

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE

FEDERAL UNIVERSITY LOKOJA, KOGI STATE

INTERNATIONAL CONFERENCE

TABLE OF CONTENTS

TABLE OF CONTENTS ii

Community Engagements through Library Innovations and Creativity
Abdussamad Yusuf Haruna 1

AI Automation and Digital Content Creation: Emerging Roles for Librarians in Academic Libraries the Digital Age: A Systematic Literature Review
Kolawole Francis Ogunbodede, Imoisili O. Odigie 14

Emerging Trends in Library and Information Services: The Impact of Artificial Intelligence
LAWAL, Bilal Muhammad 32

Infopreneurial Opportunities in Research Data Management Services in Nigerian University Libraries: A Review
Lois Yabanet PhD, Jamila Muhammed, PhD, Ajayi Joshua Eyiolorunshe 41

Infopreneurship and the Future of LIS Profession: An Opinion on the Role of Library Personnel
Jamila Ukan Garba, Nikoh Usman Anto, Joseph Yohanna 52

Current State of Librarianship in Nigeria, Examining the Perceived Challenges, Adaptive Innovations, and Future Pathways
ALIYU, Musa *CLN* (Ph.D.) 63

Role of E-library Resources in Supporting Academic Performance of Computer Science Education students, in the Faculty of Education, Federal University Lokoja
Labaika Aishah Oyindamola, Lois Yabanet (PhD), Jamila Muhammed (PhD) 70

Economic Prospects of Automation of Academic Libraries for Librarians in Nigeria: e-Library Consultants' Perspectives
Muhammad Etubi, CLN 82

Fee-based library services as a catalyst for enhanced service delivery in Nigerian university libraries in the era of artificial intelligence: A systematic literature review
Paul Grace Vanje, Elvis Olomu, Ejiro Onajite 90

Generative Artificial Intelligence and Infopreneurial Intentions among Academic Librarians: A Systematic Review of Emerging Evidence
Olise, Florence Nwanne (PhD), Ejitagha Stella 106

Harnessing Indigenous Knowledge Systems for Infopreneurship: Reposition Library and Information Science Professionals for Sustainable Economic Empowerment in Zamfara State, Nigeria
Saifullah Isah Muhammad 121

Exploring the State of Libraries and Librarians in Primary and Secondary Education
Umar Muhammad Karaye 139

Metaverse Libraries: The Next Frontier of Information Access and User Engagement
Habibu Mukhtar **149**

Advocacy and Marketing of the National Library of Nigeria
Ahmad Aminu Lema **158**

Digital Information Services and Commercialisation of Research Innovations in National Root Crop Research Institute for Sustainable Irish Potato Production in Nigeri
F. G. Yarima, G. U. Oyedum (PhD), G. A. Babalola (PhD) , K. A. Saka (PhD) **168**

Leveraging Library-Based Open Data Initiatives for Climate Change Mitigation and Sustainable Development in Nigeria
Muhammad Haruna, Kamaluddeen Isa El-Kalash, Sumayya Hassan **184**

Infopreneurship: A Catalyst for Youth Employment and Economic Development among Library and Information Science Graduates in Nigeria
Sumayya Hassan Abubakar, Kamaluddeen Isa El-Kalash, Muhammad Haruna **193**

Awareness and Utilization of Electronic Information Resources among Undergraduates of Library and Information Science in Federal University Dutsin-Ma (FUDMA)
Abdullahi Ibrahim Akawu **204**

Librarians' Perception and Readiness for Artificial Intelligence Based Digital Library Services
Dr. Sagiru Bala Musa **212**

Repositioning Library and Information Science Graduates for the Fourth Industrial Revolution: Emerging Career Opportunities and Competency Requirements
Abdurrahman Jibril, Shafiu Sabitu **222**

From Catalogue to Capital: A Statistical Assessment of Entrepreneurial Opportunities for Library and Information Science Professionals in the Digital Economy
Dr F. J Abduldayan, Kolade Akinpelu Ayobami, Adebayo Israel Kayode, Dr. Haruna. A. Abduldayan **230**

Application, and Utilisation of New Modern Technologies (ICTS) in Nigeria Tertiary Institution Academic Libraries
Umar Bello Naibi, Dr, Neelam Kabra **246**

Untapped Potential of Indigenous Knowledge for Digital Content Creation and Infopreneurship in Kogi State, Nigeria
Oshinaike A. B. (PhD), Danjuma Saidu **254**

Awareness and Utilisation of Infopreneurship Opportunities for Job Creation Among Undergraduate Students in Adamawa State Universities, Nigeria 265
ADAMU, Abbas Lamido Gora (CLN) , Prof. ABDULLAHI, Zainab Mohammed, PhD. (CLN), Dr. MAMZA, Wavi Pur **265**

Beyond the Stacks: Reinvigorating Information Literacy for Infopreneurial Empowerment of Young Library and Information Professionals
Sani, Job Onekutu; Oseji, Nneka Angela; Mamman Murtala Anokehi, James Friday **281**

Infopreneurship as a Catalyst for Transforming Library and Information Science Practice in the Digital Economy
Aliyu Abdu Kofar Sauri **294**

Leveraging the Role of Information Professionals in Climate Action: Enhancing Ch_4, Co_2, and N_2O Mitigation in Nigeria through Researcher-Community Partnerships
Sanusi Mamman, Prof. Abashe Atiku Maidabino[2] **303**

Artificial Intelligence in Library Education and National Development: A Qualitative Review of Librarians' Perspectives
Ayokunle Oluwadamilola Giwa, Ayomide Ayoola Giwa **313**

Repositioning infopreneurship as a Sustainable Economic Empowerment Strategy for Library and Information Professionals in Nigeria
Salihu Mahmud, Helen Emmanuel **325**

Infopreneurship and Professional Relevance: Rethinking Library and Information Science for Sustainable Economic Development
Kabir Ibrahim Yaradua **337**

Leveraging Social Media Platforms as Infopreneurial Tools for Promoting Library Services and Resources among Undergraduate Students
Olayinka Mary Adekoya (Ph.D), John Ozavize Faith, Aliu Esther Onyeche **344**

Framework of Infopreneurship Pathways for Sustainable Economic Empowerment of Librarians through Interrelated Professional Governance in Academic Libraries in Nigeria
Yani, S.D., Kasa, M.G. **358**

Challenges and Prospects of Infopreneurship among Library and Information Science Professionals in Nigeria
Rachel Agbo **366**

Infopreneurship and the Future of LIS Profession: An Opinion on the Role of Library Personnel
Jamila Ukan Garba, Nikoh Usman Anto, Joseph Yohanna **376**

Community Engagements through Library Innovations and Creativity

By

Abdussamad Yusuf Haruna
FEDERAL COLLEGE OF EDUCATION (TECHNICAL) BICHI
abdussamadyusufharuna4@gmail.com

Abstract

Libraries in the 21st century are no longer passive repositories of information but dynamic community hubs that foster learning, inclusion, and social development. This position paper argues that innovative and creative library practices are essential for strengthening community engagement, particularly in developing contexts where libraries can bridge information and opportunity gaps. The paper posits that through the integration of emerging technologies, user-centered service design, and collaborative programming, libraries can reposition themselves as catalysts for community empowerment. The paper highlights key innovative approaches such as makerspaces, digital literacy programmes, mobile library services, community-driven collections, and participatory outreach initiatives. These strategies not only expand access to information but also promote lifelong learning, social cohesion, and digital inclusion among diverse population groups. Furthermore, the paper emphasizes the importance of creativity in library service delivery encouraging librarians to adopt flexible, culturally responsive, and locally relevant engagement models. From a policy and practice perspective, the paper contends that sustainable community engagement requires institutional support, continuous professional development for library staff, and strategic partnerships with schools, civil society, and local governments. It also underscores the need to embed assessment mechanisms to measure the social impact of innovative library services. The paper concludes by calling for a paradigm shift in library philosophy from collection-centered operations to community-centered innovation ecosystems. By embracing creativity and technological innovation, libraries can remain relevant and significantly contribute to inclusive knowledge societies and sustainable development goals.

Keywords: Community Engagement, Library Innovation, Creativity, User-Centered Services, Digital Inclusion.

Introduction

Libraries have historically served as custodians of knowledge, preserving and providing access to information resources that support education, research, cultural heritage, and lifelong learning. However, the rapid evolution of information and communication technologies (ICTs), globalization, and changing community expectations have fundamentally transformed the role of libraries. Contemporary libraries are no longer viewed merely as repositories of books; rather, they have become dynamic community institutions that facilitate knowledge creation, digital inclusion, innovation, and social interaction. This transformation has shifted library services from collection-centered operations to user-centered and community-driven engagement models, where the needs, aspirations, and participation of community members shape service delivery (Rahmanova, Aytan 2025)

The concept of community engagement has emerged as a central philosophy in modern librarianship. Community engagement refers to the collaborative process through which libraries actively work with individuals, groups, institutions, and stakeholders to identify local needs, co-create relevant services, and promote sustainable social development. Unlike traditional outreach programmes that focus primarily on disseminating information, community engagement emphasizes partnership, participation, inclusiveness, and shared responsibility in addressing societal challenges. Through meaningful engagement, libraries contribute to improving literacy, digital competence, civic participation, economic empowerment, and social cohesion across diverse populations (Sung, Hui-Yun, Hepworth, Mark & Ragsdell, Gillian 2011)

Globally, libraries are increasingly recognized as strategic partners in achieving the United Nations Sustainable Development Goals (SDGs), particularly Goal 4 (Quality Education), Goal 8 (Decent Work and Economic Growth), Goal 10 (Reduced Inequalities), Goal 11 (Sustainable Cities and Communities), and Goal 16 (Peace, Justice, and Strong Institutions). The updated IFLA-UNESCO Public Library Manifesto affirms that libraries provide equitable access to knowledge, information, digital technologies, and cultural resources while fostering inclusive participation in knowledge societies. Similarly, the International Federation of Library Associations and Institutions (IFLA) emphasizes that libraries are essential development partners capable of empowering communities through innovative and responsive services (Chuenchom, Sutthinan,et al 2022)

Innovation has therefore become indispensable in ensuring that libraries remain relevant in an increasingly digital and knowledge-driven society. Library innovation extends beyond the adoption of new technologies to include the creative redesign of services, spaces, programmes, and partnerships that respond effectively to evolving community needs. Innovative libraries integrate emerging technologies such as artificial intelligence, makerspaces, virtual and augmented reality, digital repositories, mobile applications, and data-driven services to improve information access and user experiences. At the same time, innovation encompasses organizational creativity, flexible service models, collaborative problem-solving, and the development of inclusive programmes that reflect local cultural and socioeconomic realities (Yadav, Upasana & Aroslin, Stephen 2024)

Creativity complements innovation by enabling librarians to design unique and context-sensitive solutions that strengthen relationships with their communities. Creative library practices include storytelling festivals, community archives, local history digitization projects, reading clubs, entrepreneurship support programmes, health information campaigns, digital literacy workshops, makerspaces, cultural exhibitions, and participatory

learning activities. These initiatives transform libraries into vibrant social spaces where citizens not only access information but also collaborate, innovate, acquire new skills, and contribute to community development. Such approaches have proven particularly valuable in developing countries, where libraries often serve as accessible public institutions capable of reducing information poverty and bridging the digital divide. (Abubakar, Abidina Attahir & Isa Sidi 2018)

In developing countries such as Nigeria, the imperative for innovative and creative community engagement is especially significant. Rapid population growth, youth unemployment, inadequate digital skills, educational inequalities, and limited access to quality information continue to constrain socio-economic development. Libraries possess enormous potential to address these challenges by providing inclusive learning environments, free access to digital resources, information literacy training, entrepreneurial support, and platforms for civic engagement. Nevertheless, many libraries still face challenges such as inadequate funding, obsolete infrastructure, insufficient technological facilities, limited professional capacity, and weak institutional partnerships, which hinder their ability to maximize community impact. These realities underscore the need for a paradigm shift toward innovative, collaborative, and community-responsive library services (Deinibiteim, M 2026).

Recent global library strategies further reinforce this direction. The IFLA Strategy 2024–2029 and the IFLA Trend Report 2024 envision libraries as active agents of sustainable development, digital transformation, lifelong learning, and community resilience. These frameworks encourage libraries to strengthen partnerships, embrace emerging technologies, promote digital equity, and redesign services around the evolving needs of their communities. They also recognize libraries as innovation ecosystems where knowledge creation, creativity, and community participation intersect to generate meaningful social impact (Dezuanni, Michael et al 2025)

Against this background, this position paper argues that community engagement through library innovations and creativity is fundamental to the future relevance and sustainability of libraries. It contends that by embracing user-centered service design, technological innovation, creative programming, and strategic collaborations, libraries can become transformative institutions that foster inclusive learning, social inclusion, digital empowerment, and community resilience. The paper therefore advocates for a shift from traditional service delivery models toward innovative community-centered ecosystems capable of supporting sustainable national development and the realization of inclusive knowledge societies.

Statement of the Problem

Libraries are widely acknowledged as critical institutions for promoting equitable access to information, lifelong learning, digital inclusion, and community development. Over the past two decades, the role of libraries has evolved beyond traditional collection management to encompass community-centered services that address educational, technological, cultural, and socio-economic needs. This transformation has been accelerated by rapid advances in digital technologies, changing information-seeking behaviors, and increasing demand for participatory and inclusive public services. Consequently, libraries are expected to function as innovation hubs that facilitate knowledge creation, creativity, collaboration, and community empowerment (Igbinovia, Magnus Aiyebelehin, Afebuameh 2023).

Despite these evolving expectations, many libraries, particularly in developing countries, continue to operate within conventional service models that prioritize collection management over active community engagement. Library programmes in many institutions remain largely passive, with limited emphasis on user participation, collaborative learning, digital innovation, and community-driven service delivery. As a result, libraries often struggle to attract diverse user groups, particularly young people, entrepreneurs, persons with disabilities, and marginalized populations who increasingly rely on alternative digital platforms for information and learning (Aabø & Audunson, 2023).

The growing digital divide has further complicated the ability of libraries to fulfill their social mission. While access to digital technologies and online information has expanded globally, significant disparities persist in digital literacy, internet connectivity, and access to reliable information resources, especially across many African countries. According to the International Telecommunication Union (ITU, 2024), although global internet usage continues to rise, millions of people in low- and middle-income countries remain digitally excluded. This situation limits opportunities for education, employment, innovation, and civic participation. Libraries are strategically positioned to bridge these gaps through digital literacy initiatives, technology-enabled services, and inclusive community programmes; however, inadequate infrastructure, insufficient funding, obsolete technologies, and limited staff competencies often constrain their effectiveness (Kinney, Bo 2010, ITU, 2024).

In Nigeria, these challenges are even more pronounced. Many public, school, and academic libraries continue to face chronic underfunding, inadequate ICT facilities, poor internet connectivity, limited professional development opportunities, and insufficient policy support for innovative service delivery. Although several libraries have introduced automation, electronic resources, and digital services, the integration of creative community engagement initiatives such as makerspaces, digital innovation labs, mobile libraries, community archives, entrepreneurship support programmes, and participatory outreach remains limited and uneven across institutions. Consequently, libraries have not fully realized their potential as catalysts for community transformation and sustainable development (George Lukmon et al 2025).

Another critical concern is the inadequate institutional emphasis on user-centered service design. Modern library users increasingly expect flexible, collaborative, and technology-driven services that respond to their changing educational, social, and economic needs. However, many libraries still develop programmes based primarily on institutional priorities rather than systematic community needs assessments and participatory planning. This disconnect often results in low utilization of library services, reduced public visibility, and declining relevance in an increasingly digital information environment (**Ashikuzzaman** MD 2026).

Furthermore, while international organizations such as UNESCO and the International Federation of Library Associations and Institutions (IFLA) have consistently advocated for libraries as key partners in achieving the Sustainable Development Goals (SDGs), the translation of these global frameworks into local practice remains inadequate in many developing countries. Weak collaboration between libraries, educational institutions, civil society organizations, local governments, and private-sector stakeholders continues to limit the sustainability and impact of innovative community engagement initiatives (UNESCO, 2022; IFLA, 2024 & **Israel Dabengwa** 2025).

These challenges highlight a significant gap between the evolving role expected of modern libraries and the realities of library service delivery in many communities. Without deliberate investment in innovation, creativity, strategic partnerships, and community-centered programming, libraries risk becoming increasingly marginalized within contemporary knowledge ecosystems. There is therefore an urgent need to reposition libraries as active agents of community engagement through innovative and creative practices that enhance digital inclusion, lifelong learning, social cohesion, and sustainable community development. This position paper addresses this need by advocating for innovative approaches that strengthen the relationship between libraries and the communities they serve while providing policy directions for sustainable implementation.

Objectives of the Study

1. examine the concept of community engagement, library innovation, and creativity in contemporary library and information services;
2. identify innovative and creative library practices that enhance community engagement and promote inclusive access to information;
3. examine the benefits of community engagement through innovative library services for lifelong learning, digital inclusion, and community development;
4. identify the challenges hindering effective implementation of innovative and creative community engagement initiatives in libraries; and
5. Propose policy and practical strategies for strengthening community engagement through library innovations and creativity.

Research Questions

1. What are the concepts of community engagement, library innovation, and creativity in contemporary library and information services?
2. What innovative and creative library practices enhance community engagement and improve access to information?
3. What are the benefits of innovative library services in promoting lifelong learning, digital inclusion, and sustainable community development?
4. What challenges hinder the effective implementation of innovative and creative community engagement initiatives in libraries?
5. What policy and practical strategies can strengthen community engagement through library innovations and creativity?

Literature Review

Recent empirical studies demonstrate that innovative and creative library services have significantly transformed libraries into community-centered institutions that promote lifelong learning, digital inclusion, social cohesion, and sustainable development.

A quantitative study by Abimbola (2025) investigated the role of school libraries in fostering community engagement among in-school adolescents in Nigeria. The study found that libraries providing digital literacy instruction, collaborative learning activities, and community-based programmes significantly enhanced students' social participation and learning outcomes. The research further revealed that inadequate infrastructure, insufficient funding, and shortages of skilled personnel remain the major constraints limiting the capacity

of Nigerian school libraries to function as effective community engagement centers. The study recommended stronger policy support, investment in digital infrastructure, and continuous professional development for librarians. (**journals.library.ualberta.ca**)

Similarly, Rahmah et al. (2025) examined Indonesia's Social Inclusion-Based Public Library Transformation Programme using a qualitative case study approach. The findings showed that innovative library programmes substantially improved access to information, digital literacy, entrepreneurship, employment opportunities, and community participation. The study concluded that libraries implementing community-driven innovations contributed significantly to local economic development and the achievement of the Sustainable Development Goals (SDGs), particularly through skills acquisition and creative economy initiatives. (**DOI**)

Using a mixed-methods approach involving a systematic review of sixty-eight empirical studies and multiple case studies, Sulham, Reza, and Rahimi (2025) investigated participatory co-creation models in academic and public libraries. The study established that involving community members in designing and implementing library services significantly improved user satisfaction, service relevance, digital literacy, and social inclusion. The researchers emphasized that librarians should increasingly function as innovators and facilitators who collaborate with users in developing responsive library services rather than merely delivering traditional information services. (**research.adra.ac.id**)

An exploratory study by Bouaamri and Otike (2026) assessed the application of Human-Computer Interaction (HCI) principles in African public libraries. Through comparative analysis of library innovations across several African countries, the researchers found that user-centered technological design significantly enhanced accessibility, usability, and community participation. The study argued that culturally responsive digital technologies improve library relevance, particularly in multilingual and resource-constrained environments common across Africa. (**DOI**)

In India, Mittal and Mehta (2026) employed Structural Equation Modeling (SEM) to investigate the relationship between transdisciplinary collaboration, community participation, and sustainability of digital libraries in higher education institutions. The findings demonstrated that active community participation mediates the relationship between institutional collaboration and sustainable digital library development. The authors concluded that involving users in planning, evaluating, and improving digital library services strengthens long-term sustainability and enhances knowledge sharing. (**Springer Link**)

A practitioner-based study by Sharma (2025) evaluated the implementation of digital storytelling as an innovative engagement strategy in an academic library. The initiative attracted more than 7,200 participants over two years, increased library visitation by approximately 20%, and improved users' digital and multimedia literacy skills. The study concluded that creative programmes such as digital storytelling not only preserve local culture but also transform libraries into participatory learning environments where users become active creators of knowledge rather than passive consumers of information. (**ScienceDirect**)

A systematic literature review conducted by Mustofa, Wuryan, and Sentiana (2025) synthesized studies published between 2019 and 2025 on digital communication strategies in libraries. The review found that academic and public libraries increasingly employ social media, artificial intelligence, virtual reference services, and assistive technologies to improve accessibility and digital inclusion. Nevertheless, governance issues, ethical

concerns relating to artificial intelligence, and inadequate digital competencies among library personnel continue to impede effective implementation of innovative digital services. (**conference.ut.ac.id**)

Earlier qualitative research by Koontz and colleagues (2021) on social innovation in public libraries found that innovative community programmes—including educational initiatives, networking activities, cultural events, and social support services—strengthened community resilience and increased library visibility. However, the study also identified structural, organizational, financial, and personal barriers that constrain innovation in many libraries. (**ScienceDirect**)

Another systematic review focusing on African academic libraries by Shikali and Muneja (2024) found that libraries adopted various technological innovations during and after the COVID-19 pandemic, including virtual reference services, social media engagement, institutional repositories, and expanded electronic resource access. Despite these advances, inadequate ICT infrastructure, unreliable internet connectivity, and limited digital literacy among users continued to restrict equitable access to library resources across many African countries. (**arXiv**)

Collectively, these empirical studies demonstrate that innovative library practices—including digital literacy programmes, makerspaces, participatory service design, mobile technologies, community partnerships, digital storytelling, and user-centered technologies—enhance community engagement, improve digital inclusion, and strengthen libraries' contributions to sustainable development. However, they consistently identify inadequate funding, insufficient infrastructure, technological limitations, and inadequate staff competencies as persistent barriers to successful implementation.

Knowledge Gap

Although existing empirical studies provide substantial evidence on library innovation, digital transformation, and community engagement, several gaps remain.

First, most studies examine library innovation, digital services, or community engagement as separate phenomena, with relatively few adopting an integrated perspective that explains how innovation and creativity jointly strengthen sustainable community engagement.

Second, a significant proportion of the available empirical evidence originates from Europe, North America, and Asia, while comparatively fewer studies focus on Nigeria and Sub-Saharan Africa, where socioeconomic realities, digital inequalities, and resource constraints require context-specific approaches to innovative library service delivery. (**DOI**)

Third, many existing studies concentrate on technological innovations such as digital repositories, virtual services, and electronic resources, with limited attention given to creative, culturally responsive, and community-driven engagement strategies, including co-creation, indigenous knowledge preservation, makerspaces, entrepreneurship support, and participatory outreach initiatives.

Finally, much of the literature is empirical and evaluative, offering limited discussion of the policy implications and strategic frameworks needed to institutionalize innovative community engagement practices in libraries, particularly in developing countries.

This position paper addresses these gaps by synthesizing contemporary evidence and proposing a holistic framework that integrates community engagement, library innovation, and creativity as complementary strategies for repositioning libraries as inclusive knowledge

hubs, catalysts for social development, and key contributors to the achievement of the Sustainable Development Goals.

Discussion

The contemporary library operates in an environment characterized by rapid technological advancement, changing user expectations, increasing digital information, and complex social challenges. Consequently, libraries can no longer rely solely on traditional collection-centered service models but must evolve into dynamic, community-oriented institutions that foster innovation, creativity, and inclusive development. The empirical literature reviewed in this paper demonstrates that innovative library services significantly enhance community participation, digital literacy, lifelong learning, social cohesion, and local economic development. These findings reinforce the argument that community engagement is not merely an extension of library services but should constitute the core philosophy underpinning modern librarianship (IFLA, 2024).

The discussion reveals that innovation in libraries extends beyond the acquisition of digital technologies. Rather, innovation encompasses the redesign of library spaces, services, programmes, partnerships, and organizational practices to address the evolving needs of communities. Initiatives such as makerspaces, digital literacy programmes, mobile library services, community archives, entrepreneurship support centres, artificial intelligence-assisted reference services, and participatory outreach programmes have repositioned libraries globally as hubs for creativity, collaboration, and knowledge exchange. Such innovations strengthen libraries' social relevance by transforming users from passive consumers of information into active participants in knowledge creation and community development (Lankes, 2022).

Furthermore, creativity has emerged as an indispensable component of effective community engagement. Creative librarianship requires professionals to develop locally relevant, culturally responsive, and inclusive programmes that reflect the unique characteristics of the communities they serve. Rather than adopting standardized approaches, libraries should engage community members in identifying their information needs, designing services, and evaluating programme outcomes. This participatory approach promotes ownership, increases utilization of library resources, and strengthens public trust in libraries as responsive community institutions (Aabø & Audunson, 2023).

The review also highlights the growing importance of digital inclusion in contemporary library practice. As governments, educational institutions, businesses, and healthcare providers increasingly migrate their services online, digital literacy has become an essential prerequisite for social and economic participation. Libraries remain among the few public institutions capable of providing free access to computers, internet connectivity, digital skills training, and information literacy programmes, particularly for disadvantaged and marginalized populations. Consequently, libraries play a critical role in reducing digital inequalities and supporting the achievement of Sustainable Development Goals (SDGs), especially Goals 4, 8, 9, 10, 11, and 16 (UNESCO, 2022).

However, despite these opportunities, the literature consistently identifies several barriers that continue to undermine innovative community engagement in many developing countries, including Nigeria. Chronic underfunding, inadequate ICT infrastructure, unreliable electricity supply, limited internet connectivity, obsolete technologies, insufficient professional development, and weak institutional partnerships significantly constrain libraries' capacity to implement innovative services. These challenges suggest that

technological innovation alone cannot transform libraries without supportive governance structures, sustainable financing mechanisms, and strategic policy interventions (International Telecommunication Union [ITU], 2024).

The discussion further indicates that effective community engagement requires strong collaboration between libraries and key stakeholders. Partnerships with educational institutions, local governments, non-governmental organizations, community-based organizations, private-sector organizations, technology companies, and development agencies provide opportunities for resource mobilization, programme expansion, and knowledge sharing. Such collaborative networks enable libraries to deliver more responsive services while addressing complex community challenges that extend beyond traditional information provision. The collaborative model also strengthens institutional sustainability by diversifying funding sources and enhancing community ownership of library programmes.

From a policy perspective, there is an urgent need for governments to reposition libraries within national development frameworks. National information, education, and digital transformation policies should explicitly recognize libraries as strategic institutions for promoting lifelong learning, digital inclusion, innovation, and community resilience. Public investment should therefore prioritize the modernization of library infrastructure, provision of high-speed internet connectivity, acquisition of emerging technologies, and development of flexible learning spaces that encourage collaboration and creativity.

Equally important is the need to strengthen the professional competencies of librarians. Continuous professional development programmes should equip library personnel with skills in digital technologies, artificial intelligence, data management, community needs assessment, project management, entrepreneurship support, advocacy, communication, and innovation management. Future librarians should increasingly function as facilitators, educators, digital mentors, innovation managers, and community development practitioners rather than custodians of information resources alone.

The policy discussion also underscores the necessity of institutionalizing user-centered service design within library management practices. Libraries should establish mechanisms for conducting regular community needs assessments, involving users in programme planning, and evaluating service outcomes through evidence-based assessment frameworks. Performance indicators should extend beyond traditional measures such as collection size and circulation statistics to include social impact indicators, digital inclusion outcomes, user satisfaction, community participation, learning outcomes, and contributions to local development.

Furthermore, policy frameworks should encourage libraries to adopt emerging technologies responsibly. While artificial intelligence, big data analytics, cloud computing, virtual reality, and digital repositories present enormous opportunities for improving service delivery, their adoption should be guided by ethical principles relating to privacy, transparency, accessibility, inclusiveness, and intellectual freedom. Libraries should therefore develop institutional policies that promote responsible technology governance while safeguarding users' rights and equitable access to information.

Finally, achieving sustainable community engagement requires long-term commitment from policymakers, library administrators, professional associations, educational institutions, and development partners. Investment in innovative library services should not be viewed as an operational expenditure but as a strategic investment in human capital development, social

inclusion, knowledge economies, and national development. Libraries that successfully integrate innovation, creativity, and community participation are better positioned to respond to emerging societal challenges and remain relevant in an increasingly digital world.

Overall, this paper maintains that the future sustainability of libraries depends largely on their ability to embrace innovative thinking, creative service delivery, and collaborative community engagement. By repositioning libraries as inclusive innovation ecosystems, policymakers and library professionals can significantly enhance access to information, strengthen community resilience, promote lifelong learning, and contribute meaningfully to the realization of the Sustainable Development Goals.

Conclusion

Libraries have undergone a remarkable transformation from being traditional repositories of books and information resources to becoming dynamic centers for learning, innovation, collaboration, and community development. As demonstrated throughout this paper, community engagement has become a defining characteristic of contemporary librarianship, requiring libraries to move beyond conventional service delivery towards innovative, user-centered, and participatory approaches. In an era characterized by rapid technological advancement, digital transformation, and evolving societal needs, libraries must continually innovate and creatively respond to the expectations of the diverse communities they serve.

The review of empirical literature indicates that innovative library practices—including digital literacy programmes, makerspaces, mobile library services, community-driven collections, digital storytelling, participatory outreach initiatives, and strategic partnerships—significantly enhance access to information, lifelong learning, digital inclusion, and social cohesion. These initiatives also strengthen libraries' relevance as institutions that contribute meaningfully to local development, knowledge creation, and the achievement of the Sustainable Development Goals (SDGs). Creativity in library service delivery further enables librarians to design culturally responsive, flexible, and locally relevant programmes that empower community members to become active participants in knowledge production rather than passive consumers of information.

Despite these promising developments, the paper acknowledges that many libraries, particularly in developing countries such as Nigeria, continue to face significant challenges. These include inadequate funding, insufficient technological infrastructure, unreliable internet connectivity, limited professional capacity, weak institutional partnerships, and inadequate policy support for innovation. Unless these constraints are systematically addressed, libraries may struggle to fully realize their potential as agents of community transformation and sustainable development.

This paper therefore concludes that the future relevance and sustainability of libraries depend largely on their capacity to embrace innovation, creativity, and collaborative community engagement. Libraries should no longer be evaluated solely by the size of their collections but by the quality of their social impact, their responsiveness to community needs, and their contributions to education, digital empowerment, social inclusion, and national development. By repositioning themselves as community-centered innovation ecosystems, libraries will remain indispensable institutions within contemporary knowledge societies.

Recommendations

1. Adopt community-centered and innovative library services: Libraries should prioritize user-centered service delivery by actively engaging community members in identifying their information needs, designing programmes, and evaluating services. Innovative initiatives such as makerspaces, digital literacy programmes, mobile library services, community archives, and participatory outreach should be integrated into routine library operations.
2. Increase government and institutional investment in library development: Federal, state, and local governments, as well as parent institutions, should provide adequate funding for modern library infrastructure, high-speed internet connectivity, digital technologies, and creative learning spaces. Sustainable financing is essential for libraries to effectively support education, digital inclusion, and community development.
3. Strengthen the capacity of librarians through continuous professional development: Library professionals should receive regular training in emerging technologies, artificial intelligence, digital literacy instruction, community engagement strategies, innovation management, and user-centered service design to enable them to meet the changing needs of their communities.

References

Aabø, S., & Audunson, R. (2023). Public libraries as meeting places, social infrastructure and community hubs: Current perspectives and future directions. *Journal of Librarianship and Information Science, 55*(4), 903–917.

Abimbola, M. O. (2025). *The role of school libraries in fostering community engagement and collaboration among in-school adolescents in Nigeria*. *IASL Annual Conference Proceedings*.

Abubakar, A. A., & Isa, S. (2018). Innovative and creative skills for the 21st century librarian: Benefits and challenges in Nigerian academic libraries. *Information Impact: Journal of Information and Knowledge Management, 9*(2). **https://doi.org/10.4314/iijikm.v9i2.9**

Ashikuzzaman, M. D. (2026). *User-centered library services: Concepts, practices, and emerging trends*. Library and Information Science Community.

Bouaamri, A., & Otike, F. (2026). Access reframed: The role of human-computer interaction in African public library innovation and transformation. *Information Technology and Libraries*. *(DOI to be verified).*

Chuenchom, S., Wimolsittichai, N., Chaimin, C., Ammarukleart, S., Timakum, T., Putthima, S., & Wipawin, N. (2022). *Libraries for Sustainable Development Goals (SDGs).*

Dabengwa, I. (2025). Are academic libraries doing enough to support the Sustainable Development Goals (SDGs)? A mixed-methods review. *Evidence Based Library and Information Practice, 20*(1), 148–184. https://doi.org/10.18438/eblip30551

Deinibiteim, M. (2026). Entrepreneurship and youth empowerment in Nigeria: The imperative for enhanced digital skills development. *International Journal of Entrepreneurship and Business Innovation*. **https://doi.org/10.52589/IJEBI-FTWCRXVG**

Dezuanni, M., Osman, K., Burton, A., & Heck, E. (2025). *IFLA Trend Report 2024: Facing the future of information with confidence*. International Federation of Library Associations and Institutions.

George, L. A., Odugbesan, O. F., Ogunleye, O. B., & Owojuyigbe, A. A. (2025). *Global Journal of Applied, Management and Social Sciences (GOJAMSS), 31*, 264–273.

Igbinovia, M. A., & Afebuameh. (2023). Libraries as facilitators of digital inclusion for sustainable development: The Nigerian experience. *Folia Toruniensia, 23*. https://doi.org/10.12775/FT.2023.003

International Federation of Library Associations and Institutions. (2024). *IFLA Trend Report 2024*. **https://repository.ifla.org/**

International Telecommunication Union. (2024). *Measuring digital development: Facts and figures 2024*. **https://www.itu.int/**

Kinney, B. (2010). The Internet, public libraries, and the digital divide. *Public Library Quarterly, 29*(2), 104–161. https://doi.org/10.1080/01616841003779718

Koontz, C., et al. (2021). Stimulators and barriers towards social innovations in public libraries: Qualitative research study. *Library & Information Science Research, 43*(1).

Lankes, R. D. (2022). *The new librarianship field guide*. MIT Press.

Mittal, P., & Mehta, K. (2026). Community participation in digital libraries for sustainable transdisciplinary higher education. *Discover Education*.

Mustofa, M. B., Wuryan, S., & Sentiana, F. (2025). Digital communication in libraries to promote inclusive societies: A systematic literature review. *Open Society Conference Proceedings*.

National Library of Nigeria. (2023). *Annual report on library development and information services in Nigeria*. National Library of Nigeria.

Rahmah, E., Winoto, Y., Shuhidan, S. M., Marlini, Erlianti, G., Asmara, R., & Triska, Y. (2025). An exploratory study on the impact of social inclusion-based public library transformation program on sustainable development in West Sumatera. *Record and Library Journal, 11*(2), 374–388. *(DOI to be verified).*

Rahmanova, A. (2025). Evolution of libraries in the digital era: Redefining access, education, and cultural preservation. *Library Archive and Museum Research Journal, 6*. https://doi.org/10.59116/lamre.1540033

Sharma. (2025). Implementing digital storytelling to enhance library engagement: An experience. *Library Hi Tech News*.

Shikali, J. C., & Muneja, P. S. (2024). Access to library information resources by university students during COVID-19 pandemic in Africa: A systematic literature review. *arXiv*.

Sulham, B., Reza, A., & Rahimi, R. (2025). Librarian as innovator: Redesigning library services through participatory co-creation models. *Journal of Loomingulisus ja Innovatsioon*.

Sung, H.-Y., Hepworth, M., & Ragsdell, G. (2011). Community engagement in public libraries. *Malaysian Journal of Library and Information Science*. https://doi.org/10.1145/1940761.1940922

UNESCO. (2022). *IFLA-UNESCO Public Library Manifesto 2022*. United Nations Educational, Scientific and Cultural Organization. **https://www.unesco.org/**

Yadav, U., & Aroslin, S. (2024). *Digital innovations and future trends in libraries*. ISBN 9788197570728.

AI Automation and Digital Content Creation: Emerging Roles for Librarians in Academic Libraries the Digital Age: A Systematic Literature Review

By

Kolawole Francis Ogunbodede
Federal Polytechnic Orogun,
Delta State, Nigeria.
kolawole.ogunbodede@fepo.edu.ng

Imoisili O. Odigie
Department of Library and Information Science
Federal University Lokoja
Kogi State Nigeria.
odigieimoisili@gmail.com

Abstract

This study systematically reviewed the application of artificial intelligence (AI) in digital content creation within academic libraries, with emphasis on emerging technologies, evolving librarian roles, required competencies, and ethical challenges. The review followed the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) 2020 guidelines. Literature published between 2018 and June 2026 was retrieved from Scopus, Web of Science, ERIC, Library and Information Science Source (EBSCOhost), ScienceDirect, and Google Scholar. A total of 790 records were identified, of which 35 studies met the predefined inclusion criteria and were synthesized using a narrative thematic approach. The findings reveal that generative AI, machine learning, natural language processing, automated metadata generation, speech to text technologies, and AI powered translation tools are increasingly transforming digital content creation and information services in academic libraries. AI has expanded librarians' professional roles beyond traditional information management to include digital content creation, research support, digital scholarship, AI literacy instruction, institutional repository management, and AI governance. The review further identified AI literacy, information literacy, metadata management, digital content development, data analytics, cybersecurity, cloud computing, and critical thinking as essential competencies for effective AI adoption. However, inadequate digital infrastructure, limited funding, insufficient professional training, and outdated curricula remain major barriers, particularly in developing countries. Ethical and legal concerns, including algorithmic bias, misinformation, copyright, intellectual property, data privacy, transparency, and accountability, also emerged as significant challenges requiring robust institutional governance. The study concludes that responsible AI adoption in academic libraries depends on sustained investment in digital infrastructure, continuous professional development, curriculum reform, and comprehensive AI governance frameworks. It also highlights the need for further empirical research on AI implementation in African academic libraries, particularly within the Nigerian context.

Keywords: Artificial intelligence, academic libraries, digital content creation, librarians, AI competencies, digital scholarship, systematic literature review, PRISMA.

Introduction

Artificial intelligence (AI) has emerged as one of the most transformative technologies of the twenty first century, fundamentally changing how information is created, organized, accessed, disseminated, and consumed. Advances in generative AI, machine learning, natural language processing, and intelligent automation have revolutionized digital content creation by enabling the rapid production of text, images, audio, video, and other multimedia resources (Anantrasirichai et al., 2026; Mucci, 2024). These technologies have significantly reduced the time, cost, and technical expertise required to create digital content while enhancing productivity, creativity, and knowledge dissemination. Consequently, AI is reshaping teaching, learning, research, and scholarly communication across higher education institutions (Adamakis & Rachiotis, 2025; Popenici & Kerr, 2017).

Academic libraries are increasingly adopting AI technologies to improve information management and service delivery. Traditionally responsible for acquiring, organizing, preserving, and providing access to information resources, librarians now use AI to support automated cataloguing, metadata generation, intelligent indexing, semantic searching, virtual reference services, digital preservation, and personalized information retrieval (Thinh, 2026; Boateng, 2025; Mahmud, 2024). Generative AI has further expanded opportunities for librarians to create research guides, instructional materials, multimedia tutorials, institutional repository content, and library marketing resources that enhance teaching, learning, and research. The widespread application of AI technologies in academic libraries is transforming not only library operations and service delivery but also the competencies and professional responsibilities expected of librarians (Majumdar, 2026; Library Connect, 2025).

