

Digitization of Materials and Digitalization of Processes in Chukwuemeka Odumegwu Ojukwu University (COOU) Library, Anambra State, Nigeria

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Abstract

Over the years, the application of ICTs in academic libraries has expanded access to information, enabling the users to access the right information at the right time irrespective of their physical locations. Thus, modern libraries are equipped with digital resources, computers, and Internet access. The aim of this paper was to show the application of ICTs at COOU library and how it has transformed their information resources and methods of service delivery. The study examined digitization of library materials and the *digitalization* of library processes at COOU library. It addressed the concept of library systems, the concept of digitization and *digitalization*. Furthermore, the paper revealed the ICTs resources available at COOU library, and the digitization / *digitalization* processes in some sections or units of the library such as the circulation unit, technical services, serials unit, and the project unit. The paper concluded that COOU library adopts both manual or traditional and modern library systems.

Keywords: *Digitization, Digitalization, COOU Library, Academic Library, ICTs, Library Systems*

Introduction

Information activities have undergone a very fast transformation from traditional methods to modern methods, which is due to fast development and application of Information Technology. According to Muhammed et al. (2020), diverse Information Media has categorized the 21st century due to these revolutions in technology such as computer, CD-ROM, Diskette, tablets, Web sites/pages etc. The academic library is an organization that is not left out. It also needs to meet up with the

information needs of the contemporary user. Academic libraries found it compelling and necessary to expediently subscribe to the current tide of Information and Communications Technology (ICT). Information Technologies such as communication, computing, and mass storage are endlessly changing how users can access, retrieve, store, manage, and distribute information through libraries. Muhammed et al. (2020) continued that the rate of growth of information resources and the challenges faced with manual library system of information service delivery

makes it difficult to continue in the manual library system.

A library either operates a manual / traditional system or a modern system. In other words, a library can either be a traditional (manual system) or a modern system. The change from manual system to the modern system may begin with gradual changing of analog library items into digital forms (digitization), and then, eventually change the entire process of producing, acquiring and managing library materials into a digital process (*digitalization*). The COOU Library began this journey of transformation into a modern library by gradually changing its analog library materials into digital forms, a term known as 'Digitization'. The intervention of the Tertiary Education Trust FUND (TETFUND) Nigeria, by providing the necessary ICT Infrastructure, over the years, expedited the transformation of COOU Library into a modern library.

Overview of Library Systems

The primary objective of any library system is to collect, store, organize, retrieve and make available the information sources to the information users (NIOS, 2022b). A library, as a system, is a subsystem of some super-system (an organization in any field, whether education, research or social service). It has its own sub-systems, such as: circulation sub-system, technical sub-system, reference sub-system, serials sub-system, maintenance sub-system and administration sub-system. According to NIOS (2022a), there are two types of library systems:

- i. Manual/Traditional Library Systems
- ii. Modern Library Systems (Digital, Hybrid and Virtual Libraries)

The Manual Library System

The manual or traditional library is a library where the access points such as, library catalogues as well as the library collections are print-based and management is carried out manually (Singh, 2006). NIOS (2022a) explained that the maintenance of various library records, registers and cards is known as manual system. It entails execution of various activities and procedures by hand, without any intervention of computers. Also, the house keeping operations like, acquisition cataloguing, circulation, etc., are all in manual forms. The services, which are provided or delivered to the users without using computers as an intermediary, are known as manual services.

