

# THE INFORMATION TECHNOLOGIST

Volume 13 Number 1  
June, 2016

**An International  
Journal of Information  
and Communication  
Technology (ICT)**

The pioneer  
ICT Journal  
in Africa

Scientific Journal Impact Factor Score of 3.362

Available electronically!  
[www.ajol.info](http://www.ajol.info)

## OBJECTIVE AND SCOPE

*The Information Technologist: An International Journal, of Information Communication Technology (ICT)* is a referred Journal by Nigerians and foreign renowned Scholars who have distinguished themselves in the field of Information Communication Technology (ICT)

Essentially the journal concerns itself with the pervasive impact and the changes in the basic character of library and information operations and services occasioned by the use of technology.

The journal deals mainly with the publication of the results of empirical research in the field of Library, Information Science Communication and Information Technology as they affect Developing Countries. The journal is also devoted to articles of high quality on the theoretical aspects of its area of concern. Book reviews, letters to the editor, news items and other brief communications are also welcome.

## THE INFORMATION TECHNOLOGISTS:

*An International Journal of ICT*

**Editor in Chief: Dr. E.C. Madu**  
Department of Library and Information Technology,  
Federal University of Technology,  
Minna, Nigeria.  
E-mail: [evamadu@yahoo.co.uk](mailto:evamadu@yahoo.co.uk)  
Phone: 08055063324

### Associate Editor:

**Dr. (Mrs) Marie Beauty Dirisu**  
Nigerian Institute of International Affairs  
(NIIA) Library,  
Lagos  
E-mail: [beauty.dirisu@yahoo.com](mailto:beauty.dirisu@yahoo.com)  
Phone: 08054259348

## EDITORIAL BOARD

**Professor Charles Omekwu**  
Department of Library and Information Science  
University of Nigeria,  
Nsukka, Nigeria.  
E-mail: [omekwucharles@mail.com](mailto:omekwucharles@mail.com)

**Prof. (Mrs.) Clara C. Okoro**  
Adekunle Alalade Library  
Babcock University,  
Ogun State, Nigeria.  
E-mail: [clarij2002@yahoo.com](mailto:clarij2002@yahoo.com)

**Professor Emma Camble**  
Department of Library Science University of  
Maiduguri, Nigeria.

### Prof. M. Afolabi

Department of Educational Technology and  
Library Science,  
University of Uyo, Akwa-Ibom, Nigeria

### Dr. (Mrs.) J. U. Igbeka

Kenneth Dike Library  
University of Ibadan, Nigeria.

### Dr. (Mrs.) A. Agbaje

Nigerian Institute of Educational Planning and  
Administration, Ondo, Ondo State.

### Professor Ibrahim Haruna

Department of Library and Information Science  
University of Maiduguri, Nigeria.

### Dr. E. A. Apeji

Nigerian Educational Research and Development  
Council (NERDC) Abuja, Nigeria.

### Prof. B. C. Nzotta

South Africa

### Prof. M. Ochogwu

Department of Library Science,  
Benue State University, Makurdi,  
Benue State.

## SUBMISSION OF MANUSCRIPTS

Manuscripts and other editorial communications  
should be sent on-line to:

### DR. E. C. MADU

*Editor-in-chief*  
Department of Library and Information  
Technology,  
Federal University of Technology,  
Minna, Nigeria.  
E-mail: [evamadu@yahoo.co.uk](mailto:evamadu@yahoo.co.uk)  
Phone: 08055063324

### DR. [MRS] MARIE BEAUTY DIRISU

*Associate Editor*  
Nigerian Institute of International Affairs  
(NIIA) Library, Lagos, Nigeria.  
E-mail: [beauty.dirisu@yahoo.com](mailto:beauty.dirisu@yahoo.com)  
Phone: 08054259348

## ANNUAL SUBSCRIPTION RATES

Individual (Nigeria) ₦2,000.00  
Institutions (Nigeria) ₦3,000.00  
Individual (Overseas) US\$50 or £30  
Institutions (Overseas) US\$70 or £50

Overseas Subscribers can pay cash through  
**WESTERN UNION MONEY TRANSFER** to  
**DR. E. C. MADU**

*The Information Technologist: An International Journal of Information Communication Technology (ICT)* is published twice a year (June and December) by the Association of Information Professionals of Nigeria.

**THE INFORMATION TECHNOLOGIST  
AN INTERNATIONAL JOURNAL OF INFORMATION  
AND COMMUNICATION TECHNOLOGY**

*Volume 13 Number 1*

*June 2016*

**CONTENTS**

*Editorial*

**Monika Gupta and Paramjeet K. Walia**  
Wiser Ranking of the African National  
Libraries' Websites 1

**Bolanle Oluyemisi Fagbola, Ph.D**  
The State of Information and  
Communication Technologies (ICTs) in  
Research Institute Libraries in  
Southwestern Nigeria 15

**Antonia Bernadette Appiah,  
Musah Adams, Ph.D and  
Isaac Nyarko Adu**  
Change Management in Library  
Environments: A Comparative Study of  
Private and Public University Libraries  
in Ghana 25

**Emerson A. Jackson**  
Integration of Learning Technology in  
Sierra Leone's Higher Education  
System: Implications and Challenges 39

**James Ogom Odu, Ph.D**  
Assessment of Mobile Phone Use  
Pattern among Undergraduates in the  
University of Calabar, Nigeria 51

**Nonyelum P. Okpokwasili, Ph.D  
Gladys Ngozi Onyia, Ph.D and  
Florence Nwanne Olise**  
Influence of Scope of Information  
Resources on Users' Satisfaction in  
University Libraries in South-South  
Zone of Nigeria 63

**Adefunke Sarah Ebijuwa,  
Kudirat Olawumi Salami and  
Hameed Olayide Isamotu**  
Evaluation of User S' Perception and  
Satisfaction with Reference Services in  
Olusegun Oke Library, Ladoke Akintola  
University of Technology (LAUTECH)  
Ogbomoso, Nigeria 75

**Smart E. Ambrose**  
The Use of Electronic Communication  
(Social Network) by Open and Distance  
Students, The Case of National Open  
University of Nigeria, Benin Study  
Centre 85

