 5). The adoption of single library systems and a common login interface for library networks and consortia is also a current trend in resource sharing which makes information exchange easy (Li & Yang, 2018: 32). Among information networks and consortia that facilitate resource sharing, there has been an increasing trend of mergers to form larger information networks. In 2009, there was a merger between SOLINET and NELINET in USA to form Lyrasis, and between Lyrasis and DuraSpace (DSpace) in 2019 (Lyrasis, 2019). Similarly, in the Research Libraries Group (RLG) merged with OCLC in 2006, and subsequently with RLIN further widening OCLC's global reach by several hundred libraries (McCourry, 2019: 876).

The open access revolution has also driven change in resource sharing. Increasing demands for open access has affected traditional resource sharing mechanisms and tools for exchanging information and has inspired a transition of the library into a virtual digital learning environment (Saarti & Tuominen, 2020: 1). Open access has accelerated changes in resource sharing and has encouraged the involvement of policymakers and organisations that fund research to develop policies that support information resource utilisation and the provision of enhanced access options (Saarti, 2018). Saarti and Tuominen (2017: 12-13) note that further development in open access publishing models may increase direct use of resources and reduce costs associated with providing access to information in future. Therefore libraries will be mere facilitators of resource sharing rather than principal actors, and demand for interlibrary lending and document delivery services may dwindle (Piwowar et al., 2018). Furthermore, Taylor (2019: 1) opined that the implications of open access on digital resource rights management may make consortia negotiations complex and limit resource sharing in future.

2.5 Conceptual Framework

Hughes, Davis and Imenda (2019: 28) opine that a very important step in any research study is the visual illustration of the logical flow of concepts, which is referred to as the conceptual framework. Adom, Hussein and Agyem (2018: 38) define a conceptual framework as a "system of concepts, assumptions, expectations, beliefs and theories

that support and inform one's research". Conceptual frameworks suggest what data was collected in a study and how it guided the study (Hughes, Davis & Imenda, 2019: 28). In this study the framework illustrated in Fig 2.1 identifies the various variables that moderate the impact of resource sharing in academic libraries. The independent variables were library consortium management and consortium initiatives, while the dependent variable were training, technology, information networks, and management.

2.6 Variables

The study made use of the following dependent variables: training (staff expertise and capacity development to enhance resource sharing), technology (availability of technological infrastructure, systems and technical expertise), information networks (connectivity and interoperability), and management (policy, initiatives and funding). The outcome variable were research output, information access, interoperability, user satisfaction and cost effective acquisition. Resource sharing includes not only sharing of information but also technology, expertise and systems (Posner, 2017). However academic libraries are often challenged in funding modern infrastructure required to implement resource sharing programs (Chisita & Fombad, 2019: 41). Furthermore, staff expertise and proficiency in the use of modern technology is often lacking thus impeding resource sharing (Reisman, 2017: 574). In addition to these, the critical problem of standardisation and interoperability has impeded information exchange thereby making resource sharing difficult (Kannisto, Hästbacka, & Marttinen, 2020: 659-660). The study adopted these variables based on the relationships presumed above to provide a tentative explanation how they are affected by consortium management, practices and initiatives. Li and Yang (2018: 1-4) assert that consortium management and initiatives plays a critical role in resource sharing.

Figure 1: Conceptual Framework

INDEPENDENT VARIABLE   DEPENDENT VARIABLES   OUTCOMES
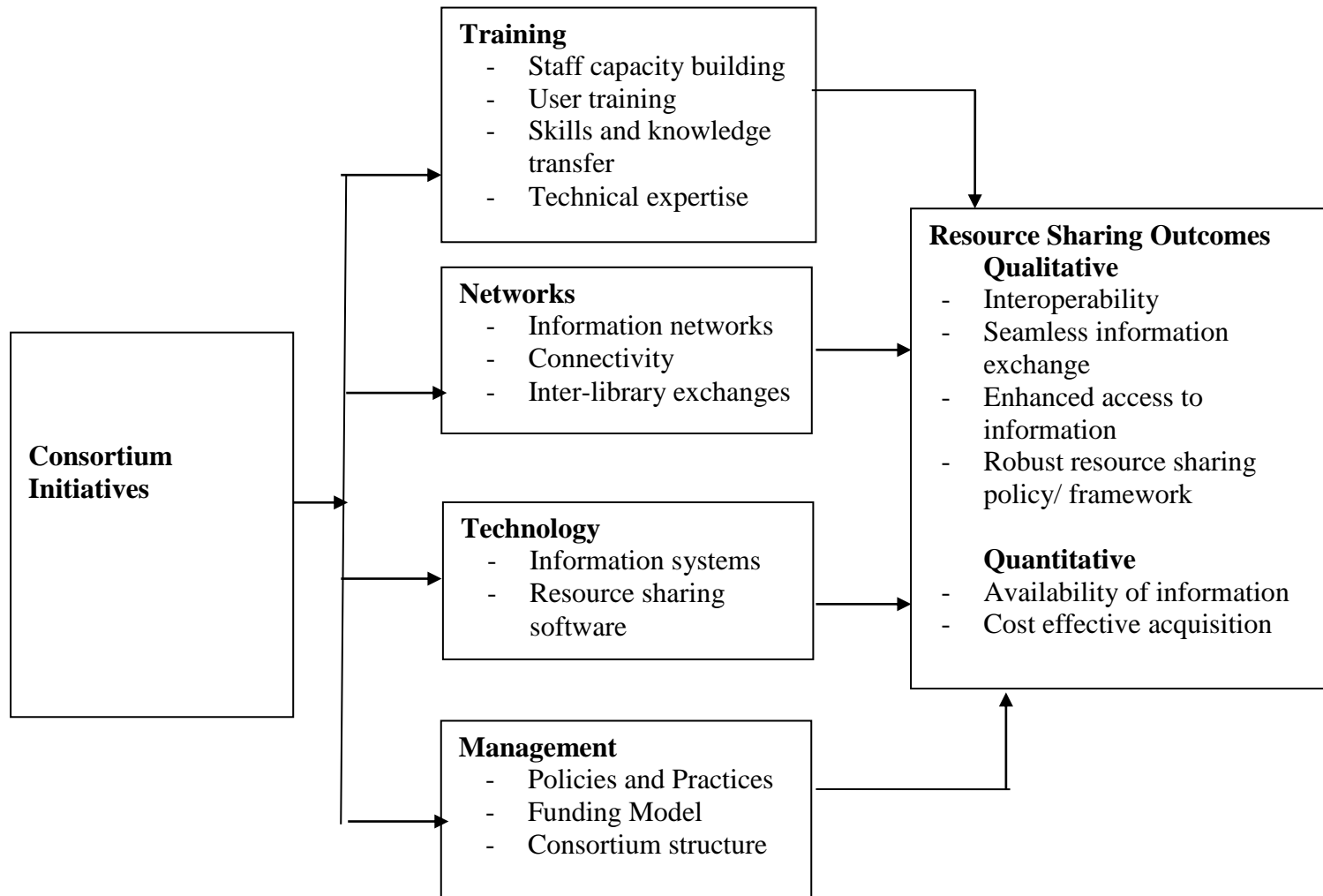
2.7 Chapter Two summary

The chapter reviewed literature on the concepts under study and begins with a discussion of the modern information environment. The various methods of resource sharing were discussed including library consortia, and several resource sharing initiatives in academic libraries were discussed. The chapter also provided a conceptual framework to illustrate the constructs between the variables and concepts in the study.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This section of the study discusses the methods employed by the researcher in planning and conducting the study. It includes the research design, target population, sampling procedures and the methods employed in the collection, analysis and interpretation of data.

3.1 Research design

Research is the systematic process of searching for knowledge in an area of study (Niraula, 2019: 1) and often employs a specific methodological approach called a research design. A research design guides a study by providing a framework for the study and a direction for addressing the problem of the study (Dikko, 2016). This study is designed as a descriptive case study. Case studies are in-depth investigations into phenomena within a specific context, and using various data sources (Rashid et al., 2019: 2). A case study was adopted because it allowed for in-depth analysis of the issues pertaining to resource sharing and the role of consortia in resource sharing. The researcher employed both qualitative and quantitative approaches to data collection and analysis to carry out the study, with the incorporation of some quantitative aspects for illustration and clarity.