The Modern Library System

Singh, Gangwar, Sharma and Devi (2022) published an overview of hybrid, digital and virtual libraries. They explained that a 'hybrid library' contains both print and non-print collections, and offers online and offline services to its users. They further explained 'virtual libraries' as a collection of full text e-books, journals and databases from various publishers and sources which can be accessed by library members at any time from any Internet-connected computer, laptop or other portable devices. A virtual library is simply the library without walls. This is done to underline that

the library does not have any material of its own. Singh et al. (2022) further explained that in 'digital libraries', all services are entirely automated. According to Singh (2006), 'digital library' and 'electronic library' mean the same thing. The British people call it electronic library while the U.S. people call it a digital library. In this type of library both the access points and the graphic records are in electronic/digital form. LIS (2020) gave an example of a digital library. The Digital Library of India (DLI) is a digital library of books,

predominantly in Indian languages, available to everyone over the Internet. Books are searchable and free-to-read. In addition, it provides links to six online Indian newspapers such as Times of India, The Hindu, Indian Express, Deccan Herald. Digital/E-library has walls or a physical location. It is therefore clearly seen that a modern library can either be a hybrid/automated library, a digital/electronic library or a virtual library. Fig 1 below summarizes the types of library systems, as discussed in this section.

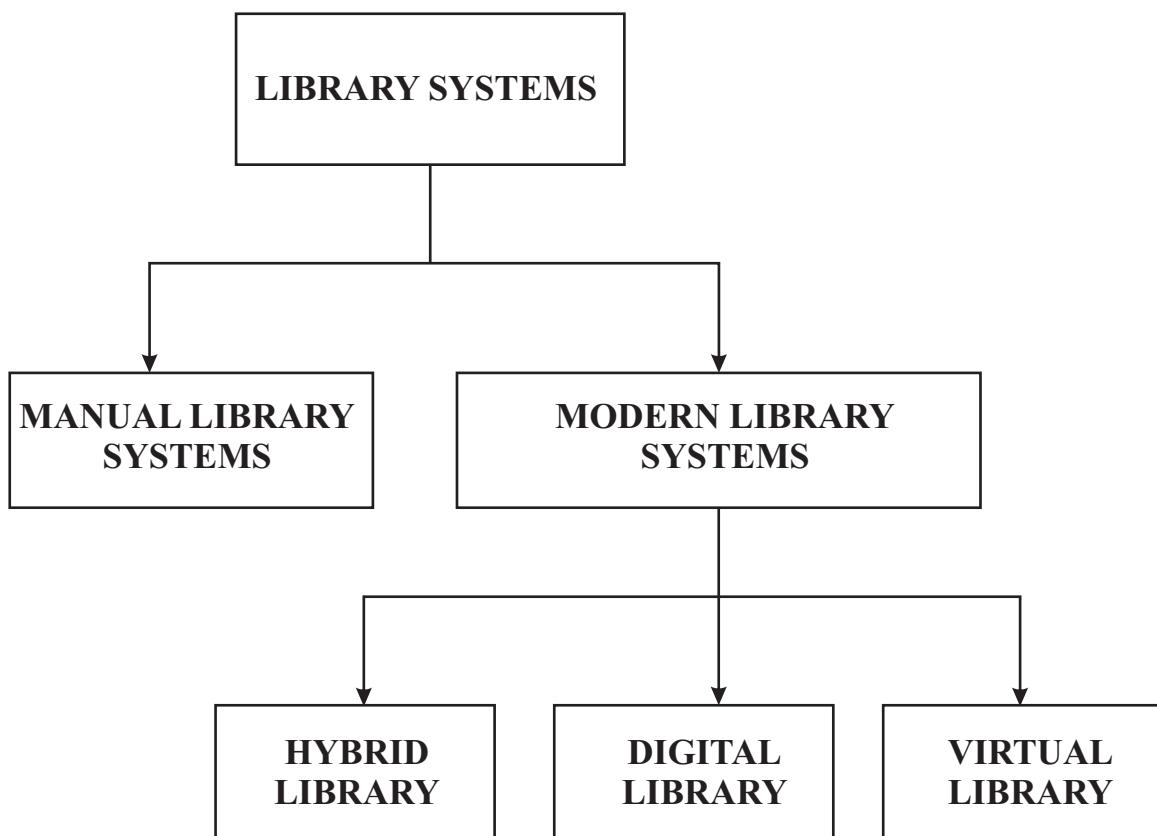


Fig 1: Library Systems

Digitization versus *Digitalization*

Digitization is the conversion of analogue data (especially in later use images, video, and text) into digital form (Brennen & Kreiss, 2014). *Digitalization* is the adoption or increase in use of digital or computer technology by an organization, industry, country, etc., (Brennen & Kreiss, 2014). This simply implies that an item is digitized, while a process is *digitalized*. In a layman's understanding, digitization happens when a particular information resource or artifact in the library is converted into a digital form. For example, the students' projects are in the library, existing only as hard copy. The library management decides to purchase a book scanner which helps the library staff to scan a hard-copy student project in order to have it also in PDF. In case of damage of that project, the PDF copy can be used to reproduce it. Thus we say that the particular student project has been 'digitized'. This does not mean that the entire project section of the library has been *digitalized*. The project section can only be said to be '*Digitalized*' when subsequent copies of students' projects are only acquired in or processed as original PDF and no more hard-copies. Both digitization and *digitalization* produce Electronic Thesis and Dissertations (ETD's). Digitization converts hard-copy thesis/dissertations from analog to digital (Gorman, 2024), producing "Digitized ETDs" (Boboc, 2024). Whereas, *digitalization* changes the entire thesis/dissertation process from analog to digital, subsequently producing "Born-Digital ETDs" (Boboc, 2024).

Digitization: Changing an Item from Analog to Digital

