

The Role of Information and Communication Technology (ICT) in Transforming Library Operations and Management into Digital Knowledge Hubs

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Abstract

The integration of ICT has expanded access to information, enabling libraries to serve their communities beyond their physical locations. The aim of this paper was to examine the role of information and communication technology in transforming library operations and management into digital knowledge hubs. It established the fact that there have been global best practices in ICT integration in library operations and management, such as seen at the New York Public Library's Digital Collection; the British Library's Online Catalogue, and the National Library of Australia's Trove, among others. It pointed out that Nigerian government, through the National University Commission (NUC) and the Nigerian National Library have made efforts at integrating ICT into library operations and management with unsatisfactory result, so far. It also examined the benefits of ICT in library operations and management; the challenges in integrating ICT into library operations and management, and finally, the future trends in ICT integration into library operations and management. The paper concluded that the future of ICT integration in libraries is bright, and libraries must be proactive in adopting new technologies to meet the changing needs of library users.

Keywords: *ICT, Digital Knowledge Hub, Library Operations and Management, National University Commission (NUC)*

Introduction

The integration of information and communication technology (ICT) library operations and management has brought about significant changes in the way libraries operate and serve their communities. Information and communication technologies (ICTs) is defined as a diverse set of technological tools and resources used to transmit, store, create, share or exchange information.

Library operations and management have been taking a shift from traditional physical spaces that housed printed materials, such as books and journals, to digital knowledge hubs that offer access towards a vast array of electronic resources, including e-books, online journals, and digital archives. In agreement with the foregoing, Olukemi and Hussaini (2010), asserted that library services are assuming a different dimension in philosophy, model and information delivery, and the trend worldwide has

shown that information provision and delivery had drifted from the traditional models to electronic and web-based formats. This makes it expedient that library operations and management across the globe have to leverage on this trend to become a digital knowledge hub that is able to provide knowledge resources to the teeming audience, without location being a constraint.

The consequence of this shift in approach in providing library services from the traditional approach that houses books and library resources at a particular location to the emergence of electronic services of libraries, is that, those who have interest in library resources are easily provided with access to it due to the presence of the Internet, which ensures people have access to library materials irrespective of their locations (Youngok, 2006). This has become possible because of the integration of ICT into the provision of library services, thereby reaching more audience without their locations being a barrier. It is understandable that with the integration of ICT, libraries have become more efficient in managing their resources and providing services to their teeming audience. Madhumay, Gaurav and Ravi (2013), pointed out that library management systems, online catalogs, and digital archives have replaced traditional card catalogs and manual record-keeping systems, making it easier for library staff to manage collections and for users to find and access materials. This is surely the way forward, if effectively managed.

Furthermore, the integration of ICT has expanded access to information, enabling

libraries to serve their communities beyond their physical locations. Through online resources and digital services, libraries are now able to reach a wider audience, including those who may not have access to physical libraries due to geographical or financial constraints. However, just as innovations have benefits, there are also potential threats, and integration of ICT into the services of library endeavors, surely possess some challenges too. Consequently, Youngok (2006) argued that the change in structure is not without its attendant challenges as electronic and digital libraries come along with their peculiar characteristics despite sharing the same purpose of preserving, organizing and distributing information resources as in the case of traditional libraries.

ICT driven library operations and management require librarians to be trained and equipped with operational capacity to manipulate relevant digital platforms that will yield expected result. It needs huge financial commitment, and other physical and material resources. This is in tandem with the position of Adebimpe (2009), who argued that digital inputs in libraries have equally brought about the need for the development and acquisitions of new skills and competencies required to drive the innovation. This is without doubt, a necessity, as the human resource of the library remains indispensable in coordinating the functionality of digital and other resource of the library. Be that as it may, the thrust of this paper is to examine the role of ICT in transforming library operations and management into digital knowledge hubs.