3.2 Area of study

The area of the study was the University of Nairobi library system which consists of twelve different libraries of the University of Nairobi. These are: Jomo Kenyatta Memorial Library, Mahatma Ghandi Graduate Library, College of Health Science Library (Medical Library), College of Biological and Physical Science Library, Chiromo, Law Library (Parklands), College of Agriculture and Veterinary Science Library (Upper Kabete), College of Education and Extra Mural Studies Library (Kikuyu town), School of Business Library (Lower Kabete), College of Architecture and Engineering (ADD) Library, Mombasa Campus Library, Kisumu Campus Library and the Institute of Anthropology, Gender and African Studies (IAGAS) . The Jomo

Kenyatta Memorial Library on the University's main campus is the largest of all twelve libraries and hosts the library's administration services.

3.3 Target population

The target population in a research study refers to the quantity of cases or things which are of interest to the researcher (Etikan, Abubakar & Alkassim, 2016: 1). In this study, the target population consisted of University of Nairobi library staff working in any of the twelve libraries within university library system. The total number of library staff in all twelve libraries at the time of the study was 116.

3.4 Sample and Sampling Strategies

3.4.1 Sample Size

A sample is a statistically representative section of the target population from which data is elicited for the study (Majid et al., 2018: 3). In this study a sample of 40 library staff from the twelve libraries in the University of Nairobi library system was employed. This sample was selected because it ensured the participation of a significant proportion (34.48%) of the target population thus ensuring that the results that are reflective of the wider population.

Table 1: Sample Size

RESPONDENTS	POPULATION SIZE	SAMPLE SIZE
Jomo Kenyatta Memorial Library	41	15
Mahamat Ghandi Graduate Library	6	2
Medical Library (CHS)	9	2
Chiromo Library (CBPS)	7	4
ADD Library (CAE)	7	3
Law Library, Parklands	8	4
Upper Kabete Library (CAVS)	7	2
Lower Kabete Library (CHSS)	6	2
Kikuyu Campus Library	11	3
Kisumu Campus Library	6	1

Mombassa Campus Library	6	1
IAGAS Library (CHSS)	2	1
TOTAL	116	40

3.4.2 Sampling Strategies

A non-probability sampling strategy was adopted for the study. This approach gives little importance to randomisation but rather adopts subjective sampling techniques to select elements of a target population into a sample (Etikan, Abubakar & Alkassim, 2016: 1). Adopting a non-probability sampling strategy allowed the researcher to ensure optimal relevance of information obtained from the sample by eliminating potentially poor sources of information.

3.4.3 Sampling Techniques

The study adopted both stratified and purposive sampling techniques. Purposive sampling was used to select library staffs that were directly concerned with resource sharing and utilisation, and top management. This method is often employed in studies where the target population is small (Etikan, Abubakar & Alkassim, 2016: 3). It was used because it enabled the limitation of the sample to participants from whom relevant information could be obtained. On the other hand, stratified sampling involves the selection of a set of elements in a population in which each sub-group (called a stratum) shares some similarities with other elements in the stratum, and this similarity is the reason for their selection (Botev & Ridder, 2017). Stratified sampling was employed because the sampling technique allows for consideration of variations in perspectives of resource sharing across different libraries within the university library network. Therefore this sampling technique eliminated the possibility of sample bias and reduced the likelihood of skewed results.

3.5 Data Collection Methods

The study relied predominantly on primary data elicited from the identified sample within the target population. In this study both questionnaires and interview guides were designed for adoption in data collection. A list of potential participants was obtained from the Director of the University Library to be used to facilitate data collection. Due to the public health restrictions and travel limitations imposed in

response to the COVID-19 pandemic the researcher had to merge both instruments into a single electronic tool using the Google Forms tool, to facilitate easy administration. Where challenges were encountered in the data administration, a follow-up was made using physical copies of the research instrument.

3.5.1 Questionnaires

One tool of data collection that was employed was semi-structured questionnaires. Questionnaires consist of series of questions that helps a researcher to test and explain relationships between variables (Rashid et al., 2019). The questionnaires were structured into various sections, beginning with an initial section for demographic data, followed by sections on the extent of resource sharing and consortia involvement, resource sharing methods and consortia initiatives, and lastly, resource sharing frameworks. Each of these questions was linked to a research objective of the study. The questions in the questionnaire consisted of both open ended and closed ended questions. Open ended questions allowed respondents to fully express their opinions on the concepts understudy. Open ended questions sought to elicit information pertaining to respondent's perception of the state of resource sharing and current initiatives, their description of existing challenges and suggestion of possible solutions to these challenges. In addition, open ended questions elicited information about existing resource sharing frameworks and avenues for potential policy improvement. On the other hand, close ended questions limited respondents to a set of predetermined possible answers on the basis of extensive review of literature. Close ended questions sought information to develop a demographic profile of respondents, and to determine the effectiveness of resource sharing initiatives and challenges encountered in resource sharing. The adoption of both open ended and close ended questions in the questionnaire enhanced the analysis of data by providing both descriptive and enumerative information about the phenomenon under study. The researcher employed Google forms to make questions accessible to respondents.

3.5.2 Interview Guides

Interviews were employed to allow for in-depth descriptive information from participants involved in the actual process of facilitating resource sharing. The interview guides were structured into the following sections: demographic

information, state of resource sharing, resource sharing methods and initiatives, and resource sharing frameworks. The interview consisted of several predetermined open ended questions. The researcher adopted a Google Form tool to make interview questions accessible to respondents, and had follow up questions for clarification through email. In cases where delays were encountered with participants, a printed version was submitted to participants and which was later scanned and sent to the researcher.

3.6 Research instruments

3.6.1 Pilot Study

Reliability is often a challenge in research studies, especially with qualitative data. As such, a pilot test is often required to determine the effectiveness of the research instruments to allow for modification and improvement where necessary (Gani, Rathakrishnan & Krishnasamy, 2020: 140). Prior to the collection of data, the researcher pre-tested the research instruments in a pilot exercise. The piloting of the questionnaire and interview guide was done at the Kenyatta University library. This library was used for the pilot exercise because it has a similar profile to the area of study. It is a public university library, and also a member of the same library consortium. The outcome of the pilot exercise informed the modification of instruments prior to actual data collection process and were not considered in the final analysis of data. Piloting is done to ensure the reliability of the questionnaires, and internal consistency.

3.6.2 Validity

The researcher developed data instruments after broad research into the study area to enable comprehensive understanding of concepts and constructs. Construction of data instruments was done in line with university's requirements and under the direction of supervisors. The instruments were also designed to elicit information that meets the objectives of the study and provides answers to the research questions.

3.6.3 Reliability

In order to ensure reliability and internal consistency, questionnaires were pretested and modified thereafter to ensure accuracy and effectiveness. Furthermore, both

interview guides and questionnaires were moderated by supervisors and due diligence was emphasized in the data collection process.

3.7 Ethical Considerations

In conducting the study, the researcher observed the following ethical considerations. After the proposal for the study was approved by the department, the researcher applied for a research permit from the National Commission for Science, Technology and Innovation. In addition, prior to the collection of data, a formal introduction letter was obtained from the department which was attached to emails sent to participants. Participation in the study was voluntary, with the purpose of the study explained in the research instrument. The confidentiality of information disclosed to the researcher was protected, and information disclosed was used exclusively for the analysis and report. Furthermore, the integrity of information disclosed was preserved, and its meaning unaltered. The researcher also strived to remain neutral and objective. Lastly, the researcher avoided plagiarism in the writing of the final report and adhered to university approved referencing styles.

3.8 Data Collection Procedures

After the pilot study, the researcher employed electronic means of communication to personally collect data. The researcher used e-mails to send the hyperlink of electronic questionnaires (on Google Forms) to respondents. The researcher made use of the staff mailing list from the university library's webpage and phone numbers from the staff profiles on the university library's webpage to initiate communication with respondents and follow up on data collection.