Digitization is the process of converting the diverse forms of information, such as text, sound, image or voice into a digital format (Khan, Khan & Aftab, 2015). They explained that digitization is one of the various applications of ICT (Information and Communications Technology), whose wave of adoption and usage have revolutionized our world by introducing technology-enabled services in every sphere of life. Singh (2006), noted that digitization started with the introduction of computers in library activities in 1980s in India but it was limited to creation of bibliographic database and house-keeping operations. This conversion of bibliographic catalogue record into digital format was the initial stage, but now it has been broadened by implementing it to conversion of full text, graphics, sound, video records etc. Khan, Khan and Aftab (2015), furthermore stated that the motivation behind digitization is to develop a digital substitute of rare, brittle or fragile original documents to provide access to users while preventing the original from damage by handling or display. They listed the benefits of digitization, thus:

- The documents can be viewed from anywhere, at any time of the day.
- The documents can be printed directly from the web.
- Users can find what they are looking for promptly and independently.
- It can save staff reference time by answering frequently asked questions on the web.

- It can enhance images electronically so that they can be viewed with greater legibility.
- It increases use of collections and facilitates learning and scholarship.
- The documents do not have to be re-shelved or located by staff.
- The documents are not handled frequently which lessen wear and tear

Digitalization: Changing a Process from Analog to Digital

Digitalization is about social life's restructuring around digital communication and media infrastructures (Ringenson, Hojer, Kramers & Viggedal, 2018). *Digitalization* is the process of spreading of a general purpose technology. *Digitalization* of products and services shortens distances between people and things. It increases mobility. It allows the use of specific data to such an extent that it permits the satisfaction of individual customer needs, be it consumers or businesses. It opens up ample opportunities for innovation, investment, and the creation of new businesses and jobs. Going forward it will be one of the main drivers of sustainable growth (Devereux & Vella, 2018). *Digitalization* refers to the use of digital technology, and probably digitized information, to create and harvest value in new ways (Gobble, 2018).

COOU Library System

In the year 2000, the COOU Library was established by Law N. 13 of Anambra State University of Science and Technology published as a supplement to the Anambra

State of Nigeria Official Gazette No. 8, volume 10 of 8th September, 2000. It started as a manual library system. All library materials were acquired in the manual (non-digitized) form. In addition, all library processes like circulation, cataloguing, preservation, patron management, etc., were done manually. With the intervention of the Tertiary Education Trust FUND (TETFUND) Nigeria, the COOU Library migrated into a modern library system, putting in place the necessary ICT Infrastructure. The existing analog materials were gradually digitized, though tedious and time-consuming. Processes in the various COOU Library sub-sections were also *digitalized*, putting the necessary software in place. The next section studied the current library services in various sub-sections or units of the COOU Library in order to determine what type of modern library it is.