The growing integration of AI has redefined the professional roles of librarians, requiring them to develop new competencies for AI enabled digital content creation and innovative information service delivery. Beyond their traditional responsibilities, librarians are increasingly serving as digital content creators, AI facilitators, digital scholarship specialists, research support professionals, data stewards, and educators in AI and information literacy (Miltenoff, 2024). Their responsibilities now include guiding users in the ethical use of AI, evaluating AI generated information, promoting information literacy, supporting open educational resources, managing institutional repositories, and ensuring compliance with copyright and academic integrity standards. In developed countries, AI has become an integral part of academic library services, with librarians playing leading roles in digital scholarship, research support, AI literacy, and institutional AI policy development (Ali & Richardson, 2025; Michalak, 2023).

Despite these advances, AI adoption in many developing countries, including Nigeria, remains constrained by inadequate digital infrastructure, unstable internet connectivity, limited funding, insufficient technical expertise, inadequate professional training, and weak institutional AI policies (Mada, 2025; Haruna, 2025; Idiegbeyan Ose & Idahosa, 2025). Although existing studies have examined AI applications such as chatbots, metadata automation, digital reference services, and intelligent information retrieval, the literature remains fragmented and provides limited synthesized evidence on how AI is transforming librarians' roles in digital content creation.

Consequently, this systematic literature review synthesizes existing evidence on the emerging roles of librarians in AI enabled digital content creation by examining AI technologies, professional competencies, institutional strategies, implementation challenges,

ethical considerations, and future research directions. The review contributes to the literature by providing a comprehensive understanding of how AI is transforming librarianship and offers evidence based insights to guide policy, professional practice, capacity building, and responsible AI adoption in academic libraries, particularly in developing countries such as Nigeria.

Statement of the Problem

AI is transforming digital content creation in higher education by automating the generation, organization, and dissemination of scholarly and educational resources. As AI adoption expands, academic librarians are increasingly expected to move beyond traditional information management roles to support AI enabled content creation, digital scholarship, research support, AI literacy, and the ethical management of AI generated information. Although numerous studies have examined specific AI applications, such as chatbots, automated cataloguing, metadata generation, and generative AI tools, the evidence remains fragmented and largely technology focused. There is limited synthesized knowledge on how AI automation is collectively reshaping librarians' professional roles, the competencies required, the challenges encountered, and the ethical, legal, and professional issues associated with AI enabled digital content creation. This gap limits the ability of library managers, university administrators, policymakers, and professional associations to develop evidence based strategies for AI adoption and workforce development. Therefore, a systematic literature review is needed to integrate existing evidence on AI enabled digital content creation in academic libraries by identifying key AI technologies, examining the emerging roles and competencies of librarians, evaluating implementation challenges and ethical implications, and highlighting priorities for policy, professional practice, and future research.

Research Questions

The following research questions were answered in this study:

- What AI technologies are being applied to digital content creation in academic libraries?
- What emerging roles are librarians performing in AI enabled digital content creation?
- What competencies are required for librarians to effectively utilize AI technologies in digital content creation?
- What ethical, legal, and professional issues are associated with AI enabled digital content creation?

Literature review

AI technologies applied to digital content creation in academic libraries

Empirical evidence shows that academic libraries across developed and developing countries are increasingly integrating AI technologies into digital content creation to improve research support, information organization, and resource accessibility. However, adoption patterns differ according to technological infrastructure, institutional priorities, and financial capacity. In developed countries, Natural Language Processing (NLP), machine learning, and generative AI have become integral to the automation of scholarly content creation and knowledge management. De Leon (2021) reported that university libraries in the United States adopted GPT based language models to generate abstracts, summarize scholarly

publications, and assist researchers in preparing research proposals and academic documents. Likewise, Gasparini and Kautonen (2022) found that European academic libraries employed conversational AI tools to generate metadata and descriptive records for institutional repositories, thereby improving resource discoverability and retrieval efficiency. Similarly, machine learning has enhanced metadata management and digital collection organization. Cox, Pinfield, and Rutter (2019) observed that libraries in the United Kingdom and Germany implemented machine learning algorithms to automate subject classification, keyword assignment, and metadata tagging, resulting in greater consistency, faster processing, and improved access to digital collections. Bashir et al. (2024) further reported that institutions such as the Massachusetts Institute of Technology integrated generative AI applications to create educational illustrations, research summaries, and visual learning materials, strengthening scholarly communication and interdisciplinary teaching. In developing countries, AI adoption has focused primarily on improving access and inclusivity. Springer Nature (2025) documented the use of AI powered translation tools at Can Tho University, Vietnam, to translate scholarly resources into local languages, thereby expanding access to international research. Similarly, Tsekea and Mandoga (2025) found that Zimbabwean academic libraries employed speech to text technologies to convert lectures and audio resources into searchable text, improving accessibility for users with hearing impairments. The literature demonstrates that AI technologies enhance the efficiency, quality, and accessibility of digital content creation in academic libraries. However, empirical evidence from African academic libraries, particularly in Nigeria, remains limited, highlighting the need for further investigation into AI enabled digital content creation within the region.

Emerging roles of librarians in an AI enabled digital content creation

Evidence from the reviewed literature indicates that AI automation is transforming the roles of librarians in academic libraries from traditional information managers to facilitators of AI enabled digital content creation, research support, digital scholarship, AI literacy, and the ethical use of artificial intelligence technologies. Research support has emerged as one of the most prominent roles, with librarians assisting researchers in selecting appropriate AI tools, evaluating AI generated content, supporting literature searching and synthesis, and promoting responsible research practices (Dhande, 2025; Adewojo et al., 2026). The literature also highlights librarians' expanding role as AI literacy educators, providing training on the effective and ethical use of generative AI tools for teaching, learning, and scholarly communication. In addition, AI has broadened librarians' responsibilities in digital resource management, data curation, and community engagement, while automation has enabled them to assume more strategic functions involving AI based data analysis, evidence based decision making, and information management (Nagare, 2025; Srirahayu et al., 2026). Another significant finding is the growing role of librarians as ethical advisors and policy advocates. The widespread use of generative AI has increased the need for guidance on copyright compliance, intellectual property, academic integrity, data privacy, and the detection of misinformation and AI generated inaccuracies. Consequently, librarians are increasingly supporting institutional AI governance and promoting responsible AI adoption (Dhande, 2025; Adewojo et al., 2026). The reviewed studies demonstrate that AI automation is redefining librarianship by expanding librarians' roles in digital scholarship, research support, AI literacy, digital resource management, data stewardship, ethical governance, and strategic decision making. However, the successful execution of these emerging

responsibilities depends on continuous professional development, institutional support, adequate digital infrastructure, and clear AI governance policies.

Competencies required for librarians to effectively utilize AI technologies

Empirical evidence indicates that the effective utilization of AI technologies in digital content creation depends on librarians possessing advanced digital, technical, and ethical competencies that extend beyond basic ICT skills. Studies consistently identify competencies such as information literacy, metadata management, AI applications, data analytics, machine learning awareness, digital resource management, cloud computing, cybersecurity, and critical thinking as essential for supporting AI enabled library services and digital scholarship. Oladokun and Umar (2025) found that librarians require competencies in information literacy, metadata management, digital content organization, and ethical decision making, although outdated LIS curricula, inadequate professional development, poor infrastructure, ethical concerns, and fear of job displacement hinder competence development. Similarly, Dube et al. (2025) emphasized the need for librarians to continuously strengthen their digital competencies to remain relevant in an increasingly technology driven environment. Akobe et al. (2026) highlighted the importance of continuous professional development, curriculum reforms, and reskilling initiatives to prepare librarians for AI powered innovations, digital preservation, and data driven library environments. Likewise, Obiano et al. (2026) reported that librarians require moderate to high competencies in online information retrieval, metadata creation, AI applications, data analytics, cybersecurity, cloud computing, and virtual reference services. Lawrence and Ejedafiru (2026) further stressed the need for institutional support and collaboration among universities, library schools, and professional associations to integrate AI related courses, practical training, and ethics into LIS education. Supporting these findings, Zhang and Liu (2025) argued that librarians must develop competencies in AI applications, data analysis, digital humanities, and critical thinking to effectively support digital scholarship and content creation. The literature demonstrates that successful AI enabled digital content creation requires continuous professional development, curriculum innovation, and institutional support. However, empirical evidence on the AI competencies of librarians in Nigerian academic libraries remains limited, highlighting the need for further investigation.

Ethical, legal, and professional issues associated with AI enabled digital content creation

AI enabled digital content creation presents significant ethical, legal, and professional challenges that extend beyond those associated with traditional artificial intelligence systems (Al Kfairy et al., 2024; Hagendorff, 2024; Surbakti, 2025). Earlier, Murugesan (2023) identified algorithmic bias, misuse and abuse of AI generators, security risks, and ethical concerns as major challenges associated with AI enabled content creation. More recent studies have expanded these concerns to include intellectual property disputes, authorship ambiguity, misinformation, accountability gaps, and inadequate governance. Existing copyright frameworks struggle to determine ownership of AI generated content, particularly where outputs are derived from copyrighted materials, while most academic publishers prohibit AI tools from being recognized as authors and instead require transparent disclosure of AI assistance (Wangmo, 2026; Yoo, 2025; Surbakti, 2025). AI detection tools also remain unreliable because they may incorrectly classify human written content as AI generated (Yoo, 2025). Bias and misinformation remain pervasive concerns. AI systems often inherit biases embedded in training data, resulting in unfair outcomes, stereotyping, and reduced diversity in generated content (Singh, 2024; Wang, 2025). Furthermore, the emergence of

deepfakes, hallucinated content, and large scale automated misinformation threatens public trust, journalistic integrity, and educational quality (Tabassum et al., 2025; Sonni et al., 2024; Yang, 2025). Accountability also remains problematic because the opaque nature of generative AI makes it difficult to determine responsibility for harmful or misleading outputs (Al Kfairy et al., 2024; Surbakti, 2025). Current governance frameworks remain fragmented and lack consistent international standards, empirical validation, and cross disciplinary coordination. Consequently, scholars advocate stronger regulatory frameworks, mandatory disclosure of AI generated content, watermarking technologies, improved explainability, enhanced security measures, and greater AI literacy to promote the responsible, transparent, and ethical use of AI in digital content creation (Al Kfairy et al., 2024; Wang, 2025; Surbakti, 2025).

Methodology

Research Design

This study adopted a Systematic Literature Review (SLR) design to synthesize empirical evidence on the application of AI technologies in digital content creation within academic libraries. A systematic literature review was considered appropriate because it enables the identification, critical appraisal, and synthesis of existing evidence in a transparent, rigorous, and reproducible manner while minimizing selection bias. The approach also facilitates the identification of research trends, knowledge gaps, and future research directions relating to AI enabled digital content creation in academic libraries.

Review Protocol

The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) 2020 guidelines. The PRISMA framework guided the processes of literature identification, screening, eligibility assessment, and study inclusion to ensure methodological transparency, consistency, and reproducibility throughout the review.

Data Sources

A comprehensive literature search was conducted between 10 June and 25 June 2026 using six major scholarly databases recognized for indexing high quality research in library and information science, education, and computer science. The final search was conducted on 25 June 2026**.** The databases searched were:

- Scopus
- Web of Science
- ERIC
- Library and Information Science Source (EBSCOhost)
- Google Scholar
- ScienceDirect

These databases were selected to ensure broad coverage of peer reviewed studies relating to AI technologies, digital content creation, librarianship, and higher education.

Search Strategy

The search strategy employed combinations of keywords and Boolean operators (AND, OR) to retrieve relevant literature. The principal search terms included:

- "Artificial Intelligence" OR "AI"
- "AI Automation"
- "Generative AI"

- "ChatGPT"
- "Academic Libraries"
- "Digital Content Creation"
- "Digital Scholarship"
- "Librarians"
- "Library Services"
- "Higher Education"

An example of the search string was:

("Artificial Intelligence" OR "Generative AI" OR "ChatGPT") AND ("Academic Libraries") AND ("Digital Content Creation" OR "Digital Scholarship") AND ("Librarians" OR "Library Services")

The search was limited to studies published between January 2018 and June 2026**.** Retrieved records were exported into Microsoft Excel for organization and management. Duplicate records were identified and removed before the screening process commenced.

Eligibility Criteria

Studies were selected using predefined inclusion and exclusion criteria to ensure that only relevant and methodologically sound evidence was synthesized.

Inclusion Criteria

Studies were included if they:

- were published in peer reviewed journals;
- were written in English;
- were published between 2018 and 2026;
- focused on academic libraries or higher education libraries;
- examined AI technologies in relation to digital content creation, digital scholarship, research support, or related library services; and
- reported empirical findings or systematic, scoping, narrative, or other evidence syntheses relevant to the review objectives.

Exclusion Criteria

Studies were excluded if they:

- were conference abstracts, editorials, commentaries, opinion papers, or book reviews;
- were duplicate records;
- were published in languages other than English;
- focused on non-library settings; or
- did not address AI technologies or digital content creation within academic libraries.

Study Selection and Screening

The study selection process followed the four stages recommended by the PRISMA 2020 framework.

- Identification: Relevant records were retrieved from the selected databases using the predefined search strategy.
- Screening: Duplicate records were removed, after which the titles and abstracts of the remaining studies were screened against the inclusion and exclusion criteria.
- Eligibility: The full texts of potentially relevant articles were retrieved and assessed to determine their eligibility for inclusion.

- Inclusion: Studies meeting all eligibility criteria were included in the final review and synthesized narratively.

The screening and eligibility assessment were conducted using the predefined criteria to ensure consistency throughout the review process. A PRISMA 2020 flow diagram was used to document the number of records identified, screened, excluded, and included at each stage of the review.

Data Extraction

A standardized data extraction form was developed to ensure consistency and accuracy during data collection. Information extracted from each eligible study included the author(s), publication year, country of study, study objective, research design, AI technology investigated, librarians' roles, competencies identified, ethical issues discussed, and the major findings relevant to the review objectives.

Table 1. Characteristics of the Included Studies

S/N	Author(s)	Year	Study Type	Main Theme
1	De Leon	2021	Empirical	AI for scholarly content generation
2	Gasparini & Kautonen	2022	Empirical	AI metadata generation
3	Cox, Pinfield & Rutter	2019	Empirical	Machine learning for metadata
4	Bashir et al.	2024	Empirical	Generative AI in academic libraries
5	Springer Nature	2025	Case study	AI translation services
6	Tsekea & Mandoga	2025	Empirical	Speech-to-text technologies
7	Dhande	2025	Empirical	Roles of librarians in AI
8	Nagare	2025	Empirical	Emerging librarian roles
9	Adewojo et al.	2026	Empirical	Generative AI and librarians
10	Srirahayu et al.	2026	Systematic Review	Information professionals in AI
11	Zhang & Liu	2025	Empirical	Role reinvention of librarians
12	Oladokun & Umar	2025	Systematic Review	AI competencies
13	Obiano et al.	2026	Empirical	Digital competencies
14	Akobe et al.	2026	Book chapter	Future competencies
15	Lawrence & Ejedafiru	2026	Empirical	AI competencies
16	Dube et al.	2024	Systematic Review	Digital competencies
17	Al-Kfairy et al.	2024	Review	Ethical challenges
18	Hagendorff	2024	Scoping Review	Ethics of Generative AI
19	Singh	2024	Empirical	AI in education
20	Sonni et al.	2024	Systematic Review	AI and journalism
21	Surbakti	2025	Systematic Review	Ethical challenges
22	Tabassum et al.	2025	Scoping Review	Legal and ethical issues
23	Wang	2025	Empirical	AI in media
24	Wangmo	2026	Legal analysis	Copyright and AI

S/N	Author(s)	Year	Study Type	Main Theme
25	Yoo	2025	Comparative Review	Editorial policies
26	Mada	2025	Empirical	ICT challenges
27	Haruna	2025	Empirical	Digital infrastructure
28	Idiegbeyan Ose & Idahosa	2025	Empirical	Digital technologies
29	Thinh	2026	Systematic Review	AI in academic libraries
30	Michalak	2023	Empirical	AI policy
31	Ali & Richardson	2025	Scoping Review	AI literacy policies
32	Miltenoff	2024	Empirical	AI literacy
33	Boateng	2025	Empirical	Generative AI services
34	Majumdar	2026	Review	Professional roles
35	Mahmud	2024	Empirical	AI cataloguing

Quality Assessment

The methodological quality of the included studies was evaluated using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist**,** which is appropriate for assessing qualitative, quantitative, and mixed methods studies commonly included in systematic reviews. Each study was appraised against the relevant JBI criteria, including the appropriateness of the research design, sampling procedures, data collection methods, data analysis, validity and reliability of findings, and overall methodological rigor. Studies were classified as high, moderate, or low quality based on their appraisal scores. Only studies demonstrating acceptable methodological quality were retained for the final synthesis. All 35 included studies met the minimum quality threshold and were retained for the final synthesis.

Data Synthesis

The extracted data were analyzed using a narrative thematic synthesis approach. Findings from the included studies were organized into four major themes derived from the research questions:

1. AI technologies applied to digital content creation in academic libraries.
2. Emerging roles of librarians in AI enabled digital content creation.
3. Competencies required for librarians to effectively utilize AI technologies in digital content creation.
4. Ethical, legal, and professional issues associated with AI enabled digital content creation.

The thematic synthesis facilitated comparison of findings across different countries and institutional contexts, enabling the identification of recurring patterns, similarities, differences, emerging trends, and knowledge gaps. Particular attention was given to evidence from developing countries, especially Nigeria, to identify contextual challenges and opportunities for AI adoption in academic libraries.

Limitations of the Review

This review was limited to peer reviewed journal articles published in English between 2018 and 2026 and indexed in the selected databases. Consequently, relevant studies published in other languages, grey literature, dissertations, conference proceedings, and unpublished reports were excluded. Despite these limitations, the selected databases provided

comprehensive coverage of the available empirical literature on AI enabled digital content creation in academic libraries.

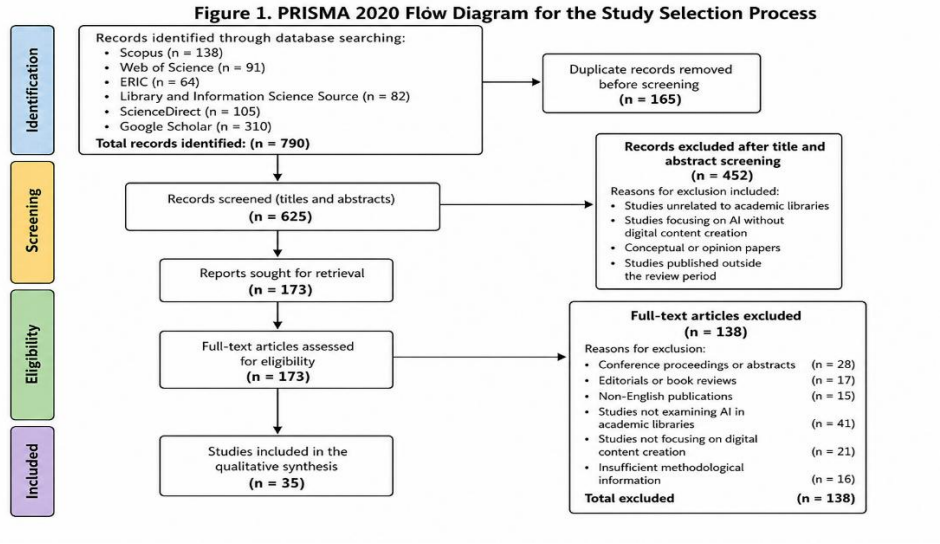


Figure 1: PRISMA 2020 Flow Diagram for the Study Selection Process

Figure 1 illustrates the PRISMA 2020 study selection process. A total of 790 records were identified through database searching. After removing 165 duplicate records, 625 records remained for title and abstract screening. Following the screening process, 173 full-text articles were assessed for eligibility. Of these, 138 articles were excluded based on the predefined eligibility criteria, resulting in 35 studies being included in the qualitative synthesis.

Identification

Records identified through database searching:

- Scopus (n = 138)
- Web of Science (n = 91)
- ERIC (n = 64)
- Library and Information Science Source (n = 82)
- ScienceDirect (n = 105)
- Google Scholar (n = 310)

Total records identified: n = 790
Duplicate records removed before screening: n = 165
Records screened (titles and abstracts): n = 625

Screening

Records excluded after title and abstract screening: n = 452
Reasons for exclusion included studies unrelated to academic libraries, studies focusing on AI without digital content creation, conceptual or opinion papers, duplicate publications that were not detected during the initial deduplication process, and studies published outside the review period.
Reports sought for retrieval: n = 173

Eligibility

Full-text articles assessed for eligibility: n = 173

Full-text articles excluded: n = 138
Reasons for exclusion:

- Conference proceedings or abstracts (n = 28)
- Editorials or book reviews (n = 17)
- Non-English publications (n = 15)
- Studies not examining AI in academic libraries (n = 41)
- Studies not focusing on digital content creation (n = 21)
- Insufficient methodological information (n = 16)

Included

Studies included in the qualitative synthesis: n = 35
The 35 eligible studies formed the basis for the thematic synthesis examining AI technologies applied to digital content creation, the emerging roles of librarians, the competencies required for AI-enabled library services, and the ethical, legal, and professional issues associated with AI-enabled digital content creation in academic libraries.

Results

The systematic review synthesized evidence from 35 studies published between 2019 and 2026 that examined the application of AI in digital content creation within academic libraries. The included studies comprised empirical studies, systematic reviews, scoping reviews, comparative reviews, legal analyses, and review articles conducted across developed and developing countries. The findings are presented under four themes corresponding to the research questions.

Theme 1: AI Technologies Used in Academic Libraries

The reviewed studies demonstrate that academic libraries are increasingly adopting AI technologies to enhance digital content creation and information services. The most frequently reported technologies include generative AI**,** NLP**,** machine learning**,** speech-to-text systems**,** AI-powered translation tools**,** automated metadata generation**,** and intelligent cataloguing systems**.** Generative AI applications such as GPT-based language models were widely used to generate research summaries, abstracts, instructional materials, library guides, and multimedia learning resources. Machine learning algorithms supported automated subject classification, metadata tagging, keyword assignment, and intelligent indexing, thereby improving the organization and retrieval of digital collections. NLP technologies facilitated semantic searching, conversational virtual assistants, automated reference services, and content summarization. AI-powered translation tools enhanced multilingual access to scholarly resources, while speech-to-text technologies improved accessibility for users with hearing impairments. Collectively, these technologies have increased efficiency, improved information discoverability, and enhanced research support services within academic libraries. Despite these advances, the review indicates that AI adoption remains considerably higher in developed countries than in developing countries because of differences in technological infrastructure, institutional investment, and digital readiness.

Theme 2: Emerging Roles of Librarians in AI-Enabled Digital Content Creation

The review reveals a significant transformation in librarians' professional responsibilities as AI technologies become integrated into academic library services. Rather than functioning solely as custodians of information resources, librarians increasingly serve as digital content creators, AI facilitators, research support specialists, digital scholarship consultants, AI literacy educators, data stewards, and institutional policy advisers. Many studies reported

that librarians now assist researchers in selecting appropriate AI tools, evaluating AI-generated content, conducting systematic literature searches, developing research guides, supporting institutional repositories, and creating digital learning resources. In addition, librarians play an important role in promoting responsible AI use by educating users about academic integrity, copyright compliance, misinformation detection, and ethical AI practices. The findings further indicate that librarians are becoming active participants in institutional AI governance through policy development, user education, advocacy, and strategic planning for responsible AI implementation.

Theme 3: Competencies Required for Effective AI Utilization

The reviewed studies consistently identified digital and technological competencies as essential prerequisites for successful AI implementation in academic libraries. Core competencies reported across the literature include AI literacy, information literacy, metadata management, digital content development, data analytics, machine learning awareness, cloud computing, cybersecurity, digital preservation, virtual reference services, and critical thinking. Beyond technical competencies, studies emphasized the importance of ethical reasoning, communication skills, problem-solving abilities, and continuous professional development. Many authors argued that existing Library and Information Science curricula require substantial revision to incorporate AI-related knowledge and practical training. The review also identified several barriers to competency development, including inadequate ICT infrastructure, limited funding, insufficient professional training opportunities, outdated curricula, and concerns about job displacement resulting from automation.

Theme 4: Ethical, Legal, and Professional Issues

Ethical and legal concerns emerged as one of the most prominent themes across the reviewed literature. The studies identified algorithmic bias, misinformation, hallucinated content, intellectual property disputes, copyright uncertainty, data privacy, cybersecurity risks, accountability challenges, and lack of transparency as major concerns associated with AI-enabled digital content creation. Several studies reported that existing copyright legislation has not adequately addressed ownership of AI-generated content, while the absence of universally accepted governance frameworks complicates accountability for AI-generated outputs. The literature also highlighted increasing concerns regarding deepfakes, plagiarism, fabricated information, and unreliable AI-detection tools. Most authors recommended strengthening institutional AI governance through comprehensive policies, mandatory disclosure of AI-assisted content, ethical guidelines, watermarking technologies, explainable AI systems, and continuous AI literacy education for librarians and library users.

Discussion

Identify research gaps and future directions This systematic literature review synthesized evidence from 35 studies published between 2019 and 2026 to examine the application of AI in digital content creation within academic libraries. Four major themes emerged from the review: AI technologies applied in academic libraries, the emerging roles of librarians, competencies required for AI enabled library services, and the ethical and legal issues associated with AI adoption.

The findings from research question 1 indicate that AI is fundamentally transforming academic librarianship by enhancing digital content creation, redefining librarians' professional responsibilities, and creating new competency and governance requirements.

The review identified generative AI, machine learning, natural language processing, automated metadata generation, speech to text technologies, and AI powered translation tools as the most widely adopted technologies supporting digital content creation. These findings are consistent with previous studies showing that AI has become a major driver of automation, metadata management, and digital scholarship in academic libraries. For example, De Leon (2021) found that GPT based language models enhance scholarly content generation, while Cox, Pinfield, and Rutter (2019) demonstrated that machine learning improves metadata creation and information retrieval. Collectively, these findings suggest that AI technologies have significantly improved the efficiency, discoverability, accessibility, and quality of digital content and library services. The review further indicates that academic libraries are evolving into intelligent digital knowledge environments that better support teaching, learning, research, and scholarly communication. However, substantial disparities in AI adoption persist between developed and developing countries due to differences in digital infrastructure, funding, technological readiness, workforce capacity, and institutional support, highlighting the need for greater investment in these areas, particularly in Nigeria.

The findings from research question 2 demonstrate that AI is fundamentally reshaping the professional roles of librarians in academic libraries. The reviewed studies consistently indicate that librarians are no longer confined to traditional responsibilities such as cataloguing and reference services but increasingly function as digital content creators, AI facilitators, research support specialists, AI literacy educators, digital scholarship consultants, and institutional policy advisers. This transformation reflects the growing integration of AI into library operations and scholarly communication. These findings are consistent with Dhande (2025), who reported that librarians increasingly support researchers by recommending appropriate AI tools, evaluating AI generated content, promoting responsible research practices, and providing guidance on the ethical use of generative AI. Similarly, Srirahayu et al. (2026) observed that AI has expanded librarians' responsibilities to include digital resource management, data curation, AI based decision making, and strategic information management. Collectively, these findings suggest that librarians' roles now extend beyond traditional information organization to encompass AI governance, user education, ethical guidance, research support, and institutional decision making, positioning librarians as strategic partners in research, innovation, and knowledge management.

The findings from research question 3 further demonstrate that successful AI implementation depends largely on librarians possessing appropriate digital and technological competencies. Information literacy, AI literacy, metadata management, digital content development, data analytics, cybersecurity, cloud computing, and critical thinking emerged as the most frequently identified competencies across the reviewed studies. These findings indicate that traditional Library and Information Science education alone is no longer sufficient to prepare librarians for AI enabled library environments. Instead, continuous professional development, curriculum reform, practical AI training, and interdisciplinary collaboration have become essential for sustaining professional competence and supporting digital scholarship. These findings are consistent with Dube et al. (2025), who emphasized that librarians must continuously strengthen their digital competencies to remain relevant in an increasingly technology driven environment. Similarly, Obiano et al. (2026) reported that librarians require competencies in online information retrieval, metadata creation, AI applications, data analytics, cybersecurity, cloud computing, and virtual reference services to effectively support AI enabled library services. Collectively, these findings underscore

the need for sustained institutional investment in staff development, curriculum innovation, and capacity building to equip librarians with the competencies required for the effective adoption and sustainable implementation of AI technologies in academic libraries.

The findings from research question 4 indicate that ethical, legal, and professional concerns emerged as another dominant theme throughout the review. Issues relating to algorithmic bias, misinformation, copyright ownership, intellectual property, data privacy, accountability, transparency, and AI generated content continue to present significant challenges for academic libraries. These findings are consistent with Al Kfairy et al. (2024), who reported that accountability, transparency, and governance remain critical concerns due to the opaque nature of generative AI and the absence of comprehensive regulatory frameworks. Similarly, Surbakti (2025) emphasized that responsible AI adoption requires stronger governance mechanisms, mandatory disclosure of AI generated content, enhanced AI literacy, and robust ethical guidelines. Collectively, these findings indicate that technological innovation must be accompanied by effective governance structures to ensure the responsible, transparent, and ethical use of AI in academic libraries. Consequently, academic libraries should strengthen institutional AI policies, promote AI literacy, provide copyright and intellectual property guidance, and establish clear ethical standards for AI generated content. Achieving responsible AI adoption also requires collaboration among librarians, university administrators, policymakers, software developers, and professional associations to develop sustainable governance frameworks that support the ethical integration of AI technologies into academic library services.

The review identified several best practices from developed countries that can inform AI implementation in developing nations. Successful institutions consistently demonstrated strong institutional leadership, reliable digital infrastructure, continuous staff development, interdisciplinary collaboration, and well established AI governance frameworks. These findings suggest that effective AI adoption extends beyond technological acquisition to include organizational readiness, strategic planning, and sustained investment in human and technological resources. The findings also have important theoretical implications by demonstrating that AI adoption represents more than technological innovation. Rather, it reflects a transformation of librarians' professional roles, organizational processes, and information service delivery. The review supports innovation adoption perspectives by showing that institutional readiness, organizational support, and librarians' competencies are critical factors influencing the successful integration of AI technologies in academic libraries.

Practical implications for academic libraries

From a practical perspective, the review highlights the urgent need for universities, library administrators, professional associations, and policymakers to strengthen AI capacity within academic libraries. Investment should focus on modern digital infrastructure, reliable internet connectivity, AI-focused professional development programmes, curriculum reform within Library and Information Science education, institutional AI governance frameworks, and the development of ethical guidelines for AI use. Such interventions will enable librarians to maximize the benefits of AI technologies while minimizing associated ethical and legal risks.

Research Gaps and Future Research Directions

Although the review provides a comprehensive synthesis of current evidence, several research gaps remain. There is limited empirical evidence from African academic libraries,

particularly within Nigeria, regarding AI-enabled digital content creation and librarians' preparedness for AI adoption. Most existing studies are descriptive and cross-sectional, providing limited understanding of long-term organizational change and the effectiveness of AI implementation strategies. Future research should therefore employ longitudinal, mixed-methods, and comparative designs to evaluate the impact of AI on library service quality, research productivity, digital scholarship, user satisfaction, and professional practice across different institutional contexts. Additional studies should also examine the effectiveness of AI governance frameworks, competency development programmes, and ethical guidelines in supporting sustainable AI adoption within academic libraries.

Conclusion and Recommendations

This systematic literature review synthesized empirical evidence from 35 studies published between 2019 and 2026 to examine the application of AI in digital content creation within academic libraries. The review demonstrates that AI is transforming academic librarianship through the adoption of technologies such as generative AI, machine learning, natural language processing, automated metadata generation, speech to text applications, and AI powered translation tools. These technologies have enhanced the efficiency, accessibility, discoverability, and quality of digital content while expanding librarians' roles from traditional information managers to research support specialists, digital scholarship facilitators, AI literacy educators, and ethical advisors. The review further reveals that successful AI implementation depends on librarians possessing advanced digital and technological competencies supported by continuous professional development, curriculum innovation, institutional leadership, and adequate digital infrastructure. At the same time, ethical and legal concerns relating to algorithmic bias, copyright, privacy, transparency, accountability, and misinformation remain significant challenges that require robust governance frameworks and responsible AI policies. Despite significant progress in developed countries, empirical evidence on AI adoption in African academic libraries, particularly Nigeria, remains limited. Academic libraries should therefore strengthen investment in digital infrastructure, AI focused professional development, and institutional governance frameworks to support responsible AI implementation. Library schools should integrate AI competencies into LIS curricula, while future research should employ longitudinal and comparative approaches to examine the long term impact of AI on library services, digital scholarship, and professional practice in developing countries.

References

Adamakis, M., & Rachiotis, T. (2025). Artificial intelligence in higher education: A state of the art overview of pedagogical integrity, artificial intelligence literacy, and policy integration. *Encyclopedia, 5*(4), 180. https://doi.org/10.3390/encyclopedia5040180

Adewojo, A. A., Nallah, B. J., Adefila, E., & Fadare, C. D. (2026). Librarians as architects: Roles in the age of generative artificial intelligence. *IFLA Journal,* 0(0).

Akobe, O. D., Ebhonu, S. I., Lukman, A. B., Abdulraheem Onivehu, K., & Onivehu, K. A. (2026). Future of libraries: Skills and competencies essential for sustainability of the Library and Information Science profession in Nigeria. In B. Chiparausha, C. T. Chisita, & M. Fombad (Eds.), *Innovating in libraries: Volume 1. Surviving technological lethargy in times of endless transformation* (pp. 183–203). Emerald Publishing Limited.

https://doi.org/10.1108/978-1-80592-965-920261011

Al-Kfairy, M., Mustafa, D. G., Kshetri, N., Insiew, M., & Alfandi, O. (2024). Ethical challenges and solutions of generative AI: An interdisciplinary perspective. *Informatics, 11*(3), 58. https://doi.org/10.3390/informatics11030058

Ali, M. Y., & Richardson, J. (2025). AI literacy guidelines and policies for academic libraries: A scoping review. *IFLA Journal, 51*(3), 588–599.

Anantrasirichai, N., Zhang, F., & Bull, D. (2026). Advances in artificial intelligence: A review for the creative industries. *Artificial Intelligence Review, 59*(3), 89.

https://doi.org/10.1007/s10462-026-11494-w

Boateng, F. (2025). The transformative potential of generative AI in academic library access services: Opportunities and challenges. *Information Services & Use, 45*(1–2), 140–147.

https://doi.org/10.1177/18758789251332800

Dhande, S. A. (2025). Role of librarian in AI age for content creation in academic research. *International Journal of Research in Library Science, 11*(3), 285–293.

https://doi.org/10.26761/IJRLS.11.3.2025.1943

Dube, T. V., Rammutloa, M. W., & Matatiele, R. (2024). Skills and competencies of academic librarians to use information technology tools in the digital era: A systematic literature review. *Information Development.* Advance online publication.

https://doi.org/10.1177/02666669241302054

Hagendorff, T. (2024). Mapping the ethics of generative AI: A comprehensive scoping review. *Minds and Machines, 34.* https://doi.org/10.1007/s11023-024-09694-w

Haruna, A. (2025). Revitalizing Nigerian libraries through digital infrastructure: A blueprint for equitable national knowledge access. *Journal of Science Innovation & Technology Research, 10*(9), 238–254. https://doi.org/10.70382/ajsitr.v10i9.073

Idiegbeyan-Ose, J., & Idahosa, M. E. (2025). Digital technologies for innovation and access in Nigeria academic libraries. *Jewel Journal of Librarianship, 20*(2), 117–124.

Lawrence, A., & Ejedafiru, E. F. (2026). Competencies required of librarians to deploy AI in academic libraries for information services. *DESIDOC Journal of Library & Information Technology, 46*(2), 115–125. https://doi.org/10.14429/djlit.20939

Library Connect. (2025, October 8). *Librarians as guides in the age of AI.* Elsevier.

https://www.elsevier.com/connect/librarians-as-guides-in-the-age-of-ai

Mada, M. G. (2025). Investigating the challenges of information and communication technology facilities for information access in academic libraries: A case study of Kano, Kaduna and Jigawa States college libraries. *International Journal of Research in Education and Sustainable Development, 5*(1), 8–18.

https://www.openjournals.ijaar.org/index.php/ijresd/article/view/871

Mahmud, M. R. (2024). AI in automating library cataloging and classification. *Library Hi Tech News.* Advance online publication. https://doi.org/10.1108/LHTN-07-2024-0114

Majumdar, A. (2026). Evolving professional roles of academic librarians in the AI era: A review of trends, needs, and opportunities. *International Journal of Novel Research and Development, 11*(6), a970–a980.

Michalak, R. (2023). From ethics to execution: The role of academic librarians in artificial intelligence (AI) policy making at colleges and universities. *Journal of Library Administration, 63*(7), 928–938. https://doi.org/10.1080/01930826.2023.2262367

Miltenoff, P. (2024). Academic librarians in times of AI and AI literacy: Tasks, responsibilities, and leadership. *The International Information & Library Review, 56*(3), 296–305.

https://doi.org/10.1080/10572317.2024.2381182

Mucci, T. (2024, May 2). *What is AI generated content?* IBM Think. https://www.ibm.com/think/insights/ai-generated-content

Nagare, N. (2025). Emerging roles of library professionals in the digital age. *International Journal of Research and Scientific Innovation, 12*(8), 1760–1767. https://doi.org/10.51244/IJRSI.2025.120800158

Obiano, D. C., Chima-James, N., Edem, A. A., Abanum, R. C., Osuji, C. E., Amadi, C. C., Agim, N. C., Opara, G. C., Dike, C. A., Moneke, P. O., Nwakwuo, C. L., Iroeze, P. C., Nse, J. S., Ogueri, E., Eke, F. M., Mbagwu, F. C., Iwuchukwu, C. O., & Nwakwuo, O. (2026). Digital librarianship competencies and technological skills for managing AI driven library information services in the twenty first century: A case of public libraries in Imo State, Nigeria. *Cineforum, 66*(2), 1577–1592.