3.9 Data Analysis and Presentation

The study employed both qualitative and quantitative approaches to data analysis. Qualitative data from open ended questions were edited and summarized to facilitate analysis. Qualitative data analysis aimed at discussing issues of resource sharing from respondents' perspectives with view of determining the state of resource sharing, current methods and consortia initiatives for resource sharing and their effectiveness. Qualitative data was analysed using Nvivo software. Thematic analysis was employed for the qualitative analysis of data, where responses were discussed based on several

broad themes in line with the concepts under study and the objectives of the study. Thematic analysis is often employed in qualitative analysis of responses to open questions, and is very useful in identifying patterns and trends between variables and concepts in a study.

Quantitative data in the study was analysed using Microsoft Excel. Data was coded and entered into Microsoft Excel spread sheet to allow statistical analysis. The results obtained were illustrated using tables and charts. Aspects of the study that required quantitative data analysis included the provision of a demographic profile of participants and an assessment of the effectiveness of resource sharing initiatives. The parameters employed to assess resource sharing methods and initiatives were interoperability, information access and availability and framework scope and effectiveness. After the data analysis, the results were discussed in relation to the various research questions and in line with reviewed literature to facilitate the interpretation of the results.

3.10 Chapter Three Summary

The chapter provides an in-depth description of the methods that were employed in conducting the study and stated the research design and area of study. The sampling strategies and sampling techniques were discussed, as well as the methods employed in data collection and analysis. The chapter also provides a description of the efforts made to ensure validity and reliability, and discusses the various ethical considerations made to ensure the integrity of the study's findings.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter makes a presentation of the results of the study that sought to determine the influence of library consortia on resource sharing in academic libraries, with reference to the University of Nairobi library. To realise the objectives of this study, two instruments of data collection were adopted: interview guide for digital content librarians and heads of centralised services, and a questionnaire for library staff at the various libraries in the University library system. The questions covered a broad array of themes and were based on the research questions. This chapter presents and analyses the results obtained after the administration of the data instruments and are divided into the following areas: background of respondents, state/extent of resource sharing, consortium initiatives to enhance resource sharing, framework for enhancing resource sharing, and lastly, a chapter summary.

4.2 Background Information of Respondents

This study sought to establish a background profile of respondents on the basis of position, gender, years of service, and level of education. In terms of the distribution of respondents across the various units of the library, the results are indicated in Table 2 on page 35. In the study, 15% (n=6) of the respondents worked in the Digital Content Unit, 10% (n4) in the Law Library, 10% (n=4) in the Chiromo Library, 7.5% (n=3) in Circulation , 7.5% (n=3) in the ADD library, 7.5% (n=3) in the Kikuyu Campus Library, 5% (n=2) in the Central Administration, 5% (n=2) in the Mahatma Ghandi Graduate Library, 5% (n=2) in the Africanna section, 5% (n=2) in the Processing Unit, 5% (n=2) in the Lower Kabete Library, 5% (n=2) in the Upper Kabete Library, 5% (n=2) in the Medical Library, 2.5% (n=1) in the Mombassa Campus Library, 2.5% (n=1) in the Kisumu Campus Library and 2.5% (n=1) in the IAGAS library. There was no respondent (n=0) in the Archives and Rare Collection unit. This indicates that most units of the library were represented and the high representation of digital content librarians ensured that the study acquires adequate data about core resource sharing activities.

Table 2: Distribution of Respondents across Departments in the Library

Unit	Frequency	Percentage (%)
Administration	2	5.0
Circulation	3	7.5
Digital Content	6	15.0
Mahatma Ghandi Graduate Library	2	5.0
Archives / Rare Collection	0	0.0
Africana / UN Reserve Collection	2	5.0
Processing Unit (Acquisition/ Cataloguing)	2	5.0
IAGAS	1	2.5
Law Library (Parklands)	4	10.0
Lower Kabete (CHSS)	2	5.0
ADD Library (CAE)	3	7.5
Upper Kabete (CAVS)	2	5.0
Kikuyu Library (CEES)	3	7.5
Chiromo Library (CBPS)	4	10.0
Medical Library (CHS)	2	5.0
Mombassa Library	1	2.5
Kisumu Library	1	2.5
Total	**40**	**100.0**

The study also established the distribution of respondents according to position held in the library as explained in Table 3 on page 36. The results indicate that 5% of respondents (n=2) were directors, 15% of respondents (n=6) were librarians and senior librarians, 32.5% of respondents (n=13) were senior library assistants while 47.5% of respondents (n=19) were library assistants. These results indicate that library assistants and senior library assistants dominated the staff population at the University library.

Table 3: Respondent's Position in the Library

Position	Frequency	Percentage (%)
Director / Deputy Director	2	5.0
Senior Librarian / Librarian	6	15.0
Senior Library Assistant	13	32.50
Library Assistant	19	47.50
TOTAL	**40**	**`100.0**

The study also established the gender of respondents as presented in Table 4 below. The results indicate that 55 % of respondents (n=22) were male, while 45% of respondents (n=18) were female. These results indicate that gender profile of staff at the University library was male dominated. In addition, it was observed that some units were entirely made up of male staff such as the digital content department.

Table 4: Gender Profile of Respondents

Gender	Frequency	Percentage (%)
Male	22	55.0
Female	18	45.0
Total	40	100.0

The length of service of library staff was also determined. The table 5 on page 37 presents the distribution of respondents according to years of service. The results indicate that 10% of respondents (n=4) had been in service for less than two years, while 45% respondents (n=18) had worked for two to five years, 27.5% respondents (11) had worked for six to ten years and 17.5% respondents (7) had worked for over ten years. This is an indication that a majority of library staff had been in service long enough to be capable of grasping the range of issues about resource sharing that the researcher sought to obtain data about.

Table 5: Respondents' Duration in Service

Duration in Service	Frequency	Percentage (%)
Less than two years	4	10.0
Two to five years	18	45.0
Six to ten years	11	27.5
Above ten years	7	17.5
TOTAL	**40**	**100.0**

In terms of level of education, the results are indicated in Table 6 below. The results indicated that 2.5% of respondents (n=1) had obtained a doctorate degree, 40% (n=16) had obtained Masters Degrees, 47.5% (n=19) had Bachelor's degree, while 10% of respondents (n=4) had diplomas. This indicates that participants most respondents had Bachelor's degrees and thus could understand the issues of concern in the study.

Table 6: Level of Education of Respondents

Level of Education	Frequency	Percentage (%)
Doctorate	1	2.5
Masters	16	40.0
Bachelor's	19	47.5
Diploma	4	10.0
TOTAL	40	100.0

4.3 Extent of Resource Sharing and Level of Consortia Involvement in Resource Sharing

One of the objectives of the study was to determine the extent of resource sharing and ascertain the level of consortia involvement in resource sharing at the University of Nairobi library. With respect to the representation of the library in the consortium's management the results indicate that 82.5% of respondents (n=33) considered the library as having adequate representation, while 17.5% (n=7) considered the library's representation as only moderate as explained in Table 7 on page 38. Respondents also

indicated that the library currently had two members in the strategic and management committees of the domestic library consortium. With respect to the extent of involvement in decision making within the consortium, 57.5% of respondents (n=23) considered the library as very active in decision making within KLISC, while 35% (n=14) indicated that involvement in decision making was only moderate and 7.5% (n=3) indicate that involvement in decision making was inadequate. The study also determined the extent to which consortia contribute to the amount of information available to users. In this case, 95% of respondents (n=38) ranked the consortium as highly responsible for the bulk of shared information resources available to users, while 10% (n=2) were neutral as indicated in Table 7 below.