Digitization/Digitalization in COOU Library Sub-Sections or Units

The COOU Library has the following sub-sections or units:

- i. The Circulation Unit
- ii. Technical Services
- iii. The Reference Unit
- iv. The Serials Unit
- v. The Project Unit

These findings are the “Expert Opinions” of the authors, which are the authors' informed perspectives based on personal/hands-on experience gathered by managing the COOU e-library, industry knowledge, reviews, and professional insight.

Digitization/Digitalization in the Circulation Unit

Digitization (Circulation)

At the traditional COOU library, library materials are managed manually. The books were manually loaned to students who want to borrow them. The location of library materials was managed without the use of computers. However, with the introduction of Alexandria Library Automation Software, the existing information about library materials, including their locations, number of copies, etc., and information on library patrons previously registered manually on a book are being transferred into the Alexandria.

Digitalization (Circulation)

At COOU library, the circulation process is now *digitalized*. As new books are acquired, they are immediately entered into the Alexandria Library Automation Software. As new patrons come in, they are registered in the Alexandria Library Automation Software. Subsequent location of library materials, lending of books, stock-taking, etc., are now done using the Library Automation Software. However, at the COOU library, the manual process of circulation is still combined with the computerized process.

This confirms Aba et al. (2015), who reported that computer technology such as CD-ROM (Compact Disk Read Only Memory) and the Internet have been successfully applied in libraries to improve the quality of circulation services. Ezeani (2010), in support established that with the

use of computer technologies, the task of circulation system of a library can be made easier. Borrowers can carry out self-issue over Internet such as the following:

- The status of borrower ascertained if lending limits have been reached;
- borrower automatically made to see which other items are on loan;
- materials that are mutilated or out of circulation;
- effective management of stock from data provided from the system;
- Librarian at a Glance, can also know the amount of fines collected;
- Invariably, time for sorting of overdue cards is saved.

Digitization/Digitalization in Technical Services

Digitization (Technical)

The traditional COOU Library made use of the manual cataloging system and manual accessioning system. However, with the introduction of the Alexandria Library Automation Software, the information in the existing paper catalogs are being digitized, in other words, are being transferred into its Online Public Access Catalog (OPAC). All items that were manually accessioned are being added to the Alexandria Library Automation Software.

Digitalization (Technical)

The new Alexandria Library Automation Software changed the process of organization of catalogs into a *digitalized* one, using the Online Public Access

Cataloging (OPAC). The manual catalogs are no longer used in COOU Library. However, the COOU Library still makes use of both the manual accessioning register and the Alexandria Library Automation “Add Items” module.

Kalita (2019) explained the steps of electronic technical processing as follows:

- i. **Selection (through E-Resources):** Systematic process of choosing materials relevant to a library or information center. Selection can be done through the use of electronic resources which are accessible through the computer. They comprised of e-books, e-journals, e-audio/video resources.
- ii. **Acquisition (through online Membership):** Libraries receive publications through membership of some organizations such as research organizations, academic bodies and professional associations. The membership to these organizations may be free or may require annual fee payment. Publications of these organizations are not available in open market. As a part of membership, the publication of these organizations is sent to the library.
- iii. **Cataloging:** Process of adding specific information about library items to the library catalog (OPAC – Online Public Access Cataloging), located through the library's intranet, to make items accessible to patrons. A Web

OPAC is accessible through a URL from any location of the world. The web Dewey is also an online version of Dewey Decimal Classification (DDC).

There are software that can carry out the technical services of a library. Example is SOUL (Software for University Library). SOUL is integrated library management software developed by INFLIBNET. The first version of SOUL 1.0 was released in 2000 while the latest version (SOUL 2.0) was released in 2009 (Kalita, 2019).