Global Best Practices in ICT Integration in Library Operations and Management Examined

This section showcases some successful examples of ICT integration in libraries in some advanced countries. It explores case studies of libraries that have leveraged ICT to enhance their services and engage with their communities better. It is understandable that libraries have been quick to adopt and leverage information and communication technology (ICT) to enhance their services. According to Hanson and Levin (2023), below are some prominent examples of libraries that have used ICT to improve their services:

- **The New York Public Library's Digital Collection:** The New York Public Library has digitized over 800,000 items from its collections, including manuscripts, photographs, maps, and more. The digital collection is accessible online, allowing users from anywhere in the world to access these resources.
- **The British Library's Online Catalogue:** The British Library's online catalogue contains over 170 million records of books, journals, manuscripts, and other materials. Users can search the catalogue and access digital copies of many of the items in the collection.
- **The National Library of Australia's Trove:** Trove is an online database of Australian resources, including books, newspapers, images, maps, and more. Users can search Trove to find and access resources from libraries, archives, and other cultural institutions across the country.
- **The Internet Archive's Open Library:** The Internet Archive's Open Library is a digital lending library that allows users to borrow and read over 1.7 million books online. Users can create an account and borrow books for up to two weeks at a time.
- **The Boston Public Library's eCard:** The Boston Public Library offers an eCard that allows users to access the library's digital resources, including e-books, e-audiobooks, and digital magazines, without visiting a physical branch.
- **The Library of Congress's Digital Preservation Program:** The Library of Congress's Digital Preservation Program is responsible for preserving and providing access to the library's digital collections. The program uses a variety of tools and techniques to ensure that the library's digital resources are available for future generations.
- **The Seattle Public Library's Wi-Fi Hotspots:** The Seattle Public Library lends out Wi-Fi hotspots to library cardholders, providing access to the internet for those who may not have reliable access at home.

National Efforts at Integrating ICT into Library Operations and Management, culled from Gbaje, E. S. as retrieved in 2023.

To facilitate the development and implementation of the national virtual library, the National University Commission (NUC) convened a stakeholder's workshop in Abuja in July 2001 where the blueprint for the project was developed and subsequently approved by

the Federal Executive Council in January 2002. Eleven universities were selected as pilot centers for the first phase of the project, with the hub at NUC. A needs assessment for these eleven universities was also conducted. The necessary computer systems and digitization equipment were procured by NUC, who reported that since January 2002 when the ICT integration in library project was initiated, they had achieved the following:

- a. Recruitment of technical staff and consultants to meet manpower needs of the Project.
- b. Carried out a Rapid Needs Assessment in eleven (11) universities selected for the pilot scheme of the first phase of the project.
- c. Development and hosting of the Nigerian Virtual Library web site on the Internet with the URL: <http://www.nigerianvirtuallibrary.com>
- d. Digitization and uploading of journals published in Nigerian Universities.
- e. Aggregation of free international e-journals into the Nigerian Virtual Library for easy access.
- f. Open Tender process for the procurement, installation and maintenance of information systems for the eleven pilot universities and the hub in NUC in-progress.
- g. Training of university librarians and deans of faculties from Nigerian universities on the use and management of virtual library.
- h. Commencement of the process for electronic publishing of academic journals in Nigerian universities.
- i. Indexing of over 5,000 journal articles from all disciplines and on-going.
- j. Training of ICT officers in Nigerian universities on Webometric ranking of universities.
- k. Online and help desk assistance to users of the project.

As part of its efforts to successfully implement the project, Gbaje (2007), observed that NUC in conjunction with Virtual Library Consultants, organized a series of training workshops to prepare the institutions and individuals for the successful deployment and management of digital libraries. Gbaje added that the training workshops covered, but were not limited to: Web Technologies, Content Management, Access Management, Database Administration, Network Administration and Security.

However, just as many wonderfully thought and crafted projects have failed to live up to expectation, Hanson and Levin (2023), decried that several years after the ICT integration in library project was initiated, and despite all the achievements enumerated by NUC; efforts of Nigerian National Library, and the series of training workshops, none of the eleven university pilot centers for the first phase of this project has begun operation to full capacity. Hanson and Levin further identified some of the problems as lack of funds, lack of competent personnel with the technical know-how of a virtual library, computer phobia, and lack of local resources for digitization.