Oladokun, B. D., & Umar, L. (2025). Artificial intelligence skills and competencies among librarians in 5IR libraries: Systematic review. *Information Services & Use, 45*(3–4), 201– 214. https://doi.org/10.1177/18758789261418488

Popenici, S. A. D., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning, 12*(1), Article 22. https://doi.org/10.1186/s41039-017-0062-8

Singh, P. P. (2024). The impact of the development of artificial intelligence with generative ability on education. *Journal of Research in Vocational Education,* 6(6), 46-52. https://doi.org/10.53469/jrve.2024.6(06).10

Sonni, A., Hafied, H., Irwanto, I., & Latuheru, R. (2024). Digital newsroom transformation: A systematic review of the impact of artificial intelligence on journalistic practices, news narratives, and ethical challenges. *Journalism and Media, 5*(4). https://doi.org/10.3390/journalmedia5040097

Srirahayu, D. P., Ekowati, D., Kusumaningtiyas, T., Anugrah, E. P., Sukma, A., Anwar, M., & Kamarudin, H. D. (2026). Evolving roles of information professionals in the artificial intelligence era: A systematic literature review. *Publications, 14*(2), 25. https://doi.org/10.3390/publications14020025

Surbakti, F. P. (2025). Systematic literature review on generative AI: Ethical challenges and opportunities. *International Journal of Advanced Computer Science and Applications, 16(5),* 307-315. https://doi.org/10.14569/ijacsa.2025.0160530

Tabassum, A., Elmahjub, E., Padela, A. I., Zwitter, A., & Qadir, J. (2025). Generative AI and the metaverse: A scoping review of ethical and legal challenges. *IEEE Open Journal of the Computer Society, 6*, 348–359. https://doi.org/10.1109/OJCS.2025.3536082

Thinh, P. V. (2026). The role of artificial intelligence in academic libraries: A systematic review of trends, applications, and challenges. *European Journal of Science, Management and Technology (EJSMT), 2*(2), 126–137. https://doi.org/10.59324/ejsmt.2026.2(2).11

Wang, R. (2025). Artificial intelligence and change in the media industry: Opportunities, challenges, and ethical considerations. *Communications in Humanities Research,* 60(1), 116-121. https://doi.org/10.54254/2753-7064/2025.22842

Wangmo, K. (2026). From human authorship to machine creation: Reassessing copyright and liability in the age of generative AI. *International Journal for Multidisciplinary Research, 8(1),* 1-10. https://doi.org/10.36948/IJFMR.2026.V08I01.62046

Yoo, J. H. (2025). Defining the boundaries of AI use in scientific writing: A comparative review of editorial policies. *Journal of Korean Medical Science, 40*, e187. https://doi.org/10.3346/jkms.2025.40.e187

Zhang, J., & Liu, J. (2025). From knowledge keeper to intelligent collaborator: The role reinvention and value reconstruction of librarians in the AI enabled era. *Publications, 13*(3), 43. https://doi.org/10.3390/publications13030043

Emerging Trends in Library and Information Services: The Impact of Artificial Intelligence

By

LAWAL, Bilal Muhammad
University Library, Federal University of Technology, Babura,
Jigawa State
Email: bmlawal.library@futb.edu.ng

Abstract

Artificial Intelligence (AI) is increasingly influencing library and information services (LIS) through applications in cataloguing, reference services, discovery systems, research support, and accessibility. However, its adoption in libraries, particularly in developing contexts such as Nigeria, remains uneven and insufficiently guided by ethical and governance frameworks. This study employs a systematic literature review to examine AI applications in LIS, assess their impacts, and identify challenges affecting effective implementation. Relevant literature was sourced from peer-reviewed journals, conference proceedings, policy documents, and institutional reports, and was analyzed thematically. The study's findings demonstrate that AI enhances operational efficiency, personalizes user services, provides inclusive access, and facilitates data-driven decision-making. Nonetheless, persistent challenges, including data privacy risks, algorithmic bias, misinformation, infrastructural constraints, skills gaps, and professional resistance, limit sustainable adoption. The study emphasizes the importance of a human-centered, ethical, and context-sensitive approach to AI integration, aligning technological innovation with core values of librarianship. It concludes that responsible AI adoption can reposition libraries as inclusive and resilient knowledge hubs in the digital age.

Keywords: Artificial Intelligence, Library and Information Services, AI Applications, Digital Libraries, Inclusive Technology

Introduction

Artificial Intelligence (AI) is redefining the boundaries of librarianship in ways that have been both transformative and disputed as libraries shift away from passive information repositories to intelligent, data-driven knowledge ecosystems. Historically, libraries were known to the keepers of printed information; however, digital transformation and intelligent technologies have transformed into interactive, data-driven ecosystems. Despite the fact that Artificial Intelligence offers transformative opportunities for enhancing efficiency, personalization, and accessibility in library and information services, its adoption remains constrained by ethical, infrastructural, and professional challenges. This study seeks to address these issues by examining how AI can be ethically, inclusively, and sustainably integrated into library operations to strengthen service delivery, uphold professional values, and promote equitable access to knowledge.

Components of AI, such as machine learning, natural language processing, and generative models, are revolutionizing cataloguing, discovery systems, reference services, and research support. These technologies are not only automating library operations but also enhancing the librarian's role through predictive analytics, adaptive systems, and personalized services. The study aims to explore how AI can be integrated into core library services, from cataloguing and metadata enrichment to virtual reference assistance and intelligent research assistants. The study will focus on understanding the application of AI and how it can contribute to redefining the traditional boundaries of librarianship.

The growing acceptance by librarians to integrate AI into library operations has prompted a closer look at its impact and the benefits it offers to libraries. AI has significantly impacted libraries, introducing transformative benefits such as personalization, inclusivity, and informed strategic decision-making. Libraries now employ AI tools to predict user needs, recommend systems to enhance discovery, and analytics tools to optimize resource allocation and management. Through AI-powered automation, routine administrative and cataloguing tasks are streamlined, freeing librarians to focus on intellectual and ethical responsibilities. Moreover, AI promotes inclusive access by supporting assistive technologies that cater to users with diverse linguistic and physical abilities. This integration transforms libraries into dynamic, user-centered environments that align with global goals for equity, innovation, and equitable access to knowledge. However, the rapid acceptance and integration of AI into library services raises critical challenges that threaten its long-term sustainability and ethical integrity. The study examines the ethical, infrastructural, and professional barriers that hinder successful implementation.

Ultimately, this study recognizes that while Artificial Intelligence presents vast potential for innovation in library and information services, its successful integration depends on human-centered and context-sensitive implementation. By systematically addressing these three research questions; examining AI's applications, identifying its impact, and evaluating its challenges, the study seeks to provide a comprehensive conceptual foundation for ethical and sustainable AI adoption in libraries. It argues that the future of librarianship lies not in resisting automation but in redefining professional identity around collaboration with intelligent systems. Libraries that strategically adopt AI as a partner rather than a replacement for human expertise can evolve into adaptive, intelligent knowledge hubs that promote creativity, inclusivity, and digital resilience in the 21st century.

Problem Statement

Artificial Intelligence (AI) has the potential to revolutionize library and information services (LIS) by improving efficiency, personalization, accessibility, and research support. However, its adoption is still uneven, mostly conceptual, and inadequately guided by ethical and governance frameworks, especially in developing contexts like Nigeria. Significant obstacles still exist, including data privacy and security risks, algorithmic bias, misinformation, inadequate infrastructure, limited funding, skills deficiencies among library professionals, and resistance stemming from fears of job displacement, even though the literature currently in publication highlights a wide range of AI applications in cataloguing, reference services, discovery systems, and library management.

The predominance of descriptive studies further reveals a gap in integrative, context-sensitive models that align AI innovation with core librarianship values and local institutional realities. If unaddressed, these challenges risk undermining user trust, reinforcing information inequality, weakening professional identity, and widening the digital divide between well-resourced and under-resourced libraries. Consequently, there is a critical need for a human-centered, ethical, and sustainable conceptual approach to AI integration that can guide libraries in leveraging intelligent technologies to strengthen service delivery while preserving professional integrity and equitable access to knowledge.

Research Objectives

1. What are the applications of Artificial Intelligence in library and information services?
2. How does **AI impact** and benefit library operations and services?
3. What challenges are associated with AI adoption in libraries?

Methodology

This study adopted a systematic literature review methodology, a structured and reproducible approach used to identify, select, and synthesize existing scholarly evidence to address clearly defined research questions (Turney, 2023). The methodology ensured transparency and minimized bias by explicitly documenting the procedures for sourcing, selecting, and analyzing relevant literature, making it suitable for a conceptual examination of Artificial Intelligence (AI) in library and information services. Relevant literature was sourced from peer-reviewed journal articles indexed in Scopus, Web of Science, Google Scholar, and ResearchGate, alongside conference proceedings, reports from professional library associations, scholarly books, white papers, policy documents, and government or institutional reports related to AI adoption in library services. Only studies directly addressing AI applications, impacts, and challenges in library and information services were included. The retrieved literature was analyzed using thematic analysis, through which recurring themes, including AI technologies, applications in library services, benefits, and associated challenges, were identified, compared, and synthesized to establish patterns, research gaps, and emerging trends in AI adoption within library and information services.

Literature Review

Applications of Artificial Intelligence in Library and Information Services

Artificial Intelligence (AI) has become increasingly relevant to library and information services because of its ability to automate information-related tasks, interpret natural-language queries, analyse large datasets, and support intelligent interaction with users. One of its major applications is cataloguing and metadata management, where machine learning, natural language processing (NLP), optical character recognition (OCR), and computer vision can support bibliographic description, classification, subject analysis, and metadata extraction. Breeding (2018) observed the increasing incorporation of intelligent technologies

into library service platforms and discovery systems, while Bagchi (2025) proposed generative AI and ontology-based approaches for more dynamic metadata modelling. AI is also applied to reference and access services through chatbots, virtual assistants, and conversational AI, which provide users with immediate assistance in searching library resources and answering routine enquiries (Boateng, 2025; Yang, 2024). According to Tunon (2024), conversational technologies are contributing to the transition from traditional desk-based reference services towards virtual consultation. Similarly, AI-powered information discovery and retrieval systems use machine learning and NLP to interpret search intentions, identify semantic relationships, rank results, and recommend relevant information resources (Enis, 2024). AI is further being applied in research support services, where tools such as Elicit, Consensus, Scite, and Perplexity assist with literature discovery, summarization, citation analysis, and research exploration. Ojala (2023) highlights the emergence of AI-powered research assistants that support researchers in managing and synthesizing large volumes of scholarly information. These applications demonstrate that AI is extending beyond traditional automation to support intellectual and user-centred functions within libraries.

Another important application is user personalization and recommendation services, where AI analyses users' interests, search behaviour, borrowing patterns, and interactions with library platforms to recommend books, articles, databases, and other relevant resources. According to Enis (2024), AI-enabled recommendation systems are increasingly incorporated into library platforms to improve information discovery and user interaction. AI is also being applied to accessibility and inclusive library services through speech recognition, text-to-speech, speech-to-text, computer vision, automated translation, and adaptive interfaces. Miller (2024) highlights the potential of AI-powered assistive technologies to support users with visual and reading difficulties, while AI translation tools can facilitate access to information across different languages. In addition, AI is increasingly used in library management and decision support, where predictive analytics, intelligent dashboards, and machine-learning systems analyse circulation statistics, collection use, staffing patterns, and user behaviour to support acquisitions, budgeting, planning, and service evaluation (Liu, 2024; Wu, 2025). Enis (2024) further reports the incorporation of AI into workflow automation and recommendation systems, demonstrating its relevance to administrative and operational functions. AI is also applied to automation of routine library operations, including circulation, inventory management, data entry, document processing, and other repetitive activities. Robotic Process Automation and machine-learning technologies can reduce manual intervention and streamline workflows (Ogungbenro et al., 2025). These applications indicate that AI is becoming embedded across both technical and managerial dimensions of library operations.

Furthermore, AI contributes to knowledge organization and semantic information management through ontologies, linked data, semantic search, automated classification, and intelligent relationship extraction. Bagchi (2025) demonstrates the potential of ontology-based AI to establish relationships among information resources and improve knowledge representation. AI is also increasingly relevant to information integrity, security, and ethical governance, where intelligent analytical systems can assist in monitoring information environments, analysing user feedback, identifying unusual patterns, and supporting institutional decision-making (Liu, 2024). In Nigerian academic libraries, Ogungbenro et al. (2025) report the relevance of NLP and machine-learning technologies to information extraction and access, although technical and ethical concerns remain. Similarly, Monyela

and Tella (2024) argue that AI-supported knowledge organization can enhance productivity, resource optimization, and inclusive information access when implemented responsibly. Overall, the literature shows that AI applications in library and information services encompass cataloguing and metadata management, reference and access services, information discovery and retrieval, research support, personalization and recommendation, accessibility, management and decision support, routine operational automation, knowledge organization, and information integrity and governance. However, the extent to which these applications are actually implemented varies according to technological infrastructure, financial capacity, staff competencies, institutional readiness, and ethical governance. This variation provides a basis for empirically examining the actual applications of AI in the library environment under investigation.

Impact and Benefits of AI Integration to Library Services

The integration of Artificial Intelligence (AI) has produced significant changes in the efficiency and effectiveness of library operations and information services. One of the most evident impacts is improved operational efficiency, particularly in technical and back-end activities such as cataloguing, metadata creation, classification, indexing, circulation, and routine data processing. Breeding (2018) observed that the incorporation of intelligent technologies into library service platforms supports automation and improves the scalability of library workflows. Similarly, evidence from Nigerian academic libraries indicates that NLP, machine learning, and related technologies can improve metadata extraction and information access (Ogungbenro et al., 2025). AI also contributes to faster and more effective information discovery and retrieval by interpreting natural-language queries, identifying semantic relationships, ranking search results, and generating recommendations. According to Enis (2024), AI-driven discovery and recommendation systems are changing how users interact with library resources. These capabilities can reduce the time users spend searching for information and improve the visibility and accessibility of relevant library collections (Bagchi, 2025). AI therefore has the potential to transform library operations from predominantly manual and reactive processes towards more automated, efficient, and responsive services.

AI has also had considerable impact on reference services, research support, personalization, and user engagement. AI-powered chatbots and virtual assistants can provide immediate responses to routine enquiries, assist users in navigating library resources, and provide support beyond conventional library opening hours. Tunon (2024) notes that conversational AI can enable librarians to concentrate on more complex research consultations and information-literacy activities, while routine enquiries are handled through automated systems. In research support, AI tools can assist with literature discovery, summarization, citation analysis, and identification of relevant scholarly evidence (Ojala, 2023). These capabilities can reduce the time required to undertake literature searches and enable librarians to provide more advanced research-support services. AI also facilitates personalized information services by analysing user interests and behaviour and recommending relevant resources (Enis, 2024). According to Monyela and Tella (2024), intelligent technologies can improve productivity, resource optimization, and user-oriented information provision when appropriately implemented. Furthermore, AI-based speech recognition, text-to-speech, computer vision, and translation technologies can improve accessibility and inclusion, allowing users with different abilities and language needs to interact more effectively with library resources (Miller, 2024; Liu, 2024). Collectively, these

developments can enhance user satisfaction, engagement, convenience, and equitable access to information.

At the managerial and professional levels, AI provides opportunities for data-driven decision-making, improved resource utilization, predictive planning, and transformation of librarians' professional roles. Predictive analytics can analyse circulation patterns, database usage, collection performance, staffing requirements, and user behaviour to support evidence-based decisions concerning acquisitions, budgeting, staffing, and service evaluation. Wu (2025) explains that predictive analytics and decision-support technologies can facilitate data-informed governance and contribute to the emergence of the "hybrid librarian," who combines conventional librarianship with technological and AI-related competencies. AI can also reduce repetitive workloads, allowing librarians to devote greater attention to research support, information literacy, digital services, and other higher-level professional activities (Enis, 2024). However, the impact of AI is not exclusively positive because its benefits can be constrained by inaccurate outputs, algorithmic bias, privacy concerns, inadequate infrastructure, financial limitations, and insufficient professional competencies (Gamage & Tammaro, 2025; Ogungbenro et al., 2025). Therefore, the overall impact and benefits of AI in library operations depend largely on the availability of appropriate infrastructure, staff training, institutional support, ethical governance, and effective human oversight. The literature consequently suggests that AI can significantly enhance library efficiency, service quality, accessibility, research support, user engagement, and managerial decision-making, but these benefits must be evaluated within the specific institutional context in which AI is implemented.

Challenges Associated with AI Adoption in Libraries

The adoption of Artificial Intelligence (AI) in libraries is associated with several technological, ethical, financial, and organizational challenges that can hinder effective implementation. One of the major concerns is data privacy and security, because AI applications often require the collection, processing, and analysis of users' personal information, search histories, borrowing records, and interaction data. Liu (2023) emphasizes that extensive data collection can expose libraries to privacy violations, unauthorized access, and cybersecurity threats. Another major concern is algorithmic bias, which may occur when AI systems are developed using incomplete or biased datasets. According to Miller (2024), biased AI models can produce discriminatory or unrepresentative outcomes, while Liu (2024) stresses the importance of transparency and accountability in AI systems. In library services, such bias may influence search results, recommendations, classification, metadata creation, and the representation of particular subjects, languages, or perspectives (Monyela & Tella, 2024). These concerns demonstrate that the adoption of AI requires strong data-protection practices, continuous evaluation, and professional oversight.

Another important challenge is the accuracy and reliability of AI-generated information, particularly with generative AI systems that may produce fabricated facts, citations, or misleading responses. Boateng (2025) and Yang (2024) emphasize the need for critical evaluation of AI-generated information, especially when AI is used in reference and research-support services. Financial and infrastructural limitations also constrain AI adoption because implementation may require considerable investment in software, hardware, internet connectivity, electricity, data storage, maintenance, and technical support. According to Gamage and Tammaro (2025), inadequate funding and ICT infrastructure can limit digital transformation, while evidence from Nigerian academic libraries indicates that

technical capacity and infrastructure remain important barriers to AI implementation (Ogungbenro et al., 2025). Furthermore, skills gaps and inadequate professional training can prevent librarians from effectively operating, evaluating, and managing AI systems. Tripathi (2024) emphasizes the need for professional competencies, while Wu (2025) advocates continuous professional development to prepare librarians for changing technological environments.

AI adoption may also be affected by resistance to technological change and fear of job displacement, particularly when librarians perceive automation as a threat to their professional responsibilities. Affum and Dwomoh (2025) discuss concerns surrounding the implications of AI for professional roles, while Wu (2025) argues that AI should be viewed as a supportive technology that complements rather than completely replaces librarians' expertise. Another important challenge is the lack of formal ethical and governance frameworks for regulating AI use in libraries. According to Liu (2024), effective AI governance should incorporate transparency, accountability, risk management, and continuous evaluation, while Monyela and Tella (2024) emphasize responsible implementation. Overall, the reviewed literature indicates that privacy and security risks, algorithmic bias, misinformation, financial constraints, inadequate infrastructure, skills shortages, resistance to change, job-displacement concerns, and weak governance frameworks can collectively hinder AI adoption. However, much of the existing literature discusses these challenges conceptually, with limited empirical evidence on their relative severity and combined influence, particularly in federal university libraries in North-West Nigeria. This gap provides justification for the present study to empirically investigate the challenges associated with AI adoption and provide context-specific evidence for effective and sustainable implementation.

Conclusion

It is concluded that Artificial Intelligence has significant applications and benefits across library and information services, including cataloguing, reference services, information retrieval, research support, personalization, accessibility, automation, and management. However, its adoption is constrained by challenges such as privacy and security risks, algorithmic bias, misinformation, inadequate infrastructure, funding limitations, skills gaps, resistance to change, and weak ethical governance. Therefore, effective AI adoption requires adequate infrastructure, continuous staff training, institutional support, ethical policies, and appropriate human oversight to ensure that AI improves library services while maintaining professional standards and user trust.

Recommendations

1. Libraries should strengthen AI infrastructure and institutional support by providing reliable internet connectivity, adequate ICT facilities, appropriate AI tools, and sustainable funding to support effective implementation and maintenance.
2. Library management should provide continuous AI training and professional development for librarians to improve their competencies in AI literacy, information evaluation, data management, ethical AI use, and effective integration of AI into library services.
3. Libraries should develop clear AI policies and ethical governance frameworks covering data privacy, security, algorithmic bias, copyright, misinformation, transparency, and human oversight to ensure responsible, reliable, and sustainable use of AI.

References

Abutayeh, N. (2024). Bringing DeepMind Technology to the Table: Envisioning Library Services using DeepMind Visualization AI. *Public Library Quarterly,* 44(1), 21-31. **https://doi.org/10.1080/01616846.2024.2357396**

Affum, M. Q. (2023). Investigating the Potential Impact of Artificial Intelligence in Librarianship. *Library Philosophy and Practice.*

Affum, M. Q. (2023). The Transformative Impact of Artificial Intelligence on Library Innovation. *Library Philosophy and Practice*. 7999. **https://digitalcommons.unl.edu/libphilprac/7999**

Ali, M. Y. (2023). AI ChatGPT applications in libraries: Challenges and opportunities. Journal of Information & Documentation Studies / Bilgi ve Belge Araştırmaları Dergisi, 20, 18–26. **https://doi.org/10.26650/bba.2023.20.1364582**

Bagchi, M. (2025). Toward Generative AI–Driven Metadata Modelling: A Human–Large Language Model Collaborative Approach. Library Trends, 73(3), 297-322. 10.1353/lib.2025.a961196.

Bates, M. E. (2019). Ay Ay AI. Online Spotlight. **https://onlinesearcher.net**

Bates, M. E. (2019). High-Tech and High Touch. Online Spotlight. **https://onlinesearcher.net**

Boateng, F. (2025). The transformative potential of generative AI in academic library access services: Opportunities and challenges. Information Services & Use, 45(1–2), 140–147. https://doi.org/10.1177/18758789251332800

Breeding, M. (2018). Possible Future Trends. Library Technology Reports. **https://alatechsource.org**

Enis, M. (2024). AI on the Horizon. *Library Journal,* 38-41. **https://www.libraryjournal.com**

Gamage, P., Tammaro, A. M. (2025). The impact of artificial intelligence on Sri Lanka libraries: an interview with Premila Gamage. *Digital Library Perspectives,* 41(1), 179-183. https://doi.org/10.1108/DLP-02-2025-154

Guevara, S. (2024). Report from the Field: Learning about AI and Libraries. Information Today, Inc. **https://infotoday.com/conferences.asp**

Liu, J. (2024). Innovation and risk avoidance of smart library services based on generative artificial intelligence. Journal of Library & Information Science in Agriculture, 53(8), 35–62. https://doi.org/10.1597/j.cnki.issn1006-1641.64-7448

Miguel-Stearns, T., & Laskowski, C., (2025). Artificial Intelligence & the Future of Law Libraries: Bringing together voices and visions to ponder and plan for the future. *AALL Spectrum,* 12-15. http://www.bit.ly/AALLcollectiondev

Miller, T. (2024). Weighing the Merits of AI for Information Access. *Computers in Libraries,* 14-16. **https://infotoday.com**

Ogungbenro, O. D., Esse, U. C., Olowoporoku, I., & Christopher, A. (2025). Revolutionizing Library Services: The Impact of Artificial Intelligence on Cataloguing and Access to

Information in Nigeria Academic Libraries. *Journal of Library Metadata*, *25*(2), 99–118. https://doi.org/10.1080/19386389.2025.2475418

Ojala, M. (2023). AI-Powered Research Assistants. *Online Searcher*, 43-44. https://infotoday.com

Tunon, J. (2024). Redefining reference services in the 21st century. *SLIS Student Research Journal, 14*(2), 11-25. https://research.ebsco.com/linkprocessor/plink?id=0e4ae7de-cc22-39a6-a0be-5554f87abf0b

Yang, S. Q. (2024). ChatGPT: Unleashing the power of conversational AI for library reference services. *International Journal of Librarianship, 9*(1), 109-115. https://doi.org/10.23974/ijol.2024.vol9.1.375

Infopreneurial Opportunities in Research Data Management Services in Nigerian University Libraries: A Review

Lois Yabanet PhD
Department of Library and Information Science
Federal University Lokoja
loisyabanet@gmail.com

Jamila Muhammed, PhD
Kashim Ibrahim Library
Ahmadu Bello University Zaria
Jamilamuhammad39@gmail.com

Ajayi Joshua Eyiolorunshe
Department of Library and Information Science
Federal University Lokoja
ajayijoshua788@yahoo.com

Abstract

In light of the quick rise of digital research outputs and growing stress on open science, research data management (RDM) is increasingly becoming an essential part of academic communication and university research support services globally. Academic librarians in Nigerian university libraries are increasingly tasked with the provision of services to organize, store, preserve, access and share research data. The paper will examine infopreneurial opportunities in research data management services in university libraries, Nigeria. This will show how librarians can shape RDM services as innovative and entrepreneurial information-based initiatives that will contribute to institutional research productivity and professional sustainability. The main aim of the paper is to review the existing literature on research data management, infopreneurship and academic librarianship to identify some key and potential areas of opportunities such as data curation, metadata and repository management, digital preservation, data literacy training, research consultation and open access support services. The paper will also illustrate the benefits of these services such as generation of income, increasing visibility of research output, enhancing collaboration among scholars, and greater relevance of librarians in digital knowledge economy. Despite these efforts, the full implementation of RDM policies and practices is hampered by insufficient ICT infrastructure; funding; absence of institutional RDM policies; technical competencies; and stakeholders' low awareness. The paper affirm that Nigerian university libraries must strategies for capacity-building initiatives, strengthen digital infrastructure, and promote entrepreneurial librarianship to seize opportunities in research data management services. This implies that RDM provides a feasible means of broadening the scope of infopreneurial practice in Nigerian university libraries and positioning librarians as strategic partners in research and innovation.

Keywords: Research Data Management, Infopreneurship, University Libraries, Academic Librarians, Nigeria.

Introduction

The rapid transformation of scholarly communication in the digital era has significantly redefined the role of academic libraries. Libraries are no longer limited to the collection and dissemination of printed resources but are now expected to actively support the entire research lifecycle, particularly in data-intensive environments (Cox & Pinfield, 2014). Research Data Management (RDM) refers to the structured organization, storage, preservation, sharing, and reuse of research data throughout the research lifecycle (Whyte & Tedds, 2011).

The research data lifecycle includes stages such as data collection, processing, analysis, storage, preservation, sharing, and reuse. Effective RDM ensures that data remain accurate, accessible, secure, and reusable over time (Jones, 2018). With the increasing adoption of open science practices, research funders and institutions now require researchers to manage and share their data responsibly (European Commission, 2016).

Parallel to this development is the emergence of infopreneurship in Library and Information Science, which refers to the entrepreneurial exploitation of information services for value creation and income generation (Aina, 2007). Infopreneurship positions librarians as knowledge entrepreneurs who design and deliver innovative information services that respond to emerging research needs.

In Nigerian university libraries, where funding constraints and increasing research demands persist, integrating infopreneurial approaches into RDM services provides a strategic opportunity for sustainability and relevance.

Research Data Management Services in University Libraries

Research Data Management (RDM) services in university libraries represent a strategic shift in the role of librarians from traditional information custodians to active partners in the research process. These services support the entire research data lifecycle and ensure that data are properly created, organized, preserved, shared, and reused for scholarly advancement. In academic environments, especially with the rise of data-driven research, university libraries have become central hubs for managing research data effectively (Cox & Pinfield, 2014; Tenopir et al., 2012). The key components of RDM services are:

1. Data Collection Support and Research Assistance

Data collection support involves assisting researchers in designing, organizing, and implementing effective strategies for gathering research data. Librarians contribute by advising on appropriate data collection tools such as surveys, interviews, observation schedules, and digital instruments. They also support researchers in selecting suitable sampling methods, ensuring consistency, and improving data quality from the onset of research.

Beyond technical support, librarians provide research assistance by guiding scholars on data ethics, informed consent, and compliance with institutional and funder requirements. This ensures that data collection processes align with legal and ethical standards, especially in studies involving human participants. According to Tenopir et al. (2012), librarians are increasingly involved in early-stage research planning, particularly in improving data quality and reproducibility through structured guidance.

2. Metadata Creation, Data Documentation, and Curation

Metadata creation and documentation are critical components of RDM because they provide the descriptive context that makes datasets understandable and reusable. Librarians assist researchers in applying standardized metadata schemas such as Dublin Core or discipline-specific standards to describe datasets accurately (Greenberg, 2009).

Data documentation includes recording essential details such as data origin, methodology, variables, file formats, and processing steps. This ensures transparency and facilitates future reuse of the data. Data curation goes a step further by actively managing datasets throughout their lifecycle cleaning, organizing, and enhancing them to maintain quality and usability.

Effective metadata practices significantly improve data discoverability and interoperability, which are essential for long-term research value (Wilkinson et al., 2016).

3. Data Storage, Preservation and Repository Management

Data storage and preservation services ensure that research data are securely maintained for both short-term use and long-term access. University libraries provide infrastructure such as institutional repositories, cloud storage systems, and digital preservation platforms to safeguard research outputs.

Repository management involves the organization, maintenance, and governance of digital platforms where datasets are deposited. Librarians ensure that datasets are properly catalogued, assigned persistent identifiers (such as DOIs), and stored in formats that support long-term accessibility.

According to Jones (2018), effective data preservation is essential for safeguarding research integrity and enabling future reuse, particularly in academic environments where data loss can significantly impact scholarly continuity.

4. Data Sharing, Access and Open Science Support

Data sharing services involve making research datasets available to other researchers and stakeholders for verification, reuse, and collaboration. This function is closely linked to the principles of open science, which promote transparency, accessibility, and collaborative knowledge production.

University libraries support researchers in selecting appropriate repositories, applying access controls, and complying with copyright, privacy, and licensing requirements. They also help implement data-sharing policies mandated by funding agencies and academic institutions.

The FAIR principles Findable, Accessible, Interoperable, and Reusable provide a widely accepted framework for ensuring effective data sharing practices (Wilkinson et al., 2016). By supporting open science, libraries enhance research visibility, reproducibility, and global scholarly engagement.

5. Research Data Literacy and User Training Services

Research data literacy refers to the ability of researchers and students to understand, manage, and use data effectively throughout the research lifecycle. University libraries play a key role in building these competencies through structured training programs and workshops.

These training services cover areas such as data management planning, metadata standards, data cleaning, ethical considerations, repository use, and data visualization techniques.

Librarians also train users on compliance with institutional and funder requirements regarding data management and sharing.

Tenopir et al. (2012) emphasize that many researchers lack adequate data management skills, highlighting the importance of librarian-led training initiatives. Through these programs, libraries strengthen research capacity and promote responsible data practices across academic communities.

Infopreneurial Opportunities within RDM Services

Infopreneurial opportunities within Research Data Management (RDM) services are rapidly expanding as university libraries transition from traditional support units into dynamic knowledge hubs within the digital and data-driven research ecosystem. Infopreneurship, which refers to the entrepreneurial exploitation of information and knowledge services for value creation and income generation, aligns naturally with RDM because research data have become a valuable scholarly asset with both academic and economic potential (Aina, 2007; Cox & Pinfield, 2014). In contemporary universities, especially in developing countries like Nigeria, librarians are increasingly leveraging RDM competencies to offer specialized, value-added services that support researchers while generating institutional and personal revenue. Infopreneurial opportunity within RDM includes research data management consultancy services, Data Management Plan (DMP) development services, metadata creation, data documentation, and curation services

Institutional repository management and data archiving services, research data analytics and visualization services, data literacy training and capacity-building programme and Open science compliance and FAIR data consultancy services.

Research Data Management consultancy services: Librarians with expertise in data lifecycle management can provide advisory services to researchers, research groups, and institutions on how to plan, organize, and manage their data effectively. This includes guidance on data collection methods, metadata standards, ethical compliance, and data governance frameworks. As funding bodies increasingly require structured data management practices, especially Data Management Plans (DMPs), librarians can offer consultancy services to assist researchers in meeting these requirements (Jones, 2018; Whyte & Tedds, 2011). This positions librarians as strategic partners in research projects while creating income-generating opportunities.

Provision of Data Management Plan (DMP) development services: Many international research grants now mandate detailed DMPs outlining how data will be collected, stored, shared, and preserved. Librarians can develop and sell customized DMP services to researchers and academic departments, ensuring compliance with funder expectations such as those of the European Commission and other global agencies (European Commission, 2016). This service is increasingly valuable in Nigerian universities seeking to attract international research funding.

M**etadata creation, data documentation, and curation services**: High-quality metadata enhances the discoverability, accessibility, and reusability of research data. Librarians can offer professional metadata design and dataset documentation services to researchers, ensuring compliance with standards such as Dublin Core or discipline-specific schemas. This improves the quality of institutional research outputs and enhances visibility in global research repositories (Greenberg, 2009; Wilkinson et al., 2016).

Institutional repository management and data archiving services: present strong entrepreneurial potential. Libraries can develop and manage institutional repositories for universities, hosting datasets, theses, and other scholarly outputs on a fee-supported or consultancy basis. This includes assigning persistent identifiers (such as DOIs), managing access rights, and ensuring long-term preservation of digital assets. Such services not only improve institutional visibility but also position libraries as central players in scholarly communication infrastructure (Jones, 2018).

Research data analytics and visualization services: With the increasing complexity of research datasets, many academics require support in interpreting and presenting data effectively. Librarians with data analytics skills can provide services such as statistical analysis, visualization dashboards, and interpretation support. This expands the traditional library role into advanced research support and creates new income streams within academic environments.

Data literacy training and capacity-building programmes: This also represent a major infopreneurial avenue. Libraries can organize paid workshops, short courses, and certification programs on RDM, FAIR data principles, data ethics, and open science practices. These programs not only build institutional capacity but also generate revenue while enhancing librarians' professional relevance (Tenopir et al., 2012).

Open science compliance and FAIR data consultancy services constitute a growing area of opportunity. As global research increasingly emphasizes transparency, interoperability, and data reuse, institutions require guidance on aligning with FAIR principles. Librarians can offer specialized consultancy services to ensure that datasets are properly structured for discoverability and reuse, thereby enhancing institutional compliance with international standards (Wilkinson et al., 2016).

Benefits of Infopreneurship in Research Data Management (RDM)

Infopreneurship within Research Data Management (RDM) represents a strategic transformation of academic libraries and librarians into knowledge-based service providers who leverage research data as a resource for innovation, consultancy and value creation. In the evolving digital scholarship environment, this development is increasingly important as universities shift towards open science, data-driven research and competitive knowledge economies (Subaveerapandiyan, 2023; Wilkinson et al., 2019).

1. Enhancement of Research Visibility and Impact

One of the major benefits of infopreneurship in RDM is the improvement of research visibility. When librarians provide services such as data curation, metadata enrichment, and repository management, research outputs become more discoverable, citable, and reusable. Properly managed research data increases citation potential and strengthens institutional research profiles. Studies have shown that well-managed and shared datasets contribute significantly to scholarly impact and global research collaboration (Páres & Organisciak, 2020; Wilkinson et al., 2019).

2. Revenue Generation and Financial Sustainability for Libraries

Infopreneurial RDM services create new income streams for university libraries through consultancy, training workshops, data management planning, and repository development services. In resource-constrained environments such as many Nigerian universities, this supports financial sustainability while expanding the relevance of library services. As

libraries increasingly offer specialized RDM services, they transition into semi-commercial knowledge hubs capable of generating internal and external revenue (Adewale & Adesina, 2021).

3. Improved Research Efficiency and Productivity

Infopreneurial engagement in RDM enhances research efficiency by reducing data loss, duplication, and mismanagement. Librarian-led services in data organization, documentation, and preservation ensure that researchers spend less time managing raw data and more time focusing on analysis and interpretation. Proper RDM also improves reproducibility and accelerates the research process, thereby increasing overall academic productivity (Tenopir et al., 2020; Jones, 2019).

4. Strengthening of Data Sharing and Collaboration

RDM-based infopreneurial services promote data sharing and interdisciplinary collaboration. Through institutional repositories and data-sharing platforms, librarians facilitate access to datasets across institutions and borders. This improves collaboration between researchers, enhances knowledge exchange and supports global research integration. Open science initiatives further reinforce this benefit by encouraging transparency and shared knowledge production (European Commission, 2020; Cox & Kennan, 2021).

5. Capacity Building and Professional Development

Infopreneurship in RDM contributes significantly to the professional development of librarians. By engaging in data consultancy, metadata design, analytics, and training services, librarians acquire advanced digital and analytical competencies. This repositioning enhances their relevance in the modern academic environment and supports continuous skill development aligned with global standards in data stewardship (Tammaro et al., 2020).

Challenges of Infopreneurship in Research Data Management (RDM)

Infopreneurship in Research Data Management (RDM) services represent a growing shift in which academic librarians leverage their expertise in data curation, metadata management, repository services, and research support to generate income and create value-added services. However, despite its potential, several structural, technical, institutional, and human-related challenges hinder its effective implementation, particularly in developing countries such as Nigeria.

1. Limited RDM Skills and Competency Gaps

One of the most persistent challenges is the shortage of advanced competencies among librarians in areas such as data analytics, metadata standards, data curation and repository management. Many academic libraries still operate with staff who are more experienced in traditional librarianship than in data-intensive research support. Studies have shown that inadequate professional preparation significantly limits librarians' ability to deliver RDM-based services effectively (Alex-Nmecha & Onifade, 2023; Hussaini et al., 2023). Similarly, global evidence suggests that lack of specialized data skills remains a major barrier to scaling RDM programs in academic libraries (Faniel & Connaway, 2018).

2. Inadequate ICT Infrastructure and Digital Tools

Infopreneurial RDM services depend heavily on reliable technological infrastructure, including institutional repositories, cloud storage systems, high-speed internet, and data

management software. In many Nigerian university libraries, these facilities are either insufficient or poorly maintained. Issues such as unstable internet connectivity, inadequate servers and erratic power supply continue to undermine service delivery (Igbinovia et al., 2023; Hussaini et al., 2023). Without robust infrastructure, librarians cannot effectively package RDM services as sustainable entrepreneurial offerings.

3. Weak Institutional and Policy Frameworks

Another major challenge is the absence or poor implementation of Research Data Management policies within universities. Many institutions lack formal guidelines for data ownership, sharing, preservation, and commercialization of data-related services. This policy gap creates uncertainty around service boundaries and limits librarians' ability to fully engage in infopreneurial activities (Alex-Nmecha & Onifade, 2023). Globally, strong leadership support and institutional policy frameworks have been identified as key determinants of successful RDM programs (Faniel & Connaway, 2018).

4. Low Awareness and Resistance to Change

Many researchers and academic staff are still unaware of the value of RDM services and often rely on informal or individual approaches to managing research data. This low awareness reduces demand for infopreneurial RDM services such as data curation, metadata consulting, and data management planning. Additionally, resistance to change among both librarians and researchers further slows adoption of new service models (Subaveerapandiyan, 2023). In Nigerian, studies confirm that awareness gaps significantly hinder the uptake of RDM and open science practices (Igbinovia et al., 2023).

5. Funding Constraints and Sustainability Issues

Infopreneurial RDM services require continuous investment in infrastructure, training, and software tools. However, many university libraries operate under severe budgetary limitations, making it difficult to sustain innovative services. Insufficient funding for training and digital infrastructure is consistently reported as a major barrier in African academic libraries (Hussaini et al., 2023; Alex-Nmecha & Onifade, 2023). Without financial sustainability, infopreneurial RDM initiatives struggle to scale or generate consistent revenue.

6. Ethical, Legal, and Data Security Concerns

RDM services often involve sensitive research data, including human subject information and institutional datasets. Infopreneurial activities must therefore comply with strict ethical, legal and privacy regulations. However, many libraries lack clear frameworks for handling data licensing, intellectual property rights and data protection compliance. These uncertainties limit the extent to which librarians can confidently commercialize or monetize certain RDM services (Wilkinson et al., 2016; Subaveerapandiyan, 2023).

7. Limited Collaboration and Stakeholder Engagement

Effective infopreneurship in RDM requires strong collaboration between librarians, researchers, ICT units, and institutional leadership. However, weak collaboration remains a significant barrier in many universities. Studies show that poor coordination between researchers and librarians reduces the effectiveness of RDM implementation and limits service innovation (Hussaini et al., 2023; Igbinovia et al., 2023).

Way forward in Strengthening Infopreneurial RDM Services in University Libraries

Strengthening of infopreneurial Research Data Management (RDM) services in university libraries requires deliberate institutional, technological, and professional interventions that reposition librarians as active participants in the knowledge economy. Recent scholarship shows that although RDM services are expanding globally, their success depends heavily on capacity building, infrastructure development, collaboration, and policy integration (Igbinovia et al., 2024; Chiarelli et al., 2022). Infopreneurial RDM services can only thrive when libraries adopt sustainable strategies that align with open science and data-driven research ecosystems.

1. Capacity Building and Continuous Professional Development

A major strategy for strengthening infopreneurial RDM services is continuous training and upskilling of librarians in data-related competencies. Igbinovia et al., (2024) is of the view that many librarians lack advanced skills in data curation, analytics and research data governance, which limits their ability to deliver robust RDM service. Therefore, structured professional development programmes in data management planning, metadata standards, data visualization and repository management are essential.

Recent RDM training models emphasize hands-on learning approaches that include data interviews, practical repository work, and engagement with researchers, which significantly improve librarians' confidence and service delivery capacity (Koos et al., 2019; Read et al., 2019). Strengthening infopreneurship in RDM therefore depends on building a workforce of "data librarians" who are equipped for consultancy, training, and analytics-based services.

2. Development of ICT Infrastructure and Digital Platforms

Effective RDM infopreneurial services require strong technological infrastructure, including institutional repositories, cloud storage systems, data management platforms and interoperability tools. Without reliable ICT systems, libraries cannot effectively store, preserve, or monetize research data services.