Table 7: Consortium Involvement in Resource Sharing

Consortium Involvement	High		Medium		Low	
	Frequency (f)	*(%)*	*f*	*(%)*	*f*	*(%)*
Consortium is dominant resource sharing model	36	90.0	4	10.0	0	0.0
Representation in consortium's management	33	82.5	7	17.5	0	0.0
Active participation in decision making	23	57.5	14	35.0	3	7.5
Responsible for provision of majority of shared information resources	38	95.0	2	5.0	0	0.0

Majority of respondents described the state of resource sharing in the University of Nairobi Library as being able to meet the current demands of information users but with considerable room for improvement in a number of areas as discussed below. According to a respondent who also served as a member of KLISC's strategic management committee, the current state of resource sharing could sustain the needs for current information provision and access, but faced limitations with respect to

inter-system navigation and the deployment of modern technological infrastructure to support the interoperability and information exchange. The results indicated that that the Kenyan Library and Information Services Consortium (KLISC) was the principal library consortium to which the library retained membership as expressed by 95% of respondents (n=38). Other international consortia and information networks were determined to supplement KLISC. Responses ranked AFLIA (77.5%), INASP (90%) and EIFL (92.5%) as the international information networks in which the library retained membership aside KLISC. The study also sought to determine the dominance of the consortium model as a resource sharing method. Respondents indicated that the consortium model of resource sharing was the dominant model in adoption, among other methods. The consortium model of resource sharing was considered to be the dominant model in adoption by 90% of respondents and KLISC was identified as the principal vehicle for enabling resource sharing for the University of Nairobi's library.

The findings confirm that library consortia are the dominant model for resource sharing n Kenyan academic libraries (Mwaurah & Namande, 2018). The challenges with decision making within the consortium reflect the views of Kostek (2019: 210) who opined that decision making in library consortia is often a challenge, especially in decentralised models where representatives of member libraries have to come to a consensus. Academic libraries join library consortia and international information networks such as INASP and EIFL to improve access to information for their users through PERI and SRKS programs. This allows libraries to have access to information resources that exceed their individual capabilities. However prevailing challenges such as inadequate capability and technological limitations may limit the maximisation of the prospects of enhanced access and information provision that resource sharing could provide.

4.4 Methods of Resource Sharing in adoption

One objective of the study was to determine the methods of resource sharing in adoption at the University of Nairobi library. The various methods of resource sharing in adoption are expressed in Figure 2 on page 40. Monolithic interlibrary lending was considered to be a method of resource sharing in adoption by 82.5% of respondents (n=33), document delivery by 70% (n=28), bi-lateral partnerships by 27.5% (n=11), domestic library consortia by 97.5% (n=39), international library networks by 77.5%

(n=31) and open access configurations by 77.5% (n=31). In addition, 90% of respondents also indicated domestic library consortium (KLISC) as the most important method of resource sharing, while 10% considered open access configurations as the most important method.

Figure 2: Methods of Resource Sharing
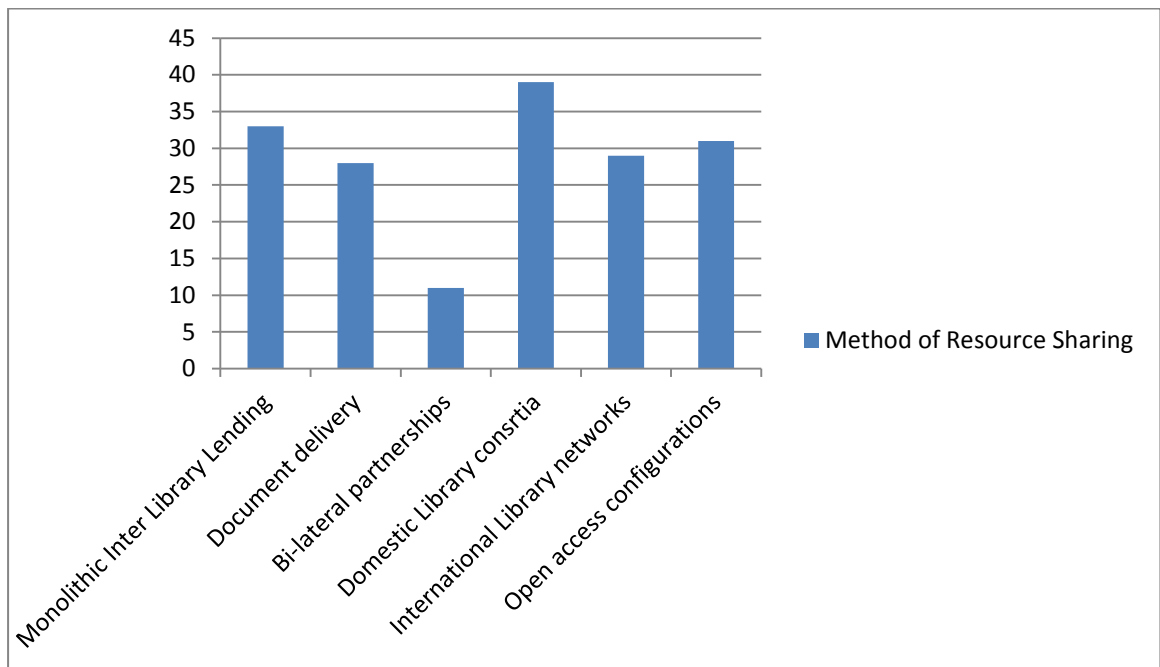
In addition to the methods of resource sharing indicated above, the deputy director of the University of Nairobi library in charge of technical services also indicated that the University of Nairobi library provided intra-library services between the branch libraries of the university's library system, without involving other libraries. However, this was often limited to physical information resources. With respect to document delivery, the deputy director in charge of technical services indicated that document delivery services were previously deployed at the University with the assistance of KLISC to enable information exchange with other libraries, but were discontinued upon the introduction of the PERI program, however Intra-library document delivery services are effective within the university library system.

The result suggests domestic library consortia as more dominant, followed by open access configurations and international library networks. Bi-lateral partnerships were shown to be the least dominant of the methods in adoption. The findings confirm that library consortia were the most popular resource sharing methods in academic

libraries (Khiste, 2017). Chisita and Fombad (2019) stated that consortia are the dominant resource sharing model in Africa enabling access to vast pools of shared resources.

4.4.1 Effectiveness of Resource Sharing Methods in Adoption

The study sought to evaluate the effectiveness of these methods in realising the library's resource sharing objectives. Responses ranked the effectiveness of resource sharing methods on several potential resource sharing objectives. Respondents considered these methods to be effective in ensuring wider access to information (100%), supporting open access (82.5%), improving information resource usability (77.5%), ensuring research output visibility (70%), facilitating information interchange (62.5%), and in ensuring interoperability (60%). Only 45% of respondents considered the current methods of resource sharing in adoption to be capable of supporting cloud storage, while 37.5% considered these methods as effective in facilitating multi-user single platform access. This result is presented in Table 8 on page 41.

Table 8: Effectiveness of Resource Sharing Methods

Effectiveness of Resource Sharing Methods	High		Medium		Low	
	Frequency (f)	*(%)*	*F*	*(%)*	*f*	*(%)*
Wider access to information	*40*	100	*0*	*0*	*0*	*0*
Visibility of research output	*28*	*70*	*7*	*17.5*	*5*	*12.5*
Improves information resource usability	*31*	*77.5*	*6*	*15*	*3*	*7.5*
Facilitates information exchange	*26*	*62.5*	*10*	*25*	*4*	*10*
Ensures interoperability	*24*	*60*	*12*	*30*	*4*	*10*
Supports cloud storage	*18*	*45*	*16*	*40*	*6*	*15*
Support open access	*33*	*82.5*	*6*	*15*	*1*	*2.*
Multi-user single platform access	*15*	*37.5*	*21*	*52.5*	*4*	*10*

The study also sought to determine the software and technological packages used to enhance resource sharing at the university of Nairobi library. Respondents indicated the following software and technological packages as being in deployment for resource sharing: RemoteXs, VPN, EZproxy and MyLOFT. Respondents indicated that these packages were independently acquired by the library without the support of the consortium.. However, respondents agreed that the adoption of the consortium model had allowed for an increase in the number of subscriptions to information resource databases, has broadened the scope of resources and their discipline coverage and enhanced capacity building for librarians that facilitate access to shared resources. There was no single gate way or multi-user single access point in deployment by the consortium through which the University of Nairobi and other libraries could access the consortium's resources. The head of the ICT unit at the University of Nairobi library explained that each institution had its own gateway through internet protocol range to access the shared database of resources made available by the consortium.

