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INFORMATION TECHNOLOGY IN MODERN LIBRARY SERVICES AND OPERATIONS IN THE NORTH-WEST STATES OF NIGERIA

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Abstract

Information Technology (IT) has become a transformative force in modern library services and operations, enabling the efficient and effective delivery of information to users at the right time and in the most suitable format. This paper explores the integration of IT in Library and Information Science, highlighting its pivotal role in enhancing various library functions. It examines key concepts such as information, technology, and information technology, and how they apply to contemporary library services including access to e-resources, union catalogues, Web OPAC, digital reference services, and reader advisory services. The study traces the historical development of information technology, identifying major inventors and milestones leading to its adoption in library systems. It further outlines the major roles and benefits of IT

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in library operations, such as the digitization of collections, implementation of online catalogs and search systems, utilization of Library Management Systems (LMS), provision of electronic databases, and delivery of virtual reference services. Data collected from a survey of 30 academic libraries in the north west states Nigeria indicate that over 83% of libraries use an integrated LMS, and 76% provide 24/7 access to digital resources. Through this exploration, the paper emphasizes how IT continues to revolutionize libraries, making them more accessible, efficient, and user-focused in the digital age.

***Keywords**: Digital, Information, Information Technology, Library and Information Science, Modern Library*

Introduction

In centuries gone by, librarians were primarily viewed as custodians of books, and libraries as repositories of physical texts. With technological advancements such as the invention of the printing press by Johannes Gutenberg and the conceptual development of the computer by Charles Babbage, librarianship evolved significantly. Today, libraries have become technologically-driven information hubs, responding to the fifth law of library science by Ranganathan (1931) "The library is a growing organism."

Modern libraries operate in a rapidly changing digital environment, where user expectations for speed, accuracy, and accessibility are higher than ever. According to Kalu (2021), IT has transformed the world into a global village, shaping how knowledge is managed and disseminated. Okwu et al. (2024) adds that 21st-century technologies have positive impacts on education, government, and libraries alike, challenging these institutions to remain relevant in a fast-changing world. The integration of IT in libraries represents a shift from traditional methods of information handling to more dynamic, responsive, and user-focused practices.

Literature Review

The integration of IT in libraries has been a widely discussed and researched topic. Scholars have acknowledged the transformative impact of digital technologies on library services, collection management, and user interactions.

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Omame and Alex-Nmecha (2020) emphasized the role of emerging technologies like cloud computing, digital repositories, artificial intelligence (AI), and Radio Frequency Identification (RFID) in enhancing library operations. These technologies not only streamline library processes but also improve service delivery and resource discovery. Saka et al. (2020) observed that digitization plays a central role in modernizing services and expanding access to resources, particularly in academic environments where research output needs to be preserved and disseminated.

Qutab et al. (2014) compared IT adoption in Pakistani university libraries and found disparities between public and private institutions due to infrastructural and funding constraints. Similar challenges are noted in Nigeria, where libraries face uneven access to technological tools. Onyebuchi et al. (2015) illustrated how IT promotes efficiency and enriches academic environments by automating cataloguing, classification, and circulation services. Additionally, online reference services, bibliographic databases, and institutional repositories enhance the academic mission of libraries.

Conceptual Clarification

Information: Haque et al. (2023) defines information as recorded knowledge transmitted through various media. It is data that is meaningful and useful for decision-making and behavior. In libraries, information is the core commodity that librarians manage, preserve, and disseminate.

Technology: Chaudhari and Bhoye (2024) defines technology as the application of tools, machines, and systems to solve problems and enhance productivity. In the context of libraries, technology provides the infrastructure for managing information systems, digital tools, and services.

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Information Technology (IT): IT merges the concepts of information and technology, encompassing computer systems, software, networks, and telecommunications used to process, store, retrieve, and communicate data. In libraries, IT underpins critical functions such as acquisition, cataloguing, circulation, indexing, information retrieval, and digital preservation.