Benefits of Information and Communication Technology in Library Operations and Management

Integrating Information and Communication Technology (ICT) in libraries offers a wide range of benefits for both library professionals and library users. Some of the key benefits include, but are not limited to:

- i. Improved access to information:** ICT enables libraries to digitize and provide easy access to their collections. This makes it easier for library users to access the information they need quickly and efficiently.
- ii. Enhanced communication and collaboration:** ICT tools such as email, instant messaging, and video conferencing facilitate communication and collaboration among library staff and users, regardless of their physical location.
- iii. Increased efficiency and productivity:** ICT can help automate many routine library tasks, such as cataloging, circulation, and inventory management. This frees up library staff to focus on more value-added activities, such as providing personalized services to library users.
- iv. Greater flexibility and customization:** ICT tools allow libraries to customize their services to meet the specific needs of different user groups. For example, libraries can offer customized search interfaces for different subject areas or age groups.
- v. Improved user experience:** ICT tools such as online catalogs,

databases, and digital libraries provide library users with a more engaging and interactive experience, enabling them to discover, access, and use information more effectively.

- vi. Enhanced learning and research:** ICT tools provide library users with access to a wide range of digital resources, including e-books, online journals, and multimedia content. This enables users to engage in self-directed learning and research.
- vii. Increased cost-effectiveness:** ICT tools can help libraries reduce their operating costs by automating many routine tasks and reducing the need for physical storage space.

Challenges in Integrating ICT into Library Operations and Management

The constraints in effectively integrating ICT into library operations and management are conspicuous. No wonder, Gbaje (2007), lamented that lack of a national fiber network backbone infrastructure, highly expensive bandwidth with poor connectivity, erratic nature of electric power supply in Nigeria, ill-skilled ICT officers and librarians, vandalism of ICT supportive infrastructure, poor maintenance and dysfunctional web servers, etc., have conspired to make successful ICT integration in libraries unproductive. Notwithstanding the fact that integrating ICT in libraries has become increasingly popular in recent years, as it can enhance the overall user experience and provide new opportunities for information management and sharing, there are several challenges that come with this integration. These include, but are not limited to:

- a. Financial constraints:** One of the main challenges of integrating ICT in libraries is the cost associated with it. Purchasing hardware, software, and other equipment can be expensive, and libraries may not have the budget to make these purchases.
- b. Technological infrastructure:** Libraries also need to have a solid technological infrastructure to support ICT integration. This includes high-speed internet connections, reliable computer systems, and software applications that can handle various functions. Libraries in remote or rural areas may struggle with these requirements.
- c. Staff training:** Library staff may not be familiar with the latest ICT technologies and may require training to use them effectively. This can be time-consuming and costly for libraries.
- d. User adoption:** Even if libraries invest in ICT, there is no guarantee that users will adopt the new technologies. Users may prefer traditional methods of accessing information and may not see the value in using ICT in the library.
- e. Privacy and security concerns:** Integrating ICT in libraries can raise privacy and security concerns. Libraries must ensure that user data is protected, and information is not accessed by unauthorized individuals.
- f. Maintenance and sustainability:** ICT equipment requires ongoing maintenance and upgrading to remain effective. Libraries must plan for ongoing maintenance costs and

ensure that they have the resources to sustain ICT integration in the long term.

