

BENEFITS AND THE IMPEDIMENT OF DIGITIZATION OF INFORMATION RESOURCES IN NIGERIAN UNIVERSITY LIBRARIES

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Abstracts

Purpose: The general purpose of this study is the benefits and the impediment of digitization of information resources in Nigerian university libraries.

Design/ Method and Approach/The population for the study was 250 library staff (librarians, library officers and library ICT staff) of the five Federal University Libraries in Northern and southern Nigeria that are involved in library materials digitization. Four research questions were used for this study. Frequency counts, percentages and mean were used to analyze data for the research questions. All inferential statistics were performed at 0.05 level of significance. The study revealed among others that the five Federal University in Nigeria are involved in digitization of information materials in their libraries. These include Ahmadu Bello University library, Zaria; University of Jos library, Plateau state; University of Nigeria, Nsukka library, Enugu state; Obafemi Awolowo University library, Ile-Ife, Osun state and Federal University of Technology library, Owerri.

Findings: The study revealed that 203 (82.5%) library staff (librarian, library officers and library ICT staff) who answered the questionnaire were involved in the exercise of digitization of information resources in their libraries. The study shows that web server, hard disk, local server, external drive, blogs / repository among others are used for digital preservation. It also revealed that dissertation, theses, staff abstract among others were the major materials they digitized. Desktop computer, laptop, and scanner were the major hardware facilities used while Dspace, KOHA and Endnote were the major Software used. The research shows to large and very large extent the benefits of digitization. All these benefits of digitization are accepted, since all of them have calculated mean value greater than 2.5. These includes: It makes information accessible globally (3.8). It facilitates value added services by enabling the combination of data from different sources(3.8), It enables the integration of disintegrated information (3.3), It quickens access and dissemination of information(3.3), It facilitates decision making (3.2), perpetual digital preservation of data (3.5), easy storage of information (3.6), effortless duplication, quick and easy retrieval(3.5), easy access (3.5), easy transportation (3.5), saving time and space, and compatibility with all modes of digital data transfer (3.5). The extent of the benefits is to a large extent and very large extent because of the high mean values that is 3.2 and above, (3.8).The study found out that copyright restriction, insufficient fund and epileptic power supply were the main challenges encountered.

Implications: The study ascertained that digitization of library materials has numerous benefits and challenges. The research recommend that copyright issue should be properly addressed, fund and power supply should be made available in Nigerian University Libraries to enable digitization of library resources, digital preservation, and accessibility online.

Originality / Value: This study is virtually a new research that address the benefits and the impediment of digitization of information resources in Nigerian university libraries.

Keywords: Digitization, benefits, Internet, repository, challenges, impediment, e-library, Nigeria

Paper type: Empirical

Introduction

Libraries all over the world try to convert the printed information resources of the institution to digital format for easy access.

According to Eke (2011) the process of capturing and converting analogue (paper) format to digital or electronic format

is known as digitization. Digitization refers to all the steps involved in the process of making collection of materials available online. It is the process of converting analogue (paper) materials into computer compatible formats. It is the process by which physical or manual records such as texts, videos, and images are converted into digital format which are accessible and shareable.

Digitization refers to all the steps involved in the process of making collection of materials that are in analogue format to be in digital format accessible online. It is the process of converting analogue (paper) materials into computer compatible formats. It can also be defined as a process in which materials are converted from the hard copies to electronic or soft copies. Witten and David (2003) defines digitization as the process of taking traditional library materials that are in book form and papers and converting them to the electronic format where they can be stored and manipulated by a computer. Kannappanava; Rajamkanta and Tandur (2010) stated that digitization refers to the conversion of materials created in another format into an electronic format; this definition excludes materials that were initially created digitally. Similarly, Jagboro, Omotayo and Aboyade (2012) define digitization as all the steps involved in the process of making collections of historical and other materials available online. Pandey and Misra (2014) describe digitization as the course of converting analogue information to a digital format. While Fabunmi, Paris, and Fabunmi (2014) asserted that the major purposes of digitalization are: to enhance access and improve preservation of library materials. To do this the librarians need certain skills. In this digital era the librarians need skills in conversion of the analogue materials, processing the materials, preserving of the materials and its accessibility in order to make them online so that they can meet their work as time become important.

In this current information age where time is precious people have become increasingly dependent on digital information and Internet for their research work. It is an age where there is increased access to up-to-date information, in print and electronic format. This age is also

known as digital era where information is recorded, stored, retrieved and disseminated in digital format. Digital era according to Byamugisha (2010) is an era where several persons can access and exchange information simultaneously without stress; a time where remote access and exchange of information online have become easy, unlike the situation in the past when information was accessed in analogue (paper) format. Bhardwaj (2018) asserted that the modern academic libraries do not only provide users with access to paper based information but digital information resources. Nevertheless the recent means have become digital. (Digital Library of Georgia, 2004);

Jagboro; Omotayo, and Aboyade (2012). The authors further explained that digitization is the conversion of materials or analogue media into electronic format. Materials in analogue media include books, journal articles, microform, photos, audio, video, etc. Digitization is carried out to ensure accessibility and preservation of information resources which stand as the most important component of digital library. Digitization creates room for digital library which is not a single entity but have digital contents created in-house or acquired from outside in digital format (Jagboro, Omotayo & Aboyade, 2012). In library, it involves conversion of books, journals etc.

