

THE APPLICATION OF INFORMATION COMMUNICATION TECHNOLOGIES  
(ICTS) IN THE MANAGEMENT OF LIBRARY INFORMATION RESOURCES AT  
THE NATIONAL OPEN UNIVERSITY OF NIGERIA.

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### Abstract

*This study examined the use of ICTs in managing library information resources at the National Open University of Nigeria (NOUN). The main objectives were to assess available ICT resources and address challenges hindering effective ICT utilization in the NOUN library. Using a descriptive survey, the study targeted 1,160 librarians across 30 study centers, with a sample of 334 librarians selected for analysis. Findings indicates that ICT applications, such as Integrated Library Management Systems (ILMS), digital libraries, online public access catalogs (OPAC), e-resources, cloud-based solutions, and mobile applications, are enhancing library efficiency, accessibility, and user experience at NOUN. However, challenges were identified, including limited digital literacy, inadequate infrastructure and internet connectivity, user resistance, and a lack of technical expertise among staff. Security concerns and potential privacy breaches were also noted as barriers to effective ICT adoption. To address these issues, the study recommended that NOUN library should enhance internet connectivity by partnering with telecommunications providers, ensuring consistent access across study centers. Additionally, ongoing training for staff in ICT management and troubleshooting was advised to build technical skills and improve overall system performance. These measures aim to optimize ICT utility for better resource management and accessibility within the NOUN library system.*

**Keywords:** ICTs (Information Communication Technologies), Library Management Systems, Digital Repositories, E-resources and Distance Education.

### Introduction

The rapid growth of knowledge in today's digital age has expanded opportunities that go beyond the physical confines of libraries. The advent of Information and Communication

Technology (ICT) has revolutionized the management of library resources, making it easier and more efficient for libraries to deliver services to their communities, even remotely. Sunusi (2020) noted that in this digital era, libraries can serve users without requiring their physical presence, opening doors to greater access and engagement with library resources.

However, Owolabi et al. (2020) argues that the traditional role of librarians, as providers of access to information, remains significant. While users now have broad access to diverse information sources, librarians have evolved into mediators, guiding users to select the most relevant and reliable resources. Sunusi (2020) emphasizes that librarians are responsible for understanding users' existing information retrieval techniques and addressing their evolving needs.

With ICT's integration into libraries, Wani (2019) posited that traditional reference and circulation services are increasingly being supplemented or replaced by digital solutions. Virtual reference services, such as online chats, emails, and FAQs, enable users to access library support remotely, providing flexibility and 24/7 access. Self-service kiosks and automated circulation systems, allowing for self-checkouts and online renewals, further enhance convenience and efficiency. These advancements, driven by ICT, meet the demands of modern library users for instant access to resources.

Oladokun et al. (2021) highlights the transformative impact of ICT on libraries, noting its significant role in education, research, and other scholarly activities by improving communication and access to information. The development of digital catalog systems like Online Public Access Catalogs (OPACs), e-books, and other digital resources has greatly improved the efficiency and accessibility of library services. As libraries increasingly adopt tools like virtual reality (VR) and augmented reality (AR), along with interactive digital signage, they provide immersive learning experiences and innovative ways for users to engage with library resources.

Distance education, especially in a country like Nigeria with vast geographical challenges, is becoming a powerful tool to improve access to education. Jamuna and Dhanamjaya (2021) explained in their studies that as distance education leverages ICT, it breaks down the barriers of location and time, providing students in remote or underserved areas with opportunities to learn. This form of education not only enhances access to knowledge but also reduces costs, making education more affordable and accessible for Nigeria's growing population. By

embracing distance learning, Nigeria can contribute to the knowledge economy and foster greater equity in education, creating transformative opportunities for marginalized communities and students across the country.

### **Statement of the Problem**

The exponential growth of library and information resources in size, format, and variety has created a complex information landscape that is increasingly difficult to navigate. The digital revolution has profoundly impacted Nigerian libraries, with the deregulation of telecommunication industries making ICTs (Information and Communication Technologies) widely accessible and affordable (Oloniruha et al., 2022). However, despite these advancements, the extent to which academic libraries effectively leverage ICTs to manage their diverse resources remains ambiguous, particularly in a developing country context.