Recent studies highlight that technological inadequacy remains a major barrier to RDM implementation in many academic libraries, particularly in developing countries (Igbinovia et al., 2024). Emerging research also emphasizes the importance of interoperability tools and standardized platforms to enhance data accessibility and reuse across institutions (Efeoglu et al., 2024). Therefore, investment in scalable digital infrastructure is a critical enabler of sustainable RDM-based infopreneurship.

3. Institutional Policy Development and Governance Frameworks

Another key strategy is the establishment of clear institutional policies for RDM. Policies provide a framework for standardizing data collection, documentation, sharing, preservation practices, thereby creating a structured environment for service delivery and entrepreneurship.

According to Chiarelli et al. (2022), effective RDM service development requires a strategic roadmap that aligns institutional priorities, funding structures, and stakeholder roles. Policies should also define intellectual property rights, data ownership, licensing and ethical guidelines, all of which are essential for monetizing RDM services while ensuring compliance with legal and ethical standards.

4. Collaboration and Strategic Partnerships

Collaboration is a central strategy for scaling infopreneurial RDM services. Libraries cannot independently provide all aspects of RDM; therefore, partnerships with ICT departments, research offices, funding agencies, and external data organizations are essential.

Evidence from library case studies according to Read et al., (2019) shows that collaboration significantly enhances RDM service delivery, enabling libraries to build shared repositories, training programmes and research support systems (Read et al., 2019). Additionally, global RDM initiatives encourage inter-institutional collaboration to strengthen capacity and reduce duplication of effort in data management services (Bryant et al., 2023). Such partnerships also create opportunities for joint consultancy and shared revenue-generating services.

5. Integration of RDM into Library Education and Service Innovation

Sustaining infopreneurial RDM services requires embedding data management competencies into Library and Information Science (LIS) curricula. This ensures that future librarians are adequately prepared for emerging roles in data stewardship, analytics, and open science support.

Furthermore, libraries must adopt a culture of innovation by developing new service models such as Data Management Plan (DMP) consultancy, metadata design services, research data analytics, and training workshops. These services represent viable infopreneurial ventures that align with global trends in open science and data commercialization (Tenopir et al., 2012; Wilkinson et al., 2016).

Conclusion

Research Data Management (RDM) has become essential amid rising digital research outputs and open science. Nigerian university libraries can transform RDM services such as data curation, metadata work, repository management, training, DMP development, analytics, and FAIR consultancy into viable infopreneurial activities. These services deliver clear benefits: greater research visibility and impact, new income streams for sustainability, improved research efficiency, stronger collaboration and enhanced professional relevance for librarians. However, progress is limited by skill gaps, weak ICT infrastructure, absent policies, low awareness, funding shortages, ethical/legal uncertainties and poor collaboration. Overall, RDM offers a practical route for Nigerian academic libraries to expand infopreneurial practice, support institutional research productivity and secure librarians' strategic role in the data-driven scholarly environment provided the identified barriers are addressed

References

Adewale, T., & Adesina, O. (2021). *Emerging roles of academic librarians in digital scholarship and data services*. Journal of Library Innovation, 12(3), 45–58.

Aina, L. O. (2007). *Information provision in Nigeria: The library context*. Third World Information Services.

Alex-Nmecha, J. C., & Onifade, A. (2023). Research data management practices: Preparedness and challenges among librarians in Nigeria. *Ghana Library Journal, 28*(2), 75–157. https://doi.org/10.4314/glj.v28i2.6

Bryant, R., Lavoie, B., & Rinehart, A. K. (2023). *Building research data management capacity: Case studies in strategic library collaboration*. OCLC Research.

Chiarelli, A., Beagrie, N., Boon, L., Mallalieu, R., Johnson, R., Warner, A., & Wilson, R. (2022). To protect and to serve: Developing a roadmap for research data management services. *Insights, 35*, 4. https://doi.org/10.1629/uksg.566

Cox, A. M., & Kennan, M. A. (2021). Research data management and library roles in the open science era. *Journal of Librarianship and Information Science, 53*(2), 1–15.

Cox, A. M., & Pinfield, S. (2014). Research data management and libraries: Current activities and future priorities. *Journal of Librarianship and Information Science, 46*(4), 299–316.

Efeoglu, S., Chen, Z., Schimmler, S., & Wentzel, B. (2024). Converter: Enhancing interoperability in research data management. *arXiv preprint*. https://arxiv.org/abs/2404.13406

European Commission. (2016). *Guidelines on FAIR data management in Horizon 2020*. European Union.

European Commission. (2020). *FAIR data principles and open science policy guidelines*. European Union Publications.

Faniel, I. M., & Connaway, L. S. (2018). Librarians' perspectives on the factors influencing research data management programs. *College & Research Libraries, 79*(1). https://doi.org/10.5860/crl.79.1.100

Greenberg, J. (2009). Theoretical considerations of lifecycle modeling: An analysis of the DCC curation lifecycle model. *International Journal of Digital Curation, 4*(1), 3–20.

Hussaini, M. H., Noorhidawati, A., & M.K.A., Y. I. (2023). Exploring research data management in academic libraries in Nigeria: Drivers, challenges and influencing factors. *ICoLIS Conference Proceedings*.

Igbinovia, M. O., Okuonghae, O., & Solanke, O. E. (2023). Research data management in university libraries: Evidence from Nigeria. *Rajagiri Journal of Social Development, 15*(2), 41–49.

Igbinovia, M. O., Segun-Adeniran, C. D., & Okuonghae, O. (2024). Research data management in university libraries: The need for data literacy and technological revamp. *International Journal of Information Management*, 51(1). https://doi.org/10.1177/03400352241280902

Jones, S. (2018). *How to develop research data management services*. Facet Publishing.

Jones, S. (2019). *How to develop research data management services*. Facet Publishing.

Koos, J. A., Scheinfeld, L., Read, K. B., Miller, R. S., Miller, C. F., Phillips, G. A., & Surkis, A. (2019). A model for initiating research data management services at academic libraries. *Journal of the Medical Library Association, 107*(3), 432–441. https://doi.org/10.5195/jmla.2019.545

Páres, N., & Organisciak, P. (2020). The effects of research data management services on open data production. *College & Research Libraries, 81*(6), 945–963.

Read, K. B., Koos, J. A., Miller, R. S., Miller, C. F., Phillips, G. A., Scheinfeld, L., & Surkis, A. (2019). A model for initiating research data management services at academic libraries. *Journal of the Medical Library Association, 107*(3), 432–441.

Subaveerapandiyan, A. (2023). Research data management practices and challenges in academic libraries: A comprehensive review. *SSRN Working Paper*.

Tammaro, A. M., Ross, S., & Casarosa, V. (2020). Data literacy and academic libraries in the digital age. *New Review of Academic Librarianship, 26*(2–4), 243–260.

Tenopir, C., Birch, B., & Allard, S. (2012). Academic libraries and research data services. *College & Research Libraries, 73*(2), 170–189.

Tenopir, C., et al. (2020). Research data services in academic libraries: A global perspective. *College & Research Libraries, 81*(2), 235–255.

Whyte, A., & Tedds, J. (2011). *Making the case for research data management*. Digital Curation Centre.

Wilkinson, M. D., et al. (2019). The FAIR guiding principles for scientific data management and stewardship. *Scientific Data, 6*, 160018.

Infopreneurship and the Future of LIS Profession: An Opinion on the Role of Library Personnel

Jamila Ukan Garba
garbaj7979@gmail.com;
Kaduna State College of Education Gidan-Waya

Nikoh Usman Anto
nikohanto2018@gmail.com;
Kaduna State College of Education Gidan-Waya

Joseph Yohanna
kyanathyayok@gmail.com
Kaduna State College of Education Gidan-Waya

Abstract

The rapid advancement of information and communication technologies (ICTs), digital scholarship, artificial intelligence, and the global knowledge economy has transformed the responsibilities of Library and Information Science (LIS) professionals. Traditional library functions are no longer sufficient to meet the dynamic information needs of contemporary society, making entrepreneurial thinking an indispensable component of professional practice. This opinion paper argues that infopreneurship should no longer be viewed as an optional career pathway but as a strategic necessity for the future sustainability and relevance of the LIS profession. Drawing on contemporary literature and observations from the evolving operations of A. W. Ambi Library, Kaduna State College of Education Gidan Waya, the paper contends that library personnel possess unique competencies that can be transformed into innovative information products and services capable of creating both social and economic value. It further expresses the opinion that embracing information consultancy, digital content development, research support services, institutional repository management, information brokerage, and other knowledge-based enterprises will strengthen professional relevance while contributing to institutional development and national economic growth. Although challenges such as inadequate entrepreneurial training, limited digital infrastructure, poor funding, and weak policy support continue to hinder the growth of infopreneurship among librarians, these obstacles should be regarded as opportunities for strategic reforms rather than barriers to innovation. The paper concludes that integrating entrepreneurship education into LIS curricula, promoting continuous professional development, and strengthening institutional support mechanisms are essential steps toward preparing library personnel for the future of the knowledge economy. Ultimately, infopreneurship represents a practical and sustainable direction for repositioning the LIS profession in Nigeria and beyond.

Keywords: *Infopreneurship, Library and Information Science, Entrepreneurship, Digital Libraries, Knowledge Economy, Innovation, Library Personnel.*

Introduction

The twenty-first century has ushered in unprecedented technological advancements that continue to reshape the global information landscape. Innovations such as artificial intelligence, cloud computing, big data analytics, digital repositories, and electronic

communication have fundamentally changed the ways information is created, organized, stored, disseminated, and accessed. Consequently, Libraries have evolved from traditional repositories of information into dynamic centres supporting research, digital scholarship, innovation, and lifelong learning (IFLA, 2022; UNESCO, 2023).

This transformation has equally altered the expectations placed upon Library and Information Science (LIS) professionals, who are increasingly required to combine traditional librarianship skills with technological competence, creativity, and entrepreneurial thinking.

In our view, one of the most significant developments influencing the future of the LIS profession is the emergence of infopreneurship has expanded the professional landscape of librarians by encouraging the creation and commercialization of information products and services (Chiwara-Ndoro & Dewah, 2020; Mubofu & Malekani, 2023). Infopreneurship represents the application of entrepreneurial principles to the creation, management, packaging, and dissemination of information products and services. Rather than depending solely on conventional employment opportunities within academic, public, or special libraries, librarians now have the opportunity to transform their professional expertise into sustainable enterprises that respond to the growing demand for quality information services. These may include research consultancy, digital publishing, indexing and abstracting services, bibliometric analysis, academic editing, records management consultancy, institutional repository management, information literacy training, and digital content development.

It is our considered opinion that the future of the Library and Information Science profession will largely depend on how effectively librarians embrace innovation and entrepreneurial practices. The traditional perception of librarians as custodians of books is gradually becoming obsolete in an era characterized by digital transformation and rapidly changing user expectations. Today's information professionals must become creators of value, managers of digital knowledge, consultants, innovators, educators, and entrepreneurs capable of delivering specialized information solutions across multiple sectors of society.

The increasing integration of entrepreneurship into higher education reflects the growing recognition that graduates require innovative competencies to compete within modern labour markets (WEF, 2023).

This opinion is particularly relevant within Nigerian higher education institutions, where declining public funding, rising unemployment among graduates, and increasing technological demands require librarians to diversify their professional competencies. Libraries can no longer rely exclusively on institutional budgets to sustain quality service delivery. Instead, they should explore innovative approaches that generate additional value while improving access to information and supporting teaching, research, community engagement, and institutional development.

A. W. Ambi Library, Kaduna State College of Education Gidan Waya, provides an appropriate context for this discussion because it reflects many of the realities confronting academic libraries in Nigeria. Like many institutions, the library operates within a rapidly evolving information environment where technological innovation presents both opportunities and challenges. In our opinion, the library possesses considerable human capital capable of driving infopreneurial initiatives if supported through appropriate policies,

professional development programmes, digital infrastructure, and institutional commitment. Such initiatives would not only enhance service delivery but also position library personnel as active contributors to the knowledge economy.

This paper therefore presents our professional opinion that infopreneurship is no longer a supplementary aspect of librarianship but a strategic direction for the future of the profession. We argue that entrepreneurial competencies should become an integral component of library education, professional practice, and institutional policy. By embracing innovation, technology, and enterprise development, librarians can strengthen their professional relevance, improve institutional sustainability, create employment opportunities, and contribute meaningfully to national development.

Infopreneurship: A Strategic Imperative for the Future of the LIS Profession

The Library and Information Science (LIS) profession is experiencing one of the most significant transitions in its history. Digital transformation, globalization, changing user expectations, and the increasing commercialization of information have altered the traditional responsibilities of librarians. In our opinion, these developments demand a paradigm shift in the way library professionals perceive their roles. Rather than viewing themselves solely as custodians of information resources, librarians should embrace their identities as innovators, entrepreneurs, consultants, and creators of knowledge-based solutions.

Infopreneurship enables librarians to transform professional knowledge into innovative services that generate educational, economic and social value (Ramugondo, 2022), that can be responsibly harnessed through entrepreneurial initiatives. Unlike conventional business enterprises that primarily deal with physical goods, infopreneurship focuses on creating, organizing, packaging, and disseminating information products and services that address specific knowledge needs. This perspective aligns closely with the professional competencies of librarians, whose expertise lies in information organization, retrieval, evaluation, preservation, and dissemination.

In our view, digital transformation has significantly expanded the responsibilities of librarians beyond collection management to include digital preservation, research support, scholarly communication, and knowledge management (Noh, 2021).The rapid expansion of digital scholarship, online education, open science, research data management, and artificial intelligence has created new opportunities that extend beyond the physical library environment. Librarians who develop entrepreneurial competencies are better positioned to provide specialized services that meet these evolving demands while strengthening the visibility and relevance of their profession.

Furthermore, infopreneurship should not be interpreted as replacing the traditional values of librarianship. Rather, it complements the ethical principles of equitable information access, intellectual freedom, lifelong learning, and community development by introducing sustainable approaches to service delivery. Entrepreneurial thinking enables libraries to diversify their activities, improve financial resilience, and expand their societal impact without compromising their professional obligations.

Another reason why infopreneurship has become strategically important is the growing mismatch between the number of LIS graduates and the availability of conventional employment opportunities. Many graduates possess valuable knowledge and technical skills

but remain unemployed because they continue to depend exclusively on vacancies in public institutions. We believe that entrepreneurship education should encourage graduates to identify information needs within society and transform those needs into viable professional enterprises. Such enterprises can generate employment not only for librarians but also for other professionals working within the information ecosystem.

Equally important is the emergence of artificial intelligence and digital automation, which have prompted concerns regarding the future relevance of librarians. While some routine library operations are increasingly automated, technologies such as artificial intelligence cannot completely replace the professional judgment, ethical reasoning, instructional competence, and user-centred services provided by trained librarians. Instead, these technologies should be viewed as tools that enhance professional productivity and create new entrepreneurial opportunities. Librarians who understand how to integrate emerging technologies into information services will remain indispensable contributors to research, education, innovation, and national development. Therefore, artificial intelligence and emerging digital technologies should be viewed as opportunities for professional innovation rather than threats to librarianship (Raju, 2021).

It is therefore our opinion that institutions responsible for educating future librarians should move beyond teaching entrepreneurship as a peripheral course. Entrepreneurial thinking should be embedded throughout the LIS curriculum, enabling students to acquire practical experience in business planning, digital innovation, project management, marketing of information services, financial sustainability, and technology-driven service delivery. Such reforms would better prepare graduates to thrive within an increasingly competitive knowledge economy.

Emerging Opportunities for Library Personnel through Infopreneurship

The expanding digital information environment has created numerous opportunities that can reposition library personnel as active participants in the knowledge economy. In our opinion, these opportunities remain underutilized, particularly within many developing countries where librarians continue to focus primarily on conventional library operations despite possessing competencies that are highly valuable in diverse sectors of society.

One of the most promising opportunities lies in **Research Consultancy SERVICES**. Research consultancy, bibliometric analysis, institutional repository management, academic editing, digital publishing, and information literacy training represent important entrepreneurial opportunities for librarians (Mubofu & Malekani, 2023) Contemporary researchers increasingly require assistance with literature searching, systematic reviews, reference management, plagiarism detection, research impact analysis, citation indexing, bibliometric studies, and scholarly publishing. These services fall naturally within the professional expertise of librarians and can be offered as specialized consultancy services to universities, research institutes, government agencies, and private organizations.

Another important opportunity involves **Digital Publishing and Academic Editing**. The rapid growth of open-access publishing, institutional repositories, electronic journals, and online learning platforms has increased the demand for professionals capable of managing editorial workflows, metadata creation, indexing, proofreading, copyright compliance, and digital preservation. Library personnel or Information professionals possess competencies

that are increasingly demanded by universities, government agencies, industries, and research organizations (Ramugondo, 2022).

Information Literacy Education also presents significant entrepreneurial potential. As misinformation, disinformation, and digital manipulation become increasingly prevalent, individuals require guidance in locating, evaluating, and ethically using information. Librarians can develop online training programmes, professional workshops, certification courses, and educational content that improve digital literacy across educational institutions, corporate organizations, and local communities.

We further believe that **Records and Archives Management** represents another expanding area of professional opportunity. Government institutions, healthcare organizations, financial institutions, and private companies continue to generate enormous quantities of digital records requiring systematic organization, preservation, retrieval, and compliance with regulatory standards. Library professionals possess transferable competencies that can be adapted to these growing information management needs.

Digital Content Creation has equally emerged as an attractive area for infopreneurship. Librarians can produce educational videos, podcasts, webinars, blogs, newsletters, online tutorials, electronic databases, and specialized information products tailored to specific user communities. These activities not only generate income but also increase professional visibility and demonstrate the continuing relevance of librarians within the digital society.

Within A. W. Ambi Library in Kaduna State College of Education Gidan-Waya, these opportunities could significantly enhance institutional visibility while creating additional avenues for professional growth. By encouraging library personnel to explore entrepreneurial initiatives, the institution can strengthen service delivery, improve staff motivation, attract external collaborations, and contribute more effectively to teaching, research, innovation, and community engagement. In our opinion, infopreneurship should therefore become an integral component of institutional strategic planning rather than an individual career aspiration.

The expanding digital information environment has created numerous opportunities that can reposition library personnel as active participants in the knowledge economy. In our opinion, these opportunities remain underutilized, particularly within many developing countries where librarians continue to focus primarily on conventional library operations despite possessing competencies that are highly valuable in diverse sectors of society.

Challenges Limiting the Growth of Infopreneurship among Library Personnel

Although infopreneurship presents enormous opportunities for Library and Information Science (LIS) professionals, its adoption within many developing countries, including Nigeria, remains relatively limited. In our opinion, this slow progression is not a reflection of inadequate professional competence but rather the result of institutional, economic, technological, and policy-related constraints that continue to affect the profession. These challenges deserve serious attention because they determine the extent to which librarians can successfully participate in the emerging knowledge economy.

Limited entrepreneurial education, inadequate funding, poor ICT infrastructure, and weak institutional support remain significant barriers to infopreneurship in many developing countries (Chiwara-Ndoro & Dewah, 2020).

One of the most significant barriers is **inadequate entrepreneurial education**. While many Library and Information Science programmes now include entrepreneurship courses, these courses often emphasize theoretical concepts rather than practical enterprise development. Consequently, many graduates leave higher institutions with sound professional knowledge but limited experience in business planning, innovation management, digital marketing, financial management, client relations, and enterprise sustainability. We believe that entrepreneurship education should move beyond classroom instruction to include practical incubation programmes, mentorship, internships, and collaborative innovation projects that expose students to real entrepreneurial experiences.

Another major challenge is **insufficient technological infrastructure**. Modern infopreneurship depends heavily on reliable internet connectivity, cloud computing services, digital repositories, electronic databases, content management systems, artificial intelligence tools, and other information technologies. Unfortunately, many academic libraries continue to experience inadequate internet bandwidth, irregular electricity supply, obsolete computer systems, and insufficient investment in digital infrastructure. These limitations reduce the ability of library personnel to develop innovative information products and compete effectively within the digital marketplace.

Financial constraints also remain a significant obstacle. Establishing information-based enterprises often requires investment in hardware, software, internet services, professional certification, office facilities, digital platforms, and continuous skills development. However, access to startup capital remains difficult for many librarians, particularly young graduates who lack collateral or institutional support. In our opinion, governments, financial institutions, professional associations, and educational institutions should establish funding mechanisms specifically designed to support knowledge-based entrepreneurial initiatives within the information sector.

Equally important is the **persistence of traditional professional mindsets**. Many librarians continue to associate professional success exclusively with permanent employment in government institutions or academic libraries. While such employment remains valuable, exclusive dependence on conventional career pathways limits innovation and reduces the profession's adaptability to changing economic realities. We argue that cultivating an entrepreneurial culture within the profession requires changing attitudes toward self-employment, innovation, calculated risk-taking, and value creation.

The **rapidly evolving technological environment** presents another important challenge. Emerging technologies such as artificial intelligence, machine learning, blockchain, data analytics, and virtual reality continue to transform information services at an unprecedented pace. Library personnel who fail to update their knowledge risk becoming professionally irrelevant. Continuous professional development should therefore become an essential component of librarianship rather than an optional activity.

Policy and institutional support also deserve careful consideration. Many academic institutions have yet to develop comprehensive policies that encourage entrepreneurial innovation among library personnel. Existing administrative structures often prioritize routine service delivery while providing limited incentives for creativity, commercialization of information products, interdisciplinary collaboration, or external consultancy. In our opinion, institutional leaders should create environments that encourage experimentation,

reward innovation, and support responsible entrepreneurial initiatives that align with the educational mission of their institutions.

Finally, **public awareness** remains relatively low regarding the diverse competencies possessed by librarians. Many individuals continue to perceive librarians primarily as custodians of books rather than information specialists capable of providing consultancy, digital knowledge management, research support, scholarly communication, and technology-driven information solutions. Improving public understanding of these competencies is essential for expanding the market for infopreneurial services and enhancing the overall visibility of the profession.

Despite these challenges, we remain optimistic about the future of infopreneurship within the LIS profession. Most of these obstacles are not permanent limitations but transitional issues that can be addressed through strategic investment, policy reforms, technological advancement, continuous professional development, and stronger collaboration among educational institutions, governments, professional associations, and private-sector partners.

Therefore, continuous professional development is essential if librarians are to adapt to rapidly changing technologies and user expectations (IFLA, 2022).

Our Perspective on the Future of Library and Information Science Profession

Noh, 2021; and Raju, 2021 opined that future librarians will increasingly function as a digital knowledge manager, research consultant, innovation facilitator, and information entrepreneur. According to UNESCO (2023) academic libraries should become centres of innovation capable of supporting digital transformation and sustainable development.

The future of the library and information science profession will be shaped not merely by technological advancement but by the willingness of information professionals to embrace innovation, entrepreneurship, adaptability, and lifelong learning. In our opinion, librarians who continue to rely exclusively on traditional service models may find it increasingly difficult to remain relevant in an information environment characterized by rapid technological change, evolving user expectations, and growing competition from commercial information providers.

Rather than viewing technological innovations as threats, the profession should recognize them as catalysts for transformation. Artificial intelligence, cloud computing, data analytics, digital repositories, and automation are redefining information management across the world. These technologies are capable of improving service efficiency, supporting evidence-based decision-making, enhancing user experiences, and expanding access to knowledge. However, their successful application depends on professionals who understand both technological systems and the ethical principles governing information access, preservation, privacy, and intellectual freedom. Librarians possess this unique combination of competencies and should therefore position themselves as leaders in the responsible use of emerging technologies.

We further believe that the future librarian will function as a multidisciplinary knowledge professional rather than a conventional information custodian. Future responsibilities are likely to include research data management, digital scholarship support, open-access publishing, metadata architecture, digital preservation, knowledge consultancy, information policy development, scholarly communication, digital literacy education, and innovation

management. These expanding roles demonstrate that the profession is evolving rather than declining.

Within Nigerian higher education institutions, this transformation presents both opportunities and responsibilities. Institutions such as A. W. Ambi Library, Kaduna State College of Education Gidan Waya, have the potential to become centres of innovation where librarians actively contribute to institutional research, digital transformation, entrepreneurship education, and community development. By encouraging staff to establish information-based enterprises, participate in interdisciplinary collaborations, and develop technology-driven services, academic libraries can strengthen their relevance while contributing directly to national development priorities.

We also contend that future library schools must redesign their curricula to reflect the realities of the digital knowledge economy. Courses on artificial intelligence applications in libraries, digital entrepreneurship, innovation management, business development, intellectual property, research analytics, digital content creation, project management, and technology commercialization should become integral components of Library and Information Science Education. Such reforms would ensure that graduates possess both professional competence and entrepreneurial confidence.

Professional associations likewise have an important responsibility to provide continuous training, mentorship programmes, innovation competitions, enterprise development workshops, and networking opportunities that expose librarians to emerging entrepreneurial possibilities. These initiatives would strengthen professional resilience while promoting a culture of creativity and lifelong learning across the profession.

Ultimately, we are convinced that infopreneurship represents more than an alternative source of income for librarians. It is a strategic philosophy that encourages innovation, expands career opportunities, improves institutional sustainability, and enhances the contribution of libraries to national development. The future of the Library and Information Science profession therefore depends not on preserving traditional practices but on combining professional ethics with entrepreneurial vision, technological competence, and a commitment to continuous innovation.

Suggestions

Based on the opinions presented in this paper, the following suggestions are proposed to strengthen the adoption of infopreneurship and enhance the future of the Library and Information Science (LIS) profession in Nigeria and other developing countries.

1. Entrepreneurship Education should be integrated throughout the LIS Curriculum. Rather than limiting entrepreneurship to a single course, library schools should embed entrepreneurial thinking across the curriculum. Students should receive practical training in innovation, business development, digital marketing, project management, financial literacy, and information product design to prepare them for both traditional employment and self-employment.

2. Academic Libraries should establish Innovation and Infopreneurship Hubs. Universities and colleges should create dedicated innovation centres where library personnel and students can develop, test, and commercialize information-based products and services.

Such centres would encourage creativity, interdisciplinary collaboration, and the practical application of professional knowledge.

3. Continuous Professional Development should become mandatory. Library personnel should regularly participate in workshops, seminars, conferences, certification programmes, and online training on emerging technologies, artificial intelligence, digital scholarship, data analytics, research support services, and entrepreneurial skills. Continuous learning is essential for maintaining professional relevance in an evolving information environment.

4. Governments and institutional administrators should increase investment in digital infrastructure. Reliable internet connectivity, uninterrupted electricity, modern computer facilities, digital repositories, cloud-based platforms, and emerging information technologies are fundamental requirements for successful infopreneurship. Increased investment in these areas will improve both service delivery and entrepreneurial innovation.

5. Professional associations should actively promote entrepreneurial culture. Organizations representing library professionals should organize mentorship programmes, innovation competitions, enterprise development workshops, and networking platforms that expose librarians to successful infopreneurial practices. Recognition and awards for innovative information services would further encourage professional creativity.

6. Financial support mechanisms should be established for information-based enterprises. Government agencies, development partners, financial institutions, and educational institutions should introduce grants, innovation funds, low-interest loans, and business incubation programmes specifically designed to support librarians who wish to establish sustainable information enterprises.

7. Academic libraries should encourage strategic partnerships. Collaboration with universities, research institutes, technology companies, publishers, non-governmental organizations, and private-sector organizations will enable library personnel to expand their professional services, access new technologies, and create innovative solutions to societal information challenges.

8. Greater public awareness of librarians' competencies should be promoted. Libraries should implement advocacy campaigns highlighting the diverse expertise of librarians in research consultancy, digital information management, scholarly communication, data management, information literacy, records management, and knowledge organization. Improved public awareness will increase demand for professional information services and strengthen the visibility of the profession.

In our opinion, implementing these recommendations will not only strengthen infopreneurship but will also reposition the Library and Information Science profession as a strategic contributor to national development, digital transformation, innovation, and the knowledge economy.

Conclusion

The transformation currently taking place within the global information environment presents both challenges and unprecedented opportunities for the Library and Information Science profession. Advances in digital technologies, artificial intelligence, open source, and the knowledge economy have fundamentally changed how information is created, managed,

disseminated, and utilized. Consequently, librarians must continually redefine their professional roles to remain relevant within this rapidly evolving landscape.

This opinion paper has argued that infopreneurship represents one of the most promising pathways for achieving this transformation. Rather than viewing entrepreneurship as an activity separate from librarianship, we maintain that it should be recognized as a natural extension of the professional competencies already possessed by Library and Information Science practitioners. Skills in information organization, knowledge management, research support, digital literacy, scholarly communication, and information technology provide a strong foundation upon which sustainable information enterprises can be developed.

Using the context of A. W. Ambi Library, Kaduna State College of Education Gidan Waya, this paper has expressed the view that academic libraries possess significant untapped potential to become centres of innovation, digital transformation, and entrepreneurial excellence. By embracing infopreneurship, library personnel can diversify their professional roles, improve institutional sustainability, expand access to information, create employment opportunities, and contribute meaningfully to educational advancement and national development.

We acknowledge that barriers such as inadequate funding, limited technological infrastructure, insufficient entrepreneurial education, weak policy support, and resistance to organizational change continue to hinder progress. Nevertheless, these challenges should be regarded as opportunities for strategic reform rather than reasons for professional stagnation. Through collaborative efforts involving educational institutions, governments, professional associations, and the private sector, the conditions necessary for successful infopreneurship can be established.

In conclusion, we firmly believe that the future of the Library and Information Science profession will depend not only on technological advancement but also on the willingness of librarians to innovate, collaborate, and embrace entrepreneurial thinking. Infopreneurship is therefore more than a professional alternative; it is a strategic imperative that will determine the sustainability, visibility, and societal relevance of librarianship in the twenty-first century. Library professionals who embrace this philosophy will not merely adapt to change—they will become leaders in shaping the future of knowledge creation, information access, and national development.

References

Aina, L. O. (2004). *Library and information science text for Africa*. Third World Information Services.

Aina, L. O. (2022). Entrepreneurship education and professional development in Library and Information Science in Nigeria. *Nigerian Library and Information Science Review, 40*(2), 15–28.

Association of College and Research Libraries. (2023). *Framework for information literacy for higher education*. American Library Association.

Chiwara-Ndoro, L., & Dewah, P. (2020). Infopreneurship as a sustainable career option for library and information science professionals in developing countries. *Mousaion, 38*(4), 1–18.

International Federation of Library Associations and Institutions. (2022). *IFLA trend report 2022 update*.

International Federation of Library Associations and Institutions. (2023). *IFLA strategy 2024–2029*.

Mubofu, C., & Malekani, A. W. (2023). Infopreneurship and digital innovation opportunities for information professionals in Africa. *African Journal of Library, Archives and Information Science, 33*(1), 45–60.

Noh, Y. (2021). A study on the changing role of libraries and librarians in the era of the Fourth Industrial Revolution. *Journal of Librarianship and Information Science, 53*(4), 612–624.

Ocholla, D. N. (2021). Digital transformation and the future of Library and Information Science education in Africa. *South African Journal of Libraries and Information Science, 87*(2), 1–13.

Ramugondo, E. (2022). Information entrepreneurship as a strategy for professional sustainability among library professionals. *Library Management, 43*(6/7), 421–436.

Raju, R. (2021). The evolving role of academic librarians in the digital knowledge economy. *Journal of Academic Librarianship, 47*(5), Article 102387.

Sulyman, A., Abdullahi, H., & Ibrahim, M. (2024). Digital competencies and entrepreneurial readiness among academic librarians in Nigeria. *Nigerian Libraries, 57*(1), 77–95.

United Nations Educational, Scientific and Cultural Organization. (2023). *Global education monitoring report 2023: Technology in education*.

World Economic Forum. (2023). *The future of jobs report 2023*.

World Intellectual Property Organization. (2022). *World intellectual property indicators 2022*.

Current State of Librarianship in Nigeria, Examining the Perceived Challenges, Adaptive Innovations, and Future Pathways

By

ALIYU, Musa *CLN* (Ph.D.)
Email: aliyumusa989@gmail.com
Abubakar Tatari Ali Polytechnic, Bauchi Library Department,
P. M. B 0094, Wuntin Dada, Jos Road,
Bauchi, Bauchi State.

Abstract

Librarianship in Nigeria is at a pivotal transition point, shaped by rapid technological shifts, evolving user expectations, and persistent structural constraints. This article assesses the present landscape of the profession by analyzing three core dimensions: systemic challenges, emerging innovations, and prospective trajectories. The ***perceived challenges*** *remain largely infrastructural and institutional. Key issues include chronic understanding of public and academic libraries. Inadequate ICT infrastructure and intermittent power supply, limited digital literacy among both librarians and users, and a skills gap between traditional cataloging practices and modern information management demands. Professional recognition and remuneration are also cited as barriers to talent retention, alongside policy gaps in national library development and copyright enforcement in the digital era. Despite these constraints,* ***adoptive innovations*** *are gaining attraction. Academic and research libraries in particular have embraced open access repositories, institutional digital libraries, and the integration of library management systems such as KOHA and DSpace. social media outreach is being used to extend access beyond physical locations, especially for youth and underserved communities. Partnerships with international organizations and donor-funded projects have facilitated training programs in data curation, research support and information literacy. There is also a growing emphasis on rebranding librarianship through community engagement and advocacy for information as a public good. Looking ahead, the* ***future pathways*** *point toward a hybrid model that blends physical and digital services. The article highlights the need for continuous professional development, curriculum reform in library schools to emphasize data science and AI literacy, and strong public private partnership to address funding deficits. Policy harmonization at the federal and state levels, coupled with investment in broadband infrastructure, is identified as critical for scaling digital access. Ultimately, the sustainability of Nigerian librarianship will depend on repositioning librarians as information strategists and knowledge brokers within the broader national development agenda. This synthesis suggests that while challenges are substantial, the profession is demonstrating resilience and strategic adaptation, with technology and collaboration serving as the primary levers for transformation.*

Keyword: *Librarianship, perceived challenges, adoptive innovations and future pathways*

Introduction

For decades, Nigerian librarianship has operated under a familiar set of constraints: underfunded libraries, outdated infrastructure, and curricula slow respond to digital transformation. These constraints have shape training, services delivery, and public perception of the profession for decades.

Yet the landscape is shifting. Driving by the rapid diffusion of ICT, policy reforms from NUC and NBTE, and a new generation of librarians trained in digital skills, Nigerian libraries are experimenting with creative solutions to old problems (Ocholla and Shongwe 2013). From open access initiative to mobile library service and digital literacy programs, the profession is redefining its value in a knowledge-driven economy.

This article traces that evolution-from constraint to creativity and asks what it will take to sustain it through 2030. It examines the current state of librarianship in Nigeria, identifies key drivers of change, and outline pathways for curriculum development, professional practice, and institutional collaboration that align with Nigeria's national development agenda. In doing so, it argues that the future of librarianship lies not in waiting for resources, but in leveraging creativity, partnerships, and technology to expand access and impact.

➢ Perceived challenges of Librarianship in Nigeria

Librarianship in Nigeria has evolved from largely print-based practice to one increasingly shaped by digital transformation. However, this transition has been constrained by a set of interrelated challenges that librarians perceives as limiting professional growth, service delivery, and alignment with global standards (Aina 2006). These challenges can be grouped into infrastructural, skills-based, funding, policy and professional identity domains.

1. Infrastructural and Technological Constraints

The most frequently cited barrier is inadequate ICT infrastructure, Nigeria university librarian report that unstable electricity supply, poor internet connection, and insufficient ICT facilities hinder the development of digital repositories, electronic resources management, and open access initiatives (Olorunda 2023). These infrastructural deficits restrict libraries' ability to support research visibility and scholarly communication in line with global open science expectations. The problem extends to library schools, where many lack appropriate ICT facilities for training, resulting in graduates with limited hands-on experience in library automation and digital services. This creates a digital divide not only between Nigeria libraries and their global counterparts but also among institutions within the country.

2. Skill and Curriculum Deficiencies

Alongside infrastructure gaps, there are persistent concerns about professional skills and curriculum relevance. Recent studies show that while future academic librarians demonstrate moderate awareness of disruptive trends such as artificial intelligence, open access, and digital technologies in technical skills including data analytics, digital literacy, and the use of AI tools (Fricke 2024). Confidence in managing electronic resources and leading technological projects remains low. These gaps are partly attributed to curricula that are divergent across institutions and slow to incorporate modules on digital literacy, data analytics, artificial intelligence, and information ethics. Consequently, many practitioners fell inadequately prepared to navigate the demands of modern library management.

3. Funding and Human Resource Limitations

Inadequate funding remains a structural constraint affecting both practice and education. Limited budgets restrict the acquisition of current e-resources, maintenance of ICT systems, and staff development programs (Okiy 2014). Library schools face additional challenges in recruiting and retaining qualified teaching staff, contributing to a brain that further weakens program quality. At the institutional level, high levels of organizational constraints in public university libraries have been linked to reduced job performance among librarians, suggesting that resource scarcity affects not only tools but also morale and productivity.

4. Policy and Professional Status Issues

Professional credibility is undermined by policy and governance challenges. Nigeria librarians have raise concerns about the appointment of unqualified individuals to head libraries, arguing that such practices weaken institutional efficiency and compromise service quality (Oladokun, Ogunjimi, Oyetola et.al). Delay in registration with the Librarians Registration Council of Nigeria (LRCN) and the non-registration of some degree holders further fragment the professional pipeline. Weak institutional policies on open access, digital preservation, and ICT adaptation also slow the implementation of innovative services.

5. Emerging and Identity Related Challenges

The rise of predatory journals, unethical open access publishing, and the misuse of AI in scholarly communication present new ethical and operational challenges for Nigerian librarians (Nigerian Education News). These issues demand new competencies in information literacy and

research integrity that many practitioners feel unprepared to address. At a deeper level, scholars have noted an ongoing identity crisis within the professional catchphrase. This ambiguity affects public perception and the profession's ability to advocate effectively for its role in national development.

Collectively, these challenges illustrate why Nigeria librarianship is perceived as operating "from constraint." Addressing them requires coordinated interventions in infrastructure investment, and professional advocacy. The following section examines how these constraints are being met with creative responses and outlines pathways for progress toward 2030.

➢ Adoptive Innovations in Nigerian Librarianship

Despite infrastructural and policy constraints, Nigerian librarians have adopted a range of innovations to expand services delivery, improve access, and reposition libraries within the knowledge economy (Okiy 2014). These innovations are driven by the need to remain relevant amid digital disruption, user expectation shifts, and curriculum reforms.

1. Digital Repositories and Open Access Initiatives

Institutional repositories have become a key innovation across Nigerian universities. Librarians are leading the digitization of theses, dissertations, and research outputs to increase visibility and preserve institutional memory (Ezeani and Ezema 2020). This shift aligns with the global open access movement and is supported by curriculum changes that now include modules on digital libraries and institutional repositories. The adoption remains uneven due to ICT and funding gaps, but where implemented, repositories have improved access to local scholarship and reduced reliance on foreign journals.

2. ICT Integration in Service Delivery

Librarians have moved beyond traditional circulation and reference services to adopt ICT enabled services (Fricke 2024). Common innovation includes:

- **Library automation:** Use of Koha DSpace, and other open-source systems for cataloguing, circulation, and OPACs.
- **Virtual reference and chat services:** Especially adopted during and after COVID-19 maintain user engagement.
- **Digital literacy programs:** Training for students and faculty on information retrieval, referencing tools, and database use.

The 2022 NUC CCMAS and ICT courses such as Introduction to ICT in library & Information Science, Library Automation, and Library Application Software, creating a pipeline of graduates better equipped to sustain these innovations (National University Commission 2022).

