

**MANAGEMENT OF DIGITISATION PROJECTS IN NIGERIAN
UNIVERSITY LIBRARIES**

BY

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DECLARATION

I declare that this thesis titled “Management of Digitisation Projects in Nigerian University Libraries” has been written by me under the supervision of Professor Zakari Mohammed and Dr Ezra S, Gbaje. 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 any form of degree or Diploma at any University.

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CERTIFICATION

This is to certify that this thesis titled “Management of Digitisation Projects in Nigerian University Libraries” by Mohammed Mohammed Kpakiko has met the requirements governing the award of the degree of Masters in Information Science of Ahmadu Bello University, Zaria and is hereby approved for its contributions to knowledge.

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DEDICATION

This work is dedicated to Allah Almighty and to my family members for their support and encouragement.

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First and foremost, my sincere gratitude goes to Almighty Allah for the blessings, mercy and good health bestowed on me throughout this academic venture. And to my two supervisors, Professor Zakari Mohammed and Dr Ezra Shiloba Gbaje, words are not enough to express my heartfelt gratitude for creating time despite their tight scholastic schedules to go through every single line of this research work and offered useful suggestions from their wealth of experiences to make this scholarly rich. May Allah Almighty reward you abundantly.

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ABSTRACT

The study Management of Digitisation Projects in Nigerian University Libraries was conducted to assess how digitisation projects are being managed in Nigerian University Libraries. This is because efforts are being put forward to improve on the information resource handling and management from being manually driven to electronic driven especially in Libraries and Information centers where information bearing mediums were originally in printed formats. And as such a particular library could not participate effectively in the information sharing methods that can be facilitated by digitisation. Four objectives were achieved by formulating and answering four research questions for the study. The objectives were to find out the skill sets available for managing digitisation projects in Nigerian university libraries, identify the types of information resources that are being digitized, find out the criteria that are being used for the selection digital asset management software and to assess digital preservation policy and strategies that are employed in the management of digitisation projects in Nigerian university libraries, Survey method was adopted for the study. The research instruments used to collect data for the study were questionnaire and interview. Since the whole population for the study is 40, all of them were used. That is 8 subjects from Ahmadu Bello University, Zaria, 8 from University of Jos, 6 from Covenant University, Ota, 11 from University of Nigeria, Nsukka and 7 from Federal University of Technology, Akure. Data were presented in frequency tables and percentages. Analysis and discussions were made to each table. Findings of the study revealed that majority of staff that engaged in digitisation project management are librarians who possess the ability to use software packages like Abbyfine reader, Omnipage and PDF respectively. Again the finding revealed that all universities where digitisation project is going on emphasize mostly on PhD dissertations, Masters theses and university Journal articles whose copyright have been obtained. That many universities consider open source criteria, functionality, interoperability, scalability and extensibility as criteria for selecting digital asset management software, principle statement, contextual link, preservation objectives and identification content were the major policy elements The study concluded that inadequate staff skill sets possessed by the digitisation staff and the digitisation management stakeholders impedes digitisation project management best practices in Nigerian university libraries. Based on these findings several recommendations were made such as librarians, system analysts and archivists should be awarded short and long-time training or courses to acquire more skills, University libraries in Nigeria should focus their digitisation project on local contents such as dissertations, theses, journal articles and university journals. They should be committed to a substantial investment in keeping pace with open source digital asset management software for managing digitisation projects and there is need for a written policy document that will help to focus the digitisation project management.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Recent development in the world of information resource handling and management have moved from being manually driven to electronic driven especially in Libraries, Information centers, Museums and Archival centers where information bearing media were originally in printed formats. The need to source and present information for academic purpose is a daily routine for university libraries all over the world. Digitisation of library collections is a common phenomenon amongst academic and research institutions because it improves access and preservation of information resources. Libraries are making effort to convert text and images of their local and rare materials into digital formats so that they can be available to a wider audience. Gbaje and Bot (2009) stated that when print collections in the library are transformed into electronic and online resources, they reduce the need for library customers to physically visit the library building to access them.

Asogwa (2011) asserted that traditionally, librarians in academic institutions today make use of modern technologies to provide quicker, accurate and more sophisticated information services to customers. In Nigerian university libraries, the picture has rapidly changed due to the ability of librarians to make effective use of computer and telecommunication technologies to create, manage and disseminate digital contents across the globe. Creation of digital materials has become an emerging practice of today's information professionals. This is made feasible by high processing speed and large storage media capability of the computers as well as the power of the Internet to transmit information globally provided greater opportunities and challenges to librarians and information professionals. Technology has made information traditionally provided in paper to be digitised, preserved and made available and accessible to customers in electronic format.

Akintunde (2007) postulated that, the vision of any library that wants to go digital is the total digitization of its records and resources for easy access in electronic format with the goal to create and enhance access to electronic documents. The demands for more and more digital content in an ever-increasing electronic world as a result of its flexibility and its multimedia nature paved a way where access to information has become paramount in this millennium.

Urban (2002) in Akintunde (2007) stressed that the purpose of digitising library material is for increase in access to resources, preserving the original through reduced handling and for the building of a digital library. Other reasons for digitisation of library collections according to Akintunde (2007) include:

- i. Increase access because of high demand from the customers and the desire by the library to improve access to a specific collection;
- ii. Improve services to an expanding customers group by providing an enhanced access to the institution's resources;
- iii. Reduce the handling and use of fragile or heavily used original material and creating a "back up" copy such as brittle documents;
- iv. Development of technical infrastructure and staff skill capacity;
- v. To create a virtual collections that permit sharing partnerships with other institutions to increase worldwide access;
- vi. Reduction of the volume of the printed material and necessary operational space for its storage;
- vii. Reduction of the cost for acquiring and maintaining the printed material;
- viii. Faster search and access to the required information through a terminal;
- ix. Multi-user access to the same information simultaneously through a terminal and among others.

In recognition of the significance of digitisation Durodolu (2010) asserted that university libraries in Nigeria are digitising their collections in order to contribute their own quota to the world information resource and making such resources available electronically for a wider access. Digitisation offers a way of preserving aging materials which could have otherwise gone out of use. Records such as dissertations, theses, journal publications, articles, public records and examination records amongst others are being digitized, printed, bound and placed back on shelves. In a similar opinion Gbaje (2010) remarked that when the materials are uploaded on the web it increases a library's visibility as the library's customers all over the world access the material. Fatoki (2005) pointed out that digitisation presents for improving the local content and improving indigenous knowledge which is abysmally low presently. Through digitization, visibility of Nigerian research and researchers, accessibility would be greatly improved, resulting in enhanced utilization of research outputs which has positive economic, social and industrial implications for the nation.

The concept 'management' is not fixed, but changes according to time and circumstances. Terry (2000) defined management as a distinct process consisting of planning, organizing, directing and controlling in order to determine and accomplish the objectives by the use of human beings and other resources. Carlisle (2009) on the other hand defined management of digitisation project as the process by which the elements of a group are integrated, coordinated and utilized so as to effectively and efficiently achieve digitisation objectives.

Rane (2007) remarked that every university libraries management has developed and implemented its own digitisation management concepts in order for it to run smoothly and accomplish the vision, goals and objectives it has set forth. As such, the basic functions of digitisation management connotes with the term management which include planning, organizing, directing and controlling peculiar to all digitisation projects. According to

Rosette-Tavares (2008) digitisation projects management principles consist of the following factors:

- Increase in efficiency: this principle provides guidelines to the digitisation project manager for handling digitisation complex problems more effectively. It also facilitates digitisation project managers in performing their duties smoothly.
- Achieving social objectives: digitisation project managers develop spirit of co-operation and co-ordination among staffers. It helps in the optimum utilization of social sources. It eliminates unnecessary wastage of resources.
- Generation of sound understanding: digitisation project management principles generate sound understanding of the difficult problems. Digitisation project manager applies scientific approach for the solution of the complex problem.
- Directing areas of training: this principle of digitisation project management identify the present and prospective areas of management and make significant finding in the areas that require training program.
- Guiding research work in digitisation programme management: the digitisation project management principles needed to make guidelines which require necessary modifications with the changing situations.

Digitisation, according to Hughes (2004), is “the process by which physical or printed contents is converted into a sequence of 0s (zeros) and 1s (ones) put into a binary code to be readable by computer.” It is the transformation of analogue information from whatever form and from whatever support to digital code using computer technologies. Cornell University Library (2001) identified physical information contents to include “electronic snapshots taken of a scene or photographs, films, manuscripts, printed texts and artworks scanned from documents.” Digitisation process involves conversion of historical materials from formats that can be read by people to a format that can be read only by machines. It is a process of

taking a physical object and taking photographs of or scanning the item and transferring the photographs into a digital device. It is also a process of archiving born digital materials into the institutions collections.

The British Library (2012) defined digitisation as a process of selecting materials, scanning them and saving the scanned document into computers. The scanned document could be saved in different formats such as JPEG, MPEG, MP3 or MP4, TIFF, GIF, PNG and PDF. The documents could also be cropped or trimmed before they are permanently saved and made available for use on the network by sharing the folder or placing on web site. They could further be written to CDs or DVDs for preservation and usage by other libraries that have no internet access (Asogwa, 2011). One great advantage of digital resources has over print collection is that digital documents may be read, reformatted, compressed, transferred and retrieved over computer networks. Digitised resources can be accessed over the internet simultaneously by millions of customers world over without degradation and can be copied unlimited times. Fabunmi, Paris and Fabunmi (2006) cited in Eke (2011) asserted that some of the aims of digitisation is to improve access to library resources. By digitizing library collections, information will be accessible to all instead of a group of researchers.

Many library, archive and information centre managers in Nigeria are in dilemma concerning decision of whether to digitise in-house or to outsource. Joint Information Systems Committee (2012) recommended that it is appropriate to ask this vital question at the planning stage: should we be doing the digitisation in-house or should we be outsourcing? Careful consideration should be given to this question as it significantly changes all further project development.

According to Joint Information Systems Committee (2012) there are two types of digitisation services as follows:

1. In-house digitisation: this involves carrying out the digitisation activities by the staff members of the library who have passed through digitisation training. It may be cheaper to digitise in-house if the contractor has labour saving technology or is able to achieve good economies of scale

Someone in-house will require a working knowledge of the digitisation process in order to work in line with quality assurance. Digitising in-house may be more appropriate if you already have the skills and facilities, or if you would like to develop them for future endeavours. Digitisation work in-house can at first seem daunting but it does allow for the development of valuable staff skills and ensures project sustainability. Advantages of in-house digitisation include:

- i. Learn by doing;
- ii. Define requirements incrementally rather than upfront;
- iii. Retain direct control over entire range of imaging functions;
- iv. Provide for security, proper handling, and accessibility to materials;
- v. Ensure primacy of library/archives requirements and
- vi. Maintain consistent and high quality assurance requirements.

Cornell University Library (2001) identified the following disadvantages of in-house digitisation to include:

- i. Large investment and ramp-up time;
- ii. No set per-image cost;
- iii. Range of staffing expertise required;
- iv. Inadequate ICT infrastructure;
- v. Limited production capabilities and facilities;
- vi. Poor funding.

2. Outsource digitisation: this involves contracting out the digitisation work to a specialized company with experience and expertise in digitisation project. Outsourcing may only make more sense for those projects that do not have a great amount of material to digitise. However, such services do not come cheap because you need to create and monitor the service level agreement and the contractor may not have had direct experience of carrying out the intended work. It may not always be possible or desirable to allow some materials out of their natural environment such as valuable, rare and fragile materials. Some of the advantages of outsourcing include:

- i. You don't have to find the money to buy and maintain expensive equipment
- ii. You don't have to recruit new staff or train existing staff
- iii. You don't have to find large spaces for people and equipment to be housed to undertake the project
- iv. You don't have to develop in-depth knowledge of digitisation
- v. The contractor may be able to achieve a better quality result if they have high-end equipment

JISC (2012) identified the following disadvantages of Outsourcing:

- i. You don't develop institutional capacity or knowledge in digitisation techniques
- ii. There are risks associated with external parties to deliver digitised content of sufficiently high quality
- iii. The contractor may not be able to accommodate your timescale
- iv. Contractor may charge you more than it would cost to digitise in-house
- v. You will still need to develop your internal quality control checking to ensure the quality of the contractor's work before you sign the invoice
- vi. There may be some risk of materials if it is going off-site when dealing with external digitisation services

Various information resources are being selected for digitisation in university libraries. Texas History Portal (2007) brought to light the range of digitised materials in academic libraries to include; dissertations, theses, journals, weekly news papers, historical materials, among others. There is also the Higher Education Resources On-demand (HERON) project which provides a national service for the UK Higher Education Sector for copy right clearance, digitisation, delivery of electronic articles, book extracts, build up a national database and resource bank of electronic texts (SCONUL, 2000).

According to Harry Ramsom Centre Project (2012) many digitisation projects focus on different resources for three purposes namely:

1. Research-oriented resources which provide information for specialized researchers, whether professional, academic or others with access to unique database with similar capacity as a library catalogue or an archival finding aid.
2. Education oriented resources that can be used by lecturers and students typically include all the selected materials by the curriculum.
3. Outreach resources are digitised purposely for entertaining the general public. These often take the form of online exhibits where items are selected specifically for their ability to document a specific subject.