From the results, the methods of resource sharing in adoption were most effective in enhancing access, supporting open access and ensuring the usability and visibility of shared information resources. They were least effective in supporting cloud storage and facilitating multi-user single platform access. These results confirm that interlibrary lending and consortium resource sharing were effective in ensuring access to resources (Breeding, 2018). Similarly, the study agrees with Kimanga (2018) that the domestic library consortium in Kenya (KLISC) does not provide technological support to member libraries. The findings are also in tandem with Naphtali (2018) that library consortia were effective in improving the usability of information resources and the visibility of research output of academic institutions but are often challenge in ensuring interoperability. Despite the ineffectiveness of current methods of resource sharing to support cloud storage and the deployment of multi-user single login platforms for access, the deployment of cloud computing and common interfaces will ensure optimal resource utilisation and reduce duplication (Xiong et al., 2020; Chisita and Fombad, 2019: 4).

4.5 Consortia Initiatives to Enhance Resource Sharing

The study sought to establish the consortium initiatives to enhance resource sharing at the University of Nairobi library. Consortium initiatives to enhance resource sharing

were determined as cooperative collection development (95%), the provision of support for institutional repository development (92.5%), the provision of a shared information pool (77.5%), the provision of inter-library lending services (77.5%), provision of network support services (35%) and the development of a union catalog (27.5%). The results are presented in Table 9 below. The results indicate that cooperative collection development, institutional repository development, interlibrary lending service and the provision of a share information pool were the most prioritised resource sharing initiatives by consortia. While provision of network support services and a union catalog were not highly prioritised. Respondents expressed that the consortium had no single catalog that contained bibliographic descriptions of holdings in all member libraries, and as such cross-searching was not possible. However, a prototype for a virtual union catalog has been in existence since 2011, even though it was yet to be deployed.

The findings confirm that collective development and the provision of interlibrary services as very essential resource sharing initiatives for consortium (Posner, 2017). It also affirms the findings of Mwaurah and Namande (2018) who stated that there was no union catalog for academic libraries in Kenya. Similar studies in Zimbabwe equally suggested challenges and delays in the development of a union catalog after its design (Chisita & Fombad, 2019:4). However, Breeding (2018) explains that the development of a virtual union catalog was an effective means of synchronising the bibliographic descriptions of various member libraries in the consortium despite limitations with performance and scale.

Table 9: Resource Sharing Initiatives

Resource Sharing Initiatives	High		Medium		Low	
	Frequency (f)	*(%)*	*F*	*(%)*	*f*	*(%)*
Union Catalog	*11*	27.5	*17*	*42.5*	*12*	*30*
Shared information pool	*31*	*77.5*	*8*	*20*	*1*	*2.5*
Inter-library lending	*31*	*77.5*	*7*	*17.5*	*2*	*5*
Network support services	*14*	*35*	*21*	*52.5*	*5*	*12.5*
Institutional repository development	*37*	*92.5*	*3*	*7.5*	*0*	*0*

Cooperative collection development	38	95	2	5	0	0

4.5.1 Significance of Consortium Initiatives

Respondents were made to provide information about consortium initiatives such as a union catalog, access to ILL WorldShare, integrated network architecture, integrated library system, technical support and training, coordinated collection development and bibliographic exchange. The results obtained suggested that respondents considered the consortium to be very significant in the provision of technical support and training for resource sharing activities (92.5%) and the coordination of efforts to develop and manage the collection of shared resources (82.5%). Also, the consortium was shown to be moderately significant in the provision of access to a shared catalog (62.5%). However, the consortium was shown to be not significant in the provision of an integrated library system (25%), the provision of integrated network architectures (15%), bibliographic information exchange (22.5%) and the provision of access to ILL World Share (27.5%). Respondents indicated that the consortium organised capacity building workshops for librarians involved in aspects of resource sharing on an annual basis. However, in some cases, these capacity building efforts are made available on a bi-annual basis.

According to a Deputy Director of the University of Nairobi library, capacity building for resource sharing at the university is supported by KLISC in collaboration with EIFL, INASP, AFLIA and IFLA. The focus of capacity building initiatives include the development of open access capability, training in evaluation and benchmarking, and skills transfer for managing information resources. However, respondents expressed issues such as lack of resources as an impediment to KLISC's ability to support capacity building initiatives for librarians at the University of Nairobi library. Also, despite the absence of an integrated library system for enhancing resource sharing between the University of Nairobi library and other libraries in the consortium, respondents indicated that the adoption of DuraSpace and associated protocol has improved standardisation and the prospects of future integration. In addition, the library has adopted benchmarking to improve internal systems standards in response to the consortium's drive to help libraries meet prevailing standards

through internal benchmarking among consortium members, and with other libraries in the western world.

The findings confirm that consortium led capacity building initiatives and the pursuit of professional development and training were critical for enhancing resource sharing (Konnur, 2019: 18; Chisita & Fombad, 2019:4). In addition, it was affirmed that in the absence of standards for bibliographic description, information exchange would be challenging (Ramzan, Ashfaq & Zaheer, 2019; Michalka & Thompson, 2017). The absence of standards for bibliographic description limits the prospects for potential integration of library systems within the consortium. Integrated library systems enable horizontal expansion of consortium membership further increasing the amount of available resources and the capabilities for resource sharing.

Table 10: Significance of Consortia in Facilitating Resource Sharing Activities

Significance of Consortia in facilitating resource sharing activities	High		Medium		Low	
	Frequency (f)	*(%)*	*f*	*(%)*	*F*	*(%)*
Co-ordination of collection development	*34*	82.5	*13*	*32.5*	*3*	*7.5*
Provision of integrated library system	*10*	25	*9*	*22.5*	*21*	*42.5*
Integrated network architecture	*6*	15	*3*	*7.5*	*31*	*77.5*
Access to shared catalog	*25*	62.5	*9*	*22.5*	*6*	*15*
Technical support and training	*37*	92.5	*3*	*7.5*	*0*	*0*
Bibliographic information exchange	*9*	22.5	*12*	*30*	*19*	*47.5*
Access to ILL WorldShare	*11*	27.5	*13*	*32.5*	*16*	*40*

4.6 Framework for Enhancing Resource Sharing

The study also sought to evaluate existing resource sharing policies or frameworks with view of identifying current gaps for potential policy review or revision. From the

responses, it was determined that no explicit policy exists at the University of Nairobi library that exclusively caters for resource sharing. However, resource sharing activities were covered by several other internal and external policies and guidelines such as the CUE Standard for libraries and the EIFL's Collective Management Organisations (CMO) policy framework was adopted by all member libraries of KLISC including the University of Nairobi library to inform resource. In addition to this, there was no institutional policy in place to exclusively cater to the aspect of resource sharing at the University of Nairobi, or a national policy for resource sharing in Kenya at large.

The study sought to determine the areas of prioritisation in existing policies and guidelines on resource sharing by analysing the following five key issues: interoperability and information exchange, standardisation, funding models, capacity building and policy flexibility. With respect to the prioritisation of issues of interoperability and information exchange, 60% (n=24) considered this issue to be highly prioritised, while 22.5% respondents (n=9) considered it as moderately prioritised and 17.5% (n=7) considered them to be of low priority. With respect to the prioritisation of standardisation, 40% (n=16) considered this issue to be highly prioritised, while 35% respondents (n=14) considered it as moderately prioritised and 35% (n=14) considered it to be lowly prioritise. Respondents also indicated that existing frameworks such as the EIFL CMOs framework could address issues of interoperability and standardisation, but faced challenges with respect to implementation due to the prevailing institutional differences between the University of Nairobi library and other libraries in the consortium. Similarly, the existing policies were shown to be inadequate in accommodating changes in the information environment.

Despite the impact of obsolescence on standardisation, existing policies did not specify any standards for technological equipment, network architecture or software deployment at the University library or other members of the consortium and thus limited the potential for direct information exchange between the University of Nairobi library and other libraries in the consortium. A respondent from the Digital Content unit suggested that software in deployment for digital content management at the University of Nairobi library was sometimes incompatible with those in other libraries within the network and thus impeded the potential for information exchange.

