APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) TO MANAGEMENT OF LIBRARY INFORMATION RESOURCES IN SELECTED NIGERIAN FEDERAL UNIVERSITY LIBRARIES

By

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MSc/EDUC/00106/08-09

A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A
MASTER OF INFORMATION SCIENCE (MSc)

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE,
FACULTY OF EDUCATION,
AHMADU BELLO UNIVERSITY, ZARIA

MAY 2014

DECLARATION

I declare that this work in this thesis entitled "Application of Information and Communication Technologies (ICTs) to Management of Library Information Resources in Selected Nigerian Federal University Libraries" has been carried out by me in the Department of Library and Information Science. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other Institution.

Fidelia Mbowheing WHONG ---------- ----------

Signature Date

CERTIFICATION

This thesis entitled APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) TO MANAGEMENT OF LIBRARY INFORMATION RESOURCES IN SELECTED NIGERIAN FEDERAL UNIVERSITY LIBRARIES," by Fidelia Mbowheing WHONG meets the regulations governing the award of the degree of Master of Information Science (MSc) of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This research work is dedicated to God Almighty for his mercies and divine protection upon my life and my late father Mr. John Katunku Madugu Yum, for the good foundation.

ACKNOWLEDGEMENT

I am most grateful to God for granting me the opportunity to be alive despite all the ups and downs during this programme. May your holy name be blessed forever.

Special thanks to my supervisors Prof. Z. Mohammed and Dr. E. S. Gbaje for their encouragement, understanding, patience, showing me every facet of the world; for teaching me how to do research properly and constructive criticisms throughout the period of this work despite their tight schedules. My gratitude goes to the Head of Department, Library and Information Science, Dr. A. I. Musa for my academic success.

I am grateful to Prof. U. Ibrahim and Prof. T. Abubakar for encouragement, advice and support during the course of this work. Worthy to mention is also the contributions of Prof. I. I. Ekoja, Dr. K. A. Momoh, Dr. (Mrs.) H. M. Daudu, Dr. A. Yusuf, Dr. A. M. Ibrahim, Dr. B. S. Aduku, late Dr. A. A. Lemu, Mal. M. H. Musa, Dr. B. D. Umar, Dr. U. Lawal, Mrs. M. F. Mohammed and Mal. I. Dauda, for the moral and constructive criticisms offered and their willingness to help at all times with the study. My gratitude also goes to Mr. E. U. Nnachi, Mr. Felix, Mrs. F. Illiyasu, late Malama Amina Abdul, Mal. J. Mustapha, Baba Adamu, and Mama Maria Ishaya for their encouragement and support.

My sincere gratitude goes to the management and staff of Kashim Ibrahim Library, ABU, Zaria, especially Mrs. C. Adikwu, Mal. A. Abdulkadri, Mal. H. Mohammad, Mr. John Abu and all my colleagues. To my 2008/2009 course mates, Denfa S. S., Oyewumi R., Shuga Y., Yunusa M., Ibrahim H., Alkasim H., Hamza M., Ado S. K., Ofurum M., Isyaku I., Gani E., John A. I., Alfa Y., David O., Kekere L. Y. and all students of the Department of Library and Information Science, ABU. Zaria, you are a wonderful family. I appreciate you all.

My special gratitude also goes to Rev. Fr. (Dr) J. H. Mamman, Rev. Fr. (Dr.) P. B. Tanko, Rev. Fr. J. K. Yakubu for their fatherly support, Mrs. M. G. Oduntokun, Mr. M. Kasa. My statistics teachers Prof. E Inikwue, Mrs. J. O. Odengle and Mr. S. O. Umoru of Iya Abubakar Computer Centre ABU, Zaria. Mr. A. N. Francis (Ramat Library, University of Maiduguri), Dr. (Mrs.) Uduakaodong O. Udoh (University of Uyo Library), Mrs. Oludipe and Dr. (Mrs.) Akiboro (University of Ilorin Library), Mrs. Nduka and Dr (Mrs.) Y. Zaid (University of Lagos Library) and Mr. Imo Nwabinisi (Nnamdi Azikiwe Library,

UNN).Words are not enough to express my thanks.

Most importantly, I want to appreciate the efforts, encouragement, support and prayers of my husband, Prof. C.M.Z. Whong who stood by me ensuring I completed this work. I am also grateful to my lovely and understanding children, I. Nzallah and M. Zaman Whong for their patience and endurance throughout the period of this work.

Lastly, I want to sincerely appreciate my brother in-law, the late Mr. Richard M. Zaman, who passed away during the course of this programme, I say thank you and may you continue to rest in the bosom of the Lord. To my mother, Mrs. Paulina J. Katunku, my brothers and sisters Mr. & Mrs. I. Madugu, Mr. & Mrs. D. John , Mr. & Mrs. B. John, Mr. & Mrs. A. Kogi, Mr. & Mrs. A. Ahu, Mr. & Mrs. L. Silas, Miss Philomena John, Mr. Jerry and Akas John. I appreciate you all.

ABSTRACT

Digital media have revolutionized information sources and advances in Information and Communication Technologies (ICTs) and have dramatically enhanced information provision. The process of information management has become very challenging and complex. Libraries as centres for learning, teaching and research can no longer cope with information management through the use of traditional methods. To this end, the study was aimed at examining the application of ICTs to management of library information resources in selected Nigerian Federal University Libraries(NFUL) with regards to type of library information resources, type of ICT facilities available and being used, where these ICT facilities are applied in libraries operations and routine, staff ICT competence in the management of library information resources and challenges of ICT facilities utilisation in the management of library information resources in NFUL studied. Survey research method was adopted. Three hundred and thirty six (336) library technical staff from six (6) NFUL were used as sample size for the study. Questionnaire, interview and observation were the instruments used for data collection. The data collected were presented and analysed using descriptive and inferential statistics. The study found among others that books, newspapers, and magazines with a mean score of .9911, .9702 and .9524 respectively, were the major types of library information resources available and frequently used in the libraries studied. Computers with a score of 323 (96%) and internet facilities with a score of 292 (87%) were the most available ICT facilities available for the management of library information resources. Computerized exit doors with a score of 106 (32%) is less available ICT facilities in the libraries studied. lack of ICT policies with a score of 226 (79%) and power outage with a score of 262 (78%) were some of the major challenges facing the NFUL studied. The inferential analysis showed that there was significant difference among the NFUL studied in the type of ICT facilities available and used for the management of their library information resources and there was no significant difference among the NFUL studied staff ICT competences in the management of information resources. The study concluded that digital media have revolutionized information resources and the advances in ICT have dramatically enhanced information provision not only in the selection, ordering, acquisition, processing, storage and retrieval of library information resources but also improved staff productivity. It is expected that the NFUL can fully utilize the benefit of ICT facilities, especially, the digitization of local contents, institutional repository, functioning websites and a policy on ICT information resources management. The challenges of ICT utilization in the libraries if not properly handled will reduce their potentials to achieve the goals and objectives of their parent institutions. The study recommended among others that, the NFUL should use Open-source library information management software and DSpace content management system and document management to manage the library information resources.

TABLE OF CONTENTS

Title Page - - - - - - - - - i

Declaration - - - - - - - - - ii

Certification - - - - - - - - - iii

Dedication - - - - - - - - - iv

Acknowledgment - - - - - - - - v

Abstract - - - - - - - - - vii

Table of content - - - - - - - - viii

List of figures - - - - - - - - - xii

List of tables - - - - - - - - - xiii

List of appendices - - - - - - - - xvi

List of abbreviations - - - - - - - - xvi

Operational definition of terms - - - - - - xvii

CHAPTER ONE

1.0 Introduction

1.1 Background to the Study - - - - - - 1

1.1.1 University library information resources - - - - 3

1.1.2 Concept of management in libraries - - - - - 4

1.1.3 Information and Communication Technology - - - 6

1.1.4 Nigerian university libraries - - - - - - 8

1.2 Statement of the Problem - - - - - - 9

1.3 Research Questions - - - - - - - 12

1.4 Hypotheses - - - - - - - - 12

1.5 Objectives of the Study - - - - - - - 13

1.6 Significance of the Study - - - - - - 13

1.7 Scope of the Study - - - - - - - 14

1.8 Delimitation - - - - - - - - 15

References - - - - - - - - 16

CHAPTER TWO

2.0 REVIEW OF RELATED LITERATURE

2.1 Introduction - - - - - - - - 20

2.2 Library Information Resources - - - - - 20

2.3 ICT Facilities available in Libraries - - - - - 23

2.4 Library Operations and routines where ICT facilities are applied 27

2.4.1 ICT Use in Selection of Information Resources - - 27

2.4.2 ICT Facilities used in resources development - - - 30

2.4.3 Use of ICTs facilities in the processing of information resources - - 31

2.4.4 Use of ICTs facilities in the customers service division - - 32

2.4.5 Use of ICTs for preservation of information resources in the library- 36

2.5 Utilization of ICT in the Libraries - - - - - 38

2.6 Extent of ICT utilization in libraries - - - - 39

2.6.1 ICT facilities utilization in the users operations and services in libraries 42

2.7 Competence of Library Staff in the Application of ICT Facilities in the Management of Library Information Resources - 45

2.8 Challenges of ICT Facilities Utilization in Libraries - - - 47

2.9 Strategies for Improving ICT Application in the Management of Library Resources - - - - - 53

2.10 Summary of the Review - - - - - - 55

References - - - - - - - - 57

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Method - - - - - - - 65

3.2 Population of the Study - - - - - - 66

3.3 Sample and Sampling Technique - - - - - 67

3.4 Instruments for Data Collection - - - - - 68

3.5 Reliability and Validity of the Instrument - - - - 70

3.6 Procedure for Data Collection - - - - - 70

3.7 Procedure for Data Presentation and Analysis - - - 71

References - - - - - - - - 72

CHAPTER FOUR

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Response Rate - - - - - - - - 74

4.2 Presentation of Data, Analysis and Discussion - - - 75

4.2.1 Type of library information resources available in the Nigerian federal university libraries - - - - - 76

4.2.2 Type of ICT facilities available for the management of library information resources in Nigerian federal university libraries 79

4.2.3 Library operations and routine where ICT facilities are Applied in the management of library information resources in Nigerian federal university libraries - - - 88

4.2.4 Extent of ICT facilities utilization in the management of library information resources in Nigeria federal universities - - 96

4.2.5 Competence of library staff in the application of ICT facilities for the management of library information resources. - 98

4.2.6 Challenges to ICT facilities Utilization in the management of library information resources in Nigerian federal university libraries studied - - - - - - - 102

4.3 Analysis of the Interview - - - - - - 105

4.4 Analysis of the Observation - - - - - - 106

4.5 Inferential Analysis - - - - - - - 106

References - - - - - - - - 113

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Study - - - - - - 115

5.2 Summary of Findings - - - - - - - 117

5.2.1 Findings on descriptive analysis - - - - - 117

5.2.2 Findings on statistical analysis - - - - - 119

5.3 Conclusion - - - - - - - - 119

5.4 Recommendations - - - - - - - 120

5.5 Suggestions for Further Studies - - - - - 123

Bibliography - - - - - - - - 124

Appendix i: Letter of Introduction - - - - - 135

Appendix ii: Study Questionnaire - - - - - 136

LIST OF FIGURES

Fig 1 Type of library information resources available in Nigerian federal university libraries studied - - - 77

Fig 2 Type of ICT facilities available for the management of information resources in Nigerian federal university libraries studied - 80

Fig 3 Library function where ICT facilities are applied for the management of information resources - - - 82

Fig 4 ICT facilities applications in library operations and routines for information resources management in the federal university libraries studied - - - - - - 90

Fig. 5 Integrated Library Software ILS applications to library operations and Routines in the management of library information resources- - - - - 94

Fig. 6 Communication media used to communicate with the library stake holders - - - - - - 95

Fig. 7 Challenges to ICT facilities utilisation in the management of library resources in the federal university libraries studied - 104

LIST OF TABLES

Table 3.1 Population of staff (respondents) that manage library information resources in the six (6) selected Nigerian federal university libraries - - - 66

Table 4.1 Distribution of the response rate of the respondents according to their university - - - - - - 74

Table 4.2 Type of library information resources available in the Nigerian federal university libraries studied - 76

Table 4.3 Frequency of library information resources used in Nigerian federal university libraries studied - 78

Table 4.4 Type of ICT facilities available for the management of information Resources in the Nigerian federal university libraries studied - - - - 79

Table 4.5 Library operations and routine where ICT facilities are applied for the management of information resources - 81

Table 4.6 Extent to which the applications of ICT facilities affect the management of library information resources in the libraries studied - - - - - - - 84

Table 4.7 Extent of ICT facilities' usefulness to management of library information resources in the Nigerian federal university libraries studied - - - - - - 86

Table 4.8 Extent of improvement on information resources management operations and routine using ICTs - - 87

Table 4.9 ICT facilities applications in library operations and routines for information resources management in the federal university Libraries studied - - - - - - 89

Table 4.10 ICT facilities utilization for the management of information resources in the federal university libraries studied - - 91

Table 4.11 Integrated Library Software available and are being used for the management of information resources in the federal university libraries studied - - - - - 92

Table 4.12 use of ILS modules to library operations and routine in the management of library information resources - - 93

Table 4.13 Communication media used with the library stake holders - 95

Table 4. 14 Extent to which ICT facilities are utilised for the management of library information resources in the federal university libraries studied. - - - - 97

Table 4.15 Staff competency in the application of ICT facilities to the management of library information resources - - 99

Table 4.16 Staff level of satisfaction with the application of ICTs facilities to the management of the library information resources in their libraries - - - - 101

Table 4.17 Challenges to ICT facilities utilization in the management of library resources in the Federal University libraries studied 103

Table 4.18(a) Analysis of Variance (ANOVA) statistics on the differences among the six federal university libraries respondents' perception regarding the type of ICT facilities available and used for the management of library information resources - - 107

Table 4.18(b) Post Hoc Tests multiple comparison (pair wise)of perception of respondents on types of ICT facilities available and used for management of library information resources from the federal university libraries studied - - - - - 109

Table 4.19 Analysis of Variance (ANOVA) statistics on the differences among the staff competences in the management of information resources in the libraries studied - - - - 111

Table 4.20(a) Correlations between ICT facilities utilization and management of library information resources - - - - 112

LIST OF APPENDICES

Questionnaire on Application of Information
and Communication Technologies (ICTs) to
Management of Library Information
Resources in selected Nigerian Federal University Libraries - - 140

LIST OF ABBREVIATIONS

ABU	-	Ahmadu Bello University, Zaria
AFW	-	Alice for Windows
AGM	-	Annual General Meeting
ANOVA	-	Analysis of Variance
CCTV	-	Close Circuit Television
CD	-	Compact Disk
CD-ROM	-	Compact Disk Read Only Memory
CLR	-	Centre for Learning Resources
DVD	-	Digital Video Disk
EDI	-	Electronic Data Interchange
FUTO	-	Federal University of Technology Owerri
GLAS	-	Graphical Library Automation Systems
Ho	-	Null Hypotheses
ICT	-	Information and Communication Technology
IITA	-	International Institute for Tropical Agriculture
IJEDICT	-	International Journal of Education and Development using Information and Communication Technology
IR	-	Institutional Repository
KIL	-	Kashim Ibrahim Library
LAN	-	Local Area Network
LPP	-	Library Philosophy and Practice
MARC	-	Machine Readable Catalogue
NFUL	-	Nigerian Federal University Libraries
NFULns	-	Nigerian Federal University Librarians
NIIA	-	National Institute of International Affairs
NLA	-	Nigerian Library Association
NUC	-	National Universities Commission
OA	-	Open Access
OPAC	-	Online Public Access Catalogue
PPMC	-	Pearson Product Moment Correlation
RMRDC	-	Raw Materials and Resources Development Council
TINLIB	-	The Information Navigator Library Software
UI	-	University of Ibadan
UNIBEN	-	University of Benin
UNICAL	-	University of Calabar
UNILAG	-	University of Lagos
UNIUYO	-	University of Uyo

UNIPORT	-	University of Port Harcourt
UNN	-	University of Nigeria Nsukka
USA	-	United States of America
UV	-	Ultra Violet
VTLS	-	Visionary Technology Library Solution
WAN	-	Wide Area Network

Operational Definition of Terms

Information: is the additional knowledge a user gets or supplies about something or somebody in the library.

Communication: transfer of knowledge, ideas and information among librarians and users.

Technology: is the infrastructure used in the library to support the management of library resources.

Information and Communication Technologies (ICTs): are electronic technologies used to enhance library routine e.g acquisition, processing, storage, retrieval, management and preservation of library resources. The technologies are computer, telephone, scanners, digital cameras and the internet.

Management: is the process of getting activities completed efficiently and effectively by way of planning, organizing, staffing, directing, coordinating, reporting and budgeting

Library resources: are the human and material resources found in the library. The Human resources include the users and library staff who manage the resources for effective service delivery to the users and the material resources include the information resources, library building, equipment and financial resource in the library.

University library: is an academic library, established to meet the goals and objectives of the university to promote learning, teaching and research.

Application: is the use of ICT facilities in the management of library resources.

Library functions: are the major activities done in the library through the divisions or unit, such as acquisition, processing, storing, disseminating and preservation of information resources among others.

Library operations: are routines librarians carry out in the library, such as selection, ordering, classification, cataloguing, charging and discharging of information resources in the various division of the library

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Information and Communication Technology (ICT) has made a significant impact in every human endeavour. The impact has been rather prominent in areas of service activities such as banking, health, transportation, education and libraries. Chauhan (2004) posited that the benefits of use of ICT in services can be broadly explained in terms of economy, ease, extension (or expansion) and efficiency. Devchoudhary (2007) also observed that ICT has influenced the traditional library services; bringing out fundamental changes in the process of acquiring, processing, storing, retrieving and information delivery.

The term, Information and Communication Technology (ICT) as it relates to library and as noted by deWatteville and Gilbert (2000), is the acquisition, analysis, manipulation, storage and distribution of information; and the design and provision of equipment and software for these purposes. Oketunji (2002) defines ICT as computers and other technologies that are used in the acquisition, organisation, storage, retrieval and disseminating of information in libraries. Mayer (2006) added that ICT in libraries is a term that covers the acquisition, processing, storage and dissemination of information in textual, numerical, pictorial and audio-visual formats. He further stated that the term is restricted to systems dependent on microelectronics; that is the technology and techniques involved in the design, development and construction of extremely small electronic circuits such as computer on a single silicon chip. Similarly, Daniel (2010) sees ICT as forms of technology that are used to create, store, transmit, share or exchange information. This broad definition of ICT includes such technologies as: radio, television, video, Digital Versatile Disk (DVD), telephone (both fixed line and mobile phones),

satellite systems, computer and network hardware, software and the Internet, as well as the equipment and services associated with these technologies, such as videoconferencing and electronic mail.

These different tools are able to work together to form our networked world. UNESCO (2000) posited that the inception of ICT in libraries which is the utilisation of all the technologies that enable the handling of information, facilitate different forms of communication between man and electronic systems, widened the scope of librarianship and put new roles on librarians, changed the curriculum of library schools, training now includes use of information technologies in work places thus improving their skill, efficiency and status as information workers and enable them to fulfil their roles as provider of knowledge. Ogunsola and Abayade (2005) added that librarians have begun to adopt new designations to reflect their new roles i.e. information scientists, system librarians, digital librarians and information managers etc. Kaling and Gautam (2008) observed that the common theme behind ICT application in the library is to enhance library functions and make service delivery such as acquisition, organisation, storage, retrieval, dissemination and maintenance of information resources more effective.

The library is the nerve centre of academic activities in universities. It is a depository of knowledge with varied and useful information in numerous formats. Like every other library, the core functions of university libraries are; acquisition, cataloguing, circulation, serial control, interlibrary loan and management and delivery of information in both traditional and electronic format. They assist in achieving the goals and objectives of their parent institutions through the provision of current and relevant information resources that are necessary for sustaining the learning, teaching, research, other functions and activities within the institutions. In line with this, Vickus and Metsar (2004) noted that the library is a place where different social policies, theories and

ideologies are met and a space to study different arts and cultures provided. In order to achieve these, the library acquires and manages resources which include material and human resources.

1.1.1 University Library Information Resources

The primary purpose of university libraries is to support the university functions of teaching, learning, research and community services in ways consistent with, and supportive of, the institution's mission and goals. In support of the above, Chiweza (2006) added that the growth of research in all fields of human endeavour is becoming increasingly detailed and sophisticated; Also, the staff and students have realized that the library has great roles to play in the provision of the information necessary for their day to day research. The library acts as a medium of getting the latest scientific and technological information either in print or in electronic form, for accessibility and use of the library patrons. Library resources include not only traditional print-on-paper media like books, journals, newspapers, and maps, but also audio-visual materials like cinematograph film records, audiocassettes, video cassettes, projectors, microfiches, Compact Disk Read Only Memory (CD-ROM), computer software, online databases, electronic books and e-journals and other media via the Internet. Halsey (2006) added that libraries maintain collections that include not only printed materials but also art reproductions, maps, photographs, etc. In addition to maintaining collections within library buildings, libraries often offer telecommunications links that provide users with access to information at remote sites. University libraries are often considered the most important resource centres of an academic institution. Hence, they should be sufficient in quality, depth, diversity and current to support the institution’s curriculum as posited by Oyewusi and Oyeboade (2009).

Other important resources in the library are the human beings who are the most valuable asset of any library. Even with the availability of ICT infrastructure, funds and information resources in a library, nothing gets done without man-power. Adekunle *et al*. (2007) noted that applying ICT in a library depends largely on human resource attitudes toward it.

1.1.2 Concept of management in libraries

Management is that field of human behaviour in which managers plan, organise, staff, direct, and control human and financial resources in an organisation in order to achieve the desired individual and group objectives with optimum efficiency and effectiveness,(Subedi, 2007). Management has been defined as the process of getting things done through and with people. It is the planning and directing of efforts and the organizing and employing resources (both human and material) to accomplish some predetermined objectives. For the purpose of this study, management is the use of people, technology and resources to achieve the set goals and objectives of a library.

In a book entitled Foundation of Management by Robbins and David (2004) looked at management as it relates to libraries as the ability of a librarian to manipulate library staff, users and material resources in order to achieve its organisational goals and objectives. It is also the act to exploiting the resources of a library efficiently in cost-effective ways to facilitate efficiency in decision making through planning of what to select and acquire. Management of library resources includes organizing orientation, staff training, workshop and seminar for staff and patrons and making sure that the information resources shelved for users are easily accessible. More so, leading other library staff in the management of information resources, controlling the library staff to see that they perform their duties and ensure that users obliged to obey rules and

regulations governing the library. Management in libraries also involves recruitment of new staff and developing the old ones. It also entails reporting what the library has achieved quarterly, biannually or annually to the management and preparing annual budget on the type of information resources the departments need based on requests made by users or funds available to the library, what they will need to meet the demand of the users and other administrative duties (Robbins, & David, 2004). In his paper, "Introduction to Modern School and College Library Management, Ekoja (2010) summarised library management as:

> Working with and through people using material and other resources to achieve set goals, in other words, management is the synchronization of people and resources to achieve organisational goals. Management thus involves planning (deciding on future activities and putting in place plans for action); organisation (implementation of plans by making maximal use of required resources to achieve them); staffing (job analysis, recruitment and hiring of the appropriate staff to discharge the appropriate functions); leading/directing (determining what needs to be done in work situations and getting the people to do them); controlling/monitoring (checking progress against plans); and motivation (providing incentive to get the personnel to work effectively and efficiently).

The implication of the statement above is that no individual can work alone to achieve the organisational goals and objectives without working with other staff in the library to effectively manage the resources to meet the user's need.

University library has to manage its resources for effective service delivery to its patrons. Iya *et al*. (2005) asserted that the basic tasks in managing library resources include acquisitions, processing, storing, maintenance, preservation, loaning and general administration. Other management issues include the planning of the construction of new libraries or extensions to existing ones and the development and implementation of outreach services and reading-enhancement services. Akintunde (2006) noted that having resources in the library is one thing and managing them for effective service

delivery is another. Most of the libraries are managing their resources manually which takes time and energy. Faboyinde (2006) pointed out that this can be done in a short period of time through the use of internet, computers and other ICTs facilities.