Electronic resources are immensely appealing to nearly everyone concerned with education and scholarship. In reality, the creation and maintenance of electronic resources require funding, skill, and ongoing commitment. Hazen, Horrell & Marill-Oldham (2009) similarly stated that in creating digital products, the decision making process must be well organized and its results must be fully in consonance with the university's goals and objectives. Preparing for digitisation is a complicated process. It involves the processes of planning, document preparation, conversion to presentation and archiving which

encompasses a range of procedures and technologies with widely varying implications and cost.

According to Federal Agencies Digitisation Guidelines Initiatives (2009) there is no single approach to digitisation and metadata creation/management for all digitisation projects. This is because type of records, media type, quality and condition of records, nature of information, and preservation risk level amongst others determine the complement of approaches for digitisation and metadata requirements that are matched on the hardcopies. The specific work process should be tailored to each individual digitisation effort due to differences in the capture and the media type, the extent and nature of existing descriptive or bibliographic information and maximum efficiency and cost-effectiveness of the existing copies. If there is pre-existing descriptive or bibliographic information (metadata) in either hard copy or electronic form, that is related to candidate materials, it should be collected and brought into the digitisation work process as early as possible, ideally in the pre-digitisation phase.

These activities according to Kamdar (2012) are series of activities for all types of hardcopies (manuscripts, books, still photography, maps, plans, artifacts, audio, video, motion pictures, aerial photography amongst others). Asogwa (2011) remarked that the success of digitisation projects in Nigerian university libraries do not depend completely on the expensive technology, but rather on proper planning for the project. This is because technology alone does not drive digitisation project, but its goals after which appropriate technology can be selected. Asogwa (2011) identified the following factors that must be considered when embarking on digitisation project in Nigerian university libraries.

i. Planning: this involves forecasting or preparing for future events. Planning for digitisation project begins by identifying and establishing clear objectives. This is done by asking series of questions which include: Are the library materials to be digitized frequently consulted?

This means that high demand for records may justify digitisation. Can the materials selected for digitization be safely digitised? How can library collection in an institutions repository be provided in electronic format? What are the steps for digitisation?

The Pennsylvania Digital Library (2008) reported that planning is the first important task university libraries digitisation project strategic plan must consider. It involves identifying the university's vision, goals and objectives, values and missions as basis for all future decisions. Other factors include identifying the stakeholders within the institution that is staff, contributors, volunteers and end users. Gaining their support by finding out what is important to them will increase the potential of success. Consider the funds needed to start and sustain the project by establishing a budget to major cost components such as staff time, training, documenting and reporting, operations and supplies, software and hardware, maintenance, conversion cost and data storage costs. Search for available grants and donations from organizations that can fund the project.

ii. Setting goals: the project objectives should be clearly identified as well as obtaining the technology and resources necessary to achieve the goals. Long-term costs of a digitisation capacity must be maintained and supported by the university and other stakeholders in the project. University libraries that wish to embark on preservation in digital form must also commit to a substantial investment in keeping up with technology.

iii. Develop digitisation policies: this is an operational guiding principles covering selection of materials that add value for digitisation, sufficient value of the materials to ensure interest for digitisation. Policy should also cover access enhancement and increase use of materials, the right and permission for electronic distribution, the goals that will be met by digitisation, the institutions expertise on digitisation project management and technical infrastructure adequate needs.

iv. Legal/Copyright Law: - materials selected for digitisation should be subjected to a clear understanding of copyright law and rights of ownership (Zulu, 2008). Physical ownership does not mean that an institution owns the rights to reproduce it. Copyright status of the original materials is a very important selection criterion for digitization. Universities libraries should not embark on digitisation of any material they do not have rights to digitise or do not have the means to manage the digital assets.

v. Establishing Selection Criteria:- selecting materials for digitisation employs standard library selection criteria such as value, significance to the overall collections, customer demand and interest, available and fragility of the original (Asogwa, 2011). The UNESCO, IFLA and ICA Guidelines for Digitisation Projects (2002) postulated that digitisation projects should be customer driven or based on high demand for access. It is therefore, not advisable to digitise records that are not in demand by patrons.

vi. Verification: when materials are selected for digitisation, the next activity that follows is to verify or ascertain whether digital copies of such materials already exist. Conventional development policies always try to avoid re-digitisation unless the earlier copies were digitised using old technology. In addition, if the copyright permission to digitise resources was for internal use only and the university concerned wish to go on wider area network such as the internet or World Wide Web, there is the need to obtain permission within that context of the copy right act.

vii. Metadata: this simply means information about information that describes digitised records, information about the university's file, databases that have detail information about the digital contents, technical environment in which digital files was created, equipments used, the software, operating system and enables customers to find, manage and use the records. It is a representation of total historic record of the digitised objects and the totality of information about the digitisation project. For universities libraries, good metadata is a key

component of developing digital records that are usable and useful for long-term. Good metadata makes it possible to catalogue and effectively present digital information to the public and also helps to identify the work, who creates it, migrated or re-formatted it (Jones, 2001 cited in Asogwa, 2011).

viii. Develop digitisation project:- Developing digitisation project, you need to evaluate the necessary and available resources. These resources should be based on the customer community, define the primary and secondary user groups upon which the selection will be based. Evaluate staff skills, training needs and resource availability against the digital collection management system selected for use. Weigh also the hardware and software needs and develop a marketing communication plan.

ix. Digitise Materials:- Once the foundation has been laid by working through the planning tasks, then, the next activity is to digitise primary source materials like journal publications, articles, theses, dissertations among others. Examine first the collections selected for scanning and decide on the minimum metadata elements needed to describe them. Metadata can be simple or complex which may include one of the following: MARC, METS, EAD and Dublin Core. Digitisation specifications such as resolution, file formats and image types should be developed or alternatively the materials can be sent to a service provider that specializes in digitisation.

1.2 Statement of the Problem

Management of digitisation is a challenging project which university libraries in Nigeria are struggling to venture into. Daniel (2002) in Obaseki & Momoh (2012) asserted that digitisation projects in Nigerian university libraries are leap frogging and are far cry to realization of its benefits. There is available manpower, materials and equipment to carry out the digitisation work but only very few of on-going digitisation projects in Nigerian

university libraries ever get to implementation stage. Even those that go beyond the implementation stage are not often sustained.

According to Information Management Resources Ltd (2010) management of digitisation projects in Nigerian universities is often difficult as a result of inadequate planning for digitisation projects, insufficient funds, inadequate ICT skills by the librarians, poor digitization policy, inadequate knowledge of digitisation management best practices, inadequate technological infrastructure such as high speed computers, scanners and network facilities, ignorance of digitisation project itself, inadequate digital preservation techniques among others were identified as bane to successful implementations of digitisation projects in Nigerian university libraries. Hence management of digitisation projects is a process that requires a combination of staff and customers with different areas of expertise.

1.3 Research Questions

This study will provide answers to the following research questions:

1. What are the skill sets available for managing digitisation projects in Nigerian university libraries?
2. What information resources are being digitized in Nigerian university libraries?
3. What are the criteria being used to select digital asset management software for digitisation projects in Nigerian university libraries?
4. What management policies and strategies are emphasized in the management of digitisation projects in Nigerian university libraries?

1.4 Objectives of the Study

The purpose of the study includes the following:

1. To determine the skill sets for managing digitisation projects in Nigerian university libraries

2. To identify the types of information resources that are being digitized in Nigerian university libraries
3. To determine the criteria that are being used to select digital asset management software for digitisation projects in Nigerian university libraries
4. To assess management policies and strategies that are employed in the management of digitisation projects in Nigerian university libraries

1.5 Significance of the Study

Several research studies have been conducted on digitization of records and archives in Nigeria. However, less has been done on management of digitisation projects in Nigerian university libraries. The finding of this study will benefit Universities under study where digitisation projects are going on.

The study would create more awareness and consciousness on how to manage the challenges under study that can lead to adequate and satisfactory management of digitisation projects in Nigerian university libraries in order to promote quality teaching, learning, showcasing the research output to the world and for possible webmetric ranking. When libraries indulge in digitisation of information resources, wastages on frequent technology migration (hardware and software), manpower recruitment and waste of funds will be minimized and saved for further growth and improvement of the libraries.

Another significance of the study is that, digitisation failure and unsuccessful digitisation projects in Nigerian universities would be averted in these universities as well as other universities in general. Hence, it will create more awareness and consciousness on how to manage challenges under study. This will challenge system/IT librarians to put their technical skills in practice in order to make themselves and the project successful and progressive. Also, librarians are challenged to acquire ICT skills that will enable them adequately manage electronic access points in the library. In addition, further contribution of

the study to knowledge is that, it will enlighten the digitisation stakeholders to some of the challenges that can make the digitisation unsuccessful. The study will also contribute to the body of knowledge in Nigeria and the world at large especially to the scholars and researchers in Library, Archival and Information Science.

1.6 Assumptions of the Study

The study is based on the assumption that:

1. The available skill sets for digitisation and types of information resources digitised will provide information far beyond the limits of print information resources in the library.
2. Use of high speed equipment and adoption of appropriate policies and strategies will enhance effective management of digitisation projects in Nigerian University Libraries.

1.7 Scope of the Study

The study covers digitisation of local contents in the following university libraries in Nigeria that have registered with the opendoar institutional repository website as at the time of this study. They are:

- i. Ahmadu Bello University, Zaria – Kaduna State
- ii. University of Jos, Plateau State
- iii. Covenant University, Ota - Ogun State
- iv. University of Nigeria, Nsukka - Enugu State
- v. Federal University of Technology, Akure – Ondo State

1.8 Operational Definition of Terms

For an understanding of the context of terms used in this study, the following are defined:

Management of Digitisation Projects: Management of digitisation projects is a process of getting people and facilities together to accomplish desired digitisation goals and objectives using available resources efficiently and effectively.

Digitisation: Defined procedure through which non-digital materials are converted into digital format either by scanner, digital camera or any other digital machine.

Digitisation Project: A planned and step by step set of activities from text or image capture to the stage of implementation.

Digital Libraries: A collection of electronic information resources in which all the information resources are organized and made available in computer which can be retrieved or accessed by means of a computer machines.

Digital Information Resources: These are information resources that are converted from physical or print format into digital format which can only be read through the computer.

Scanning: The process of capturing image from the original object or document to create a digital master image and saved in digital file format on to the CD-R/RW, disks or other long-term storage media.

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CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter reviewed the available literature that are related to this study the following:

2.2 Skill Sets Available for Managing Digitisation Projects in University Libraries

2.3 Types of Information Resources Digitised in University Libraries

2.4 Criteria for Selection of Digital Asset Management Software for Digitisation Projects in University Libraries

2.5 Policies and Strategies Employed for the Management of Digitisation Projects in University Libraries

2.6 Summary of the Review

2.2 Skill Sets for Managing Digitisation Projects in University Libraries

University libraries all over the world have been digitizing their collections for more than a decade now; their collective experiences have produced a depth of technical expertise and practical knowledge that can be widely shared among colleagues. In contrast, Igbeka (2010) argued that in most African university libraries there are issues that are yet to be resolved fully which hinder the realization of some digitisation objectives especially poor commitment by library managers, poor digitisation model, inadequate expertise and IT infrastructure among others borders on the full implementations and sustainability of digitisation projects.

There are many diverse skills required for a well-managed digitisation project. Identifying the librarians and information scientists with both technical knowledge and digitisation project management skills to keep everything on track is very important. Youngs (2001) pointed out that digitisation project staff should consist of a number of people with a range of talents, expertise and experience. These include: librarians, metadata specialist, digital

specialist, subject experts, system administrator as well as project manager. Gaining their support for your digitisation project will increase its potential for success. In support of Youngs (2001), Digital Library Initiative (2007) remarked that digitisation project in university libraries will require a combination of skills from the following numbers of staff to succeed. They are project manager that will oversee and coordinate all aspects of the project, Selectors who will decide on what is going to be digitised, Conservators and Preservationists that will repair and preserve the original materials once they have been digitised, Scanning Technician responsible for the actual scanning of the materials, Photographers that will use a digital camera to take pictures of items selected for digitisation, Quality Control Technicians for double-checking the quality of scanned images or photographs to ensure they meet the required standard, Metadata Schemas needed to attach metadata to the digital images, Network Administrators responsible for keeping your network properly and up and running, Web Page Designers that will plan to make these digital objects accessible on the internet as well as Database Managers to ensure that databases are created, stored and properly managed for retrieval by the patrons.

Joint Information Systems Committee (2012) emphasized that ultimately, the staff skills for digitisation project management has overall responsibilities for all aspects of the work throughout the course of the project. This is because no two digitisation projects are the same. Each will vary in the type of materials being digitised, the timescale, budget, staff skills and the project 'scope'. Some may be large collaborative ventures requiring frequent meetings of the 'digitisation management team' and complex workflow control mechanisms; others may be small budget and independent projects for meeting the needs of a modest user group. Sharing the same point of view with JISC (2012), Selematsela (2009) submitted that the digitisation management staff skill sets are likely to include, but not limited to:

- Defining the project scope: Defining the goals, establishing the deliverables and ensuring that the project undertakes all the work required but no more than that (preventing scope creep);
- Digitisation project integration: Establishing and managing a digitisation project, the digitisation management team can support and oversee the whole project by integrating the needs and requirements of the project;
- Managing budget: Digitisation management team assess the cost of the project, applying for funding (if necessary) and once funded, keeping the project within the approved budget;
- Procurement: Specifying, choosing and installing the project's hardware, management and storage infrastructure;
- Designing workflows: Establishing and overseeing an effective and efficient workflow from digitisation to delivery;
- Recruitment: Acquiring staff, training them, and allocating them to each activity in the workflow;
- Managing progress: Ensuring that the project finishes on time. This means estimating the duration of each process in the workflow and creating a project schedule with appropriate and realistic milestones;
- Assuring quality: Guaranteeing that all deliverable work is up to the benchmark established in the project specifications;
- Communicating: Establishing clear lines of communication with all interested parties and disseminating project progress information (internally through the steering group and externally through appropriate channels);
- Managing risk: Undertaking a 'risk assessment' to anticipate potential risks and then develop strategies for addressing them;

- Addressing usability and sustainability: Considering the future of the collection beyond the life of the current state of the project (the 'exit strategy'). This might include finding additional funding or ensuring the on-going maintenance and preservation of the resource.