Future Trends in ICT Integration into Library Operations and Management

This section explores the future of ICT integration in libraries by examining emerging technologies such as artificial intelligence, virtual and augmented reality, and blockchain, and how they might impact libraries in the future. It also speculates on how libraries will continue to evolve as digital knowledge hubs in the coming years. Indeed, the integration of ICT in libraries has become essential to meet the changing needs of library users. Here are some possible future trends in ICT integration in libraries:

- 1. Cloud-based Services:** Cloud-based services such as Google Drive and Microsoft OneDrive provide users with an easy way to store, share and collaborate on documents. In the future, libraries are likely to adopt cloud-based services to provide users with access to digital resources (Adesanya & Idogwu, 2015).
- 2. Virtual and Augmented Reality:** Virtual and augmented reality technologies offer new opportunities for libraries to enhance the user experience. Libraries can use these technologies to create immersive learning experiences, virtual tours, and interactive exhibits.
- 3. Open Access and Open Data:** Open access and open data initiatives have gained momentum in recent years, and libraries are likely to continue to

play a critical role in providing access to open resources. The integration of ICT in libraries will enable better access to open resources and facilitate their discovery.

4. *Artificial Intelligence:* The use of artificial intelligence (AI) is expected to grow in libraries in the future. AI-powered chatbots can help users find resources and answer questions. Libraries can also use AI to analyze data and provide personalized services to users.
5. *Internet of Things:* The Internet of Things (IoT) is a network of devices that can communicate with each other, and it has the potential to revolutionize the way libraries operate. Libraries can use IoT devices to monitor and manage resources, and create a more efficient and effective library environment.
6. *Digital Preservation:* Digital preservation is becoming increasingly important as more resources are created in digital format. Libraries are likely to adopt new technologies to preserve and manage digital resources effectively.

The foregoing is a testament to the reality that ICT and library operations and management are inseparable in the future, because ICT complement libraries, thereby enhancing its services as the digital knowledge hub.

Conclusion

Overall, the integration of ICT has revolutionized the role of libraries in society, transforming them into dynamic

digital knowledge hubs that offer a wealth of resources and services to their communities. Integrating ICT in libraries offers many benefits that enhance the user experience, such as improved access to information, enhanced research capabilities, facilitates research and learning, and increased efficiency in managing library resources. While integrating ICT in libraries can enhance the user experience, it requires careful planning, significant investment, and ongoing maintenance and support to subdue potential challenges, like: epileptic power supply, dysfunctioning of the server, lack of ICT technicalities on the part of librarians, etc. The libraries, such as the New York Public Library's Digital Collection; the British Library's Online Catalogue; the National Library of Australia's Trove; the Internet Archive's Open Library, etc., that have leveraged ICT to enhance their services, should be studied in detail, and their approaches adopted. The future of ICT integration in libraries is bright, and libraries must be proactive in adopting new technologies to meet the changing needs of library users.

References

- Adebimpe, F. O. (2009). Advocacy for benchmarking in the Nigerian Institute of Advanced Legal Studies Library, Lagos: A valedictory lecture to mark the end of sabbatical year spent at the Nigerian Institute of Advanced Legal Studies Library, University of Lagos Campus, Akoka, Lagos, Nigeria on Tuesday, 30th June, 2009.

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- Adesanya, O. O. & Idogwu, K. U. (2015). The evolution of e-library in Nigerian academic libraries: Challenges and way forward. *Asian Journal of Education and e-Learning*, 3(4), 271-276.
- Gbaje, E. S. (2007). Implementing a National Virtual Library for Higher Institutions in Nigeria. *Library and Information Science Research Electronic Journal*, 17(2), 1-15.
- Hanson A. & Levin L.B. (2023). *Building a virtual library*. Hershey PA: Idea Group Publishing Inc.
- Madhumay, S., Gaurav, K. J. & Ravi, R. (2013). Evolution of digital libraries, problems and prospects. *IJLTEMAS*, 2(3), 9-21.
- Olukemi A. F. & Hussaini, A. (2010). Educational needs of librarians in the digital environment: Case studies of selected academic libraries in Lagos State, Nigeria. *Library Philosophy and Practice*, 1-11.
- Youngok, Choi (2006). What is needed to educate future digital librarians? *D-Lib Magazine* 12(9), 1-9. Retrieved from <http://www.dlib.org/dlibseptember06/choi.html>