1.1.3 Information and Communication Technology

Information and Communication Technology (ICT) according to Chauhan and Murphy (2004) comprises two strong technologies, one is *information technology* which usually deals with the hardware and software elements that allow us to access, store, organise, and manipulate the information by electronic means, and the other is *communication technology,* which deals with the equipment, infrastructure and software through which information can be received, accessed and disseminated, for example, phones, faxes, modems, networks, etc. Today, we all are dealing with information and it is the strength of each nation, new status of any nation can be determined by its information resources rather than economic resources. All professions the library inclusive, are dominated by ICT and now we can hear about e-governance, e-banking, e-learning, e-business, e-education, e-publishing, e-documents, e-journals, etc.

The ICT as the synergy between computers and communication devices is a composite term, which embodies three important concepts, i.e. information, communication and technology. Information means many things to many people, depending on the context. According to deWatteville and Gilbert (2000), information is any potentially useful fact, quantity or value that can be expressed uniquely with exactness. Womboh and Abba (2008) noted that information is processed data that aids decision making. It could also be visualized as a commodity that could be bought or sold. In this study, information is anything that we come in contact with directly or indirectly that adds to our knowledge and is capable of causing a human mind to change its opinion about the current state of the real world, and in a library, information is data

that have been processed into form that is meaningful to the recipient/user and is of real or perceived value in current and future decision.

Communication refers to the transfer or exchange of information from person to person or from one place to another. When action produces a reaction, whether positive or negative, communication has taken place Kindersley (2003) noted that communication is the process of sharing our ideas, thoughts, and feelings understood by the people we are talking with. It is also an act of impacting news to the science and practice of transmitting information. Sanchez (2004) observed that communication is transfer of information, ideas, thoughts and messages that involves a sender, a receiver, a code and, a language that is understood by both the sender and the receiver. There must be a sender to transmit the message, and receiver to make appropriate decisions on how the rest of the exchange should continue (James, 2004). Womboh and Abba (2008) posited that it is a process involving the passing of messages through the use of symbols which all parties in the communication understand. It involves the exchange of ideas, facts, opinions, attitudes and beliefs among people. It is not a one-way affair. Communication is the activity of conveying meaningful information. Communication requires a sender, a message, massager and an intended recipient, even though the receiver may not be present or aware of the sender's intent to communicate at the time of communication. Thus it can occur across vast distances in time and space. It requires that the communicating parties share an area of communicative commonality. In the context of this work, communication is the process of information exchange between the user and the librarian.

Technology refers to the use of scientific knowledge to invent tools that assist human beings in their efforts to overcome environmental hazards and impediments to comfort. In this regard, technology refers to things like the computer, telephone, cell

phone, GSM handsets, television, radio, etc. Thus, ICT includes: Computer, Internet, Digital camera, Webcam, Smart Card, Scanner, E-Books, Printers, Electronic Journals, WEB-OPAC, Animation, E-Mail, CD-ROM, DVD, RFID Technologies that enhance the acquisition, analysis, manipulation, storage and distribution of information; and the design and provision of equipment and software in the library (deWatteville and Gilbert, 2000).

1.1.4 Nigerian university libraries

The history of university libraries in Nigeria dates back to 1948 with the establishment of the University College, Ibadan, an affiliate of University College London. Development of university libraries in Nigeria cannot be separated from the evolution and growth of universities in the country. The history of library development in Nigeria dates back to pre–independence, when the University of Ibadan and its library were established in 1948. As pointed out by Aguolu (1996), since independence in 1960, there has been an unrelenting upsurge in the establishment of educational institutions at all levels, but especially at the university level. University libraries, as integral academic parts of universities, generally emerged simultaneously with their parent institutions.

At independence in 1960, the Federal Government of Nigeria wanted to bridge the literacy and administrative manpower gaps existing in various regions of the country. It elected to establish a university in each of the regions in existence at that time. This brought about the establishment of the University of Nigeria in Nsukka, University of Ife (now Obafemi Awolowo University) in Ile-Ife, and Ahmadu Bello University in Zaria. These universities all established libraries to meet the needs of their students and staff. Over the years, universities and university libraries have increased in number. Federal and state governments have opened more universities, while private individuals and organisations are now licensed to operate universities. Presently (August, 2013), one

hundred and twenty nine (129) universities were accredited by the National Universities Commission (NUC, 2013). They comprised forty (40) federal universities, thirty nine (39) state owned universities and fifty 50 private universities spread across the six geo-political zones of the country. They have witnessed different levels of growth, manpower, infrastructural and technological changes according to the capabilities and visions of their owners. Agboola (2000) was of the opinion that the university libraries have long been recognized as the hub of their institutions in order to fulfil their mission of supporting the educational objectives of their parent bodies. Opera (2004) added that the libraries are continually acquiring and maintaining standard books, journals, databases, visual and audio-visual collections and the resultant services. Ogunsola (2004) noted that the new and emerging technologies challenge the traditional processes of teaching and learning and the way education is managed. Poor and inadequate funding of university libraries is widely reported in Nigeria to constitute the setback observed in library development and service delivery in Nigerian libraries.

1.2 Statement of the Problem

Over the years, library information resources have grown in terms of size, format and variety. The digital era has seen the emergence of digital information resources in Nigerian libraries. Similarly the deregulation of the telecommunication industries has made ICT accessible and available in Nigerian libraries (Gbaje and Okojie, 2010). Many libraries especially the academic libraries use ICT to manage their resources, the degree of which is yet to be established.

The advent of ICTs has given librarians a face lift in the organisation and management of information in libraries. Digital media have revolutionized information sources and advances in ICT have dramatically changed information provision. The process of collection management has become very challenging and complex. According

to Singh (2004), acquisition, processing, organisation, storage, preservation relegation and withdrawal of library resources will continue to evolve with new ICT products and services. Gone is the era in which housing a large collection that spans linear miles was a matter of great pride for a library. At that time, libraries were able to meet most user requirements with the resources they owned. Today, physical location of libraries is less important as long as the information is accessible. The recognition of the Nigerian university libraries, especially their roles in university development remains very significant. Their tasks have been simplified by the use of ICT facilities in the acquisition, organisation, management, and preservation of library resources among others. Oketunji (2002) noted that the tasks have not been fully exploited because of numerous challenges such as power failure, lack of funds, and lack of competent staff to manage the ICT facilities, which hinder the application of ICT in the different Nigerian libraries. Okiy (2005) asserted that libraries as centres for learning, teaching and research can no longer cope with information management through the use of traditional methods; where the process of acquisition, processing and organisation of information resources may take up to six months before the patrons use them.

Bozimo (2006) and Igun and Adogbeji (2007) observed that human capacity building is critical to the success of ICT use. Even where funds and resources are readily available, except there are competent and committed staff, very little can be achieved. Each university has variable setbacks which consequently constraint it from exploiting the advantages of ICT applications. Olagun (1997), Ezeani (2000), Zaid (2008) and Abidoye (2011), found in their studies that lack of adequate finance, shortage of manpower, system failure, staff attitude towards use of ICT, lack of ICT policies in the libraries are some of the constraints to the adaptation of ICT in Nigerian universities. Annan (2003) noted that the pervasiveness and importance of Information and Communication Technologies

(ICTs) throughout the economy and society cannot be ignored especially were information is housed for national development, such as the libraries and the information centres, but the question is how many countries especially the developing countries have policies to guide them in implementing ICT facilities to improve the economy of the nation. In line with this, Okiy (2005) pointed out that lack of functional ICT policy in Nigerian libraries are factors undermining the use of ICTs especially the management of information resources.

The researcher observed that the objectives and goals of any library are the provision of timely, current and relevant information to the users, and they find it difficult to come and use the available information resources in the library since internet is there for them to utilise, with the current trend in the world. Why can the Nigerian library adapt the application of ICT to manage her information resources? Could it be that the Nigerian university libraries do not have the right information resources for their users? Could it be that the type of ICT facilities available for the management of library information resources are not adequate? Could it be that library operations and routines ICT facilities are applied in the management of information resources in the Nigerian federal university libraries are not adequate? Could it be that the extent of ICT facilities utilisation has affected the management of information resources in Nigerian federal university libraries? Could it be that the staff ICT competences has affect the management of library information resources in the Nigerian federal university libraries? Also could it be that the Nigerian federal university libraries have not overcome the challenges of ICT facilities utilisation to the management of library information resources? It is against this background that this study is designed to examine the application of information and communication technologies to management of library information resources in selected Nigerian federal university libraries.

1.3 Research Questions

This research provided answers to the following research questions:

1. What type of information resources are available and are being used in the Nigerian federal university libraries?
2. What type of ICT facilities are available and being used for the management of library information resources in Nigerian federal university libraries?
3. Which library operations and routines are ICT facilities applied for the management of library information resources in Nigerian federal university libraries?
4. To what extent have the ICT facilities utilisation affected the management of information resources in the Nigerian federal university libraries?
5. How have the staff ICT competences affect the management of library information resources in the Nigerian federal university libraries?
6. What are the challenges to the utilisation of ICT facilities in the management of library information resources in the Nigerian federal university libraries?

1.4 Hypotheses

This study tested the following hypotheses for the research.

The hypotheses proffered are:

Ho1. There is no significant difference among the Nigerian federal university libraries in the type of ICT facilities available and being used for the management of their library information resources.

Ho2. There is no significant difference among the Nigerian federal university libraries' staff ICT competences in the management of information resources.

Ho3. The ICT facilities utilisation in the Nigerian federal university libraries has no significant effect on the management of their library information resources.

1.5 Objectives of the Study

The broad objective of the study is to examine the application of ICTs to management of library information resources in selected Nigerian federal university libraries. The specific objectives are:

1. To identify the type of information resources available and being used in the Nigerian federal university libraries.
2. To identify the type of ICT facilities available and being used for the management of library information resources in the Nigerian federal university libraries.
3. To identify areas where library operations and routine ICT facilities are applied for the management of library information resources in the Nigerian federal university libraries.
4. To ascertain the extent to which ICT facilities utilisation have affected the management of library information resources in the Nigerian federal university libraries.
5. To ascertain the staff ICT competences in the management of library information resources in the Nigerian federal university libraries.
6. To proffer solutions to the challenges of ICT facilities utilisation in the management of library information resources in the Nigerian federal university libraries.

1.6 Significance of the Study

The essence of ICT facilities application in libraries is to improve the face of information acquisition, processing, dissemination, storage and also facilitate electronic networking, creation and accessing of remote electronic databases, putting at the disposal of libraries and library users a wide range of information services and products. However, this will only be possible if Nigerian libraries understand and apply it.

It is expected that the result of the study will encourage the university library management to provide the necessary and adequate ICT facilities that will enhance the management of library information resources in the respective university libraries.

The library staff will have an insight in the need to maximize ICT facilities utilisation for better management of their library information resources to adhere to the mission and objectives of the respective libraries.

The study provided opportunities for further study on the ICT facilities utilisation for the provision of library services in the Nigerian federal university libraries and the ICT facilities utilisation to management of human or financial resources in Nigerian federal university libraries. It contributed to the existing knowledge on the ICT facilities usage in university libraries.

1.7 Scope of the Study

This study centred on the application of ICT to management of library information resources in six (6) selected Nigerian federal university libraries located at each of the six (6) geopolitical zones of the country. The university libraries are: Kashim Ibrahim Library, Ahmadu Bello University, Zaria. Kaduna State (North-West); University of Ilorin Library, Kwara State (North-Central); Nnamdi Azikiwe Library, University of Nigeria, Nsukka, Enugu State (South-East); University of Lagos Library, Lagos State (South-West); University of Uyo Library, Akwa Ibom State (South-South) and Ramat Library, University of Maiduguri, Borno State (North-East) respectively. The choice of the universities was prompted by the fact that these universities are funded by the federal government and it is expected that they are well equipped with ICT facilities and spread in the six geo-political zones which will give a better understanding of application of ICT to management of library resources in Nigerian federal university

libraries. Their choice also conforms with National Universities Commission's (NUC) required standard and beneficiaries of numerous ICT infrastructure by Federal, State, and private organisations (Oketunji, 2002).

1.8 Limitation

The most obvious limitation of this study is the inability to cover the entire Nigerian federal universities population due to their size, time and the cost implication of carrying out such a task. Secondly, the risk on the road to distribute the questionnaire was very challenging. Thirdly, it was not easy collecting the questionnaire back from the various university libraries because they spread in the six geo political zone of Nigeria. Lastly during the analysis, the researcher found that many respondent working in the same library could not differentiate between which integrated library software their library using at the time of collecting data, the researcher has to used the interview and observation to clear it.

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CHAPTER TWO

2.0 REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter presents a review of literature that are related to application of Information and Communication Technology to management of library information resources. The review also provides the literature that will be used to defend the findings of the study. The literature review is discussed under the following sub-headings: library information resources, ICT facilities available in libraries, extent of ICT application in libraries, utilisation of information and communication technology in libraries, staff competency in applying ICT facilities in the library, challenges of ICT facilities utilisation in libraries and strategies for improving ICT application in the management of library resources and summary of review.

2.2 Library Information Resources

The aim and objective of any library is to meet the information needs of her users especially, in the digital age. Forrest (2006) noted that the library resources include but not limited to material resources, human resources and financial resources. Library materials consist of media, non-book and non-print resources. Examples of media resources include computer hard-drive, databases, library software; non-book materials include CD ROMs, audio and video tapes, while print materials include pictures, magazines, books, maps & photographic materials etc. (Olatoku, 2008). Selection of materials is a continuous process dictated by the changing curriculum as well as the availability of new materials. As in all library purchases, the primary criterion for selection is the extent to which the material is relevant to the curriculum, improves the overall library collection, and enhances access to information. The general

policy for selection applies equally to all types of materials being considered for the library's collection, print and non-print.

A study by Marama and Ogunrombi (1996) noted that library resources include resources confirms high unavailability of Library and Information Science (LIS) collections in most Nigerian university libraries, which had a negative effect on the use of information sources in the libraries studied. The librarians cannot conduct quality research and get published, and library students cannot even use library services. The authors recommended that at least 5% of the book budget be set aside for LIS information sources. The study, though limited to LIS, can be extended to other subject areas. Unomah (1987) conducted a study at the former Bendel State University to determine the unavailability rate of information resources in the library and to find out the causes. The survey revealed an unavailability rate of information resources at 34%. One effect on the use of library service was that 300 users (71.4%) gave up and went away frustrated. On acquisition performance, the survey showed that the library acquired only a little more than half the items requested. A similar study by Okiy (2005) showed an unavailability rate of only 7.5%. Iyoro (2004) found that the availability of serials at the University of Ibadan was 94%, with 242 of 256 respondents agreeing that serial publications are available and readily accessible. Ajayi and Akinniyi (2004) found frustration among information seekers due to the non-availabilityof sources. Aina (1985) analysed the availability of periodical titles used in Nigerian libraries, finding, only 67 (11.5%) of the 578 periodical titles studied were not available in any of the major libraries, hereby confirming a high availability rate. Oyediran-Tidings (2004) studied information needs of library users at the Yaba College of Technology, Lagos, and observed low use of the library by the students, which was attributed to the expressed unavailability of desired information resources.

Academic libraries worldwide are ‘custom’ built for their respective institutions, with space and appropriate facilities as listed in the design brief. This has been the case for many academic libraries in Nigeria. Many of them were designed between the last fifteen and thirty years when ICT as deployed today, was not of significant interest. There was, therefore, no consideration for the provision of space and outlets for ICT facilities. Mosuro (2000) noted that the implication of this is that all Nigerian academic libraries including the newer ones have no ICT customized structures. Re-design, reconstruction, and modifications are happening in the libraries that are deploying ICT today. In many cases, network and electrical cables are lined up as if a trap were set to trip over. Indeed, many times, people have tripped over these cables and caused damage to computer systems and network links. The imperative of this is for libraries that are yet to complete their structures, or move into their structures, to ensure that necessary adjustments and modifications are made before they move into the buildings. Lines for electrical and network cables should be provided. Space for servers and switches must be provided. There should be provision for purely electronic mail services, teaching laboratories, as well as laboratories for library patrons to browse and do their research and learning. Space for electronic mail service and Online Public Access Catalogue should be clearly marked out, as well as space for seminars, (video) conferencing, and gaming.

Gaming is assuming a more intellectual status in forward-looking academic institutions today; Nigerian libraries need to take cognizance of this. Mosuro (2000) also added that sufficient space should be provided for students to pursue group learning as this is necessary for electronic learning system that is fast becoming the mode of learning worldwide. Moreover, students today combine multiple electronic resources - such as email, on-line chat, mobile telephony, iPod music, and gaming all at the same

time - for their studies and personal space. The furniture of libraries should suit patrons' needs to work both independently and in groups. There should be space, for instance on the readers' tables for computer power cables and network cables to be plugged in. flexible chairs for patron to relaxed, students should study more than the present where it is the exception. The walls of the libraries should be provided with network outlets and sockets for plugging in of computer power cables. Significantly, our libraries need to start making provisions for the physically challenged (disabled). This should be in the form physical access, media formats, service and communication (Forrest, 2006). In all our academic libraries, little consideration has been given to this particular set of library patrons. In modifying our library buildings, the physically challenged should be taken into consideration.

2.3 ICT Facilities Available in Libraries

The development and availability of Information and Communication Technologies (ICTs) in libraries have today not only increased and broadened the impact of information resources and brought them to their doorsteps, but also placed more emphasis on effective and efficient services. Their applications in libraries have indeed continued to ease and promote quick and timely access to and transfer of information resources that are found dispensed round the globe. In his study on the availability and use of ICTs in collection management, Nwalo (2005) listed the following ICT facilities used in the management of library resources to include; computers, DVDs, CDs, internet and telephones. deWatteville and Gilbert (2000) noted that the ICT includes; Computer, Internet, Digital camera, Webcam, Smart Card, Scanner, E-Books, Printers, Electronic Journals, WEB-OPAC, Animation, E-Mail, CD-ROM, DVD, RFID Technologies. In this study, the researcher will see how these

types of ICTs are used in the management of library resources in the area of acquisition, organisation, storage, retrieval, dissemination, maintenance, and preservation of the resources.

Ogunsola, (2004, as cited in Abdulwahab et al.2011) noted that in libraries, several systems have been developed for their various house-keeping chores and more still are being designed and refined due to the technology of large-scale integration. These are known as microcomputers; designed to handle any of the library processes like acquisitions, cataloguing, serials control, circulation control, bibliographic control, or Selective Dissemination of Information (SDI). ICT is applied to the operation of libraries and information centres to ensure that information delivered is timely, accurate, precise and relevant (Madu, 2002). The concept, Library Automation, thus became popular and of which Cobin (1985) as cited in Abdulwahb et al (2011) explained that, "in the traditional manual library system, staff perform the various tasks required to complete each operation, but if a computer is used to perform some processing operations, an automated library results." Bierman (1980) in Madu (2002) defined library automation as "the use of computers and associated technology to do exactly what has been done in libraries with the justification of reduced cost and or increased performance. Thus, automation helps in the acquisitions, organisation, storage and dissemination of information in libraries. Generally, IT applies to library services in a number of ways, which include: Acquisitions, Cataloguing, Circulation, Serials and User Services.

Gbaje (2007) in his study on Challenges of Implementing Virtual Library for Higher Institutions in Nigeria observed that not all the university libraries in Nigeria provide ICT facilities for their patrons. In line with this Okore & Ekere (2008) noted

that the availability of ICT facilities and the awareness of them by the patrons will go a long way for academic librarian to be relevant to their patrons and be up to date so that they can manage the ever-growing information needs in this electronic age. Adeniji, Adeniji & Oguniyi (2011) in their study on availability and use of ICT in Olabisi Onabanjo University Library stressed the fact that almost all the libraries for the study had computers, printers, scanners, and Internet for the use of their patrons. However, it was observed that none of the libraries had CD-ROM Technology and Fax Machine in their domain.

Iwu (2003) in Afolabi and Abidoye (2012) in their study on the integration of information and communication technology in library operations towards effective library services categorized types of ICTs into the following:

1. **Sensing technologies:** These equipment gather data and translate them into a form that can be understood by the computer. These include sensors, scanners, keyboard, mouse, electronic pen, touch or digital boards, barcode sensors or readers, voice recognition system, etc.
2. **Communication technologies:** These are equipment that enable information to be transferred from the source to user. It also tries to overcome natural barriers to information transfer like speed and distance, some of these include: facsimile machines (fax), telecommunication system, telephone, electronic mail, teleconferencing, electronic bulletin boards, etc.
3. **Display technologies:** These are output devices that form the interface between sensing, communication and analyzing technologies and human user. They include: computer screen, printers, television, etc.
4. **Analysis technologies:** These are the technologies that help in the investigation or query of data, analysis and in-depth query for answers from simple to complex

phenomena in research procedures. A complete set of a computer system could be a micro, mini, mainframe or super scamper.

5. **Storage technologies:** These technologies facilitate the efficient and effective storage of information in a form that can be easily accessed. They include: magnetic tapes, disks, optical disks cassettes, computer hard drive, library website, etc.

The above view explains that computers, DVDs, CDs internet and telephone among others, were the type of ICTs available for the management of library resources.

The demand for distant access to information in Nigeria is increasing, although this is still based on the traditional technology of print media. Thus, there is the need to integrate ICT into the library operations. Ogunsola (2004) noted that majority of higher institutions in Nigeria; even those with good Internet connectivity are still at a low level of integration of ICT in teaching, learning, research, library services, information and managerial services. Ekong (2005) pointed out, however, that in some of the first generation university libraries (University of Benin Library, Benin, Kashim Ibrahim Library (ABU), Zaria, University of Nigeria Nsukka Library, Nsukka, and a few others), digitalization is in place and library information networks are established with connectivity through the university campus network to the Internet.

The Centre for Learning Resources (CLR) Covenant University, Ota, has been placed on the platform of full application of ICT because funds are made available for such innovations. Ogunsola (2004) explained that some Nigerian university campuses are now jam-packed with IT facilities. It is no longer strange to see lecturers and students doing their research and other academic works using various ICT devices like e-mail and the Internet. Students can absorb more information and take less time to do so with the use of ICT. Ogunsola (2004) declared that librarians or member of the academic community at Obafemi Awolowo University Library can now easily

find information concerning any book in the Library of Congress in the US.

University libraries can be transformed into a new information services unit, providing electronic cataloguing, OPAC, electronic acquisition/serials control, electronic inter-library loan and calculation functions (Ogunsola, 2004). Nigerian academic libraries should not be left out of this global educational revolution. Ekong (2005) pointed out that one is also happy to note that both the Federal Government of Nigeria and international funding agencies are very interested in the general development of ICT in Nigerian universities. The Federal Ministry of Education embarked on the establishment of the National Virtual (Digital) Library Project, to provide, in an equitable and cost-effective manner, enhanced access to national and international library and information resources and to share locally available resources with libraries all over the world using digital technology; among other objectives. A model Virtual (Digital) Library at the National Universities Commission (NUC) will be the laboratory of Nigerian university libraries.

2.4 Library Operations and Routines where ICT Facilities are applied

Libraries in the third world including Nigeria are gradually but steadily converting from manual to computerised routines. The benefit of the automated or uses of ICT in a library system are both self evident and overwhelming (Nwalo, 2005). This library operations and routines are the activities the librarians do on daily basis, such as selection, ordering, cataloguing and classification of information resources etc. Also Okolo (2002) opines that in this age of information era, the library needs ICT in order to give efficient services to its users. Not only is the speed of its operation high, the volume of its output is correspondingly large. When ICT is used in the library, there is economy of labour and operating cost. In short, its application in the activities of the

libraries will enhance their information delivery and the overall performance of the library services.

2.4.1 Information and Communication Technology Use in Selection of Information Resources

Selection of library information resources is the heart of the resource development process. It builds the library's collection for a particular user skill, knowledge, and the right tools are required to select appropriate library materials and sources that meet the needs of the community, to aid in the challenging task of building an appropriately balanced collection that meets the needs of the user community (Bluh and Hepfer, 2006).