The process of digitizing information materials such as texts, images, cards is mainly through capturing such objects (documents) using scanner and converting them into formats such as Hypertext Markup Language (HTML) files. Ratanya (2010) and Digital library of Georgia (2004) identified some file formats and deduced that the essence of this format is for the files to be opened using such format. It may be in HTML format that can be accessed using Internet explorer and Mozilla Firefox. They can also be converted into Portable Document Format (PDF) which is a file that can be opened using Acrobat Reader Software. In the same vane, document can be converted into Microsoft Word (DOC) format which can be opened using Microsoft Word. Other documents formats include Graphic Image Format (GIF), Joint Photograph Enlarged Graphics (JPEG) for

photographs. These file formats are used to offer information resources in digital forms.

It becomes imperative, therefore, that digital librarians are expected to perform searches that are manually not feasible and provide access to resources from different databases or web sites so as to offer services to information seekers. This is due to the fact that higher education needs are becoming more electronic, which is forcing libraries into digitization. This technology push compels university libraries into electronic service rendering as resources are required more in digital format. This propels Byamugisha (2010) to further assert that university library materials that are in analogue format should be digitized so that the resources can be accessed and disseminated easily online. According to Eke (2011, Jagboro, Omotayo and Aboyade (2012) stated that there are university libraries in Nigeria that are currently digitizing their library materials. These include the following: Obafemi Awolowo University Library, University of Nigeria Library, Nsukka; University of Jos Library; Federal University of Technology, Owerri, Almandu Bello University libraries among others.

At present, university libraries are compelled to digitize their materials especially their projects, dissertations and theses by some important factors, one of which is the fact that almost everyone that is currently involved in knowledge production process prefers the electronic form. Kanyergo(2006) identified those involved in this process to include creators of knowledge, publishers and those that are finally responsible for permanently storing the resulting knowledge like the library. This development in electronic format has resulted in fast, timely and efficient ways of producing and disseminating information.

There are different materials to digitize, these includes such library materials as publications, journal articles, theses, dissertations, abstracts. On the basis of the needs, libraries embarking on digitization project do so in selected materials especially those materials which are of great value to the libraries. Eke (2011); Jagboro, Omotayo and Aboyade (2012) reported that at the University of Jos, Obafemi Awolowo University, Ile Ife, University of

Nigeria, Nsukka, the libraries mainly digitize their newspapers, theses, and dissertations.

Considering the facilities use in the process of digitization, there are facilities that are engaged. Facilities in this context are hardware equipment and software made available and use, for digitization project to be a reality. Byamugisha (2010) spelt out these facilities to include computer, scanners, digital cameras, cleaning brush, dust protectors, mask, cello tapes etc. In the same vein, software facilities such as photo essential for editing of scanned documents, Dspace, FEDORA, Greenstone, Acrobat Reader and Eprintsetc are used for storage, and distribution.

The major advantages of digitization are provision of access to primary electronic sources from any remote geographical location, preservation among others. The result of digitization of Electronic Theses and Dissertations (ETDs) study carried out in selected Nigerian universities on effective development of electronic information resources showed that out of 19 responding universities only three federal university libraries (15.8%) were digitizing their ETDs as at that time of the survey. The three federal universities as at that time were Almadu Bello University library; Hezekiah Oluwansanmi Library, Obafemi Awolowo University, Ile – Ife, and University of Jos (Ani & Ahiauzu, 2008). These universities involved in digitizing abstracts of theses and dissertations which are currently in the Association of African Universities (AAU) Database for African Theses and Dissertations (DATAD). This database can be accessed through AAU website (Afolabi, 2007).

Digital resources that are created or acquired are arranged in a systematic order for easy accessibility by attaching metadata to the digital objects so that users can retrieve the information needed easily. The means through which the materials can be accessed include the following, Internet, Intranet, hard drive, flash drive, CD-ROM, institutional repository, library software such as the use of Dspace, KOHA Software etc.

Digitization of information materials has several benefits. Benefit in this context is the

advantages or the gains derived when the university libraries digitize library resources. The benefits derivable by library from digitization includes perpetual preservation of data, easy storage and sharing of information, effortless duplication, quick and easy retrieval, easy access, easy transportation, compatibility with all modes of digital resources transfer, etc.(Digital Library of Georgia, 2004);(Outsource Data & Document Digitization, 2009). Furthermore, digitization offers a solution of theft of items especially in developing countries where some libraries have little or no electronic security systems to prevent theft of their collections (Jagboro, Omotayo & Aboyade, 2012)

Research Questions

The researchers therefore employed the following four research questions to guide the study.