While ICTs hold immense potential to transform information organization, accessibility, and user engagement, Nigerian academic libraries face persistent challenges. These challenges include limited digital infrastructure, inadequate funding, and gaps in librarians' technical skills, all of which hinder the seamless integration of ICT solutions. Research highlights that without the necessary infrastructure and expertise, ICTs may exacerbate issues related to outdated, fragmented, and underutilized library resources, ultimately impacting the quality-of-service delivery to users. Moreover, the lack of unified standards in digital resource management further complicates librarians' ability to provide timely, current, and relevant information to meet the dynamic needs of students and faculty (Baradol, 2021).

Effective ICT utilization demands robust human capacity building, as emphasized by Livina and Mole (2021), yet limited training opportunities and resource constraints often leave librarians underprepared for this transition. Consequently, users may experience delays, limited access to essential resources, and difficulty navigating digital platforms, all of which impair academic performance and satisfaction. These barriers highlight an urgent need to evaluate the current ICT framework and identify actionable strategies for improvement.

Against this backdrop, this research aims to investigate the application of ICTs in managing library information resources at the National Open University of Nigeria (NOUN). By examining the current capabilities, limitations, and impact on user experience, this study seeks to identify critical areas for improvement. The findings are expected to inform strategic recommendations that enhance ICT adoption, optimize resource management, and elevate the

overall user experience within NOUN libraries, contributing to the broader goal of advancing academic success and innovation in Nigerian higher education.

### **Objectives of the Study**

1. To assess the current application of Information Communication Technologies (ICTs) in managing library information resources at the National Open University of Nigeria (NOUN).
2. To address challenges hindering effective ICT utilization in the National Open University of Nigeria (NOUN) library

### **Review of Related Literature**

The primary aim of any library is to meet the information needs of its users, especially in the digital age. Library resources include material, human, and financial resources. Jamuna and Dhanamjaya (2021) categorize library materials into media, non-book, and print resources. Media resources encompass computer hard drives, databases, and library software; non-book materials include CD-ROMs, audio, and video tapes; and print materials consist of books, magazines, maps, and photographic materials. Additionally, digital platforms like social media (e.g., Twitter), online educational tools (e.g., PBS Learning Media, Canvas), and mobile apps for STEAM subjects enrich library resources (Oloniruha et al., 2022). According to Usoro (2019), the selection of these resources is influenced by changes in the curriculum and the availability of new materials.

In Nigerian university libraries, Jamuna and Dhanamjaya (2021) found an abundance of Library and Information Science (LIS) collections, but noted this negatively affected the use of information sources. Both librarians and students benefit from skill development that enables full engagement with library resources. For librarians, it enhances research capacity, while students gain critical research skills and confidence (Olajide & Adetimirin, 2019).

The availability of ICTs in libraries has broadened the impact of information resources, facilitating easier, faster access globally (Wain, 2020). Oladokun (2021) listed various ICT tools used in managing library resources, including computers, DVDs, CDs, e-books, RFID technologies, and the internet. Additionally, automated cataloging systems improve the efficiency of searching and managing resources. These ICT advancements, as Usoro (2019) noted, have transformed libraries, enabling easy access to vast data and offering efficient storage solutions like cloud storage, revolutionizing the user experience.

Moreover, ICT enables seamless resource sharing among libraries, facilitating consortia and joint subscriptions to electronic resources like journals and e-books. In this digital landscape, Owolabi *et al.* (2020) observed that librarians have evolved from traditional information gatekeepers to information navigators, harnessing and filtering information in various formats. They now play a crucial role as educators, teaching users how to navigate and utilize information effectively. Additionally, librarians are responsible for promoting Open Access resources and educating users about their importance and benefits, further expanding the scope of their role. As noted by Usoro (2019), Open Access complements traditional scholarly literature by upholding copyrights, peer reviews, revenue streams, print and digital preservation, prestige, career advancement, indexing, and supportive services.

Olajide and Adetimirin (2019) observed that librarians are adapting to the digital age by embracing new roles enabled by ICTs. ICTs play a central role in efficiently managing library resources and support crucial functions like collection development, cataloging, metadata creation, resource sharing, interlibrary loans, digital preservation, and conservation. Additionally, ICTs facilitate information literacy programs, research support, reference services, and community outreach. By leveraging these technologies, librarians can enhance services, promote Open Access, and meet the evolving needs of researchers, scholars, and the wider community.