The key information that affects the selection of library information resources is current demands of the users and the current information resources available. The current needs of the users and in a university set-up usually come from the faculties. They must be checked against what is available in the library. Kaling and Gauta (2008) in their study on the application of ICT in academic libraries in Arunachal Pradesh found that telephone and online interaction were the major source of communication between the resource development librarian and the staff of the institution, the collection resource development librarian will call, send alert text to the department with the list of information resources via their E-mail for selection and for what the library will add to her budget of the year.

Another study on the state of ICTs in tertiary institutions in Nigeria by Akintunde (2006) revealed that the social media like face book, twitter, blog flickers were used to reach out to department and faculty library board on issues of selection of library resources before the acquisition proper. Tinio (2002) noted that through the use of computer network, internet to interact with the information resource vendors, book

sellers and publishers, the resources development librarian can use their website for comparison and quotation of what the library wants to acquire. Mosuro (2000) noted that this will enable the librarian to determine what the actual demand is. Information on borrowing can also be compared with the current stock to ascertain which books are hardly used. Computer is used to check the users' statistics. When the borrowing information is matched with current stock it shows which books and by which authors are in more demand, and that way, libraries can maximise their budget allocations by buying books that are very much in high demand.

The use of ICTs makes it possible for libraries to use online library catalogues. The searching of catalogues by libraries around the world has been made possible by the Internet. Ezeani (2010) noted the following as some online catalogues:

a. British Library http://catalogue.bl.uk.
b. Northern Ireland http:Ilopac.ni-libraries.net/cgibin /nirelanthvpssh.
c. Neath Port Talbot http:[Iipac.npt.gov.uk//focus].
d. Birmingham iflJ/www.bjrmin am. ov.ukllibcat.bcc.

She added that the most obvious place to search for information online is Publishers' and Booksellers' websites, such as Amazon.com, Walahi.com, Kalahar.com.ng and Latern books.com among others. These companies aim at selling the items and so, one would expect that they contain the most up-to-date information on prices and publication dates of the items. Some of the websites offer a range of sophisticated services-such as pre-publication ordering facilities, Electronic Data Interchange (EDI) information, download facilities of Machine Reading Catalogue (MARC) records and tracking systems for current orders. The most important aspect of these online acquisition resources is that money saving, particularly, for libraries in developing economies. When you think of the amount used in procuring publishers'

catalogues and books-in-print on yearly basis, the amount saved by the use of these online catalogues is enormous. Some of these online publishers' catalogues include; Vanschaik.com, biblio.com//south-Africa, Adamsbooks.co.za andMahoganybooks.com.

The above view explains that ICTs use in selection of library information resources includes the telephone to communicate with the departmental staff, vendors, booksellers and publishers, using internet and social media such as face book, twitter, blogs as media for interaction, as well as the e-mail.

2.4.2 ICT facilities used in resources development

The acquisition of new items for library information resources is governed principally by an acquisition policy. Ezeani (2010) noted that different types of libraries have different methods but the following areas are usually covered in any acquisition policy regardless of which type of library:

a. the total level of resources available for the library service as a whole is slated;
b. priorities for spending are agreed;
c. the total budget is then broken down across the various budget headings, e.g.: books, journals, and other resources in other formats such as DVDs; and
d. budget holders and key functionaries such as Heads of Department and Deans of Faculty as obtained in tertiary institutions are informed of their budget allocation and that acquisitions may proceed.

The automated system helps to facilitate the process of acquisition with regard to ordering, receipting and invoicing. The system then will allow the acquisitions process to run, using its reporting systems and order transmission.

The automated system helps to expedite the acquisition process in no small way. It provides spending situation under the various budget headings in no time. This

includes both the projected and the actual spending to date. This can be ensured by entering of order information accurately to enable the computer do the computation effectively. E-mails, phone calls and other ICTs facilities are used to contact the library information resource vendors and make inquiries on what to acquire, the receipting of invoices is done online, and other processing of the resources is made faster and the users will have access to the resources in time. Zaid (2007) noted that Lagos State Library used the acquisition module of the library software to acquire most of its resources.

2.4.3 Use of ICTs facilities in the processing of library information resources

The function of a library catalogue is two-fold: First, it provides a record of the library stock, including the authors as in the authors' catalogue, the title for the title catalogue and the subjects as in the subject catalogue. The second function is that it enables library clients to know the resources available in a particular library and their various locations (Demsey, 2006). Barton & Waters (2004) noted that in an automated catalogue library, patrons use keywords to search for resources and their various locations in the library. With the Internet, it is possible to search for catalogues of other libraries remotely. This is far better than the manual system of surfing through card catalogues of materials only within a library. In line with this, Adebisi (2009) observed that from the user's point of view the cataloguing module of the automated system is the most powerful and useful part of the library. The advantages of automated catalogues are multifarious. They include sophisticated searching of the library stock. They link to the circulation control system so that not only can a borrower ascertain that the library holds a particular item, he/she can also see its loan status at the time, that if an information resource is loaned out, the user will know when it is to be returned and be able to put a hold on it.

The search facility of the catalogue module is very flexible. It will allow searching for items such as author, title, accession number as well as class mark/call number. However, its greatest power for users is the search on subject keyword or word in title.

2.4.4 Use of ICTs facilities in the customer service division

The circulation section involves core duties such as issuing, renewing resources, reserving items and charging and discharging of books. In addition, charges and fines are also imposed on clients who have overdue books. These tasks have greatly been made easier by the use of ICTs.

Ezeani (2010) noted that borrowers can carry out self-issue over the Internet in certain libraries. The automated system checks the status of the borrower to ascertain if lending limits have been reached. The borrower automatically is made to see which other items they have on loan. If a requested book is damaged and is out of circulation, this is often revealed by the computer and the patrons are further provided the opportunity to reserve the desired item on line. Data provided by the circulation control module of the automated management system can make a significant contribution to the successful management of stock. When used properly, the system can provide data on usage for managers to support their decisions in areas such as stock selection policy, opening hours, staffing levels, distribution of stock and information for statutory and local performance indicators. In addition, overdue notices are automatically generated and amount to be collected immediately known. The library at a glance can decipher how much is realised from such payments. This is also time-saving and better than the manual sorting of overdue cards.

The rapid developments in information technology have brought tremendous revolutionary changes in information processing, storage, dissemination and distribution

and have indeed become a key factor in bringing about the rapid changes witnessed in every sphere of human endeavour (Ezeani, 2010). The society has constantly been evolving and so have the library patrons. Library users are fast becoming inpatient in their quest for information. They want information now or never. For the library professionals to live up to their mettle, application of these ICTs becomes inevitable.

These days, it is very common to find users who are no longer limited by print copies but users who want to access information in different formats such as; digitized information' comprising textual to multimedia data consisting of both text, images, digitized voice and video collections. Thus, the information stored in most modern libraries have taken a major - shift from volume-limiting paper to limitless multimedia digital form. Aho (1992) in Ezeani (2010) observed that digital publishing technologies and global networking have given rise to the development of a wide variety of digital libraries all over the world. Users can be connected to these collections via the Internet. This no doubt ensures that information dissemination is more robust and more comprehensive than it would have been were readers limited to only print copies.

Again when we realize that the unique feature of libraries all over the world is their ability to provide information services and respond to particular questions and needs of individuals, in a timely manner, the application of ICTs to our services can no longer be neglected. Dempsey (2006) in agreement to this assertion explained that over the last ten years we have witnessed the convergence of the human-readable Web with increased connectivity. In addition, in recent times there has also been a wave of several communicating applications and more pervasive, broadband connectivity. According to the author, the world is flatter because computing and communications are more pervasive of our working and learning lives: we create, share and use digital content and services as no generation in the past has been known to have done and the application of

ICTs has brought tremendous advantages to libraries. Cardinal among these advantages as noted by Ezeani (2010) are:

a. **Speed:** The speed with which information is harnessed presently can never be compared with what obtained in the past. With a click of the mouse volumes of information is collected for library patrons. This in a way has also improved a lot for the library professionals. Rather than walk from one section to another collecting information for clients, librarians can search several websites with several search engines and collate needed information which may be sent to the box of a client.
b. **Storage:** Large volumes of information can be collected and burnt in a CD or saved in a flash for a library patron. This saves the library user from carrying many books home. This makes for encapsulation of information as large volumes are packaged in a small container such as flash, CDs or floppy disk.
c. **Ease of use:** With the above mentioned advantages the next normal thing which ICT readily offers is ease of information search by the librarians and ease of use by the library patrons.
d. **Availability:** Resources belonging to several libraries can be easily shared and consortia of libraries can also be formed so that several libraries can pay for particular electronic resources such as journals and sometimes books. This helps libraries within the consortia to keep acquiring up-to-date resources cheaper. Consortia help to reduce journal cost of libraries and opens up an avenue for cheaper procurement of timely quality resources.

There are many advantages and emerging opportunities in moving from the analogue to the digital paradigm as noted by Etebu (2010). These are:

a. The movement from traditional libraries to digital libraries. Whereas in the traditional library system a reader would need to visit the library and sort for materials. This undoubtedly restricts the reader to only libraries within the locality but in this digital era a librarian can stay in his/her office and access materials from most libraries in the world.
b. With the advent of ICTs there has been a movement from print on paper to digital information which includes audios, videos, and information in different formats.
c. In the digital era, librarians have moved beyond card catalogues to Web OPACs which makes for a more robust and comprehensive information.
d. There has also been a shift from only the use of print journals to online or electronic journals.
e. Information availability from libraries is no longer limited to use for a specific period as was obtained in the past. Users can access resources from libraries round the clock online.
f. Finally, emphasis has moved beyond ownership to access. Libraries worldwide are making concerted efforts at digitizing and making public their resources in order to encourage access.

In this digital era, the role of librarians has also moved from the traditional role of searching; selecting; collecting; organizing; and preserving information to that of harnessing and filtering of information in every format. Librarians are also expected to act as educators- teaching users ways and methods of harnessing required information in different formats.

Building Institutional Repositories is a new task which librarians are also entrusted to do in the digital era. Tangible heritage of the institution or the community wherein the library is situated are digitized and uploaded in the Internet for the use of

clients all over the world. The Institutional Repository (IR) is a contemporary concept that captures and makes available as much of institutional research output as possible to the users. It is a sort of database of digital information resources, accessible through Internet or Intranet (Barton & Waters 2004). This can often come as open access resources or limited access, but each library regardless of the type is presently required to create access to their local content.

In doing this, another new task for librarians automatically unfolds which is not only providing Open Access (OA) as mentioned earlier but also educating clients on the importance and use of OA resources. According to Suber (2009) OA is compatible with copyright, peer review, revenue, print, preservation, prestige, career advancement, indexing and supportive services associated with conventional scholarly literature. So far, an attempt has been made at examining the roles of librarians in the ICTs era in a general way; however ICTs can be deployed in certain key functions in libraries.

2.4.5 Use of ICTs for preservation of information resources in the library

Maravilla (2008) noted that librarians the world over are tasked with the responsibility of acquiring, processing, disseminating information to users, and due to constant exposure of clients to these materials the rate of degradation increases. Every library is prone to two kinds of deterioration: biological deterioration caused by insect attack/fungal growth or environmental deterioration caused by extreme dampness, wide fluctuations of relative humidity, variations in temperatures, light and atmospheric pollutants. Njeze (2012) noted that library materials deteriorate faster when publishers use sub-standard or very low quality materials like paper which changes colour when exposed to either internal or external light, or the wear out of paper glue and thread for sewing the book. This is very rampant in our local publications. We know that books

cannot last forever. Thus, as librarians, we are left with the option of preserving these materials for future generations.

Deterioration of information resources in Nigerian university libraries has been established in literature as a universal phenomenon. While these materials are negatively affected by natural and human factors, observations and experience have shown that they are more vulnerable to decay and damage by climatic and environmental factors. The deterioration of library materials, especially the print materials has been in existence for some decades but has escalated drastically. Librarians must declare a state of emergency on the rate of deterioration of their collections in other to slow down the level of deterioration. However, in spite of the awareness and technological advancement in the field of preservation and conservation there seems to be more books deteriorating and consequently there is a need to apply ICT in Nigerian libraries.

Deterioration of library materials is a challenge in most academic libraries. In most Nigerian libraries today, preservation is not taken seriously until most library materials start showing traces of deterioration. According to Reed-Scott (2000), libraries currently face the intellectual problems of determining what should be preserved and what should deteriorate. Preservation problems are pushing collection managers into a more activist role, in which they must make crucial preservation decisions. Hence, the growing awareness in the past decade, of the magnitude of preservation problems which has resulted in a steady increase of preservation programmes within research, academic, and public libraries. Efforts must be made by librarians to ensure that these valuable resources are well preserved for future generations to avoid extinction. Jordan (2003) describes preservation as an umbrella term for an array of activities; principles, practices, and organisations that ensure the

usability, longevity, and accessibility of recorded knowledge. Activities currently defining the realm of preservation of library materials include conservation (general collections repair and special collections), reformatting (microfilming, photocopying, and digitisation), selection for preservation, environmental monitoring and control, care and handling of materials, disaster preparedness and recovery, standards relating to materials, practice, and techniques, commercial binding, and preservation education and training.

Muhammad (2006) states that light from incandescent source generate heat and must be kept a distance from library collections. Blinds and shutters completely block out light from the sun, thus aid in temperature control by minimising heat loss and heat generated by sunlight during the day. Filters made of special plastics help control Ultra Violet (UV) radiation, and the use of special low UV florescent tubes is very important. Olubanke (2010) submitted that paper identifies moulds as the most important bio deteriorating agents of library materials. In addition to destroying, disfiguring and staining books, the moulds have been linked to numerous adverse human health effects that fall into three categories: allergic, toxic and infectious. The other biological agents include bacteria, insects and rodents. The important insects in tropical environment are cockroaches and termites. In her studies, Njeze (2012) noted that the most common storage device is flash drive (29%); database 31%, library software 31%, computer hard-drive 31%, and tape recorder57%.

2.5 Utilisation of Information and Communication Technology in Libraries

Adeniji *et al* (2011) in their study on the availability and use of ICT in Olabisi Onabanjo University Library found that 40 (33%) of the respondents use ICT facilities for web browsing, 25 (21%), 20 (17%), 15 (13%) of the respondents used the ICT facilities for class assignment, career advancement, and project writing, respectively

while 10 (8%) of the respondents use the ICT resources for scholarship purposes and charting with colleagues. Ani *et al* (2007) also agreed with other writers on information and communication technology facilities that are used for various purposes to accomplish a variety of functions in the libraries. Its usage has transformed library and information services that are available for users in the library. Edoka and Anunobi (2010) noted that university libraries functions performed with ICT facilities in their study show that all library functions in OAU are performed with ICT facilities; UNAAB and UI have (75%) of their library functions performed with ICT. Half of the functions (50%) are performed with ICT in UNILAG, UNIBEN, UNICAL, MOUAU and FUTO. UNIUYO and UNN performs only processing and public services, serials functions with ICT respectively while none of the functions is performed with ICT at UNIPORT. Considering the 50% bench mark for acceptability, only UNIUYO, UNIPORT and UNN did not perform serials functions with ICT. Other libraries in the study did. The study of Adeniji *et al* (2011) also shows that (55% and 72%) of the libraries perform library preservation especially serials and public services function with ICT facilities respectively. The libraries perform acquisition and processing functions with ICT facilities with a score of 36%.Considering the percentage of the universities using each of the ICT facilities, the result shows that majority of the university libraries (73%) used photocopier for their serials duplication. This was followed by (64%) and 45% which used personal computers and CD-ROMs respectively. Printers, diskettes, LAN and OPAC were each used with a score of (27%). The Internet with a score of (18%); and scanner, fax machine, CD writer and CD ROM (9%) had very low use in the serial units studied. None of the libraries was using e-mail and WAN facilities in the library functions. Considering the 50% bench mark, only personal computers and photocopiers were the ICT facilities being used by the staff of the studied university libraries.

2.6 Extent of ICT utilisation in libraries

Application of information and communication technology for the management of library resources is the reality of the 21st century. It makes libraries smart and offers many opportunities to improve services to library patrons. Information technology has been found to be applicable to all facets of library operations. Library automation, information super highway etc, are the languages of the 21st century. The use of information technology, especially, in libraries cannot be over-emphasized because an automated library has the potentials for satisfying library patrons' needs beyond the capabilities of the manual system. Idowu and Mabawonku (1999) surveyed information technology facilities and applications in some Nigerian research and university libraries; the general objective of the survey was to investigate the types of hardware and software available for use in the libraries. The survey found out that 92.3% of the thirteen (13) federal universities studied were using the TINLIB software for their automation projects, while 15.4% of the universities were using CDS/ISIS. Akintunde (2004) in his paper at the NLA national conferences, pointed out that the library used ICT in management of library administration, processing of library materials, developing online resources, accessing online resources, developing offline resources, accessing offline resources and providing service to clients.

Igben and Akobo (2007) studied the state of Information and Communication Technology (ICT) in libraries in Rivers State, Nigeria. The general objective of the study was to establish the number of computers, the existence of local area networks, the extent of automation and types of software in use. They found that 75% of the libraries studied used computers for the operations of their libraries. Ugah (2001) also reviewed some automation attempts and processes in some Nigerian libraries. Specific mention was made of the experiences of International Institute of Tropical Agriculture

(IITA) Library, Ibadan; Nigerian Institute of International Affairs (NIIA) Library, Victoria Island, Lagos; Raw Materials and Research Development Council (RMRDC) Library, University of Ibadan Library; Abubakar Tafawa Balewa University Library, Bauchi; Hezekiah Oluwasanmi Library (OAU), Ile-Ife and Ladoke Akintola University of Science and Technology Library. The software programmes used by these institutions to manage these automation projects include TINLIBs, AFW etc.

Adeniji *et al* (2011) found out in their study that the Internet is the most used ICT resource, with 50 (42%), while computer, E-publication, printers, and scanners were also used by the respondents to source for information in their various fields of learning. This agrees with the position of Daraman (1997) as cited by Azubogu and Madu (2007). This shows Internet being used by professionals in major disciplines of the world because it offers current information to the users and addresses the shortcoming as witnessed with manual system of information provision to the clienteles is imperative. Adeniji *et al* (2011) noted that 45% respondents from Ibogun, Aiyetoro, Sagamu and Ikenne campus of the university were satisfied with the ICT facilities of the university while some respondents from Ibogun were not satisfied with the facilities. They also saw that the ICT resources were not adequate in meeting their information needs. The finding of the study indicates that the level of satisfaction that users derive from any resources determines their use pattern.

Ogunrombi and Oladokun (1992), Omoniwa (2001), Akintunde (2002) and Bozimo (2006) all discussed issues of automation of specific university libraries. Bozimo while discussing the automation project of Ahmadu Bello University Library pointed out the criteria for the selection of the software "Alice for Windows", for the project. Indicating the unsteadiness of use of software by libraries, she noted that the university library will be migrating "to more sophisticated software called the VTLS"

which has various modules for selecting, acquiring, processing etc of library resources.

To determine the level of ICT usage for the management of library resources in Nigerian federal universities, especially the cataloguing of the library information resources through the use of automated software, Imo and Igbo (2011) in their study on the challenges of software use in Nigerian university libraries found out that more than 75% of the university libraries surveyed have used more than one software in their automation projects. These university libraries mostly migrated from TINLIB (The Information Navigator Library) management software to other software regimes. The survey also showed that these libraries had made use of seven types of software, namely TINLIB, GLAS, Alice for Windows, Lib+ (X-Lib), Virtua, E-Lib. SLAM and CD-ISIS. This indicates that apart from TINLIB software which was introduced to these university libraries by the National Universities Commission (NUC), there is no attempt by these libraries to adopt a common software platform.

2.6.1 ICT facilities application in users operations and services in libraries

The development and availability of Information and Communication Technologies (ICTs) in libraries have today not only increased and broadened the impact of information resources at their doorsteps, but also placed more emphasis on effective and efficient services. Their applications in libraries, commonly known as library automation, have indeed continued to ease and promote quick and timely access to and transfer of information resources that are found dispensed round the globe. Afolabi and Abidoye, Aderele and Adelokun (2011) listed the following as some of the ICT facilities or resources that a librarian can use for effective library operations and services to the users:

a) **Computer:** Computer can be referred to as the backbone; nucleus or hub of ICT application in library operation in virtually all ICT applications; the computer is

interfaced with other devices in order to function effectively. Computer on its own can be used to perform the following functions in the library by the library staff; ordering / acquisition, circulation, library data base, inter library loan by two or more libraries that are connected, documentation and administration, desktop publishing, budgeting, cataloguing/classification and serials management.

b) **Internet Facility:** The Internet is used by the library staff to communicate with their users. It is described as a worldwide network of computers and people. Built upon state of the art technology, the internet makes it possible for thousands of dissimilar physical networks that are not connected to one another and that use diverse hardware technologies to connect and operate as a single communication system. There are locations of various types of information on a computer system linked to the internet. It is an important tool for global on line services, especially, to access the data bases, sending e-mails among others.

c) **Video Conferencing:** Through video conferencing, people at different locations in the world could be allowed to hold meetings especially librarians. Nwabueze and Ozioko (2007) described video conferencing as a means of linking up two or more remote computers, all of which have a small camera attached which enables the participants to see each other, to speak to each other and in some systems, to be able to start, send documents through the linked computer. Some libraries use this medium to source for information that are not available in their own libraries and at the same time use this great medium to create awareness for users who are ignorant of the availability of information resources in the library.

d) **Electronic Mail (e-mail):** This medium can also be used to send and receive mails between the library staff and users to send remainders on overdue books. This is

commonly and widely used with the internet facilities. E-mail is very useful for sending messages to and from remote areas with enhanced network.

e) **Networks:** This is a system of interconnected computers for sharing information and resources that may involve two or more computers in a single office or several computers in different units across an organisation or across a country. The networks include the local area network (LAN) and wide area network (WAN). With computer network, libraries can access and share information in different locations and download for users' needs.

Krubu and Osawaru (2011) noted in their study that the impacts of new technologies are felt by libraries in every aspect. Computing technology, communication technology and mass storage technology are some of the areas of continuous development that reshape the way that libraries access, retrieve, store, manipulate and disseminate information to users. Fan (2009) noted that academic libraries deal mostly with students who spend most of their time on-line, and find it difficult to utilise what is available in the library, the library staff are responsible for creating awareness on what is available in their libraries to users through social media like face book, twitter, YouTube, blog, yahoo messenger etc. He added that for any library to render effective service to her users in the digital era, they need to be equipped with the technological knowhow through training and retraining to meet the users need. Akintunde (2006) noted that the library website should have links to social media and users should be allowed to make contributions to what they feel is the need in the library, links to the reference librarian, bulk SMS, e-mail services, video chatting and many others can greatly improve the library service to the users.

2.7 Competence of Library Staff in Application of ICT Facilities to management of Library Information Resources

Information and Communication Technology application in libraries requires that those who are going to operate the electronic systems possess a certain level of knowledge and skill to be effective in the expectation of what ICT application has to offer. Majority of librarians are trained in the traditional methods of librarianship. In view of this, Morgan (1998) argued thus: in today's world, why would anybody trust a librarian whose profession is about information and knowledge, who had not mastered a computer? This argument explains why we librarians must acquire computer knowledge to be committed to providing ICT-based services. This in turn means that we will be failing those whom we serve if we do not acquire ICT skills (Olorunsola, 1997). Though information technology applications in library service are included in the curriculum in library schools but these are not taught effectively due to lack of equipped laboratory for practical classes in the library schools (Omoniwa, 2001). Information technology is the language of the 21st century. Thus, librarians need to continuously update their skills to be able to function maximally in an IT environment.