Table 11: Prioritisation of Issues in Resource Sharing Frameworks

Level of prioritisation of issues in resource sharing policy/ framework	High		Medium		Low	
	Frequency (f)	*(%)*	*f*	*(%)*	*f*	*(%)*
Enhancing interoperability and information exchange	24	60.0	9	22.5	7	17.5
Ensuring standardisation	16	40.0	14	35.0	10	25.0
Alternative funding models	6	15.0	11	27.5	23	57.5
Capacity building	32	80.0	7	17.5	1	2.5
Flexibility to accommodate changing information environment	6	15.0	11	27.5	23	57.5

Respondents also indicated that very minimal policy coverage existed despite the on-going efforts of the consortium to help the University of Nairobi library to adopt a common open access configuration for its institutional repository and its support in the provision of DuraSpace and associated protocols to ensure some level of standardisation. Standardisation efforts were shown to be limited to the development of the institutional repository and the provision of access to this through open access configurations. Existing policies died not specify standards for adoption or provide any guidelines for adherence in the development of infrastructure and technology critical to the access of shared resources at the University of Nairobi library.

On the provision of alternative funding models for resource sharing in the policies and frameworks governing resource sharing activities, 15% (n=6) considered this issue to be highly prioritised, while 27.5% respondents (n=11) considered it as moderately prioritised and 57.5% (n=23) considered them to be of low priority. With respect to the provision of capacity 80% (n=32) of respondents considered the issue as highly prioritised, whilst 17.5% (n=7) considered it as moderately prioritised and 2.5% (n=1) did not consider it to have been a priority. Lastly, on the extent to which these policies and frameworks made provisions to accommodate changes in the information environment, 6 respondents (15%) considered the issue to have been a top priority,

while 11 (27.5%) consider it to have been only moderately prioritised and 23 (57.5%) consider it to not have a priority. These results are presented on Table 11.

The findings affirm that in spite of IFLA requirements for a national resource sharing policy for each country, there was no comprehensive resource policy for academic libraries in Kenya (Mwaurah & Namande, 2018). Capacity building, standardisation and interoperability were determined as the most prioritised issues in current frameworks however, differences between libraries impeded the realisation of interoperability. These findings affirm that institutional differences in an information network could impede the attainment of resource sharing objectives (Idiegbeyan-ose, Ugwunwa & Adewole-Odeshi , 2015) and that the use of different and sometimes incompatible technologies in libraries often makes it challenging to streamline interlibrary workflows and enable integration (Breeding, 2008). Even though policy coverage on open access initiatives is low, Saarti and Tuominen (2017) describe open access as a critical aspect of resource sharing and very important for the elimination of access barriers to research information.

4.6.1 Gaps in Existing Frameworks and Policies

Senior librarians and directors at the University of Nairobi library who provided responses to the questions in the interview guide described the current policies are not broad enough to cater for all aspects of resource sharing in the university library, and wholly inadequate in some areas such as local content and indigenous information resource development and sharing. Other respondents pointed to the lack of depth of existing policies and frameworks on ensuring local content availability, with some noting that the local content proportion of shared resources available to the university of Nairobi library's users was inadequate to support the needs of contextually relevant research and thus needed improvement. The College Librarian at the Lower Kabete library suggested the need to strengthen local repositories to tackle issues of duplication of shared resources made available to users through open access configurations..

Another gap identified for possible review had to do with information exchange. The researcher found out that information exchange between the University of Nairobi library and KLISC was shown to be vertical and not horizontal. According to a respondent from the Processing Unit, while existing policy suggests that information

exchange was an objective of the consortium, the University of Nairobi library was only able to undertake bibliographic exchange with KLISC as an institution, and not with other member libraries. A senior librarian identified the inability of current policies to accommodate the changing needs of users as a major gap for consideration in resource sharing policy development. Other issues identified as policy gaps by respondents included the absence of strategies to enhance open access and inadequate provisions to mitigate the fallout of technological obsolescence.

These findings are consistent with Namande and Muthee (2018) who argued that the over reliance on external organisations such as INASP and EIFL for the fun ding of resource sharing, posed a threat to indigenous knowledge and the adoption of systems that inadequately represent indigenous knowledge. The findings are also affirm that technological obsolescence is a critical issue in planning resource sharing initiatives since the emergence of new digital formats and technological packages often renders old research data inaccessible (Carter, 2001). The identification of gaps in existing frameworks is critical for determining critical areas for inclusion in frameworks for resource sharing.

4.7 Chapter Summary

The chapter provided a detailed analysis of the data collected from participants in the study and was discussed under four main sections with each pertaining to a research objective. The demographic profile of respondents was established, including gender, age distribution, duration in service, position within the library and library section or unit. The extent of resource sharing was analysed, and respondents' perception of the effectiveness of resource sharing methods was analysed. This was followed by an analysis of the influence of the consortium in the development and implementation of resource sharing initiatives, and an analysis of the resource sharing frameworks in place, with view of identifying existing gaps.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

This section of the study presents a summary of the findings made upon the analysis of data and in the light of the research objectives.

5.1.1 Extent of resource sharing and Level of Consortium Involvement

The study determined scope of resource sharing to be limited to cooperative collection development and access provision, institutional repository development and the capacity building for resource sharing. However the aspects of resource sharing in adoption were significantly dependent on consortium involvement in their realisation. KLISC was identified as the principal library consortium (95%), alongside other networks such as EIFL (92.5%) and AFLIA (77.5%). The study also determined the level of consortium involvement in resource sharing to be very significant. The library's representation in the management of the consortium was determined as very high (90%), meanwhile its level of participation in decision making with respect to resource sharing was determined as moderate (57.5%). The consortium (KLISC) was also shown to be responsible for the provision of access to the bulk of shared information resources available to users (95%).

5.1.2 Methods of Resource Sharing and an Evaluation of their Effectiveness in Enhancing Resource Sharing.

The study identified various methods of resource sharing in adoption at the University of Nairobi library. Some of these methods were more dominant than others, with the most dominant being domestic library consortia(97.5%), followed by monolithic interlibrary lending (82.5%) and international library networks (72.5%). Bi-lateral partnerships outside of the consortium were identified as the least dominant method of resource sharing (27.5%). Findings suggested that the most important model of resource sharing was the domestic library consortium, in this case KLISC, and that the University of Nairobi library had joined KLISC and other international library networks to enhance access to information resources for its users. The findings

indicate that the resource sharing methods in adoption at the University of Nairobi library were very effective in ensuring wider access to information (100%), supporting open access (82.5%), improving information resource usability (77.5%) and ensuring research output visibility (70%). However, they were only moderately effective in facilitating information interchange at the (62.5%) and in ensuring interoperability (60%). The use of current methods of resource sharing to support cloud storage was however ineffective (45%), likewise in in facilitating multi-user single access to shared resources (37.5%).

5.1.3 Consortium Initiatives and Activities to Enhance Resource Sharing

The findings indicate that the consortium facilitated several resource sharing initiatives which benefitted the University of Nairobi library. The most dominant of these initiatives were cooperative collection development (95%), the provision of support for institutional repository development (92.5%), the provision of access to a shared information pool (77.5%) and the provision of inter-library lending services (77.5%). Despite being important resource sharing initiatives often prioritised by library consortia, the findings suggest that the provision of network support services by the consortium was not dominant at the University of Nairobi library (35%) and the development of union catalog was not pursued by the consortium (27.5%). The study also suggested the absence of any single multi-user login platforms or gateway to access shared information resources. Similarly, the findings suggested that interoperability and standardisation efforts were much limited. The adoption of DSpace with consortium support had helped the University of Nairobi library maintain prevailing standards with respect to open access configurations and bibliographic description of information resources in its institutional repository. Beyond this, the study suggested the absence of adequate efforts by the consortium to support standardisation at the University of Nairobi library.