On the other hand, Harrison (2012) identified the various skills that are required from the library staff for effective management of digitisation projects in Nigerian university libraries. They include:

- i. Ability to use various computer hardware and software packages
- ii. Networking and web publishing skills
- iii. Ability to create metadata
- iv. Skills in cataloguing/indexing electronic resources
- v. Creating subject gateways and archiving of digital information resources
- vi. Management of web servers and multimedia system and
- vii. Database management skills amongst others

Digital Library Initiative (2007) argued that digitisation project management staff should take into account a sundry of factors including an understanding of the general technical architecture available and institutional policy. Fundamentally, digitisation project management staff take decisions on document selection, applying decisions consistently at the project level, describe intended audience for the collection and potential uses of materials, analyze the user needs which may include guidance from subject experts or advisory committee (comprised of staff, faculty or leaders in the community), formal usability studies, determination of the success of the digitisation project including an evaluation of how well the final product meets user needs.

Sharing similar view with Digital Library Initiative (2007), Information Management Resources Ltd (2010) attributed the skill sets of the digitisation project management staff to

include description of the materials to be digitized such as the scope and content, quantity, types of materials and any special conditions. Document the location of original materials. Provide the process by which materials are selected. It is also recommended that they perform a physical review of the items to identify any fragile items that may need special treatment prior to scanning, the file types and formats for both master and derivatives versions as well as the quantitative targets pre-determined by review of best practices and available technology.

In a contrary opinion, Selematsela (2009) remarked that digitisation project management staff skill sets are far more than what Digital Library Initiative (2007) and Information Management Resources Ltd (2010) have identified. Selematsela (2009) therefore, explained that the required skill sets of digitisation project management staff involve the collection of data and information for the establishment of a portal for digitisation project that will ensure accessibility, identifying the levels of expert/skills availability across the institution for digitisation, establishing digitisation needs, generation of a standard database that will be updated regularly for distribution and access, management of human, financial and technology infrastructure (hard ware, software and connectivity), setting of standards for the management of the digital information resources and the policies on various aspects of digital knowledge particularly intellectual property rights and ownership of content, developing digitisation frame work and manual among others.

2.3 Types of Information Resources Digitised in University Libraries

The digitization of the university's academic heritage is a collaborative effort of the university library and the Management and Information System (MIS) department of the university. According to Evans and Zarnosky (2000) university libraries are involved in the generation of information resources internally and externally in the course of their daily activities. Some of these resources are collected from university offices, departments and

units, government and private organizations, institutions, agencies and individuals which have enabled them to build the large volumes of their collections. This indicates that information resources can be evidence of events, activities, programmes and facts in any form or medium which may be manual or electronic. Esse (2000) shared the same opinion when he defined information resources as any document or other source of information compiled or stored in written form or in any other means organized for the purpose of teaching, learning and research.

Hughes (2004) posited that for a university library to function effectively and carry on with its services, it must put in stock collection of information resources. Furthermore, Hughes (2004) pointed out that university libraries keep the following materials as part of their information resource collection: books, periodicals and geographical sources, reference sources, theses and dissertations, e-books and e-journals, internet and A/V materials amongst others. Mudd (2012) reported that information resources in the university libraries can be inactive or permanent. Inactive information resources are those that are no longer used in the day-today course of business. Permanent information resources are those that may be used for legal, historical or operational purposes now and in the future. Examples of these information resources include:

- i. Administrative reports include reports, which summarize activities of an organizational body over a period of time.
- ii. Subject files such as files from department heads or central subject files for offices or administrative units.
- iii. Committee records involve minutes of the meetings, which document the activities of advisory boards, faculty committees and other university organizations and initiatives.

- iv. Correspondence records including mails especially of executives and high-level administrators.
- v. Photographs, films, and videotapes which provides a visual record of the university and its activities.
- vi. Publications including students and alumni publications, bulletins, newsletters, newspapers, magazines, government publications, journals, promotional materials for university events and programs.
- vii. Published books and articles.
- viii. Financial records such as invoices or financial statements documenting financial transactions.
- ix. Duplicates or multiple copies of students research works such as projects, theses and dissertations.
- x. Materials relating to employees' records and job performance.
- xi. Faculty research notes, blank papers kept for supply purposes, personal or private papers either created or received in connection with the university's business and
- xii. Registers such as attendance register, time book and inventories amongst others.

Hughes (2000) indicated that university libraries in Africa have two on-going digitization projects. They are: the digitization of some of the indigenous newspaper collection which the library subscribes to; and the digitisation of Master's and Doctoral theses and dissertations of the University. The choice of the newspaper collection for digitization was informed by its high demand and heavy usage by both staff and students for research purposes. An earlier work on newspaper management and use in university libraries attested that the newspapers served as good complements of books, journals and other resources in the library. Hughes (2000) added that one would ask why digitise newspapers at a time online versions are available? What is

rather peculiar about the newspaper digitization is its complete digitization and not part as typified by the on-line version. Almost all newspapers from many African countries have gone digital, but the online version excludes adverts, change of name and other important and relevant information. University libraries digitise the complete newspaper as published, because the library's copy can serve as authentic, original and certified copy for evidence in court proceedings.

On the other hand, Rihak (2012) identified other materials like Masters theses and PhD dissertations, Bachelors degree projects, Inaugural lectures, university newsletters, lecturers' scholarly articles/publications, textbooks on which copyright has been obtained, term papers, and many other materials belonging to the university. Rihak (2010) further stated that some university libraries in Czech Republic particularly the University of Prague Library digitize research works from postgraduate students as well as Collections that are published by the staff members of the university with special interest focused towards education, politics, culture, tradition, technology, commerce, history among others. Among such collections include the following:

1. The Publication Ordinance Monographs (which are textbooks), Publication Ordinance Serials, (which are magazines, journals, newspapers).
2. Government Documents: These consist of publications by the Government of Czech Republic such as gazettes, reports (commissions and panels' reports) and publications by governments of other countries and organizations such as the World Health Organization, World Bank, UNESCO, UNIDO, UNICEF, UNDP, etc.
3. Journals of art and culture: These include publications of the Historical Society of Czech Republic and some journals from religious bodies. Most of these are solicited by various departments in the University, e.g. Institute of International Studies, Religious Studies Department, etc.

4. Staff Publications that are also digitised include: inaugural, university, postgraduate, and valedictory lectures.

2.4 Criteria for Selection of Digital Asset Management Software for Digitisation Projects in University Libraries

Building and sustaining a digitisation project requires the proper technological infrastructure. Rajashekar (2003) posited that the goals of digitization projects will determine what hardware and software you need to successfully complete the project. Scanning, image manipulation, attaching text information, indexing, image display and long-term storage can require different equipment and user expertise. What materials are to be scanned and how those images are to be used will impact software choices. These selection guidelines are intended as general recommendations. International Association of Assessing Officers (2003) asserted that since digitization is an area that is evolving, it is strongly recommended that you research the current literature in print and online for the latest developments before purchasing any software.

Digital asset management software provides a managed environment to store and retrieve digital objects, such as documents, images, audio/video clippings and their metadata. Digital asset management software usually includes tools to allow librarians and library customers to exploit the stored objects and their metadata. To create a digital asset one needs digital asset management software. Sastry and Reddy (2010) described digital asset management software into two categories: Proprietary/Commercial software packages like IBM digital library, IBM Content Manager, Archival Ware, CONTENTdm, Digitool, VITAL etc and Open Source software packages like DSpace, Greenstone, Eprints, Fedora etc are available free to build digital repositories.

Open source digital asset management software is viable to the academic and research organizations to preserve and share their knowledge. In Nigeria, most of the academic and research organizations are using Open Source digital asset management software such as DSpace, Fedora, Eprints or Greenstone. According to Information Management Resources Ltd (2010) having chosen repository software and for digitisation project to succeed you need the following types of application software as indicated in the table.

Table: 2.1: Showing application software for digitisation project

Software type	Purpose	Examples
Scanning and OCR	To convert the hardcopy image to a digital one and then into text that a word processor can understand A lite version of scanning and OCR software is normally provided when you buy a scanner.	ReadIris, Omnipage, Abby FineReader etc
Word processor and spellchecker	To correct text errors and to optimize page layout	Microsoft Office words, Corel Wordperfect, OpenOffice
File conversion	To convert files from one format to another	Microsoft Word, Many open source converters available
Image management	To view, modify and manage images	Compupic, Kudo, ACDSee, Irfanview
Image editing	To edit images	Adobe photoshop, Corel photopaint, Microsoft photoDraw Image magic
PDF Creation	To create PDF documents	Adobe Acrobat, PDF-PHP, PDF creator, PDF995, CutePDF writer
PDF viewing	To read PDF documents	Adobe Reader

Source: Information Management Resources Ltd, Lagos (2010)

In addition, you may be dealing with languages that use Roman scripts with a lot of accented characters such as (â á é ë) and non Roman scripts such as Arabic, Chinese and Latin etc. If the software you are using has problems recognizing, correcting and representing characters in these scripts, you can take the following precautions to solve these problems:

- seek OCR software that is specific for your language;
- set up a language-specific dictionary in your spellchecking or word processing program (you can create a language-specific dictionary for Microsoft word); and

- if you are not using Unicode, find programs that convert from other encoding systems to Unicode. This means that users will not have to download special fonts to read the text.

The software identified by Information Management Resources Ltd above can lead to a better reproduction of the physical materials. For the software to work in harmony there is the need for effective installation and customization in order to create digital environment for proper flow of digitization processes. A well equipped digitisation project will no longer be deficient of producing quality digital objects.

Heery and Anderson (2005) recommended that before deploying any digital asset management software it should be subjected to a review of analysis based on its currency, gap, flexibility of use, its architecture or modules, content management and its ability to enhance resource preservation and access. The potential coverage of a repository is much more required as well as its role when doing a thorough review. One of the qualities necessary for review is the increasing range of activity areas within the information environment to their deposited content collections.

Similarly, Heery and Anderson (2005) outlined some issues that are central when deploying digital asset management software: they meant that digital asset management software should undergo analysis for currency, it also implies ensuring standard for improvement in the process of sustaining digitisation project; and this involve also the review of required resources for software adoption especially to financially disadvantaged academic libraries. This is to ensure that production and services actually meets the required digitisation standard thereby creating proper sensitization and awareness in academic libraries.

Furthermore, Sotosek (2011) asserted that for digitisation to succeed Digital Asset Management Software Evaluation and Selection Working Group must be established to

evaluate commercial and open source software in order to select one for use. The scope of this working group is to perform an extensive hands-on testing against a set of functional requirements based on the Open Archival Information System (OAIS) model which include: ingest, archival storage, data management, administration, preservation planning and access as may be specified in the institutions repository policies and functional requirements specifications.

According to Harry Ramsom Centre Project (2012), digital asset management software should include a working guideline that will help further define the goals and scope of the institutional repository requirements. Some of the requirements are:

- Institutional resource; digital asset management software should be a resource that will enable academic library operations to preserve and provide long-term access to digital collections.
- Contents; digital asset management software should contain a wide variety of digitized collections including manuscripts, pamphlets, monographs, images, movies, audio, and other digital items. These will include digitised representations of physical items, as well as born digital collections.
- Future growth; digital asset management software should provide a platform and flexible development environment that will enable institutions to explore and implement innovative digital projects and customer services utilizing the library's digital collections.
- Resources; library IT staff in conjunction with the institution's computer centre provides system architecture and software development resources to assist in the implementation and maintenance of the institution's digital repository.

Sotosek (2011) emphasized that the following factors should be considered when selecting digital asset management software for digitisation in university libraries. They include:

- i. Functionality; this measures the degree of satisfaction by design analysis of the requirements needed by the institutions;
- ii. Scalability; ability of the software to manage large collections of digital asset;
- iii. Extensibility; ability to integrate external tools with the repository to extend the functionality of the repository via provided software interfaces (APIs), or by modifying the code-base (open source software);
- iv. Interoperability; digital asset management software should interoperate with other repositories both within the institution and outside the institution as well as with the institution's integrated library system;
- v. Ease of deployment; simplicity of installation and ease of integration with other needed software;
- vi. System security; digital asset management software should meet the institution's security requirements;
- vii. System performance; overall performance and response time, system availability 24x7 both internally and externally;
- viii. Physical environment; ability to deploy multiple instances for off-site and disaster recovery; ability to function with the institution's off-site backup facility; ability for components to reside at different physical locations; ability for development, testing and production environment;
- ix. Platform support; digital asset management software should support operating system and database requirements, staff expertise to deal with required infrastructure;
- x. Demonstrated successful deployment; relative number of satisfied customer or organizations;
- xi. System support; quality of documentation and responsiveness of support staff or developer/customer community to assist with problems;

- xii. Strength of development community; reliability and support track record of the company providing the software or size, productivity and cohesion of the open source developer community;
- xiii. Stability of development organization; viability of the company providing the software, or stability of the funding sources and organizations developing open source software and
- xiv. Strength of technology roadmap for the future; technology roadmap that defines a system evolution path incorporating innovations and “next practices” that are likely to deliver value.