Librarians have found themselves in a new environment, otherwise known as digital environment. The environment is characterised with uncertainties and increasing complexities of digital technology (Nwakama, 2003). Librarians need ICT skills for a number of reasons. The new working environment has become a competitive one and many players are now involved in information provision which include, Internet cafe, mobile communication medias, ICT staff, and many others in the information profession (Wittmer, 2001). Some of these players especially the internet café providers lack the necessary IT skills to obtain quality information (Stubbings and McNab, 2001). Librarians will be called upon to act as both educators and intermediaries (Sharp, 2002). New services are emerging in the new working environment.

Published works in this area revealed these trends; too much emphasis has been placed on the development of ICT infrastructure in developing countries, and not enough considerations have been given to human resource development (Lim, 1999; Jensen, 2002; Magara, 2002). This is responsible for the much talked about global digital divide. Aschroft and Watts (2005) observed that in Africa, one in a hundred people has access to a Personal Computer. They added that there is a significant skills gap among information professionals in Nigeria, which has resulted in serious underutilisation of electronic resources in many libraries in Nigeria. But it can be improved when librarians in developed economies gain knowledge of new technologies through continuing educational programmes, professional training, and revision in the library school curricular. Ramzan (2004) noted that the application of ICT to library processes will help librarians develop appropriate ICT skills. University libraries, especially in Nigeria should focus their attention on applying ICT in their operations so as to keep pace with the developments in both education and ICT around the world (Adeyoyin, 2005).

Librarians are expected to possess these ICT knowledge and skills: operating system, packages and programming languages, web awareness, technical skills and knowledge of online services. Warmwin (1998) observed that because computers have assumed such a central role in our profession over the years, we need to know more about them. It is therefore imperative for librarians to have technical skills and subject knowledge so as to add value to library services for user. Morgan (1998) considered other skills such as elementary programming of one or two languages, project management, and change management charge. Islam and Islam (2007) also observed that librarians must develop the competencies to carry out effective searches on CD-ROMs, OPAC, on the web and other electronic databases. Pairy (2007) outlined the ICT

skills of librarians as database management, web development, management of multiple media, metadata skills, knowledge of standards such as Z39.50 and Dublin Core.

Levine (2007) listed some of the ICT skills to include but not limited to word processing skills, spread sheet skills, database skills, electronic presentation skills, web navigation skills, website design skills, e-mail, management skills, Windows Explorer skills, etc which will enable the library staff to manage the resources. Nyamboga (2007) enumerated the ICT skills among librarians as operating systems, packages and programming languages, knowledge of library automation software, web awareness, knowledge of online facilities/services, technical services, and managerial skills.

The use of training tools has been found to be effective in training library academic staff. Some of these training tools include in-house training manuals, software programmes, and self-instruction and vendor annuals. Other methods identified by Kirkpatrick (2007) include individual training by co-worker, individual training by other individual, individual training by supervisor, outside workshops, and in-house workshops of all these, he found that individual training by co-worker was the most commonly used method.

2.8 Challenges of ICT Facilities Application in Libraries

The challenge of ICT facilities application in libraries in African countries is enormous. Emmanuel and Alfred (2008) in their study on the challenges of managing information and communication technologies for education in Tanzania noted that while new technologies have added value to library services by presenting new modes of collecting, storing, retrieving and providing information, they have also brought new challenges and aggravated some of the challenges that had faced libraries before. The challenges relate to acquisition of ICTs, preservation of electronic information resources, maintenance and security issues, training of users, and general lack of

awareness and commitment among library stakeholders. Walmiki and Ramakrishnegowda (2009) studied ICT infrastructure in university libraries of Karnataka and found that most of the libraries lacked sufficient hardware, software facilities and do not have adequate internet nodes and bandwidth. The campus LANs were not fully extended to exploit the benefits of digital information environment. Sivakumaren, Geetha & Jeyaprakash (2011) in their study on ICT facilities in university libraries in India found that computers, printers, scanners and photocopiers were most of the facilities used and the application of ICTs has increased the library functions and user's expectations have increased due to development in technologies.

Jordan (2003) was of the opinion that barriers to adequate ICT skills training in developing countries arose from both lack of ICT literacy and the fact that many local library schools failed to integrate ICTs into their curricular has greatly affected the performance of library staff. Other barriers or constraints as enumerated by Ashcroft and Watts (2005) include shortage of technology literate staff in libraries, the lack of skilled human resources to install and manage computer networks, and poor funding to develop ICT skills in existing staff. Goulding (2000) asserted that teaching departments have a responsibility to support the development of appropriate ICT skills to deliver modern information services, by incorporating new skills requirement into syllabi. One other solution is to encourage information professionals from developing countries to spend time learning in libraries in developed countries. This can be achieved through partnership programmes between libraries in developed and developing countries.

Adeleke and Olorunsola (2010) studied ICT and library operations and found that ICT facilities were the major constraints facing libraries in the use of tools. Shafi-Ullah and Roberts (2010) found that ICT infrastructure is necessary to provide a research culture in higher education institutions and recommended allocating funds for ICT

infrastructure. Etebu (2010) studied ICT availability and found that the situation is not encouraging. Adeniji *et al* (2011) added that there are several problems militating against the respondents using the ICT facilities in their various campuses in Nigerian universities, such factors include power outage, the high cost of connectivity, lack of ICT skills, interconnectivity problem and obsolete equipment. Most of these challenges are to be overcome by both the library management and information providers before they can satisfy the information needs of their numerous users on daily basis. The above finding has established that respondents who make use of the ICT resources encounter various problems when sourcing their information. This finding correlates with Missen *et al* (2007) as cited by Okon (2007) who identified infrastructural impediments to internet connectivity and peculiar problems that are unique to the African context-power failure, equipment failure, and regulatory restriction of communication technologies, expensive or unreliable technologies and low content. Imo and Igbo (2011) noted in their study that most Nigerian universities changed software averagely within five years of use. This length of time does not show evidence of adequate experimentation with the software. The reasons given ranged from inadequate technical support for the software (100%), lack of proper feasibility studies (85.71%), deficiencies discovered (71.43%) to high cost of maintenance (57.14%). Inadequate technical support and lack of proper feasibility studies are two technical areas which need to be properly taken care of if software use in Nigeria university libraries is to be meaningful. The importance of this lies in the fact that technology changes very fast.

Martel (2003) argued that because technology changes often, roles are grabbed on the fly noting that experts in one piece of software with its related slice of the information world might be obsolete with the release of a new piece of software with a new slice of the world. Inadequate knowledge of this among software users might lead

to users subscribing to software with obsolete technology. This response is corroborated when the surveyed libraries rated lack of maintenance support for the software (3.57 mean score) and lack of proper planning and evaluation of software before acquisition (3.86 mean score) as the problems associated with software use in libraries.

Zaid (2008), Afolabi and Abidoye, *et al* (2011) noted some of the challenges encountered in the library in ICT application to include:

1. **Lack of adequate finance and cost of ICT facilities**: The current downturn in the Nigerian economy has affected the educational sector and libraries are no exceptions. Lots of equipment and manpower are needed for successful automation of library services. Zaid (2008) noted that the university of Lagos library like other academic libraries in Nigeria is under-funded. The Library Development Fund is no more a reality as universities have to depend on the support which the Vice-Chancellors can give from the limited resources and despite the fact that ICT is applicable to library services, high cost of ICT equipment could not make it to be widely utilised by most libraries. Abidoye, *et al* (2010) stress that most library users and librarians could not afford the cost of common personal computer
2. **Shortage of manpower and low level of ICT compliance**: This was a major problem. Full library ICT application requires a large number of staff participants especially to manage data to really make it available to the users and many users and members of the library community require knowledge of ICT.
3. **Power outage**: For the past few years, the nation has been experiencing power outage. There had been problem with the generation and distribution of power by Power Holding Company of Nigeria (PHCN).
4. **Occasional system failure/ poor maintenance of ICT equipment:** The system occasionally breaks down and is out of use for few days before the consultants come

to rectify the faults. The time lag usually affects the keying – in process as data entry has to be stopped. It would not have been necessary waiting for the consultants if staff had the competence, especially, on the software used. Most libraries lack conducive environments for keeping and effective functioning of ICT equipment. Besides, most of the ICT equipment are poorly managed by most libraries. In addition, the cost of maintaining ICT equipment is very high.

5. **Staff attitude towards ICT utilisation/technophobia**: Many staff shy away from electronic systems for the fear of damaging or deleting important information while keying-in. This slows down the automation processing. The University of Lagos Library management had addressed the problem by putting a PC on every librarian's table and embarked on training them on the use of it. The use of ICTs is easier for younger librarians. Several studies, according to Ezeani (2000) have showed that older librarians find it difficult to use some of these newer technologies.
6. **Inadequate training and technical/skilled manpower:** Staff are trained. However, the training is inadequate as staff need to always acquire more skills especially on the use of software currently used in the library. There should be continuous training and retraining. There is a death of technical manpower in the area of ICT in Nigeria. Faulty equipment is abandoned in some libraries because there is no knowledgeable staff to repair them.
7. **Frequent change in technology which might lead to total overhauling of the existing system:** Frequent changes in software upgrading lead to total overhauling of the existing system as we have in some academic libraries in Nigeria.
8. **Lack of ICT policies/ inability of the government to monitor effectively the policy on information technology:** There is a lack of systematic ICT policy in most libraries in developing countries and this impedes the deployment of ICTs. Various

polices on ICTs in Nigeria like Nigerian University NET, school-net etc are not properly monitored. Also, there is lack of systematic ICT policy in most libraries in developing countries of which Nigeria is apart.

Imo and Igbo (2011) in their study of the challenges of software use in Nigerian university libraries found that more than 75% of the university libraries surveyed have used more than one software in their automation project. These university libraries mostly migrated from The Information Navigator Library (TINLIB) management software to other software regimes. The survey also showed that these libraries have made use many types of software, namely TINLIB, GLAS, Alice for Window, Lib+ (X-Lib), Virtua, E-Lib. SLAM and CD-ISIS. This indicates that apart from TINLIB software which was introduced to these university libraries by the National Universities Commission (NUC), there is no attempt by these libraries to adopt a common software platform. The survey also showed that these universities changed software averagely within five years of use. This length of time does not show evidence of adequate experimentation with the software. The reasons given ranged from, inadequate technical support for the software (100%), lack of proper feasibility studies, (85.71%), deficiencies discovered (71.43%) to high cost of maintenance (57.14%).

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noted that problems associated with software use in libraries include lack of knowledge of how to identify the software available in the market which the respondents did not agree with (mean score of 2.29), which agreed with all others. Inadequate provision of funds for university libraries and lack of maintenance support for the software had the highest rating of 3.57 each. Omoniwa (2001) reporting on the computerisation of Kashim Ibrahim Library (KIL) of the Ahmadu Bellow University argued that the big mistake made in the planning and execution of the project was that no budget back-up was provided for the initial attempts. He also noted that the NUC initiative for federal universities failed because the project was not backed up with funding. He also pointed out that lack of feasibility study before embarking on computerisation led to the failure of the K.I.L project.

Lack of trained staff to manage the software for automation in these libraries was also seen as a problem in the ICT utilisation in Nigeria. Nwagwu (2006) argued that the failure rate of ICT project in the least industrialised countries is 75% higher than in developed countries mainly due to lack of appropriate skills and knowledge to identify and deal with the risks associated with ICT on a long-term basis. Ogunleye (1997) was very blunt in his own assessment. He pointed out that university libraries had no manpower to implement library computerisation programme which was initiated by NUC in 1995. He did not agree that the development of software in-house is a good enough strategy to sustain software use.

2.9 Strategies for Improving ICT Application to Management of Library Resources

Strategies are usually the measures, scheme, plan of action, approach, schedule, master plan or blueprint adopted by an organisations, institutions, or individuals in order to carry out any action for the purpose of accomplishing tasks. The developing world is

driven by ICTs and information service providers have been preparing to catch up with the global trend so that they will not be abandoned. Etim (2006) observed that the strategies to cope with the challenges of ICTs application in Nigerian university libraries must start with education for librarianship. He stressed that the advocacy for continuing professional education becomes inevitable, especially, in core competencies of ICT.

To improve the application of ICT in libraries, Ademodi and Adepoju (2009) noted that the following strategies be adopted:

a. More attention and funds should be committed to the training and procurement of ICT infrastructure in Nigerian university libraries.
b. Training should be aimed at the upcoming computerisation of libraries
c. Library administrators should seek funds from many foreign agencies and foundations who give financial assistance and equipment to libraries.
d. Finally, policy should be put in place by National Universities Commission mandating all universities to automate their libraries within a specific period of time.

Similarly, Mutula and Mutula (2007) outline some of the strategies to be adopted for improving the ICT application and job performances of the library staff in the digital age as:

a. Enhancing universal access through deployment of affordable ICTs.
b. Improvement of connectivity in libraries.
c. Enabling access by all people to information through the use of ICTs.
d. Building of public awareness on the capabilities of ICTs.
e. Developing human capacity to exploit the benefits of ICTs.
f. Providing technical assistance and support to ICT and making available appropriate electric power sources.

Motivation is a major strategy that can be adopted to enhance ICT application and improve human resources development in Nigerian university libraries. According to Kamali *et al* (2009), in a study on the power of ICT in the human resource development in India, noted that when employees enjoy their jobs, find the work challenging, and like the work environment, they will usually put forth efforts and perform their tasks enthusiastically. In other words, if employees cannot wait for the end of the workday, are alienated from the results of their efforts, and feel their work is terribly boring, they will not do their best. They will do the minimum required to keep their jobs. That is to say, they are not very motivated to perform well. Job motivation is important for organisational effectiveness.

2.10 Summary of the Review

From the above review, it can be summarised that application of ICT to management of library information resources has indeed continued to ease and promote quick and timely access to information resources. Computer, Internet, Digital camera, Webcam, Smart Card, Scanner, E-Books, Printers, Electronic Journals, WEB-OPAC, Animation, e-Mail, CDROM, DVD and RFID technologies were some of the available ICT facilities used in the management of library resources especially in the selection, acquisition and processing of information resources.

It shows that most Nigerian universities have changed software averagely within five years of use. This length of time does not show evidence of adequate experimentation with the software because of technology changes, and the cost involved in the maintenance of the library software, the donor agency will provide and maintain it for a few years expecting the beneficiary to continue the subscription but lack of proper funding will make the library to seek intervention with other agencies.

Information technology is the language of the 21st century. Thus, librarians need to continuously update their skills to be able to function maximally in an IT environment.

Considering the percentage of the universities using each of the ICT facilities, the review shows that majority of the university libraries used some of the ICT facilities for their library operations.

Lack of adequate finance, high cost of ICT facilities, shortage of manpower, low level of ICT compliance, power outage, occasional system failure/ poor maintenance of ICT equipment, staff attitude towards ICT utilisation/technophobia, inadequate training, lack of technical/skilled manpower, frequent change in technology, lack of ICT policies/ inability of the government to monitor effectively the policy on information technology were some of the challenges facing ICT utilisation in libraries, especially in the developing countries.

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CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter describes the methodology and procedures employed in carrying out the study. It covers the following sub-headings: Research method, Population of the study, Sample size, Instruments for data collection, Reliability and Validity of the instrument, Procedure for data collection and Procedure for data analysis.

3.1 Research Method

The survey research method was adopted for the study. This is because of the numerous advantages attributed to it by statisticians and professionals such as Busha and Harter (1980), Aina and Ajiferuke (2002). They observed that survey method/design could be conveniently used in the study of large and small populations without sacrificing efficiency in addition to time and money and accuracy. Osuala (1987) also recommended that a study based on large cross-sectional sample should adopt the survey research method for carrying out the study. Muranda (2004) observed that survey research is one of the most popular techniques for collecting quantifiable data. Survey is a form of descriptive research used when dealing with a very systematic collection of data or information from population or a sample of the population. According to Punch (2005) descriptive study or survey often involves summarising specific factual information into empirical generalisation. Sulaiman (2007) also expressed this much, when he said that the aim of a survey research is to obtain information from sample of respondents that relate to the problem being investigated. The use of survey research method is suitable for this work because the study is aimed at surveying the application of ICT to management of library resources in selected

Nigerian federal universities. Mohammed (2005) noted that a research design is said to be a survey design if it has no control group. It involves the gathering of required data and information from the observation of samples of the given population devoid of any manipulation of cause and effect relationship. Since this study is a fact-finding research about how Nigerian federal university libraries use ICT in managing their library information resources, survey research method/design is found to be most appropriate for use.

3.2 Population of the Study

The target group for this study are the federal university libraries in Nigeria, because they have the common characteristics needed by the researcher. In that case, the researcher used a theoretical population as noted by Baiyewu (2003) that a researcher can use a theoretical population to generalise the study if the researcher may not have access to the population, the researcher selected six (6) federal university libraries in the six geo-political zones of Nigeria. The selected libraries are; Kashim Ibrahim Library, Ahmadu Bello University, Zaria, Kaduna State; University of Ilorin Library, Kwara State; Nnamdi Azikiwe Library, University of Nigeria, Nsukka, Enugu State; University of Lagos Library, Lagos State; University of Uyo Library, Akwa Ibom State and Ramat Library, University of Maiduguri, Borno State respectively.

However, the subjects of the study were the staff that manages the information in the library. They include; Resources Development Division (RDD) formally Collection Development Unit, Resources Processing Division (RPD), formally Cataloguing and Classification Unit, Customer Services Division (CSD) Circulation Unit and Information, Communication Technology Division, formally Media Unit and the University Librarian, of the selected federal university libraries. The choice of the library staff in these divisions was informed by their being involved in the management

of the library information resources. The inclusion of the university librarians as part of the respondents is simply due to the fact that they are the Chief Managers of the library in the selection and acquisition of ICT infrastructures as well as in the management of the library information resources. The breakdown of the number of staff (respondents) in each of the geo- political zone of Nigerian federal universities is as follows:

Table 3.1: Population of staff (respondents) that manage library information resources in the six (6) selected Nigerian federal university libraries

S/No	Zone	University libraries	Number of staff
1	North West	Kashim Ibrahim Library, Ahmadu Bello University, Zaria, Kaduna State	67
2	North Central	University of Ilorin Library, Kwara State	41
3	South East	Nnamdi Azikiwe Library, University of Nigeria, Nsukka, Enugu State	52
4	South- South	University of Uyo Library, Akwa Ibom State	76
5	South West	University of Lagos Library, Lagos State	88
6	North East	Ramat Library, University of Maiduguri, Borno State	40
Total			**364**

Source: Through phone calls and e-mails from the universities. (June, 2012)

3.3 Sample and Sampling Techniques

All the 364 management (technical) staff of the six (6) selected federal university libraries in Nigeria were used for this study. This is due to the fact that the population of the study is not too large; thereby allowing the researcher to provide

treatment to each of the staff. Area or cluster probability sampling was used for this study because every member of the population has an equal and independent chance of being a sample. Ndagi (1999) noted that, researchers can sample area of cluster (the entire university library) or the individual elements within the clusters (the Library Information Resources Management Divisions (i.e. Resources Development Division (RDD) formally Collection Development Unit, Resources Processing Division (RPD), formally Cataloguing and Classification Unit, Customer Services Division (CSD) Circulation Unit and Information, Communication Technology Division, formally Media Unit and the University Librarian in each of the selected university libraries). Olayiwola (2007) observed that cluster sampling is a process in which groups, not individuals are selected and have similar characteristics or on the basis of geographical proximity.

3.4 Instruments for Data Collection

The research instruments used are questionnaire, interview and observation. The questionnaire was designed essentially for collection of data on the application of Information and Communication Technologies to the management of library information resources in the stated Nigerian university libraries. Osuala (1993) and Sambo (2005) argued that questionnaire is more economical for reasons of time or funds and are directly associated to survey research design. Borg and Gall (1983) described the adoption of questionnaire as the most common instrument for data collection in survey research. Akuezuilo (1993) and Ikweh (2003) postulated that the survey researcher utilises instruments like questionnaire, interview and/or observation. Ndagi (1999) noted that questionnaire is easy to administer and helps to keep the respondent's mind fixed to the subject and facilitate the process of tabulation, analysis and generalisation. Similarly, The researcher felt that questionnaire, interview and

observation would be adequate to provide the data required for the study. The questionnaire collected data that provide answers to the research questions and hypotheses raised in the study.

The questionnaire contained six (6) sections: Section A described type of library information resources available and being used in the Nigerian federal universities; Section B gave an insight on the type of ICT facilities available and being used for the management of library information resources in Nigerian federal universities; Section C looked at the library operations and routines ICT facilities are applied for the management of library information resources in the Nigerian federal universities; Section D ascertain the extent to which ICT facilities utilisation have affected the management of library information resources in the Nigerian federal universities; Section E looked at staff ICT competences in the management of library information resources; Section F looked at the challenges in the utilisation of ICT facilities in the management of library information resources in the Nigerian federal universities.

The interview and observation method was utilised to fill the information gap that the questionnaire did not give, especially from the University Librarians or their representatives. The added advantage in using the method is the face to face interaction between the researcher and the correspondents and equally where the researcher could not meet with the respondents, phone calls were used through the research assistants to verify issues not clear in the questionnaire. The issues include, the type of library software currently used in the library and the numbers of respondents, also the researcher observed what was physically available in the library such as computers, internet technologies and how the staff were using them in the management of information resources.

3.5 Validity and Reliability of the Instrument

Kerlinger (1973) noted that validation by others is an effective method for face validation of research instrument. Similarly, Mohammed (2005) noted that the instrument for data collection is said to be valid when it is able to produce correct responses from the subject of the sample study. In order to ensure that the questionnaire was capable of eliciting the required data and information used for this study, it was validated by the supervisor(s), academic staff, research experts and colleagues in the Department of Library and Information Science, Faculty of Education, Ahmadu Bello University, Zaria for proper validation. Corrections, vetting and suggestions by the aforementioned were incorporated in the final copy before administering it.

The reliability of the instrument was established by conducting a pilot study within two weeks at the University of Abuja Library. The choice of this university is because it did not form part of the scope of the study. The researcher personally distributed the research instrument to 20 library staff. This is in line with Adigun (2011); Dangani (2010); and Overa (2001) who noted that pilot testing is usually done on a much smaller scale than the main study but under the same or similar conditions.

The questionnaire consists of 25 structured questions for the library staff, the result of the pilot study was used to determine the reliability coefficient of the questionnaire and the appropriate timing for the completion of the questionnaire. ANOVA and Pearson Product Moment Correlation (PPMC) were used and the analysis was tested at 0.05 significant level.

3.6 Procedure for Data Collection

The researcher solicited the cooperation of the authority of the University Librarians and Heads of divisions of the selected university libraries for the

administration of questionnaire to their respective staff through the introduction letter the researcher collected in the department. Also the researcher administered the copies of the questionnaire personally with the assistance of five (5) research assistants who were mainly the staff of the respective libraries studied. The researcher visited five libraries except Ramat Library Maiduguri due to insecurity in the State at the time of this research, but an electronic copy was sent to the research assistant who assisted in downloading, printing and photocopying of questionnaire and distribution to the respondents. University of Lagos and Nsukka staff were on long vocation training, so the researcher had to allow the research assistant to help in distributing and collecting the questionnaire back before returning it by speed post to the researcher, 6 weeks were used to distribute copies of the questionnaire and 2 weeks to follow-up to collect back the completed questionnaire.

3.7 Procedure for Data Presentation and Analysis

The data collected for this research was presented and analysed using descriptive and inferential statistics in order to obtain relevant answers to the research questions formulated and also test the hypotheses respectively. In this regard, frequency distribution tables, simple percentages, charts and One Way Analysis of Variance (ANOVA) were used to test hypotheses one and two while correlation was used for hypotheses three. The choice of ANOVA is based on the fact that more than two sample groups are involved in the study, while correlation analysis is used to test the relationship of ICT facilities utilisation and management of library information resources among the population. All the hypotheses were tested at 0.05 level of significance.

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CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter presents the data collected, analysed, discussed and the findings of the study. The discussion was done under the following sub-headings: Response rate of the respondents in the six (6) selected Nigerian federal universities; Presentation, Analysis and Discussion of data and Inferential analyses.