**Janet Onomeh Ubogu**  
Cataloguing of Electronic Resources in  
some Selected University Libraries in  
South-South, Nigeria 97

**Reuben Abiodun Ojo, CLN and  
Titilayo Comfort Ilesanmi, CLN**  
Implementing Digitization Initiatives in  
University Libraries in Nigeria, A  
Backbone for Achieving Institutional  
Repository (IR): Kenneth Dike Library,  
University of Ibadan Experience. 105

**Mosumade Opeoluwa Oloruntola**  
Study Habits and Library Usage among  
Undergraduates in Federal Universities  
in South-West Nigeria 121

**Abiola Abosede Sokoya, CLN  
and Fadekemi Oyewumi, Ph.D**  
Relationship between Computer  
Anxiety and Internet Satisfaction of  
Secondary School Students in Lagos  
State, Nigeria 133

**Opeyemi Oluwabunmi Oyinloye, Tabawa Yusuf Dangwaran and Helen Solomon Kantiok**  
Information Seeking Behaviour and Use of Information Resources, by Bingham University Humanities, Social and Management Sciences Undergraduate Student. 141

**Blessings Amina Akporhonor, Ph.D and Christy Benaïke-Ebide Endouware**  
Challenges of Using Web 2.0 Tools among University Librarians in the Niger Delta Region of Nigeria 153

**Pearl C. Akanwa, Ph.D, Ogechi Nkechi Okorie and Chioma Okere**  
Influence of Planning on the Provision of Services to Children in Eastern States of Nigeria 163

**Fidelis E. Inyokwe, Ph.D and Juliana Agwunobi**  
Internet and Library Classification as Determinants of Students Utilisation of Information Resources In University of Calabar Library 171

**Anne Edem, Judith Nse and Ogueri Emeka**  
Extent of Implementation of Collection Development Policies in Academic Libraries in Imo State 183

**Dare Abel Lamidi, Benjamin Olukayode Alafiatayo and Tabawa Yusuf Dangwaran**  
Preservation and Conservation of Electronic Information Resources of Television Stations in Africa: A Case Study of Selected Broadcast Libraries of the Nigerian Television Authority (NTA) 189

**Yinasim Pius Musa and Pius Musa (CLN)**  
An Assessment of the Implementation of E-Governance in Adamawa State Nigeria 199

**Diyoshak Rhoda Danladi CLN and Panle Paul Patrick CLN**  
Exploring Best Cataloguing Rules in the 21st Century: Changes From AACR2 to RDA 207

**P.C. Akanwa Ph.D, and Ijeoma F. Mbagwu**  
School Library Services and Students' Satisfaction in the School Library of Federal Government Girls College Owerri 215

**Adefunke Sarah Ebijuwa**  
Electronic Resources Access and Usage among the Postgraduates of a Nigerian University of Technology 227



## **IMPLEMENTING DIGITIZATION INITIATIVES IN UNIVERSITY LIBRARIES IN NIGERIA, A BACKBONE FOR ACHIEVING INSTITUTIONAL REPOSITORY (IR): KENNETH DIKE LIBRARY, UNIVERSITY OF IBADAN EXPERIENCE.**

Reuben Abiodun Ojo\* CLN  
and  
Titilayo Comfort Ilesanmi\*\* CLN

\*Mr. Reuben Abiodun Ojo is currently a Principal Librarian, Kenneth Dike Library University of Ibadan, Nigeria. He holds a B.Sc. (Hons) degree in computer Science, an MLS in Library and Information Science and an MA in Peace and conflict Studies. He is a certified librarian, and a member of Nigerian Library Association. His research interest is in the area of ICT Application to Library Services. E-mail: reubenojo2012@gmail.com Phone: No: 07065562318

\*\*Mrs. Titilayo C. Ilesanmi is currently the Head, Digitization Unit, Kenneth Dike Library, University of Ibadan, Nigeria. She holds a BLIS and an MLS degrees in Library and Information Science. She is a certified librarian and a member of Nigerian Library Association. Her areas of research interest include: Digitization, Institutional Repository, Electronic Information Resources Management. E-Mail: datitilayo@yahoo.com Phone No:08056408646

### **Abstract**

This paper addressed digitization initiatives in university libraries in Nigeria as a backbone for implementing a sustainable and reliable institutional repository (IR), using Kenneth Dike Library, University of Ibadan, Ibadan as a reference point. It discussed among other things, provision of background information about the initiative, looking at digitisation initiative from global perspective, taking decisions on what part of the collections to be digitised, why is digitisation so accentuated, statement of problem, justification for embracing digitisation initiative, critical elements of digitisation processes, copyright issues, handling copyright issues, using Sherpa Romeo colour web page, basic library responsibilities in managing digital project (IR), a documentation of digitisation efforts at University of Ibadan Kenneth Dike Library: The story so far, prospects, lesson learnt and conclusion. In a nutshell, the whole essence of this paper is to document Kenneth Dike Library experience in respect of the digitization initiative taken in October, 2010, as a platform for implementing Institutional Repository (IR) for the University of Ibadan, Ibadan. The progress reports as well as other details in respect of digitisation processes are hereby provided. This will serve as a blue print for any university academic library wanting to implement institutional repository (IR), using digitisation as a back bone.

**Key Words:** Digitization, University, Libraries, Repository, Institutional.

### Brief Introduction

Digitization, in a nutshell, can be defined as scanning analog sources into the computer. The scanned physical materials are held in digital format, that is, in bit-streams (0s & 1s). It is a process of converting information held in human readable format to machine readable format. The whole initiative is aimed at ensuring that digital media and information systems are interpretable into the future generations. It is an assumption, worthy of being accepted that traditional representation of information is limited by storage space whereas information held in digital format has potential of accommodating much more information because digital information requires very little physical space to contain it. In terms of cost implications in respect of maintenance, information held in digital format is cost effective compare to traditional format representation. It is a backbone for achieving and implementing a sustainable Institutional Repository (IR) for the University. Institutional repository (IR) is a digital archive of a university's intellectual output

### Background Information

The University Librarian (Dr. B. A. Oladele) initiated the process of digitizing Kenneth Dike Library rare collections in October, 2010. To this end, a digitization chamber was set up as a takeoff site sufficiently equipped with computers and accessories with internet connectivity. This initiative was targeted towards enhancing our services as a library, serving academic community to support Teaching, Learning and Research (TLR) initiative of the entire University of Ibadan system in order to ensure digital preservation of our materials. At the point of its commencement, an implementation committee was constituted and given the following terms of reference in order to aid successful implementation plan.