- i. What are the types of materials digitized in the university libraries?
- ii. What are the facilities used for digitization in the library
- iii. What are the benefits to digitization of library information resources?
- iv. What are the challenges to digitization of information resources in the library?

Population of the Study

The population of this study consists of the all the library staff (librarians and library officers) involved in digitization of information resources in their university library. This consists of the five federal universities libraries involved in digitization in Northern and Southern Nigeria.

S/N	Name of University	Location	Library staff involve	Year started Digitization
1	Federal University of Technology, Owerri	South East	40	2006
2	ObafemiAwolowo University, Ile-Ife, Osun state	South West	44	2006
3	University of Nigeria, Nsukka, Enugu state	South East	46	2008
4	Ahmadu Bello University, Zaria,	North West	70	2009
5	University of Jos, Plateau state	North Central	50	1998

250

Review of Related Literature

Types of Information Materials Digitized in University Libraries

In embarking on digitization of information resources there is need to consider the types of materials to digitize. The choice of materials to digitize varies from library to library. In most cases it depends on the priority of the library concerned but there are widely accepted criteria which are normally applied such as materials of high demand by patrons especially when such materials are available in limited copies or are on restricted access, materials that are of local and unique needs, items that are of immediate and curricular importance, aging materials that are on high demand by patrons, and materials that are difficult to handle (Jagboro, Omotayo&Aboyade, 2012).

Moreover, many libraries are digitizing materials which are in danger of being lost in

the future, such as old manuscripts, photo images, non – commercial live musical recordings, theses, and other pieces of history such as books, newspapers, postcards, journals (Liu 2004);(Vrana, 2010).Liu (2004) reported that libraries usually digitize the achieve of newspapers, artifacts, maps, coins, art, music, children’s literature, historical records and images of international and cultural interests such digital collections will allow the public researchers to view, read, and hear the photographs, speeches and documents. Liu reported further that most of the libraries in the United States that are involved in digitization projects were academic libraries.

The libraries embarking on digitization projects do so with selected materials such as abstracts of staff publications, dissertations, and theses as applicable to the University of Nigeria, Nsukka , University of Jos; Obafemi Awolowo University, Ile-Ife, ABU Zaria among others. (Ogushola, 2004); (Ezeani & Ezema, 2009); (Ibinaye, 2012).

The types of materials digitized are numerous, Eke (2011) identified some which includes theses, dissertations, projects, inaugural lectures, university newspaper, lecturers scholarly articles and publications, text books, term papers, past question papers, and other materials belonging to the university. These listed materials are university resources that the university has legal right to digitize without reactions from the people involved. At the Obafemi Awolowo University library, abstracts of theses and dissertations starting from 2004 and newspapers (Daily Times, National Concord, and Daily Sketch) that are out of circulation are being digitized. Other includes the Nation, The Guardian, The Nigerian Tribune, The Punch and the Vanguard have been digitized from 1986 to 2006 (20 years records). So far 1172 records have been digitized covering 1989-2004 at the Obafemi Awolowo University Library. These digitized records are copied into CD or DVD and sent to the Association of African Universities (DATAD) unit, based in Accra Ghana for upload into the database while a copy of such records is kept with the library for users' online access. Similarly, in India, textbooks / reference books, manuscripts, rare books, serial publications, technical reports and annual reports, newspapers and magazines, video, audio etc. are digitized (Sigh, 2006).

In similar development, academic libraries all over the world are digitizing materials that are in danger of being lost in the future especially old manuscripts, photo images, theses, musical recordings which are mostly historical. Harvard law school library digitized 82,000 documents from Nuremberg war crimes: Brown university library digitized 1500 pieces of African American sheet music dated from 1780 to 1960 and the University of California at Berkeley digitized medieval and renaissance manuscripts. (Liu, 2004).

In Malaysia, in line (tandem) with vision 2020 which aimed to achieve a knowledge rich society among Malaysians, the National Digital Library System (System PERDANA) which propagates a nationwide digital library services was conceptualized PERDANA encourages the development of local content among libraries which envisage the networking, and sharing of digital resources among all libraries in Malaysia.

All types of libraries such as national, academic, public and special libraries in Malaysia are involved in digitization of library materials as reported by Mat & Kolej (2005). In this study out of the fifteen (15) libraries thirteen (13) of the libraries have digitized their theses collections, 12 have digitized their exam questions papers.

Among the university studied, University Malaysia Sabah (USM) was the earliest to embark on digitization of theses, which started in 1996. Other materials digitized in Malaysia include final year projects and publications by their academic staff but few libraries in Malaysia have started digitizing their photographs. The study equally revealed that not all the universities digitized their exam questions papers because they must get approval from the faculties before putting them in their portals.