4.1 Response Rate

Out of the 364 copies of the questionnaire administered to the respondents, a total of 336 (92.4 %) copies were retrieved and duly completed and found usable for this study. The high response rate is attributed to the fact that the respondents were duly followed up and given up to eight weeks within which to complete and return them. The response rate of the respondents according to their university libraries is shown in Table 4.1 below.

Table 4.1 Distribution of the Response rate of the respondents according to their university libraries

Zone	**University libraries**	**Number of questionnaire administered**	**Number of valid questionnaire retrieved**	
		n^1	**n^2**	**% y**
North West	Kashim Ibrahim Library, Ahmadu Bello University, Zaria, Kaduna state;	67	64	17.6
North Central	University of Ilorin library, Kwara state	41	39	10.7
South East	Nnamdi Azikiwe Library, University of Nigeria, Nsukka, Enugu State;	52	48	13.2
South-South	University of Uyo Library, Akwa Ibom State	76	69	19.0
South West	University of Lagos Library, Lagos State;	88	79	21.7
North East	Ramat Library, University of Maiduguri, Borno state	40	37	10.2
Total		**N^1= 364**	**N^2 =336**	**92.4**

Key:

*Number of valid copies of the questionnaire returned

n^1 = number of the copies of the questionnaire distributed to each university library

n^2 = number of the copies of the questionnaire returned from each university,

N^1 = Total number of the copies of the questionnaire distributed from the six federal university libraries

N^2 = Total number of the copies of the questionnaire returned from the six federal university libraries

% y = percentage of the total number of questionnaire returned by all the six University libraries.

i.e $n^2/N^1 \times 100/1 = \%\ y$

Table 4.1 shows that the University of Lagos Library recorded the highest number of respondents with the score of 79 (21.7%), followed closely by the University of Uyo Library with a score of 69 (19.09%) respondents. The university with the least respondents was the University of Ilorin Library with the score of 39 (10.7%) respondents and the University of Maiduguri with the score of 37 (10.2%). The differences in the response rates are mainly due to the population size of the respondents by their university since administering of the instruments was done by the population of the libraries. This will help in generalising the result.

4.2. Presentation of Data, Analysis and Discussion

This section analyses and discusses the data collected for the purposes of answering the six research questions raised in the study. Frequencies, percentages and charts were used to compute and present the results.

4.2.1 Type of library information resources available in the federal university libraries studied

In order to identify the type of library information resources available in the Nigerian federal university libraries studied, lists of possible library information resources were highlighted to the respondents to tick as many information resources as possible. Table 4.2 below shows the type of library information resources available as indicated by the respondents in Nigerian federal university libraries.

Table 4.2: Type of library information resources available in the federal university libraries studied

Information resources Available	**Institution**												**Total**		**Mean**
	ABU		**UNI ILO**		**UNN**		**UNI UYO**		**UNI LAG**		**UNI MAID**				
	f	%	F	%	f	%	f	%	f	%	f	%	**F**	**%**	
Printed Books	64	19	38	11	47	14	68	20	79	24	37	11	333	99	.9911
News papers	64	19	37	11	46	14	66	20	77	23	36	11	326	97	.9702
Magazines	63	19	37	11	45	13	65	19	75	22	35	10	320	95	.9524
Journals	53	16	38	11	39	12	69	21	78	23	34	10	311	93	.9256
Maps	52	15	27	8	35	10	57	17	66	20	23	7	260	77	.7738
Monograph	49	15	25	7	34	10	52	15	62	18	22	7	244	73	.7262
Almanacs	57	17	27	8	39	12	43	13	70	21	28	8	264	79	.7917
Encyclopaedias	59	18	34	10	43	13	64	19	73	22	31	9	304	90	.9048
Dictionaries	55	16	33	10	41	12	61	18	70	21	30	9	290	86	.8631
Cinematography film records	34	10	10	3	18	5	39	12	49	15	8	2	158	48	.4792
Audiocassettes	40	12	15	4	24	7	45	13	54	16	13	4	191	57	.5685
Video cassettes	39	12	14	4	23	7	44	13	53	16	13	4	186	55	.5536
Television	45	13	20	6	29	9	50	15	60	18	18	5	222	66	.6607
Microfiches	40	12	14	4	23	7	45	13	53	16	13	4	188	56	.5595
Compact disk read only memory	46	14	21	6	29	9	51	15	61	18	19	6	227	68	.6756
DVDs	45	13	20	6	29	9	50	15	60	18	18	5	222	66	.6607
Online Databases	52	15	27	8	36	11	58	17	68	20	25	7	266	79	.7917
Electronic books	50	15	25	7	34	10	54	16	66	20	22	7	251	75	.7530
Internet	55	16	30	9	39	12	60	18	70	21	31	9	285	85	.8482
Electronic Journals	48	14	23	7	32	10	53	16	63	19	23	7	242	72	.7202
CD-ROM databases	52	15	27	8	36	11	57	17	67	20	24	7	263	79	.7857

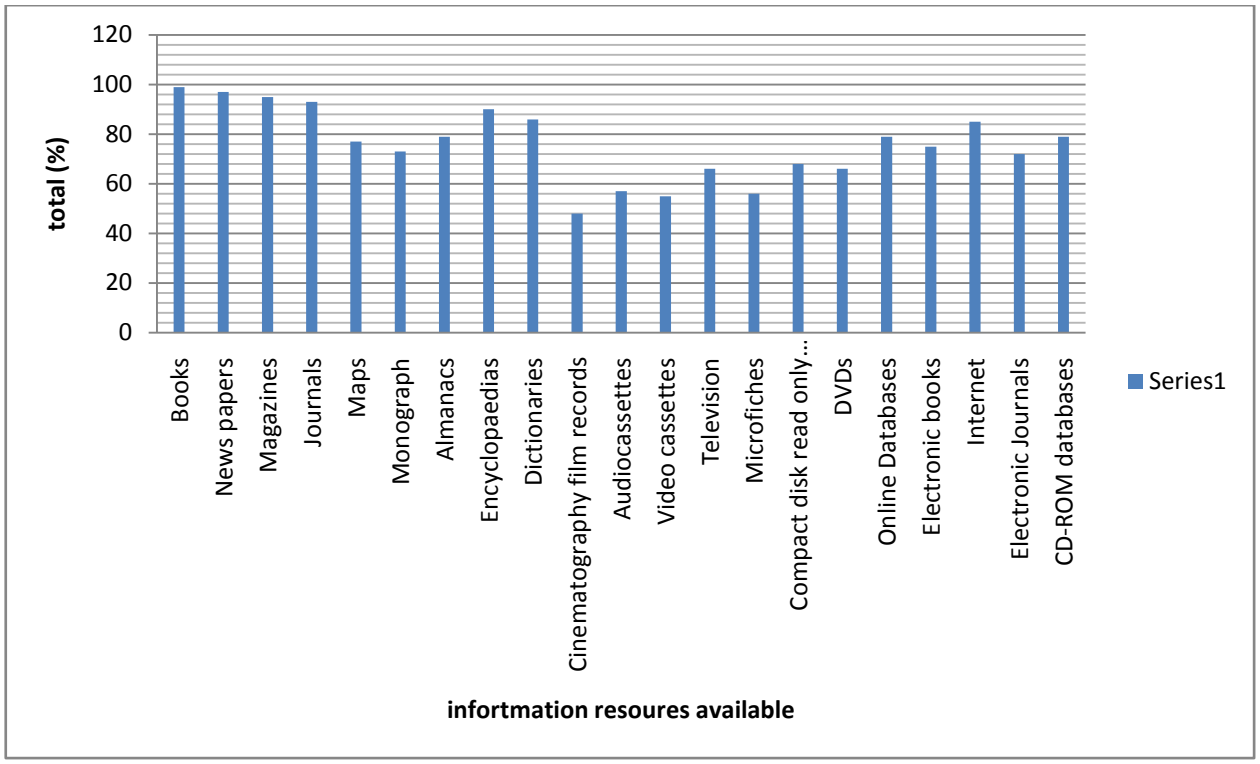


Fig. 1: Type of library information resources available in the federal university libraries studied

Table 4.2 and Fig. 1 above indicate that printed books with mean score of (.9911) dominated the available information resources in the university libraries, followed by newspapers, magazines, and journals with mean scores of (.9702), (.9524) and (.9256) respectively. However, cinematography film records and video cassettes were the least information resources available in the libraries with mean scores of (.4792) and (.5536). These findings aligned with that of Sali (2011) who noted that 70 to 90% of the information resources available in the university libraries were mainly books, journals, dictionaries and almanacs. Therefore, the Nigerian university libraries studied have all types of information resources in both print and non-print to assist their users in meeting the university library goals and objectives to support teaching learning and research.

The respondents were further requested to indicate the frequency of the information resources used in their libraries. Table 4.3 below shows their responses:

Table 4.3: Frequency of library information resources use in the federal university libraries studied

Information resources	Level of frequency										
	VF	**%**	**F**	**%**	**UD**	**%**	**RF**	**%**	**NF**	**%**	**Mean**
Books	302	89.9	26	7.7	1	0.3	7	2.1	0	0	4.806
News papers	241	71.7	55	16.4	12	3.6	4	1.2	24	7.1	4.479
Magazines	194	57.7	94	28.0	4	1.2	4	1.2	29	8.6	4.300
Journals	222	66.1	88	26.2	12	3.6	4	1.2	10	3.0	4.467
Maps	79	23.5	63	18.8	69	20.5	33	9.8	92	27.4	2.955
Monograph	57	17.0	79	23.5	114	34.0	19	5.7	67	19.9	2.545
Almanacs	83	24.7	83	24.7	91	27.1	23	6.8	56	16.7	2.896
Encyclopaedias	162	48.2	106	31.5	46	13.7	11	3.3	11	3.3	3.851
Dictionaries	164	48.8	85	25.3	71	21.1	7	2.1	9	2.7	3.708
Cinematography film records	57	17.0	48	14.3	198	59.0	13	3.9	20	6.0	1.715
Audiocassettes	31	9.2	40	11.9	186	55.4	29	8.6	50	14.9	2.161
Video cassettes	34	10.1	47	14.0	165	49.1	33	9.8	57	17.0	1.857
Television	41	12.2	55	16.4	154	45.8	29	8.6	57	17.0	2.048
Microfiches	63	18.8	54	16.1	150	44.6	22	6.5	47	14.0	2.235
Compact disk read only memory	47	14.0	54	16.1	142	42.2	38	11.3	55	16.4	2.161
DVDs	64	19.0	82	24.4	110	32.7	24	7.1	56	16.7	2.744
Internet	98	29.2	96	28.6	83	24.8	23	6.8	36	10.7	3.137
Online Databases	157	46.7	68	20.2	75	22.3	9	2.7	27	8.0	3.473
Electronic books	158	47.0	55	16.4	91	27.1	5	1.5	27	8.0	3.316

Key: Very Frequent [**VF**]; Frequent [**F**]; Undecided [**UD**]; Rarely Frequent [**RF**] and Not Frequent [**NF**]

Table 4.3 above shows the frequency distribution of the library information resources being used in the Nigerian federal university libraries studied. The five likert scale was used to rate the frequency of library information resources use. Majority of the respondents indicated that books, newspapers, journals and magazines were frequently used with mean scores of (4.806), (4.479), (4.467) and (4.300) respectively. The cinematography film records and video cassettes type of library information resources were not frequently used with mean scores of (1.715) and (1.857). This may be due to the fact that they are not always available and with the availability of databases, the users might have found that they could easily print information available in the Internet, electronic books and online databases and other related articles. Another reason the researcher observed was that some of the machines to decode/access information resources such as audio/video cassette players were not functional. This made the information difficult to access and utilise. So, libraries should ensure that

these machines are working to enable the young library users see and use what was used in the 19th and 20th century and such information in such media can be digitalised into the 21st century such as DVD, CD or stored in the library online Database.

4.2.2 Type of ICT facilities available for the management of library information resources in the Nigerian federal university libraries

In order to identify the type of ICT facilities available and where they are applied for the management of information resources in the libraries, a set of possible options were presented to the respondents to choose from. The analysis is shown in Tables 4.4 to 4.8 below:

Table 4.4: Type of ICT facilities available for the management of information resources in the federal universities studied

ICT facilities	Institution												Total	
	ABU		UNI ILO		UNN		UNI UYO		UNI LAG		UNI MAID			
	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Scanners	47	14	22	7	31	9	52	15	63	19	21	6	236	70
Computers	62	18	37	11	46	14	67	20	77	23	34	10	323	96
DVD	44	13	19	6	28	8	49	15	59	18	17	5	216	64
CD	47	14	23	7	32	10	53	16	63	19	20	6	238	71
Digital cameras	34	10	9	3	18	5	39	12	48	14	7	2	155	46
Barcode sensors or readers	27	8	13	4	22	7	38	11	49	15	19	6	168	50
Internet facilities	57	17	32	10	41	12	61	18	72	21	29	9	292	87
Telephones	39	12	14	4	24	7	44	13	54	16	12	4	188	56
Memory cards	35	10	10	3	19	6	39	12	50	15	8	2	161	48
Flash drives	43	13	18	5	27	8	47	14	56	17	16	5	207	62
Radio	31	9	6	2	15	4	36	11	44	13	4	1	136	40
Library website	49	15	25	7	33	10	54	16	64	19	22	7	247	74
Electronic shelves	31	9	6	2	15	4	36	11	46	14	6	2	140	42
Computerised exit doors	34	10	0	0	9	3	27	8	36	11	0	0	106	32
Others	17	5	0	0	1	0	20	6	18	5	0	0	56	17

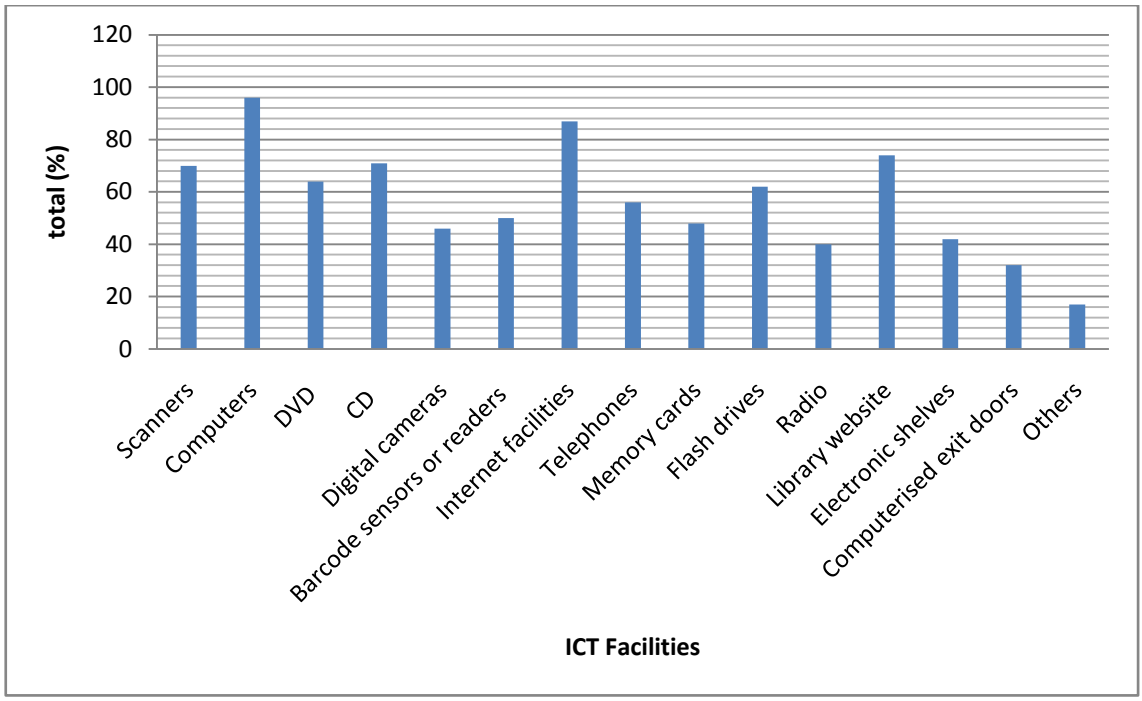


Fig. 2: Type of ICT facilities available for the management of information resources in the federal university libraries studied

Table 4.4 and Fig. 2 above indicate that computers with score of 323 (96%), Internet facilities 292 (87%), library website 247 (74%) and CD 238 (71%) are the commonly available ICT facilities being used for the management of the information resources in the Nigerian federal university libraries studied. The assertion that ICT applications have indeed continued to ease and promote quick and timely access to and transfer of information resources that are found indispensable around the globe indeed available in Nigerian university libraries (Nwalo, 2005). Electronic shelves, radio and computerised exit doors show scores of 140 (42%), 136 (40%) and 106 (32%) respectively in the libraries studied. This implies that such technologies are not fully being used or they are very few in the libraries. This finding is in line with that of Adeniji, Adeniji and Oguniyi (2011) who indicated that availability and use of ICT in Olabisi Onabanjo University Library stresses the fact that almost all the libraries in the study had computers, printers, scanners, and Internet for the use of their patrons but

their maintenance was a challenge to them all.

The respondents were asked to indicate the library functions where the type of ICT facilities are applied for the management of information resources in their libraries. A list of possible library functions was presented to the respondents to tick as many as relevant that are applied in their libraries. Table 4.5 and Fig. 3 show their responses:

Table 4.5: Library functions where ICT facilities are applied for management of information resources

Library functions where ICT facilities are applied	Institution												Total	
	ABU		UNI ILO		UNN		UNI UYO		UNI LAG		UNI MAID			
	f	%	f	%	f	%	f	%	F	%	f	%	F	%
Acquisition of information resources	40	12	15	4	24	7	46	14	55	16	14	4	194	58
Processing of information resources	48	14	23	7	32	10	54	16	63	19	22	7	242	72
Storing of information resources	50	15	25	7	34	10	56	17	65	19	25	7	255	76
Retrieval of information resources	52	15	27	8	36	11	58	17	67	20	26	8	266	79
Dissemination of information resources	45	13	20	6	29	9	51	15	60	18	14	4	219	65
Preservation and conservation of information resources	44	13	20	6	28	8	50	15	59	18	14	4	215	64
Relegation/weeding of information resources	35	10	11	3	21	6	40	12	47	14	10	3	164	49
Serial control	33	10	9	3	18	5	39	12	43	13	7	2	149	44
Interlibrary loan	34	10	10	3	19	6	38	11	40	12	10	3	151	45
Others	11	3	3	1	5	1	4	1	7	2	6	2	36	11

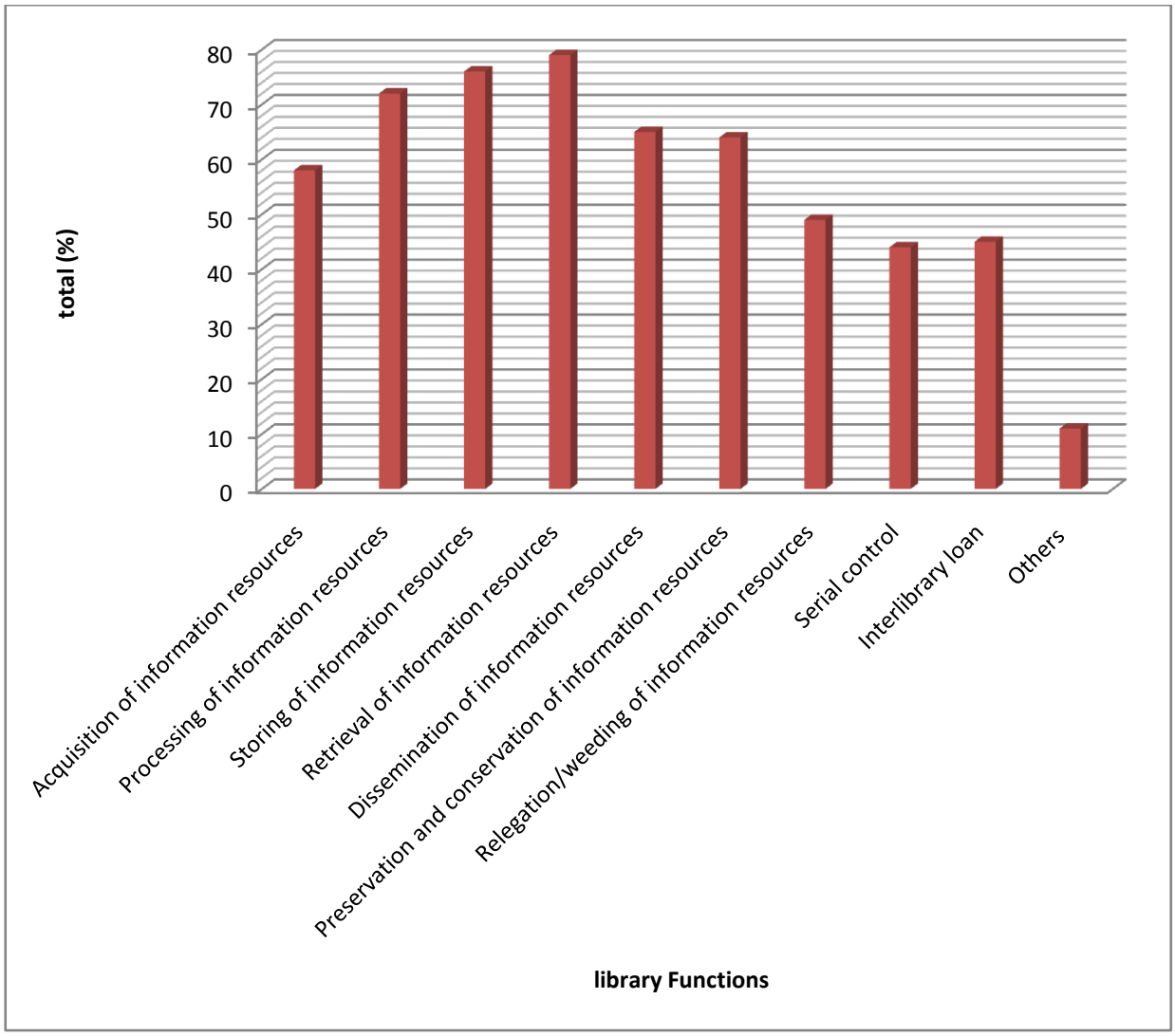


Fig. 3: Library function where ICT facilities are applied for the management of information resources

Table 4.5 and Fig. 3 above show that the responses of the staff on the library function where ICT facilities are applied to the management of information resources in their respective libraries. It was discovered that retrieval of information resources scored 266 (79%); Storing of information resources scored 255 (76%) and Processing of information resources scored 242 (72%). This implies that the library staff can have quick access to the information resources in their libraries using some of the ICT facilities such as computers and Internet facilities to enhance the management of their library information resources. The respondents indicated that ICT facilities were less applied in serial control with frequency score of 149 (44%) and interlibrary loan with a

score of 151(45%). The implication is that libraries could improve on marketing of their information products and services to enable their customers to be aware of what is available in their libraries since most of them find it difficult to visit and utilise information resources within the walls of the library (Nwalo, 2005). The libraries have to utilise ICT facilities such as telephone calls; Short Message Services (SMS); e-mails; social network; library websites; the parent institutions' students' registrations portals; library users awareness campaign during orientations; and many more to reach their clients. Otherwise, the vision and mission of the libraries to provide timely, relevant and accurate information resources to customers will not be achieved.