- To identify materials to be digitized
- To plan out all the materials and logistics for digitization

- To host the web of the digitized materials where appropriate
- To report to the University Librarian on the progress of the job

When the committee met for the first time, the materials to be digitized in prioritized order were identified as follows:

- Grey literature
- Manuscripts
- Arabic Collections
- Theses: This is a collection of Ph.D. theses submitted to the university, which must be limited to abstract and content.
- Photographs
- Sound/ Video Records
- Artefacts
- University archives
- Lectures ( inaugural, Vaedictory, PG lectures, Links, etc)
- University Bulletins
- The Africana Collection: These include newspapers, magazines and books published on Africa (with very strong emphasis on Nigeria) which were acquired through the legal deposit, monographs, Publication Ordinance, magazines, legal deposit materials, special publications by International organisations (e.g. UNICEF, World Bank etc), old Newspapers, Manuscripts and Government documents that can be located using subject catalogue and Author-Title catalogue, non-book materials such as microfilms, slides, records, video tapes, etc are all housed.

### Digitization Initiatives from Global Perspective

Digitization, in a nutshell, can be defined as scanning analog sources into the computer. The scanned physical materials are held in digital format that is in bit-streams (0s & 1s). One of the crucial processes of digital collection, particularly in implementing IR for the university and allied institutions is

digitization. The reason for this is not far-fetched because it is the backbone for achieving a sustainable and reliable Institutional Repository (IR) for the University. Simply put, in explaining digitisation further, it is the conversion of any fixed or analogue media, such as: books, journal articles, pictures, etc, into electronic form through scanning, sampling, or in fact even re-keying. An obvious obstacle to digitization is that it is very expensive in terms of implementation. One estimate from the University of Michigan at Ann Arbor, the organization responsible for the JSTOR project, puts the cost of digitizing a single page at \$2 to \$6 dollars US (Chepesuk, 1997).

#### **Decision on what part of the collection to be digitised**

There are several approaches available, at least theoretically in respect of deciding on what part of the collection is to be digitised. These approaches are hereby listed and briefly explained: Retrospective conversion of collections, Digitization of a particular special collection or a portion of one, Highlight a diverse collection, High-use materials, An *ad hoc* approach.

- **Retrospective conversion of collections**- essentially, starting at A and ending up a Z. However ideal such complete conversion would be, it is impractical or impossible technically, legally, and economically. This approach can arguably be dispensed with as a pipe dream.
- **Digitization of a particular special collection or a portion of one.** A small collection of manageable size, and which is highly valued, is a prime candidate.
- **Highlight a diverse collection** by digitizing particularly good

examples of some collection strength

- **High-use materials**, making those materials that are in most demand more accessible.
- **An *ad hoc* approach** where one digitizes and stores materials as they are requested. This is, however, a haphazard method of digital collection building.
- The above approaches can be used as an entity or in combination, depending upon a particular institution's goals and aspirations for digitization. Nested within these approaches are several criteria for selecting individual items. These include:
  - Potential for long-term use
  - Intellectual or cultural value
  - Provision of greater access than possible with original materials (e.g., fragile, rare materials)
  - Copyright restrictions or licensing which permits conversion.

It is worth noting that libraries in the developed countries have taken giant stride in digitizing their collections, particularly those materials that cannot weather storm in terms of long term preservation using traditional format. The reason being that access to materials being held in traditional format is restrictive because of the level of deterioration. Moreover, unless users register their physical presence where these materials are located, they cannot access the contents. There is therefore need to provide wider visibility in terms of speedy access to these material without geographical limitation. This is of course what digitisation tends to address so that access to digital archives of materials can be provided to all and sundry in global terms. This will raise the profile and prestige of the affected institution which is a plus.

Universities, both in the developed as well as developing world, serve as the arena in respect of Teaching, Learning and Research (TLR) for development. University libraries as the crucial and important components of the entire systems are the heartbeats of these institutions. The reason for this is that learning and research start and end in the university library. University libraries as information bank for academic community, acquire, organise, disseminate and preserve materials to achieve the vision and mission of the institution within their jurisdiction. The adoption and implementation of Information and Communications Technology (ICT) in the library and information profession has changed the ways in which these activities are handled. One of these is the digitization of library materials held in human readable formats and have undergone repeated use.

Digitization, in the context of global perspective can be seen as the transformation of traditional contents into electronic or digital formats. This can be seen as a new trend in the library profession that is still at an infant stage of development, especially in the developing countries. This development has placed higher level of demand on information professionals, particularly librarians, working in an academic library attached to a university in terms of responsibilities they perform. Part of these is the ability to be able to package information in different formats apart from printed formats. The packaged information must be made available and accessible in electronic format to whoever needs such information without restriction in terms of geographical location of such individual. In essence, the students and researchers alike, regardless of their locations should be able to access and use the available resources anytime, any day (Fabunmi, Paris and Fabunmi (2006)). Any digitized materials should be made accessible through the library websites in order to create necessary awareness for users both within and outside the university community and particularly in global terms.

It needs to be emphasized here that the original copies of the digitized materials should be kept in the local server of the affected institution so that what would be pasted on the site is just the information about the availability of such materials in the library in case the need arises (abstract).

### **Why is the digitization so accentuated?**

The digital information is independent of the media on which it is recorded and it can be stored with certain redundancies enabling its full and exact reconstruction even when the media has been partly damaged. The digitized manuscript differs substantially from the original which is condemned by its substance to a successive loss of information until its final doom. For the purpose of further thinking it is recommended to realize what kind of information the manuscript contains and to define it. There is information which the scribe may want to communicate to the reader of the manuscript.

Today we could say that it is basic image data. The scribe may intend to transmit certain information by underlining or embellishing it, to express emotional relationship with it.

