Digital Library Services in University Libraries in Nigeria: A Literature Study

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ABSTRACT: *Digitization of information resources for making digital library is the process of converting information into a digital (i.e. computer-readable) format. The result is the representation of an object, image, sound, document, or signal (usually an analog signal) obtained by generating a series of numbers that describe a discrete set of points or samples. The result is called digital representation or, more specifically, a digital image, for the object, and digital form, for the signal. On the one hand it can be argued that dramatic changes have been made at academic libraries in response to the new digital information environment. Most academic libraries, including University Libraries in Nigeria, offers a wide range of digital services and resources. But on the other hand, at a closer examination, one will find that these services and resources are mainly organized according to traditional library principles. In this case a guiding principle for the digital library need to be set up to create systematic and well organized general services and e-resources, for example subject specific gateway services. Thus, the digital part of the library functioned as an extension of the traditional library, an enterprise on the side with relatively high priority in this digital age, especially for of e-journals*

KEYWORDS: digital library services, university libraries, Nigeria

INTRODUCTION

Library is established to ensure quality and sustainable education and promote literacy. To achieve this, several measures have been put in place such as the adoption of e-learning, blended learning, Learning Management System (LMS) and the provision of books both in print and non-print in the library. Consequently, libraries have resulted to digitizing its collections and the acquisition of born digital collections to enhance the quality of education. Students, lecturers and researchers no longer limit themselves to print resources. As a matter of fact, the utilization of electronic

information resources is now on the high side. To this effect and to function and promote education in this new normal, libraries are providing digital services (Tom-George and Onyema, 2020).

A library is fundamentally an organized set of resources, which include human services as well as the entire spectrum of media (e.g., text, video, hypermedia). Libraries have physical components such as space, equipment, and storage media; intellectual components such as collection policies that determine what materials will be included and organizational schemes that determine how the collection is accessed; and people who manage the physical and intellectual components and interact with users to solve information problems (Marchionini and Maurer, n.d).

Libraries serve at least three roles in learning. First, they serve a practical role in sharing expensive resources. Physical resources such as books and periodicals, films and videos, software and electronic databases, and specialized tools such as projectors, graphics equipment and cameras are shared by a community of users. Human resources--librarians (also called media specialists or information specialists) support instructional programs by responding to the requests of teachers and students (responsive service) and by initiating activities for teachers and students (proactive services). Responsive services include maintaining reserve materials, answering reference questions, providing bibliographic instruction, developing media packages, recommending books or films, and teaching users how to use materials. Proactive services include selective dissemination of information to faculty and students, initiating thematic events, collaborating with instructors to plan instruction, and introducing new instructional methods and tools. In these ways, libraries serve to allow instructors and students to share expensive materials and expertise (Marchionini and Maurer, n.d).

Second, libraries serve a cultural role in preserving and organizing artifacts and ideas. Great works of literature, art, and science must be preserved and made accessible to future learners. Although libraries have traditionally been viewed as facilities for printed artifacts, primary and secondary school libraries often also serve as museums and laboratories. Libraries preserve objects through careful storage procedures, policies of borrowing and use, and repair and maintenance as needed. In addition to preservation, libraries ensure access to materials through indexes, catalogs, and other finding aids that allow learners to locate items appropriate to their needs (Marchionini and Maurer, n.d).

Third, libraries serve social and intellectual roles in bringing together people and ideas. This is distinct from the practical role of sharing resources in that libraries provide a physical place for teachers and learners to meet outside the structure of the classroom, thus allowing people with different perspectives to interact in a knowledge space that is both larger and more general than that shared by any single discipline or affinity group. Browsing a catalog in a library provides a global view for people engaged in specialized study and offers opportunities for serendipitous insights or alternative views. In many respects, libraries serve as centers of interdisciplinarity--

places shared by learners from all disciplines. Digital libraries extend such interdisciplinarity by making diverse information resources available beyond the physical space shared by groups of learners. One of the greatest benefits of digital libraries is bringing together people with formal, informal, and professional learning missions (Marchionini and Maurer, n.d) .