Hardware and Software used for Digitization in University Libraries

Sophisticated equipment are highly needed for digitization of information materials, these include fast processing computers, scanners which could be flat bed, handheld, or sophisticated scanning machines like SMA 2 and Kirtas, digital cameras, digital phones among others (Jagboro, Omotayo & Aboyade, 2012) identified the various hardware and software facilities that are used for the digitization of information resources. They stress further that digitization projects encompass the use of certain equipment such as computer, scanners, digital cameras etc.

Equipment for digitization: The equipment for digitization includes computers, scanners, digital camera, software and storage devices such as CD, DVD, memory cards, flash drive etc. (Digital Library of Georgia, 2004).

Computer: The personal computers to use for the digitization must be the one with higher memory and high processor, with bigger storage capacity that provides for external storage port or devices (Adogbeji, 2005).

Scanners: The scanner selected must be the type with quality (features) to carry out quality scanning. Flatbed or a model that picks every dot in the item to be scanned is to be considered. A scanner with 600 dpi (dots per

inch) optical resolution or higher is needed in order to produce quality scanning (Digital Library of Georgia, 2004).

At the University of Nigeria, Nsukka, computers, and scanners are used for digitization. EPSON GT – 15,000 fast scanner and HP scanner are mostly use for the digitization. There are many digital devices for scanning but five basic types of digital capture devices include flatbed scanner, sheet-fed scanner, drum scanner, digital camera and film scanner (Okorie, 2011).

Flatbed scanner: This is the most commonly used scanner. It accepts a broad range of formats, varies in quality and price. Flatbed scanners are typically modified for a scan area of 8” x 11”. However, larger flatbed scanners are available

Sheet-fed scanner: This type of scanner is similar to the flatbed scanner but it is used for batch work and should never be employed with originals because of potential jamming which could damage or destroy the originals.

Plan scan Hybrid (Scanning and Microfilming system): This type of scanner can scan entire book.



Scan Robot (Automatic Book Scanner): This book scanner also scan entire book – Source: (NLA conference, 2010)



Bookeye 3 (A2 Book Scanner) – High quality production system for digitization and content indexing of books, maps etc. – Source: (NLA, 2010 Conference|)

Film scanner: This is the type of scanner that is specifically designed to digitize transparent materials such as 35mm films. The film scanner is particularly good for roll film but less productive for slides.

Drum scanner: Drum scanner produces high quality images but is quite expensive because materials are affixed to a rotating drum. This type of scanner is not recommended for cultural materials but suitable for surrogate negatives and transparencies. The drum scanner is sometimes called roll scanners (Okorie, 2011).

Scan Robot (Automatic Book Scanner) (It can scan 2,500 pages of book per hour)

Digital Camera: For quality digitization, digital camera must be set up with adequate provision for reproducing archival materials such as those made by Phase One or Better Light. Although these digital cameras are expensive they are very good for digitization of materials. Digital cameras are good for 3 – dimensional objects (Okorie, 2011).



Book Scanning Scanner: This is also a high book scanner that is also designed to scan entire book-
Source :((NLA 2010 Conference)

Source: (Jagboro, Omotayo & Adebayo, 2012)

Software: The manipulation of the digitized materials is very important. Software is needed for better editing when materials are scanned. Adobe Photoshop, ScanGate, dLOC digitization Toolkit software are good for producing high quality reproduction of the item scanned. The quality of images produced by Photoshop has been shown to be of good quality and better than others. Nevertheless, scanners come with some drivers that contain Photoshop or other software that can be used for scanning and possibly editing of the scanned items (materials). In the same vein, software is used in the processing, managing and sharing of the digitized resources. This includes such software as Adobe Photoshop, for producing high quality reproduction of the item scanned and Adobe Acrobat readers for creating resources that cannot be edited online by users (Outsource data & document digitization, 2009). At the Hezekiah Oluwasanmi Library, Obafemi University, Ile-Ife, Omnipage 14 professional and Procite bibliographic software are in used. The title page and abstract of the theses and dissertations are scanned using the Omnipage 14 pro (Jagboro, Omotayo & Aboyade, 2012).

At present Kenya Information Preservation Society (KIPS) has taken the compilation of theses and dissertations seriously. The KIP initiatives encouraged higher institutions to collect paper and electronic theses such as ETDs to be uploaded and made accessible on the net for Internet users. The Kenya ETDs (Electronic Theses and Dissertations) through the aid of the Kenya Information Preservation Society has been able to compile a union list of theses and dissertations in Kenya. Currently, KIPS has produced three union lists issue No 1 (March

2003), issues No 2 (March 2005) and issue No 3 (March 2008). Since 1999, this KIPs initiative has gathered strength across Kenya with corporation of 24 contributors. The issue No. 3 has entries of 11,343 from the 24 contributors. On this KIPS initiative, librarians are encouraged to engage in digitization of electronic collections that would provide Open Access service to theses and dissertations online (Ratanya, 2010).