### **Current Application of ICTs in the Management of Library Information Resources.**

The integration of Information Communication Technologies (ICTs) in academic libraries has revolutionized the management, access, and utilization of library information resources. Moruf and Olaojo (2020) explained that key ICT applications currently used in academic libraries include Integrated Library Management Systems (ILMS), such as Koha, SirsiDynix, and Aleph. These platforms consolidate various library functions—acquisitions, cataloging, circulation, and user access—into one system, streamlining operations and enhancing resource management (Wain, 2020). ILMS improves inventory control, automates routine tasks, and allows library staff to focus on more complex services.

Digital Repositories, like DSpace and EPrints, host collections of research, theses, dissertations, and faculty publications. These platforms support long-term preservation and open access initiatives, enhancing the visibility and accessibility of academic work (McCombes, 2023; Usoro, 2019). Electronic Resource Management (ERM) Systems, such as ProQuest and Ex Libris Alma, help manage subscriptions to e-journals, e-books, and databases,

ensuring seamless access and efficient tracking of licenses and renewals (Nwachi & Idoko, 2021).

Other notable ICT applications in libraries include automated cataloging, metadata standards, Radio Frequency Identification (RFID) and Barcode Systems, self-service kiosks, Online Public Access Catalogs (OPAC), library mobile apps, e-learning platforms, and cloud-based storage solutions. These technologies enhance library efficiency, broaden access, and support research and academic goals, reflecting a shift toward more dynamic, user-centered library services (Nyoupene & Nyaichyai, 2023).

### **Challenges in Utilizing ICT Facilities for Managing Library Information Resources**

Nigerian libraries face several challenges in effectively using ICT facilities to manage library information resources. Limited access to ICT equipment, often due to fears of damaging the devices and poor maintenance practices, is compounded by a lack of skilled personnel to repair them. This results in bureaucratic delays in addressing technological issues (Nyoupene & Nyaichyai, 2023). Additionally, poor networking infrastructure leads to slow and unreliable internet connectivity, while the absence of trained staff to manage technology services further exacerbates the problem (Wani, 2019). An erratic power supply also hinders the effective use of ICT tools in libraries.

Further challenges include the lack of digital literacy among library users, as many are unaware of or unfamiliar with ICT tools. Financial constraints limit libraries' ability to upgrade technology and infrastructure, including essential services such as roads, telephone networks, and power supply (Nwachi & Idoko, 2021). Moreover, Wani (2019) points out that Nigeria's policy and political framework fails to adequately prioritize ICT, resulting in insufficient policies for its adoption and use. Economic challenges and cultural barriers, such as language difficulties, restrict access to technology, while cost and limited availability of computers and internet services further complicate ICT integration in libraries.

### **Methodology**

This study adopts a descriptive survey research design, following McCombes' (2023) definition, to assess the status of Information and Communication Technology (ICT) resources in academic libraries at the National Open University of Nigeria (NOUN). This design is suited for generalizing findings across the population and supports comprehensive data collection and reporting on the availability and use of ICT resources. The survey approach was selected for

its multiple benefits, as highlighted by Du and Wang (2018).

The study targets a population of One Thousand, one hundred and sixty (1,160) librarians who work in the ICT sections of NOUN libraries within 30 study centres libraries. From this population, a sample size of three Hundred and Thirty-Four (334) librarians was chosen. This group was selected due to their direct experience with ICT resources, enabling them to offer valuable insights into the availability and utilization of ICT in academic library settings.

### Findings of the Study

In other to evaluate current application of ICTs in managing library information resources in the National Open University of Nigeria.