The used techniques were applied for one fundamental goal which was an appropriate visual understanding of the given information. However, the manuscript also contains the visual information which was recorded unintentionally; for example, details of characters appeared during the writing or details determined by used materials, damage, and repairs. This information can be called secondary image data. There is also a lot of other information contained in the manuscript which is especially of physical and technological character, (used materials, their origin and binding, etc.), and information enabling discovery of the history of the manuscript. This information can be called physical data. Any material that is held in electronic format which is achieved through digitization can be accessed anytime, anywhere, any day without any restriction as long as there are



Internet facilities and sustainable platform for making accessibility possible. The primary purpose of digitization is to preserve, make visible and access traditional format resources held in electronic format globally. This development necessitated the initiative taken by the management of KDL to set up a digitization chamber in October, 2010 where library materials, particularly manuscripts, and journals with University of Ibadan origin are being digitized on daily basis. This is aimed at preserving our cultural heritage such as artefacts and paper documents in order to create better visibility and accessibility to individuals, researchers, organizations who are interested in such collections with global perspective. Digital library is a tool for preservation, accessibility and visibility of important materials in the library. Part of such materials is manuscripts. Manuscripts are hand written paper documents that contain vital information. They are usually primary sources of information.

#### **Statement of problem**

The main objective of digitization initiatives, especially in our academic libraries in Nigeria is to preserve our cultural heritage, bridge the digital divide and create wider access to knowledge which will result in coping with the challenges of information explosion and its effective management in the information age. Researchers within and outside the University of Ibadan community do visit Kenneth Dike Library (KDL) to consult materials for Teaching, Learning and Research (TLR) purposes either remotely or on the site. Part of its valuable materials consulted by researchers is manuscripts collections. These collections serve as primary sources of information to both students and researchers alike. Due to the texture of these materials, wear and tear of use as well as the weather condition and poor mechanism of search and accessibility necessitated the adoption of digitising these materials at Kenneth Dike Library.

University of Ibadan, Ibadan. The urgent need to project the image of the library, in terms of the available contents with respect to preservation of our cultural heritage is yet another consideration.

#### **Justification for embracing digitization initiatives.**

Digitization is embraced all around the world because of the potential values embedded in it. These values are preservation, borderless visibility and accessibility. Digitization preserves materials most especially of important information which may get lost in the future due to texture of such materials. For instance, most paper used for documenting information are not acid free, hence possibility of quick deformation. However acid free boxes are been used to prevent fast deterioration but would not last long. These information sources are available in print and non-print. Borderless visibility and accessibility connotes researchers using digital libraries anytime anywhere. Fabunmi, Paris and Fabunmi (2006). Location barrier has been eliminated as a result of the advent of Information and Communication Technologies in respect of scholars' access from other parts of the country and globally. A digital library is a collection of documents in organized electronic form, available on the Intranet, Internet or on CD-ROM. Literature revealed that digitization has been established in both developed and developing countries. In the developed countries, for instance in the United State of America, Lieu 2004, and United Kingdom, Chowdhury, et al (2008) revealed that digitization was majorly carried out by academic and public libraries. Such projects are funded by their government as well as funding agencies. In developing countries, Okiy (2008) reported the Database of African Theses And Dissertations (DATAD) been implemented by the Association of African Universities. In Nigeria, some university libraries like University of Jos,

University of Nigeria Nsukka, University of Ibadan have joined the digitization initiatives. Generic purpose of digital libraries is to enhance access to information globally and bridge digital divide between developed and developing countries.

### **Critical Elements of Digitisation Processes**

#### ***Metadata as a Professional Activity***

Talking in respect of digitisation, metadata is a crucial element which is a professional activity. What then is metadata?. Metadata is the data that describes the contents and attributes of any particular item in a digital library. It is central to the deployment of digital libraries. It is a concept familiar to librarians because it is one of the primary professional activities that librarians do engage in, particularly, in creating cataloguing records that give bibliographic description of documents. Metadata is important in digital libraries because it is the key to resource discovery and use of any document. Anyone who has used search engines such as: Alta Vista, Excite, or any of the other advanced search engines on the Internet knows that simple full-text searches don't scale in a large network. One can get thousands of hits, but most of them will be irrelevant. While there are formal library standards for metadata, namely AACR, such records are very time-consuming to create and require specially trained personnel. Human cataloguing, though superior, is just too laboured extensive for the already large and rapidly expanding information environment. Thus, simpler schemes for metadata are being proposed as solutions by different school of thought. Prominent among these is Dublin Core Schema. Dublin Core schema is an effort to determine the "core" elements needed in describing a particular material for the purpose of visibility and accessibility. It is the default metadata format within the DSpace application which allows one to add or change any field to customise it for application.

### **Choosing Content Management System Software for Digitisation**

Choosing appropriate content management system software for digitisation is very crucial and critical. Example of content management system software is DSpace. It is freely available open source software. It is one of the open source software platforms to store, manage and distribute the collections in digital formats. It supports next generation digital archiving that is more permanent and shareable than the current analog archives. It supports a wide variety of artefacts, including books, theses and 3D digital scans of objects, photographs, films, videos, research data sets and other forms of contents. It offers facilities the advantages and convenience of web-based submission and dissemination. It provides a way to manage research materials and publications in a professionally maintained repository to give users greater visibility and accessibility overtime. To achieve inter-operability of information system so that resources can be shared, there is need to establish minimum standard of connectivity in respect of both the hardware and software. To this end, DSpace has the largest community of users and developers worldwide among those institutions when it comes to choice of digitisation software. It has over two hundred and fifty (250) institutions that are currently using it within their organisation in a production or project environment. A census of IR in United State was carried out by CLIR in 2007 and found that DSpace was the preferred IR system software of the four hundred and forty six (446) participant in the survey.

### **Naming, identifiers, and persistence**

Names are strings that uniquely identify digital objects and are part of any document's metadata. Names are as important in a digital library as an ISBN number is in a traditional library. They are needed to uniquely identify digital objects for purposes such as: Citations, information retrieval, making links among objects, for managing copyright. Any

system of naming that is developed must be permanent, lasting indefinitely. This means, among other things, that the name can't be bound up with a specific location. The unique name and its location must be separate. This is very much unlike URLs, the current method for identifying objects on the Internet. URL's confound in one string several items that should be separate. They include the method by which a document is accessed (e.g., HTTP), a machine name and document path (its location), and a document file name which may or may not be unique (e.g., how many index.html files do you have on your Web site?).