Digital Libraries
A digital library, also called an online library, an internet library, a digital repository, or a digital collection is an online database of digital objects that can include text, still images, audio, video, digital documents, or other digital media formats or a library accessible through the internet. Objects can consist of digitized content like print or photographs, as well as originally produced digital content like word processor files or social media posts. In addition to storing content, digital libraries provide means for organizing, searching, and retrieving the content contained in the collection. Digital libraries can vary immensely in size and scope, and can be maintained by individuals or organizations. The digital content may be stored locally, or accessed remotely via computer networks. These information retrieval systems are able to exchange information with each other through interoperability and sustainability (Wikipedia, 2023).

Digital libraries combine technology and information resources to allow remote access, breaking down the physical barriers between resources. Although these resources will remain specialized to meet the needs of specific communities of learners, digital libraries will allow teachers and students to take advantage of wider ranges of materials and communicate with people outside the formal learning environment. This will allow more integration of the different types of learning. Although not all students or teachers in formal learning settings will use information resources beyond their circumscribed curriculum and not all professionals will want to interact even occasionally with novices, digital libraries will allow learners of all types to share resources, time and energy, and expertise to their mutual benefits (Marchionini and Maurer, n.d).

According to Wikipedia (2023) the advantages of digital libraries as a means of easily and rapidly accessing books, archives and images of various types are now widely recognized by commercial interests and public bodies alike. Traditional libraries are limited by storage space; digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain it. As such, the cost of maintaining a digital library can be much lower than that of a traditional library. A physical library must spend large sums of money paying for staff, book maintenance, rent, and additional books. Digital libraries may reduce or, in some instances, do away with these fees. Both types of library require cataloging input to allow users to locate and retrieve material. Digital libraries may be more willing to adopt innovations in technology providing users with improvements in electronic and audio book technology as well as presenting new forms of communication such as wikis and blogs; conventional libraries may consider that providing online access to their OP AC catalog is sufficient. An important advantage to digital conversion is increased accessibility to users. They also increase availability to

individuals who may not be traditional patrons of a library, due to geographic location or organizational affiliation. Wikipedia (2023) listed the advantages as following:

- No physical boundary: The user of a digital library need not to go to the library physically; people from all over the world can gain access to the same information, as long as an Internet connection is available.
- Round the clock availability: A major advantage of digital libraries is that people can gain access 24/7 to the information.
- Multiple access: The same resources can be used simultaneously by a number of institutions and patrons. This may not be the case for copyrighted material: a library may have a license for "lending out" only one copy at a time; this is achieved with a system of digital rights management where a resource can become inaccessible after expiration of the lending period or after the lender chooses to make it inaccessible (equivalent to returning the resource).
- Information retrieval: The user is able to use any search term (word, phrase, title, name, subject) to search the entire collection. Digital libraries can provide very user-friendly interfaces, giving click able access to its resources.
- Preservation and conservation: Digitization is not a long-term preservation solution for physical collections, but does succeed in providing access copies for materials that would otherwise fall to degradation from repeated use. Digitized collections and born-digital objects pose many preservation and conservation concerns that analog materials do not. Please see the following "Problems" section of this page for examples.
- Space: Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them and media storage technologies are more affordable than ever before.
- Added value: Certain characteristics of objects, primarily the quality of images, may be improved. Digitization can enhance legibility and remove visible flaws such as stains and discoloration.
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It can therefore be said that Digitization of information resources for making digital library is the process of converting information into a digital (i.e. computer-readable) format. The result is the representation of an object, image, sound, document, or signal (usually an analog signal) obtained by generating a series of numbers that describe a discrete set of points or samples. The result is called digital representation or, more specifically, a digital image, for the object, and digital form, for the signal (Wikipedia, 2022). In addition, 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 and 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 (Adogbeji and Akporhonor,2021). A collection of library or archival materials converted to machine-readable format to provide electronic access or for

preservation purposes are known as digitalized material. Typically, digital collections are library-created digital copies of original materials presented online and organized to be easily searched. They may offer features such as: full text search, browsing, zooming and panning, side by side comparison of objects, and export for presentation and reuse (Lampert and Vaughan, 2009).

Digitization is of crucial importance to data processing, storage, and transmission, because it allows information resources of all kinds in all formats to be carried with the same efficiency and also intermingled. Though analog data is typically more stable, digital data has the potential to be more easily shared and accessed and, in theory, can be propagated indefinitely without generation loss, provided it is migrated to new, stable formats as needed. This potential has led to institutional digitization projects designed to improve access and the rapid growth of the digital preservation field (Wikipedia, 2022).