3. Mobile and Outreach Services

To address low physical access and rural exclusion, some libraries have adopted mobile library services and outreach programs. These use mobile devices, WhatsApp, and SMS to deliver current awareness services, selective dissemination of information, and training to users outside the library space (Nwachukwu and Ogunyemi 2021). This is a low-cost innovation that leverages existing mobile penetration in Nigeria.

4. Adoption of AI and Emerging Technologies

While still at an early stage, there is growing experimentation with AI tools for cataloguing, plagiarism detection, and chatbots for reference services. Librarians report moderate awareness of

AI and digital technologies, though technical skill, remain a gap (Aliyu 2025). Workshops and hands-on sessions organized by libraries are beginning to bridge this gap.

5. Collaborative and Consortia Models

Resources sharing through consortia like the Nigerian University Libraries Consortium has allowed smaller institutions to access e-resources they could not afford individually (Librarian Registration Council of Nigeria 2020). Librarians also collaborate on capacity building through workshops, webinars, and professional association like NLA and LRCN.

6. Rebranding Library Spaces

Some academic libraries are rebranding spaces into “learning commons” and “Innovation hub” that integrate makerspaces, digital labs, and collaborative study areas (IFLA 2019). This reflects a shift from libraries as book repositories to libraries as centers for knowledge creation and digital literacy

- **Why these Innovations Matter**

These adoptive innovations show that Nigerian librarians are not passive in the face of constraint. Instead, they are leveraging, and partnerships to create new service models (IFLA 2019). The innovations also align with the IFLA Global Vision and Nigeria’s development goals of 2030, which emphasize digital literacy, research support, and inclusive access to information.

- **Future pathways for Nigerian Librarianship**

Librarianship in Nigeria is shifting fast from "just books and shelves" to "information, tech, and community impact" here are the key pathways shaping the next 10-15 years:

1. **Digital & Tech-Driven Librarianship**
   This is the biggest shift
- **Digital Libraries & Institutional Repositories:** Universities like UNILAG, ABU, and UI are already building IRs for theses, journals, and research output.
- **AI & Data Librarianship:** Using AI for cataloguing, chatbots for reference, and data management for researchers. Librarians will become data curators.
- **Library Automation:** More libraries moving to KOHA, Virtua, and cloud-based system instead of manual processes.
- **Cybersecurity & Digital Preservation:** Protecting Nigeria's digital heritage, e-books, and government records

2. **Specialized & Subject Librarianship**
   General librarianship alone won't cut it anymore
- **Health Librarians:** Supporting hospitals, NCDC, and medical research with evidence-based information.
- **Law Librarians:** For courts, law firms and NIALS.
- **Agricultural & Rural Information librarians:** Working with NAL, ADP, and farmers to bridge info gaps.
- **Business & Financial Information Librarians:** For banks, CBN, SMEDAN and startups needing market data.

3. **Community & Development Librarianship**

Libraries as community hubs, not just quiet spaces.

- **Public Library Transformation:** Partnership with NGOs and government to make public libraries into ICT plus skills centers. Think coding classes, CV writing, Entrepreneurship training.
- **Rural Information Centers:** Using solar-power libraries plus mobile library vans to reach underserved areas.
- **Literacy & SDG Alignment:** Libraries diving SDG 4 Education, SDG 5 Gender, and SDG 16 Access to Information.

4. **Information Entrepreneurship**
   Librarians creating their own jobs.
- **Information Consultancy:** competitive intelligence, research services and information audits for companies.
- **Content Creation & Knowledge Management:** Managing corporate knowledge bases, archive, and intranets.
- **E-learning & Educational Technology:** Developing digital courses, curating OER, and supporting distance learning with NUC and NBTE.

5. **Policy, Advocacy & Leadership**
- **Advocacy:** Pushing Nigerian research to be global visible.
- **Copyright & Information Law:** Librarians advising on FAIR use, plagiarism, and digital rights.
- **Professional Leadership:** More Nigerian librarians in LRCN, NLA leadership, and global bodies like IFLA to influence policy.

6. **Skills Nigerian Librarians Need Going Forward**

S/No.	Skill	Why it Matters
1	**ICT & Coding Basic**	To manage library system, websites, and databases
2	**Data Literacy**	To support research and teach data management
3	**Digital Content Curation**	To preserve Nigerian content online
4	**Marketing & UX**	To make libraries attractive to Gen Z
5	**Grant Writing & Partnership**	To fund projects and modernize libraries

Key Drivers

1. **LRCN Act & professionalization:** The Librarians Registration council is pushing for standards and licensing.
2. **Internet & Mobile Penetration:** Over 100m internet users demand for digital library services
3. **NUC Benchmarks:** Universities and other higher academic institutions now require e-library and librarian involvement in research support.
4. **Global Trends:** AI misinformation, and the need for verified information puts librarians at the center.

Bottom Line

The future Nigerian librarian won't just be a "custodian of books". They will be a tech specialist, data manager, community developer, and information entrepreneur.

The pathway you choose depends on interest:

- Techy?'n Digital Librarianship, AI data
- People focused? 'n Community, Public School Librarianship
- Research focused? 'n in Academic, Special, Knowledge Management

However, sustainability depends on three factors

1. **Continuous skills upgrade** for librarians in ICT, data, and AI
2. **Stable funding** for infrastructure and software licensing
3. **Policy support** from institutions and government to institutionalized these practices

References

Aina, L. O. (2006). Curriculum development in library and information science education in Nigeria. *Journal of Library and Information Science,* 3(1), 1-15

Aliyu, M. (2025). *Application of library network for the effective provision of information resources and services in federal university libraries in north east Nigeria.* Unpublished theses, university of Nigeria Nsukka

Ezeani, C. N., & Ezema, I. J. (2020). Institutional repositories in Nigerian universities: Status, challenges and prospects. *Library philosophy and practice (e-journal),* 3876

Fricke, M. (2024). *Artificial Intelligent and librarianship: a note for teaching.* http//: creativecommons.org/licenses/by/4.01

International Federation of Library Associations and Institutions. (2019). *IFLA global vision: Building a strong and united library field. IFLA*

Librarians Registration Council of Nigeria. (2020). *National diploma program in library and information science; Curriculum and course specifications.* Kaduna; NBTE **https://doi.org/10.1177/09610006251323456**

National University Commission. (2022). *Core curriculum and minimum academic standards for library and information science.* Abuja: NUC. https://doi.org/10.1177/09610006251323456

Nwachukwu, V. N., & Ogunyemi, F. T. (2021). Assessment of ICT integration in library and information science curriculum in Nigeria universities. *journal of Information Science Theory and practice, 9_ (3) 45-58* https://doi.org/10.1633/JISTaP2021.9.3.4

Ocholla, D. N., & Shongwe, M. (2013). An analysis of the library and information science education landscape in Africa. *Education of Information*, 30_ (3-4), 103-130 https://doi.org/10.32233/EFI-130933

Okiy, R. B. (2014). Strengthening information provision in Nigeria libraries: Challenges and prospects. *Library philosophy and practice (e-journal),* 1056.

Oladokun, B. D., Ogunjimi, B. E., Oyetola, S. O., Orubebe, E. D., & Enakrire, R. T. (2025). Library management in an era of disruption: assessing skills and knowledge of future academic librarians in Nigeria. *Journal of librarianship and information Science.* **https://doi.org/10.1177/09610006251323456**

Olorunda, O. A. (2023). Digital literacy skills and the adoption of institutional repositories by librarians in Nigerian universities. African Journal of library Archives and Information Science, 33_ (1), 12-24.

The Nigerian Education News. (2025, September 4). Nigerian university librarians raise alarm over predatory journals, unethical open access publishing. **https://thenigeriaeducationnews.com**

Role of E-library Resources in Supporting Academic Performance of Computer Science Education students, in the Faculty of Education, Federal University Lokoja

Labaika Aishah Oyindamola
Department of Library and Information Science
Federal University Lokoja
aishyindamola0@gmail.com

Lois Yabanet (PhD)
Department of Library and Information Science
Federal University Lokoja
loisyabanet@gmail.com

Jamila Muhammed (PhD)
Kashim Ibrahim Library
Ahmadu Bello University Zaria
Jamilamuhammad39@gmail.com

Abstract

This study examined the role of e-library resources in supporting academic performance of Computer Science Education students, in the Faculty of Education, Federal University Lokoja. The research investigated the impact of e-library on the academic performance of students in the Faculty of Education Federal University Lokoja and barriers for effective utilization of e-resources. The study adopted a descriptive survey design, with a population of 495 computer science education students, and data were collected using structured online questionnaires. A sample of 217 was selected using a random sampling procedure determined by Krejcie and Morgan's (1970) table, and a total of 133 online questionnaires were filled out and submitted, representing a 61.8% response rate. Findings revealed that e-library resources positively influence academic performance by enhancing access to scholarly materials, promoting collaboration, supporting independent learning, and improving research outcomes. However, barriers such as poor internet connectivity, inadequate ICT infrastructure, limited computer access, and lack of updated resources significantly hinder effective utilization. The study concludes that maximizing the benefits of e-library resources requires both infrastructural development and user capacity building, which are essential for improving students' academic performance and digital competence. It was recommended that the university invest in modern ICT facilities, including servers and upgraded hardware, to support large-scale access and improve the efficiency of the e-library system.

Key words: E-library, E-resources, information resources, students' performance, resources utilization, ICT.

Introduction

The role of libraries as intellectual repositories within tertiary institutions remains indispensable, owing to their immense contribution to the core functions of higher education teaching, learning, and research (Ogunwede et al., 2024). As noted by Bribena et al. (2021), a major development shaping academic libraries in recent years has been the rapid advancement of information and communication technologies. These innovations have transformed access to knowledge, enabling users to retrieve information seamlessly through e-libraries and other digital platforms (Moorthy et al., 2018). In this regard, Udoudoh et al. (2021) contend that the integration of electronic technologies into library services is primarily aimed at fostering active, engaged learners, thereby discouraging passivity in the educational process.

Nigerian tertiary institutions, particularly universities, have increasingly invested in digital transformation, diffusion, and preservation of educational resources (Omotayo & Haliru, 2020). The adoption of e-library platforms has significantly enhanced accesses to a wide range of cross-border information, allowing students, faculty, and other members of the academic community to obtain resources in real-time with relative ease (Moorthy et al., 2018). According to Chime and Ekwueme (2023), the resources provided through e-libraries serve as critical enablers of academic research and scholarship.

Given the evolving nature of information management, the traditional methods of maintaining libraries are no longer adequate for efficient storage, retrieval, and dissemination of knowledge. Consequently, the application of modern technological approaches has become indispensable for improving library services to students. A well-structured computerized library enables users to receive prompt and efficient services, thereby enhancing the overall learning experience. In this regard, a digital library may be understood as an automated or electronic information system in which processes such as access, storage, and resource sharing are facilitated through computer technologies. The concept of "digital" extends beyond mere computerization; it encompasses the design and development of electronic systems that support various information services, including word processing, micrographics, reprographics, video-based resources, and electronic communication tools such as fax, voice mail, email, and the internet (Encyclopedia, 2013).

The Library of Congress Collections Policy Statements Supplementary Guidelines (2008) stressed that electronic resource is any work encoded and made available for access through the use of a computer. It includes electronic data available by remote access referring to the use of electronic resources via computer networks; and direct access (fixed media) referring to the use of electronic resources via carriers (e.g. discs/disks, cassettes, cartridges) designed to be inserted into a computerized device or its auxiliary equipment. Ugwu and Onyegiri (2013) clearly gave examples of electronic resources which include, but are not limited to: web sites, online databases, e-journals, e-books, electronic integrating resources, and physical carriers in all formats, whether free or fee-based, required to support research in the subject covered, and may be audio, visual, and/or text files. They further enlisted specific types of electronic information resources as consisting of electronic books (e-books), electronic journals (e-journal), and indexes, collections of journal articles, reference works, digital collections and databases.

Statement of the Problem

The Electronic Library (E-library) of the Federal University Lokoja, situated within the main library, provides seamless access to a wide range of digital resources that support innovative teaching, learning, and research. Prior studies, such as Ogunwede et al. (2024), have examined the roles and impacts of e-libraries in selected tertiary institutions in Kaduna State. However, limited attention has been given to the Faculty of Education in Nigerian universities, and to date, no research has specifically investigated the challenges and opportunities of the E-library at the Federal University Lokoja. Although existing studies have explored the general contributions of e-libraries to students' academic performance in tertiary institutions, they have not sufficiently delineated the specific impacts across different faculties and disciplines. This lack of discipline-specific evidence underscores a critical research gap. Accordingly, the present study seeks to investigate the role of the E-library in enhancing academic activities among students in the Faculty of Education, Federal University Lokoja, with the aim of identifying strategies to strengthen its effectiveness in promoting student learning and academic success.

The following research questions guided the study:

1. To determine the impacts of E-library supporting the academic performance of students in Faculty of Education, Federal University Lokoja.
2. To identify the barriers that hinder students' effective use of e-library resources in Faculty of Education, Federal University Lokoja.

Literature Review

The emergence of e-libraries has significantly transformed how students access, use, and engage with academic resources, thereby influencing their overall academic performance. One of the most notable impacts is improved access to scholarly materials. Unlike traditional libraries with physical and time limitations, e-libraries provide students with round-the-clock access to a vast collection of e-books, journals, databases, theses, and multimedia resources. This ensures that students can retrieve relevant information anytime and anywhere, thereby supporting timely completion of assignments, projects, and research work (Nguyen & Nguyen, 2022).

Furthermore, e-libraries contribute to enhanced learning outcomes by exposing students to current and peer-reviewed information that strengthens the quality of their academic work. Suleman and Gul (2023) observed that students who frequently use e-library resources develop stronger analytical and critical thinking skills, which reflect in improved grades and research quality. In addition, e-libraries foster independent and lifelong learning, enabling students to go beyond the prescribed curriculum and build a deeper understanding of subjects (Tammaro, 2024). Another crucial impact is time efficiency and equity of access. With advanced search tools, students can quickly retrieve specific and credible information, reducing the time spent on research. At the same time, e-libraries ensure that all students, regardless of financial background, have equal access to high-quality learning materials (IFLA, 2021). This democratization of knowledge allows for fairer competition and improved overall performance across diverse groups of students.

Ekong & Ekong (2018) conducted a study titled "Impact of Information Literacy Skills on the Use of E-Library Resources among Tertiary Institution Students in Akwa Ibom State." The study adopted an empirical survey design, administering 500 questionnaires which were analyzed using ANOVA. Findings revealed that students' ability to effectively utilize e-

library resources was strongly dependent on their computer and information literacy skills. It concluded that the quality and volume of academic work are largely influenced by students' competence in handling e-resources. The authors recommended that tertiary institutions should prioritize regular training to improve students' information literacy skills for better academic outcomes.

Ogunbona & Onaolapo (2024) examined "Assessing the Impact of Library Electronic Resources on Students' Academic Performance in Economics in Private Universities in Lagos State, Nigeria." Using a descriptive survey design, a sample of 80 economics students was selected via simple random sampling. Data were gathered with a self-structured questionnaire and analyzed with frequency tables, percentages, and Pearson Product Moment Correlation (PPMC) at a 0.05 significance level. Findings showed a significant positive relationship between the use of library electronic resources and students' performance in assignments, projects, exams, and overall academic achievement. The study concluded that e-resources enhance comprehension and academic success in economics and recommended government policy on digital libraries, adoption of global best practices, and regular awareness programs such as trainings and workshops by university libraries.

Despite the numerous advantages e-libraries offer, several barriers hinder students from fully utilizing these resources for academic purposes. A major challenge is limited digital literacy skills among students. Many users lack adequate training in information retrieval, database searching, or proper citation management, which restricts their ability to maximize the resources available in e-libraries (Adebayo & Ahmed, 2022). Without proper orientation, students may find it difficult to navigate platforms and may default to less reliable sources such as free web contents.

Another barrier is inadequate infrastructure and unstable internet connectivity, particularly in developing countries. E-libraries depend heavily on reliable internet services and adequate bandwidth; however, poor network coverage, frequent power outages, and limited access to personal devices make it difficult for students to access materials consistently (Ogunlade & Adegbesan, 2020). Additionally, subscription and licensing issues often limit access to a wide range of current journals and databases. Universities in resource-constrained environments may not afford subscription fees for multiple databases, leaving students with fewer scholarly materials compared to counterparts in well-funded institutions (Nguyen & Nguyen, 2022).

Furthermore, user attitudes and low awareness play a role in underutilization. Some students prefer traditional print materials or are unaware of the scope of e-library resources available to them. Lack of promotional strategies by libraries and insufficient user support also exacerbate this problem (IFLA, 2021).

1. Limited ICT and Digital Literacy Skills: Many students lack the technical skills needed to search databases, use search operators, manage references, or evaluate information quality. This reduces the effectiveness of their use of e-library platforms. Information literacy is the set of skills required to identify, locate, evaluate, and use information effectively and ethically (Ishola and Oduwole, 2021). Many undergraduates lack the necessary competencies to navigate online catalogs, databases, and other sophisticated digital tools provided by academic libraries. Due to inadequate training, students often feel overwhelmed by search processes or fail to understand how to evaluate sources for accuracy and credibility. This result in

underutilization of quality academic materials and a tendency to rely on unverified information found through general web searches. Strengthening information literacy is essential for empowering students to make full use of library resources and to become independent lifelong learners (EzeandUzoigwe, 2021).

2. Poor Internet Connectivity and Power Supply: In many developing regions, unstable internet networks and frequent power outages make it difficult for students to access e-resources consistently. Internet connectivity refers to the ability to access and maintain a stable, high-speed connection to online networks, which enables access to electronic library resources such as e-books, e-journals, online databases, and digital repositories (Adegbilero-Iwari&Igwe, 2021). In many universities, students experience frequent disconnections, slow download and upload speeds, and network congestion, especially during peak hours. These challenges hinder access to academic databases and online learning platforms and discourage students from attempting to use electronic library resources altogether. Furthermore, high data costs force some students to limit their time online or avoid using electronic resources entirely (OkaforandEze, 2021). The lack of robust internet connectivity diminishes the relevance of digital library initiatives and undermines the investments made in e-resources.
3. Inadequate Infrastructure and Devices: Limited availability of computers in university libraries, high costs of laptops/smart phones, and insufficient bandwidth restrict access. Information and Communication Technology (ICT) infrastructure refers to the basic physical and organizational structures needed to operate digital library services, including computer systems, internet facilities, power supply, and software tools (Ishola&Oduwole, 2021). Most academic libraries are plagued with insufficient or outdated ICT infrastructure. Limited computer terminals, lack of modern equipment (e.g., scanners, projectors), and poor maintenance of existing facilities discourage students from visiting the library. In addition, erratic electricity supply and absence of backup generators or inverters disrupt access to electronic services. Without adequate ICT infrastructure, students cannot fully benefit from digital collections, regardless of their availability. The poor state of ICT resources also affects the overall image of libraries, making them less attractive as centers of learning and innovation (Obinyanand Eke, 2021).
4. Low Awareness and Promotion: Some students are not aware of the full range of e-resources available in their institution's library. Poor orientation and lack of user education limit utilization.
5. User Attitudes and Preferences: Some students prefer traditional print materials, either because of reading habits or discomfort with electronic screens, leading to low use of e-resources.

Despite the growing provision of e-library resources in Nigerian universities, several barriers continue to hinder their effective use among students. One of the most frequently reported challenges is poor infrastructure, particularly unreliable electricity supply and unstable internet connectivity. These infrastructural gaps disrupt consistent access to online databases and digital resources, especially in universities across southern and southeastern Nigeria (Nwokedi, 2022; Okorie & Agu, 2023). Limited access to functional computers and personal devices further compounds the problem, leaving many students unable to maximize the available e-resources (Eze & Uzoigwe, 2021).

Another significant barrier is the low level of digital and information literacy skills among students. Many undergraduates and postgraduates lack adequate training in navigating electronic databases, applying advanced search strategies, and evaluating the quality of digital information. As highlighted by Tella and colleagues (2024), insufficient information literacy is a strong predictor of under-utilization of digital resources, even when access is available. Similarly, Afolabi (2023) noted that preference for open web sources such as Google often replaces more scholarly databases due to skill deficits.

Access and usability issues also pose barriers. Students frequently encounter login difficulties, fragmented platforms, and unfriendly user interfaces, which discourage effective usage (Onuoha & Anyaegbu, 2022). Subscription and licensing restrictions also limit the scope of databases accessible to students, as many universities cannot afford up-to-date journals and e-databases due to financial constraints (Ademola & Fagbohun, 2023).

Finally, awareness and support services remain inadequate. Studies show that many students are not fully aware of the breadth of e-resources available in their institutional libraries, largely due to poor orientation and weak promotional strategies by librarians (Adeniran, 2022). Without sustained sensitization, training, and user-support systems, e-library resources remain underutilized.

Methodology

A total of 495 undergraduate students from the Department of computer science education across 100 to 400 level, constituted the study population. To ensure representativeness and statistical significance, a sample of (217) students was selected using a random sampling procedure. The sample size for this study was determined using Krejcie and Morgan's (1970) table for determining sample size from a given population. The sample size was proportionally distributed across all academic levels based on the total population of undergraduate students in the department. This study adopted the descriptive survey design. A self-designed google form served as the primary instrument for gathering data from respondents. This study utilized descriptive statistical methods to analyze the collected data. The analysis was carried out using the Statistical Package for the Social Sciences (SPSS), version 25. Descriptive statistical tools such as frequency counts, percentages, and arithmetic means was employed to summarize and interpret the responses obtained from the questionnaires. The results were presented in tables, with scores converted into frequencies and simple percentages for clearer interpretation.

Result and Discussion

Table 1: Impacts of the e-library on the academic performance of students in the Faculty of Education Federal University Lokoja

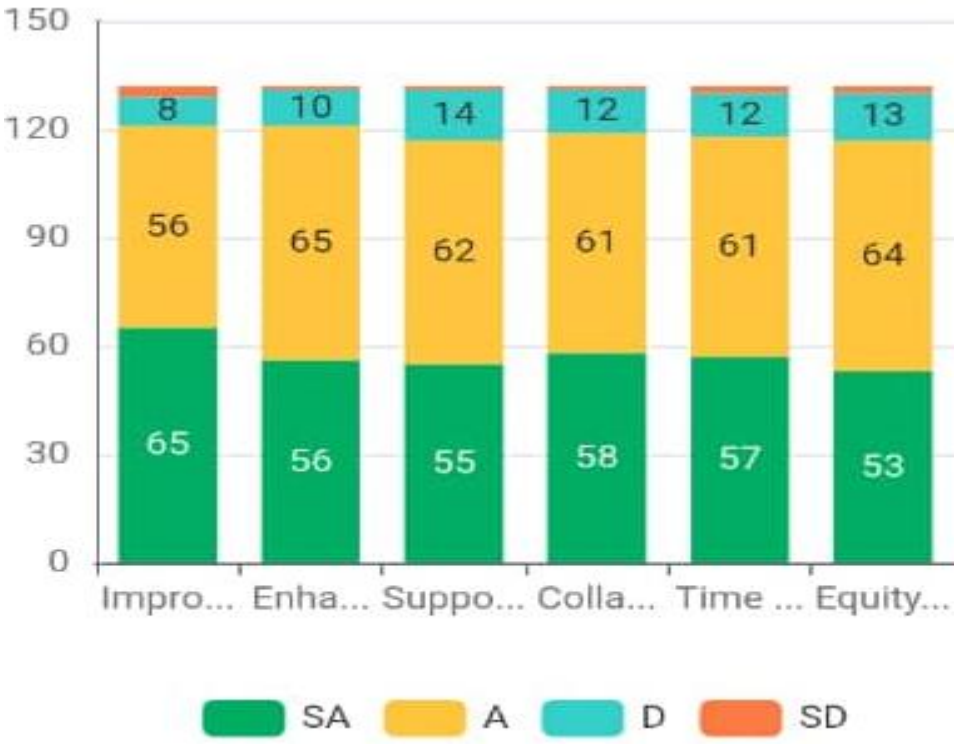
S/N	Impacts	SA	A	D	SD	X	RMK
1	Improved access to scholarly resources	65 (48.87%)	57 (42.86%)	8 (6.02%)	3 (2.26%)	3.33	Agree
2	Enhanced learning outcome	56 (42.11%)	66 (49.62%)	10 (7.52%)	1 (0.75%)	3.33	Agree
3	Support for independent and lifelong learning	55 (41.35%)	63 (47.37%)	14 (10.53%)	1 (0.75%)	3.29	Agree

4	Collaboration and knowledge sharing	58 (43.61)	62 (46.62)	12 (9.02%)	2 (1.5%)	3.34	Agree
5	Time efficiency and information retrieval skills	57 (42.86%)	62 (45.62%)	12 (9.2%)	2 (1.5%)	3.31	Agree
6	Equity of access	53 (39.85%)	65 (48.87%)	13 (9.77%)	2 (1.5%)	3.27	Agree

Benchmark= 2.50

Strongly Agreed (SD): 4, Agree (A):3, Disagree (D): 2, Strongly Disagree (D): 1

The findings indicated in Table 1 which explains the effectiveness of the impact of e-resources on the academic performance of computer science education students, federal university Lokoja. The analysis shows that one of the highest rated impact of e-library on academic performance is that it improved access to scholarly resources with the (mean score= 3.33), respectively, it also greatly impact in enhancing learning outcome with (mean score= 3.33), Support for independent and lifelong learning with (mean score= 3.29), Collaboration and knowledge sharing with (mean score= 3.34), Time efficiency and information retrieval skills with the (mean score= 3.34) and lastly equity of access (mean score= 3.27) which is the least impact but still far greater than the bench mark.



The findings in Table 1 revealed that the impact of e-library resources on students' academic performance was generally high across all indicators. The highest rated impact was on collaboration and knowledge sharing and time efficiency and information retrieval skills, with each recording 90.23% positive responses (SA + A). This shows that students value e-resources for enabling group work, knowledge exchange, and quick access to needed information. Similarly, improved access to scholarly resources and enhancing learning outcomes were also highly rated, with 91.73% positive responses each, reflecting how e-

resources broaden students' access to materials and contribute directly to academic success. On the other hand, the least rated impact was equity of access, with 88.72% positive responses, though still far above the benchmark. This suggests that while students acknowledge improved access, issues such as limited devices and internet challenges may restrict equal opportunities for all users.

Table 2: Barriers hindering students' effective use of the e-library resources in faculty of education, federal University Lokoja

S/N	Barriers	SA	A	D	SD	X	RMK
1	Poor internet connectivity	84 (63.16%)	39 (29.32%)	8 (6.02%)	2 (1.5%)	3.54	Agree
2	Lack of awareness of available e-resources	68 (51.13%)	54 (40.6%)	9 (6.77%)	2 (1.5%)	3.41	Agree
3	Inadequate ICT infrastructure	67 (50.38%)	49 (36.84%)	14 (10.53%)	3 (2.26%)	3.40	Agree
4	Low information literacy skills	63 (47.37%)	46 (34.59%)	20 (15.4%)	4 (3.01%)	3.26	Agree
5	Limited access to computers	65 (48.87%)	49 (36.84%)	16 (12.03%)	3 (2.26%)	3.32	Agree
6	Difficulty in navigating/searching e-resources	61 (45.86%)	51 (38.35%)	17 (12.78%)	4 (3.01%)	3.27	Agree
7	Lack of relevant and updated e-resources	57 (42.86%)	49 (36.84%)	24 (18.05%)	3 (2.26%)	1.8	Disagree

Bench Mark= 2.50
Strongly Agreed (SD): 4, Agree (A):3, Disagree (D): 2, Strongly Disagree (D): 1

The findings indicated in Table 2 which states the challenges faced while accessing and utilizing library e-resources by computer science education students, Federal University Lokoja, Kogi State. The analysis shows that the highest barriers faced by these students in utilizing e-resources are the lack of internet connectivity with (mean score= 3.54), Lack of awareness of available e-resources with (mean score= 3.41), Inadequate ICT infrastructure with (mean score= 3.40), Low information literacy skills (mean score=3.40), Limited access to computers with (mean score= 3.40), Difficulty in navigating/searching e-resources (mean score= 3.27) however, Lack of relevant and updated e-resources with the (mean score =1.8) was proved to be disagreed. This result shows most of the items listed are the problems faced by students' experience in accessing and utilizing library resources in the university library and it is accepted because the mean is greater than the Benchmark of 2.50 on a four-point rating scale.



The findings revealed that the highest barrier to the effective use of e-library resources is poor internet connectivity, with 92.48% of respondents (63.16% strongly agreed and 29.32% agreed) identifying it as a major challenge. This finding reflects the reality that without stable and fast internet, students face serious limitations in accessing e-books, journals, and online databases, which directly hinders their academic work. Conversely, the lowest barrier reported was the lack of relevant and updated e-resources, with 79.7% of students (42.86% strongly agreed and 36.84% agreed) recognizing it as a challenge. Although still significant, this lower percentage compared to other barriers suggests that while students occasionally encounter outdated or insufficient resources, they still find enough useful materials within the e-library to support their studies.

Discussion

The study revealed that e-library resources have a strong and positive influence on students' academic performance. They provide improved access to scholarly materials, which enriches research and academic work while also contributing to better learning outcomes. The resources promote collaboration and knowledge sharing among students, thereby creating opportunities for group learning and academic interaction. The e-library also ensures equity of access by giving all students equal opportunities to consult the same resources regardless of background. Beyond classroom learning, it supports independent and lifelong learning, encouraging students to develop self-directed study habits. In addition, the e-library enhances time efficiency and builds students' information retrieval skills, enabling them to quickly locate and use relevant materials. Altogether, these impacts underline the vital role of the e-library in supporting academic growth, fostering digital literacy, and strengthening overall student achievement.

The study also revealed several barriers that hinder the effective use of e-library resources by students. The most pressing challenge identified was poor internet connectivity, which limits students' ability to consistently access materials online. Closely related to this is the lack of awareness of available e-resources, as many students are not fully informed about the range of materials and services provided by the e-library. Inadequate ICT infrastructure

was also highlighted, with students pointing out that the facilities and systems available are insufficient to meet their academic needs. Limited access to computers further constrains usage, as many students struggle with competition for the few available systems. In addition, difficulty in navigating and searching e-resources was noted as a barrier, reflecting challenges in finding relevant information quickly. Low information literacy skills also emerged as a factor, as some students lack the training and ability to maximize the full benefits of the e-library. Finally, the lack of relevant and regularly updated resources was identified, making it difficult for students to access the most current and useful academic information.

Conclusion

This study examined the roles of e-library resources in supporting the academic performance of students in the Faculty of Education, Federal University Lokoja. The findings revealed that a variety of e-library resources are available to students. In conclusion, the study affirms that e-library resources play a vital role in supporting students' academic activities and improving their academic performance. However, the full benefits of these resources can only be realized when the identified barriers are adequately addressed through improved internet services, enhanced ICT facilities, increased awareness programs, and continuous information literacy training for students.

Recommendations

1. Creating more awareness and strengthen information literacy programs: Regular workshops and orientations should be conducted to equip students with skills in searching, evaluating, and effectively using electronic information resources.
2. Improve internet connectivity and expand ICT infrastructure: A stable and high-speed internet connection should be provided in federal university Lokoja, to ensure seamless access to e-books, journals, databases, and other e-resources without interruptions, and also the University should invest in modern ICT facilities, including servers and upgraded hardware, to support large-scale access and improve the efficiency of the e-library system

REFERENCES

Adebayo, O., & Ahmed, H. (2022). Availability and use of electronic resources in Nigerian university libraries: Implications for academic productivity. *International Journal of Library and Information Science*, 14(2), 21–29. https://doi.org/10.5897/IJLIS2022.1167

Bribena, E., Yusuf, D., & Irenoa, L. (2021). Electronic Libraries in Tertiary Institutions in Nigeria: The Issues and Prospects. *Niger Delta Journal of Library and Information Science, 2*(1).

Chime, A., & Ekwueme, L. (2023). Assessing the Usage of Electronic Information Resources and the Nature of Research Output by Postgraduate Students in Federal University Libraries in South-East, Nigeria. *Lokoja Journal of Information Science Research, 1*(2), 1-17.

Crow, R. (2002). *The case for institutional repositories: A SPARC position paper*. Washington, DC: Scholarly Publishing and Academic Resources Coalition (SPARC).

Ekong, U. O., & Ekong, V. E. (2018). Impact of information literacy skills on the use of e-library resources among tertiary institution students in Akwa Ibom State. *Nigerian Journal of Technology, 37*(2), 423-431.

Ezema, I. J. (2011). Building open access institutional repositories for global visibility of Nigerian scholarly publication. *Library Review, 60*(6), 473–485. **https://doi.org/10.1108/00242531111147198**

IFLA (International Federation of Library Associations). (2021). Guidelines for digital library services. IFLA Publications Series. https://www.ifla.org/publications

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610. https://doi.org/ 10.1177 /001316447003000308

Moorthy, K., Chun T'ing, L., Ming, K. S., Ping, C. C., Ping, L. Y., Joe, L. Q., & Jie, W. Y. (2019). Behavioral intention to adopt digital library by the undergraduates. *International Information & Library Review, 51*(2), 128-144.

Nguyen, T., & Nguyen, L. (2022). Digital libraries and student learning outcomes: A systematic review. *Journal of Academic Librarianship, 48*(5), 102567. https://doi.org/10.1016/j.acalib.2022.102567

Ogunlade, O. O., & Adegbesan, S. O. (2020). Utilization of electronic resources by undergraduates in selected Nigerian universities. *Library Philosophy and Practice*, 2020(1), 1–15. https://digitalcommons.unl.edu/libphilprac/

Ogunwede, O. A., Zakari, Y. H., & Afolayan, S. O. (2024). Impact of e-library on academic performance of students across disciplines in selected tertiary institutions in Kaduna State, Nigeria. *International Journal of Intellectual Discourse, 7*(2), 152–164.

Omotayo, F. O., & Haliru, A. (2020). Perception of task-technology fit of digital library among undergraduates in selected universities in Nigeria. *The Journal of Academic Librarianship, 46*(1), 102097.

Ray, K., & Day, J. (1998). Student attitudes towards electronic information resources. *Information Research, 4*(2). Retrieved from http://informationr.net/ir/4-2/paper54.html

Richardson, S. L., & Terrell, E. (2008). Library of Congress. Retrieved from Business Reference Services website: http://www. loc. gov/rr/business/businesshistory /April/apple. html# history.

Suleman, Q., & Gul, R. (2023). Impact of digital libraries on academic performance in higher education institutions. *Education and Information Technologies, 28*(3), 3451–3472. **https://doi.org/10.1007/s10639-022-11459-9**

Tammaro, A. M. (2024). Digital libraries and open science: Current developments and future directions. *Library Management, 45*(2), 123–138. **https://doi.org/10.1108/LM-08-2023-0095**

Tenopir, C., & King, D. W. (2002). Reading behavior and electronic journals. *Learned Publishing, 15*(4), 259–265. **https://doi.org/10.1087/095315102760319206**

Udoudoh, F. P., & Bassey, L. E. (2021). Traditional building materials in housing construction: usage and maintenance strategy. *PM World Journal, 10*(4), 1-20.

Ugwu, C. I., & Onyegiri, D. C. (2013). Management problems of electronic information resources: A case study of UNN Library. *International Journal of Library and Information Science, 5*(5), 126-133.

York, T., Gibson, C., & Rankin, S. (2015). Defining and measuring academic success. *Practical Assessment, Research & Evaluation, 20*(5), 1–20. https://doi.org/10.7275/hz5x-tm67

Economic Prospects of Automation of Academic Libraries for Librarians in Nigeria: e-Library Consultants' Perspectives

By

Muhammad Etubi, CLN
University of Jos Library
etubim@gmail.com

Abstract

This paper, economic prospects of automation of academic libraries for librarians in Nigeria, explores the experiences of electronic library (e-library) consultants in automation of academic libraries for economic gain. It systematically investigates the e-library consultants' skills, service delivery process, benefits, challenges, and prospects. Qualitative exploratory research design is adopted for this study to enable an in-depth interview of the consultants. Electronic library consultants bridge library and information science (LIS) theory and practical technology implementation. Understanding their experience helps LIS schools update curricula, libraries to know what to expect when hiring consultants, future LIS professionals to see career paths, policy makers to understand capacity gaps in digital library development.

Keywords: Automation, Economic prospects, e-Library Consultants, Academic libraries, Librarians

Introduction

The automation of academic libraries has become a defining feature of contemporary librarianship, driven by rapid advancements in information and communication technologies (ICTs), the proliferation of electronic information resources, and the demand for efficient access to scholarly content. In Nigeria, academic libraries—particularly those in universities, polytechnics, and colleges of education—have increasingly adopted automated systems such as Integrated Library Management Systems (ILMS), institutional repositories, digital databases, and electronic library (e library) platforms to support teaching, learning, and research.

The implementation of these automated systems has given rise to a specialized category of professionals known as e-library consultants. These consultants—often librarians or ICT specialists with expertise in library automation—provide services such as needs assessment, system selection, software installation, database configuration, staff training, digitization, and ongoing technical support. Through consultancy services, librarians increasingly participate in library automation not only as institutional employees but also as independent or contracted professionals pursuing economic gain.

For Nigerian librarians, the growing demand for automated academic libraries presents important economic prospects. Consultancy in library automation opens opportunities for income diversification, professional specialization, entrepreneurship, and enhanced visibility within the knowledge economy. However, engaging successfully in e-library consultancy requires advanced technical skills, project management competence, and the ability to navigate infrastructural, financial, and organizational challenges common in Nigerian academic institutions.

Despite the growth of library automation projects across Nigeria, there is limited systematic research focusing on the experiences of e-library consultants, particularly in relation to their skills, service delivery processes, economic outcomes, challenges, and future prospects. This paper therefore seeks to fill this gap by examining the economic prospects of automation of academic libraries in Nigeria for librarians, from the perspectives of e-library consultants actively involved in automation projects.

Objectives of the Study

The broad objective of this study is to examine the economic prospects of automation of academic libraries in Nigeria for librarians, using the experiences of e library consultants.

The specific objectives are to:

1. Identify the professional and technical skills possessed by e-library consultants involved in academic library automation in Nigeria.
2. Examine the service delivery processes used by e-library consultants in automating academic libraries.
3. Assess the economic benefits derived by librarians from e-library consultancy services.
4. Examine the challenges faced by e library consultants in the automation of academic libraries in Nigeria.
5. Explore the future prospects of e library consultancy as an economic pathway for librarians in Nigeria.

Research Questions

1. What professional and technical skills should e-library consultants possess in academic library automation in Nigeria?
2. What is the service delivery processes used by e-library consultants in automating academic libraries?
3. What are the economic benefits derived by librarians from e-library consultancy services?
4. What are the challenges faced by e library consultants in the automation of academic libraries in Nigeria?
5. What are the future prospects of e library consultancy as an economic pathway for librarians in Nigeria?

Literature Review

Library automation involves the application of information and communication technologies to perform routine and advanced library operations such as cataloguing, circulation, serials management, electronic resource access, and institutional repository development. Rawayyau (2024) posit that in Nigerian academic libraries, automation has become increasingly important due to pressure from accreditation bodies, the growth of electronic scholarly resources, and the adoption of blended and digital learning models. Nigerian universities have implemented varying degrees of automation using open source systems such as Koha, CDS/ISIS, and proprietary platforms such Virtua and Integrated Technical Systems; however, progress remains uneven across institutions due to infrastructural and financial constraints.

The increasing complexity of library automation projects has led to the rise of e-library consultancy as a specialized professional practice. E-library consultants provide services including system analysis, software installation, customization, digitization, data migration, staff training, and technical support. These consultants, according to Ashikuzzaman (2024) are often librarians with strong ICT competencies who leverage automation projects as entrepreneurial ventures. In Nigeria, where many academic libraries lack in-house technical expertise, consultancy services have become central to automation initiatives, thereby creating a pathway for librarians to generate income beyond salaried employment.