A global scheme of unique identifiers is required; one that has persistence beyond the life of the originating organization and that is not tied to specific locations or processes. These names must remain valid whenever documents are moved from one location to another, or are migrated from one storage medium to another.

Three examples of schemes proposed, according to (Chowdhury, 2008) to get around the problem of persistent naming are PURLs, URNs, and Digital Object Identifiers. These are hereby briefly explained.

- **PURLS.** PURLs are persistent URLs. They are a scheme developed by OCLC in an attempt to separate a document name from its location and therefore increase the probability that it will always be found. PURLs work through a mapping of a unique, never-changing PURL to an actual URL. If a document moves, the URL is updated, but the PURL stays the same. In operation, a user requests a document through a PURL, a PURL server looks up the corresponding URL in a database, and then the URL is used to pass the document to the user
- **Uniform Resource Name (URN).** URNs are a development of the

Internet Engineering Task Force (IETF). A URN is not a naming scheme in itself, but a *framework* for defining identifiers (Lynch, 1998). They contain a naming authority identifier (a central authority given the task of assigning identifiers) and an object identifier (assigned by the central authority). Like PURLs, URNs must be resolved, through a database or other such system, into actual URLs. Unlike PURLs, however, a URN can be resolved into more than one URL, such as one for each of several different formats. There is currently no working URN system.

- **Digital Object Identifier (DOI) System.** DOI is an initiative by the Association of American Publishers and the (American) Corporation for National Research Initiatives designed to provide a method by which digital objects can be reliably identified and accessed. The CNRI Handle system, which underlies DOI, is a system that resolves digital identifiers into the information required to locate and access a digital object. The main impetus of the DOI system is to provide publishers with a method by which the intellectual property right issues associated with their materials can be managed (Eke, 2011).

The issue of persistent naming raises its head in a coordinated scheme, as well. Persistent names are an organizational problem, rather than an engineering problem. Technically, a system to handle names is possible; however, unique identifiers will only persist if some institution takes responsibility for their management and migration from a current technology to succeeding generations of technologies. Thus, one goal of a coordinated digital library scheme would be to identify an

institution or institutions that would take charge of issuing, resolving, and migrating a system of unique names.

Copyright issues and its practical management.

Copyright issue has been called the "single most vexing barrier to digital library development" (Chepesuik, 1997). Digital Librarian needs to be informed about the complexity of copyright issues and know which resources to access and monitor in order to keep abreast of developments. The following are key decisions to be made: End user agreement, take down notice, copyright notices on the article, deposit notices, copyright information for end users. The current paper-based concept of copyright breaks down in the digital environment because the control of copies is lost. Digital objects are less fixed, easily copied, and remotely accessible by multiple users simultaneously. The problem for libraries is that, unlike private businesses or publishers that own their information, libraries are, for the most part, simply caretakers of information—they don't own the copyright of the material they hold. It is unlikely that libraries will ever be able to freely digitize and provide access to the copyrighted materials in their collections. Instead, they will have to develop mechanisms for managing copyright, mechanisms that allow them to provide information without violating copyright, called rights management. Some rights management functions could include, for example:

- usage tracking
- identifying and authenticating users
- provision of copyright status of each digital object, and the restrictions on its use or the fees associated with it
- handling transactions with users by allowing only so many copies to be accessed, or by charging them for a copy, or by passing the request on to a publisher

**The Romeo Project (Right Metadata for open archiving)**

Still on handling copyright management, Romeo project was a Joint Information System Council (JISC) in collaboration with Well come Trust in United Kingdom funded project. Investigation on the rights issues surrounding the self-archiving of research in the United Kingdom was carried out. They created a list of publishers' conditions for self-archiving. The outcome of this wonderful initiative was the creation of a database-driven searchable service and knowledge bank of information on rights given to authors by the major publishers of peer-reviewed academic journals. This has now made it possible to search for many publishers and find out what permissions are normally given as part of publisher's copyright transfer agreement. The majority of publishers support the right of academic authors to mount their work online (i.e make deposit into IR). However, some on the other hand prohibit authors from using their work in this way as a condition of their copyright transfer agreement which they ask the author to sign when his/her article was accepted for publication. Proper understanding of a copyright transfer agreement (CTA) on the part of author is very crucial.

#### **The Sherpa Romeo Website**

This was established with support from JISC & Well come Trust as earlier mentioned to locate publishers' policies on copyright and self-archiving. It has collected and analysed policy statements of nearly three hundred (300) major publishers. It also has a rating system to indicate the level of self-archiving supported by the major publishers. These policies can be viewed either by publishers or journal titles. The Web Address is as stated below for checking copyright transfer agreement supported by different major publishers:

<http://www.sherpa.ac.uk/romeo/browse.php?>  
**Sherpa Romeo Colours Web Page**

The Sherpa Romeo colour page, as indicated on the web page explains the rating system as follows: **Green** means can archive pre-print & post-print; **Blue** indicates can archive post-print (i.e final draft); **Yellow** shows can archive pre-print (i.e pre-refereeing). **White** connotes archiving not formally supported.

Note: As at April 2007, the eprint summary statistics on journal policies "Says, 62% of the publishers registered are "green" publishers.

Preservation: Another important issue in digitization is preservation which connotes, keeping digital information available in perpetuity. In the preservation of digital materials, the real issue is technical obsolescence. Technical obsolescence in the digital age is like the deterioration of paper in the paper age. Libraries in the pre-digital era had to worry about climate control and the de-acidification of paper based materials. However, the preservation of digital information will mean constantly coming up with new technical solutions. When considering digital materials, there are three types of "preservation" one can refer to: the preservation of the storage medium, the preservation of access to content, the preservation of fixed-media materials through digital technology, the preservation of the storage medium. Tapes, hard drives, and floppy discs have a very short life span when considered in terms of obsolescence. The data on them can be refreshed; keeping the bits valid, but refreshing is only effective as long as the media are still current. The media used to store digital materials become obsolete in anywhere from two to five years before they are replaced by better technology. Over the long term, materials stored on older media could be lost because there will no longer have the hardware or software to read them. Thus, libraries will have to keep moving digital information from storage medium to storage medium.