Sometimes digitization and digital preservation are mistaken for the same thing. They are different, but digitization is often a vital first step in digital preservation. Libraries, archives, museums, and other memory institutions digitize items to preserve fragile materials and create more access points for patrons. Doing this creates challenges for information professionals and solutions can be as varied as the institutions that implement them. Some analog materials, such as audio and video tapes, are nearing the end of their life-cycle, and it is important to digitize them before equipment obsolescence and media deterioration makes the data irretrievable. Technological changes can happen often and quickly, so digitization standards are difficult to keep updated. Professionals in the field can attend conferences and join organizations and working groups to keep their knowledge current and add to the conversation (Wikipedia, 2022).

Therefore, Adogbeji and Akporhonor,(2021) expressed that 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) in Adogbeji and Akporhonor, (2021) 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 vein, 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. 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.

Digital Library and Nigerian Universities

Ogunsola (2005) in Magoi and Gani, (2014) asserted that the development of digital libraries in Nigerian Universities started with the application of Information and Communication Technology (I C T) championed by the computer. This led to the computerization of libraries in the 1970s. However, Abolaji (2000) in Magoi and Gani, (2014) pointed out that "significant and widespread efforts of computerizing library services started in the early 1990s".

This move resulted to automating the operations of many libraries, particularly research libraries. The International Institute for Tropical Agriculture (IITA), Library, Ibadan, an agricultural research library, migrated to a fully computerized integrated library system. The Institute for Policy and Strategic Studies, Kuru, Jos, the International Livestock Centre for Africa (ILCA), the Federal Institute for Industrial Research (FIIR), Oshodi, Lagos, the Nigerian Institute for International Affairs (NIIA), the British Council Library, the United States Information Service (USIS), and the Raw Materials Research and Development Council among others Library have implemented various degrees of automation in their library services. In fact, the Raw Materials Research and Development Council Library pioneered the development of indigenous Windows-based library software called X-Lib.

The growth from having computer to automating library operations in Nigerian universities accelerated greatly in the 1990s, when the World Bank intervened with a loan to improve the institutional capacities and with specific focus on automating the universities libraries. Abdulkadir, (1995) in Magoi and Gani, (2014) highlighted that the setting up of a technical committee to design hardware and software prototypes along with the World Bank intervention, eventually led to the introduction and development of university electronic resources databases through the Nigerian Universities Management Information System (NUMIS), electronic connectivity and through the Nigerian Universities Network (NUNet), and automation of university libraries and also through the TINLIB library software. NUMIS strives to increase control, access and updating of information, production of regular reports, and effectiveness in management of decision making. Whereas, NUNet aimed at setting the paced and direction for network computer and information resource in the universities through intra-campus inter-university and global electronic connectivity. This brought about Wide Area Network (WAN) and Local Area Network (LAN) in the university environment. Nok (2006) in Magoi and Gani, (2014) confirmed that to a large extent, the existence of a university Wide Area Network (WAN) and a Local Area Network (LAN) helps in the establishment of internet in the university libraries. The establishments of internet in Nigeria universities by extension necessitated the need to provide space and computers where users will comfortably browse. That is why, Ayo (2000) in Magoi and Gani, (2014) affirmed that with the internet, university libraries are able to provide in academic search, website management, d-base management and general online services.

Magoi and Gani, (2014) Digital libraries as occasioned by the information and communication technology (ICT) revolution has given Nigeria a chance to stamp and showcase her authority in knowledge and subsequently contribute as never before in the national development through university education. Hence, university education in Nigeria began with the establishment of the University College Ibadan in 1948 during British Colonia masters. Immediately after the Nigerian Independence celebration in 1960, four additional universities were established. Thus: University of Lagos, University of Nigeria, Nsukka, Obafemi Awolowo University, Ile-Ife and Ahmadu Bello University, Zaria. These were referred to as the first generation universities in Nigeria with the aimed to lead in man-power development and advancement in educational development of the country. However, in the 1970s, seven more additional universities were founded, and they were referred to, as the second generation universities, which among them were: Usmanu Danfodio University Sokoto and Bayero University, Kano. These were found in the North West Zone. Ogunsola (2005) in Magoi and Gani, (2014) expressed that these universities greatly help bringing university education closer to the citizens of the country. The third generation universities came on board in the 1980s with the establishment of Federal University of Technologies and Agricultures. None was established in the northwest zone.