The above criteria for selecting digital asset management by Sotosek (2011) depicts that the proliferation of digital asset management software boils down to extensive and thorough review of the software. Each criterion should be equally assessed on a scale. In order to conduct these initial investigations, the factors may be grouped and each should be evaluated consistently and findings presented upon which the choice would be based.

2.5 Policies and Strategies Emphasized in the Management of Digitisation Projects in University Libraries

A policy is a plan of action designed to guide decisions and achieve rational outcomes which may be applied to government, private sector organizations and groups, as well as individuals. According to the Electronic Resource Preservation and Access Network Digital Preservation policy tool (2003:3) cited in Gbaje (2011) the primary aims of a digital preservation policy are to provide guidance and authorization on the preservation of digital materials and to ensure their authenticity, reliability and long-term accessibility. Digital preservation policy should be directly connected to the aims and goals of the institution. A digital preservation policy would state the principles and long-term direction that would guide preservation strategies and actions.

Gbaje (2011) stated that digital preservation policy should explain how digital preservation can serve the major needs of an institution and state some principles and rules on

specific aspects which lay the basis of implementation. Beagrie et. al. (2008:3) cited in Gbaje (2011) proposed a model framework and guidance for the development of digital preservation policy and implementation clauses. The model framework clauses can be taken into consideration when creating digital preservation policy for any institution as follows:

- Principle statement; addresses how the digital preservation policy can serve the needs;
- Contextual links; how the policy will integrate into institution's strategies;
- Preservation objectives; information about the preservation objectives and how it will be supported;
- Identification of content; what the overall policy is in terms of content and its relationship with collection development aims;
- Procedural accountability; identifying high level responsibilities for the policy and provide recognition of the most important obligations faced in preserving key institutional resources;
- Guidance and implementation; how to implement the preservation policy and where additional guidance and procedures are available in separate document or from staff;
- Financial and staff responsibility; who is responsible for digital preservation within the institution and how the policy sits within the institution's financial plan;
- Intellectual property; the awareness of copyright issues and how the institution plans to recognize and tackle the issue;
- Distributed services; decision on whether to digitise in-house or outsource;
- Standards compliance; the standards archives is committed to;
- Review and certification; description on how frequent a review is carried out for example bi-annually, annually, biennially;
- Auditing and risk assessment; procedures for carrying out standardized auditing and recognition of risks facing the policy;

- Stakeholders; identification of all the parties involved in the policy and its implementation procedures;
- Preservation strategies; a guidance time-table on preservation strategies adopted and technical implementation of the policy and
- Glossary; list of definitions where applicable.

Kennedy (2005) further explained that digitisation project and strategies include the criteria used in the prioritization and selection of materials for digitisation, defining primary and secondary user groups, considerations on whether to digitise in-house or outsource by comparing staff skills, training needs and resource availability. It may also address intellectual freedom, future goals, metadata scheme to be adopted, copyrights law storage, preservation, retrieval, access and special areas of attention. Druke, Borje and Tamaro (2003) posited that digitisation project management policies and strategies should cover the goal of the digitisation, approach that will be used for digitisation, technology requirement, digitisation processes, access to digital assets and preservation. Other important areas include sources of fund and human resources needed for the project. This means that digitisation team must develop institutional guidelines for partnership and sponsorships; and identify alternative sources and mechanism of support.

In agreement with Druke, Borje and Tamaro (2003), Smithsonian Institution (2012) remarked that digitisation project management policies and strategies in university libraries in Africa is not well structured because of poor knowledge of digitisation management best practices by the digitisation project management stakeholders. Therefore, Smithsonian Institution (2012) recommended that digitisation project team must first assess the existing resources across the institution and the technologies in order to define criteria for selecting and prioritizing resources to digitize because there are no sufficient financial resources to meet total demand.

Policies and strategies should be drafted for promoting greater use of our assets within the institution and throughout the world. This could be achieved by developing policies and strategies on requirements for life cycle-management of digital assets to ensure immediate access and long-term preservation, build strategic partnerships for content development and management that protect public interest and access, construct a common data model to facilitate exchange of information in-house and to provide a mechanism that enables broader use among many communities of practice, document rights, restrictions, and security requirements, use issues, identify what assets can be made readily available, and support our responsibilities as stewards of the collections and empowering staff and audiences to use the digital resources by developing user-friendly methods and tools.

Also, the digitisation project management policies and strategies according to National Library of Finland (2011) should include comprehensive digital collections and critical mass of digitised content, authentic and trustworthy digital surrogates of original source material, sustainable digitisation and life cycle management of digitised content, maximum use and reuse of digitised content and freeing digitised content for online distribution. Similarly, Smithsonian Institution (2011) further explained that digitisation project policies and strategies revolved around the operational guiding principles covering the objectives and goals of digitisation project, scope of digitisation project, roles and responsibilities, digitization plans and digital asset management issues. It also establishes the functions and roles of the digitization project which oversees the implementation of this policy.

Furthermore, Smithsonian Institution (2011) added that digitisation project management policies and strategies is a mandate that spelt out digitisation principles viz:

- Digitization of the collections (including ancillary information and objects) and management of born- digital materials (assets originally created in digital format) that support the university's strategic plan and are important goals for the institution;

- Libraries are responsible for setting priorities for digitization, for maintaining digital assets under their control, and for establishing written unit digitization plans and digital asset management plans that document how these assets are developed and administered throughout their life cycle;
- Digital assets are publicly accessible unless covered by an allowable restriction category, as set forth in digital asset access and use plan;
- The Digitization Project Unit is responsible for improving the overall stewardship and long-term management of the university's digital assets by providing leadership for institutional digitization project. Working with university library management and in concert with a digitization project advisory committee (DPAC), the Digitization Project Unit guides implementation of the digitization strategic plan, and develops long-term strategies, best practices and procedures that address institutional digitization needs.
- The Digitization Project Advisory Committee (DPAC), composed of representatives from across the institution, assists the Digitization Project Unit in implementing the digitization strategic plan by advising on policies, standards, priorities, processes, performance metrics, and funding strategies for digitization.
- Digitisation Project Unit shall develop digital asset management plans for every digital asset. These plans must cover the full data life cycle (from planning for data creation to accessible archiving, preservation, and possible disposition) for each digital asset. The Digitisation Project Unit shall provide guidance in developing these plans.
- Digital asset management plans shall be developed at the beginning of the project and shall be updated and revised as a project continues, in accordance with the scope and needs of the institution.

- Aggregates and reports statistics regarding digitization activities and communicating institutional digitization priorities as appropriate. In addition, the digitisation project unit keeps abreast of best practices in digitization and serves as the university's representative to external forums such as interagency committees and working groups, and national and international conferences.

In a contrary opinion to what Smithsonian Institution (2011), said, Druke, Borje and Tammaro (2003) argued that digitisation project management policies and strategies should not be too voluminous and time consuming but should be comprehensive and snappy for easy understanding. It should cover only very significant areas that require periodic review. In a related opinion, Ison (2011) advised that digitisation management policies should also cover sources of funding because the public-owned Federal University Libraries are allocated a meager ten percent of university overhead cost. Therefore, universities can approach organizations and multinationals that is prepared to support digitization project. For example Online Computer Library Centre available at (<http://www.oclc.org/ca/en/digitalpreservation/education/grants/guide/hints.html>) can be contacted via this address.

2.6 Summary of the Review

The review has tried to bring to light the fundamental issues that surround management of digitisation projects in Nigerian university libraries. Adequate planning for a digitisation project largely determines its success and helps you to achieve digitisation project goals as well as helping you to avoid some of the pitfalls. The process of creating digital information resources is determined by the available number of skill sets and through a well established management policy for producing local information resources into digital form for global access. University libraries are involved in the generation of information resources internally

and externally in the course of their daily activities. These information resources can successfully be digitised through the establishment of digitisation project management best practices by putting together combination of skills and specialized digital asset management software such as DSpace, IBM Content Manager, Archival Ware, Eprints, Open Repository etc.

From the review, it is clear that establishing a skill set for digitisation project, identifying consistent approach to digitisation project itself, adequate and appropriate digitisation project management policy and strategy, adequate training, sufficient funding, available digitisation project management experts and state-of-the art technology infrastructure amongst others were identified as major factors that facilitate successful implementation of digitisation project in university libraries. It would interest one to establish a clear position as it affects the library customers thereby paving a way to seek for appropriate means for the management of digitisation project in university libraries. This is the position of the researcher of course in a way that this study can contribute to knowledge in the field of study.

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CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter under the following headings: the research methodology, population of the study, sample and sampling procedure, research instruments and procedures for data collection and analysis.

3.2 Research Methodology

The research method adopted for this study was the survey method. A survey is data collection technique in which information is gathered from respondents, by carefully selecting a sample from a population who respond to questions and the findings obtained from the sample can be used to generalize the population. Osuala (2005) defined survey methodology as a research method that studies both small and large populations by selecting and studying samples chosen from the population. Survey research method helps to discover the relative incidence distribution and interrelations of variables.

Aina (2002) remarked that survey is a descriptive research methodology that describes and interprets the existing phenomenon, opinions, processes that are going on, conditions or relationships that exist. It is concerned also with the trends that are developing and the effects. This implies that survey research primarily deals with the present event even though it often considers past events and influences current conditions as they relate. In a similar opinion Baba (2005) pointed out that survey research clearly defined a problem, collects relevant and adequate data from a few population considered to be representative of the entire group, carefully analyze it and interprets such data in order to come up with skillful findings.

Kolo (2003) explained that survey research is characterized by the selection of random samples from large and small populations to obtain empirical knowledge of a contemporary nature. This knowledge allows generalizations to be made about characteristics, opinions, beliefs and attitudes amongst others of the entire population been studied. This will enable the researcher collect pertinent data and to enable him accurately describe the problem that will be investigated.

In line with the above assertions, a survey research method was found to be the appropriate type of inquiry in the management of digitisation projects in Nigerian university libraries.

3.3 Population of the Study

The population for this study consists of the five university libraries where digitisation project has been implemented and have registered with the Directorate of Open Access Repositories. The population therefore, was delimited to the library staff who are directly involved in digitisation exercise in the selected university libraries in Nigeria. These comprised of ICT heads and other library staff engaged in digitisation exercise. This is because they belong to the team that plan and manage digitisation projects under study and who are also in better position to supply the required information needed for the study. Therefore, the entire staff members that are directly involved in digitisation exercise were used for this study. Ali (2005) defined population as the whole number of people in a place or in a given area. With respect to the subject of the study, the research population comprised of eight (8) staff from Ahmadu Bello University, Zaria, Eight (8) from University of Jos, Six (6) from Covenant University, Ota, Eleven (11) from University of Nigeria, Nsukka and Seven (7) from Federal University of Technology, Akure making a total of forty (40).

Table 3.1: Distribution of Digitisation Staff Population from the Institutions under Study.

S/No.	Institutions	No. of Digitisation Staff
1.	Ahmadu Bello University, Zaria	8
2.	University of Jos	8
3.	Covenant University, Ota	6
4.	University of Nigeria, Nsukka	11
5.	Federal University of Technology, Akure	7

	Total	40
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3.4 Sample and Sampling Technique

The fact that the population of this study is not large, the entire digitisation staff was purposively used in carrying out this study. This is in agreement with Bernard (2012) who asserted that if the population of a study is less than two hundred (200) the entire population should be used for the study.

3.5 Instruments for Data Collection

The research instruments that were adopted for use in this study include questionnaire and interview.

Questionnaire

The need to collect current and up-to-date data on the subject under study necessitates the use of questionnaire. This is because; it enables the respondents to express their opinions freely. Omotosho (1990) described questionnaire as the form containing prepared questions to which the respondent is expected to supply answers. Akuezuilo (1993) remarked that some of the advantages of using questionnaire by a researcher is to provide an opportunity for respondents to prepare and revise their answers. It permits wide coverage for a minimum cost both in terms of money and effort. It affords not only wider geographical coverage than any other technique, but also reaches individuals who are normally difficult to contact.

Rooke (1990) opined that the method used in gathering information varies depending on how much detail is required. Rooke (1990) also recommended the use of questionnaire to be completed by respondents. Questionnaire could be structured (close ended) or Unstructured (open ended). Structured or closed ended questions will facilitate reasonable response from respondents and can easily be interpreted quantitatively for data analysis. The questionnaire was divided into the following sections:

Section A: Demographic information.

Section B: Skill sets for managing digitization projects.

Section C: Types of information resources digitised.

Section D: Criteria for selection of digital asset management software for digitisation.

Section E: Policies and strategies that are employed in the management of Digitisation Projects.

Interview

Interview is the second instrument that was used to obtain detail information from the respondents through verbal interaction. Interview will enable the researcher to explain and clarify issues with the respondents on the problem under investigation that could not be explicit in the questionnaire. The interview was conducted with the head of digitization unit that is involved in the digitization exercise from the selected institutions.