Digitization/Digitalization in the Reference Unit

Digitization (Reference):

The traditional COOU Library recorded reference materials manually. They offered in-person assistance, telephone assistance, research consultations, library tours and orientations, reader's advisory services and community outreach. With the introduction of the social media, reference services are now made available on the new COOU library website (<https://elibrary.coou.edu.ng>).

Digitalization (Reference):

ICT resources, which enables all subsequent activities in the reference unit to be computer-based and done online, are made available at the COOU library. These resources include social media accounts like Facebook, Instagram, etc., to be used for digital reference services. Unfortunately, these resources are not being utilized.

Awodoyin and Aina, (2018), revealed that reference service is a precise service adapted towards the information needs of each library patron thereby giving them a sense of belonging to the library. It includes guiding patrons in order to help them to know what services and materials are accessible and how to find them inside the library. On the other hand, digital reference service is a platform by which people can present their questions and have them answered by library personnel through some electronic means (Abubakar & Kacholom, 2017).

Ubogu (2020), conducted a research on the provision of digital reference services in selected Nigerian State University libraries. Adopting a survey research methodology, 45 professional librarians from three different universities in Nigeria, were used. Ubogu's study revealed that digital reference services offered in the university libraries include instructions, guidance, information and research assistance and consultation to library users. Social media like Facebook and Twitter, text-based chats, email correspondences, live chat and telephone communication are all channels through which digital reference services are delivered in the State university libraries studied. Ubogu further reported that digital reference services effected the following:

- Increased patrons' interactions;
- Increased speed of service delivery to users;
- Increased accessibility of Information Services.

He further revealed that the challenges faced in the provision of digital reference

services were low bandwidth in remote areas, hitches in downloading articles, slow Internet connection and insufficient support for reference librarians (Ubogu, 2020).

Digitization/Digitalization in the Serial Unit

Digitization (Serials):

The traditional COOU Library acquired only hard copy periodicals like journals, magazines, newspapers, reports, bulletins, proceedings, etc. These materials are being digitized by scanning them with ATIZ Book Scanner and saved on a disk. The online versions of these materials are also being downloaded and stored in disks, for access via a computer.

Digitalization (Serials):

The modern COOU Library has *digitalized* its serial section by subscribing to several online databases. COOU Library subscribed to the following: Ebscohost, Research4life, Safari, Elsevier and Law Pavilion (for Law Reports). See "elibrary.coou.edu.ng" for their links. This *digitalized* process gives users unlimited access to journal articles, conference reports, newspaper articles, magazine articles, technical reports, thesis, dissertations, government documents, transcripts, data sets, references, papers, publications, web resources and e-books. Their login details can be obtained, free for students and university staff, at the COOU Library.

However, the serials unit still acquire and shelve hard copy materials. In other words,

the serial section of the COOU library offers both manual and computerized services. Serial material are in both print and non-print forms.

Digitization/Digitalization in the Project Unit

Digitization (Project):

The traditional COOU Library received and shelved only hard copies of students'

projects, thesis and dissertations. However, with the provision of the ATIZ Book Scanner, the existing hard copies of projects, thesis and dissertations are being digitized, in other words, are being scanned into a .pdf digital format and uploaded to the COOU – Open Education Resources Website (OER), "oer.coou.edu.ng".