- the preservation of access to content. This form of preservation involves

preserving access to the *content* of documents, regardless of their format. While files can be moved from one physical storage medium to another, what happens when the formats (e.g., Adobe Acrobat PDF) containing the information become obsolete? This is a problem perhaps bigger than that of obsolete storage technologies. One solution is to data migration--that is, translate data from one format to another preserving the ability of users to retrieve and display the information content. However, there are difficulties here too--data migration is costly, there are as yet no standards for data migration, and distortion or information loss is inevitably introduced every time data is migrated from format to format. The bottom line is that no one really knows how best to migrate digital information. *Preserving digital information: The Report of the Task Force on Archiving of Digital Information* (RLG, 1995) by the US Commission on Preservation and Access and RLG states, "the preservation community is only beginning to address migration of complex digital objects" and such migration remains "largely experimental." Even if there were adequate technology available today, information will have to be migrated from format to format over many generations, passing a huge and costly responsibility to those who come after.

- the preservation of fixed-media materials through digital technology. This is premised on the issue that involves the use of digital technology as a replacement for current preservation media, such as microforms. Again, there are, as yet, no common standards for the use of

digital media as a preservation medium and it is unclear whether digital media are as yet up to the task of long-term preservation. Digital preservation standards will be required to consistently store and share materials preserved digitally (Chepesuik, 1997).

#### **Basic Library Responsibilities in Managing Digitisation Project (IR)**

Library staff (Digital Librarian as project manager), plays prominent roles in managing effectively the processes involved in digitisation. These roles are, but not limited to the following:

- Sensitise the university community and stress the need for them to deposit materials into the IR being packaged through the process of digitisation.
- Provision of advice to members of the university community about copyright as well as journal embargo policies for materials which they would like to deposit in the Institutional Repository (IR).
- Deposit materials directly on behalf of members of the university community who do not or cannot self-archive their materials.
- Review the metadata of content which has been self-archived to maintain the quality of the records.

**Note:** Training in these areas is crucial to ensure quality control, particularly in the areas of data entry and review.

#### **Digitisation Efforts at University of Ibadan Kenneth Dike Library: The story so far**

##### **Kenneth Dike Library: An Historical Perspective.**

□ Kenneth Dike Library (KDL) is as old as the University itself. KDL, University of Ibadan being the first tertiary institution in Nigeria holds the largest collection of materials that cannot be found on the shelves in the public domain again but very useful

for Teaching, Learning and Research (TLR) activities. Also, complementing this is the fact that Kenneth Dike Library, University of Ibadan was acting as national library until 1964 when the current national library was established. The implication of this development is that KDL is a repository of all government publications before 1964 and not only that the subsequent deposits in the national library, copies were/are being brought to KDL for continuity. These documents cannot be found elsewhere except in KDL. Rare materials (e.g., manuscripts collections of Nigerian past heroes such as: Herbert Macaulay, Ransome Kuti, etc. are also available in KDL with valuable contents that can support TLR. This development necessitated the commencement of digitization efforts at Kenneth Dike Library (KDL), University of Ibadan, Ibadan. The ultimate goal of this initiative is to metamorphous into building Institutional Repository (IR) for the university of Ibadan. Institutional Repository (IR) is a digital archive of a typical University's intellectual output. Therefore, a University-based IR is a set of services that a University offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. Digitisation, however, provides a platform for implementing IR for the University.

##### **Identification of Material to be digitized:**

Suggestions on selecting materials to be digitized are as listed below:

- Grey literature
- Manuscripts
- Arabic Collections
- Theses: This is a collection of Ph.D. theses submitted to the university, which must be limited to abstract and content.
- Photographs
- Sound/ Video Records
- Artifacts
- University archives

- Lectures ( inaugural, Valedictory, PG lectures, Links,etc)
  - University Bulletins
  - The Africana Collection: These include newspapers, magazines and books published on Africa (with very strong emphasis on Nigeria) which were acquired through the legal deposit, monographs, Publication Ordinance, magazines, special publications by International organisations (e.g. UNICEF, World Bank etc), old Newspapers, Manuscripts and Government documents that can be located using subject catalogue and Author-Title catalogue, non-book materials such as microfilms, slides, records, video tapes, etc are all housed.
- 12/16 GB system memory for advanced multitasking
  - SuperMulti DVD/CD burner
  - 1TB hard drive for ample file storage space
  - Built-in TrueVision 720p HD webcam with microphones
  - Built-in media reader.
  - 2 USB 3.0 ports maximize the latest high-speed devices
  - Wireless and wired network connectivity.
  - Bluetooth 4.0 interface syncs with compatible devices
  - Wireless keyboard and wireless mouse reduce cable clutter

#### **The Project, how it all started**

The digitization initiative commenced in KDL in October, 2010 with the acquisition of basic digitization equipment (both hardware and software) which are listed below:

#### **Hardware Acquisition**

- 11 HP desktop computers
- 10 OCR Scanners
- 11 UPS
- 2 Printers
- A linux based operating system server
- Digital Camera
- External Storage Device ( terabyte disks for data backup)

#### **Recommended Configuration for Server and Work Stations for IR**

##### **SERVER:**

HP – ML 350 4.0 Ghz

##### **WORKSTATION:**

HP - All-In-One - 4th Gen Intel® Core™ i3-4160T processor

- 4GB system memory for advanced multitasking
- SuperMulti DVD/CD burner
- 500GB hard drive for ample file storage space
- Built-in TrueVision 720p HD webcam with microphones
- Built-in media reader.
- 2 USB 3.0 ports maximize the latest high-speed devices
- Wireless and wired network connectivity.
- Bluetooth 4.0 interface syncs with compatible devices
- Wireless keyboard and wireless mouse reduce cable clutter

##### **Other Equipment:**

##### **Configuration for Flatbed Scanner:**

- 4800 (4800 x9600) optical resolution

- 12,800 x 12,800 DPI with interpolation
- 11" x 17" maximum scan area
- Color depth: up to 48 bits (selectable)
- Grayscale depth: up to 16 bits (selectable)
- Optical density: 4.0 Dmax
- Scanning speed in 4800 dpi high-speed mode
- Color = Monochrome 12.3 msec/line; Full color 12.3 msec/line

**Software Acquisition:** Majorly, the following are used:

- Adobe Acrobat Pro is used to create and edit PDF files with rich media included and share information more securely.
- Macromedia Fireworks software is a graphic editor for editing and managing the quality of graphics.
- Flipping tool software is used for final presentation of output, i.e., opening of the digitized work electronically.
- Antivirus- For the workstations accessing the server (housing the IR).