3.5.1 Validity of the Research Instrument

The questionnaire contained fourteen (14) items. Interview questions cover five (5) items and were given to ICT Head of Kebbi State University of Science and Technology and the digitisation project manager of Usmanu Danfodiyo University, Sokoto to scrutinize and evaluate the validity of the instrument used. It was also scrutinized by the researcher's supervisors.

3.5.2 Reliability Test of the Research Instrument

The reliability test was conducted using Guttman's split-half method of measuring reliability of the items in the questionnaire. A pilot study was conducted on Usmanu Danfodiyo University, Sokoto which was not among the five universities sampled for the study. Ten (10) copies of the questionnaire were numbered and five (5) each were administered to the digitisation staff. This was to enable the researcher determine the reliability coefficient. All odd numbers constituted one half while the rest numbers that were

even formed the second half. The responses in the two sets were correlated to give the reliability coefficient of 0.72 which was found reliable and could produce good result.

3.6 Procedure for Data Collection

The researcher visited the research areas and administered the copies of the questionnaire personally and also retrieved from the respondents. The choice for this procedure is due to the limited number of staff in the units. The researcher conducted 15 minutes interview sessions each with the heads of digitisation units of the selected institutions visited.

3.7 Procedure for Data Analysis

Descriptive statistics such as frequency table, percentages and charts were used to analyze and present the data collected according to the questions raised in the study. The findings were discussed according to the research questions raised using frequency distribution table and percentage scores statistic tool.

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CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents data collected from the University Libraries in Nigeria on Management of Digitisation Projects in Nigerian University Libraries. The data was further analyzed and discussed according to the research questions raised for the study.

4.2 Response Rate

A total of forty (40) copies of the questionnaire were administered to the respondents at their various locations. Out of this, 36 (90%) were duly completed and returned. The high

response rate could be as a result of personal contact with the respondents by the researcher.

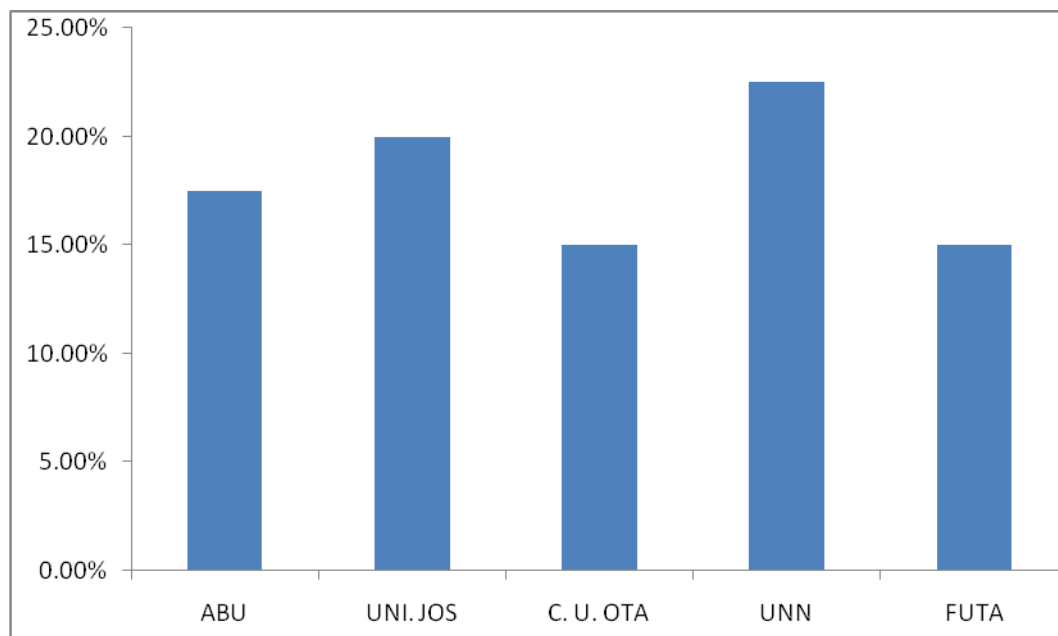
The distribution of the respondents by their university libraries is shown in Table 4.1 below and Figure 4.1 overleaf.

Table 4.1: Response Rate

Universities	No. of Digitisation Staff	No. of Questionnaires Distributed	No. of Questionnaires Returned	Percentage (%)
ABU	8	8	7	17.5
UNI JOS	8	8	8	20
C. U. OTA	6	6	6	15
UNN	11	11	9	22.5
FUTA	7	7	6	15
TOTAL	40	40	36	90%

KEY

ABU= Ahmadu Bello University, Zaria
 UNI. JOS = University of Jos
 C. U. OTA = Covenant University, Ota
 UNN=University of Nigeria, Nsukka
 FUTA= Federal University of Technology, Akure



KEY

ABU ZARIA = 17.5% ,
 UNL. OF JOS = 20%
 COV. UNI. OTA = 15%
 UNIV. OF NIG. NSUKKA =22.5%
 FUT AKURE = 15%

Figure 4.1: Distribution of Responses

Table 4.1 and Figure 4.1 showed the response rate of respondents. The results showed that University of Nigeria Nsukka had the highest response rate (9:22.5%), followed by University of Jos with (8:20%) and A.B.U. Zaria with (7:17.5%). This is because the researcher was patient with the respondents to fill the questionnaire before they were collected and high sense of cooperation demonstrated by the staff of these institutions. While the University with least respondents is that of Covenant University, Ota and Federal University of Technology, Akure with 6 (15%) each as a result of the small number of staff that are engaged in digitisation activities and absence of a staff from FUT Akure at the time the researcher went back to collect the questionnaires.

4.2.1 Demographic Features of the Respondents

This section analyzed the demographic features of the respondents that are related to the study. This is because, analyzing these features would add more light on the characteristic nature of the respondents.

Table 4.2: Distribution of Respondents by Demographic Characteristics

Digitisation Staff				
S/No.	Variables	Classification	Frequency	Percentage (%)
1.	Gender	Male	34	84
		Female	2	5
		Total	36	89
2.	Qualification	First Degree	26	65
		Masters & Above	10	25
		Total	36	90
3.	Staff Category	Librarians	30	75
		IT Librarians	4	10
		Archivists	2	2
			50	

		Total	36	90
4.	Working experience	Below 5yrs	24	60
		5-10 yrs	12	30
		10 yrs & Above	-	-
		Total	36	90

In table 4.2, the gender compositions of respondents were not proportionately distributed. It was clear that the male population is higher numbering (34:85%) against the females with just (2:5%). This may be due to the fact that Men are usually more actively involved in technical aspects of information work than their female counterpart.

It was ascertained in the literature review that those that should engage in digitisation activities must possess digitisation management best practices skills. It was also discovered in this research that universities that have implemented their digitisation project had in place high number of professionals with IT literacy numbering (30:75%). This is followed by the availability of few numbers of System/IT librarians (4:10%) and (2:5%) respectively. This explains why digitisation programmes have been fully successful in these universities.

From the distribution 24(60%) have spent less than 5 years in the unit, while 12(30%) had spent between 5 to 10 years. The length of period respondents worked in the digitisation unit as presented in the table is a clear indicator that this unit is still at the infancy stage and will need more time to produce experts in digitisation management activities.

4.3 Data Analysis

This section presents the data collected with regards to the research questions raised in the study. The descriptive analysis such as frequency table, percentages and charts were used and discussions were also carried out on the findings of the study as presented in sub headings.

4.3.1 Skill Sets for Managing Digitisation Projects in Nigerian University Libraries

The first objective of this study was to identify the skill sets of digitisation staff in Nigerian university libraries. To achieve this objective the respondents were asked to indicate the skills possess by them. Table 4.3 and figure 4.2 overleaf present their responses.

Table 4.3 Skill Sets for the Management of Digitisation Projects in Nigerian University Libraries

Skill Sets	University Libraries											
	ABU		UNLJOS		C.U OTA		UNN		FUTA		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
Ability to use tools for digital collection development	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Ability to use tools for digital collection development	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Ability to use various computer hardware	7	17.5	6	15	6	15	8	20	6	15	33	82.5
Ability to use various computer software packages	6	15	5	12.5	6	15	8	20	6	15	31	77.5
Ability to use digitisation open source software	6	15	6	15	5	12.5	7	17.5	5	12.5	29	72.5
Skills for digitisation process	4	10	5	12.5	4	10	6	15	4	10	23	57.5
Networking skills and ability to use digital technologies to store information	4	10	5	12.5	4	10	6	15	4	10	23	57.5
Web publishing skills	4	10	4	10	3	7.5	5	12.5	5	12.5	21	52.5

KEY

ABU= Ahmadu Bello University, Zaria
 UNLJOS= University of Jos
 C.U.OTA= Covenant University, Ota
 UNN= University of Nigeria, Nsukka
 FUTA= Federal University of Technology, Akure

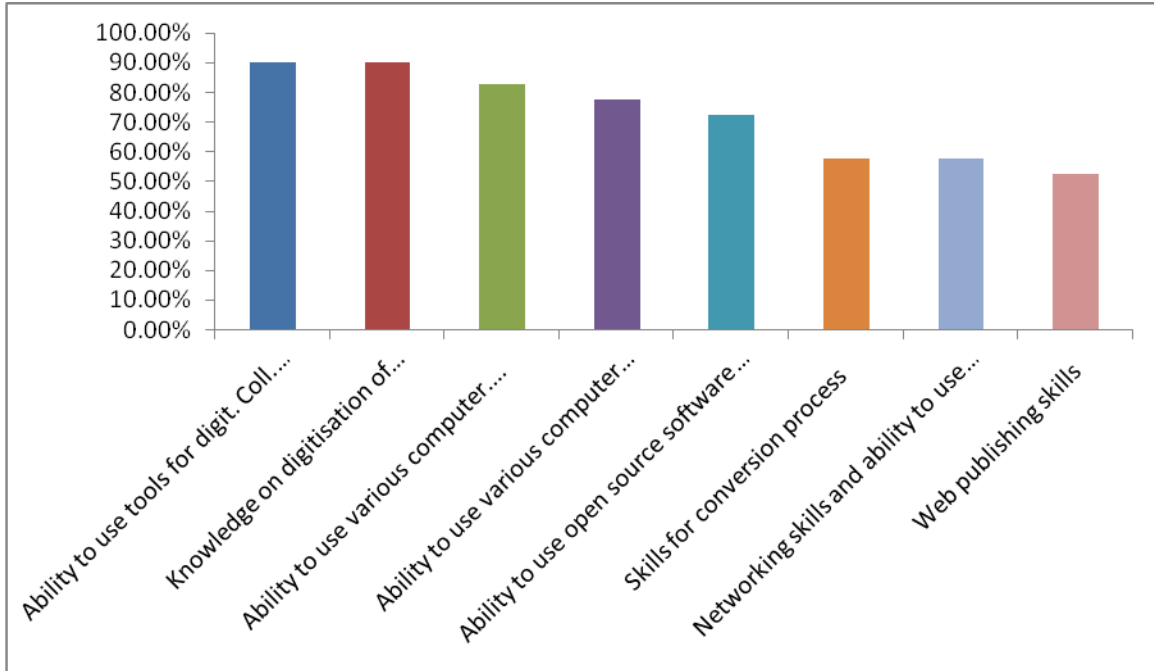


Figure 4.2: Distribution of Response rate on the Skill Sets for managing Digitisation Projects in Nigerian University Libraries

KEY

- Ability to use tools for digital collection development = 90%
- Knowledge on digitization of library resources = 90%
- Ability to use various computer hardware = 82.5%
- Ability to use various computer software packages = 77.5%
- Ability to use open source software = 72.5%
- Skills for conversion process = 57.5%
- Networking skills/ability to use digital technologies to store information = 57.5%
- Web publishing skills = 52.5%

The analysis as indicated in table 4.3 and figure 4.2 clearly showed that implementation and management of digitisation projects depends largely on the staff skill sets such as ability to use tools (search engines and URL's) for digital collection development and knowledge on digitisation of library resources recorded (36:90%), ability to use various computer hardware, scanners and digital cameras recorded (33:82.5%) and ability to use various computer software packages (abbyfine reader, omnipage, word perfect, pdf and compupic) had (31:77.5%) score higher number of responses. This analysis indicated that staff skills are essential and are necessary ingredients for the best digitisation management practices. This agrees with that of Youngs (2001) who asserted that

digitisation management staff should consist of a number of staff with a range of talents, expertise and experience hence gaining their support will increase its potential for success.

In addition to these, is ability to use open source software (operating systems, dspace, eprints, fedora, open repository etc) with (29:72.5%), while skills for conversion process, networking skills and ability to use digital technologies to store information recorded (23:57.5%). The findings are in line with that of Digital Library Initiative (2007) which remarked that digitisation project in university libraries will require a combination of skills from a numbers of staff with diverse skill sets. Web publishing skills had the least with (21:52.5%) responses. Scoring this skill low contradicts the position of Joint Information Systems Committee (2012) who emphasized that ultimately, the staff skills for digitisation project management has overall responsibilities for all aspects of the work throughout the course of the project. This is because no two digitisation projects are the same.

4.3.2 Types of Information Resources Digitised in Nigerian University Libraries

The second objective of this study was to find out the types of information resources digitised in Nigerian university libraries. Varieties of responses were collected from the respondents and are shown in Table 4.4 and figure 4.3.