The respondents were further requested to indicate the extent to which ICT facilities applications affect the management of library information resources in their libraries. A list of hypothetical statement on effects of ICTs in libraries was provided using the five likert scales of measurements: strongly agree, agree, undecided, disagree and strongly disagree were used to analyse their responses. Table 4.6 shows their responses:

Table 4.6: Extent to which the applications of ICT facilities affect the management of library information resources in the libraries studied

Library resources management	Extent of effect										Mean
	Strongly agree		Agree		Undecided		Disagree		Strongly Disagree		
	F	%	F	%	F	%	F	%	F	%	
It has improved staff productivity	160	47.6	140	41.7	4	1.2	10	3.0	22	6.6	4.1488
It enhances users satisfaction	146	43.5	159	47.3	18	5.4	3	0.9	10	3.0	4.2440
It facilitates acquisition of library resources	116	34.5	136	40.5	61	18.2	7	2.1	16	4.8	3.9405
It is instrumental in expanding the library e-resources	131	39.0	139	41.4	31	9.2	6	1.8	29	8.6	3.9167
Through copy-catalogue, ICT has radically enhanced processing of library resources	107	31.8	154	45.8	38	11.3	16	4.8	21	6.3	3.8690
It facilitates registration of library users, charging and discharging of library information resources.	103	30.7	164	48.8	37	11.0	11	3.3	21	6.3	3.8899
It enhances marketing of library and information products and services	76	22.6	157	46.7	41	12.2	17	5.1	45	13.4	3.4881
It has enhanced the preservation of library resources	89	26.5	159	47.3	36	10.7	14	4.2	38	11.3	3.6399
It has made access to library information resources management easier than with the manual system	134	39.9	153	45.5	14	4.2	8	2.4	27	8.0	3.9970
It facilitates quick retrieval of information resources	138	41.1	154	45.8	9	2.7	8	2.4	27	8.1	4.0388
It helps in ordering of information resources	91	27.1	164	48.8	39	11.6	2	0.6	33	9.8	3.7143
It enhances the preservation of information resources	98	29.2	147	43.8	36	10.7	11	3.3	44	13.1	3.5982
It has made library information resource management routines easier	108	32.1	149	44.3	33	9.8	9	2.7	37	11.0	3.7605
has increased the numbers of users in the library	94	28.0	122	36.3	46	13.7	33	9.8	41	12.2	3.4732
Processing of library information resources take less time using the automated library application software	98	29.2	156	46.4	34	10.1	11	3.3	37	11.0	3.7202
It has eased the production of library catalogue and users can access information resources easily through the library OPAC	121	36.0	129	38.4	36	10.7	10	3.0	40	11.9	3.7500
Users can easily access the library database and IDRs	103	30.7	161	47.9	32	9.5	14	4.2	26	7.7	3.8244
Application of ICTs in cataloguing/classification system of a library and information centre is most successful due to its speed, accuracy and reliability than the manual system	129	38.4	133	39.6	34	10.1	10	1.0	30	8.9	3.9851
The library application software in the library allows users to easily know if certain information resource has been issued out, to whom and when it is due to be returned	108	32.1	146	43.5	30	8.9	12	3.6	40	11.9	3.6964

The responses in Table 4.6 above indicate the extent to which the application of ICT facilities affected the management of information resources in the Nigerian University libraries studied. Most of the respondents agreed that ICT has enhanced their users' satisfaction with mean scores of 4.2440. This is followed by improved staff productivity and facilitated acquisition of library resources with mean scores of 4.1488 and 3.9405 respectively. The ICT facilities have not increased the numbers of library users and marketing of library and information products and services with mean scores of 3.4732 and 3.4881 respectively. This contradicted the study of Afolabi and Abidoye (2011); Aderele and Adelokun (2011) who observed that the development and availability of ICTs in libraries have today not only increased and broadened the impact of information resources at their doorsteps, but also placed more emphasis on effective and efficient library services to users.

Attempt was also made by the researcher to find out from the respondents the extent of ICT facilities' usefulness in the management of library information resources in the Nigerian federal university Libraries studied using the likert scale of measurements: very useful; useful; undecided; rarely useful and not useful. List of ICT facilities to choose from was given to the respondents to do so. The table 4.7 presented the summary of the responses:

Table 4.7: Extent of ICT facilities' usefulness to management of library information resources in the Nigerian federal university libraries studied

ICT facilities	Level of usefulness										Mean
	Very Useful		Useful		Undecided		Rarely Useful		Not Useful		
	F	%	F	%	F	%	F	%	F	%	
Scanners	138	41.1	116	34.5	55	16.4	16	4.8	11	3.3	3.6726
Computers	231	68.8	81	24.1	18	5.4	5	1.5	1	0.3	4.4388
DVD	100	29.8	140	41.7	56	16.7	30	8.9	10	3.0	3.4673
CD	107	31.8	136	40.5	52	15.5	28	8.3	13	3.9	3.5298
Digital cameras	79	23.5	145	43.2	77	23.0	19	5.7	16	4.8	3.2262
Barcode sensors or readers	115	34.2	108	32.1	82	24.4	17	5.1	14	4.2	3.5565
Telephones	130	38.7	104	31.0	68	20.2	20	6.0	12	3.6	3.4611
Internet facilities	192	57.1	73	21.7	46	13.7	7	2.1	18	5.4	3.9554
Memory card	119	35.4	113	33.6	63	18.8	15	4.5	26	7.7	3.4911
Printers	162	48.2	100	48.2	48	14.3	6	1.8	20	6.0	3.8393
Electronic shelves	59	17.9	80	23.8	122	36.3	29	8.6	46	13.7	2.5506
Computerised exit doors	75	22.3	83	24.7	110	32.7	25	7.4	43	12.7	2.7411
CCTV surveillance security system	75	22.3	92	27.4	112	33.3	16	4.8	41	12.2	2.7976

From Table 4.7 above, it is clear that computers with mean score of (4.4388) and Internet facilities (3.9554) indicated the highest extent of ICT facilities usefulness for the management of library information resources in the Nigerian federal university libraries studied. The respondents, however, indicated that electronic shelves, computerised exit doors and CCTV surveillance security systems with mean scores of (2.5506), (2.7411) and (2.7976) respectively are rarely or not useful for the management of information resources because such ICT facilities are not available in the libraries. This implies that only the available ICT facilities in the libraries could be useful for the management of information resources.

The respondents were further requested to indicate the extent of ICT facilities applications for improvement of the management of information resources operations in the library using the likert scale of measurement: highly improved; improved; undecided; rarely improved and not improved. Table 4.8 is the summary of their responses.

Table 4.8: Extent of improvement on information resources management operations and routines using ICTs

Library operations and routines	Level of improvement										Mean
	Highly Improved		Improved		Undecided		Rarely improved		Not improved		
	F	%	F	%	F	%	F	%	F	%	
Selection of information resources	127	37.8	156	46.4	34	10.1	5	1.5	14	4.2	3.6250
Ordering of information resources	98	29.2	198	56.6	29	8.6	6	1.8	13	3.9	3.5506
Acquisition of information resources	121	36.0	171	51.9	29	8.6	0	0.0	15	4.5	3.6815
Processing of information resources	136	40.5	150	44.7	27	8.0	5	1.5	18	5.4	3.7649
Storing of information resources	136	40.5	159	47.3	26	7.7	7	2.1	8	2.4	3.7827
Retrieval of information resources	131	39.0	164	48.8	24	7.1	8	2.4	9	2.7	3.8244
Dissemination of information resources	119	35.4	165	49.1	28	8.3	10	3.0	14	4.2	3.6786
Preservation and conservation of information resources	100	29.8	163	48.5	37	11.0	15	4.5	21	6.3	3.3899
Marketing of library and information products and services	83	24.7	154	45.9	31	9.2	24	7.1	44	13.1	3.2321
Registration of library users	117	34.8	157	46.8	26	7.7	14	4.2	22	6.5	3.6161
Storage of staff record	88	26.2	182	54.2	30	8.9	11	8.9	25	7.4	3.4911
Communication with staff within and outside the library	80	23.8	151	44.9	54	16.0	21	6.3	30	8.9	3.0298

Table 4.8 above shows the response rate of the respondents on relevance to which ICT facilities have helped to improve the management of information resources in their libraries. Retrieval of information resources, storing of information resources, processing of information resources, acquisition, dissemination, selection, registration and ordering of information resources with a mean scores of 3.8244, 3.7827, 2.7649, 3.6815, 3.6786, 3.6250, 3.6161 and 3.5506 respectively, indicated that the use of ICT facilities have highly assisted to improve the management of information resources in the Nigerian federal university libraries studied. Communication with staff within and outside the library, marketing of library and information products and services, preservation and conservation of information resources and storage of staff records with the mean scores of 3.0298, 3.2321, 3.3899, and 3.4911 respectively were the library operations where ICT facilities applications have least improved the management of information resources in the Nigerian federal university libraries studied. This may be due to non-provision of official telephones for communication with staff, poor

communication network service in Nigeria and non-utilisation of library website to push information services to the library client through the social network, like Facebook, twitter, Skype, LinkedIn, yahoo messenger etc.

4.2.3 Library operations and routines where ICT facilities are applied in the management of library information resources in the federal university libraries studied

In order to identify the library operations and routines where ICT facilities are applied in the management of library information resources in the Federal university libraries studied, the researcher requested the respondents to indicate where ICT facilities are applied in the library operations and routines. Lists of relevant library operations and routines were provided for them to choose. Their responses are shown in Table 4.9 and Fig. 4:

Table 4.9: ICT facilities applications in library operations and routines for information resources management in the federal university libraries studied

Type of library operations and routines	Institution												Total		
	ABU		UNI ILO		UNN		UNI UYO		UNI LAG		UNI MAID				
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	Mean
Selection of library resources	49	15	24	7	33	10	54	16	62	18	22	7	244	73	.7262
Ordering of information resources	39	12	14	4	23	7	44	13	54	16	13	4	187	56	.5547
Use of publisher catalogue	47	14	22	7	31	9	52	15	59	18	20	6	231	69	.6875
Purchasing of information resources	43	13	18	5	27	8	48	14	55	16	15	4	206	61	.6131
Payment for information resources	35	10	10	3	19	6	40	12	47	14	8	2	159	47	.4732
Cataloguing /classification of information resources	50	15	25	7	34	10	55	16	63	19	23	7	250	74	.7440
Charging and discharging of information resources	40	12	15	4	24	7	45	13	53	16	14	4	191	57	.5685
Library information resources statistics records	33	10	8	2	17	5	36	11	46	14	7	2	147	44	.4358
Marketing of library and information products and services	37	11	15	4	32	10	45	13	46	14	14	4	189	56	.5625
Registration of library users	43	13	21	6	37	11	46	14	43	13	16	5	206	61	.6131
Library Staff/Students daily statistic records	40	12	16	5	25	7	46	14	53	16	14	4	194	58	.5774
Entrance/ exit to the library security devices	35	10	11	3	20	6	41	12	45	13	9	3	161	48	.4792
Fire and smoke detection facilities	33	10	9	3	18	5	39	12	43	13	7	2	149	44	.4435
Communication between library staff	34	10	10	3	19	6	38	11	40	12	10	3	151	45	.4494
Surveillance of information resources on the shelves	37	11	13	4	22	7	45	13	43	13	13	4	173	51	.5149

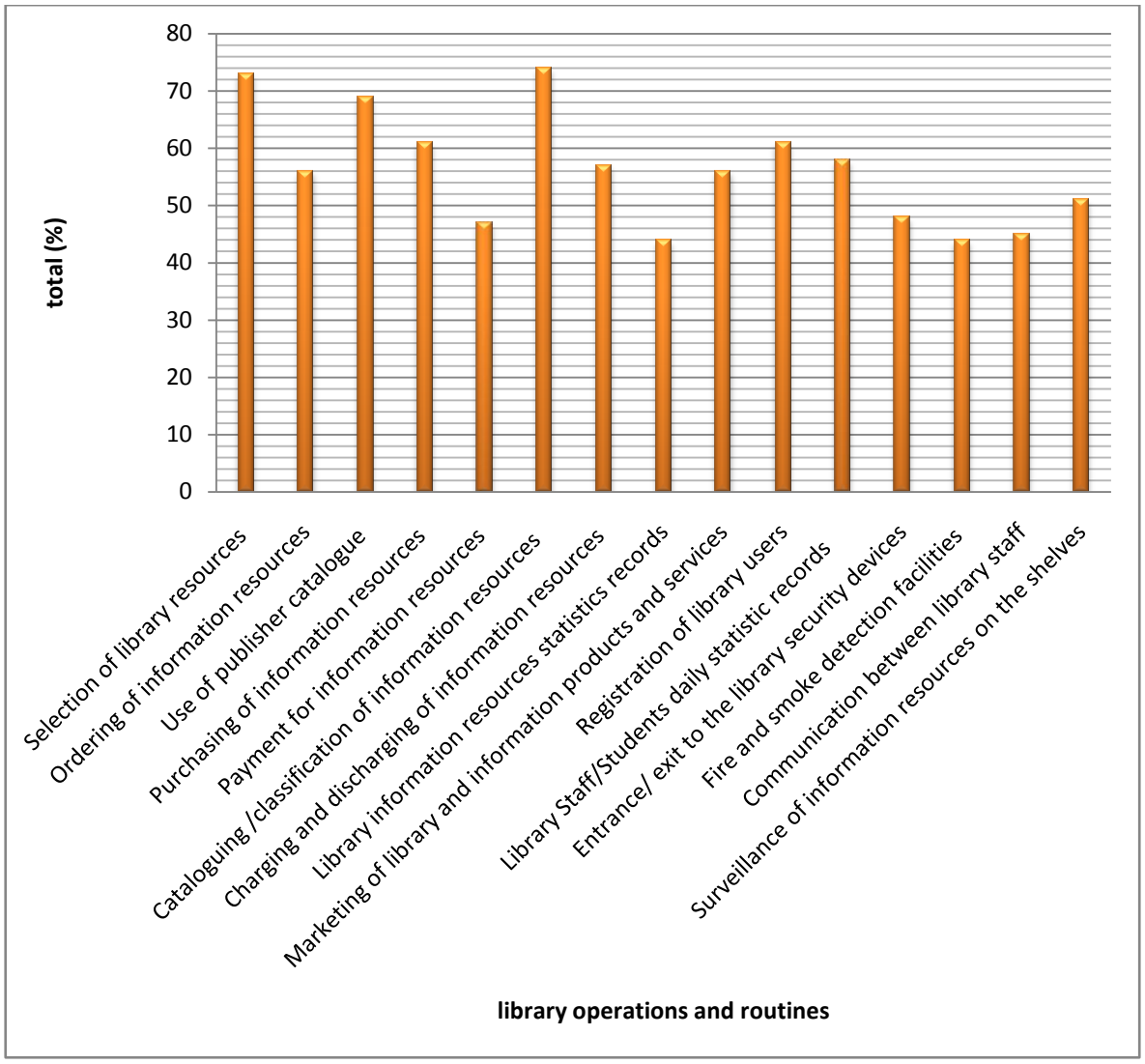


Fig. 4: ICT facilities applications in library operations and routines for information resources management in the federal university libraries studied

Table 4.9 and Fig.4 above indicate that ICT facilities are frequently applied in cataloguing and classification of information resources with a score of 250 (74%) followed by selection of information resources which scored 244 (73%). Library information resources statistic records have the least frequency of 147 (44%). This may be because many libraries still use manual system of statistical record and ICT has not been applied in such operations and routines of the libraries.

The respondents were further required to indicate how often the ICT facilities

are utilised to achieve the operations and routines for information resources management in Table 4.9. A list of ICT facilities were provided for the respondents, using the likert scale of measurement: very often, often, undecided, rarely often and not often to indicate their opinions. Table 4.10 below summarises their responses.

Table 4.10: ICT facilities utilisation for management of information resources in the federal university libraries studied

ICT facilities	Extent of library ICT application										Mean
	Very Often		Often		Undecided		Rarely often		Not often		
	F	%	F	%	F	%	F	%	F	%	
Scanners	118	35.1	75	22.3	50	14.9	37	11.0	56	16.7	3.4256
Computers	232	69.0	53	15.8	27	8.0	2	0.6	22	6.5	4.3065
DVD	90	26.8	99	29.5	52	15.5	25	7.4	70	20.8	3.3393
CD	93	27.7	93	27.7	55	16.4	34	10.1	61	18.2	3.2887
Digital cameras	67	19.9	88	26.2	77	22.9	37	11.0	67	19.9	2.9613
Barcode sensors or readers	86	25.6	71	21.1	87	25.9	36	10.7	56	16.7	2.9405
Telephones	132	39.3	83	24.7	66	19.6	19	5.7	36	10.7	3.4643
Internet facilities	184	54.8	65	19.3	36	10.7	14	4.2	37	11.0	3.9643
Memory card	113	33.6	80	23.8	65	19.3	26	7.7	52	15.5	3.3363
Printers	143	42.6	80	23.8	56	16.7	33	9.8	24	7.1	3.5417

Table 4.10 above shows the responses of the respondents on the extent of the utilisation of ICT facilities in libraries studied for the management of information resources. It indicates that computers are often utilised with a mean score of 4.3065 and Internet facilities have the second highest mean score of 3.9643.This is because computers and internet facilities work together. The least of the ICTs utilisation for information resources management in the libraries studied is the barcode sensors or readers. Barcode readers are only used in converting retrospective bibliographic information to the library OPAC in the libraries studied and none of libraries studied utilise this ICT for discharging of information resources in their libraries.

Information and Communication Technology has been found to be applied to all facets of library operations and routines. Library automation, information super highway etc. are the languages of the 21st century. Zaid (2004) noted that the use of ICT

especially in libraries cannot be over-emphasized because an automated library has the potentials for satisfying library patrons' needs beyond the capabilities of the manual system. In order to achieve this, the researcher asked the respondents to indicate which integrated library software their library was using at the time of the study; their responses were not cleared since many indicated different ILS. Therefore the researcher interviewed the research assistants' from the federal university libraries studied, if the libraries studied were using any Integrated Library Software (ILS) to manage their information resources. A list of commonly used ILS in the Nigerian libraries was drawn for the respondents to indicate which of them is in use in the respective libraries. The summary of the responses is shown in Table 4. 11 below:

Table 4.11: Integrated Library Software (ILS) available and are being used for the management of information resources in the federal university libraries studied

Type of ILSs	**Institution**					
	ABU	**UNI ILO**	**UNN**	**UNI UYO**	**UNI LAG**	**UNI MAID**
CDS/ISIS	X	X	X	X	X	X
X-LIB	X	X	X	X	X	X
TINLIB	X	X	X	X	X	X
GLAS	X	X	X	X	X	X
ALICE FOR WINDOWS	X	X	X	X	X	X
LIBSYS	X	X	X	X	X	X
VIRTUA	√	X	X	X	X	X
MILLENNIUM	X	X	X	X	√	X
KOHA	X	√	√	√	X	X

Key: X = Not Applicable √ = Applicable

The responses in Table 4.11 above show that Nnamdi Azikiwe Library, University of Ilorin Library and University of Uyo Library use KOHA ILS for the management of their information resources. Kashim Ibrahim Library (ABU) uses Virtua, while the University of Lagos Library uses Millennium ILS to manage their

information resources. Ramat Library (UNI MAID) is yet to apply any ILS to manage its information resources.

Surprisingly, none of the libraries studied uses X-LIB the Nigerian indigenous ILS developed by the Raw Materials Research and Development Council (RMRDC). It was also revealed that KOHA is Open Source library software where subscription is free. It was discovered that the libraries which opted for Open Source Software (OSS) do so due to financial constraints. This agrees with the study of Imo and Igbo (2011) who noted that more than 75% of the university libraries in Nigeria have used more than one Integrated Library Software in their automation project and have changed them averagely within five years of use.

The respondents were asked to indicate which modules their ILS can perform. Lists of possible ILS modules were provided for them to tick from. Their responses are shown in Table 4.12 below.

Table 4.12: Use of ILS modules to library operations and routines in the management of library information resources

Library operations and routines	**Institution**												**Total**	
	ABU		**UNI ILO**		**UNN**		**UNI UYO**		**UNI LAG**		**UNI MAID**			
		%	F	%	F	%	F	%	F	%	F	%	F	%
Acquisition	4	1	2	1	0	0	4	1	4	1	-	-	14	5
Cataloguing	3	1	5	1	6	2	10	3	8	2	-	-	32	11
OPAC services	30	9	10	3	30	9	24	7	25	7	-	-	119	40
Circulation	22	7	6	2	6	2	20	6	30	9	-	-	84	28
Serial control	0	0	7	2	6	2	6	2	6	2	-	-	25	8
Reporting	5	1	9	3	0	0	4	1	6	2	-	-	25	8

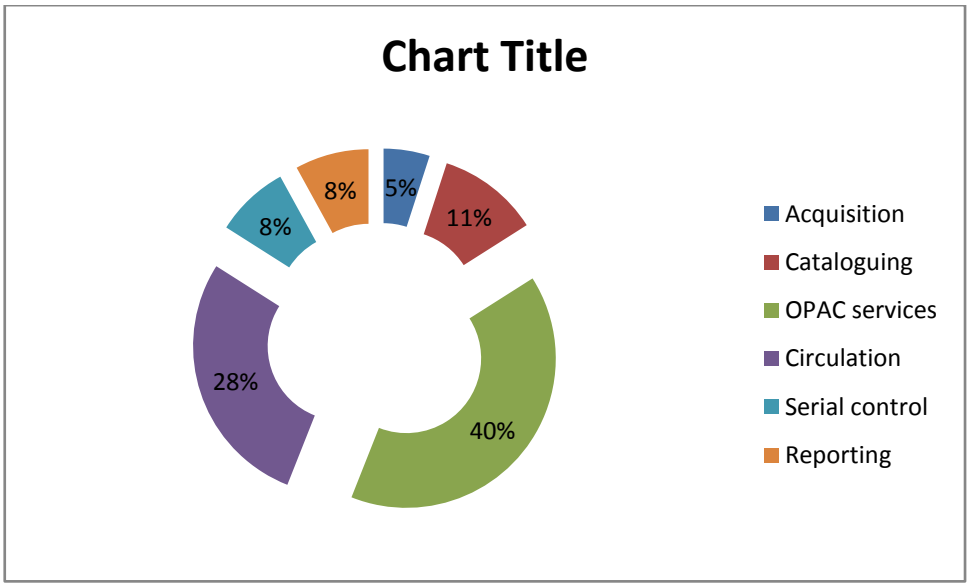


Fig. 5: ILS applications to library operations and routines in the management of library information resources

Table 4.12 and Fig.5 above show the library operations and routines in which ILS are applied. It was discovered that ILS is being applied in the provision of OPAC services with the score of 115 (42.4%) and circulation with a score of 81 (29.9%). Library acquisition has the least response with the score of 7 (2.6%). From the interview with some staff of the libraries studied, the researcher discovered that acquisition module of the ILS is rarely used due to lack of regular internet connectivity and the staff inability to acquire information resources online. OPAC and circulation modules of the ILS are partially utilised because the libraries have LAN network but have challenges of internet connectivity, otherwise library client, can lend or put book on hold in the comfort of their homes before coming to the library.

The respondents were also asked to indicate which type of communication media they use to get information from the information resources vendors, library users, donor agencies and the university management. A list of relevant communication media was provided for them to select as many as relevant. Their responses are shown in Table 4.13.