**Scanning Software:** This is in-built into the scanners that are acquired (e.g., for HP Scanners, HP Solution Center). Other examples of scanning software that are available:

- Epson Scan ver. 2.65A
- HP Image zone software 8.4.2
- Epson Twain Pro 2.10A
- HP Photo & Imaging Gallery 1.1
- Color Network ScanGear ver. 2.2
- Colorado MX ver. 4.5
- Canon Color ImageRUNNER C3220
- Adobe Photoshop Elements – for image manipulation and creation of derivatives
- OmniPage Pro or Abbyy FineReader (Optical Character Recognition software – if you are digitizing text-

based materials and you want to make them keyword searchable

**Funding**

The digitization project was funded initially by Macarthur Foundation, USA. A memorandum of understanding (MOU) was later signed with JSTOR in collaboration towards enhancing the digitization effort in KDL. Some equipment were donated to the Library which will help in handling some difficult tasks that cannot be achieved using the initially acquired equipment. This effort is occasionally complemented by the University management in order to achieve the set objectives.

**Kenneth Dike Library Digital Workflow Model**

Figure 1 shows the digital workflow model for the on going digitization project at Kenneth Dike Library, University of Ibadan, Ibadan.

- STAGE 1:** Materials are moved to the chamber
- STAGE 2:** Materials are scanned
- STAGE 3:** Image editing
- STAGE 4:** Generation of metadata
- STAGE 5:** Converting Image to searchable text, using OCR software:
- STAGE 6:** Convert to PDF
- STAGE 7:** Quality Assurance (Verification of Previous Processes)
- STAGE 8:** Storage
  - A:** Offline – Terabyte Storage Disk (TSD)
  - B:** Online – Digital Asset Repository (DAR)
- STAGE 9:** Materials are checked out of the chamber

Fig.1: KDL Digital Work Flow Model

To date, KDL has digitised over 100,000 pages of manuscripts, lectures, journals to mention few.



### **Challenges**

From the aforementioned, the following are some of the challenges associated with digitization initiatives in our academic libraries in Nigeria: funding, electricity, generation of metadata, quality control, copy right issues, limited expertise etc.

**Funding** – Digitization is capital intensive, hence being faced with underfunding because its being sponsored by Mac Arthur Foundation and the management of the University of Ibadan. Funding has been the back bone of realisation of any project embarked on. University libraries depend on the subvention from both federal and state governments to implement its projects. Federal government tertiary institution in Nigeria in which University of Ibadan is part is underfunded. Ola and Adeyemi (2000), Ola and Adeyemi (2001), Ekpenyong (1993), Fabunmi, Paris and Fabunmi (2006), Oyelude and Ola (2008), Ola (2011), and Eke (2011). This development informed the challenges currently being witnessed in our digitization effort in KDL. Funding of the work could not cater for all capital and concurrent expenditure of the project. There is need to increase the funds being allocated to the University libraries in Nigeria as digitization is a laudable project if the vision and mission of the University are to be realised particularly for the TLR. Such funds should be received timely and regular review of policy guiding allocation of funds to university management should be embraced. This will ensure return on investment on the part of the university management.

**Electricity** - Unsteady electricity supply hampers the smooth processing of digitised materials. As a result, there is need for electricity back-up in the event that the power source is interrupted during the process of digitisation. This becomes necessary in order to maintain the integrity of our equipment as well as the throughput.

**Metadata** – Digitisation goes beyond scanning and storing of documents alone.

The crucial aspect of metadata generation must not be lost sight of. Metadata simply means cataloguing in another format or simply put data about data. It is the most crucial aspect of digitisation because; whatever is scanned and stored must be made searchable on the net. To do this, there is need for something that will serve as a descriptor, thereby making it possible for whoever is looking for document to find it with remarkable ease.

**Quality Control** – Quality Control is aimed at ensuring that the digitised work follows the required and specified standards. In the case of KDL, University of Ibadan, this exercise is carried out by the digitisation librarian.

**Copyright issues** - The intellectual contents of the manuscripts and other materials that have been identified for digitisation require that library must get clearance from copyright owners before making the intellectual work visible to the outside world. The copyright clearance must be documented and kept for any possible future litigation. This, as a matter of fact, may take a longer time before an approval is communicated.

**Limited Expertise** – Digitization initiatives in our university libraries in Nigeria is at infant stage that requires competent and adequate knowledge of the concept for effective and successful implementation (Fatoki, 2007). Lack of expertise and technical knowhow on the part of staff; affect the speed at which the work is expected to move. Institutions where staff do not have the necessary and required skills for digitization cannot become a major node in a national scheme. There is need for constant training and re-training of staff, possibly both nationally and internationally. This will bring in new innovations and at the same time enhance digital staff job performance.

**Attitude** – The staff attitude and commitment to work go a long way as to having either negative or positive impact on the progress of the work. The staff should be

encouraged to register their unalloyed commitments to the initiative without being coerced. This will guide against the project being frustrated.