Table 4.4 Types of Information Resources Digitised in Nigerian University Libraries

Types of Information Resources Digitised	University Libraries											
	ABU		UNIJOS		C.U OTA		UNN		FUTA		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
PhD dissertations	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Masters theses	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Journal articles	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Research reports	5	12.5	6	15	4	10	7	17.5	4	10	26	65
Staff conferences, seminar and workshop papers	4	10	4	10	6	15	6	15	5	12.5	25	62.5
University journals	-	-	6	15	5	12.5	4	10	4	10	19	47.5
Newspapers	2	5	4	10	3	7.5	4	10	3	7.5	16	40
Audio/Visual materials	-	-	6	15	3	7.5	-	-	-	-	9	22.5

KEY

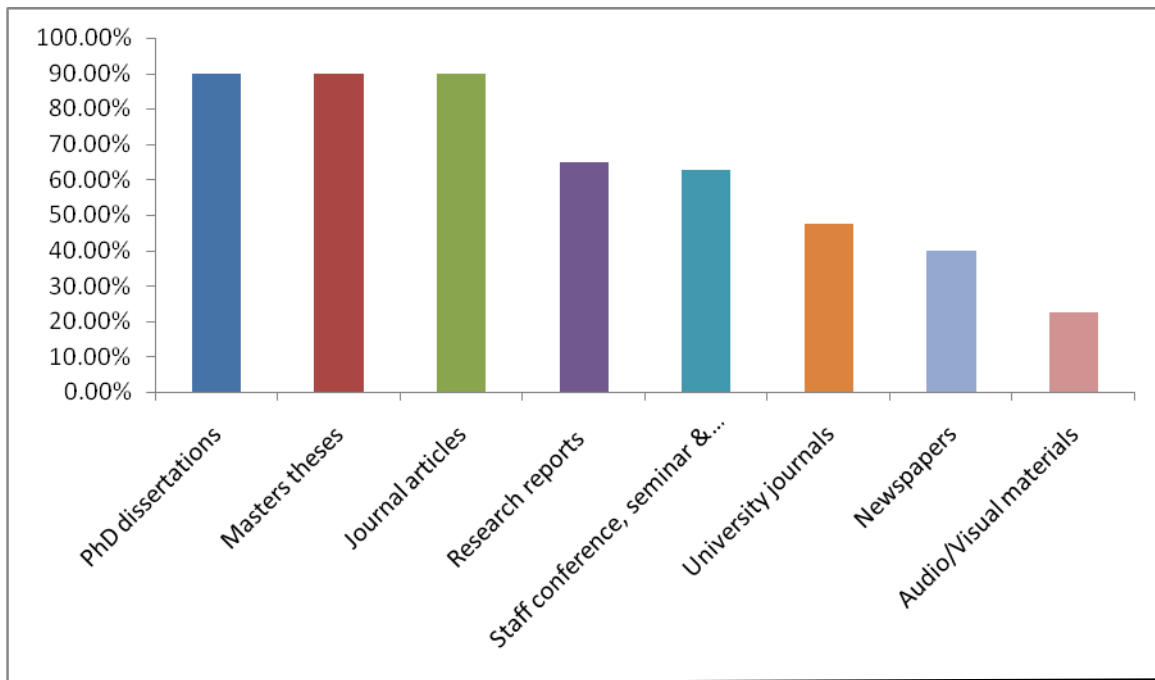
ABU= Ahmadu Bello University, Zaria

UNIJOS= University of Jos

C.U.OTA= Covenant University, Ota

UNN= University of Nigeria Nsukka

FUTA= Federal University of Technology, Akure



KEY **Figure 4.3: Distribution of Response rate on the Types of Information Resources Digitised in Nigerian University Libraries**

PhD dissertations = 90%
 Masters theses = 90%
 Journal articles = 90%
 Research reports = 65%
 Staff conference, seminars and workshop papers = 62.5%
 University journals = 47.5%
 Newspapers = 40%
 Audio/Visual materials = 22.5%

The analysis in table 4.4 and figure 4.3 showed that all universities under study mostly emphasized on digitisation of dissertations, theses and Journal articles each with (36:90%) and recorded higher number of responses. This is because the copyright of such research materials have been obtained by the institution from the researcher at the point of submission of their completed research work for the award of a degree. The choice of the journal articles for digitisation is because they are published by the staff members of the university with special interest focused towards education, politics, culture, tradition, technology, commerce, history among others. Research reports (26:65%), Staff conference, seminar and workshop papers recorded (25:62.5%) and University journals had (19:47.5%). This was informed by their high demand and heavy usage by both staff and students for research purposes. This confirmed the assertion of Evans and Zarnosky (2000) that university libraries are involved in the digitisation of information resources generated internally and externally in the course of

their daily activities. Some of these resources are collected from university offices, departments and units.

Furthermore, Newspapers digitisation attracted (16:40%) of respondents while Audio/Visual materials are rarely digitised because of their characteristic nature and technical demands and therefore recorded 9(22.3%) responses. The findings agree with that of Hughes (2000) who indicated that university libraries in Africa have two on-going digitization programmes which are: the digitization of some of the indigenous collections which the library subscribes to; and the digitisation of research documents as well as Master's theses and Doctoral dissertations of the University. Other resources such as Lecture notes, Undergraduate projects, Books, Periodicals, Administrative reports, Minutes of meetings, Financial reports, Past question papers, Admission list, Handbooks, University addresses and speeches as well as Newsletters/bulletins were not scored by the respondents. This signifies that the resources do not meet up with selection criteria for digitisation as a result of their value, copyright permission, poor quality and issues of plagiarism. This finding is in agreement with that of Zulu (2008) which stated that materials selected for digitisation should be subjected to a clear understanding of copyright law and rights of ownership. Physical ownership does not mean that an institution owns the rights to reproduce it.

1. Criteria for Selecting Information Resources for Digitisation

The study also attempted to find out the selection criteria which a resource must meet before it can be selected for digitisation. Table 4.5 and figure 4.4 overleaf present their responses.

Table 4.5 Criteria for Selecting Information Resources for Digitisation

Criteria for Selection	University Libraries											
	ABU		UNI.JOS		C.U OTA		UNN		FUTA		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
Value of the information resource to the university	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Documents in the public domain	7	17.5	8	20	6	15	9	22.5	6	15	36	90
User demand	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Very limited copies of the original in the library	5	12.5	6	15	4	10	7	17.5	4	10	26	65
Fragility of the original document	4	10	4	10	6	15	6	15	5	12.5	25	62.5

KEY

ABU = Ahmadu Bello University, Zaria
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 C.U.OTA =Covenant University, Ota
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 FUTA = Federal University of Technology, Akure

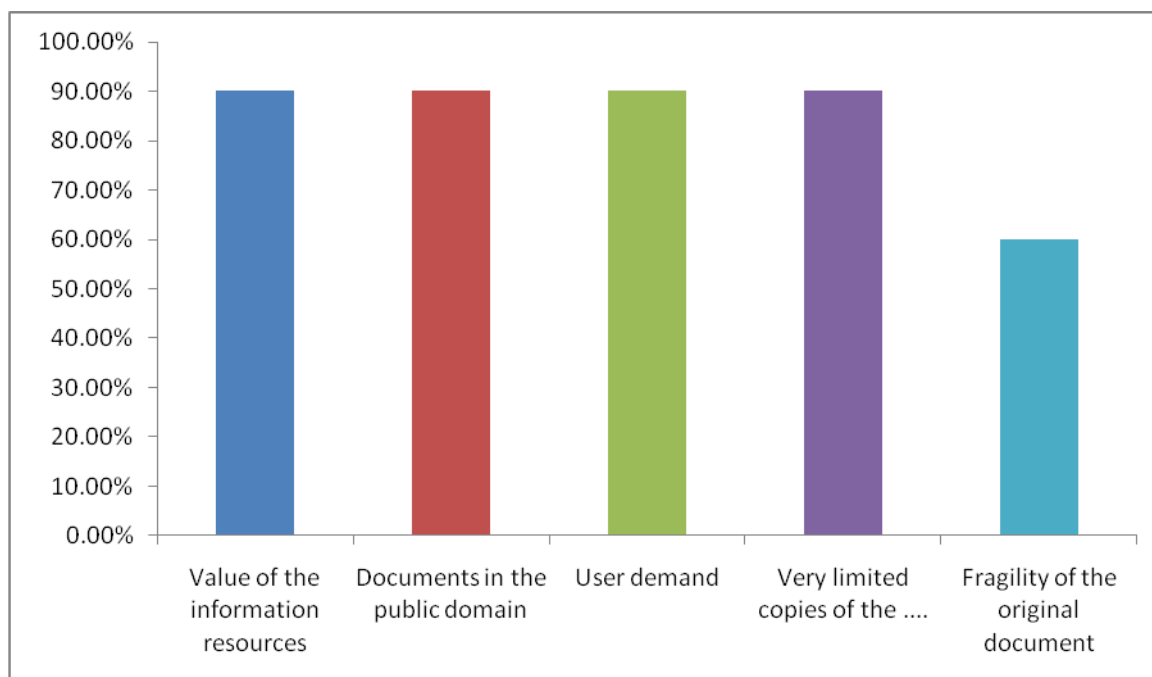


Figure 4.4: Distribution of Response rate on the Criteria for Selecting Information Resources for Digitisation

KEY

Value of the information resource to the university = 90%

Documents in the public domain = 90%

User demand = 90%

Very limited copies of the original in the library = 90%

Fragility of the original document = 60%

Table 4.5 and figure 4.4 revealed that value of the information material, document in the public domain (local contents), user demand and very limited copies of the original in the library are the major factors that are considered necessary when selecting information resources for digitisation and had the highest number of respondents (36:90%). This could be attributed to the fact that many document selected for digitisation are those which are produced by members of the university community and are in high demand by the users as well as those which their copyright is own or had been obtained by the university. This finding has again confirmed the assertion of Zulu (2008) that materials selected for digitisation should be subjected to a clear understanding of copyright law and rights of ownership. That it is not advisable to digitise documents for which copyrights have not been obtained.

Fragility of the original document had the least number of respondents with 24(60%). This finding is contrary with Urban (2002) in Akintunde (2007) who stressed that digitising

library material is for increase in access to resources, preserving the original through reduced handling of the original material and creating a “back up” copy. This finding also, revealed that few printed resources only promote stand alone system but where a particular information resource is digitised and put online it can participate effectively in the information sharing methods.

4.3.3 Criteria for Selection of Digital Asset Management Software for Digitisation Projects in Nigerian University Libraries

The third objective of this study was to ascertain the criteria that are being used in the selection of digital asset management software in Nigerian libraries for digitisation project. The main aim here was to obtain the general opinion of the respondents on the adequacy of software for successful implementation of digitisation project in the library. Opinions of the respondents are presented in table 4.6 and figure 4.5.

Table 4.6 Criteria Used for Selection of Digital Asset Management Software for Digitisation Projects in Nigerian University Libraries

Criteria for Selection of Digital Asset Management Software	University Libraries											
	ABU		UNI.JOS		C.U OTA		UNN		FUTA		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
Open source	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Functionality	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Scalability	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Extensibility	7	17.5	6	15	6	15	8	20	6	15	33	82.5
Interoperability	6	15	5	12.5	6	15	8	20	6	15	31	77.5
Ability to keep track of institutions' data	6	15	6	15	5	12.5	7	17.5	5	12.5	29	72.5
Ability to migrate data to new formats as old ones become obsolete	5	12.5	6	15	4	10	7	17.5	4	10	26	65
Ability to manage, preserve and maintain digital assets	4	10	4	10	6	15	6	15	5	12.5	25	62.5
Ability to index documents for easy searching, retrieving and archiving	2	5	4	10	3	7.5	4	10	3	7.5	16	40

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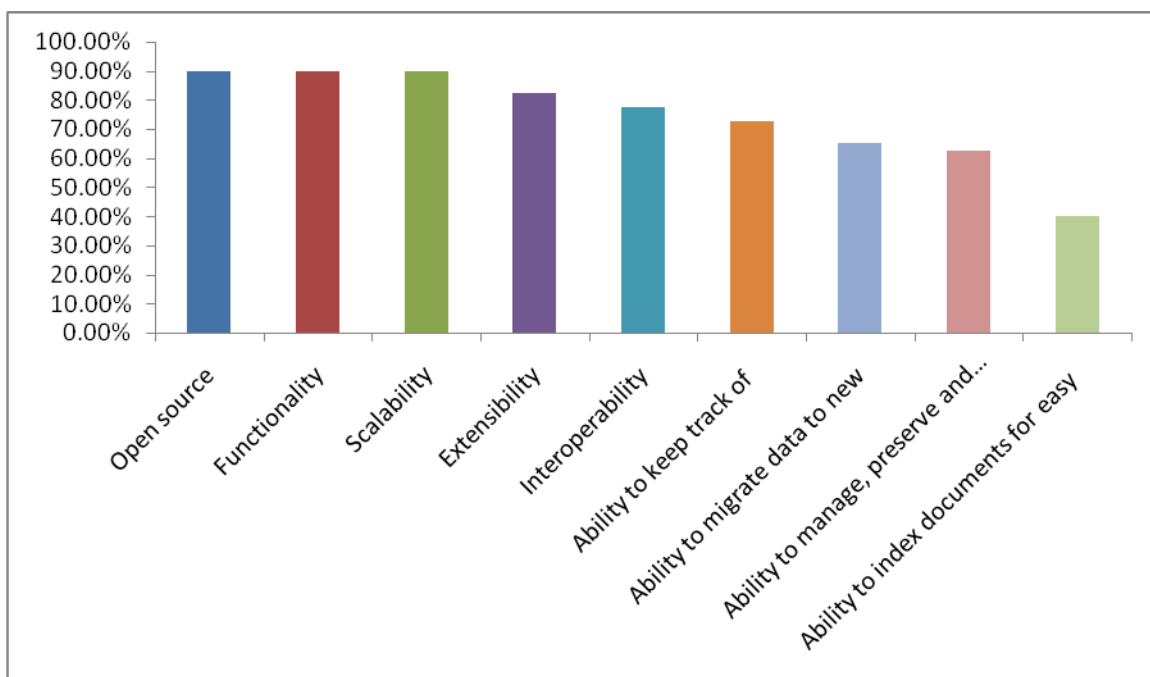


Figure 4.5: Distribution of Response rate on the Criteria for Selecting Digital Asset Management Software for Digitisation

KEY

- Open source = 90%
- Functionality = 90%
- Scalability= 90%
- Extensibility = 82.5%
- Interoperability = 77.5%
- Ability to keep track of institution's data = 72.5%
- Ability to migrate data to new format as old one become obsolete = 65%
- Ability to manage, preserve and maintain digital asset = 62.5%
- Ability to index documents for easy searching, retrieving & archiving = 40%

Table 4.6 and Figure 4.5 showed that open source feature of the digital asset management software, functionality, scalability, scored the highest with (36:90%) responses. The researcher found out that apart from being free, it also allows user to modify some features to meet their needs. Other criteria with high number of responses included Extensibility with (33:82.5%) and interoperability with (31:77.5%). The implication of this could be attributed to the fact that successful performance of such software depends largely upon the degree of satisfaction by its design, ability to integrate easily with external tools to extend the functionality of the repository by modifying the code-base, available service modules, the resources it contains and the ability of the software to interoperate with other repositories within the institution and outside the institution as well as the institution's integrated library system.