**Table 1: Current Application of ICTs in managing library information resources in NOUN.**

S/N	Satisfaction with Online (N =334)	SA 4	A 3	D 2	SA 1	$\bar{X}$	Std.	Remark
1	<b>Integrated Library Management Systems (ILMS)</b>	139(41.6)	138(41.3)	21(6.3)	36(10.8)	3.14	0.945	SA
2	<b>Digital Library Platforms</b>	61(18.3)	186(55.7)	34(10.2)	53(15.9)	2.76	0.930	A
3	<b>Online Public Access Catalog (OPAC)</b>	135(40.4)	115(34.4)	1(.3)	83(24.9)	2.90	1.182	A
4	<b>E-Resources and Databases</b>	139(41.6)	120(35.9)	12(3.6)	63(18.9)	3.00	1.100	SA
5	<b>Library Automation Tools.</b>	116(34.7)	145(43.4)	13(3.9)	60(18.0)	2.95	1.051	A
6	<b>Cloud-Based Library Solutions</b>	27(8.1)	187(56.0)	43(12.9)	77(23.1)	2.49	0.936	A
7	<b>Mobile Library Applications</b>	150(44.9)	137(41.0)	12(3.6)	35(10.5)	3.20	0.930	SA
8	<b>Library Websites and Portals</b>	54(16.2)	182(54.5)	34(10.2)	64(19.2)	2.68	0.963	A
9	<b>Social Media and Online Communities</b>	46(13.8)	200(59.9)	45(13.5)	43(12.9)	2.75	0.851	A
$\bar{X}_w=2.88$								

**Key:** Strongly agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)

The current application of ICTs in managing library information resources is vast and transformative, improving efficiency, accessibility, and user experience. Tools such as Integrated Library Management Systems (ILMS), digital library platforms, OPAC, e-resources, cloud-based solutions, mobile apps, and library websites enhance resource management and service delivery. These applications enable more effective management of resources and provide users with better access to information, aligning with Du and Wang's (2018) findings. Additionally, Jamuna and Dhanamjaya (2021) highlighted that OPAC systems allow users to remotely search for books, journals, and other resources, offering convenience and enabling users to check availability, make reservations, and renew materials from anywhere, enhancing the overall library experience.

**Table 2:** To address challenges hindering effective ICT utilization in the National Open University of Nigeria (NOUN) library.

S/N	Challenges hindering ICTs utilization N (334)	SA 4	A 3	D 3	SD 4	$\bar{X}$	Std.	Remark
1.	Cyber-attacks and hacking of sensitive information	172( 51.5 )	120(35. 9)	25(7.5 )	17(5.1 )	3.3 4	0.82 5	SA
2.	Lack of Skilled Personnel	187( 56.0 )	114(34. 1)	24(7.2 )	9(2.7)	3.4 3	0.74 3	SA
3.	Financial Constraints	166( 49.7 )	116(34. 7)	25(7.5 )	27(8.1 )	3.2 6	0.91 1	SA
4.	User Resistance and Limited Digital Literacy	164( 49.1 )	119(35. 6)	22(6.6 )	29(8.7 )	3.2 5	0.91 8	SA
5.	Adherence and compliance of providers to security standard	144( 43.1 )	152(45. 5)	18(5.4 )	20(6.0 )	3.2 6	0.81 3	A
6.	Data loss	139( 41.6 )	158(47. 3)	27(8.1 )	10(3.0 )	3.2 8	0.73 7	A
7.	User Resistance and Limited Digital Literacy	104( 31.1 )	176(52. 7)	36(10. 8)	18(5.4 )	3.1 0	0.79 2	A
8.	Lack of Technical Expertise	172( 51.5 )	117(35. 0)	36(10. 8)	9(2.7)	3.3 5	0.77 9	SA



9.	Evolving threats that may target clouds	105(31.4)	175(52.4)	35(10.5)	19(5.7)	3.10	0.80	A
10.	Privacy concern	165(49.4)	118(35.3)	42(12.6)	9(2.7)	3.31	0.79	SA
11.	Insider breaches	156(46.7)	127(38.0)	41(12.3)	10(3.0)	3.28	0.79	SA
12.	Malicious Code Injections	150(44.9)	135(40.4)	29(8.7)	20(6.0)	3.24	0.84	SA
13.	Inadequate Infrastructure and Connectivity	109(32.6)	173(51.8)	24(7.2)	28(8.4)	3.24	0.85	A
14.	Inadequate Infrastructure and Connectivity	116(34.7)	160(47.9)	23(6.9)	35(10.5)	3.07	0.91	A
15.	Data loss/Leakage	117(35.0)	159(47.6)	26(7.8)	32(9.6)	3.08	0.89	A

Table 2 presents the descriptive statistics on challenges and strategies for improving ICT utilization, accessibility, and library resource management at NOUN. Responses indicate that challenges range from a lack of skilled personnel ( $M = 3.07$ ) to financial constraints ( $M = 3.43$ ), with all thirteen items scoring above the 2.5 threshold, reflecting a generally positive response toward identifying and addressing these issues. Respondents agreed on key challenges such as user resistance, limited digital literacy, inadequate infrastructure and connectivity, resistance to change, security concerns, privacy risks, insider breaches, and lack of technical expertise. These findings align with Olajide and Adetimirin (2019), who highlighted that users less familiar with technology may face difficulties accessing or effectively using digital resources, impacting satisfaction with library services. To address these challenges, strategies like securing funding, enhancing digital literacy, upgrading infrastructure, and fostering a supportive security culture are essential for optimizing ICT use and improving resource accessibility and management at NOUN.