Benefits Derived from Digitization in University Libraries

Digitization improves access to library resources as through digitizing library collections; the information will be accessible to all instead of a group of researchers. Digital projects allow users to search for collections rapidly and comprehensively from anywhere at any time as several users can access the same material at the same time without hindrance. (Fabunmi, Paris & Fabunmi, 2006) asserted that digitization makes the invisible to be visible and helps to remove the problem of distance, as users do not have to travel to libraries which own the hard copies of the library material they require before access and use of such resources.

Other benefits of digitization include the ability to search for an item electronically which implies that rather than scanning through the table of contents in a book or newspaper, one does a quick electronic search and obtain what one is looking for. (Silkroad, 2009) noted that digitization helps to save the time of researchers, students and enhance corporations. While (Jagboro, Omotayo & Aboyade, 2012) reported that digitization offer a solution of theft of items especially in

developing countries where some libraries have little or no electronic security systems to prevent theft of their collections.

Other benefits derivable from digitization also include perpetual preservation of data, easy storage, easy sharing of information, effortless duplication, quick and easy retrieval, easy access, easy transportation and compatibility with all modes of digital data transfer as explain below (Outsource Data & Document Digitization, 2009).

- i. Perpetual preservation of all vulnerable physical documents: Digitization enables perpetual preservation of resources that can easily damage. When sure resources are digitized they can be preserved electronically in several storage devices such as the CD-ROM, flash drive, hard disk, tapes, memory card etc.
- ii. Easy storage advantages: Digitization ease storage of resources, the digitized resources are stored easily in such devices as mentioned above. This helps in ordering archiving of documents.
- iii. Effortless duplication of data: Digitization of resources helps in duplicating information resources so easily which brings about effortless duplication of the digitized resources when more copies are required, unlike materials that are in analogue form. For instance, digitized resources stored in a CD-ROM or flash drive can easily be duplicated.
- iv. Quick and easy retrieval: digitized resources can easily and quickly retrieve. Retrieval online removes the barriers of distance and permits quick access to such data (information materials), unlike materials that are in print format.
- v. Easy access: Beside quick access to information resources that are digitized, the access can still be easy. It takes less time to obtain digitized resources than documents that are in analogue (paper documents).

- vi. Easy transportation: This is the moving of materials from one place to another. When objects (materials) are digitized, they are easily transported. This makes it easy to move these books in such storage devices from one place to another even online.
- vii. Easy to share: sharing resources that are in analogue form is always difficult but digitized resources are easily shared in a network among several users. Distance, in this case, may not act as a barrier to sharing of this digitized data that are now in electronic version through the Intranet or the Internet.
- viii. Compatibility with all modes of digital data transfer: Digitized resources are in software format which can be saved in any file format as such digitized resources are easily compatible with desire software environment. When such materials are digitized, they become softcopy. They can then be adapted and adopted to any file format using Microsoft Word 13 or any other converter. In view of this, the digitized resources can be compatible with all modes of digital data transfer. The resources can be transferred from one file format to another e.g. from image file (JPEG) to PDF (acrobat reader) or (DOC) document files etc., provided there is software compatibility.

Nnenna and Emenike (2015) Studied digitization of Library Resources in Academic Libraries: Challenges and Implication. They observed that there are some benefits of digitization. It enables greater access to collections of all types. All manner of material can be digitized and delivered in electronic form. Digital materials can be made available to a broader audience than those who have the resources or ability to travel to see the analogue collections, and access can be expanded to non – traditional audiences such as lifelong learners.

Jagboro, Omotayo and Aboyade (2012) Studied digitization of Library Collection in Developing Countries: The Hezekiah Oluwasanmi Library, Obafemi Awolowo University experience. The researchers identified some benefits. The

benefits accruable from digitization of library collections cannot be quantified. Aside making the library collections viewed and accessed at anytime from anywhere, printing is also possible from the web. The library's collection will also be opened and made accessible to a much larger user-base within and outside the university community. In addition, users can easily find the required materials quickly and independently with less stress and without having to border the library staff. This is because the services and the resources are offered Online.

Impediments to digitization in University Libraries

Challenges of Digital Libraries in Africa (Uganda)

The preservation of digital resources is a complex task that imposes numerous challenges. Shiri (2003) asserted that the challenges involve Africa in general but Uganda in particular with regard to digitization consists of the following:

1. The Selection of the materials: the primary purpose and the orientation of the digital project impose selection of materials challenges as the sources of the data need to be determined. In this regard, the libraries need to ascertain the source of the materials before digitizing and uploading such.
2. The Installation of proper storage facilities is a prerequisite for a well working repository. In this aspect, it is expected that the libraries must install good and workable server and backup servers with very large storage and processing speed to meet users' needs.
3. The library must adapt to cope with the digitization project. The challenge therein here is that the libraries must meet the budget needs of the project by accepting to be involved in fund drive in collaboration with the management and government to augment the subvention to meet up with the needs as most cases done in the developed nations to meet the

training and acquisition of the equipment.