The ability to manage, preserve and maintain digital asset (25:62.5%) and Ability to index documents for easy searching, retrieving and archiving (16:40%) attracted the least number of respondents. Consideration of these criteria could be as a result of the ability of the software to manage large volumes of digital collections. The study revealed that the high number of respondents that went for open source, functionality, scalability, interoperability and extensibility indicated that digitisation staff has good knowledge of digital asset management software adopted for digitisation project. This is contrary to that of Sastry and Reddy (2010) who stated that lack of adequate knowledge and information about the digital asset management software on how to manage the software often result to unrealistic digitisation goal and inappropriate adoption of the right digital repository software.

The finding also revealed that even though the repository software adopted is open source (free), ease of deployment is not an essential criterion because in many cases vendors or software engineers usually do the installation, customization and integration with other required software and therefore recorded (0:0%) respondents as well as System security.

4.3.3.1 Digital Asset Management Software Adopted for Digitisation Projects in Nigerian University Libraries

Another objective of this study is to find out the type of repository software adopted for digitisation by university libraries. Table 4.7 and figure 4.6 present the data collected from the respondents.

Table 4.7 Digital Asset Management Software Adopted for Digitisation Projects in Nigerian University Libraries

Digital Asset Management Software	University Libraries											
	ABU		UNL.JOS		C.U OTA		UNN		FUTA		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
DSpace	7	17.5	8	20	6	15	6	15	6	15	33	82.5
Open Repository	-	-	-	-	-	-	9	222.5	-	-	9	22.5
Eprints	-	-	-	-	6	15	-	-	-	-	6	15

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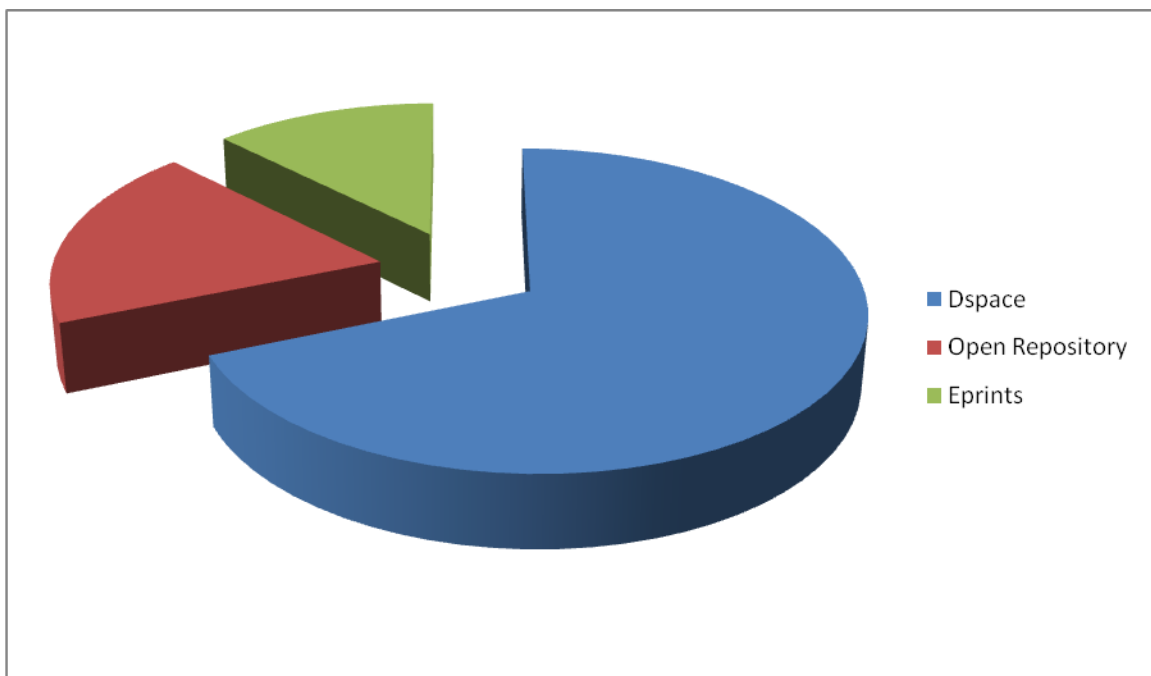


Figure 4.6: Distribution of Response rate on the Digital Asset Management Software Adopted for Digitisation Projects in Nigerian University Libraries

KEY

Dspace = 82.5%

Open Repository = 22.5%

Eprints = 15%

In table 4.7 and figure 4.6, the data collected from respondents indicated that in many university libraries where digitisation project is going on, they adopted Dspace for their institutional repository and therefore accounted for (33:82.5%). The reason for this highest number of respondents received is due to the fact that Dspace is open software that does not require any financial implication to acquire it, ability to migrate the data to new formats as old ones become obsolete and ability to index documents for easy searching, retrieving and archiving. Other reasons are because of its interoperability, viability and ease of use. Similarly, Open repository has (9:22.5%) of the respondents. The reason for the choice of this software is because of its design architecture which satisfies the requirement needed by the institution, easy integration with other repository software such as Dspace or Eprints.

Findings revealed that it shares similar features and characteristics with any other open software and can be concurrently run with others for resource sharing.

Another digital asset management software that is adopted for digitisation project as indicated by the respondents is the Eprints with (6:15%) of respondents. The responses recorded here is that Eprints is open too but the fact is that each institution reserves the liberty to choose its own software vendor based on the design analysis, available staff skills, experience, scope and goals of its digitisation project. The researcher discovered that the features mentioned are in consonance with Sastry and Reddy's work (2010) which recommended that open source software is viable to the academic and research organizations to preserve and share their knowledge.

4.3.4 Policies and Strategies Employed for the Management of Digitisation Projects in Nigerian University Libraries

The fourth objective of this study is to find out the policies and strategies put in place to manage digitisation projects in Nigerian university libraries. Table 4.8 and figure 4.7 give the responses.

Table 4.8 Availability of Digitisation Management Policy

Options	University Libraries											
	ABU		UNI.JOS		C.U OTA		UNN		FUTA		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
Yes	7	17.5	8	20	6	15	-	-	-	-	21	52.5
No	-	-	-	-	-	-	9	22.5	6	15	15	37.5

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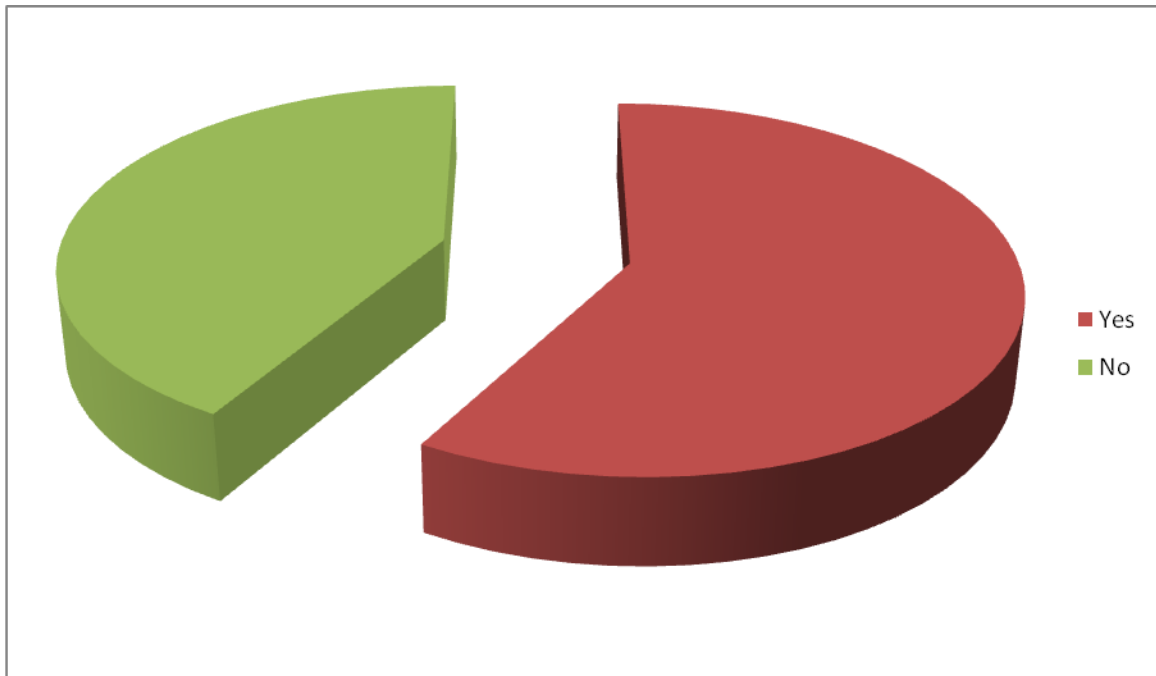


Figure 4.7 Distributions of Response rate on the Availability of Digitisation Management Policy

KEY

Yes = 52.5%

No = 37.5%

Table 4.9 and Figure 4.7 revealed that (21:52.5%) respondents indicated that they have a written guideline on digitisation management policy. On the contrary opinion, (15:37.5%) of the respondents pointed out that there is no written document on digital preservation policy. Although, there is a written guidelines for preserving digital surrogates but it has not been transformed into a policy document. This is in consonance with the position of Smithsonian Institution (2012) who remarked that digitisation project management policies and strategies in university libraries in Africa is not well structured because of poor knowledge of digitisation management best practices by the digitisation project management stakeholders.

4.3.4.1 Policy Elements Employed for the Management of Digitisation Projects in Nigerian University Libraries

The researcher attempted to find out the policy elements employed for managing digitisation projects in Nigerian university libraries. Table 4.9 and figure 4.8 present the opinions of the respondents.