Successful e-library consultants possess a blend of librarianship, technical, and entrepreneurial skills. These include proficiency in integrated library management systems, database management, metadata standards, digitization technologies, networking, and basic programming or scripting (Dube et al., 2024). Soft skills such as communication, documentation, project management, and user training are equally critical for effective service delivery. Continuous professional development is emphasized as essential due to the rapidly evolving technological environment (Pierce, 2025).

E-library consultancy provides librarians with opportunities for economic gain through consultancy fees, system maintenance contracts, training workshops, and long term support arrangements. Bouchrika (2026) indicates that librarians engaged in consultancy enjoy greater professional autonomy, diversified income streams, and enhanced marketability within and beyond academic institutions. In the Nigerian context, where public sector salary structures are rigid, consultancy offers an alternative economic model through which librarians can monetize their expertise and technical skills.

Despite its economic potential, e-library consultancy in Nigeria faces significant challenges. These include inadequate funding of academic libraries, erratic power supply, poor internet connectivity, delayed payment of consultancy fees, and resistance to change among library staff (Rawayau, 2024). Institutional bureaucracy and lack of clear contractual frameworks also pose risks to consultants, often affecting project timelines and financial sustainability. These challenges emphasize the need for supportive institutional and policy environments for consultancy based automation initiatives.

The prospects of e-library consultancy in Nigeria appear promising due to the continued expansion of higher education, increased demand for digital library services, and growing emphasis on research visibility through institutional repositories and electronic databases. Pierce (2025) captures it all by indicating that emerging technologies such as cloud computing, artificial intelligence, and research data management are expected to broaden the scope of consultancy services. Scholars argue that librarians who strategically acquire advanced ICT skills and entrepreneurial competencies will remain economically relevant and professionally influential in the evolving academic library setting (Salubi, 2023).

Methodology

A group of five (5) consultants of the Belt e-library Consultants in Jos, Plateau State were approach for this research. This study adopts a qualitative exploratory research design to examine the economic prospects of automation of academic libraries for librarians in Nigeria from the perspectives of e-Library consultants. Data is collected through semi structured web link interviews with purposively selected consultants and analyzed using thematic analysis.

Results

Responses to semi structured interview on the Economic Prospect of Automation of Academic Libraries for Librarians in Nigeria were thematically organized below:

Background Information

Participant 1 (p1)

I am a library officer and e-library consultant with experience in library automation, digital repositories, and electronic resource management. I support institutions in implementing systems such as Koha, DSpace, and Open Journal Systems, while providing training and guidance on digital library services, open access, and scholarly communication.

Participant 2 (p2)

I am a Server and Network Administrator. I am involved in server installation, library web design, and cloud computing.

Participant 3 (p3)

I function as e-library Consultant with the portfolio of Server Administrator and Network Administrator. Parts of my work are koha installation and configuration, provides security for library network, and computer programming.

Participant 4 (p4)

I serve as Director of trainings and Electronic Cataloguer. I identify e-library training needs of clients and develop programmes for such trainings.

Participant 5 (p5)

I am the E-library Project Manager of Belt e-Library Cosultant, an Electronic Cataloguer and Information Manager. I provide parameters for electronic cataloguing on library software, ensures seamless interaction between human and computer of Library Management Systems and coordinates the entire computerization project of a library.

Theme 1: Skills Required for E-Library Consultancy

Librarians need skills in digital literacy, library automation, data management, information literacy instruction, research support, artificial intelligence, digital preservation, project management, and communication. Continuous learning and adaptability are also essential to remain relevant in an automated academic library environment. (p1)
Let librarian be conversant with the operation of the library software by collaborating with ICT personnel for software installation and programming. (p2)
e-library consultant sure requires skills in computer networking, programming and excellent human relations. (p3).
Software installation and knowledge of marketing the e-library work. (p4)
Librarians need to be skillful in the use of library management system modules, excel, library software installation, computer networking and programming. (p5)

Theme 2: Service Delivery Process

Networking is the backbone before other things such as apps installation (p2)
My automation workflow includes assessing library needs, implementing and configuring digital library systems such as Koha and DSpace, digitizing resources, integrating electronic databases, training staff, monitoring system performance, and providing ongoing technical support and system improvements. (p1)
Get library automation job first, negotiate mode of payment for the job, purchase hardware and software, then the job proper. (p3)
Library automation begins with preliminary investigation of the library available resources, preparation and submission of proposal, approval of proposal, request for initial payment of the project, then real work start by networking, Software installation, Customization, completion of the project, and ask for the balance of payment. (5)
Hardware and software installation, then training in the use of the library software. (p4)

Theme 3: Economic Benefits of Library Automation Consultancy

The librarian is exposed to field work and taste of professional reward. (p3)

Yes. Automation increases the economic value of librarians by reducing routine tasks and allowing them to focus on higher value services such as research support, digital resource management, data curation, information literacy, and technology integration. This makes librarians more valuable to their institutions and users. (p1)

For a salary earner, the benefit is extra money in the pocket.(p2)

Improved productivity, and career opportunities. Automation influences the earning capacity of librarians. (p5)

The economic benefit is financial gain, especially when paid as soon as project is completed. (p4)

Theme 4: Challenges Facing E-Library Consultants

There is constant experience of fluctuation in the prices of automation equipment. (p2)

Logistics challenges in the face of high cost of petrol price in Nigeria. (p3)

Institutional support of library automation is low, as such proposal for automation is at times thrown into the trash. (p4)

Prolong period before financial backing of library automation after submission of proposal. (p5)

Automation poses challenges such as the need for continuous training, the risk of skill obsolescence, increased competition for technology focused roles, and possible reduction of routine positions for librarians who do not adapt to digital technologies. (p1)

Theme 5: Economic Prospects of Automation

Library automation has created new roles in systems administration, digital libraries, electronic resource management, research support, and data management. While some routine tasks have been reduced, automation has shifted librarians toward technology driven and user focused services rather than replacing them. Automation creates opportunities in library systems administration, digital repository management, ICT consulting, staff training, research support, data management, digitization projects, electronic resource management, and freelance technology services for libraries. (p1)

Librarians would be involved in independent specialized professional practice such as digital preservation, hardware and software installations for a fee. (p5)

Library automation work is available but librarians have to search for it. (p3)

e-library consultancy will continue to be relevant because scholars in universities want their published works uploaded in institutional repository for visibility. (p2).

The job opportunity is always available, but the will power to automate remain a challenge (p4)

Discussion

The profile of participants (p1 to p5) showed a conglomerate of experts with practical experience in library automation consultancy. Each participant has responsibilities that span from automation planning (p5) to final training of personnel (p4) for utilization of installed and configured library management software (LMS), (p1, p2, and p3).

Participants agreed that librarians with interest in e-library consultancy require skills in Information and communication technology (ICT), saying that "*Librarians need to be skillful in the use of library management system modules, excel, library software installation, computer networking and programming." (p5), "e-library consultant sure requires skills in computer networking, programming and excellent human relations." (p3),* which is in line with Dube, Rammutloa and Matatiele (2024) recommendation that academic librarians need practical experience in web development and database management to facilitate information technology usage in the digital age. This implies that librarians, at whatever level of their profession, require continuous up skilling to stay economically relevant in automation consultancy services.

The findings in theme 2: service delivery process revealed Library automation workflow commences with networking and ends with customization from the quotes of the participants

indicating "*Networking is the backbone before other things such as apps installation," (p2). "My automation workflow includes .... monitoring system performance, and providing ongoing technical support and system improvements." (p1).* This denotes installations are done on machines that are connected and only software that is installed could be customized.

Librarians into automation consultancy job gain financially from their work. *"For a salary earner, the benefit is extra money in the pocket," (p2). "Yes. Automation increases the economic value of librarians by reducing routine tasks and allowing them to focus on higher value services such as research support, digital resource management, data curation, information literacy, and technology integration. This makes librarians more valuable to their institutions and users," (p1),* quoted the participants. These extracts from the participants corroborates Bouchrika's (2026) point that AI and automation are reshaping library service by fostering specialization among librarians for improved wages.

The major challenge of automation for librarians in Nigeria is financial support; either it is delayed or lack of budget for it as mentioned by the participants that "*Institutional support of library automation is low, as such proposal for automation is at times thrown into the trash," (p4). "Prolong period before financial backing of library automation after submission of proposal," (p5*). These declarations by the participants are in alignment with Siddique and Mahmood (2016) assertion that financial constraint hinders software and hardware acquisition in higher educational setups.

Comments from all participants point to abundant economic prospect in automation for Nigerian librarians. They disclose that "*Automation creates opportunities in library systems administration, digital repository management, ICT consulting, staff training, research support, data management, digitization projects, electronic resource management, and freelance technology services for libraries," (p1). "Librarians would be involved in independent specialized professional practice such as digital preservation, hardware and software installations for a fee," (p5).*

Conclusion

The workflow in automation requires librarians having skills in Information and Communication Technology. Entrepreneurial engagement in Automation increases the economic value of librarians in Nigeria by improving their earning capacity.

Recommendations

In view of the preceding results, it is recommended that LIS schools should pursue vigorously entrepreneurial studies inclusion in academic curriculum to enable students have business librarianship in their mindset.

Libraries need to collaborate with e-library consultants for the establishment of a seamless library automated operations.

Budding LIS professionals should think out of the box for professional growth beyond the library environment.

Host institutions of libraries need to support library automation proposals, administratively and financially, as the library's growth is an extension of the overall development of the institution.

REFERENCES

Ashikuzzaman, M. (2024). The impact of artificial intelligence on library professionals: Threat or opportunity? Library & Information Science Education Network. https://www.lisedunetwork.com/the-impact-of-artificial-intelligence-on-library-professionals-threat-or-opportunity/

Bouchrika, I. (2026). AI, automation, and the future of library science degree careers. Research.com. https://research.com/advice/ai-automation-and-the-future-of-library-science-degree-careers.

Dube, T. V., Rammutloa, M. W., & Matatiele, R. (2024). Skills and competencies of academic librarians to use information technology tools in the digital era: A systematic literature review. *Information Development*, 1–24. https://doi.org/10.1177/02666669241302054.

Pierce, D. (2025). AI: Helping librarians work smarter, not harder. Library Journal. https://www.libraryjournal.com/story/ai-helping-librarians-work-smarter-not-harder-lj250326.

Rawayau, U. H. (2024). The pervasive challenges of ICT integration in Nigerian library environments. *International Journal of Innovative Information Systems & Technology Research*, 12(2), 60–65.

Saddique, N. & Mahmood, K (2016). Combating problems related to library software in higher education institutions of Pakistan: An analysis of four groups. *Malaysian Journal of Library & Information Science,* Vol. 21, no. , 2016: 35-51.

Salubi, O. (2023). Transforming libraries and information professionals for the Fourth Industrial Revolution in developing countries. Alexandria: *The Journal of National and International Library and Information Issues,* 35(1–2), 3–18. **https://doi.org/10.1177/09557490231197971**.

Fee-based library services as a catalyst for enhanced service delivery in Nigerian university libraries in the era of artificial intelligence: A systematic literature review

Paul Grace Vanje[1], Elvis Olomu[2] & Ejiro Onajite[3]
[1&2]Federal Polytechnic Orogun,
Delta State, Nigeria.
[1]gracevanje@gmail.com
[2]elvisolomu@gmail.com
[3]dorcasejiro@gmail.com

Abstract
This study systematically reviewed the literature on fee based library services as a catalyst for enhanced service delivery in Nigerian university libraries in the era of artificial intelligence (AI). The review examined the fee based services currently provided by university libraries, their contribution to service delivery, and AI enabled fee based services that can strengthen library sustainability and innovation. A Systematic Literature Review guided by the PRISMA 2020 framework was adopted. Relevant studies published between 2018 and 2026 were retrieved from Scopus, Web of Science, ERIC, Library and Information Science Source, ScienceDirect, and Google Scholar. Following the screening and eligibility process, 35 empirical studies met the inclusion criteria and were synthesized using a narrative thematic approach. The findings revealed that Nigerian university libraries predominantly provide conventional fee based services such as photocopying, binding, printing, internet access, and consultancy services. These services contribute to improved service quality, operational efficiency, financial sustainability, and user satisfaction. The review further identified AI enabled opportunities including automated literature searching, systematic review support, research data management, AI assisted bibliometric analysis, metadata generation, digital content creation, virtual reference services, AI literacy training, and scholarly communication support. However, inadequate funding, weak digital infrastructure, limited AI competencies, and the absence of institutional AI governance frameworks continue to constrain implementation. The study concludes that integrating AI into fee based library services can diversify revenue sources, enhance research support, and improve service delivery. It recommends increased investment in digital infrastructure, continuous professional development, curriculum reform, and institutional AI governance to promote sustainable and innovative library services in Nigerian university libraries.

Keywords: Artificial intelligence, fee based library services, academic libraries, university libraries, service delivery, digital scholarship, Nigeria, systematic literature review.

Introduction
The rapid advancement of artificial intelligence (AI) is transforming higher education and reshaping the operations of academic libraries worldwide. AI technologies such as machine learning, natural language processing, generative AI, intelligent automation, and predictive analytics are increasingly being integrated into library services to enhance information organization, digital content creation, user engagement, and research support (Alajmi & Alhajri, 2021; Ahmed & Ali, 2020; Liu et al., 2020). These technologies have improved the efficiency, accuracy, and responsiveness of library operations while enabling librarians to deliver innovative services that meet the evolving information needs of users. As universities

continue to embrace digital transformation, academic libraries are expected to provide high quality, technology driven services despite persistent financial and operational constraints.

In developed countries, academic libraries have increasingly diversified their revenue streams in response to rising operational costs and growing demand for specialized information services. Universities in the United States, the United Kingdom, Canada, and Australia offer value added fee based services such as research data management, bibliometric analysis, systematic review support, digitization, scholarly publishing assistance, digital preservation, and information consultancy (Olaseigbe et al., 2025; Tan, 2021; Marshall & Bly, 2019). These services have enabled libraries to supplement institutional funding, improve service quality, and strengthen their contribution to teaching, learning, and research while maintaining equitable access to core library resources. The experiences of these countries demonstrate that well managed fee based services can enhance the financial sustainability and long term relevance of academic libraries.

University libraries play a central role in supporting teaching, learning, research, and community service by acquiring, organizing, preserving, and disseminating information resources. However, many university libraries, particularly in developing countries such as Nigeria, continue to face challenges including inadequate funding, rising costs of information resources, obsolete infrastructure, insufficient technological facilities, and increasing user expectations (Ukaegbu & Okwu, 2023; Ukaegbu & Wegwu, 2019; Saka et al., 2014). These challenges have been exacerbated by the growing demand for digital resources, electronic databases, institutional repositories, research support services, and AI enabled library applications. Consequently, traditional funding mechanisms are often insufficient to sustain the quality and expansion of library services, prompting many university libraries to explore alternative sources of revenue (Olaseigbe et al., 2025).

Fee based library services have emerged as one of the strategies adopted by university libraries to supplement limited institutional funding and improve service delivery (Ejezie & Okeke, 2021). Such services involve charging users for specialized library products and services that extend beyond the institution's core statutory responsibilities. Common examples include document delivery, interlibrary loan, printing and photocopying, internet access, binding and lamination, plagiarism detection, digitization services, research consultancy, bibliometric analysis, institutional repository support, training workshops, and information literacy programmes. Revenue generated from these services can be reinvested in improving library infrastructure, expanding digital collections, acquiring emerging technologies, and enhancing staff capacity (Olaseigbe et al., 2025). When carefully implemented, fee based services provide libraries with additional financial resources without undermining their primary mission of equitable access to information.

The emergence of AI has further expanded the scope and value of fee based library services. AI powered tools now enable librarians to offer advanced services such as automated literature searching, systematic review support, research data management, AI assisted bibliometric analysis, metadata generation, digital content creation, virtual reference services, research impact assessment, and AI literacy training (Abu & Musa, 2025; Ogungbenro et al., 2025; Yusuf et al., 2022). Generative AI applications also support the development of research guides, instructional materials, digital learning resources, and scholarly communication services that can be delivered as premium value added offerings. These technologies improve service efficiency, reduce routine workloads, enhance research productivity, and create new opportunities for libraries to generate revenue through

innovative digital services. Consequently, AI is repositioning university libraries from traditional information providers to technology enabled knowledge and innovation hubs capable of delivering high quality, user centred, and financially sustainable services while strengthening institutional teaching, learning, research, and scholarly communication (Obi, 2026; Ogungbenro et al., 2025; Stephen & Chatterjee, 2025).

In contrast to the progress recorded in developed countries, the adoption of fee based AI enabled services in Nigerian university libraries remains relatively limited. Existing studies identify persistent barriers including inadequate funding, poor technological infrastructure, unstable internet connectivity, insufficient AI competencies among librarians, weak institutional policies, and limited investment in digital innovation (Igbo et al., 2025; Lakan, 2025). These constraints reduce libraries' capacity to introduce sustainable revenue generating services and fully exploit AI technologies for enhanced service delivery. Although many Nigerian university libraries provide traditional fee based services such as photocopying, printing, internet access, and binding, more advanced AI enabled services remain largely underdeveloped.

Despite growing scholarly interest in fee based library services, library sustainability, and AI adoption, the literature remains fragmented. Existing studies have largely examined these issues independently, with limited synthesized evidence on how fee based library services can enhance service delivery within the context of AI driven transformation in Nigerian university libraries (Igbo et al., 2025; Olaseigbe et al., 2025). Furthermore, little attention has been given to lessons that can be drawn from developed countries where AI supported value added library services have become increasingly institutionalized. This systematic literature review therefore synthesizes existing empirical evidence on fee based library services as a catalyst for enhanced service delivery in Nigerian university libraries in the era of artificial intelligence. Specifically, the review examines the range of fee based services offered by university libraries, lessons from developed countries, the contribution of these services to library performance and sustainability, the influence of AI technologies on fee based service delivery, the challenges affecting implementation, and the strategies required to strengthen sustainable, innovative, and user centered library services. The review provides evidence based insights to guide library managers, university administrators, policymakers, and professional associations in developing financially sustainable and AI enabled library services that can effectively support teaching, learning, research, and innovation in Nigerian universities.

Statement of the Problem

The rapid advancement of AI is reshaping academic libraries by expanding opportunities for innovative service delivery, digital scholarship, and value added information services. AI technologies have enhanced research support, metadata generation, digital content creation, virtual reference services, and data management, enabling libraries to deliver more specialized and user centred services. In developed countries, these advances have been accompanied by the expansion of fee based library services, allowing university libraries to diversify revenue sources, improve financial sustainability, and strengthen teaching, learning, and research. However, the situation in many developing countries, including Nigeria, remains markedly different. Nigerian university libraries continue to face persistent challenges, including inadequate funding, obsolete infrastructure, insufficient technological facilities, unreliable internet connectivity, and limited investment in AI technologies. These constraints have hindered the introduction of innovative fee based services and the effective integration of AI into library operations, making it difficult to meet users' evolving

information needs while sustaining high quality service delivery. Although numerous studies have examined fee based library services, library sustainability, and AI adoption independently, the existing literature remains fragmented and provides limited synthesized evidence on how fee based library services can enhance service delivery in Nigerian university libraries within the context of AI driven transformation. This gap underscores the need for a systematic literature review to examine fee based services, AI enabled service innovation, implementation challenges, and strategies for strengthening financially sustainable and user centered academic library services in Nigeria.

Research Questions

The following research questions were answered in this study:

- What fee based library services are provided in university libraries?
- How do fee based library services contribute to enhanced service delivery in university libraries?
- What AI enabled fee based library services can university libraries in Nigeria provide?

Literature review

Fee-based library services provided in university libraries

Empirical evidence from Nigeria indicates that the provision of fee based library services remains largely concentrated on traditional services, with relatively limited adoption of technology driven and AI enabled offerings. Idubor and Stella (2025), drawing on the Resource Based View (RBV) theory, found that Nigerian university libraries provide fee based services such as binding, photocopying, and user registration, whereas more specialized services, including data analysis and laptop lending, are rarely offered. The study concluded that although fee based services contribute to improved service delivery, their scope remains limited because of inadequate technological resources and institutional capacity. Similarly, Odusanya et al. (2024) reported that private university libraries in Ede, Osun State, offered fee based services including computer typesetting, consultancy services, online searching, internet browsing, and overdue fines, demonstrating a gradual expansion from conventional to technology supported services. Likewise, Tsenongu and Otuza (2024) found that private university libraries in Akwa Ibom State primarily relied on traditional revenue generating services such as photocopying, membership registration, library card replacement, overdue fines, lamination, and binding, with little evidence of advanced digital or AI enabled services. Furthermore, Nuhu and Aliyu (2022) investigated fee based electronic information services in Nigerian federal university libraries and revealed that only the University of Lagos had partially implemented electronic fee based services, specifically internet access and laptop lending. Collectively, these studies suggest that while fee based services have become an important strategy for supplementing library funding, their implementation remains largely conventional, highlighting substantial opportunities for Nigerian university libraries to diversify their service portfolios through AI enabled, value added services that can enhance service delivery, research support, and financial sustainability.

Contribution of fee-based library services to enhanced service delivery

Empirical evidence consistently demonstrates that fee based library services contribute significantly to enhanced service delivery in university libraries by improving service quality, operational efficiency, financial sustainability, and user satisfaction. Idubor and Stella (2025) found that fee based services positively influence both the quality and

efficiency of library service delivery, with the availability of a wider range of fee based services significantly enhancing users' perceptions of service quality in Nigerian university libraries. Similarly, Odusanya et al. (2024) reported that fee based library services have a meaningful positive impact on service delivery in private university libraries by expanding access to specialized information services. Likewise, Tsenongu and Otuza (2024) observed that fee based services increase internally generated revenue, improve service standards, and promote innovation in library operations. Supporting these findings, Nuhu and Aliyu (2022) revealed that the implementation of fee based electronic information services at the University of Lagos generated additional income and increased users' patronage of library services. Collectively, these studies indicate that fee based library services provide an important mechanism for strengthening service delivery, improving resource availability, and enhancing the long term sustainability of university libraries.

AI enabled fee based library services that university libraries can provide

Empirical evidence indicates that AI is creating new opportunities for university libraries to expand fee based service delivery through innovative, technology driven offerings. Across the reviewed studies, AI technologies have been increasingly integrated into reference services, research support, instructional services, workflow automation, metadata management, and scholarly communication, resulting in improved efficiency, faster service delivery, enhanced personalization, and increased research productivity (Sheikh, 2026; Egbe, 2026; Kim, 2025). Luo (2025) reported that academic librarians increasingly utilize generative AI for literature searching, brainstorming, drafting instructional materials, and supporting reference services, while Kim (2025) observed that AI powered chatbots and intelligent virtual assistants have transformed academic libraries into proactive research and knowledge support centres. The reviewed literature further demonstrates that these technological advancements provide opportunities for university libraries to introduce premium AI enabled services. These include automated literature searching and advanced search strategy support (Boateng, 2024), systematic review assistance through AI supported screening and evidence mapping (King's College London Libraries & Collections, 2025), research data management (Mwantimwa & Msoffe, 2025), AI assisted bibliometric analysis and research impact assessment (Hussain & Ahmad, 2024), metadata generation for institutional repositories, digital content creation, virtual reference services and AI chatbots (Tella, 2023), AI literacy training (Lo, 2024), and scholarly communication support, including manuscript preparation and research dissemination (Raghavendra et al., 2025). Collectively, these studies suggest that AI enabled fee based services can diversify library revenue, strengthen institutional research support, improve operational efficiency, and enhance user satisfaction. Nevertheless, successful implementation depends on skilled librarians, robust digital infrastructure, and appropriate ethical oversight to ensure responsible, accurate, and trustworthy AI supported service delivery.

Methodology

Research Design

This study adopted a Systematic Literature Review (SLR) design to synthesize existing evidence on fee-based library services and their contribution to enhanced service delivery in Nigerian university libraries within the context of AI. A systematic literature review was considered appropriate because it enables the identification, selection, critical appraisal, and synthesis of relevant evidence in a transparent, rigorous, and reproducible manner while minimizing selection bias. The review also facilitates the identification of emerging trends,

research gaps, and future directions regarding the integration of AI into fee-based library services.

Review Protocol

The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The PRISMA framework guided the identification, screening, eligibility assessment, and inclusion of studies to ensure methodological transparency, consistency, and reproducibility throughout the review process.

Data Sources

A comprehensive literature search was conducted between 10 June and 25 June 2026, with the final search completed on 25 June 2026. Six major scholarly databases were searched because of their broad coverage of library and information science, higher education, management, and technology-related literature.

The databases searched were:

- Scopus
- Web of Science
- Library and Information Science Source (EBSCOhost)
- ERIC
- ScienceDirect
- Google Scholar

These databases were selected because they index high-quality peer-reviewed literature relevant to university libraries, AI, library management, and service innovation.

Search Strategy

The search strategy employed Boolean operators (**AND**, **OR**) and truncation where appropriate. The principal search terms included:

- "Fee-based library services"
- "Revenue generation"
- "Income generating services"
- "Cost recovery"
- "Academic libraries"
- "University libraries"
- "Artificial Intelligence"
- "AI"
- "Library services"
- "Service delivery"
- "Nigeria"

An example of the search string was:

("Fee-based library services" OR "Income generating services" OR "Cost recovery") AND ("University libraries" OR "Academic libraries") AND ("Artificial Intelligence" OR AI) AND ("Service delivery") AND Nigeria

The search was limited to studies published between 2018 and June 2026. Retrieved records were exported into Microsoft Excel for organization, duplicate identification, and screening.

Eligibility Criteria

Studies were selected using predefined inclusion and exclusion criteria.

Inclusion Criteria

Studies were included if they:

- were published in peer-reviewed journals or scholarly books/book chapters;
- were published between 2018 and 2026;

- were written in English;
- focused on university or academic libraries;
- examined fee-based library services, cost recovery, revenue generation, or paid information services;
- discussed AI or digital technologies where relevant to library service delivery; and
- reported empirical findings or systematic, scoping, or narrative reviews relevant to the study objectives.

Exclusion Criteria

Studies were excluded if they:

- were conference abstracts, editorials, opinion papers, commentaries, or book reviews;
- were duplicate records;
- were published in languages other than English;
- focused on non-library settings;
- did not address fee-based library services or enhanced library service delivery; or
- lacked sufficient methodological information.

Study Selection and Screening

The study selection process followed the four stages recommended by the PRISMA 2020 framework.

Identification

Relevant studies were retrieved from the selected databases using the predefined search strategy.

Screening

Duplicate records were removed, after which titles and abstracts were screened against the inclusion and exclusion criteria.

Eligibility

The full texts of potentially eligible articles were retrieved and assessed independently using the predefined eligibility criteria.

Inclusion

Studies meeting all eligibility requirements were included in the final synthesis.

A PRISMA 2020 flow diagram was used to document the number of records identified, screened, excluded, and included at each stage.

Data Extraction

Data extracted from each eligible study included the authors, publication year, country of study, study objectives, research design, study setting, types of fee-based library services investigated, reported contributions of fee-based services to library service delivery, AI-enabled fee-based library services identified, implementation challenges, and the key findings relevant to the research questions. The extracted information was organized in Microsoft Excel and subsequently synthesized using thematic analysis.

Table 1: Characteristics of the Included Studies

S/N	Author(s)	Year	Study Type	Main Theme
1	Ahmed & Ali	2020	Empirical	AI opportunities and challenges in libraries
2	Alajmi & Alhajri	2021	Systematic Review	AI applications for accessibility
3	Boateng	2025	Empirical	Generative AI access services
4	Egbe	2026	Empirical	AI and reference services
5	Hussain & Ahmad	2024	Bibliometric Study	AI research trends in academic libraries
6	Igbo et al.	2025	Empirical	AI adoption requirements and challenges
7	Kim	2025	Empirical	Generative AI in academic libraries
8	Liu, Zhang & Li	2020	Empirical	AI-powered virtual reference services
9	Lo	2025	Review	Generative AI and scholarly publishing
10	Luo	2025	Survey	Librarians' use of generative AI
11	Marshall & Bly	2019	Conceptual	Intelligent information spaces
12	Mwantimwa & Msoffe	2025	Scoping Review	Generative AI in library operations
13	Obi	2026	Systematic Review	AI-enhanced library services
14	Ogungbenro et al.	2025	Empirical	AI in cataloguing and information access
15	Raghavendra et al.	2025	Systematic Review	Generative AI in LIS
16	Sheikh	2026	Systematic Review	AI reference services and librarian roles
17	Stephen & Chatterjee	2025	Review	Smart libraries
18	Tan	2021	Case Study	Library chatbots
19	Tella	2023	Systematic Review	AI for reference services
20	Yusuf et al.	2022	Empirical	AI adoption in Nigerian academic libraries
21	Abu & Musa	2025	Literature Review	AI for enhanced service delivery
22	Lakan	2025	Empirical	AI adoption, challenges and prospects
23	King's College London Libraries	2025	Professional Guideline	AI tools in evidence synthesis
24	Idubor & Stella	2025	Empirical	Fee-based library services
25	Ejezie & Okeke	2021	Empirical	Fee-based services
26	Nuhu & Aliyu	2022	Empirical	Electronic fee-based services
27	Odusanya et al.	2024	Empirical	Fee-based service delivery
28	Olaseigbe et al.	2025	Empirical	Sustainable fee-based initiatives
29	Tsenongu & Otuza	2024	Empirical	Fee-based services implementation
30	Ukaegbu & Okwu	2023	Empirical	Library collaboration
31	Ukaegbu & Wegwu	2019	Empirical	ICT resources in libraries

Quality Assessment

The methodological quality of the included studies was assessed using the appropriate Joanna Briggs Institute (JBI) Critical Appraisal Checklist according to each study's research design. The appraisal considered the suitability of the research design, sampling procedures, data collection methods, analytical techniques, validity and reliability of findings, and overall methodological rigor. Based on the appraisal outcomes, studies rated as low methodological quality were excluded from the final synthesis, while studies rated as moderate or high quality were retained. Only studies that met the predefined methodological quality threshold were retained for the final synthesis. Consequently, 31 studies satisfied both the eligibility criteria and quality assessment requirements and were included in the qualitative synthesis.

Data Synthesis

Findings were synthesized using narrative thematic synthesis because the included studies employed diverse research designs, settings, and outcome measures, making statistical meta-analysis inappropriate. The thematic synthesis focused on:

- Fee-based library services provided in university libraries;
- The contribution of fee-based library services to enhanced service delivery in university libraries; and
- AI-enabled fee-based library services that can be implemented in Nigerian university libraries.

The synthesis enabled comparison of findings across different institutional and geographical contexts, facilitating the identification of recurring themes, emerging trends, similarities, differences, and gaps in the existing literature.

Limitations of the Review

This review was limited to English-language studies published between 2018 and 2026 and indexed in the selected databases. Grey literature, dissertations, conference proceedings, unpublished reports, and other non-peer-reviewed publications were excluded. Consequently, some relevant studies may not have been captured. Nevertheless, the selected databases provided comprehensive coverage of high-quality literature relating to fee-based library services, artificial intelligence, and service delivery in university libraries.

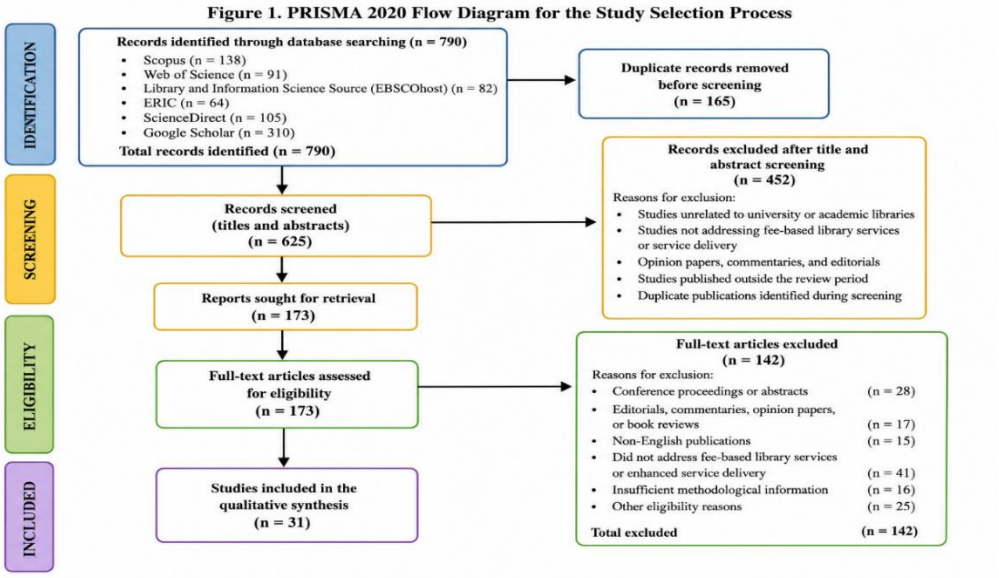


Figure 1. PRISMA 2020 flow diagram illustrating the study selection process.

Figure 1 presents the PRISMA 2020 study selection process employed in this review. A total of 790 records were identified through searches of six electronic databases. Following the removal of 165 duplicate records, 625 records remained for title and abstract screening. During the screening stage, 452 records were excluded because they did not meet the inclusion criteria. Subsequently, 173 full-text articles were assessed for eligibility. Of these, 142 articles were excluded for reasons including publication type, language, insufficient methodological information, and lack of relevance to the review objectives. Consequently, 31 studies met all eligibility and quality assessment criteria and were included in the final qualitative synthesis.

PRISMA Flow Summary

Identification

- Records identified through database searching (n = 790)
    - Scopus (n = 138)
    - Web of Science (n = 91)
    - Library and Information Science Source (EBSCOhost) (n = 82)
    - ERIC (n = 64)
    - ScienceDirect (n = 105)
    - Google Scholar (n = 310)
    - Duplicate records removed before screening (n = 165)

Screening

- Records screened (titles and abstracts) (n = 625)
- Records excluded (n = 452)

Eligibility

- Full-text articles assessed for eligibility (n = 173)
- Full-text articles excluded (n = 142)
    - Conference proceedings or abstracts (n = 28)
    - Editorials, commentaries, opinion papers, or book reviews (n = 17)
    - Non-English publications (n = 15)
    - Studies not addressing fee-based library services or enhanced service delivery (n = 41)
    - Insufficient methodological information (n = 16)
    - Other reasons not meeting the eligibility criteria (n = 25)

Included

- Studies included in the qualitative synthesis (n = 31)

Results

Fee-based library services provided in university libraries

The reviewed studies indicate that university libraries predominantly provide conventional fee based services, with relatively limited adoption of technology driven and AI enabled services. Commonly reported services include photocopying, binding, printing, internet access, online searching, consultancy services, user registration, overdue fines, library card replacement, lamination, and laptop lending. Although some private and federal university libraries have expanded into electronic information services such as online searching and internet access, advanced digital services remain uncommon. Overall, the findings suggest that fee based services in Nigerian university libraries are still largely traditional and have not fully evolved to meet the growing demand for technology enabled and research oriented library services.

Contribution of fee-based library services to enhanced service delivery

The reviewed literature consistently demonstrates that fee based library services contribute positively to university library service delivery. The studies indicate that these services improve operational efficiency, generate additional revenue, enhance the quality of library services, increase users' patronage, and promote service innovation. Revenue generated from fee based services enables libraries to support infrastructure development, maintain existing services, and improve access to specialized information resources. Overall, the evidence suggests that fee based services represent an important strategy for strengthening the financial sustainability and effectiveness of university libraries.

AI-enabled fee based library services that university libraries can provide

The review shows that artificial intelligence has significantly expanded opportunities for university libraries to introduce innovative fee based services. The most frequently identified AI enabled services include automated literature searching, systematic review support, research data management, AI assisted bibliometric analysis, research impact assessment, metadata generation, digital content creation, virtual reference services, AI powered chatbots, AI literacy training, and scholarly communication support. These services have been reported to improve service efficiency, reduce routine workloads, enhance research productivity, and provide personalized user support. The findings further indicate that AI enabled services have considerable potential to diversify library revenue while strengthening teaching, learning, research, and institutional visibility. However, their successful implementation depends on adequate digital infrastructure, skilled librarians, institutional support, and appropriate ethical and governance frameworks.

Discussion

Fee-based library services provided in university libraries

The findings indicate that fee based library services in Nigerian university libraries remain largely concentrated on conventional services such as photocopying, binding, printing, internet access, and consultancy, with relatively limited integration of technology driven and AI enabled services. This suggests that although university libraries recognize the importance of internally generated revenue, they have yet to fully exploit emerging digital technologies to diversify their service portfolios. The predominance of traditional services may reflect persistent challenges such as inadequate funding, poor technological infrastructure, insufficient digital competencies, and weak institutional support for innovation. These findings are consistent with Idubor and Stella (2025), who found that Nigerian university libraries primarily provide conventional fee based services, with limited provision of specialized services such as data analysis and laptop lending. Similarly, Tsenongu and Otuza (2024) observed that most private university libraries continue to rely on traditional revenue generating services including photocopying, binding, and library registration. The findings therefore suggest that Nigerian university libraries need to transition from conventional fee based services to technology enabled and knowledge intensive services that better support contemporary teaching, learning, and research.

Contribution of fee-based library services to enhanced service delivery

The findings demonstrate that fee based library services contribute significantly to improved service delivery by generating additional revenue, enhancing operational efficiency, improving service quality, and increasing user patronage. This implies that fee based services have become an important mechanism for addressing persistent financial constraints confronting university libraries. Revenue generated through these services enables libraries to maintain infrastructure, expand collections, improve access to digital resources, and

introduce innovative services that may not be adequately supported through institutional funding alone. These findings corroborate those of Idubor and Stella (2025), who reported that fee based services positively influence both the quality and efficiency of library service delivery. Likewise, Odusanya et al. (2024) found that fee based services significantly enhance service delivery by expanding access to specialized information services. The findings therefore reinforce the view that well managed fee based services can strengthen the financial sustainability and long term effectiveness of university libraries without compromising their core educational mission.

AI-enabled fee based library services that university libraries can provide

The findings reveal that artificial intelligence presents significant opportunities for university libraries to diversify their fee based services through innovative, technology driven offerings that extend beyond traditional library operations. Services such as automated literature searching, systematic review support, AI assisted bibliometric analysis, research data management, digital content creation, virtual reference services, AI literacy training, and scholarly communication support reflect the evolving role of academic libraries in supporting research and digital scholarship. These findings suggest that AI is not only improving operational efficiency but also creating new revenue generating opportunities through specialized, high value information services. The findings align with Luo (2025), who reported that generative AI enhances literature searching, instructional content development, and research support within academic libraries. Similarly, Kim (2025) found that AI powered chatbots and intelligent virtual assistants are transforming libraries into proactive knowledge and research support centres. The findings therefore indicate that successful implementation of AI enabled fee based services will require sustained investment in digital infrastructure, continuous professional development, institutional commitment, and ethical governance to ensure that AI technologies are deployed responsibly while maximizing their benefits for teaching, learning, research, and institutional sustainability.

Practical implications for academic libraries

The findings of this review have important implications for university administrators, library managers, policymakers, and professional associations. Although fee based library services have enhanced service delivery, their implementation in Nigerian university libraries remains largely conventional. Libraries should diversify their services by introducing AI enabled offerings such as automated literature searching, systematic review support, AI assisted bibliometric analysis, research data management, virtual reference services, and AI literacy training to improve research support, user satisfaction, and revenue generation. Achieving this requires sustained investment in digital infrastructure, AI technologies, reliable internet connectivity, continuous professional development, curriculum reform in Library and Information Science education, and the establishment of institutional AI governance frameworks and ethical guidelines to support responsible AI adoption.