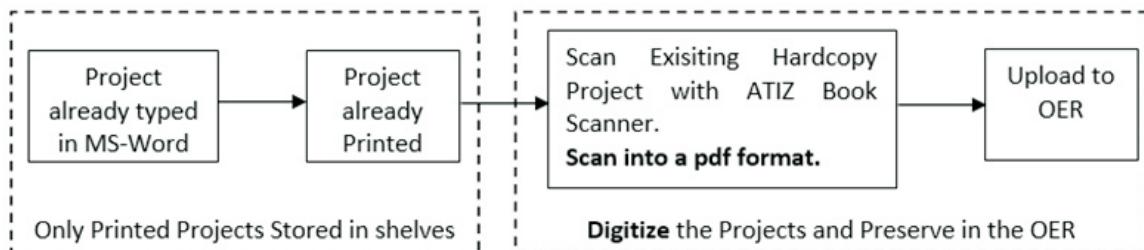


Fig 2: COOU Library Digitization of Hard Copy Projects

Digitalization (Project):

The modern COOU Library receives students' projects, thesis and dissertations both in hard copies and in soft copies (.pdf formats). The soft copies are being uploaded to the COOU - Open Education

Resources Website (OER), "oer.coou.edu.ng". These soft (*digitalized*) copies are smaller in size and occupies lesser disk space, compare to scanned (*digitized*) copies. Here, the PDF files are "born digital", meaning that they are created initially as digital documents.

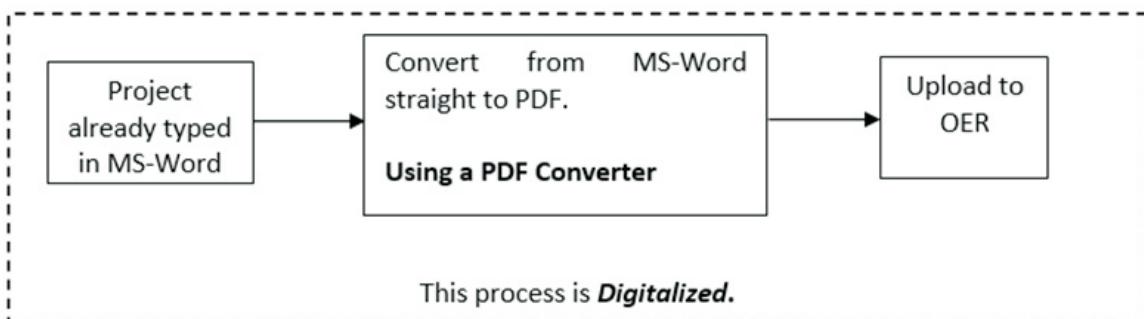


Fig 3: COOU Library *Digitalization* of the Projects Unit Process

Table 1: Summary of available Manual and ICT Resources at the COOU library and how library services are offered in the COOU library:

S/N	UNIT	MANUAL RESOURCES	ICT RESOURCES	MANUAL / COMPUTERIZED / BOTH
1	Circulation	Checkout and Return Cards, Shelves, Due Date Stamps, User Files and Circulation ledger	Library Automation, Computers, Printer, Scanner, Internet.	Both
2	Technical	Card Catalog, Stamping Tool, Date Stamps, Classification Tools and Acquisition Tools.	OPAC, Computers, Printer, Scanner, Internet.	Both
3	Reference	Printed Reference Sources, Photocopier, GSM, Printed Directories and Guides.	Library Website, Social Media handles, Computers, Internet.	Manual
4	Serials	Shelves, Binding Tools and Serial Holding Lists,	Library Website, Online Databases, Computers, Printer, Scanner, Internet.	Both
5	Project	Hardcopy Thesis and Dissertations, Check out and Return Cards, and Photocopier.	Open Educational Resource (OER), ATIZ Book Scanner, Computers, Printer, Scanner, Internet.	Both

Conclusion

There are available ICT resources at the Chukwuemeka Odumegwu Ojukwu University (COOU) Library. Therefore, COOU library is a modern library. Moreover, it is seen that in the circulation, technical, reference, serials and in the project units, the COOU Library still offer library services in both manual and ICT

resources respectively. Therefore, the COOU Library is hybrid or automated. This paper therefore concludes that the COOU library is a hybrid/automated modern library. The summary above, indicates that the reference unit still completely renders manual services to library users. This implies under-utilization of ICT resources and ineffective digitization and *digitalization* of materials and processes respectively, at the COOU library.

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