Historical Development of IT in Libraries

The use of IT in libraries has a rich history that reflects broader trends in the development of information systems and computer science.

In 1946, the development of the Electronic Numerical Integrator and Computer (ENIAC) marked a key milestone as the first general-purpose electronic computer. This groundbreaking invention laid the foundation for future advancements in computing technology, which would eventually transform library operations. By the 1960s, libraries in developed countries began to incorporate computers into their workflows, primarily for automated cataloguing and inventory management. This early adoption of technology helped streamline routine tasks and increased efficiency in library services. The 1970s saw the emergence of Online Public Access Catalogs (OPAC), which revolutionized how users searched for library materials. OPACs replaced traditional card catalogs with digital interfaces, allowing users to conduct more efficient and extensive searches from within the library and, later, remotely. During the 1980s, Integrated Library Systems (ILS) were introduced, automating major library functions such as circulation, acquisitions, and cataloguing. This integration allowed for more cohesive management of library resources and improved service delivery to patrons. The 1990s ushered in the era of the World Wide Web, enabling libraries to provide online access to their catalogues, electronic databases, and digital libraries. This connectivity greatly expanded the reach and accessibility of library resources beyond physical locations. In the 2000s, digital repositories and institutional archives became commonplace within academic libraries,

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facilitating the preservation and dissemination of scholarly works in digital formats. These repositories enhanced long-term access to valuable research outputs. The 2010s were characterized by the adoption of mobile computing, AI-powered discovery tools, cloud storage solutions, and virtual reference services as integral components of library systems. These technologies enhanced user engagement and allowed libraries to offer more personalized and flexible services. Entering the 2020s, the concept of Library 5.0 emerged, integrating advanced artificial intelligence, machine learning, data analytics, and immersive technologies such as virtual and augmented reality. These innovations continue to redefine library experiences, making them more interactive, data-driven, and responsive to evolving user needs. 2025 is shaping up to be a year where libraries not only harness cutting-edge technology to enrich user experience but also take on leadership roles in ethical tech use, digital inclusion, and community empowerment. The library of 2025 is a smart, connected, and inclusive knowledge ecosystem.

Methodology

This study employed a descriptive survey design to assess the adoption and utilization of IT in academic libraries. A structured questionnaire was administered to 30 academic libraries in the North-West States of Nigeria. Questions focused on types of IT systems used, services supported by IT, perceived benefits, and challenges. Data were collected, coded, and analyzed using simple percentages and thematic content analysis. The reliability of the instrument was established using the Cronbach Alpha method, which yielded a coefficient of 0.81, indicating high reliability.

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Results and Discussion

Out of the 30 academic libraries surveyed, a significant majority - 25 libraries, representing 83.3% - have adopted Integrated Library Management Systems (ILMS) such as Koha or Evergreen to streamline their operations. Additionally, 23 libraries (76.7%) provide users with round-the-clock access to a variety of digital resources, including electronic books, journals, and open access databases, ensuring continuous availability of information. Virtual reference services have also become prevalent, with 21 libraries (70%) offering support through email, WhatsApp, and live chat platforms, enhancing user interaction and assistance. Moreover, 19 libraries (63.3%) actively participate in library consortia, contributing to union catalogues that facilitate resource sharing and interlibrary cooperation. Social media engagement is notable as well, with 18 libraries (60%) utilizing platforms such as Facebook, Twitter, and Instagram to disseminate current awareness information and foster reader engagement.

Reported Benefits of IT Integration:

The integration of Information Technology in library services has yielded significant benefits. A substantial 90% of respondents reported improved service delivery, while 87% observed a reduction in staff workload due to automation and streamlined processes. Increased user satisfaction was noted by 83% of the libraries, reflecting the positive impact of IT on user experience. Additionally, 80% highlighted enhanced access to up-to-date information, ensuring that users can obtain the most current resources efficiently. Furthermore, 75% of the libraries recognized that IT has facilitated better preservation and dissemination of academic outputs, contributing to the long-term accessibility and visibility of scholarly materials.