4. Digital content and collection: it is observed that one major challenge with regard to metadata is the diversity of digital formats and the way they should be described in different collections with different target audience and uses. This is because in the electronic environment institutions and individuals have licensed access to content, but never owns the containers that surround the content (Shiri, 2003).
5. Fund: Since digitization is an expensive project which requires fund to make it, the libraries must seek financial support from the government, funding agencies etc.
6. The technical-know-how: The digitization requires technical skills to carry it out, therefore, the project needs skillful personnel to handle it but so many libraries lack that hence there comes the need for training.

In line with this, a study carried out in Malaysia revealed that major problem facing most staff of the libraries is that of training and retraining so that the staff could perform better in the work of digitization. Other challenges facing university libraries in Malaysia is shortage of storage, quality control and personnel to maintain their portals. The staff of libraries are therefore required to have technical skills, knowledge of metadata, checking and verifying skills for quality control and selection of hardware and software. Similarly, lack of technical knowledge and support, lack of sufficient funding are also challenges of digitization in Malaysia and Bangladeshi (Raza, 2006). Raza stressed further that budget allocation of most university libraries is not sufficient for digital library research and development since it involves huge expenditure.

The impediments to digitization of information resources are numerous. In India, the challenges include legal issues, constant changing software and hardware, funding, technophobia, technical expertise, inadequate technology infrastructure, technological obsolescence, continuous

migration, deterioration of digital media among others (Pandey&Misra, 2014). Other challenges consist of selection of materials, the installation of proper storage facilities, the ability of the library to adapt to the digitization project, digital content, collection, fund, copyright issues, technical know-how etc. In Uganda and other part of the world, challenges involved include the following as explained below (Shiri, 2003);(Digital Library of Georgia, 2004);(Okorie, 2011); (Jagboro, Omotayo & Aboyade, 2012).

The Selection of materials: the primary purpose and orientation of the digital project impose selection of materials challenges as the source of the data needs to be determined. In this regard, the libraries need to ascertain the source of the materials before digitizing and uploading (Byamugisha, 2009).

The installation of storage facilities: The installing of proper storage facilities is a prerequisite for a well working repository. In this aspect, it is expected that the libraries would install good and workable server and backup servers with very large storage and processing speed to meet users' needs.

The digitization project: The library must cope with the project. The challenge therein is that the library has to meet the budget needs of digitization project by accepting to be involved in fund drives with permission from the management to augment the government subvention in order to meet up with the needs, as most cases done in the developed nations to meet with the training and acquisition of the equipment.

Digital content and collection: one major challenge with regard to metadata is the diversity of digital formats and the way they should be described in different collections with different target audience and uses. This is because in the electronic environment institutions and individuals license access to content, they do not own the containers that surround the content (Shiri, 2003).

Fund: Since digitization is an expensive project, which requires fund, the libraries must seek financial support from the government, funding agencies.

Technical-know-how: Digitization requires technical skills to carry it out, therefore, the project needs skillful personnel to handle the project but so many libraries lack such personnel hence there comes the need for training (Shiri, 2003); (Jagboro, Omotayo & Aboyade, 2012).

Similarly, a study carried out in Nigeria revealed that digitization project at the University of Nigeria, Nsukka, was confronted with some difficulties such as slowness of the scanners, occasional breakdown of systems, legal aspect and insufficient technical support in some cases. It is wise for institutions intending to embark upon digitization project to be conversant with the copyright situation for resources to be scanned and the legal position for accessing these documents. At the University of Nigeria, Nsukka, the employee work belongs to the university, which in a way empowers the university to scan and made such documents accessible to users online. Similarly, training staff on technical skills is a challenge. Alagbeleye (2009) identified the problems militating against digitization in Africa as lack of expertise, legal copyright laws, poor funding and lack of organizational infrastructure. Agreeing with this, Shibanda (2001) believed that a major challenge facing digitization projects in Africa is that of skilled manpower.

In the same vein, Ezeani and Ezema (2009) observed that infrastructure is another challenge faced by other institutions as well as UNN. For digitization to be effective there should be standby generator, effective scanning machines and other equipment to ease the project exercise. The ownership of the intellectual property sometimes resists submitting their resources for digitization but if there is financial benefit for them, then they will easily submit their resources for digitization.

Irrespective of the benefits associated with digitization, there are numerous impediments such as the infrastructure in place for digitization, transition of the digital materials and resources into the existing library collections, digitization technology equipment and the know-how etc. as observed by (Graham, Skaggs & Stevens, 2006). Besides manpower and epileptic power supply as

challenges of digitization, funding, skills, copy right issues are great problem in digitization. Copyright means that an author’s right to an original work of literature, music and art is legally protected. Copyright portends that an author’s right to an original work is legally protected. (Eke, 2011); (Ibinaye, 2012) are of the view, that copyright gives the owner of resource the exclusive right over material concerned. Even, when the resource or the research work is made by an employee as a part

of his or her employment responsibilities, the employee is still considered copyright owner.

It is therefore important to ascertain the benefits of digitization in university libraries in Nigeria. This will be ascertain from the five federal university libraries that are involved in this digitization project in Nigeria.