5.1.4 Resource Sharing Frameworks and Policies

The findings suggested that the University of Nairobi library had to rely on several external policies for resource sharing and had no internal policy that exclusively caters the subject of resource sharing. At the national level, there was also no binding resource sharing policy to inform the direction of resource sharing activities at the

University of Nairobi library. A wide range of issues were shown to have been covered in these policies and frameworks, and to various degrees of prioritisation. The findings suggest that issues of capacity building for resource sharing were the most prioritised (80%), followed by interoperability and information exchange (60%). On the other hand, issues of alternative funding (6%) and flexibility to reflect changes in the environment were of the least priority (6%). Even though existing resource sharing policies from external institutions in adoption were not comprehensive, the findings suggested that prevailing institutional differences between the University of Nairobi and other members in the consortium was also shown to have been a limiting factor in the realisation of the objectives of existing policies.

5.2 Conclusion

On the basis of the findings made in this study, the following conclusions are made:

- Resource sharing is a very critical aspect of librarianship and improves information users' access to information, and the diversity of information resources available to users. However, the scope of resource sharing activities at the University of Nairobi Kenyan library is narrow and does not fully meet the information needs of users.

- Issues of standardisation and interoperability have limited resource sharing in Kenya to the development and use of jointly acquired resources, despite the potential for a broader scope of resource sharing activities and the integration of library services to attain seamless information exchange and enable cross searching .

- The enforcement of standards in the development of shared information resources and the management of associated resource sharing infrastructure in critical for bibliographic exchange, union catalog development and in ensuring conformity within information networks or consortia.

- Institutional repositories have employed open access to ensure visibility of domestic research output but local content is still inadequate in shared information databases, while institutional repositories are in need of strengthening. The absence of potential for cross-searching further compounds to the problem and limits access to indigenous research as opposed to research made available by the consortium through partners such as EIFL.

- Resource sharing policies are very important in coordinating resource sharing efforts, assigning responsibilities, specifying standards and determining resource sharing objectives. The absence of a comprehensive policy at the level of the University of Nairobi or at the national level has undermined resource sharing efforts.

- The consortium model of resource sharing is heavily dependent on support from international institutions such as EIFL and INASP. While these institutions greatly support information provision and access, over reliance on them may threaten sustainability and financial viability in the absence of continuous funding.

5.3 Recommendations

5.3.1 Improving the State of Resource Sharing

This study recommends the adoption of cloud computing by the University library and the consortium at large to help reduce storage costs for hosting locally held resources. The findings suggest that despite the prospects of cloud computing in enhancing resource sharing, its adoption was low. The study also recommends the strengthening of institutional repositories to help improve the proportion of local content among shared resources. The adoption of a specified set of standards in the deployment of institutional repositories enhanced the usability of local content. The study also recommends the development of a union catalog and avenues for bibliographic exchange and collaboration in the development of the aforementioned union catalog. The findings of the study suggested that despite the effectiveness of resource sharing initiatives in cooperative collection development and in providing access to shared information resources, bibliographic exchange was limited and there was no unified record of all bibliographic information held within the consortium.

5.3.2 Ensuring Sustainability of Consortium Model

This study recommends the improvement of efforts to ensure the sustainability of the consortium model of resource sharing. Findings reveal that the consortium model was the dominant model of resource sharing in adoption. However, the lack of policy coverage on the issue of sustainability requires attention. Firstly, with respect to financial sustainability, it is recommended that the consortium and member libraries

explore alternative models of raising funds to support resource sharing activities so as to ensure continuity in the event of unexpected budgetary challenges from consortium members. This is important because the consortium is made up of a diverse array of member with different financial strengths and limitations and no guarantees for continuous funding. Another dimension of sustainability has to do with the ability of academic libraries in the consortium to accommodate changes in the information environment. It is recommended that the consortium and member libraries, including the University of Nairobi library, prioritise the adoption of standards and specifications for technological infrastructure, and improve investment in capacity building, especially for digital content librarians.

5.3.3 Proposed Framework for Resource Sharing

The study recommends the adoption of an exclusive resource sharing policy which integrates relevant aspects of CUE's directives for resource sharing and EIFL's CMO framework, and which takes consideration of the library's capabilities and available resources, and also its resource sharing objectives. The policy should be comprehensive enough to cover all aspects of resource sharing relevant to the University of Nairobi, including the defining of the scope of resource sharing and the assignment of resource sharing responsibilities, the provision of avenues for alternative funding, and the specification of standards for the deployment of technological infrastructure associated with resource sharing. The policy should make provision for the adoption of the ISO 23950 model to enhance capacity to support remote access to information resources and the ISO 10161-1: 2014which is a framework for information management that supports open systems and enhances the technical inter-operability of databases. The adoption of this framework ensures the specification of protocols for user-provider interactions including interlibrary loan services, and facilitates the development of a union catalogue through the provision of reciprocal access to bibliographic information between the University of Nairobi library and other libraries in the consortium. This framework also supports the enabling of a single login for multi-user access, and support the integration of the University of Nairobi library system with other library systems upon subsequent adoption. The integration of library systems within the consortium would improve

information exchange and help in the materialisation of the long expected virtual union catalog.

Figure 3: Proposed Resource Sharing Framework
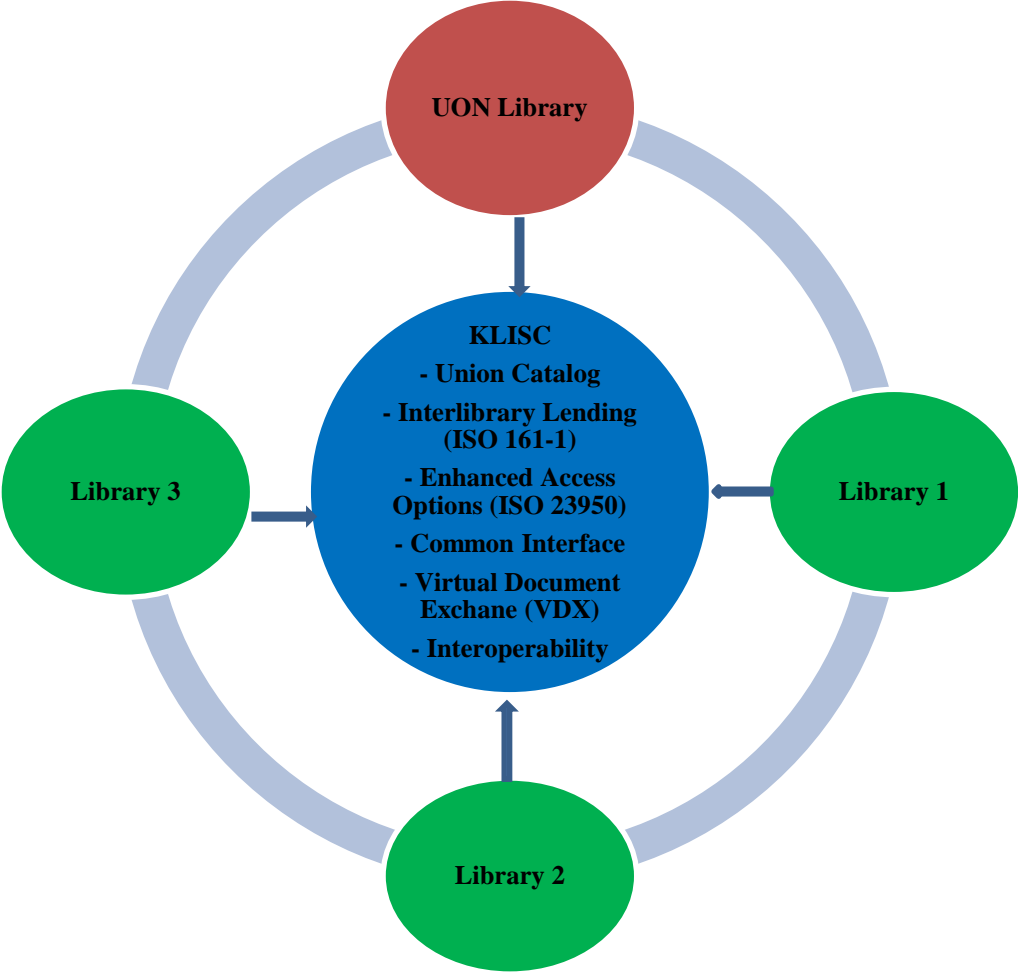
5.4 Suggestions for Further Research

The following areas are suggested for further research inquiry:

5.4.1 Development of a Virtual Union Catalog

A major gap in current resource sharing identified in this study was the absence of a unified record of bibliographic information for the University library and other members of the consortium. This study suggests further research on the feasibility of the development of a virtual union catalog to enhance resource sharing in academic libraries in Kenya. The study would assess existing capabilities and resources of academic libraries vis a vis the requirements for a virtual union catalog, and suggest measures to be implemented for its realisation.