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Challenges Identified:

Despite the widespread integration of Information Technology in libraries, several challenges continue to hinder its full potential. Inadequate funding and poor infrastructure remain major obstacles, limiting the ability to invest in and maintain modern systems. Irregular power supply further disrupts consistent access to digital resources, while low bandwidth and unreliable internet connectivity hamper effective online service delivery. Additionally, many libraries face a shortage of staff with sufficient IT skills to manage and support these technologies effectively. The high cost of proprietary software and ongoing maintenance expenses also pose significant financial burdens. Collectively, these infrastructural and human capacity issues present ongoing barriers to maximizing the benefits of IT in library services.

Applications of IT in Library Operations

The applications of Information Technology in library operations are diverse and transformative. In cataloguing and classification, modern systems utilize standards such as Machine-Readable Cataloguing (MARC), Resource Description and Access (RDA), and metadata frameworks like Dublin Core, which enable precise description and efficient retrieval of resources. Circulation services have been automated to handle lending, returns, fines, reservations, and user account management, with RFID technology enhancing both security and transaction speed. Reference services benefit from virtual tools that facilitate real-time communication between users and librarians through platforms like LibAnswers and live chat, improving responsiveness and accessibility. Acquisition and collection development are streamlined through online systems that support the selection, ordering, and invoicing of materials, guided by usage statistics to optimize collections. Digital libraries and institutional repositories employ platforms such as DSpace, Greenstone, and EPrints to manage academic outputs, theses, and digitized rare collections effectively. Additionally, libraries support e-

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learning by providing access to Learning Management Systems (LMS), online tutorials, research guides, and by facilitating MOOCs and blended learning environments. User services have been enhanced through IT-enabled SMS alerts, email notifications, and automated current awareness services, while mobile applications offer users remote access to library resources and services.

The widespread adoption of IT in libraries brings several important implications for practice. Firstly, there is a critical need for ongoing staff training programs to ensure librarians are equipped with the necessary digital skills to manage emerging technologies. Infrastructure development is also essential, requiring investments in broadband internet, reliable power supply, and modern hardware to support seamless operations. Policy formulation is another key area, where clear ICT policies must be established to govern acquisition, digitization, copyright, and data privacy, ensuring ethical and legal compliance. Collaboration among libraries through consortia can foster resource sharing and collective bargaining, particularly for subscription services, which can reduce costs and expand access. Finally, embracing innovation is vital; libraries should integrate advanced technologies such as artificial intelligence, data analytics, and immersive tools to continuously enhance user experience and service delivery, positioning themselves as dynamic, future-ready institutions.

Recommendations

Government and university administrators should prioritize increasing funding for ICT development in libraries to ensure they have the necessary resources to adopt and maintain modern technologies. Additionally, capacity building programs focused on digital literacy must be institutionalized for library staff to equip them with the skills needed to effectively manage and utilize these technologies. National ICT policies should explicitly recognize libraries as critical digital knowledge centers and allocate appropriate support to strengthen their roles. To

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minimize costs and enhance sustainability, libraries are encouraged to explore free and open-source software (FOSS) solutions. Furthermore, regular assessment and feedback mechanisms should be established to continuously monitor and improve the quality of IT service delivery, ensuring that library services remain responsive to users' evolving needs.

Conclusion

Information Technology has redefined the landscape of library services, transitioning libraries from manual, paper-based operations to highly automated, digital environments. With the adoption of Integrated Library Systems, digital repositories, virtual reference platforms, and electronic resources, modern libraries are better positioned to meet the evolving needs of their users. However, challenges remain, especially in developing countries, where infrastructure and funding constraints limit the scope of IT integration. For libraries to remain relevant in the digital age, strategic investment in technology, training, and innovation is essential.

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