Research gaps and future research directions

Although this review provides a comprehensive synthesis of the existing literature, several important research gaps remain. First, empirical evidence on AI enabled fee based library services is still limited, particularly within African countries and Nigerian university libraries. Most existing studies focus on traditional fee based services or general AI adoption, with relatively few examining the integration of AI into revenue generating library services. Second, the majority of reviewed studies employed descriptive and cross sectional research

designs, providing limited evidence on the long term impact of AI enabled fee based services on library sustainability, research productivity, user satisfaction, and institutional performance. Future studies should therefore adopt longitudinal, mixed methods, and comparative research designs to evaluate the effectiveness and sustainability of AI enabled library services across different institutional contexts. Future research should also investigate users' willingness to pay for AI enabled library services, librarians' readiness and competencies for AI driven service delivery, the cost effectiveness of AI based services, and the development of governance frameworks that address ethical, legal, and privacy concerns associated with AI implementation. Comparative studies between developed and developing countries would further provide valuable insights into best practices for strengthening AI enabled fee based library services in Nigerian university libraries.

Conclusion and Recommendations

This systematic literature review synthesized empirical evidence on fee based library services as a catalyst for enhanced service delivery in Nigerian university libraries in the era of artificial intelligence. The review found that university libraries continue to rely predominantly on traditional fee based services, which contribute to improved service quality, operational efficiency, financial sustainability, and user satisfaction. It also revealed that artificial intelligence offers significant opportunities to diversify library services through innovative offerings such as automated literature searching, systematic review support, AI assisted bibliometric analysis, research data management, digital content creation, virtual reference services, and AI literacy training. These services have the potential to strengthen research support, enhance institutional visibility, improve user satisfaction, and generate sustainable revenue. Despite these opportunities, the adoption of AI enabled fee based services remains constrained by inadequate funding, weak digital infrastructure, limited AI competencies among librarians, and the absence of comprehensive institutional policies and governance frameworks. To maximize the benefits of AI, university libraries should diversify their service portfolios by adopting innovative AI enabled services, while universities and government agencies should invest in digital infrastructure, AI technologies, and continuous staff development. Furthermore, Library and Information Science curricula should incorporate AI related competencies, and institutions should establish appropriate AI governance and ethical frameworks. These measures will strengthen the sustainability, innovation, and relevance of Nigerian university libraries in supporting teaching, learning, research, and scholarly communication.

References

Abu, I. O., & Musa, H. (2025). Artificial intelligence application for enhanced service delivery in academic libraries in Nigeria: An analysis of the literature. *NLA Delta Library Journal, 13*, 13–28.

Ahmed, S., & Ali, M. (2020). Artificial intelligence in libraries: Opportunities and challenges. *Journal of Librarianship and Information Science, 52*(3), 789–801. https://doi.org/10.1177/0961000619870452

Alajmi, B., & Alhajri, N. (2021). Artificial intelligence applications for accessibility in academic libraries: A systematic review. *Library Hi Tech, 39*(4), 821–837. https://doi.org/10.1108/LHT-01-2021-0023

Boateng, F. (2025). The transformative potential of generative AI in academic library access services: Opportunities and challenges. *Information Services & Use, 45*(1–2), 140–147. https://doi.org/10.1177/18758789251332800

Egbe, N. G. (2026). The influence of generative artificial intelligence on academic library reference services: An empirical analysis. *International Journal of Knowledge Stewardship and Information Science, 1*(1), 32–45. https://doi.org/10.5281/zenodo.20681645

Ejezie, J. K., & Okeke, I. E. (2021). Fee based library services: Availability, extent of use, and impediments in federal academic libraries in South East Nigeria. *International Journal of Social Sciences and Humanities Reviews, 11*(1), 62–75.

Hussain, A., & Ahmad, S. (2024). Mapping the Literature on Artificial Intelligence in Academic Libraries: A Bibliometrics Approach. *Science & Technology Libraries*, *43*(2), 131–146. https://doi.org/10.1080/0194262X.2023.2238198

Idubor, I., & Stella, E. (2025). Fee based services as a catalyst for enhanced service delivery in Nigerian university libraries. *Indonesian Journal of Library and Information Science, 6*(2), 110–128.

Igbo, H. U., Imo, N. T., Jidere, U. J., & Ugwu, F. N. (2025). Adopting artificial intelligence in academic library services in Nigeria: Requirements and challenges. *Nigerbiblios: Journal of the National Library of Nigeria, 34*(1), 1–18. https://nigerbiblios.nln.gov.ng/index.php/nigerbiblios/article/view/145

Kim, J. (2025). Academic library with generative AI: From passive information providers to proactive knowledge facilitators. *Publications, 13*(3), 37. https://doi.org/10.3390/publications13030037

King's College London Libraries & Collections. (2025, June 10). *Searching for systematic reviews & evidence synthesis: AI tools in evidence*. https://libguides.kcl.ac.uk/systematicreview/ai

Lakan, L. E. (2025). Utilisation of artificial intelligence tools in Nigerian academic libraries: Adoption, challenges, and prospects. *International Journal of Arts, Languages and Business Studies, 16*, 14–20.

Liu, X., Zhang, Y., & Li, J. (2020). AI powered virtual reference services in academic libraries: Performance and user satisfaction. *College & Research Libraries, 81*(5), 721–736. https://doi.org/10.5860/crl.81.5.721

Lo, L. S. (2025). Generative AI and open access publishing: A new economic paradigm. *Library Trends, 73*(3), 160–176. https://doi.org/10.1353/lib.2025.a961190 (ResearchGate)

Luo, L. (2025, November 15). *How librarians are using generative AI: Insights from a nationwide survey*. San José State University School of Information, Center for Information Research and Innovation. https://ischool.sjsu.edu/ciri-blog/how-librarians-are-using-generative-ai-insights-nationwide-survey

Marshall, C. C., & Bly, S. (2019). From smart libraries to intelligent information spaces. *Proceedings of the ACM on Human Computer Interaction, 3*(CSCW), 1–24. https://doi.org/10.1145/3359305

Mwantimwa, K., & Msoffe, G. (2025). Application of generative artificial intelligence in library operations and service delivery: A scoping review. *Technical Services Quarterly*, *42*(2), 139–168. https://doi.org/10.1080/07317131.2025.2467574

Nuhu, A. K., & Aliyu, J. S. (2022). Fee-based electronic information services and effective service delivery by federal university libraries in Nigeria. *Ghana Library Journal*, *27*(1), 93–103. https://doi.org/10.4314/glj.v27i1.8

Obi, C. (2026). The role of artificial intelligence in enhancing library services: A systematic review. *International Journal of Librarianship, 11*(1), 33–46. https://doi.org/10.23974/ijol.2026.vol11.1.521

Odusanya, T. F., Olaseni, A. T., Ogunkeyede, A. N., & Olaseigbe, Y. F. (2024). Impact of fee based library services on service delivery in private university libraries in Ede, Osun State. *FUOYE Journal of Public Administration and Management, 2*(1), 62–69.

Ogungbenro, O. D., Esse, U. C., Olowoporoku, I., & Christopher, A. (2025). Revolutionizing library services: The impact of artificial intelligence on cataloguing and access to information in Nigeria academic libraries. *Journal of Library Metadata, 25*(2), 99–118. https://doi.org/10.1080/19386389.2025.2475418

Olaseigbe, Y. F., Ozonuwe, O. S., Ogunojemite, A. T., Rotimi, R. A., Giwa, A. O., & Ogundana, A. A. (2025). Self-sustaining library services through strategic fee based initiatives: A roadmap for academic library administrators in Nigeria. *Communicate: Journal of Library and Information Science, 26*(2), 160–170. https://cjolis.org/cjolis/article/view/122

Raghavendra, G., Mallya, J., & Payini, V. (2025). Generative artificial intelligence in library and information science literature: a structured systematic review. *Cogent Education*, *12*(1). https://doi.org/10.1080/2331186X.2025.2591500

Saka, K. A., Musa, H., & Usman, A. N. (2014). Emerging issues in Nigerian university libraries. *Journal of Information, Education, Science & Technology, 1*(2), 62–67.

Sheikh, A. (2026). Generative AI in academic libraries: A systematic review of AI mediated reference services, librarian roles, and user trust. *Majestic Multidisciplinary Science Insight, 1*, 1–12. https://doi.org/10.65080/inprocess

Stephen, G., & Chatterjee, I. (2025). Artificial intelligence driven smart libraries: Enhancing user experience, resource management, and accessibility. *Journal of Advances in Library and Information Science, 14*(4), 320–326.

Tan, K. L. (2021). Chatbots in public libraries: The case of Singapore's "Ask NLB." *Library Technology Reports, 57*(4), 22–29.

Tella, A. (2023). Application of Artificial Intelligence for Reference Services in Academic Libraries: A Global Overview through a Systematic Review of Literature. *Journal of Library Resource Sharing*, *32*(1–5), 11–26. https://doi.org/10.1080/26915979.2023.2281668

Tsenongu, C. T., & Otuza, E. (2024). *Fee based library services and their implementation in private university libraries in Akwa Ibom State, Nigeria*. *Nasarawa Journal of Library and Information Science (NAJLIS), 8*(1), 170–180.

Ukaegbu, B. C. N., & Okwu, E. (2023). Collaboration in Nigerian university libraries: A diagnosis. *International Journal of Library and Information Science Studies, 9*(6), 18–32. https://doi.org/10.37745/ijliss.15/vol9n61832

Ukaegbu, B. C. N., & Wegwu, B. I. (2019). Assessing library resources for ICT skill acquisition in Nigerian universities. *The Information Technologist, 16*(1), 203–209. https://doi.org/10.4314/ict.v16i1

Yusuf, T. I., Adebayo, O. A., Bello, L. A., & Kayode, J. O. (2022). Adoption of artificial intelligence for effective library service delivery in academic libraries in Nigeria. *Library Philosophy and Practice (e Journal)*, Article 6804. https://digitalcommons.unl.edu/libphilprac/6804

Generative Artificial Intelligence and Infopreneurial Intentions among Academic Librarians: A Systematic Review of Emerging Evidence

By

Olise, Florence Nwanne (PhD)
Principal Lecturer, Department of Library and Information Science,
Delta State Polytechnic, Ogwashi-uku,
Delta State, Nigeria.
Email: **floxyolise@gmail.com**

and
Ejitagha Stella
Delta State Polytechnic,
Otefe-Oghara.
Email: **stejitagha@gmail.com**

Abstract

Generative artificial intelligence (GenAI) is widely adopted, creating new opportunities to provide innovative information services, such as infopreneurial activities in academic libraries. Despite increasing academic interest in GenAI, the evidence regarding its impact on the infopreneurial intentions of academic librarians has remained fragmented and largely descriptive. Thus, this systematic review examines evidence on how generative AI influences the infopreneurial intentions of academic librarians. The paper specifically analyses the extent to which academic librarians are using generative AI, how GenAI influences their infopreneurial intentions and practices of librarians, and factors that promote or constrain the use of generative AI for infopreneurial activities among academic librarians. Studies were searched from Databases like ScienceDirect, JSTOR, Library and Information Science Source (EBSCOhost), Emerald, and Google Scholar and other grey literature sources were searched using keywords combined with Boolean operators to form search strings. A PRISMA flow diagram was used to report the study selection process. After screening, a total of 14 empirical studies met the eligibility criteria and were selected for final synthesis. Empirical work clusters in four disconnected areas: GenAI adoption patterns in libraries, AI literacy assessment, entrepreneurial-skills assessment, and infopreneurial-intention measurement. No included study directly tests a GenAI→infopreneurial-intention relationship among practising academic librarians, and none documents actual income-generating behaviour. GenAI use is widespread but task-oriented; entrepreneurial interest among LIS professionals coexists with demonstrable skill and institutional deficits and intention-level evidence is confined to one small graduating-student study with no GenAI component. Therefore, the author recommended that there should be continuing programmes that build capacity in respect of artificial intelligence (AI), amongst other things.

Keywords: Generative Artificial Intelligence; Academic Librarians; Infopreneurship; Information brokerage; Entrepreneurial Intention; Systematic Review

Introduction

The rapid mainstreaming of generative AI following the release of ChatGPT has prompted libraries to reconsider their service portfolios (Hosseini & Holmes, 2023). In parallel, a distinct strand of LIS scholarship has argued that entrepreneurial or "infopreneurial" activity offers information professionals an employment and income pathway beyond salaried posts (Kamarudin et al., 2025; Ramugondo, 2021). Infopreneurship, the creation, management, and commercialisation of information-based services and products (Amakiri, 2025), has been documented as a growing practice in African information sectors, although largely among computer science rather than LIS graduates (Ivwurie & Ocholla, 2016).

The significance of this development extends beyond the use of GenAI as a tool for improving routine library operations. Academic librarians increasingly work within an information environment in which users expect rapid, personalised and digitally delivered services, while libraries themselves face continuing pressure to demonstrate value, innovate services and respond to changing patterns of information consumption. In this environment, GenAI can potentially lower the time, technical effort and production costs associated with developing information products and services. For librarians with appropriate digital, information and entrepreneurial competencies, such capabilities may create possibilities for transforming professional knowledge into services that can be offered beyond the traditional institutional setting. Such possibilities are particularly relevant to infopreneurship, where the value of professional information expertise depends not only on possessing knowledge but also on the ability to package, communicate and commercialise that knowledge.

The potential relationship is nevertheless more complex than simply assuming that access to GenAI will produce greater entrepreneurial activity. Infopreneurship requires more than technological access; it also involves the recognition of opportunities, willingness to assume entrepreneurial roles, relevant skills, confidence and the ability to convert information expertise into viable products or services. Existing LIS research has identified entrepreneurial competencies and intentions among information professionals, including activities such as information consultancy, research support, writing, proofreading and other information-based services (Chiwara-Ndoro & Dewah, 2020; Makinde et al., 2023). At the same time, evidence on GenAI use among library professionals indicates that adoption can be accompanied by limitations in AI literacy, implementation readiness, training and institutional support (Lo, 2024; Luo, 2025). These observations suggest that GenAI may function simultaneously as an enabler and a constraint: it can expand what librarians are technically able to produce, while the extent to which those capabilities translate into entrepreneurial intentions may depend on individual competencies and the surrounding institutional environment.

This distinction is important because the existence of technological opportunities does not necessarily mean that librarians will perceive, pursue or commercialise those opportunities. A librarian may use GenAI regularly for research queries, summarisation, writing or other professional tasks without intending to establish an information-based venture. Conversely, an individual with strong entrepreneurial intentions may identify opportunities for consultancy, content creation, information brokerage or other services but lack the technological competence, institutional support or resources required to act on those intentions. The emerging literature therefore points to a potentially important intersection between technological capability and entrepreneurial orientation, but the nature and strength of that intersection remain uncertain. Establishing what is actually known about this

relationship requires bringing together evidence that has largely developed in separate areas of scholarship.

A far smaller literature connects these two trajectories: GenAI as a lever for entrepreneurial activity by librarians themselves. Studies of GenAI adoption in libraries have examined professional-use patterns (Luo, 2025), adoption determinants in entrepreneurial-support settings (Gupta, 2025), and AI literacy deficits (Lo, 2024), while studies of entrepreneurship in LIS have examined skills and intentions largely without reference to AI (Chiwara-Ndoro & Dewah, 2020; Makinde et al., 2023). Whether GenAI materially increases infopreneurial intention among academic librarians has not been systematically established.

Statement of the Problem

The emergence of generative artificial intelligence has created a new set of possibilities and uncertainties for academic librarians and the wider library and information science profession. While GenAI is increasingly being incorporated into professional activities, much of the existing discussion has focused on its usefulness for improving productivity, information retrieval, research support, content generation and service delivery. At the same time, the changing information economy has increased interest in entrepreneurial and infopreneurial pathways through which information professionals can develop services and products beyond conventional salaried employment. These developments raise an important question about whether the growing capabilities provided by GenAI are translating into greater entrepreneurial intentions among academic librarians. Although it is plausible that GenAI could reduce barriers to creating and delivering information-based services, technological capability alone does not establish entrepreneurial intention, nor does intention necessarily result in actual income-generating behaviour. The central problem, therefore, is that the relationship between GenAI and infopreneurial intentions among academic librarians remains insufficiently understood and is currently surrounded by claims that extend beyond what the empirical evidence can demonstrate.

Three observations motivate this review. First, claims about GenAI-enabled entrepreneurship for information professionals are proliferating in professional venues, resting on extrapolation from general GenAI economics (Demirci et al., 2025; Kanbach et al., 2023) rather than on studies of librarians. Second, the few empirical contributions are methodologically heterogeneous cross-sectional surveys, a qualitative case study, and small-scale intention surveys, and no synthesis has appraised them as a body. Third, critical distinctions that matter for policy and practice between AI use and entrepreneurial intention, between intention and behaviour, and between perceived opportunity and demonstrated commercial success are routinely conflated in the literature. This review therefore asks what the evidence actually demonstrates.

Objectives and Research Questions

Four objectives guide the review: analyse the levels and patterns of GenAI use by academic librarians relevant to information-based entrepreneurship and income-generating activity; synthesise evidence on how GenAI influences infopreneurial intentions and practices in developing, delivering and commercialising information services; investigate the infopreneurial opportunities created by GenAI for academic librarians; and analyse internal and external factors that facilitate or constrain GenAI-enabled information entrepreneurship.

RQ1. What are the levels and patterns of GenAI use by academic librarians for information-based entrepreneurship and income-generating activities?

RQ2. How does GenAI influence the infopreneurial intentions and practices of academic librarians?

RQ3. What infopreneurial opportunities does GenAI create for academic librarians?

RQ4. Which internal and external factors facilitate or constrain GenAI use for information entrepreneurship among academic librarians?

Conceptual and Literature Background

Infopreneurship and entrepreneurial intention. Infopreneurial roles identified in the literature include information consultant, information broker, researcher, information-literacy assistant, writer and proofreader (Chiwara-Ndoro & Dewah, 2020), alongside ICT-oriented ventures such as information-systems consultancy, blogging and advertisement, web development, and database design (Mohammed et al., 2022). Intentions research in the wider entrepreneurship literature is anchored in the Theory of Planned Behaviour, which models intention as the immediate antecedent of behaviour, predicted by attitude, subjective norms and perceived behavioural control (Pauline & Padmavathi, 2019). The TPB has been proposed for librarian entrepreneurial competencies (Anis et al., 2016), but its application to infopreneurial intention among librarians is rare and has not yet incorporated technology-specific antecedents.

GenAI in academic libraries. Surveys show broad adoption for daily professional tasks — text-generating tools being most popular, with productivity gains offset by accuracy and prompt-design challenges (Luo, 2025) — and, in the GCC, high adoption of ChatGPT, Gemini and Microsoft Copilot for research queries, summarisation, research writing and information retrieval, alongside major training gaps (Khan, 2025). AI literacy among academic library employees is modest, with limited hands-on experience and low implementation readiness (Lo, 2024). Earlier, pre-generative work framed libraries' AI futures through the "intelligent library" paradigm (Cox et al., 2018) and reviewed research-library AI engagement (Gasparini & Kautonen, 2022), establishing the service-innovation framing that GenAI scholarship now extends.

GenAI and entrepreneurship. Outside librarianship, GenAI scholarship documents ambiguous labour-market effects: reduced demand for automation-prone freelance writing, translation and image work, with corresponding shifts toward greater specialisation and higher complexity (Demirci et al., 2025; Hui et al., 2024; Teutloff et al., 2025), and business-model innovation through new value propositions, revenue models and reduced marginal content costs (Kanbach et al., 2023). These findings caution against assuming that GenAI uniformly creates rather than erodes income opportunities.

Methodology

Review design

The review follows the systematic-review approach exemplified by Al-Emran et al. (Al-Emran et al., 2018): explicit inclusion/exclusion criteria, defined data sources and search strategies, quality assessment, and data coding and analysis, reported in line with PRISMA flow categories rather than the 2009 version used by the sample (Al-Emran et al., 2018). The sample's reporting conventions transparent search records, a quality checklist, and results organised by research questions were used as a structural guide without copying its wording, tables or references.

Search Strategy

Searches were executed between 15th to 23 August 2026 through an aggregated scholarly discovery service covering peer-reviewed journals, conference proceedings and preprint repositories. Studies were searched from Databases like ScienceDirect, JSTOR, Library and Information Science Source (EBSCOhost), Emerald, and Google Scholar and other grey literature sources were searched using keywords combined with Boolean operators to form search strings. Four concept blocks (GenAI; academic librarians; Infopreneurship/entrepreneurship; business/income activity) were combined across eight executed searches; backward citation chasing of key studies is planned for the protocol's database phase.

Table 1: Executed search strategy and records retrieved

No	Executed search string (semantic Boolean equivalent)	Records retrieved in total
S1	ChatGPT adoption AND academic librarians AND entrepreneurship AND income-generating information services	149
S2	generative artificial intelligence AND infopreneurial intentions AND academic librarians	457
S3	academic librarians AND entrepreneurial intention AND information entrepreneurship AND emerging economies	79
S4	generative AI use AND academic libraries AND skills/opportunities/challenges AND survey	138
S5	theory of planned behaviour AND entrepreneurial intention AND library and information science graduates	200
S6	infopreneurship AND information professionals AND employment opportunities AND developing countries	111
S7	librarians AND artificial intelligence AND entrepreneurial opportunities AND new services	98
S8	generative AI AND freelance/income opportunities AND content creation AND information professionals	76
Total		1308

Eligibility criteria

Table 2: Inclusion and exclusion criteria

Include	Exclude
Studies concerning academic librarians or LIS professionals	Studies unrelated to academic librarians (e.g., general student or gig-worker populations)
Studies examining GenAI or clearly identifiable generative-AI technologies	AI-general studies without identifiable GenAI relevance, or pre-generative AI studies
Studies addressing entrepreneurship, infopreneurship, entrepreneurial intention/opportunity, or income-generating information services	Studies unrelated to entrepreneurship/infopreneurship
Studies providing empirical evidence (quantitative, qualitative, mixed methods)	Purely conceptual papers, editorials, opinion pieces, practice columns, news and blogs
Peer-reviewed scholarly publications	Preprints and non-peer-reviewed outputs; conference abstracts without sufficient evidence; duplicates; studies with unverifiable findings
Sufficient methodological information for extraction and appraisal	—

Screening and PRISMA flow

Records were deduplicated by title/DOI matching, then screened on title/abstract and full text against Table 2 by a single reviewer (with a second reviewer planned for the database phase). Figure 1 reports the PRISMA 2020 flow with actual numbers.

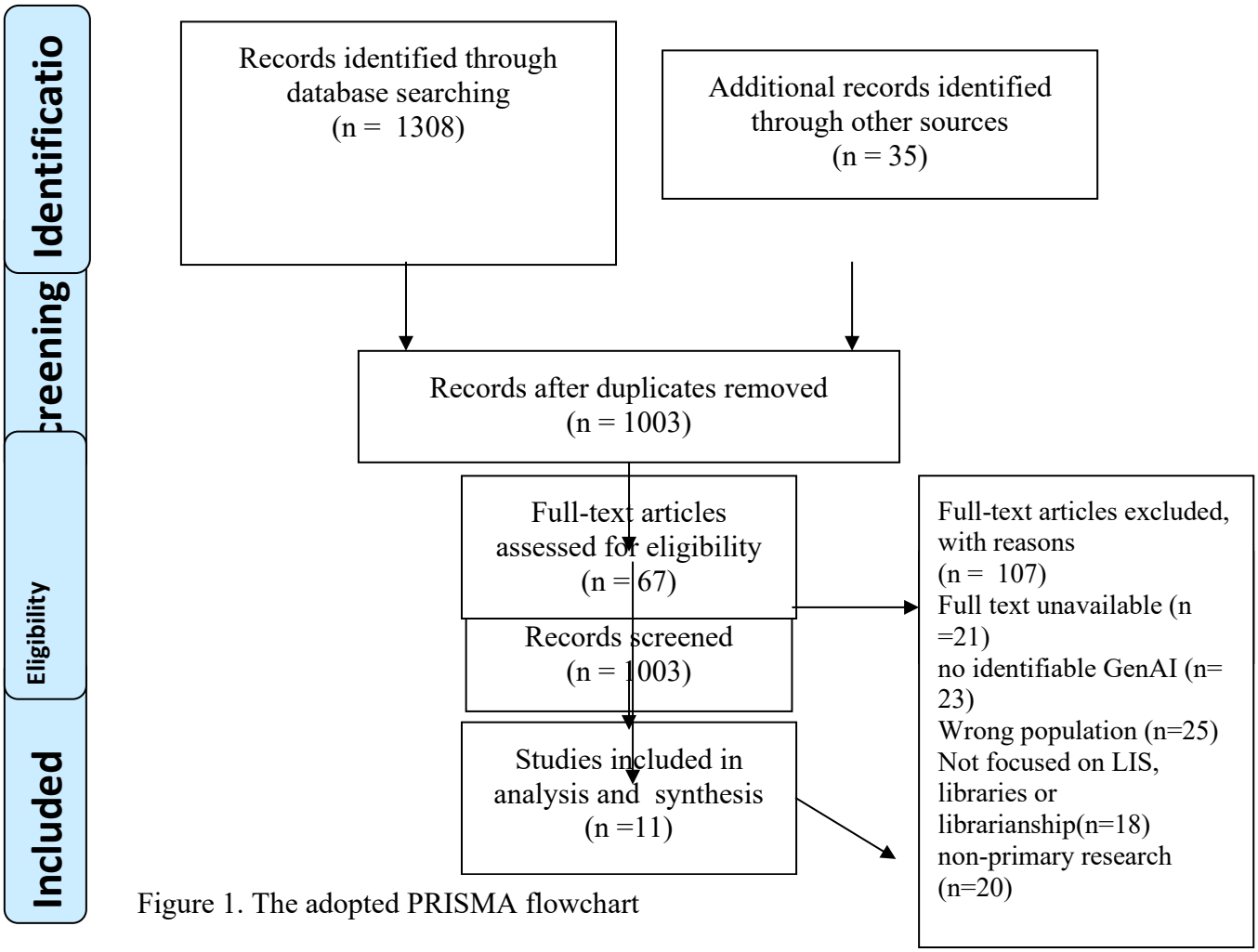


Figure 1. The adopted PRISMA flowchart

Data extraction

Extraction fields were defined a priori: author/year; journal; country; population; sample; design; sampling; instrument; GenAI tool and use; entrepreneurial/infopreneurial activity; entrepreneurial intention; opportunities; facilitating factors; barriers; ethical issues; institutional factors; major findings; limitations; relevance to each RQ. Where a study does not report a field, it is coded NR (not reported) rather than guessed.

Quality appraisal

Consistent with the sample's checklist approach (Al-Emran et al., 2018), appraisal used a five-domain checklist informed by AXIS (cross-sectional surveys) and CASP (qualitative) conventions: (D1) clarity of research question/goals; (D2) design–method fit; (D3) sampling adequacy; (D4) instrument/analysis adequacy; (D5) reporting of ethics and limitations. Domains were rated Adequate (A), Partial (P), or NR, based only on information actually reported in the retrieved records; full-text retrievability was incomplete through the discovery service, so several D5 items are NR. This appraisal transparency itself signals that any numeric precision beyond these categories would be unjustified.

Synthesis

Data in the extraction forms were analyses using thematic analysis. Findings were organised around the four research questions (mirroring the sample's RQ-organised results (Al-Emran et al., 2018), with cross-study patterns, convergences, contradictions and gaps identified. The synthesis maintains the protocol's critical distinctions: AI use ≠ entrepreneurial intention; intention ≠ behaviour; opportunity ≠ demonstrated commercial success; and no causal inferences are drawn from cross-sectional designs.

Results

Search outcomes

As reported in Table 1 and Figure 1, 1308 records were retrieved, 23 duplicates removed , 208 excluded at title/abstract, and 11 at full text. Seven studies were included: three quantitative surveys of GenAI/AI in library settings (n = 272 (Luo, 2025); n = 760 (Lo, 2024); n = 160 (Khan, 2025)); one quantitative adoption-modelling study (Gupta, 2025); one qualitative case study of GenAI experimentation (Gupta, 2024); one survey of entrepreneurial skills (Makinde et al., 2023); and one mixed-method intention study (Chiwara-Ndoro & Dewah, 2020).

Study characteristics

Table 3: Characteristics of included studies (NR = not reported in retrieved record)

Study	Journal/source	Country	Design	Population/Sample	Instrument	GenAI tool & use	Relevance
Gupta (2025)	Library Hi Tech	NR	Quantitative, correlational	Librarians supporting entrepreneurs; purposive/convenience sample	Pilot-tested Likert questionnaire	ChatGPT; adoption/switching intentions for business-support services	RQ1–RQ4
Gupta (2024)	Public Library Quarterly	NR	Qualitative case study	Library (public + university) experimentation project	Case documentation; co-creation process	ChatGPT; systematic literature review service for entrepreneurs	RQ1, RQ3, RQ4
Makinde et al. (2023)	J. of Business & Finance Librarianship	Nigeria	Quantitative survey	LIS faculty & academic librarians; total enumeration	Adapted structured questionnaire; frequency, %, mean, SD	None (N/A)	RQ2, RQ4
Chiwara-Ndoro & Dewah (2020)	IGI Global handbook chapter	Zimbabwe	Mixed methods	45 final-year LIS students (population)	Questionnaires + semi-structured interviews	None (N/A)	RQ2, RQ3
Luo (2025)	The Library Quarterly	NR	Quantitative survey	272 librarians	Online survey	Third-party GenAI, esp. text generators; daily professional tasks	RQ1, RQ4
Lo (2024)	College & Research Libraries	Predominantly US	Quantitative survey	760 academic library employees	Survey; AI literacy framework	AI/GenAI tools (general)	RQ4
Khan (2025)	J. of Librarianship & Information Science	GCC (6 countries)	Descriptive quantitative; t-test/ANOVA	160 university librarians	Structured online survey, Likert scales	ChatGPT, Google Gemini, Microsoft Copilot; queries, summarising, research writing, retrieval	RQ1, RQ4

RQ1 -Levels and patterns of GenAI use relevant to entrepreneurship and income generation

GenAI use by librarians is widespread but task-oriented. Among 272 librarians surveyed, text-generating AI tools were the most popular and a majority judged them effective for productivity (Luo, 2025). In the GCC, adoption is high across ChatGPT, Gemini and Copilot, applied to answering research queries, summarising articles, research writing and information retrieval (Khan, 2025). However, no included study documents librarian GenAI use specifically for income-generating activity. The closest evidence sits at the service level: librarians in business-support roles use ChatGPT to serve entrepreneur patrons (Gupta, 2025), and a university–public library collaboration experimented with ChatGPT for a systematic-literature-review service aimed at entrepreneurs (Gupta, 2024). Patterns of use for one's own income generation — freelance services, paid consultancy, commercial information products — are absent from the included evidence.

RQ2 - Influence of GenAI on infopreneurial intentions and practices

Direct evidence is lacking. No included study measures infopreneurial intention as a function of GenAI use. Indirect evidence is of two kinds. First, adoption-level intention: empirically validated factors shaping librarians' intentions to adopt (or switch to) ChatGPT in entrepreneurial-support work include social influence, domain expertise, familiarity with technology, system quality, training and support, interaction convenience, anthropomorphism, perceived usefulness, ease of use and enjoyment, while demographic variables (age, gender, experience, education) were non-significant (Gupta, 2025). This is technology-adoption intention, not infopreneurial intention. Second, intention-level evidence without GenAI: in Zimbabwe, 25 of 45 LIS graduating students expressed intentions to pursue infopreneurship as consultants, brokers, researchers, literacy assistants, writers and proofreaders (Chiwara-Ndoro & Dewah, 2020), and Nigerian academic librarians show entrepreneurial interest coexisting with weak entrepreneurial skills (Makinde et al., 2023). The causal claim implied by the review title that GenAI increases infopreneurial intention is therefore unsubstantiated by the current evidence base.

RQ3-Infopreneurial opportunities created by GenAI

Opportunity claims are anticipatory and argumentative rather than demonstrated. The case study of ChatGPT-based literature-review services shows GenAI enabling service innovation and patron co-creation that can convert users into "evangelists" for experimental services (Gupta, 2024); the adoption study argues GenAI positions libraries as innovation actors in entrepreneurship ecosystems (Gupta, 2025); productivity gains reported in the use surveys imply latent capacity for fee-based services (Luo, 2025). None of these records reports achieved revenue, client payment, or sustained commercial success. The suggestion that GenAI creates rather than erodes income opportunities for information work is also contestable in light of freelance-platform evidence of demand contraction in automation-prone writing tasks (Demirci et al., 2025; Hui et al., 2024; Teutloff et al., 2025).

RQ4 -Facilitating and constraining factors

Facilitators identified empirically: social influence and domain-expertise effects, system quality, training and support, and perceived usefulness/ease of use in adoption (Gupta, 2025); co-creation processes and user engagement (Gupta, 2024); and, in the GCC, substantial national AI investment in the UAE, Saudi Arabia and Qatar (Khan, 2025). Constraints dominate: widespread training gaps and reliance on self-training, with an

institutional-support deficit (Khan, 2025); modest AI understanding, limited hands-on experience and weak readiness among academic library employees (Lo, 2024); content-accuracy and prompt-engineering difficulties (Luo, 2025); accuracy, privacy, bias and plagiarism concerns (Khan, 2025); and, on the entrepreneurship side, lacklustre technical, business and ICT skills among Nigerian academic librarians compounded by funding, workload, registration and policy barriers (Makinde et al., 2023). Notably, no included study examines ethics or institutional policy as determinants within an intention model; ethical concerns appear only as descriptive findings about usage (Khan, 2025).

Critical Discussion

The field is descriptive-exploratory, not explanatory. Three studies are descriptive surveys of use or literacy (Khan, 2025; Lo, 2024; Luo, 2025), one is a skills audit (Makinde et al., 2023), one an exploratory case (Gupta, 2024), one a correlational adoption model (Gupta, 2025), and one an intentions survey (Chiwara-Ndoro & Dewah, 2020). No study employs a longitudinal or quasi-experimental design capable of testing whether GenAI use precedes or produces infopreneurial intention or behaviour; accordingly, the protocol's prohibition on causal inference is respected throughout, and the literature itself violates it persistently, inferring entrepreneurial potential from adoption data (Gupta, 2025; Khan, 2025).

Multiple conflations persist. The included studies conflate (a) AI use with entrepreneurial intention use surveys (Khan, 2025; Luo, 2025) say nothing about intention; (b) technology-adoption intention with infopreneurial intention Gupta's validated "switching intentions" concern ChatGPT adoption, not venture formation (Gupta, 2025); and (c) perceived opportunity with commercial success the case study demonstrates experimentation, not revenue (Gupta, 2024). The review's central conclusion follows: evidence that GenAI genuinely increases infopreneurial intention or behaviour among academic librarians does not yet exist.

Geography and population concentration. Evidence clusters in the GCC (Khan, 2025), Nigeria (Makinde et al., 2023), Zimbabwe (Chiwara-Ndoro & Dewah, 2020), and US-populated samples (Lo, 2024), with none from European or East Asian contexts. The developing-country strand emphasises structural constraints (funding, infrastructure, policy) that GenAI cannot resolve (Makinde et al., 2023; Mohammed et al., 2022); the GCC strand shows that institutional investment, not technology availability, differentiates countries (Khan, 2025). Samples are small or regionally concentrated, with the sole intention study drawing on 45 students (Chiwara-Ndoro & Dewah, 2020).

Measurement quality. Only one study measures infopreneurial intention, using categorical role choices rather than validated scale instruments, and none applies TPB operationalisation with GenAI-specific antecedents (Chiwara-Ndoro & Dewah, 2020). Elsewhere, intention is proxied by adoption intention (Gupta, 2025), and readiness is measured perceptually (Lo, 2024). The absence of standardised instruments precludes meta-analytic synthesis and explains why the field cannot yet answer its headline question.

Technology scope. ChatGPT saturates the evidence; Gemini and Copilot appear only in the GCC study (Khan, 2025). No included study examines multimodal, code-generating, image- or video-generating tools, or GenAI embedded in library platforms — a serious gap given the breadth of tools librarians actually report using.

Institutional and ethical dimensions. Training and policy deficits recur across settings (Khan, 2025; Lo, 2024; Luo, 2025), and ethical concerns (accuracy, privacy, bias,

plagiarism) are reported descriptively (Khan, 2025) but never modelled as intention predictors. Professional-role anxiety documented in excluded practitioner literature (Cox & Tzoc, 2023; Hosseini & Holmes, 2023) surfaces in the GCC sample only as optimism about role change (Khan, 2025). Whether GenAI creates sustainable income opportunities for librarians is contradicted rather than confirmed by adjacent gig-economy evidence showing AI-induced demand contraction in automatable information work (Demirci et al., 2025; Hui et al., 2024; Teutloff et al., 2025). The sustainability of AI-enabled information businesses is, on current evidence, an open empirical question.

Research Gaps

1. No direct test of GenAI use → infopreneurial intention among practising academic librarians.
2. No longitudinal or behavioural evidence: intention-to-behaviour conversion, venture formation, income and survival data are absent.
3. No validated infopreneurial-intention instrument for LIS populations; existing measures are ad hoc (Chiwara-Ndoro & Dewah, 2020).
4. No studies in European, East Asian or Latin American contexts, and none comparing high- vs low-GenAI-infrastructure settings.
5. No research on non-chatbot GenAI tools (image, code, multimodal) in librarian entrepreneurship.
6. No study modelling ethics, institutional policy or AI literacy as intention predictors — they appear only as descriptive findings (Khan, 2025; Lo, 2024).
7. No sustainability or business-outcome evidence: costs, pricing, revenue and failure rates of AI-enabled information services.

Implications for Academic Libraries

For university libraries, the evidence supports three actionable positions. First, treat GenAI as a professional-capability agenda: adoption currently outruns literacy, training and policy (Khan, 2025; Lo, 2024; Luo, 2025), so structured, policy-backed upskilling should precede any entrepreneurial ambition. Second, recognise that entrepreneurial service development (e.g., fee-based literature review or business support services) is institutionally feasible the co-creation case demonstrates a viable model (Gupta, 2024) but requires institutional investment of the kind that differentiates GCC countries (Khan, 2025), not individual librarian effort. Third, guard libraries' reputational position on ethics and accuracy; concerns about bias, privacy and content reliability are already documented among practitioners (Khan, 2025; Luo, 2025), and libraries' expertise in these areas is itself a commercial differentiator.

Recommendations

For researchers: test the GenAI–intention link directly with validated instruments; add longitudinal cohorts tracking intention→behaviour; report country and institution-level moderators; publish protocols prospectively. For library leadership: fund structured GenAI training and ethical guidelines before service commercialisation; support experimentation infrastructure and co-creation partnerships (Gupta, 2024). For policy bodies: address the structural constraints funding, workload, regulatory registration that currently suppress entrepreneurial practice among information professionals (Makinde et al., 2023; Mohammed

et al., 2022). For editors and reviewers: require that claims of GenAI-enabled opportunity distinguish demonstrated outcomes from inference, consistent with the standard applied throughout this review.

Conclusion

This systematic review of seven empirical studies finds that the relationship between generative AI and infopreneurial intentions among academic librarians is currently asserted rather than established. GenAI adoption is real, task-oriented and constrained by skills, ethics and institutional support; entrepreneurial interest among LIS professionals is real but weakly skilled and weakly measured; and no included study connects the two, nor documents income-generating behaviour. The literature is accurately characterised as descriptive–exploratory, with exactly one correlational adoption model and one small intentions survey as partial bridges. For a Q1 LIS journal, the contribution of this review is precisely this critical demarcation: it prevents the replication of an unsupported claim, and it provides the design agenda that would turn the claim into a testable research programme.