Table 4.13: Communication media used to communicate with the library stakeholders

Communication media	Institution												Total		Mean
	ABU		UNI ILO		UNN		UNI UYO		UNI LAG		UNI MAID				
	f	%	f	%	f	%	F	%	f	%	f	%	F	%	
Telephone calls	36	11	22	7	20	6	31	9	45	13	9	3	163	49	.4851
e-mail	51	15	26	8	35	10	56	17	66	20	24	7	258	77	.7679
Social media. E.g face book, twitter, blog etc	18	5	9	3	7	2	21	6	30	9	5	1	90	27	.2679
Using teleconferences	4	1	7	2	4	1	4	1	6	2	0	0	25	7	.0744
Others (SMS, MMS)	2	1	1	0	4	1	1	0	3	1	0	0	11	3	.0327

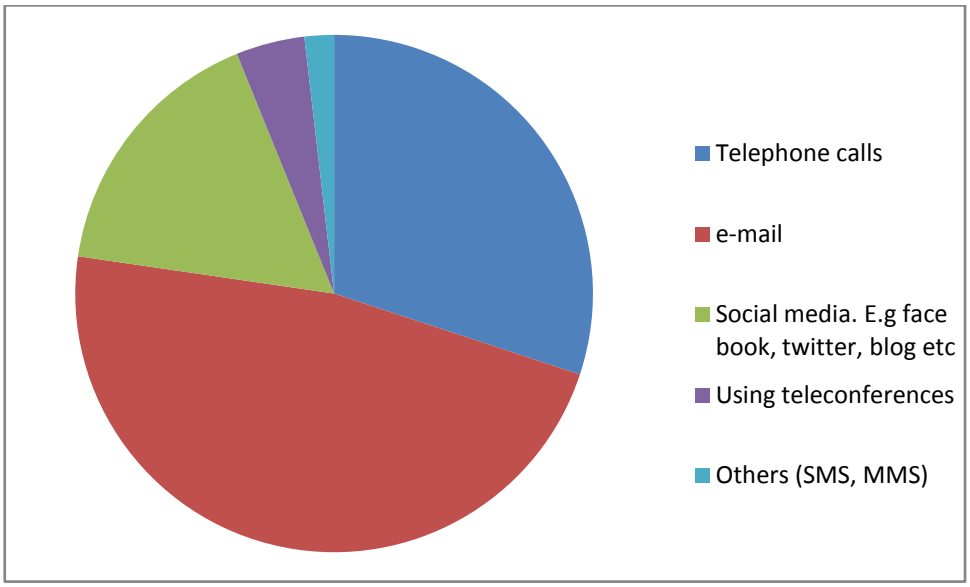


Fig. 6: Communication media used to communicate with the library stakeholders

Table 4.13 and Fig. 6 above show that the respondents used e-mail more to communicate with the stakeholders with the score of 258 (47.2%), followed by telephone calls with the score of 163 (29.8%). The result of the interview revealed that many libraries have computers that are connected to the Internet which made communication easier and cheaper. However, some of the respondents complained of

non-provision of official telephones or communication allowances to ease interaction with staff within and outside the library especially the library with satellite libraries. Surprisingly, teleconferences which is supposed to be the most useful facilities in communication, recorded the least score of 25 (4.6%). Nwabueze and Ozioko (2007) noted that some libraries use teleconferences in social media such as You-tube and yahoo messenger to source for information that are not available in their own libraries with other library abroad and at the same time also use the medium to create awareness for users who are ignorant of the availability of certain information resources in the libraries studied.

4.2.4 Extent of ICT facilities utilisation in the management of library information resources in the federal university libraries studied

In order to ascertain the extent of ICT facilities utilisation and effect on the management of library information resources in the Nigerian federal university libraries studied, the respondents were first provided with a list of possible ICT facilities used in the management of library information resources using the five likert scale of measurement: very often, often, undecided, rarely often and not often for the respondents to choose from. Table 4.14 below presents the result of the findings:

Table 4. 14: Extent to which ICT facilities are utilised for the management of library information resources in the federal university libraries studied

ICT facilities	Extent of ICT facilities utilisation										Mean
	Very often		Often		Undecided		Rarely often		Not Often		
	F	%	F	%	F	%	F	%	F	%	
Scanners	101	30.1	83	24.7	88	26.2	28	8.3	36	10.7	3.2411
Computers	204	60.7	67	19.9	59	17.6	2	0.6	4	1.2	4.0565
DVD	72	21.4	92	27.4	80	23.8	31	9.2	61	18.2	3.1339
CD	75	22.3	94	28.0	82	24.4	28	8.3	57	17.0	3.1548
Digital cameras	55	16.4	87	25.9	104	31.0	36	10.7	54	16.1	2.8601
Barcode sensors or readers	73	21.7	79	21.7	110	32.7	31	9.2	43	12.8	2.9226
Telephones	122	36.3	78	23.2	105	31.3	14	4.2	17	5.1	3.2917
Internet facilities	178	53.0	68	20.2	65	19.3	15	4.5	10	3.0	3.8304
Memory card	85	25.3	65	19.3	115	34.2	37	11.0	34	10.1	2.9048
Printers	145	43.2	80	23.8	71	21.1	18	5.4	22	6.5	3.6250
Electronic shelves	43	12.8	38	11.3	180	53.6	35	10.4	40	11.9	2.1910
Computerised exit doors	33	9.8	30	8.9	56	16.7	49	14.6	168	50.0	2.3810
CCTV surveillance security system	56	16.7	43	12.8	21	6.3	36	10.7	180	53.6	2.2827

Table 4.14 above provides information on how often ICT facilities are utilised for the management of information resources in the libraries studied. The responses show that computers with mean score of 4.0565 and Internet facilities with mean score of 3.8304 were found to be often utilised in the libraries studied. Computerised exit doors and electronic shelves were not often used ICT facilities with the mean score of 2.3810 and 2.1910 respectively. This is because; none of such ICT facilities are available and utilised in the libraries studied.

Disappointingly, it was discovered that most of the Nigerian university libraries studied are not using computerised exit doors and Closed-Circuit Television (CCTV) surveillance security system to safe guard their information resources despite the security challenges in the country and users or library staff may be caught removing information resources out of the library. This finding agrees with Womboh and Abba

(2008) who in their study also discovered that lack of computerised security system in polytechnic libraries made students and library staff get away with information resources which they never returned. And this has done a lot of harm to the quality of information resources available in the libraries.

4.2.5 Competence of library staff in the application of ICT facilities for the management of library information resources

Human capacity building is crucial to the success of ICT utilisation. In order to ascertain the staff ICT competences in the management of library information resources in the Nigerian federal university libraries studied and also to find out the competence of the library staff in the application of ICT, the researcher provided a list of hypothetical statements for the respondents to choose using the five Likert scale of measurement: strongly agree; agree; undecided; disagree and strongly disagree. Table 4.15 summarises their responses:

Table 4.15: Staff competency in the application of ICT facilities to the management of library information resources

Type of staff Competences	Extent of staff ICT competency										Mean
	Strongly agree		Agree		Undecided		Disagree		Strongly disagree		
	F	%	F	%	F	%	F	%	F	%	
I can select, order and acquire library information resources online through the online publisher catalogue	130	38.7	118	35.1	45	13.4	14	4.2	29	8.7	3.8482
I can catalogue/classify information resources with the use of library application software	132	39.3	146	43.5	14	4.2	8	2.4	46	10.7	3.9137
I can save, retrieve and disseminate library information resources with the library integrated software	157	46.7	124	36.9	15	4.5	9	2.7	31	9.2	4.0208
I can scan information resources in the library using scanners	101	30.1	151	44.9	32	9.5	20	6.0	32	9.5	3.7351
I can digitise library information resources available in the library	92	27.4	126	37.5	56	16.7	18	5.4	44	13.1	3.5089
I can create backup of information resources into the storage devices like DVDs, CDs, Memory card, flash drive e.t.c.	99	29.5	149	44.3	34	10.1	19	5.7	35	10.4	3.6815
I can use digital cameras to digitise library information resources	49	14.6	128	38.1	78	23.2	28	8.3	53	15.8	3.1488
I can use barcode sensor or reader in securing the library information resources.	94	28.0	94	28.0	61	18.2	24	7.1	63	18.7	3.2708

Table 4.15 above reveals that most of the library staff agreed that they are more competent in saving, retrieving and disseminating library information resources with the ILS in use with a mean score of 4.0208, catalogue/classification of information resources with a mean score of 3.9137; Selection, ordering and acquisition of information resources with a mean score of 3.8482 and scanning information resources with a mean score of 3.7351. The reason for this is because most of the library staff do use computer systems in the management of their information resources. Some staff indicated that they could not use barcode sensor/reader in securing their library

information resources with the mean score of 3.2708. This is in agreement with Aschroft and Watts (2005) who observed that there are significant skills gap among information professionals in Nigerian libraries, which has resulted in serious underutilisation of electronic resources in many libraries in Nigeria. So, training and retraining of library staff is very essential in the use of available ICT in the management of library information resources which reduce the time staff use to enter bibliographic information of a book during charging and discharging to library clients. Attempt was also made by the researcher to find out from the respondents the extent of their satisfaction with the application of ICT facilities in the management of library information resources in their libraries. They were asked to indicate the basic library operations and routines which they are satisfied with using the Likert scale of measurement: very satisfied, satisfied, undecided, not satisfied and not very satisfied. Table 4.16 represents the summary of their responses:

Table 4.16: Staff level of satisfaction with the application of ICTs facilities to the management of the library information resources in their libraries

Type of library operations and routines	Extent of staff satisfaction with ICTs										Mean
	Very satisfied		Satisfied		Undecided		Not satisfied		Not very satisfied		
		%	F	%	F	%	F	%	F	%	
Selection of information resources	103	30.7	161	47.9	31	9.2	19	5.7	22	6.5	3.7857
Ordering of information resources	91	27.1	157	46.7	29	8.7	27	8.0	32	9.5	3.6964
Acquisition of information resources	109	32.4	142	42.3	38	11.3	18	5.4	29	8.6	3.7173
Processing of information resources	123	36.6	142	42.3	37	11.0	11	3.3	22	6.5	3.8299
Storing of information resources	138	41.1	142	42.3	34	10.1	13	3.9	9	2.7	3.9286
Retrieval of information resources	146	43.5	124	36.9	28	8.4	17	5.1	21	6.3	3.9583
Dissemination of information Resources	111	33.0	145	43.2	32	9.5	16	4.8	32	9.5	3.7798
Preservation and conservation of information resources	97	28.9	148	44.0	33	9.8	24	7.1	34	10.1	3.6845
Marketing of library and information products and services	63	18.8	144	42.9	53	15.8	33	9.8	43	12.8	3.3006
Registration of library users	106	31.5	122	36.3	39	11.6	27	8.0	42	12.5	3.6071
Storage of staff record	96	28.6	136	40.5	51	15.2	17	5.1	36	10.7	3.5327
Communication with staff within and outside the library	94	28.0	107	31.8	63	18.8	25	7.4	47	14.0	3.2976

Table 4.16 above reveals that most of the library staff are very satisfied with using ICT facilities in retrieving information resources with a mean score of 3.9583, followed by storing of information resources with a mean score of 3.9286 and processing of information resources with mean score of 3.8299. These library operations and routines were the library functions where ICT facilities were utilised for the management of library information resources. The respondents were also satisfied with the application of ICTs in selection, dissemination and acquisition of information resources with mean scores of 3.7857, 3.7798 and 3.7173 respectively. The implication of the above findings is that the Nigerian federal university libraries need to continue to apply of ICTs especially in the area of communication with staff, preservation and

conservation of information resources and storage of information resources. This can be achieved through training of the staff and utilisation of the available ICT facilities in the libraries. Levine (2007) noted in his study that 40% to 70% of the staff in Kerala, India possessed skills of selection, database skills, electronic presentation skills, web navigation skills, website design skills, e-mail, management skills, Windows Explorer skills, etc. which helped the library staff to manage their information resources.

4.2.6 Challenges to ICT facilities utilisation in the management of library information resources in the Nigerian federal university libraries studied

In order to find out the challenges to ICT facilities utilisation in the management of library information resources in the Nigerian federal university libraries studied, the researcher provided a list of possible challenges facing the Nigerian federal university libraries for the respondents to choose from. Table 4.17 and Fig. 7 present their responses:

Table 4.17: Challenges to ICT facilities utilisation in the management of library resources in the federal university libraries studied

Type of Challenges	Institution												Total	
	ABU		UNI ILO		UNN		UNI UYO		UNI LAG		UNI MAID			
	f	%	f	%	f	%	f	%	f	%	F	%	F	%
Inadequate funding	29	9	21	6	19	6	45	13	48	14	19	6	181	54
Shortage of manpower	46	14	23	7	19	6	51	15	61	18	19	6	219	65
Power outage	51	15	27	8	36	11	57	17	67	20	24	7	262	78
Occasional system failure	48	14	23	7	32	10	53	16	63	19	21	6	240	71
Staff attitude towards ICT use	37	11	12	4	21	6	40	12	50	15	10	3	170	51
Inadequate staff training opportunities	48	14	23	7	32	10	51	15	63	19	21	6	238	71
Poor infrastructural facilities	44	13	19	6	28	8	48	14	57	17	17	5	213	63
Skeletal level of ICT compliance	36	11	15	4	18	5	38	11	49	15	9	3	165	49
Customers attitude	34	10	17	5	19	6	40	12	44	13	11	3	165	49
Cost of ICT facilities	39	12	23	7	26	8	45	13	50	15	16	5	199	59
Poor maintenance of ICT equipment	43	13	28	8	29	9	50	15	53	16	19	6	222	66
Frequent change in technology	31	9	20	6	21	6	42	13	45	13	11	3	170	51
Lack of ICT policies	53	16	28	8	36	11	58	17	68	20	23	7	266	79
Technophobia	31	9	9	3	15	4	36	11	40	12	7	2	138	41
Data base subscription	37	11	15	4	21	6	42	13	44	13	13	4	172	51
Low bandwidth (slow Internet connection)	46	14	24	7	30	9	51	15	53	16	22	7	226	67

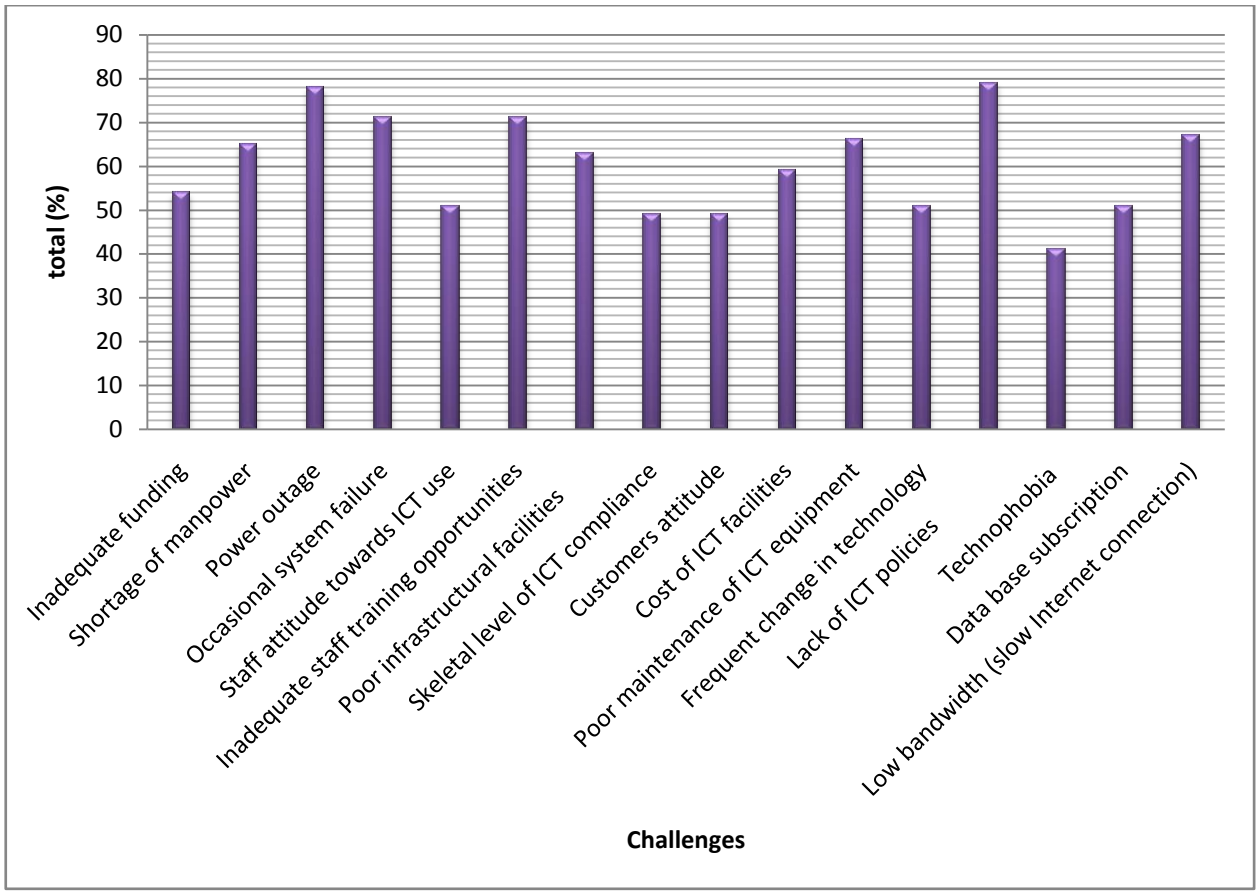


Fig. 7: Challenges to ICT facilities utilisation in the management of library resources in the federal university libraries studied

Table 4.17 and Fig. 7 above show the respondents indicated such challenges to ICT facilities utilisation as: lack of ICT information resources management policy with the score of 266 (79%), power outage with the score of 262 (78%), occasional system failure with the score of 240 (71%) and inadequate staff training opportunities with the score of 236 (71%). This finding agrees with the findings of Ashcroft and Watts (2005) that lack of ICTs information management policies, poor funding in libraries, the lack of skilled human resources to install and manage computer networks which cause slow Internet connection, and shortage of technological literate manpower to manage the ICT facilities will make ICT application to the Nigerian libraries difficult, staff of the library

may not be able to compete with other librarians around the world and the goals and objectives of their libraries may not be achieved in meeting the current, timely and relevant information need of the clients.

The table also reveals that poor ICT infrastructure, cost of ICT facilities, lack of ICT policies, database subscription, staff attitude towards ICT facilities utilisation and frequent changes in technology were some of the challenges still facing the Nigerian federal university libraries. Imo and Igbo (2011) noted in their study that most Nigerian universities change software averagely within five years of use; this length of time does not show evidence of adequate experimentation with the software. The reasons given ranged from inadequate technical support for the software (100%), lack of proper feasibility studies with the score of 85 (71%) to high cost of maintenance with a score of 57 (14%).

On the other hand, skeletal level of ICT compliance, customer's attitude and technophobia were the least challenges to ICT facilities utilisation in the management of library information resources in the libraries studied. This implies that resistance to new technology level of compliance by library staff has greatly improved since many library staff directly or indirectly own and use one form of ICT facilities such as telephones and computers.

4.3 Analysis of the Interview

To offer more explanation on the data collected from the interview, the researcher interviewed the research assistants from the various university libraries understudied. The analysis is presented below.

On the issue of Integrated Library Software (ILS) available and are being used for the management of information resources in the Nigerian federal university

Libraries studied, the responses from the questionnaire were not uniform and respondents were not sure of which ILS their libraries were using or the respondents did not read the question well and may not understand what ILS meant. Therefore, the researcher interviewed one staff in the five university libraries. Details of the responses are shown in Table 4.11 page (92).

4.4 Analysis of the Observations

It was observed that library clienteles were using the libraries Online Public Access Catalogue (OPAC), but borrower module was not fully utilised. Fire extinguishers were mounted on the walls of the libraries studied in case of fire outbreak but many of them were expired and staff were not capable of using them. Staff were seen busy on their desk top with computers doing their library operations and routines. The implication is that the Nigerian federal university libraries studied should utilise all the modules of the ILS they used. Staff should be trained on how to use fire extinguishers in case of fire outbreak.

4.5 Inferential Analysis

This section presents the result of the inferential statistics used to test the three (3) research hypotheses formulated for this study. In order to test the hypotheses, the researcher used one way Analysis of Variance (ANOVA) to test hypotheses one and two while correlation analysis was used for hypothesis three. The choice of ANOVA is based on the fact that more than two sample groups were involved in the study, while correlation analysis is used to test the relationship of ICT facilities utilisation and the management of library information resources among the population. All the hypotheses were tested at 0.05 level of significance.

Hypothesis one

The null hypothesis stated that "there is no significant difference among the Nigerian federal university libraries in the type of ICT facilities available and used for the management of their library information resources."

This hypothesis is aimed at establishing the different types of ICT facilities available and are being used in the Nigerian federal university libraries for the management of their information resources. In order to test the hypothesis, one way Analysis of Variance was used. A summary of the result is presented in Tables 4.18a and 4.18b.

Table 4.18(a): Analysis of Variance (ANOVA) statistics on the differences among the six federal university libraries respondents' perception regarding the type of ICT facilities available and used for the management of library information resources

Variation	**Sum of square**	**Df**	**Mean square**	**Fraction**	**F. critical**	**Sig (P)**
Between group	306.825	5	61.365	3.746	2.60	.003
Within group	5258.043	321	16.380			
Total	**5564.869**	**326**				

Table 4.18 (a) shows the calculated mean score between groups of respondents to be 61.365 for the different types of ICT facilities available and being used for the management of library information resources in the Nigerian federal university libraries studied. The 16.380 mean score represented the within group i.e. by each university library. The table reveals that there are significant differences in the type of ICT

facilities available and are being used for the management of library information resources because the calculated value of .003 is less than the alpha level of 0.05. That means the null hypothesis which stated that there is no significant difference among the Nigerian federal universities in the type of ICT facilities available and being used for the management of their library information resources is rejected. Thus, there is a significant difference in the type of ICT facilities available and being used for the management of library information resources in the Nigerian federal university libraries studied. A post hoc test of multiple comparisons was carried out to show where these differences exist. The summary is presented in Table 4.18(b) below.

Table 4.18 (b): Post Hoc Tests multiple comparisons (pair wise) of perception of respondents on types of ICT facilities available and used for management of library information resources from the federal university libraries studied

(I) name of institution	(J) name of institution	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
ABU	UNILORIN	.23438	.82885	.778	-1.3963	1.8650
	UNN	2.33012*	.77747	.003	.8005	3.8597
	UNILAG	.03872	.70238	.956	-1.3431	1.4206
	UNIUYO	1.93708*	.69087	.005	.5779	3.2963
	UNIMAID	1.50580	.85085	.078	-.1681	3.1798
UNILORIN	ABU	-.23438	.82885	.778	-1.8650	1.3963
	UNN	2.09574*	.88293	.018	.3587	3.8328
	UNILAG	-.19565	.81759	.811	-1.8042	1.4129
	UNIUYO	1.70270*	.80772	.036	.1136	3.2918
	UNIMAID	1.27143	.94819	.181	-.5940	3.1369
UNN	ABU	-2.33012*	.77747	.003	-3.8597	-.8005
	UNILORIN	-2.09574*	.88293	.018	-3.8328	-.3587
	UNILAG	-2.29140*	.76545	.003	-3.7973	-.7855
	UNIUYO	-.39304	.75490	.603	-1.8782	1.0921
	UNIMAID	-.82432	.90362	.362	-2.6021	.9534
UNILAG	ABU	-.03872	.70238	.956	-1.4206	1.3431
	UNILORIN	.19565	.81759	.811	-1.4129	1.8042
	UNN	2.29140*	.76545	.003	.7855	3.7973
	UNIUYO	1.89835*	.67731	.005	.5658	3.2309
	UNIMAID	1.46708	.83988	.082	-.1853	3.1194
UNIUYO	ABU	-1.93708*	.69087	.005	-3.2963	-.5779
	UNILORIN	-1.70270*	.80772	.036	-3.2918	-.1136
	UNN	.39304	.75490	.603	-1.0921	1.8782
	UNILAG	-1.89835*	.67731	.005	-3.2309	-.5658
	UNIMAID	-.43127	.83028	.604	-2.0647	1.2022
UNIMAID	ABU	-1.50580	.85085	.078	-3.1798	.1681
	UNILORIN	-1.27143	.94819	.181	-3.1369	.5940
	UNN	.82432	.90362	.362	-.9534	2.6021
	UNILAG	-1.46708	.83988	.082	-3.1194	.1853
	UNIUYO	.43127	.83028	.604	-1.2022	2.0647

**. The mean difference is significant at the 0.05 level.*

Table 4.18 (b) reveals the Post hoc multiple comparisons (pair wise), between Kashim Ibrahim Library and Nnamdi Azikiwe Library, and between the Kashim Ibrahim Library and the University of Uyo Library with significant differences of .003 and .005 existing respectively in the type of ICT facilities available and used for the management of library information resources.

Different types of ICT facilities existed between the University of Ilorin Library and the Nnamdi Azikiwe Library with significant (P) value of .018 and between the University of Ilorin library and the University of Uyo Library with P value of .036. The Nnamdi Azikiwe Library has differences with Kashim Ibrahim Library at .003 level of significance and the University of Lagos Library at .003 level of significance. The University of Lagos Library has differences with the Nnamdi Azikiwe Library at .003 and the University of the Uyo library with P value of .005. The University of Uyo Library has differences with the Kashim Ibrahim Library with P value of .036 and the University of Lagos Library with P value of .005.