Findings of the Research

The findings of this research is presented in the six Tables as indicated below:

Table 1: Name of University and the number of staff involved in digitization process

S/N	Name of University	Questionnaire distributed	Questionnaire returned and used
1	Federal University of Technology, Owerri	40	34
2	ObafemiAwolowo University, Ile-Ife, Osun state	44	38
3	University of Nigeria, Nsukka, Enugu state	46	26
4	Ahmadu Bello University, Zaria,	70	56
5	University of Jos, Plateau state	50	49
Total		250	203

A total of two hundred and fifty copies of the questionnaire were distributed but two hundred and three (82.5%) were returned and used for the study from the five Federal Universities that are digitizing their library materials. Note that in the analysis of data retrieved from the 203 respondents the values

of 1, 2, 3 and 4 were assigned to the options; Strongly Disagree (SD), Disagree (D), Agree (A) and Strongly Agreed (SA) respectively using a 4-point Likert scale. In analyzing responses for the research questions, a benchmark of mean ≥ 2.5 which implies “Accepted” else ≤ 2.5 “Rejected” was set for this study.

Table 2: Types of materials digitize

Types of materials digitize	Number	%
Abstracts of staff publications	158	79%
Postgraduate Theses and Dissertations	203	100%
Students results	2	1%
Senate reports / bulletins	32	16%
Inaugural Lectures papers	75	38%

The study reveals that Postgraduate Dissertations and Theses (100%), and abstracts of staff publications (79%) are the major resources being digitized in the five university libraries. In this study, it reveals that Postgraduate Theses and Dissertations, and abstracts of staff publications are the major resources being digitized in the five university libraries. This is line with Jagboro, Omotayo & Aboyade (2012) that materials of high demand by patrons especially when such materials are available in limited copies or are on restricted access, materials that are of local and unique needs, items that are of immediate and curricular importance and materials that are difficult to handle are being digitized.

(Ogushola, 2004); (Ezeani & Ezema, 2009); (Ibinaye, 2012) study also support this finding that libraries embarking on digitization projects do so with selected materials such as abstracts of staff publications, dissertations, and theses as applicable to the University of Nigeria, such as UNN Nsukka, University of Jos; Obafemi Awolowo University, Ile-Ife, ABU Zaria. The types of materials digitize are numerous, Eke (2011) identified some which includes theses, dissertations, projects, inaugural lectures, university newspaper, lecturers scholarly articles and publications, text books, term papers, past question papers, and other materials belonging to the university. Moreover theses, and other pieces of history such as books, newspapers, postcards, journals (Liu

2004); (Vrana, 2010). Liu (2004) posited that libraries usually digitize newspapers, maps, art, music, children’s literature, historical records

and images of international and cultural interests in the United States.

Table 3: Hardware facilities used for digitization

Hardware used	Number	%
Desktop computer	203	100%
Laptop	176	88%
Scanner	203	100%
Book Scanner	186	88%
Digital Camera	70	35%
Digital Phone or Digitizer	58	29%
Photo smart with three in one (Printer, photocopier, and scanner)	84	42%

The study identifies that desktop computer (100%), scanner (100%) book scanner (88%), digital camera (35%) digital phone or digitizer (29%) are mostly required for digitization of information resources. The study identifies that desktop computer, scanner, book scanner, digital camera or digitizer are the mostly require

facilities for digitization of information resources. This is in support of (Jagboro, Omotayo & Aboyade, 2012) who identified the various hardware in digitization projects to encompass the use of certain equipment such as computer, scanners, and digital cameras.

Table 4: Software is used for digitization and management of materials in my library?

Software used for digitization	Number	%
Dspace	196	98%
E-Print	17	9%
Fedora	-	-
Endnote	20	10%
KOHA	68	34%

The study reveals that two Software are mainly use in the management of the digitized library

resources. These are Dspace (98%), Endnote (10%) and KOHA (34%).

Table 5: Extent of Benefits of digitization

Benefits of digitization	N	Mini mum	Maxi mum	Mean
Digitization enables easy duplication of information	203	1	4	3.8
It eases data transfer	203	1	4	3.8
It makes information accessible globally	203	2	4	3.8
It facilitates value added services by enabling the combination of data from different sources	197	2	4	3.5
It enables the integration of disintegrated information	199	3	4	3.3
It quickens access and dissemination of information	195	2	4	3.3
It facilitates decision making	191	2	4	3.2
Perpetual preservation of all vulnerable physical documents	191	2	4	3.5
Easy storage of information	199	3	4	3.6
Quicken and easy retrieval of information	183	3	4	3.5
Easy access, transportation and easy to share (when data are digitized)	197	3	4	3.5
It makes data compatible with all modes of digital transfer	195	2	4	3.5
Valid N (list wise)	165			