5.4.2 Improvement of Local Content

This study also recommends the assessment of the proportion of local content in shared resources made available to the University of Nairobi by the consortium, and the determination of the impact of the possible absence of adequate local content in the consortiums shared resources on the quality of research output at the University of Nairobi. Local content is critical for conducting contextually relevant research that addresses the challenges of the Kenya. This study should therefore propose a viable strategy for the improvement of the local content proportion of shared resources, and the enhancement of access to these resources.

5.5 Chapter Summary

The chapter provides an overall conclusion for the study as well as a summary of its findings. The findings were discussed in the light of reviewed literature and in line with the study's objectives. The chapter then provides recommendations for stakeholders including the improvement of resource sharing, ensuring sustainability of the consortium models and the proposal of a viable framework for resource sharing. The chapter then concludes by making some suggestions for further scholarly inquiry as necessitated by the outcome of this study.

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APPENDIX I: RESEARCH PERMIT

Ref No: 748833

Date of Issue: 01/October/2021

RESEARCH LICENSE

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

This is to Certify that Mr.. EUGENE CHE NCHE of University of Nairobi, has been licensed to conduct research in Nairobi on the topic: INFLUENCE OF LIBRARY CONSORTIA ON RESOURCE SHARING IN ACADEMIC LIBRARIES: CASE OF UNIVERSITY OF NAIROBI LIBRARY for the period ending : 01/October/2022.

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Department of Library and Information Science

Telephone: 020318262 / 020318305   **P.O. Box 30197,**
NAIROBI

Website: www.dlis.uonbi.ac.ke   **Email: dept-**
lisl@uonbi.ac.ke

Ref: C54/28793/2019   August 23, 2021

To whom it may concern,

RE: NCHE EUGENE CHE C54/28793/2019

This is to confirm that the above-named person is a bona fide student at the University of Nairobi in the Department of Library and Information Science undertaking a degree in Master of Library and Information Science.

He is currently in the process of collecting data on his project titled *"Influence of Library Consortia on Resource Sharing in Academic Libraries: Case of University of Nairobi Library."* as part of the requirements for the course.

Any assistance accorded to him will be highly appreciated.

Dr. Dorothy Njiraine
Chairperson,
Department of Library and Information Science

QUESTIONNAIRE FOR LIBRARIANS AT UNIVERSITY OF NAIROBI LIBRARY

INSTRUCTIONS

Please respond by ticking (√) against your preferred response for questions with options. For questions that require suggestions or comments, please use the provided space.

A. Background Information

1. Name of library _____

2. Gender _____

3. Department within the library_____

4. Position in the university library_____

5. Years in service in the university library_____

6. Highest level of education attained _____

B. State of Resource Sharing and Consortia Involvement

7. What is the extent of library consortia on resource sharing in academic libraries? _____

8. Comment on the state of resource sharing in your library? _____

9. Mention any other consortia in which your library retains membership apart from KLISC? Indicate whether a local or international consortium _____

10. What is the level of involvement of consortia in resource sharing in academic libraries? Make use of the matrix below: High, Medium, Low

Extent of consortia involvement and level of resource sharing	High	Medium	Low
Consortium model is the dominant form of			

resource sharing in my library			
My library has representatives in consortia's committees			
My library actively participates in consortium decision making pertaining to resource sharing			
The bulk of shared information resources accessible to users is a result of consortium involvement			

C. Current Methods of Resource Sharing

11. What are the current methods of resource sharing in adoption in academic libraries? Tick all that apply

Monolithic inter library lending	
Document delivery	
Bi-lateral partnerships	
Domestic library consortia	
International Library network	
Open access configurations	

12. Which of these methods is the most important in your opinion?
    _____

13. Rank the effectiveness of current resource sharing methods in adoption in academic libraries. Make use of the matrix - High, Medium, Low

Effectiveness of current method of resource sharing	High	Medium	Low
Ensures wider access to information			
Increases visibility of research output			
Increases usability of information resources			
Facilitates information exchange			
Ensures interoperability across systems			
Supports cloud storage			

Supports open access			
Multi-user single access platform			

D. Resource Sharing Initiatives Supported by Consortia

16. Mention the resource sharing initiatives that are being made available by consortium effort. Make use of the matrix below: High, Medium, Low

Resource sharing initiatives	High	Medium	Low
Union catalog			
Shared information pool			
Interlibrary lending			
Network support services			
Institutional repository development			
Collective development and management of shared resources			

14. Indicate how these activities improve resource sharing in academic libraries. Make use of the matrix below: High, Medium, Low.

Significance of consortia in facilitating resource sharing activities	High	Medium	Low
Coordinated collection development			
Provision of an integrated library system			
Access to shared catalog			
Technical support and training			
Exchange of bibliographic information with members			
Access to ILL World share			
Integrated network architecture			

15. Mention the range of resource sharing technologies/ software in use within your library and state their application in resource sharing

_____

16. Indicate which of these technologies are provided with the support of the consortium. _____

E. Resource Sharing Frameworks for Academic libraries.

17. Comment on the extent to which the library's existing policy cover the scope of issues pertaining to resource sharing

_____

18. Indicate the level of prioritisation of the following issues in the existing resource sharing policy or framework. Make use of the matrix - High, Medium, Low.

Prioritisation of issues in resource sharing policy	High	Medium	Low
Enhancing interoperability and information exchange			
Ensuring adherence to standards			
Flexibility to accommodate changes in technology and information environment			
Accommodating alternative funding models			
Enhancing capacity development for resource sharing activities			

19. Indicate the aspects of existing resource sharing policy or framework that ensures changes in the information environment are accommodated in resource

sharing_____

20. Which framework can be adopted to enhance resource sharing in academic libraries? _____

APPENDIX IV: INTERVIEW GUIDE

INTERVIEW FOR LIBRARIANS AT UNIVERSITY OF NAIROBI LIBRARY

A. BACKGROUND INFORMATION

1. Name of library _____

2. Gender _____

3. Department within the library_____

4. Position in the university library_____

5. Years in service in the university library_____

6. Highest level of education attained_____

B. State of Resource Sharing and Extent of Consortium Involvement

7. How long has your library been a member of KLISC? _____

8. Comment on the role of consortia in enabling access to shared information resources. _____

9. Comment on other resource sharing methods such as inter library lending and document delivery in your library. _____

C. Current Resource Sharing Methods

10. Explain the various ways in which current resource sharing methods have improved information access and provision in your library _____

11. Comment on the cost effectiveness of the dominant resource sharing method in adoption. _____

12. Comment on the ability of the dominant resource sharing method in supporting interoperability_____

13. Academic libraries join domestic and international information networks to enhance access to a vast pool of information for their users. Highlight in either case.

_____

D. Resource sharing activities and consortium initiatives

14. Describe the adoption of new technology such as cloud storage in resource sharing in resource sharing activities?

_____

15. Comment on the efforts of library consortia to enable access to shared information in international information networks

_____

16. Comment on the role of consortia in developing the capacity of librarians to support resource sharing activities.

_____

17. Mention any consortium efforts to ensure standardisation of resource sharing technologies and platforms. _____

E. Resource Sharing Framework

18. Comment on aspects of resource sharing policy that ensure interoperability and effective information exchange.

_____

19. Comment on the sustainability of resource sharing activities in the existing resource sharing policy.

_____

20. Identify any existing gaps in the current resource sharing framework

_____

21. Suggest any areas for priority in the revision and strengthening of existing resource sharing policy.

_____