### Discussion of Findings

The findings of this study reveal the significant role that Information and Communication Technology (ICT) plays in enhancing the management and accessibility of library resources at the National Open University of Nigeria (NOUN). The study's results align with the current

global trends in library science, where ICT has become central to managing, organizing, and disseminating information. The use of Integrated Library Management Systems (ILMS) such as Koha, SirsiDynix, and Aleph was found to be pivotal in streamlining library functions such as cataloging, circulation, and user access. These systems according to Baradol (2021) enable efficient tracking of resources, improve inventory management, and allow for quicker responses to user needs, which supports the earlier findings by Wain (2020). The digitalization of library resources through e-books, OPAC, and institutional repositories has significantly improved resource accessibility, echoing the studies by McCombes (2023) and Usoro (2019). These digital platforms support not only local but also remote access to materials, which is especially relevant in distance learning environments like NOUN.

Despite the positive impact of ICT on library resource management, several challenges were identified. These included limited access to ICT resources, insufficient infrastructure, and inadequate funding. Poor networking infrastructure and unreliable internet connectivity, which were highlighted in the study, mirror the findings of Wani (2019) and Nwachi & Idoko (2021), who pointed to the economic and technological barriers hindering ICT integration in Nigerian libraries. Additionally, the lack of skilled personnel in managing ICT tools, as noted by the respondents, further complicates the effective utilization of these technologies. This underlines the need for targeted professional development programs for library staff to build the necessary technical expertise to manage and maintain ICT resources.

Another significant finding was the resistance to change from both library staff and users, particularly those less familiar with ICT tools. This finding corroborates the observations by Olajide and Adetimirin (2019), who noted that users limited digital literacy often hinders their ability to fully engage with available resources. Furthermore, cultural factors such as language barriers, as discussed by Wani (2019), were also identified as challenges affecting user engagement with ICT tools. These factors underscore the importance of providing tailored training sessions, workshops, and support services to boost ICT adoption among library users.

## **Conclusion**

In conclusion, the effective use of ICTs in the National Open University of Nigeria (NOUN) library is essential for improving resource management, accessibility, and operational efficiency. However, several challenges hinder the full realization of these benefits. Inadequate infrastructure and poor connectivity limit access to digital resources, especially in remote areas, while insufficient funding prevents necessary technology upgrades and expansion of digital

resources. Limited technical expertise among library staff also affects ICT use, leading to inefficiencies. Additionally, resistance to change, particularly from those less familiar with technology, further impacts user adoption and satisfaction. Cybersecurity and data privacy concerns add substantial risks, as data breaches can compromise user trust. To address these challenges, the NOUN library must secure adequate funding, offer continuous training, upgrade infrastructure, and promote a culture that encourages digital adoption. Robust cybersecurity measures are also essential to protect user data. By overcoming these obstacles, the NOUN library can fully leverage ICT, ensuring more accessible, secure, and effective resource management for its academic community.

### **Recommendations**

Based on the findings and conclusions of the study, the following recommendations are proposed:

1. National Open University of Nigeria (NOUN) library should improve internet connectivity across all study centre libraries, ensuring that both library staff and users can reliably access digital resources and ICT tools. This might involve collaborating with telecommunications providers for better broadband coverage. Continuous training for library staff in managing and troubleshooting ICT systems will help improve system performance and ensure that staff are equipped to assist users with technical issues.
2. The National Open University of Nigeria (NOUN) Library should enhance user ICT skills by offering workshops, tutorials, and support materials. A dedicated helpdesk could further support users facing challenges. Additionally, NOUN should allocate more resources to upgrade ICT infrastructure, expand access to digital databases, and increase academic journal availability. Collaborating with organizations or government bodies may provide further funding to support these initiatives.

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