University of Maiduguri has no significant difference in the type of ICT facilities available and used for the management of library information resources with other university libraries studied. The reason being that in each comparison, its calculated P value is less than 0.05 alpha level of significance. It is, therefore, concluded that, the type of ICT facilities available and used in the Nigerian federal university libraries studied have significant difference. Therefore there is a need for library consortium in Nigerian federal university libraries in terms of ICT facilities availability and used.

Hypothesis two

It stated that "there is no significant difference among the Nigerian federal universities library staff ICT competences in the management of information resources in their libraries."

Table 4.19: Analysis of Variance (ANOVA) statistics on the differences among the staff competences in the management of information resources in the libraries studied

Variation	Sum of square	Df	Mean square	F. ratio	F. critical	Sig (P)
Between groups	.512	5	.102	1.485	2.60	0.194
Within groups	22.617	328	.069			
Total	**23.129**	**333**				

Table 4.19 above on the ANOVA statistics reveals that there is no significant difference among the federal university libraries studied regarding their staff competences in their management of information resources. This is because the ANOVA calculated P value of 0.194 is higher than the 0.05 alpha level of significance just as the calculated F value of 1.485is lower than the critical value of 2.60 at df 5 and 328. Consequently, the null hypothesis which stated that "there is no significant difference among the Nigerian federal university libraries regarding the competence of their staff in the management of their library information resources" is retained. This implies that there are no differences among the Nigerian federal university libraries regarding the competence of their staff in the management of their library information resources. Therefore librarians need to be competent at the international level in order to compete with librarians around the world and the changing technological age.

Hypothesis three

It stated that "the ICT facilities utilisation in the Nigerian federal university libraries have no significant effect on the management of their library information resources."

Table 4.20 (b): Correlations between ICT facilities utilisation and management of library information resources

Variables	N	Mean	Std. deviation	DF	Sig. (2-tailed)
ICT facilities utilisation	333	7.5940	3.73717	417	0.000
Management of library information resources	333	68.4294	17.60387		

**. Correlation is significant at the 0.05 level (2-tailed).

Table 4.20 (b) above on the outcome of the Pearson Product Moment Correlation (PPMC) statistics reveals the existence of a significant relationship between ICT facilities utilisation and management of library information resources. The reason for this outcome is that the calculated P value of 0.000 is less than the 0.05 alpha level of significance at the calculation index. Hence, the null hypotheses which stated that the ICT facilities utilisation in the federal university libraries studied has no significant effect on the management of their library information resources is rejected. This implies that ICT facilities utilisation in the Nigerian federal university libraries studied have significant effect on the management of library information resources. Therefore, the staff can perform their library operations and routines very effectively and the clients may have timely, current and relevant information within and outside the walls of the libraries.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter provides the summaries of the study, findings, conclusion, recommendations and suggestions for further studies.

5.1 Summary of the Study

The advent of ICTs has given librarians more opportunity to organisation and managers the information resources in their libraries better. Digital media have revolutionised information sources and advances in ICT and have dramatically enhanced information provision. The process of collection management in libraries and information centres has become very challenging and complex due to increase in the volume of information resources, the space to house the information resources and the increased numbers of students in the university libraries.

The purpose of this study is to examine the application of Information and Communication Technology (ICT) to management of library information resources in Nigerian Federal Universities particularly in the selected university libraries studied. The study identified the types of library information resources available in the Nigerian federal universities studied. The type of ICT facilities available and used for the management of library information resources and the library operations and routines where ICT facilities are applied in the management of library information resources in Nigerian federal universities have been determined. The study also attempted to ascertain the extent to which ICT facilities utilisation has affected the management of the library information resources in the Nigerian federal universities studied. The staff ICT competences in the management of library information resources was equally ascertained. The study had identified the challenges to ICT facilities utilisation in the

management of library information resources in Nigerian federal university libraries studied.

In order to achieve the objectives of the study, six research questions and three hypotheses were formulated and tested. The review of relevant literature revealed that the application of ICTs in the management of library information resources has indeed continued to ease and promote quick and timely access to information resources. Information and communication technology is the language of the 21st century. Thus, librarians need to continuously update their skills to be able to function maximally in an ICT environment

Survey research method was employed in conducting this study. The population of the study was the Nigerian federal university libraries. The respondents of the study were the management (technical) staff of the six (6) selected Nigerian federal university libraries. A total number of 336 samples was used for the study. The instruments used for data collection were the questionnaire, interview and observation.

The data collected for the study were presented and analysed using both descriptive and inferential statistics. Frequency distribution tables and percentages were used for the descriptive statistics, while ANOVA and PPMC were used to test the three formulated hypotheses.

5.2 Summary of Findings

5.2.1 Findings on descriptive analysis

Based on the data collected and analysed for this study, the following are the major findings of the descriptive analysis. It has been established that:

1. Books, newspapers, magazines, journals, maps, monographs, almanacs, dictionaries, were the major types of library information resources available and frequently used in the Nigerian federal university Libraries. However, video cassettes, cinematography film records and audio cassettes are not frequently used in the selected Nigerian federal university libraries.
2. Computers and Internet facilities are the ICT facilities available and used for the management of library information resources in the selected Nigerian federal university libraries. Electronic shelves, and computerised exit doors are not available and used in the libraries studied.
3. Cataloguing/classification and selection of library resources were the most ICT facilities application in library operations and routines. The ICT applications have improved the library staff productivity and facilitated the acquisition of library resources in the Nigerian federal university libraries studied. However, communication with staff, marketing of library information products and services are the least library operations and routines where ICT facilities are applied in the management of library information resources in the Nigerian federal university libraries studied. The University of Ilorin Library, Nnamdi Azikiwe Library and University of Uyo Library use KOHA ILS for the management of their information resources. The Kashim Ibrahim Library uses VIRTUA (VTLS) and the University of Lagos Library uses MILLENNIUM ILS

for the management of their library information resources. However, the Ramat Library is yet to use any of the ILS available.

4. Computers, Internet facilities, printers and scanners were found to be often used applied ICTs for the management of information resources in the libraries. Unfortunately, it was discovered that most of the Nigerian federal university libraries are not using computerised exit doors and Closed-Circuit Television (CCTV) surveillance security system to safe guard their information resources and staff despite the security challenges in the country.
5. Most of the library staff are competent in saving, retrieving and disseminating library information resources using the Integrated Library Software (ILS). However, some of the staff cannot use barcode sensor/reader in charging, discharging and securing the library information resources. Because some of the barcode readers were not functional and lack of barcode decoder through the exit doors contributed to the staff not knowing how to use the barcode reader.
6. Lack of ICT information resources management policies, power outage, occasional system failure, inadequate staff training opportunities and slow bandwidth (slow Internet connection) are some of the major challenges still facing the Nigerian federal university libraries studied in the management of their information resources electronically. However, low level of ICT compliance, customers' attitudes and technophobia are the least challenges to ICT facilities utilisation in the management of library information resources in the libraries studied. Therefore, ICTs have indeed enhanced the library operations and routines and some of these challenges can be reduced to the barest minimum to provide effective and efficient services to the library clienteles.

5.2.2 Findings on statistical analysis

The result of the hypotheses tested showed that:

1. There is significant difference among the Nigerian federal universities studied in the type of ICT facilities available and used for the management of their library information resources.
2. There is no significant difference among the Nigerian federal university libraries studied on the staff ICT competences in the management of information resources.
3. The ICT facilities utilisation in the Nigerian federal university libraries studied has a significant effect on the management of their library information resources.

Therefore, there is a need for library consortium in Nigerian federal university libraries in terms of ICT facilities availability and used. Librarians need to be competent at the international level in order to compete with librarians around the world and the changing technological age. And the staff can perform their library operations and routines very effectively for library clienteles to have timely, current and relevant information within and outside the walls of the libraries.

5.3 Conclusion

Based on the findings of this study, it could be concluded that Information and Communication Technologies (ICTs) have facilitated the management of information resources especially the areas of the selection, ordering acquisition, processing, storage and retrieval of library information resources; have improved staff competences, but have not enhanced users satisfaction and marketing of library and information products and services. Despite the fact that the university libraries are owned and funded by the Federal Government of Nigeria, they have different types of ICT facilities available and used for the management of their library information resources. However, lack of ICT information resource management policies, power outage, system failure, slow Internet connectivity and inadequate staff training in the development and use of the ICT facilities available are still factors affecting their applications in the management of library information resources in their libraries.

It is expected that the Nigerian federal university libraries can fully utilise the benefits of ICT facilities, especially, the digitisation of local contents, institutional repository, functioning websites and a policy on ICT information resources management. The challenges to ICT utilisation in the libraries if not properly handled will reduce their potentials to achieve the goals and objectives of their parent institutions especially through the provision of current and relevant information resources that are necessary to sustain their learning, teaching, research, community services and functions. It is time the Nigerian federal university librarians in collaboration with system librarians; the indigenous computer scientists come together and develop ICT facilities that can meet our environment and many other challenges facing the Nigerian federal university libraries than depending on foreign ICT facilities especially the ILS.

5.4 Recommendations

Arising from the findings and conclusion of this study, the following recommendations are made:

1. In view of the importance of current and relevant information resources in any library and the trend of digital environment, the Nigerian federal university libraries should acquire more of electronic information resources and online databases to meet their customers' needs at all time so that they can access the library information resources in media such as smart phones, personal laptops within and outside the library.
2. The university libraries should acquire relevant ICT facilities to enhance the management of their library information resources.
3. Due to the security challenges in the country, Nigerian university libraries should adopt the use of computerised exit doors and Closed-Circuit Television (CCTV) surveillance security system to safe guard their information resources and staff.
4. Human capacity building is crucial to the success of ICT utilisation and effective service delivery. There is a need, therefore, for the library staff to undergo local and international training on ICT skills and the development of indigenous integrated library software that will meet the Nigerian federal university library's needs and the staff should endeavour to utilise the knowledge they got during training to develop their libraries by training others and creating new innovation to enhance effective and efficient library information services delivery.
5. The Ministry of Education and universities management should increase their budget to libraries to enable them provide and maintain their ICT facilities.

Nigerian university libraries should solicit for grants and ICT infrastructures from local and international donor agencies, like PTDF, TET fund, MacArthur foundation, MTN foundation etc. and should utilise the funds according to specification. Alternative sources of energy like the solar system and inverter should be provided. Also, the library staff should develop interest in embracing new technologies to enable their parent institutions achieve their goals and objectives of learning, research, teaching, other functions and activities.

6. There is the need for the Nigerian university libraries to partner with other universities abroad for staff exchange programmes that will improve and widen the knowledge and skills of their staff in the management of information resources.
7. There should be a written ICT facilities library information resource management policy to guide the university libraries on what information resources to acquire, which ICT facilities to use in management of their information resources, allocation of budget to more online and e-resources where users can be reached any time, regardless of location and number of users at a time and the policy should include how the library information resource management team will be trained on how to utilise and maintain ICT facilities within the library. The policy should be reviewed at least every two (2) years to meet the current trends in technological change, and it should be distributed /communicated to all library staff.
8. With some of the long term ICT management challenges still facing the Nigerian federal university libraries studied, library should use Open-source library information management software to reduce cost of subscriptions and software maintenance; there is a need for ILS such as Koha, Greenstone and the

use of cloud-based library management system such as Libramatic, Aura software and librarika. But most importantly development of Nigeria-based ILS.

9. To meet the need of library users in this technological age and making library information resources available, there is a need for open access repositories for scholarly and/or published digital content in Nigeria university libraries, DSpace content management system and document management system should be applied to management of library information resources. DSpace repository software is used as a long-term storage, access and preservation of digital content. The DSpace platform enables libraries to: capture and describe digital material using a submission workflow module or a variety of programmatic ingests options distribute an organisation's digital assets over the web through a search and retrieval system preserve digital assets over the long term.
10. There is a need for library consortium in Nigerian federal university libraries in terms of ICT facilities availability and used.

5.5 Suggestions for Further Study

1. This study only covers the application of Information and Communication Technologies (ICTs) to management of library information resources in selected Nigerian federal university libraries. Hence, there is a need for more comprehensive study of the subject matters to cover both state and private university libraries in Nigeria.
2. There could be a study on the ICT facilities utilisation in the provision of library services in Nigerian federal university libraries.
3. Assessment of ICT facilities utilisation to the management of human and materials resources in Nigerian federal university libraries.

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APPENDIX

QUESTIONNAIRE ON APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) TO MANAGEMENT OF LIBRARY INFORMATION RESOURCES IN SELECTED NIGERIAN FEDERAL UNIVERSITY LIBRARIES

Department of Library and Information Science
Faculty of Education
Ahmadu Bello University, Zaria
October15th, 2012

Dear Sir/Madam,

I am a postgraduate student in the above named department carrying out a research on the "Application of Information and Communication Technology (ICT) to Management of Library Resources in selected Nigerian Federal University Libraries"

Your library has been selected for the study. I therefore urge you to kindly assist to respond according to the questions raised in the questionnaire. Your responses will strictly be used for research purpose only

Thank you in anticipation for your cooperation.

Fidelia Mbowheing WHONG (Mrs.)

Mobile numbers: 234-803-592-762-4

234-807-541-805-8

E-mail: fideliawhong@yahoo.com

SECTION A: Demographic Information

Instruction: Kindly tick the appropriate box [ ]

1) Gender (1) Male [ ] (2) Female [ ]
2) Name of Institution:
    1. ABU [ ]
    2. UniIorin [ ]
    3. UNN [ ]
    4. UniUyo [ ]
    5. Unilag [ ]
    6. Unimaid [ ]
3) Which section of the library do you work?
    1. Resources Development Division (collection dev.) [ ]
    2. Resources Processing Division (Cat& class) [ ]
    3. Customer Services Division (circulation) [ ]
    4. ICT division [ ]
    5. Other (s) (please specify) ----------
4) What is your highest educational qualification?
    1. O' Level [ ]
    2. OND [ ]
    3. HND [ ]
    4. DLS [ ]
    5. BLS [ ]
    6. MLS [ ]
    7. PhD [ ]
    8. Others (please specify)----------
5) How long have you been working in the library?
    1. 1-5 years [ ]
    2. 6-10 years [ ]
    3. 11-15 years [ ]
    4. 16-20 years [ ]
    5. 21 years and above [ ]
6) What is your designation
    1. Library attendant [ ]
    2. Assistant library officer [ ]
    3. Library officer [ ]
    4. Higher library officer [ ]
    5. Assistant librarian [ ]
    6. Librarian II [ ]
    7. Librarian I [ ]
    8. Principal librarian [ ]
    9. Deputy university librarian [ ]
    10. University librarian [ ]
    11. Others (please specify) [ ]

7) How long have you been involved in the management of library information resources in your library?

1. 1-5 years [ ]
2. 6-10 year [ ]
3. 10-15 years [ ]
4. 15-20 years [ ]
5. 20 years and above [ ]

SECTION B: **Type of library information resources available in Nigerian federal university libraries**

2) Please tick [√] to indicate the types of library information resources available in your library, (please tick as many)

a) Printed Books [ ]
b) Newspapers [ ]
c) Magazines [ ]
d) Journals [ ]
e) Maps [ ]
f) Monograph [ ]
g) Almanacs [ ]
h) Encyclopaedias [ ]
i) Dictionaries [ ]
j) Cinematograph film records [ ]
k) Audiocassettes [ ]
l) Video cassettes [ ]
m) Television [ ]
n) Microfiches [ ]
o) Compact disk read only memory [ ]
p) DVDs [ ]
q) Online Databases [ ]
r) Electronic books [ ]
s) Internet [ ]
t) Electronic Journals [ ]
u) CD-ROM databases [ ]

3) How frequent are these library information resources used in your library?

Information resources	**Very frequent**	**Frequent**	**Undecided**	**Rarely frequent**	**Not frequent**
Printed Books					
News papers					
Magazines					
Journals					
Maps					
Monograph					
Almanacs					
Encyclopaedias					
Dictionaries					
Cinematograph film records					
Audiocassettes					
Video cassettes					
Television					
Microfiches					
Compact disk read only memory					
DVDs					
Internet					
Online Databases					
Electronic books					
Others (please specify)					

Section C: Type of ICT facilities available for the management of library information resources in the Nigeria federal university.

4) Please tick [√] to indicate the type of ICT facilities available for the management of information resources in your library

a. Scanners [ ]
b. Computers [ ]
c. DVD [ ]
d. CD [ ]
e. Digital cameras [ ]
f. Barcode sensors/readers [ ]
g. Internet facilities [ ]
h. Telephones [ ]
i. Memory card [ ]
j. Flash drives [ ]
k. Radio [ ]
l. Library website [ ]
m. Electronic shelves [ ]
n. Computerised exit doors [ ]
o. Others (specify)---------- [ ]

5) Indicate the library functions where the type of ICT facilities are applied for the management of information resources in your library.

Please tick as appropriate.

a. Acquisition of information resources [ ]
b. Processing of information resources [ ]
c. Storing of information resources [ ]
d. Retrieval of information resources [ ]
e. Dissemination of information resources [ ]
f. Preservation and conservation of information resources [ ]
g. Relegation/ weeding of information resources [ ]
h. Serial control [ ]
i. inter library loan [ ]
j. Others (please specify)..... [ ]

6) Please indicate the extent to which the applications of ICT facilities affect the management of library information resources in the library using the following responses. **SA** (Strongly Agreed) **A** (Agreed) **UD** (Undecided) **D** (Disagreed) **SD** (Strongly Disagreed)

Library resources management	**SA**	**A**	**UD**	**D**	**SD**
It has improved staff productivity					
It enhances users satisfaction					
It facilitates acquisition of library resources					
It is instrumental in expanding the library e-resources					
Through copy-catalogue, ICT has radically enhanced processing of library resources					
It facilitates registration of library users, charging and discharging of library information resources					
It enhances marketing of library and information products and services					
It has enhanced the preservation of library resources					
It has made access to library information resources management more easier than with the manual system					
It facilitates quick retrieval of information resources					
It helps in ordering of information resources					
It enhances the preservation of information resources					
It has made library information resource management routines easier					
has increased the numbers of users in the library					
Processing of library information resources take less time using the automated library application software					
It has eased the production of library catalogue and users can access information resources easily through the library OPAC					
Users can easily access the library database and IDRs					
Application of ICTs in cataloguing/classification system of a library and information centre is most successful due to its speed, accuracy and reliability than the manual system					
The library application software in the library allows users to easily know if certain information resource has been issued out, to whom and when it is due to be returned					

7) To what extent are these ICT facilities useful for the management of library information resources in your library?

Item	**Very useful**	**Useful**	**Undecided**	**Rarely useful**	**Not useful**
Scanners					
Computers					
DVD					
CD					
Digital cameras					
Barcode sensors or readers					
Telephones					
Internet facilities					
Memory card					
Printers					
Television					
Electronic shelves					
Computerised exit doors					
CCTV surveillance security system					

8) Please indicate how ICT facilities applications have improved the management of information resources in your library. *Please tick as appropriate*, **HI**= Highly Improved; **I**= Improved; **UD**= Undecided; **RI**= Rarely Improved; **NI**= Not Improved

Extent of ICT facilities utilisation in the library	**HI**	**I**	**UD**	**RI**	**NI**
Selection of information resources					
Ordering of information resources					
Acquisition of information resources					
Processing of information resources					
Storing of information resources					
Retrieval of information resources					
Dissemination of information resources					
Preservation and conservation of information resources					
Marketing of library and information products and services					
Registration of library users					
Storage of staff record					
Communication with staff within and outside the library					
Others (please specify).....					

Section D: library operations and routines where ICT facilities are applied in the management of library information resources in Library

9) Please indicate which library operation and routines are ICT facilities apply in your library.

library operation and routines	**F**
Selection of library resources	
Ordering of information resources	
Use of publisher catalogue	
Purchasing of information resources	
Payment for information resources	
Cataloguing /classification of information resources	
Charging and discharging of information resources	
Library information resources statistics records	
Marketing of library and information products and services	
Registration of library users	
Library Staff/Students daily statistic records	
Entrance/ exit to the library security devices	
Fire and smoke detection facilities	
Communication between library staff	
Surveillance of information resources on the shelves	
Surveillance of use of information resources	

10) How often do you utilise the following ICT facilities in the management of library information resources in your library?

Item	**Very often**	**Often**	**Undecided**	**Rarely often**	**Not often**
Scanners					
Computers					
DVD					
CD					
Digital cameras					
Barcode sensors or readers					
Telephones					
Internet facilities					
Memory card					
Printers					

11) Please indicate which of the library integrated software are you using in your library now?

1. CDS/ISIS
2. X – LIB
3. TINLIB
4. GLAS
5. ALICE FOR WINDOWS
6. Libsys
7. Virtua
8. Millennium
9. Koha
10. Others (please specify)----------

12) Which of the following library operation and routines does your library software perform?

a) Acquisition
b) Cataloguing/classification
c) OPAC
d) Circulation
e) Serial control
f) Reporting

13) Which of the following communication media used to communicate with the library stakeholders in your library?

a. Telephone
b. e-mail
c. Social media e.g face book, twitter, blog etc
d. Using teleconferences
e. Others (please specify).....

Section E: Extent of ICT facilities utilisation in the management of library Information resources in Nigeria federal university

14) Please indicate the extent to which the following ICT facilities are applied for the management of library information resources.

Item	**Very often**	**Often**	**Undecided**	**Rarely often**	**Not often**
Scanners					
Computers					
DVD					
CD					
Digital cameras					
Barcode sensors or readers					
Telephones					
Internet facilities					

Memory card					
Printers					
Electronic shelves					
Computerised exit doors					
CCTV surveillance security system					

Section F: Competence of library staff in application of ICT facilities in the management of library information resources

15) Please indicate how your ICT competence enables you to perform the following library information resources management operation in your library. Use the following options: **SA** (Strongly Agreed) **A** (Agreed) **UD** (Undecided) **D** (Disagreed) **SD** (Strongly Disagreed)

Staff competence	**SA**	**A**	**UD**	**D**	**SD**
I can select, order and acquire library information resources online through the online publisher catalogue					
I can catalogue/classify information resources with the use of library application software					
I can save, retrieve and disseminate library information resources with the library application software					
I can scan information resources in the library using scanners					
I can digitise library information resources available in the library					
I can create backup of information resources into the storage devices like DVDs, CDs, Memory card, flash drive e.t.c.					
I can use digital cameras to digitise library information resources					
I can use barcode sensor or reader in securing the library information resources.					

16) Please indicate your level of satisfaction with the application of ICTs facilities in the management of the library information resources especially in the following areas.

Extent of ICT facilities satisfaction	**Very satisfied**	**Satisfied**	**Undecided**	**Not very satisfied**	**Not satisfied**
Selection of information resources					
Ordering of information resources					
Acquisition of information resources					
Processing of information resources					
Storing of information resources					
Retrieval of information resources					
Dissemination of information Resources					
Preservation and conservation of information resources					
Marketing of library and information products and services					
Registration of library users					
Storage of staff record					
Communication with staff within and outside the library					
Others (please specify).....					

Section G: Challenges of ICT facilities utilisation in the management of library resources in the Nigerian federal university libraries

17) Which of the following challenges do you encounter in ICT utilisation to the management of library resources in your library? *Please tick as applicable*

a. Inadequate funding [ ]
b. Shortage of manpower [ ]
c. Power outage [ ]
d. Occasional system failure [ ]
e. Staff attitude towards ICT use [ ]
f. Inadequate staff training opportunities [ ]
g. Poor infrastructural facilities [ ]
h. Skeletal level of ICT compliance [ ]
i. Customers attitude [ ]
j. Cost of ICT facilities [ ]
k. Poor maintenance of ICT equipment [ ]
l. Frequent changes in technology [ ]
m. Lack of ICT policies [ ]
n. Technophobia [ ]
o. Data base subscription [ ]
p. Poor and insufficient Bandwidth for effective use by the library [ ]

Thank you and God bless.