Table 4.9 Policy Elements Employed for the Management of Digitisation Projects in Nigerian University Libraries

Policy Elements	University Libraries											
	ABU		UNL.JOS		C.U OTA		UNN		FUTA		TOTAL	
	F	%	F	%	F	%	F	%	F	%	F	%
Principle statement	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Contextual links	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Preservation objectives	7	17.5	8	20	6	15	9	22.5	6	15	36	90
Identification content	7	17.5	6	15	6	15	8	20	6	15	33	82.5
Procedural accountability	6	15	5	12.5	6	15	8	20	6	15	31	77.5
Intellectual property	6	15	6	15	5	12.5	7	17.5	5	12.5	29	72.5
Distributed services	5	12.5	6	15	4	10	7	17.5	4	10	26	65
Standard compliance	4	10	4	10	6	15	6	15	5	12.5	25	62.5
Review and certification	7	17.5	8	20	6	15	-	-	-	-	21	52.5
Auditing and risk assessment	-	-	6	15	5	12.5	4	10	4	10	19	47.5
Stakeholders	2	5	4	10	3	7.5	4	10	3	7.5	16	40
Preservation strategies	-	-	6	15	3	7.5	-	-	-	-	9	22.5

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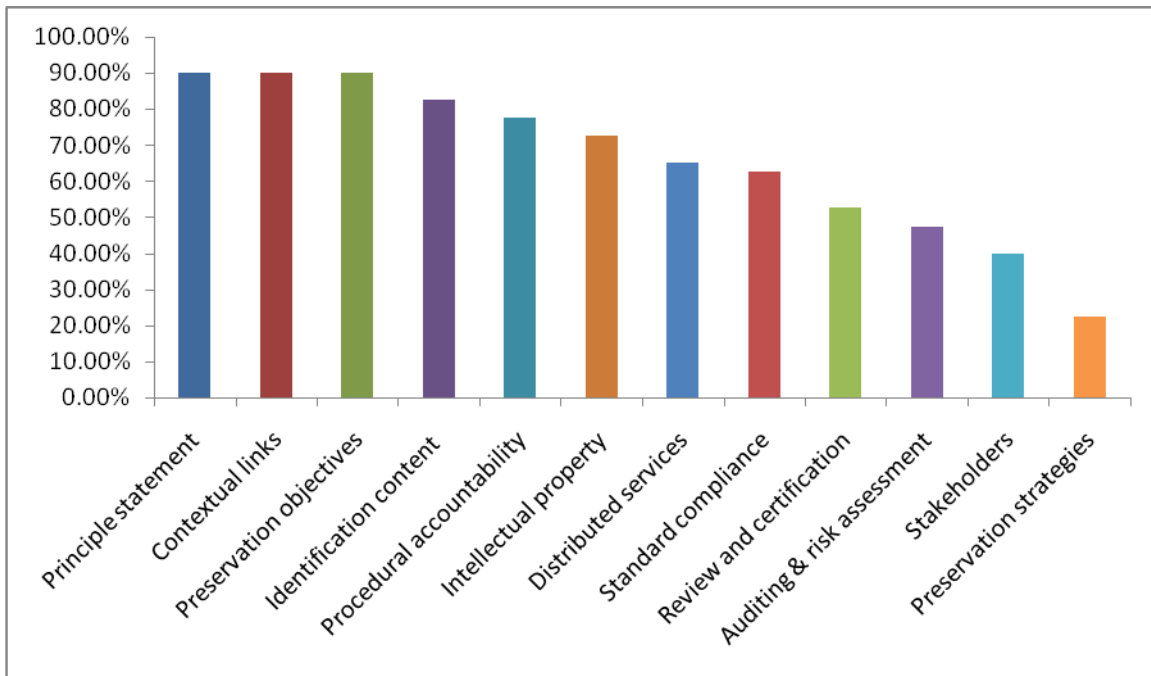


Figure 8: Distributions of Response rate on Elements of Digital Preservation Policy for Digitisation Project Management in Nigerian University Libraries

KEY

- Principle statement = 90%
- Contextual links = 90%
- Preservation objectives = 90%
- Identification content = 82.5%
- Procedural accountability = 77.5%
- Intellectual property = 72.5%
- Distributed services = 65%
- Standard compliance = 62.5%
- Review & certification = 52.5%
- Auditing & risk assessment = 47.5%
- Stakeholders = 40%
- Preservation strategies = 22.5%

From table 4.9 and figure 4.8 it can be seen that universities under study have uniform digitisation management policy elements and strategy. Respondents indicated that management of their digitisation projects is based on the following major policy elements: principle statement, contextual links preservation objectives with (39:90%). Other policy elements which scored higher numbers include identification content with (33:82.5%), procedural accountability (31:77.5%) and intellectual property (29:72.5%) respectively. This implies that virtually all universities under study managed their digitisation projects

using the same policy elements and strategy. This has revealed that digitisation management stakeholders have some degree of awareness on some technical aspects of digitisation project management.

However, the researcher gathered that digitisation staff and digitisation management stakeholders in Nigerian university required more awareness on digitisation policy clause and its area of coverage. Hence, some essential policy elements were scored low and some were not scored at all which revealed that the staff has inadequate knowledge about those essential policy clauses. For example auditing and risk assessment had (19:47.5%), stakeholders (16:40%), preservation strategies (9:22.5%), guidance and responsibility 0(0%), while financial and staff responsibility had no score. This contradicts Ison (2011) who advised that digitisation management policies should also cover sources of funding because the public-owned Federal University Libraries are allocated a meager ten percent of university overhead cost.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summaries of the study and the major findings of the study, conclusion and recommendations.

5.2 Summary of the Study

The purpose of the study was to examine the management of digitisation projects in Nigerian university libraries. The basic assumptions of this study were that digital information is essential to all categories of library customers, the researcher therefore attempted to find out the available skill sets for digitisation and types of information resources digitised that will provide information far beyond the limits of print information resources in the library. The use of appropriate facilities and adoption of the right policies and strategies will enhance effective management of digitised information resources by the customers. The research also sought to know the staff skill sets and challenges that surround the management of digitisation projects in Nigerian university libraries.

In order to achieve the objectives of the study, five research questions were raised. The research questions sought to identify the skill sets available for management of digitisation project, types of information resources digitised, facilities used for digitisation project, and policies and strategies employed for the management of digitisation projects in Nigerian university libraries.

The researcher made use of survey research method for the study. The population of the study involved the five (5) university libraries in Nigeria where digitisation project has been implemented and have registered with Directorate of Open Access Repository. The

total number of digitisation staff in these five universities was 40 and did not require sampling. The research instruments used to collect data for the study were questionnaire and interview. Descriptive analysis using frequency table, charts and simple percentages was used to analyze the data collected. The results of the findings were presented in tables and figures and showing their relative frequencies to their corresponding percentages.

5.3 Summary of Findings

The summary of the major findings of the study are as follows:

1. The skill set available for managing digitisation projects in university libraries include skills to use software packages like Abbyfine reader, Omnipage and Adobe PDF which are used for scanning and processing of digitised documents.
2. The resources digitised in Nigerian university libraries include dissertations, theses and journals published in the university.
3. The criteria used by Nigerian university libraries to select digital asset management software include open source criterion, functionality, interoperability, scalability, extensibility and and ability to keep track of institution's data.
4. All Nigerian university libraries make use of the policy clause like principle statement, contextual links, preservation objectives, identification content and intellectual property right as policy elements to manage their digitisation projects.

Conclusion

From the summary of major findings, it can be concluded that many university libraries in Nigeria engaged in the management of digitisation project in order to promote indigenous resources to showcase their research output globally and to provide the opportunity for web metric ranking. This was manifested where PhD dissertations, university journals and Masters Theses are emphatically digitised. Large number of library

customers' especially postgraduate students require information in various disciplines to carry out their researches. Obviously, their information needs have not been adequately met by print collections available in the university libraries.

Digitisation provides complementary role of information resources provision to library customers. Unfortunately, the aim of making these resources available for access 24 hours daily and globally is sometimes jeopardized by number of challenges such as human and technology errors. Judging from all efforts put together to produce the desired surrogate of indigenous information resources for access and preservation, the inadequate staff skill sets possessed by the digitisation staff and the digitisation management stakeholders impedes digitisation project management best practices in Nigerian university libraries.

5.5 Recommendations

Based on the findings of this study, the researcher found it necessary to make the following recommendations:

1. Key players such as librarians, system analysts and archivists should be awarded short and long-time hands-on digitisation training or courses to enable them update and acquire more skills from other libraries that have already advanced in the area of digitisation.
2. There is need by the universities studied to focus strictly on the digitisation of local contents only such as dissertations, theses, journal articles, university journals, hence such materials have met the library selection criteria. These include value, significance, customer demand and interest, copyright status of the original material, intellectual justification, relevance to the institution as well as necessity for storage and preservation.
3. University libraries in Nigeria should be committed to a substantial investment in keeping pace with technology in procuring cost effective (open source), functional and

- interoperable digital asset management software with ability to adequately manage institution's digital asset.
4. There is need by the university studied to liaise with other universities or organizations within and outside Nigeria that have gone far in digitisation project management in order to obtain more knowledge on digital preservation policy clauses. This will help to focus the digitisation project management for a reality check and to help ensure that everyone involved has a common understanding of the project.

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APPENDIX A

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

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Dear Respondent,

I am a postgraduate student of the Department of Library and Information Science, Ahmadu Bello University, Zaria. I am currently undertaking a research on the Management of Digitisation Projects in Nigerian University Libraries.

I therefore, wish to request you to kindly assist to provide answers to the questions contained in the attached questionnaire. All responses will be treated confidentially and purely for academic purpose only.

Thank you for your cooperation.

Yours faithfully,

Mohammed M. Kpakiko
The Researcher

APPENDIX B

QUESTIONNAIRE FOR DIGITIZATION STAFF

Instruction:

Please tick against the answers that represent your response to the questions below. You can provide additional information where the options provided do not cover your view or where you may wish to elaborate your answers further.

SECTION A: Respondents Demographic Information

1. Name of your Library. Please tick as appropriate from the list below:

- a) Kashim Ibrahim Library, Ahmadu Bello University, Zaria []
- b) University of Jos, Main Library []
- c) Covenant University, Main Library []
- d) Nnamdi Azikiwe Library, University of Nigeria, Nsukka []
- e) Federal University of Technology, Akure Main Library []

2. Gender (a) Male [] (b) Female []

3. Qualification? (a) First degree [] (b) Masters and above [] (c) others specify

4. Staff Category involved in digitisation project?

- (a) Librarians []
- (b) System/IT Librarians []
- (c) Archivists []
- (d) Others specify -----

5. Working experience?

- (a) Below 5 years []
- (b) 5 – 10 years []
- (c) 10 years and above []
- (d) Others specify -----

SECTION B: Skill Sets Available for Management of Digitisation Projects in University Libraries

7. Which of the following skills does the digitisation project management team in your library have? Please tick more than one response where necessary.

- (a) Ability to use tools for digital collection development []
- (b) Ability to use various computer hardware []
- (c) Ability to use various computer software packages []
- (d) Web publishing skills []
- (e) Skills for conversion processes []
- (f) Ability to identify vendors and suppliers required for digitisation []
- (g) Knowledge on digitisation of library resources []
- (h) Networking skills and ability to use digital technologies to store information []
- (i) Handling of hardware and determining their capacities []
- (j) Ability to use open source software []
- (k) Web access and information retrieval techniques []
- (l) Budget management skills for digitisation programme []
- (m) Others specify -----.

SECTION C: Types of Information Resources Digitised in University Libraries

8. Which of the following types of information resources do you select for digitisation in your library? Please tick more than one response where necessary.

- (a) Ph.D dissertations []
- (b) Masters theses []
- (c) Journal articles []
- (d) Staff conference, seminar and workshop papers []
- (e) Research reports []

- (f) Lecture notes []
- (g) Undergraduate projects []
- (h) Newspapers []
- (i) Books []
- (j) Periodicals []
- (k) Audio/Visual materials []
- (l) Administrative reports []
- (m) Minutes of meetings []
- (n) Financial records []
- (o) Past question papers []
- (p) Admission list []
- (q) Handbooks []
- (r) Others specify

9. Which of the following criteria do you consider when selecting information resources for digitisation in your library? Please tick more than one response where necessary.

- (a) Value of the information resource []
- (b) Documents in the public domain []
- (c) User demand []
- (d) Fragility of the original document []
- (e) Very limited copies of the original document available in the library []
- (f) Others specify -----

SECTION D: Criteria for the Selection Digital Asset Management Software

10. Which of the following criteria do you consider when selecting digital asset management software for managing digitisation project in your library? Please tick more than one response where necessary.

- (a) Open source []
- (b) Functionality []
- (c) Scalability []
- (d) Extensibility []
- (e) Interoperability []
- (f) Ability to keep track of institution's data []
- (g) Ability to migrate data to new formats as old ones become obsolete []
- (h) Ability to manage, preserve and maintain digital asset []
- (i) Ability to index documents for easy searching, retrieving and archiving []

11. Which of the following digital repository software have your library adopted for the digitisation project? Please tick more than one response where necessary.

- (a) Dspace []
- (b) E prints []
- (c) Fedora []
- (d) Green stone []
- (e) Archival ware []
- (f) IBM content manager []
- (g) CONTENT dm []
- (h) Others specify -----

SECTION E: Policies and Strategies Employed for the Management of Digitisation Project in University Libraries

12. Do you have a digital preservation policy? Please tick as appropriate.

Yes	
No	

14. Which of the following elements does your digitisation project management policy and strategies cover in your library? Please tick more than one response where necessary.

- (a) Principle statement []
- (b) Contextual link []
- (c) Preservation objectives []
- (d) Identification content []
- (e) Procedural accountability []
- (f) Guidance and implementation []
- (g) Financial and staff responsibility []
- (h) Intellectual property []
- (i) Distributed service []
- (j) Standard compliance []
- (k) Review and certification []
- (l) Auditing risk assessment []
- (j) Stakeholders []
- (k) Others specify -----

APPENDIX C

Department of Library and Information Science,
Faculty of Education,

Ahmadu Bello University,

Zaria.

Dear Respondent,

AUDIENCE TO GRANT AN INTERVIEW

I write to seek for your kind permission to grant me an interview. I am a postgraduate student in the Department of Library and Information Science, Ahmadu Bello University, Zaria. I am conducting a research on the Management of Digitisation Projects in Nigerian University Libraries.

With respect to your position as the head of digitisation unit, I deem it necessary to have discussion with you on the title of my research. I shall be glad if you grant me the audience at your convenience.

Yours faithfully

The Researcher

APPENDIX D

Interview Questions on Management of Digitisation Projects in Nigerian University Libraries, for Heads of Digitisation/ICT Units who are concerned with digitisation project in the library.

1. What is the state of digitisation project in your library?
2. Beside the digital repository software you have adopted for your digitisation project, which other application software do you acquire for the management of digitised information resources in your library?
3. What type of services are provided from the digitisation project in your library?
4. How is the digitisation project in your library funded?
5. What are the basic skills required from the library staff to be involved in the digitisation project in your library?