### **Prospects**

The digitisation initiative which has institutional repository (IR) as its by-product as it is being implemented in Kenneth Dike Library, has a sustainable and robust prospect. Through this laudable initiative, wider visibility is provided to the digitised materials because it can be accessed anywhere in the world where there are Internet facilities, particularly those materials that are categorised under public domain. The restricted materials can only be accessed by members of the immediate community which the library serves but abstracts of some materials are made available online to indicate its availability in our local server. With the support of content management system software (Dspace) being used as a platform of upload for the digitised materials, wider visibility is made achievable at any point in time. The users can read with size best suited, save copy, print and email electronically as the need arises. However, lecturers, students and researchers in the immediate community that the library serves, are privileged to access both the print and its digital version. Moreover, the searching mechanism will be greatly improved as well as quick accessibility to learning materials and research papers. Furthermore, electronic document delivery of information to researchers will be greatly enhanced. Also, through this initiative, the University of Ibadan launched her institutional repository in 2014. The implication of this is that in respect of web metric ranking of universities, it has greatly raised the profile and prestige of our premier university. The benefits to the researchers within the community are also enormous because research collaboration as well as keeping adequate record of scholarly work can also be enhanced. Also, to those who are interested in scholarly output, free

and uninterrupted access will be provided to the digital archive of information provided by the university. In case of academic promotion exercise whereby traditional methods, using surface mails to get articles across to the assessors are being currently adopted; this initiative will alleviate the associated problem in terms of delay. To this end, links to the articles will be provided to the affected assessors for the purpose of carrying out the assessment exercise. We strongly believe that turn around in the process will be reduced to the barest minimum, i.e. the time taken for the assessors to have access to the publications of the affected academic staff and when the final assessors' reports are ready for submission to the appropriate authority.

### **Lesson Learnt**

KDL had humble beginning by making use of in-expensive scanning equipment like flat bed scanners from the outset. JSTOR also donated some equipment to the university for this purpose through KDL management. This is aimed at enhancing our performance particularly, in respect of handling difficult tasks. Any institution of higher learning embarking on digitization initiative should not immediately think of giant equipment before its commencement. Humble beginning should not be despised because Kenneth Dike Library started with practically nothing but over the years, the initiative has considerably grown. If for example, at inception, we were considering getting robust equipment, peradventure nothing would have been done as at the moment.

### **Conclusion**

In conclusion, digitisation has been seen as the backbone for implementing a university based institutional repository (IR). It has also been established that when digitization processes are initiated, the ultimate goal is to achieve implementation of institutional repository (IR) for the affected university. In effect, digitisation is just the process

involved in packaging a digital archive of the university's intellectual output for wider visibility. It is also emphasised that digitisation initiative must be embraced by the university libraries in Nigeria without any further delay in order to stay relevant in the global academic community. Taking a cue from KDL initiative, it helps in revitalising the image of our collections, particularly in academic libraries in the developing countries. The challenges identified and highlighted in the process of digitising our collections and making same accessible to the wider audience through IR must be given the necessary attention it deserves. This will enable our collections and services in the university academic libraries in Nigeria and other developing countries witness turnaround. Kenneth Dike Library houses a lot of rare collections which cannot be found in other university academic libraries in Nigeria. These materials are useful and adequate for teaching, learning and research (TLR) purposes. Through the digitisation initiative being presently embraced, these rare collections can be made visible and accessible electronically on different platforms in terms of categorisation such as; public domain (i.e. Free for all), restricted (i.e. Free for members in the immediate community) as well as restriction within the restricted (i.e. free for selected members of the immediate community). This is targeted towards projecting the image of the affected academic library and by extension raises the profile and prestige of the University it serves in respect of wider visibility. It is worth noting that the digitisation initiative being embraced by the University of Ibadan Library has provided a sustainable platform for the University to implement Institutional Repository (IR). This, in turn, has enhanced the image of the University in respect to web metric ranking and in terms of other associated benefits derivable from taking digitisation initiative. Finally, the initiative has bridged digital

information gap as a result of speedy access to open access repository.

#### References

- Chepesuik, R. (1997). The future is here: America's libraries go digital. *American Libraries*. 2 . 47-49.
- Chowdhury, G. G. et al. (2008) Preservation and digitization. In: *librarianship: an introduction*. London: Facet Publishing, 73-82
- Eke, H. N. (2011) 'Digitising resources for university of Nigeria repository: process and challenges' *Webology* .8 .(1) <http://www.webology.org/2011/v8n1/a85.htm> | viewed on 11 January 2012
- Ekpenyong, D. G. (1993), 'The effect of economic recession on university libraries in Nigeria: the case of Kenneth Dike Library'. *New Library World* 94 .(1107), 19-22.
- Fabunmi B.A., Paris, M. and Fabunmi, M. (2006), 'Digitisation of library resources: challenges and implication for policy and planning'. *International Journal of African and African American Studies*. V .(2), 24-36.
- Fatoki, O. C. (2007). 'Digitisation of Library Materials in Nigeria: Issues and Considerations for Information Professionals'. *African Journal of Library Archives and Information Science* 17 .(1), 15-21.
- IFLA guidelines for digitization projects for collections and holdings in the public domain, particularly those held by libraries and archives, March 2002. <http://www.ifla.org/vii/s19/sconsu.htm> viewed on 05 January 2012-01-24.
- Liu, Y.Q. (2004). 'Best practices, standards and techniques for digitizing library materials: a snapshot of library digitization practices in the USA'. *Online Information Review*, 28, 338-345.
- Lynch, C. A. (1998). 'The role of digitization in building electronic collections: economic and problematic choices'. *Collection Development* 22 .(3&4), . 133-141.
- Okoye, R. B. (2008). 'Digitizing and archiving information resources in libraries: Reactions

to global initiatives from Nigeria'. *IFLA ITS Newsletter*. December 2008, pp.5-6.

Ola, C. O. (2011), 'Funding Nigerian university libraries: a perpetual albatross?' *KDL News* .2. 5-8.

Ola, C. O. and Adeyemi, B. M. (2000), 'Adequacy of academic journals in Nigerian university libraries during economic gloom: the Kenneth Dike Library experience'. *African Journal of Educational Management* 8 .(2) . 51-57.

Ola, C. O. and Adeyemi, B. M. (2001). 'Funding local government and public sector libraries in austere times'. In: Awosika, Y. et al, Eds. 'Topical issues in education: paper in honour of Professor C. O. Odoh'. Ibadan: Codat Publications, 107-117

Oyelude, A. A. and Ola C. O. (2008). 'Budgeting for technical services in an electronic age'. *Library Philosophy and Practice*, October

IBADAN UNIVERSITY LIBRARY