Benchmark or criterion 2.5

When the mean value of the extent of benefit is greater than or equal to 2.5 (≥ 2.5) then there is a significance benefit but when the mean value of the extent of benefit is less than 2.5 then there is no significance benefit of such

factor. All these benefits of digitization are accepted, since all of them have calculated mean value greater than 2.5. These includes: It makes information accessible globally (3.8). It facilitates value added services by enabling the combination of data from different sources(3.8),

It enables the integration of disintegrated information (3.3), It quickens access and dissemination of information(3.3), It facilitates decision making (3.2), perpetual digital preservation of data (3.5), easy storage (3.6), easy storage of information (3.6), effortless duplication, quick and easy retrieval(3.5), easy access (3.5), easy transportation (3.5), saving time and space, and compatibility with all modes of digital data transfer (3.5). The extent of the benefits is to a large extent and very large extent because of the high mean values that is

3.2 and above, (3.8). This finding is also in support of (Silkroad, 2009) who noted that digitization helps to save the time of researchers, students and enhance corporations, while (Jagboro, Omotayo & Aboyade, 2012) reported that digitization offer a solution of theft of items especially in developing countries where some libraries have little or no electronic security systems to prevent theft of their collections since resources and services are offer online that void of theft.

Table 6: Impediment to digitization of information resources in university libraries

impediment to digitization of information resources in university libraries in Nigeria				
Impediments	N	Minimum	Maximum	Mean
Copyright restriction	195	2	4	3.5
Lack of insufficient infrastructures for digitization	189	2	4	3.3
Insufficient manpower with skills for digitization	183	2	4	3.4
Insufficient fund	191	2	4	3.3
Insufficient hardware facilities	169	2	4	3.1
Frequent breakdown of Software	159	2	4	2.8
Frequent breakdown of scanner or digitizer	165	2	4	2.7
Server and workstation defect	163	1	4	2.7
Administrative procedures that delay activities	177	1	4	2.6
Inconsistency in the production of information	173	1	4	2.6
Security of data holdings and virus infection	185	1	4	2.9
Epileptic power supply	197	1	4	3.2
Metadata creation standards difficulties	183	1	4	2.9
Valid N (list wise)	125			

Benchmark or Criterion 2.5

As reveals in Table 6 above, copyright (mean 3.5), insufficient fund (mean 3.3), insufficient infrastructures (3.3), insufficient manpower (3.4) and Epileptic Power supply (mean 3.2) are the three major factors that act as impediments or challenges to digitization of information resources in the five university libraries studied. The impediments to digitization of information resources are numerous. Copyright (3.5), fund (3.3), insufficient infrastructures (3.3), insufficient manpower (3.4) and Epileptic Power supply(3.2) are the five major factors that act as impediments to digitization of information resources in the five university libraries studied. (Pandey & Misra, 2014) found out that in India, the challenges include legal issues, constant changing software and hardware, funding, technophobia, technical expertise, inadequate technology infrastructure, technological obsolescence, continuous migration, deterioration of digital media among others. (Shiri, 2003); (Okorie, 2011); (Jagboro, Omotayo

& Aboyade, 2012) also discovered that in the selection of materials: the primary purpose and orientation of the digital project impose selection of materials challenges as the source of the data needs to be determined.

Findings of the Research

- i) That postgraduate theses and dissertations, and staff abstracts are the major materials digitized in the library studied.
- ii) That desktop computers, laptops, scanner, book scanner and digitizers are the major hardware facilities used for digitization.
- iii) That Dspace, KOHA and Endnote are the three-software used for the management of the digitized information resources in Nigerian university libraries.

- iv) All the benefits of digitization considered are accepted, since all of them have calculated mean value greater than 2.5. These includes: It makes information accessible globally (3.8). It facilitates value added services by enabling the combination of data from different sources(3.8), It enables the integration of disintegrated information (3.3), It quickens access and dissemination of information(3.3), It facilitates decision making (3.2), perpetual digital preservation of data (3.5), easy storage (3.6), easy storage of information (3.6), effortless duplication, quick and easy retrieval(3.5), easy access (3.5), easy transportation (3.5), saving time and space, and compatibility with all modes of digital data transfer (3.5). The extent of the benefits is to a large and very large extent because of the high mean values of 3.2 and above (3.8)
- v) Copyright, fund and Epileptic Power supply which are the three major factors that act as impediments to digitization of information resources in the five university libraries studied.

Conclusion

This study on benefits and impediments to digitization of information resources in Nigeria exposes the types of materials digitized, hardware and software facilities used. The benefits and the impediments faced by the university libraries. It therefore nice to say that the libraries should be involve in digitization of information resources as this is beneficial to library information resources management for online services.

Recommendations

1. The research recommend that materials to digitize should be resources that are useful in the present time and the future, therefore library managers need to identify those items to reduce waste of resources.
2. The benefits of this assignment need to put into consideration which then prompt the library and university

management in embarking on digitization of library information resources.

3. To enhance digitization, the library needs to increase its budget to purchase technology equipment and offer solution to such impediment like copyright, fund and Epileptic Power supply which are the three major factors that act as limitation to digitization of information resources in Nigeria.

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