NUC, (2014) in Magoi and Gani, (2014) asserted that, for the purpose of the high quest for education and also the need to increase man power development in Nigeria, state owned universities began to spring up by individual states in Nigeria. In line with this, all states in the Northwest zone of Nigeria (seven states) established their own state universities which marked the fourth generation Universities. In 1990s, the law for the establishment of private universities was legalized and led to the establishment of private universities across the nation which the zone was not an exception. Today, there are over one hundred accreditated public and private universities in Nigeria. On record, sixteen of them are from the Northwest zone of the country. All aim at working towards the educational advancement and human resources development of the nation. Generally, the university library objective is to support academic activities in their university community. To achieve this, relevant resources of all kind need to be put in place to satisfy the learning, teaching and research needs of users.

According to Ani and Edem (2012) in Magoi and Gani, (2014), the resources utilized in the university libraries were mostly in printed format made up of books, journals, magazines, dissertations/theses and other local materials. However, in the recent development, libraries experience new technological transformation identified as the electronic information era been powered by Information and Communication Technologies (I.C.T.) with its capabilities in promoting and improving information services in all facet of live led to the establishment of digital libraries in Nigerian universities. The main goal of digitization in academic library is to promote library use through effective services. Local and international recognition and respect are partly determined by quick accessibility to published works. Some highly productive scholars globally have been found to be more information rich than their counterparts. This implies that information

adds significantly to the existing knowledge of the users. The information resources and services available in institutional information systems (library, archives, records offices, and documentation centers) are digitized and create databases capable of supporting research activities. The shift from print to electronic information means that both academic staff and students in a University system must use these resources for better quality, efficient, and effective research more than ever.

Digital libraries are libraries that are extended and enhanced through digital technology. Li and Furht (2014) noted in Magoi and Gani, (2014) that the important aspects of a digital library that may be extended and enhanced include: The collection of the library, The organization and management of the collections, Access to library items and the processing of the information contained in the items, The communication of information about the items.

They further stated that the objectives of digital libraries are:

• To speed up the systematic development of the means to collect, store, and organize information and knowledge in digital form, and of digital library collections.
• To promote the economical and efficient delivery of information to all parts of society
• To encourage co-operative efforts which leverage the considerable investment in research resources, computing and communication net-work.
• To strengthen communications and collaboration between and among the research, business, government and educational communities.
• To contribute to the lifelong learning opportunities of all people. They concluded that digital libraries distribute a rich coherent set of information services (including selection, organization, access, distribution, and persistence) to users reliably and economically.

The cardinal objectives of academic libraries are designed primarily to serve their parent institutions most especially by meeting the teaching, research, and learning needs through provision of the services (conventional and digital) that can lead to an increase in the productivity of their students, teachers and researchers. To buttress this, Trivedi (2010) in Magoi and Gani, (2014) stressed that digital libraries posses unlimited storage space at a much lower cost, enhance information users with coherent sources to a very large, organized repository of information and knowledge.

Academic Libraries are designed to serve their parent institutions by meeting the learning, teaching and research needs through the provision of the services that can lead to an increase in the productivity of their students, teachers and researchers. As earlier stated that the development of Academic libraries dated back to pre-independence time when the University of Ibadan and its library were established in 1948. Aguolu (1996) cited by Ogunsola (2004) in Magoi and Gani, (2014) noted that since independence in 1960, there has been an unrelenting upsurge in the

establishment of education institutions at all levels. Successive Nigerian government have strongly invested in education and as it were, university library, being an integral academic parts of the universities, generally emerged and cared for simultaneously, with their parent institutions. Hence, there are many universities libraries as there are universities in Nigeria. This is because the quality of teaching, research, and community services of scholars and students in any University system depends on information sources and services provided in the library. Hence, information availability, accessibility, ands uses are essential to the teaching, research, and service activities of the academics in the Nigerian University system.

Gbaje (2007) in Magoi and Gani, (2014) expressed one other giant step associated with the digital libraries development is the Nigeria Virtual Library Project in early part of 2002 by the Federal Government of Nigeria and the National workshop organized by UNESCO on the Pilot Virtual Library Project in May 2003. The mission was to provide, in an equitable and cost effective manner, enhanced access to national and international library and information resources and for sharing locally-available resources with libraries all over the world using digital technology.

Digital Library Softwares
Mintbook (2021) expressed that Digital Libraries act as an online knowledge base in these desperate times when going to traditional libraries is not feasible or possible. Even it is much difficult to find the relevant study materials on the internet. In such a scenario, digital libraries bring knowledge closer to the learners and make it possible to learn anytime, from anywhere at any pace. The digital libraries expand the horizons of learning and generate a safe online learning environment for all. So, from primary students to those pursuing higher education or even the employees of organizations who are training on the job or want to upskill, can put their faith in eLearning and choose success. For the sake of continuous learning and successful outcomes, digitization and automation of libraries hold much higher value in this digital age. By doing so, it will be possible to disrupt the learning industry and bring the much-needed transformation in this regard. Digital libraries preserve knowledge and make it more accessible. So, here's the Digital Library Software list that the organizations, as well as institutions, must know about. Today, several digital platforms are coming forward to offer either premium or open-source library management systems or software.

Premium and Open-Source Digital Library Software
There are many open-source Library management software enabling various institutions and organizations to digitize the learning content. These systems are free and by signing up institutions can easily use them for the betterment of the students and employees. Generally, these systems help automate the acquisition and management of digital libraries for no cost. So, those using these systems can manage their catalogue, generate reports, download the library management software for free without any copyright issue, offer online access to a limited range of copyright-free books.

Some open sources are also enhanced with the search tool for looking up specific study materials at an instant.

Features of the Open-Source and Premium Digital Library Software

Acquisition and Maintenance
Open-source library software comes in handy for the acquisition of the learning materials and it also allows easy maintenance of these resources. It makes the work easier at the administration level for those responsible for maintaining records of the available resources in the repositories. Just like traditional libraries, Digital Libraries also require librarians to keep track of the resources. So, it is easily manageable with the help of open-source Library Software.

Free and Time-Saving
Not only does the open-source libraries save operational costs but a lot of time. With easy access to information and maintenance, eLibrary management becomes hassle-free for educators.

Easy User Interphase
The open-source libraries are made, keeping in mind the general audience. So, it has a super simple interphase and anyone with a basic knowledge of the internet or who can use a smartphone can navigate on the platforms with ease. Indirectly it also saves added cost of hiring a help desk associate for using the eLibrary.

Efficient, Secure, And Reliable
Authorized personnel of the library can maintain the resources with a few clicks, thereby increasing the efficiency of the people managing the online libraries. On the other hand, eBooks are indestructible and the chances of knowledge or data loss are least. With the elimination of manual errors or human errors, it is reliable and secure too.

Digital Library Software List

Open-Source Library Management Systems

KOHA
KOHA is used worldwide by institutions, schools and special libraries. It is a fully-featured and scalable library system that is web-based. Institutions or organizations using the software need not manage a separate server to run KOHA as it is web-based. The software also offers backups and upgrades online.

BiblioteQ
This platform is a professional archiving, cataloging, and library management site available as an open-source for organizations and institutions. It is available for all major operating systems and

has several features that can used to run a digital library undisturbed. BiblioteQ can be used to offer access to online research papers, videos, catalog books, and much more. It is also a platform with drag and drops interphase making navigation and usability easy for the users.

OPALS (Open Physics Abstraction Layer Software)
OPALS is another open-source automated digital library software that is trustworthy, easy to afford, implement and use. Many libraries across the world are using OPALS to manage their digital libraries which is a reason enough to know more and try it. It has many useful features, support functions, and an engineering framework.

PMB (PhpMyBibli)
PMB is yet another open-source digital library software that has many useful features. It undergoes updating at regular intervals by the developers of PMB and thus is always up-to-date. It is a complete library management system that has a network of roughly 10 to 15 sites.

CONCLUSION

To conclude, on the one hand it can be argued that dramatic changes have been made at academic libraries in response to the new digital information environment. Most academic libraries, including University Libraries in Nigeria, offer a wide range of digital services and resources. But on the other hand, at a closer examination, one will find that these services and resources are mainly organized according to traditional library principles. In this case a guiding principle for the digital library need to be set up to create systematic and well organized general services and e-resources, for example subject specific gateway services. Thus, the digital part of the library functioned as an extension of the traditional library, an enterprise on the side with relatively high priority in this digital age, especially for of e-journals (Nielsen and Eriksson, n.d)

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