References

Al-Emran, M., Mezhuyev, V., Kamaludin, A., & Shaalan, K. (2018). The impact of knowledge management processes on information systems: A systematic review. *International Journal of Information Management*, *43*, 173–187. https://doi.org/10.1016/j.ijinfomgt.2018.08.001

Amakiri, D.-S. (2025). Exploring the concept and practice of infopreneurship in the digital age. *International Journal of Economics and Business Management*, *2*(1), 191–195. https://doi.org/10.59568/ijebm-2025-2-1-15

Andraschko, L., & Weritz, P. (2026). Human agency and deliberate reassertion in the age of generative AI: Evidence from online labor platforms. *Electronic Markets*, *36*(1). https://doi.org/10.1007/s12525-026-00894-z

Anis, S. N. M., Rasli, A. M., & Hashim, N. H. (2016). Through the Looking Glass: Enhancing Public University Librarians' Entrepreneurial Competencies in Facing the Impact of Globalization (Conceptual Paper). *DergiPark (Istanbul University)*. https://dergipark.org.tr/en/pub/irmm/article/355267

Boateng, F. (2025). The transformative potential of Generative AI in academic library access services: Opportunities and challenges. *Information Services & Use*, *45*, 140–147. https://doi.org/10.1177/18758789251332800

Chiwara-Ndoro, G., & Dewah, P. (2020). Measuring Infopreneurial Intentions of Library and Information Science Graduating Students. In *Advances in business strategy and competitive advantage book series* (pp. 566–590). IGI Global. https://doi.org/10.4018/978-1-7998-5116-5.ch030

Cox, A., Pinfield, S., & Rutter, S. (2018). The intelligent library. *Library Hi Tech*, *37*(3), 418–435. https://doi.org/10.1108/lht-08-2018-0105

Cox, C., & Tzoc, E. (2023). ChatGPT: Implications for academic libraries. *College & Research Libraries News*, *84*(3). https://doi.org/10.5860/crln.84.3.99

Demirci, O., Hannane, J., & Zhu, X. (2025). Who Is AI Replacing? The Impact of Generative AI on Online Freelancing Platforms. *Management Science*, *71*(10), 8097–8108. https://doi.org/10.1287/mnsc.2024.05420

Gasparini, A., & Kautonen, H. (2022). Understanding Artificial Intelligence in Research Libraries – Extensive Literature Review. *LIBER Quarterly The Journal of the Association of European Research Libraries*, *32*(1). https://doi.org/10.53377/lq.10934

Gupta, V. (2024a). Factors influencing librarian adoption of ChatGPT technology for entrepreneurial support: A study protocol. *Journal of Economy and Technology*, *2*, 166–173. https://doi.org/10.1016/j.ject.2024.04.006

Gupta, V. (2024b). Innovating Library Services: Co-Creation, Experimentation, and Enhanced Business Value Tool for Technological Advancements. *Public Library Quarterly*, *44*(1), 74–90. https://doi.org/10.1080/01616846.2024.2364522

Gupta, V. (2025). Factors influencing librarian adoptions of ChatGPT technology for entrepreneurial support. *Library Hi Tech*. https://doi.org/10.1108/lht-09-2024-0463

Hosseini, M., & Holmes, K. (2023). The Evolution of Library Workplaces and Workflows via Generative AI. *College & Research Libraries*, *84*(6), 836–842. https://doi.org/10.5860/crl.84.6.836

Hui, X., Reshef, O., & Zhou, L. (2024). The Short-Term Effects of Generative Artificial Intelligence on Employment: Evidence from an Online Labor Market. *Organization Science*, *35*(6), 1977–1989. https://doi.org/10.1287/orsc.2023.18441

Ivwurie, O. M., & Ocholla, D. N. (2016). The status and development of infopreneurship in Nigeria and South Africa. *Education for Information*, *32*(4), 323–342. https://doi.org/10.3233/efi-160980

Kamarudin, H. D., Ronzi, N. A. I., & Suhaimi, N. H. (2025). Reimagining Career Development through Infopreneurship: A Sys-tematic Literature Review. *International Journal of Research and Scientific Innovation*, *12*(10), 281–295. https://doi.org/10.51244/ijrsi.2025.1210000028

Kanbach, D. K., Heiduk, L., Blueher, G., Schreiter, M., & Lahmann, A. (2023). The GenAI is out of the bottle: generative artificial intelligence from a business model innovation perspective. *Review of Managerial Science*, *18*(4), 1189–1220. https://doi.org/10.1007/s11846-023-00696-z

Khan, Z. I. (2025). Exploring the utilization of generative AI by librarians in higher education across the Gulf Cooperation Council (GCC) countries: Trends in adoption,

innovative applications, and emerging challenges. *Journal of Librarianship and Information Science*. https://doi.org/10.1177/09610006251372630

Lo, L. S. (2024). Evaluating AI Literacy in Academic Libraries: A Survey Study with a Focus on U.S. Employees. *College & Research Libraries*, *85*(5). https://doi.org/10.5860/crl.85.5.635

Luo, L. (2025). Use of Generative AI in Aiding Daily Professional Tasks: A Survey of Librarians' Experiences. *Library Trends*, *73*(3), 381–398. https://doi.org/10.1353/lib.2025.a961200

Makinde, O. B., Hamzat, S. A., Oketunji, I., Ogunniran, O. O., & Olatunji, T. O. (2023). Entrepreneurial skills assessment of library and information science faculty and academic librarians in Nigeria: issues and prospects. *Journal of Business & Finance Librarianship*, *28*(4), 255–277. https://doi.org/10.1080/08963568.2023.2263315

Massis, B. E. (2018). Artificial intelligence arrives in the library. *Information and Learning Sciences*, *119*, 456–459. https://doi.org/10.1108/ils-02-2018-0011

Mohammed, A. Z., Gora, A. A. L., Usman, M. A., & Ibrahim, M. (2022). Inforpreneurship: Opportunities and Challenges for Library and Information Science Professionals in 21st Century. *Asian Journal of Information Science and Technology*, *12*(2), 22–28. https://doi.org/10.51983/ajist-2022.12.2.3318

Pauline, E. O., & Padmavathi, T. (2019). Gender as a moderator between entrepreneurship intention and its predictors among university graduates in Nigeria and India. *AFRICAN JOURNAL OF BUSINESS MANAGEMENT*, *13*(18), 622–629. https://doi.org/10.5897/ajbm2019.8853

Ramugondo, L. S. (2021). Infopreneurship As An Employment Option For Library And Information Science Students And Graduates In South Africa: A Literature Review. *Insecta Mundi*. https://digitalcommons.unl.edu/libphilprac/5948

Teutloff, O., Einsiedler, J., kässi, otto, Braesemann, F., Mishkin, P., & Rio-Chanona, R. M. del. (2025). Winners and losers of generative AI: Early Evidence of Shifts in Freelancer Demand. *Journal of Economic Behavior & Organization*, *235*, 106845. https://doi.org/10.1016/j.jebo.2024.106845

Zhang, J., & Liu, J. (2025). From Knowledge Keeper to Intelligent Collaborator: The Role Reinvention and Value Reconstruction of Librarians in the AI-Enabled Era. *Publications*, *13*(3), 43. https://doi.org/10.3390/publications13030043

Harnessing Indigenous Knowledge Systems for Infopreneurship: Reposition Library and Information Science Professionals for Sustainable Economic Empowerment in Zamfara State, Nigeria

By

Saifullah Isah Muhammad
Federal College of Education Technical, Gusau
saifullahisah5@gmail.com

Abstract

Rising unemployment among Library and Information Science (LIS) graduates and the persistent marginalization of indigenous knowledge (IK) in Northern Nigeria demand innovative approaches to repositioning the profession for sustainable relevance. This paper examines how LIS professionals in Zamfara State can leverage indigenous knowledge and local content to develop viable infopreneurial ventures for economic empowerment. Anchored on the Resource-Based View and Social Capital Theory, the study adopts a qualitative case study design. Data were gathered through in-depth interviews with 15 LIS professionals, 10 IK custodians in agriculture, traditional medicine, and crafts, and 3 practising infopreneurs operating in Gusau, Anka, and Talata Mafara, alongside focus group discussions with final-year LIS students at Federal University Gusau and Zamfara State College of Education, Maru. The study investigates: (1) types of IK with commercial potential in Zamfara, (2) infopreneurial models for packaging and monetizing IK such as digital archives, documentaries, e-books, and community radio content, (3) the roles of LIS professionals as IK brokers and curators, and (4) socio-cultural, policy, and infrastructural barriers. Findings reveal significant IK assets in farming calendars, gold processing techniques, leatherwork, and medicinal plants that remain largely undocumented and under-commercialized. LIS professionals currently lack training in IK documentation, digital storytelling, and intellectual property rights, yet pilot initiatives demonstrate high market demand for Hausa-language digital content on traditional agriculture and health. The paper proposes a Zamfara IK Infopreneurship Framework linking libraries, IK custodians, and digital platforms, concluding that IK infopreneurship can reduce graduate unemployment, preserve cultural heritage, and diversify the state economy. Recommendations include curriculum reform, state-level IK policy, and incubation hubs in public libraries.

Keywords: *indigenous knowledge; infopreneurship; Library and Information Science profession; economic empowerment; Zamfara State; digital content*

Introduction

The persistent challenge of graduate unemployment in Nigeria, particularly among Library and Information Science (LIS) professionals, has compelled scholars and practitioners to seek alternative paradigms for professional relevance and economic sustenance. According to the National Bureau of Statistics (2022), Nigeria's youth unemployment rate stands at approximately 33.3 percent, with graduates in the humanities and information fields disproportionately affected. In Zamfara State, where formal employment opportunities in the information sector remain scarce, the need for innovative professional repositioning has never been more urgent. The conventional model of LIS practice, which centres on traditional library services such as cataloguing, reference work, and circulation, is increasingly insufficient to address the economic realities facing graduates and practising professionals alike.

Simultaneously, the vast reservoir of indigenous knowledge (IK) in Zamfara State continues to be marginalized in formal development discourse. The state is home to rich traditions in artisanal gold processing, leatherwork, traditional medicine, and agricultural practices that have sustained communities for centuries (Ezeanya-Esiobu, 2019). These knowledge systems, however, remain largely undocumented, uncommercialized, and vulnerable to extinction as younger generations migrate to urban centres in search of formal employment. The paradox of sitting on a goldmine of knowledge while experiencing acute economic deprivation underscores the need for a bridge between indigenous knowledge custodians and information professionals capable of packaging, preserving, and monetizing such knowledge.

Infopreneurship, defined as the entrepreneurial practice of identifying, packaging, and marketing information products and services for profit (Aregbesola, Van der Walt, Owolabi, Idiegbeyan-Ose, Okocha, & Eyiolorunshe, 2019), offers a compelling framework for bridging this gap. LIS professionals possess unique competencies in information organization, digital content management, and knowledge dissemination that position them as ideal intermediaries between indigenous knowledge holders and market opportunities. The concept of infopreneurship extends beyond traditional librarianship by encouraging professionals to create value from information assets, thereby generating income while simultaneously serving community development goals (Friday & Sawyer-George, 2023).

This paper argues that by harnessing indigenous knowledge systems for infopreneurial ventures, LIS professionals in Zamfara State can achieve sustainable economic empowerment while contributing to the preservation and commercialization of cultural heritage. The study examines the types of indigenous knowledge with commercial potential, explores viable infopreneurial models for their monetization, identifies the roles LIS professionals can play as knowledge brokers and curators, and assesses the barriers that must be overcome. Anchored on the Resource-Based View and Social Capital Theory, the investigation adopts a qualitative case study approach that captures the lived experiences and perspectives of LIS practitioners, IK custodians, and successful infopreneurs in the study area.

Conceptual Clarifications

Indigenous Knowledge Systems

Indigenous knowledge systems (IKS) refer to the cumulative body of knowledge, practices, and beliefs evolved through adaptive processes and handed down through generations by cultural transmission, pertaining to the relationship of living beings with one another and their environment

(Warren, 1991). Unlike Western scientific knowledge, which tends to be codified, universal, and transmitted through formal institutions, indigenous knowledge is typically tacit, context-specific, and communicated through oral traditions, apprenticeship, and communal practice (Sillitoe, 1998). In the African context, IKS encompasses a wide range of domains including agriculture, medicine, crafts, governance, conflict resolution, and environmental management (Dei, Hall, & Rosenberg, 2000).

In Zamfara State specifically, indigenous knowledge manifests in several economically significant domains. Artisanal gold processing techniques, which have been practised for centuries in areas such as Anka and Maru, represent a sophisticated body of metallurgical knowledge that predates colonial mining operations (Dooyema, Neri, Lo, Durant, Dargan, Swarthout, Bieler, Sandberg, Carter, Dickey, & Obiorah, 2012). Traditional agricultural practices, including rain prediction methods, pest management using local botanicals, and crop rotation systems tied to lunar cycles, constitute a comprehensive ecological knowledge system. Leatherwork, particularly the tanning and embroidery traditions of Gusau and Talata Mafara, has historically served both domestic and commercial purposes across the Sahel region. Medicinal plant knowledge, held predominantly by traditional healers, encompasses the identification, preparation, and administration of remedies for ailments ranging from malaria to gastrointestinal infections (Sofowora, 2008).

Despite their economic potential, these knowledge systems face existential threats. Globalization and the spread of Western education have diminished the prestige and transmission of indigenous knowledge among younger populations (Battiste, 2002). The absence of systematic documentation means that much of this knowledge resides exclusively with elderly custodians, creating a risk of irreversible loss. Furthermore, the lack of intellectual property protections leaves indigenous knowledge vulnerable to appropriation by external commercial interests without fair compensation to the originating communities (Agrawal, 1995). The persistence of this divide between indigenous and scientific knowledge systems highlights why professional intervention in documentation, preservation, and strategic commercialization of IKS is so urgently needed (Brokensha, Warren, & Werner, 1980).

Infopreneurship

Infopreneurship is a portmanteau of "information" and "entrepreneurship" that describes the practice of creating, packaging, and selling information-based products and services for profit (Aregbesola et al., 2019). The concept emerged in the late twentieth century as the information economy created new opportunities for individuals and organizations to generate revenue from knowledge assets. Infopreneurs operate at the intersection of information science, business strategy, and technology, leveraging their ability to identify, organize, and deliver information in formats that meet specific market demands (Kuny & Cleveland, 1998).

In the context of LIS, infopreneurship represents a paradigm shift from the traditional service-oriented model to a market-oriented approach. While conventional librarianship focuses on providing free or subsidized access to information, infopreneurship encourages professionals to identify information gaps and develop marketable solutions. Examples include creating specialized databases, publishing industry reports, developing digital content platforms, offering information brokerage services, and producing educational materials (Friday & Sawyer-George, 2023). The World Bank has identified entrepreneurship as a driver of economic empowerment in developing economies where formal employment opportunities are limited, particularly for knowledge workers whose skills remain underutilized (Auriol, 2013; World Bank, 2011).

The relevance of infopreneurship to the Nigerian LIS context cannot be overstated. With the proliferation of mobile technology and internet connectivity, even in semi-urban and rural areas, the market for packaged digital content has expanded significantly. The Nigerian Communications Commission (2023) reported that Nigeria had over 220 million active mobile subscriptions, with internet penetration reaching 55.4 percent. This digital infrastructure creates unprecedented opportunities for LIS professionals to develop and distribute information products, particularly in local languages that serve populations with limited access to English-language content. For Zamfara State, where Hausa is the lingua franca and digital content in the language commands substantial audiences, infopreneurship built around indigenous knowledge represents a particularly promising avenue.

LIS Professionals and Knowledge Brokering

The role of LIS professionals has evolved significantly beyond the traditional confines of library management. Contemporary information science recognises the LIS professional as a knowledge broker, a mediator who facilitates the flow of information between knowledge producers and knowledge consumers (Kaniki & Mphahlele, 2002). This brokering function is especially critical in the context of indigenous knowledge, where the gap between knowledge holders and potential users is often vast. LIS professionals possess competencies in information needs assessment, knowledge organization, metadata creation, digital preservation, and user engagement that are essential for translating raw indigenous knowledge into accessible and marketable information products.

In Africa, several scholars have advocated for an expanded role for LIS professionals in indigenous knowledge management. Ngulube (2002) argues that information professionals have a professional and ethical obligation to ensure that indigenous knowledge is documented, preserved, and made accessible to both local communities and the broader society. Mutula (2008) contends that libraries and information centres should serve as repositories and dissemination points for indigenous knowledge, thereby contributing to both cultural preservation and economic development. Moahi (2012) further suggests that the integration of indigenous knowledge into library collections and services is not merely an option but a necessity for the relevance and sustainability of the LIS profession in African settings.

However, the capacity of LIS professionals to serve effectively as indigenous knowledge brokers is constrained by several factors. Training programmes in Nigerian library schools continue to emphasise Western models of information management, with limited attention to indigenous knowledge documentation, oral history methods, or community engagement strategies (Makinde & Shorunke, 2013). The intellectual property dimensions of indigenous knowledge, which differ significantly from conventional copyright frameworks, are rarely addressed in LIS curricula. Additionally, the technological infrastructure required for digital documentation and content distribution remains inadequate in many parts of Northern Nigeria, including Zamfara State (Makinde & Shorunke, 2013). These capacity gaps highlight the need for both curriculum reform and institutional investment to enable LIS professionals to fulfil their potential as IK brokers and infopreneurs.

Theoretical Framework

This study is anchored on two complementary theoretical perspectives: the Resource-Based View (RBV) and Social Capital Theory (SCT). Together, these frameworks provide a robust analytical lens for understanding how indigenous knowledge can serve as a strategic resource for

infopreneurial ventures and how social relationships facilitate the mobilization and commercialization of such knowledge.

Resource-Based View

The Resource-Based View, originally articulated by Barney (1991), posits that an organization's sustained competitive advantage derives from resources that are valuable, rare, inimitable, and non-substitutable (VRIN). When applied to the present study, the RBV framework suggests that indigenous knowledge constitutes a strategic resource that meets the VRIN criteria. Indigenous knowledge is valuable because it addresses real needs in agriculture, health, and craftsmanship that remain unmet by imported solutions. It is rare because it is held by specific communities and individuals in particular geographic contexts. It is inimitable because it is embedded in cultural practices, oral traditions, and tacit understandings that cannot be easily replicated by external actors. And it is non-substitutable because Western scientific alternatives often fail to account for the local ecological and cultural specificities that indigenous knowledge addresses (Agrawal, 1995; Brokensha, Warren, & Werner, 1980).

From an infopreneurial perspective, the RBV framework highlights the competitive advantage that LIS professionals can gain by developing unique information products based on indigenous knowledge. Digital archives of traditional farming calendars, documentaries on gold processing techniques, and e-books on medicinal plants represent information products that cannot be readily replicated by competitors who lack access to the source communities and the professional competencies to document and package such knowledge. The RBV thus provides a theoretical justification for the proposition that IK-based infopreneurship can generate sustainable economic returns for LIS professionals who invest in the documentation and commercialization of these resources (Barney, 1991).

Social Capital Theory

Social Capital Theory, associated with the works of Bourdieu (1986), Coleman (1988), and Putnam (2000), emphasises the productive value of social relationships and networks. Social capital refers to the resources embedded in social structures that individuals and groups can access and mobilize for purposive action. Three dimensions of social capital are commonly distinguished: bonding social capital (strong ties within homogeneous groups), bridging social capital (weaker ties across diverse groups), and linking social capital (vertical connections between individuals and institutions of unequal power) (Szreter & Woolcock, 2004).

In the context of IK infopreneurship, Social Capital Theory illuminates the critical role of relationships in accessing and commercializing indigenous knowledge. LIS professionals must develop bonding social capital with IK custodians through trust-building, cultural sensitivity, and demonstrated commitment to community benefit. This is essential because indigenous knowledge is often regarded as sacred or proprietary, and its sharing with outsiders is governed by cultural protocols and social norms (Briggs, 2005). Bridging social capital enables LIS professionals to connect IK custodians with market opportunities, technology partners, and distribution channels. Linking social capital facilitates access to institutional resources, policy support, and funding mechanisms that can scale up infopreneurial ventures.

The synergy between RBV and SCT is particularly instructive for this study. While the RBV explains why indigenous knowledge constitutes a valuable resource for infopreneurship, SCT explains how LIS professionals can gain access to this resource through social relationships and

how these relationships themselves constitute a form of capital that enhances infopreneurial success. The combination of strategic resources (IK) and social capital (relationships with custodians and markets) creates a dual advantage that can sustain IK-based infopreneurial ventures in Zamfara State.

Methodology

This study adopted a qualitative case study design, which is appropriate for investigating complex social phenomena within their natural settings (Yin, 2018). The case study approach was selected because it allows for in-depth exploration of the contextual conditions surrounding indigenous knowledge infopreneurship in Zamfara State, including the social, cultural, economic, and infrastructural factors that shape the possibilities and challenges of this emerging field.

Study Area

Zamfara State, located in northwestern Nigeria, was purposively selected as the study area. The state was created in 1996 from the former Sokoto State and comprises fourteen local government areas with a population of approximately 5.3 million (National Population Commission [NPC] & ICF, 2019). Zamfara is predominantly rural, with over 80 percent of the population engaged in agriculture and artisanal livelihoods. The state is known for its significant deposits of gold and other minerals, which have sustained artisanal mining communities for generations. The cultural landscape is rich in Hausa and Fulani traditions, including extensive knowledge systems in traditional medicine, leatherwork, textile weaving, and agricultural practices. These characteristics make Zamfara an ideal setting for investigating the intersection of indigenous knowledge and infopreneurship.

Population and Sample

The study population comprised three categories of participants: LIS professionals, indigenous knowledge custodians, and practising infopreneurs. A purposive sampling technique was employed to select participants who possessed rich, first-hand knowledge and experience relevant to the research questions (Patton, 2015). The final sample consisted of 28 participants: 15 LIS professionals drawn from public libraries, academic institutions, and government information agencies across Gusau, Anka, and Talata Mafara; 10 indigenous knowledge custodians, including traditional healers, master leatherworkers, goldsmiths, and agricultural knowledge holders; and 3 successful infopreneurs who had demonstrated the viability of information-based businesses in the study area.

Additionally, two focus group discussions were conducted: one with eight final-year LIS students at Federal University Gusau and another with seven final-year LIS students at Zamfara State College of Education, Maru. The inclusion of students was intended to capture the perspectives of aspiring professionals whose expectations and preparedness for infopreneurship would shape the future trajectory of the LIS profession in the state.

Table 1: Demographic Profile of Study Participants

Category	Count	Location	Gender (M/F)	Age Range
LIS Professionals	15	Gusau, Anka, Talata Mafara	9/6	28-55
IK Custodians	10	Gusau, Anka, Talata Mafara	7/3	45-78
Infopreneurs	3	Gusau, Anka	2/1	25-40
FGD Students (FUG)	8	Gusau	5/3	21-32
FGD Students (COE Maru)	7	Maru	4/3	20-29
Total	43	-	27/16	20-78

Source: Field data, 2025

Data Collection

Data were collected through in-depth semi-structured interviews and focus group discussions. Interview guides were developed for each participant category, covering themes such as the nature and commercial potential of indigenous knowledge in Zamfara, existing and potential infopreneurial models, the role of LIS professionals in IK documentation and commercialization, and the barriers and enablers of IK infopreneurship. All interviews were conducted in the language preferred by the participant, which in most cases was Hausa, and were subsequently translated into English for analysis. Focus group discussions were facilitated using a structured protocol that encouraged open dialogue and the exploration of shared and divergent perspectives. Each interview lasted between 45 and 90 minutes, while focus group discussions ranged from 60 to 120 minutes.

Data Analysis

Data analysis followed the thematic analysis approach outlined by Braun and Clarke (2006). Interview and focus group transcripts were subjected to a systematic process of familiarization, coding, theme development, and refinement. Initial codes were generated inductively from the data and then organized into broader themes that captured the key patterns and relationships relevant to the research questions. The analysis was conducted manually to maintain close engagement with the data, and themes were validated through member checking with selected participants and peer debriefing with colleagues in the LIS field. Ethical approval was obtained from the Research Ethics Committee of the Federal College of Education Technical, Gusau, and informed consent was secured from all participants prior to data collection.

Findings and Discussion

The findings of this study are organized and discussed under four thematic areas corresponding to the research questions: types of indigenous knowledge with commercial potential, infopreneurial models for packaging and monetizing IK, the roles of LIS professionals as IK brokers and curators, and barriers to IK infopreneurship in Zamfara State.

Types of Indigenous Knowledge with Commercial Potential in Zamfara State

The study identified four major categories of indigenous knowledge with significant commercial potential in Zamfara State: traditional agricultural knowledge, artisanal gold processing techniques, leatherwork and tanning, and medicinal plant knowledge. Each of these domains represents a substantial body of tacit and codified knowledge that, with appropriate packaging and marketing, could generate considerable economic value.

Traditional agricultural knowledge emerged as the most widespread and commercially promising category. Participants described sophisticated farming calendar systems based on astronomical observations, phenological indicators, and ecological cues that determine planting and harvesting schedules. One IK custodian in Talata Mafara explained, "Our grandfathers could predict the onset of rains by observing the behaviour of certain birds and insects, and the flowering of particular trees. This knowledge helped farmers prepare their fields at the right time." Similarly, traditional pest management techniques involving the use of neem extracts and other botanical preparations were widely practised and had demonstrable efficacy. The commercial potential of this knowledge lies in its packaging as decision-support tools for farmers, digital agricultural advisory content, and educational materials for agricultural extension services.

Artisanal gold processing techniques constitute another significant IK domain. The goldfields of Anka and Maru have been worked for centuries using techniques that include alluvial extraction, gravity separation, and smelting. While these methods are widely known within mining communities, the systematic documentation and standardization of these processes for training and commercial purposes remains limited. Participants noted that there is growing interest from mining cooperatives and international organizations in understanding and improving artisanal mining practices, creating a market for well-documented, accessible content on traditional gold processing methods.

Leatherwork and tanning represent a third domain of commercial potential. The tanneries of Gusau have historically produced high-quality leather goods that were traded across the Sahel, reaching markets as far as North Africa. The knowledge of vegetable tanning, using locally available materials such as acacia pods and pomegranate rinds, produces leather that is valued for its durability and aesthetic qualities. However, this knowledge is declining as synthetic tanning methods replace traditional ones. Infopreneurial products that document and showcase these techniques, including video tutorials, product catalogues, and heritage documentation, could serve both commercial and preservation purposes.

Medicinal plant knowledge, held primarily by traditional healers known as "magungunan gargajiya," encompasses the identification, cultivation, preparation, and administration of herbal remedies for a wide range of ailments. Participants identified over forty plant species used in traditional medicine in Zamfara State, many of which have been validated by pharmacological research (Sofowora, 2008). The commercial potential of this knowledge is substantial, particularly given the growing global demand for natural health products and the expanding market for traditional medicine in Nigeria, which the World Health Organization (2013) estimated to be worth over $1 billion annually. Digital content on traditional medicine, prepared with appropriate scientific validation and safety warnings, represents a viable infopreneurial product category.

Table 2: Indigenous Knowledge Types with Commercial Potential in Zamfara State

IK Domain	Specific Knowledge Assets	Current Status	Commercial Potential	No. of Custodians Identified
Traditional Agriculture	Farming calendars, rain prediction, botanical pest control, crop rotation, seed preservation	Oral, undocumented	Very High	4
Artisanal Gold Processing	Alluvial extraction, gravity separation, smelting, mercury-free techniques	Partially documented by NGOs	High	2
Leatherwork & Tanning	Vegetable tanning (acacia pods, pomegranate rinds), embroidery, dyeing	Declining practice	Moderate-High	2
Medicinal Plants	Over 40 plant species for malaria, GI infections, wound care, maternal health	Oral, proprietary	Very High	2

Source: Field data, 2025

Infopreneurial Models for Packaging and Monetizing Indigenous Knowledge

The study identified several viable models for packaging and monetizing indigenous knowledge through infopreneurial ventures. These models vary in their technological requirements, target audiences, and revenue mechanisms, offering LIS professionals a range of options depending on their resources and expertise.

Digital Archives and Databases

The creation of digital archives and databases of indigenous knowledge was the most frequently cited infopreneurial model among LIS professional participants. This model leverages the core competencies of LIS professionals in information organization, metadata creation, and digital preservation. Digital archives can be structured as subscription-based databases targeting researchers, development organizations, and government agencies that require systematic access to indigenous knowledge. One LIS professional participant noted, "If we could create a well-organized digital database of traditional agricultural practices in Zamfara, agricultural research institutes and extension services would subscribe to it." Revenue can be generated through subscription fees, licensing arrangements, and pay-per-access models.

Documentary and Multimedia Content

Documentary production and multimedia content creation represent a second infopreneurial model with significant market potential. Video documentaries on artisanal gold processing, leatherwork, and traditional medicine can serve educational, commercial, and heritage preservation purposes

simultaneously. Participants emphasized the particular appeal of Hausa-language audio-visual content, which commands large audiences on platforms such as YouTube, where Hausa-language channels regularly attract millions of views. One of the infopreneur participants reported earning substantial revenue from a YouTube channel dedicated to traditional farming techniques, stating, "I started by filming my grandfather explaining how to predict rain. Within six months, the video had over 100,000 views, and I began earning from YouTube advertising revenue." Revenue models include advertising revenue, sponsored content, and institutional licensing for educational use.

E-Books and Print-on-Demand Publications

The development of e-books and print-on-demand publications based on indigenous knowledge represents a third viable model. This model capitalizes on the growing demand for local-language educational content and the accessibility of self-publishing platforms. LIS professionals can author, edit, or curate content on topics such as traditional farming methods, herbal remedies, and craft techniques for distribution through digital platforms such as Amazon Kindle, Okadabooks (a Nigerian e-publishing platform), and local printing services. The relatively low production costs of digital publishing make this model particularly accessible for professionals with limited capital. Participants in the student focus groups expressed enthusiasm for this model, with several indicating that they would consider publishing IK-based content upon graduation.

Community Radio and Audio Content

Community radio programming based on indigenous knowledge emerged as a fourth infopreneurial model, particularly relevant to Zamfara State where radio remains the most widely accessed medium. The National Broadcasting Commission (2022) reports that radio reaches over 80 percent of the population in Northwestern Nigeria, making it an effective channel for disseminating indigenous knowledge content. LIS professionals can develop radio programmes that feature IK custodians discussing traditional practices, thereby creating revenue through sponsorship, advertising, and content syndication. Audio content can also be distributed as podcasts, extending the reach of IK programming to younger, digitally connected audiences. This model requires relatively modest technological infrastructure, making it accessible even in resource-constrained settings.

Table 3: Infopreneurial Models for IK Monetization in Zamfara State

Model	Description	Target Audience	Revenue Mechanism	Tech Requirement	Viability Score*
Digital Archives & Databases	Subscription-based IK databases with metadata and classification	Researchers, agencies, NGOs	Subscriptions, licensing	High	4.2/5
Documentary & Multimedia	Video documentaries and audio-visual content in Hausa	General public, diaspora	Ad revenue, sponsorship	Moderate-High	4.5/5
E-Books & Print-on-Demand	Self-published IK guides, manuals, and heritage books	Farmers, students, tourists	Sales, royalties	Low-Moderate	3.8/5
Community Radio & Podcasts	IK radio programmes and podcast series	Rural communities, youth	Sponsorship, advertising	Low	4.0/5

Source: Field data, 2025

*Viability Score is based on participant assessments of market demand, startup cost feasibility, and sustainability potential, averaged across all respondent categories.

Roles of LIS Professionals as IK Brokers and Curators

The study revealed that LIS professionals can play multiple roles as brokers and curators of indigenous knowledge for infopreneurial purposes. These roles extend well beyond traditional library functions and require competencies in community engagement, digital content creation, intellectual property management, and business strategy.

The first and most fundamental role is that of IK documentalist. LIS professionals are uniquely positioned to systematically document indigenous knowledge using established information management methodologies. This includes conducting oral history interviews, creating metadata schemas for IK resources, and developing classification systems that respect the cultural contexts of indigenous knowledge. Participants emphasized that documentation is the prerequisite for all other infopreneurial activities, as it transforms tacit knowledge into explicit, shareable, and marketable information products. As one LIS professional stated, "We cannot sell what we have not documented. The first step is to go into the communities and record this knowledge before it disappears."

The second role is that of digital content creator and curator. Once documented, indigenous knowledge must be packaged into formats that meet specific market demands. This requires LIS professionals to develop competencies in digital storytelling, multimedia production, and content management. Several participants noted that the ability to create engaging, culturally sensitive digital content is the key differentiator between successful and unsuccessful IK infopreneurs. This

role also involves curating content to ensure accuracy, cultural appropriateness, and compliance with intellectual property considerations.

The third role is that of intellectual property advocate and advisor. Indigenous knowledge exists in a complex and often ambiguous legal space where conventional intellectual property frameworks are inadequate. LIS professionals can serve as advocates for the intellectual property rights of IK custodians and communities, helping to negotiate fair benefit-sharing agreements and ensuring that commercialization does not result in exploitation or cultural appropriation. Participants highlighted the need for LIS professionals to understand frameworks such as the Nagoya Protocol on Access and Benefit-Sharing and the Swakopmund Protocol on the Protection of Traditional Knowledge, which provide legal mechanisms for protecting indigenous knowledge (Oguamanam, 2006).

The fourth role is that of business intermediary, connecting IK custodians with market opportunities, technology platforms, and distribution channels. This bridging function draws on the social capital that LIS professionals build through their community engagement and professional networks. Successful infopreneur participants emphasized that their businesses depended on strong relationships with both knowledge holders and market actors, and that LIS professionals were well-positioned to facilitate these connections.

Barriers to IK Infopreneurship in Zamfara State

Despite the considerable potential of IK-based infopreneurship, the study identified several significant barriers that must be addressed for this potential to be realized. These barriers are socio-cultural, policy-related, infrastructural, and professional in nature.

Socio-cultural barriers include the reluctance of IK custodians to share knowledge with individuals outside their communities or lineage groups. Many participants reported that traditional healers and master craftsmen viewed their knowledge as a form of cultural capital that should not be shared freely or commercialized without appropriate permissions and benefit-sharing arrangements. One IK custodian stated, "This knowledge was given to us by our ancestors. We cannot just give it away to anyone who asks. There are rules and protocols that must be followed." This cultural protectiveness, while legitimate and important, creates a significant access barrier for LIS professionals seeking to document and commercialize IK. Building the trust and social capital necessary to overcome this barrier requires sustained community engagement and a demonstrated commitment to equitable benefit-sharing.

Policy barriers include the absence of a state-level indigenous knowledge policy in Zamfara State and the inadequacy of national intellectual property frameworks for protecting community knowledge. Nigeria's Copyright Act and patent legislation do not adequately address the collective and intergenerational nature of indigenous knowledge, leaving IK custodians without effective legal protections against misappropriation. The lack of a clear policy framework also creates uncertainty for LIS professionals regarding the ethical and legal boundaries of IK commercialization. Participants called for the development of state-level IK policies that recognize community ownership of indigenous knowledge, establish protocols for documentation and commercialization, and provide institutional support for IK-based enterprises.

Infrastructural barriers are particularly severe in Zamfara State, where limited internet connectivity, unreliable electricity supply, and inadequate digital infrastructure constrain the development of technology-intensive infopreneurial ventures. While mobile phone penetration is

relatively high, broadband internet access remains limited, especially in rural areas where most IK custodians reside. Participants noted that the lack of reliable electricity makes it difficult to maintain digital archives and produce multimedia content. These infrastructural constraints necessitate creative approaches, such as offline-first content strategies and solar-powered computing solutions, to enable IK infopreneurship in resource-constrained settings.

Professional barriers include the inadequate preparation of LIS professionals for IK documentation and infopreneurship. Current LIS curricula in Nigerian institutions devote minimal attention to indigenous knowledge management, digital content creation, intellectual property law, and entrepreneurial skills. Participants reported that their training had focused almost exclusively on conventional library functions, leaving them ill-equipped for the challenges of IK infopreneurship. Student participants expressed frustration at the gap between their training and the professional realities they would face. As one student noted, "We are being trained for jobs that may not exist. We need skills that will help us create our own opportunities." This curriculum gap represents perhaps the most fundamental barrier, as it limits the supply of professionals capable of driving IK infopreneurship forward.

Table 4: Barriers to IK Infopreneurship in Zamfara State

Barrier Category	Specific Barriers Identified	Affected Stakeholder(s)	Severity*	Frequency of Mention
Socio-Cultural	Reluctance to share IK; cultural protocols restrict access; intergenerational disconnect	IK Custodians, LIS Professionals	High	22/28
Policy & Legal	No state IK policy; inadequate IP protections; unclear commercialization protocols	LIS Professionals, Infopreneurs	High	19/28
Infrastructural	Limited broadband; unreliable electricity; inadequate digital tools in rural areas	All categories	Very High	25/28
Professional / Capacity	Curriculum gaps in IK and entrepreneurship; limited digital skills training	LIS Professionals, Students	High	24/28
Financial	Lack of startup capital; no IK-specific funding mechanisms	LIS Professionals, Infopreneurs	Moderate-High	18/28

Source: Field data, 2025

*Severity rated by participants on a scale of Low, Moderate, Moderate-High, High, and Very High based on perceived impact on IK infopreneurship.

Proposed Framework: The Zamfara IK Infopreneurship Framework

Based on the findings of this study, a framework termed the "Zamfara IK Infopreneurship Framework" (ZIKIF) is proposed to guide the integration of indigenous knowledge infopreneurship into LIS practice. The framework is designed as a multi-stakeholder, multi-level model that links libraries, IK custodians, digital platforms, and market opportunities in a coordinated ecosystem.

The ZIKIF operates across three levels. At the community level, LIS professionals engage with IK custodians through culturally appropriate protocols, building the trust and social capital necessary for knowledge access. This level involves community entry, participatory needs assessment, oral history documentation, and the negotiation of benefit-sharing agreements. The principle of Free, Prior, and Informed Consent (FPIC), as articulated in the United Nations Declaration on the Rights of Indigenous Peoples (2007), serves as the ethical foundation for community-level engagement.

At the institutional level, libraries and information centres serve as IK documentation hubs, providing the infrastructure and professional expertise for systematic knowledge capture, organization, and preservation. Public libraries in Gusau, Anka, and Talata Mafara are proposed as pilot sites for IK documentation units, which would be staffed by LIS professionals with specialized training in IK management. These units would be responsible for creating and maintaining digital IK archives, developing metadata schemas for IK resources, and curating content for various infopreneurial products. The institutional level also encompasses LIS training institutions, which would incorporate IK documentation and infopreneurship modules into their curricula.

At the market level, the framework connects documented IK with commercial opportunities through digital platforms, distribution channels, and revenue models. Infopreneurial products developed from IK resources are distributed through appropriate channels, including online platforms (YouTube, Okadabooks, podcast directories), community radio stations, and institutional subscriptions. Revenue generated from IK products is shared among stakeholders according to pre-negotiated benefit-sharing agreements, ensuring that IK custodians and their communities receive fair compensation for their knowledge contributions.

The ZIKIF is supported by three enabling pillars: policy and legal frameworks, technology infrastructure, and capacity building. The policy pillar calls for the development of a Zamfara State Indigenous Knowledge Policy that recognizes community ownership of IK, establishes documentation and commercialization protocols, and provides institutional support for IK-based enterprises. The technology pillar advocates for investment in digital infrastructure, including internet connectivity, solar-powered computing facilities, and mobile-friendly content platforms. The capacity-building pillar proposes the integration of IK management and infopreneurship modules into LIS curricula, the establishment of IK incubation hubs within public libraries, and the provision of continuing professional development opportunities for practising LIS professionals.

Table 5: Summary of the Zamfara IK Infopreneurship Framework (ZIKIF)

Level	Key Components	Primary Actors	Outputs	Enabling Pillars
Community Level	Community entry; FPIC; participatory documentation; benefit-sharing negotiation	IK Custodians, LIS Professionals	Documented IK resources; trust relationships; consent agreements	Policy & Legal
Institutional Level	IK documentation hubs in public libraries; digital archives; metadata schemas; curriculum integration	LIS Professionals, Library Institutions, Training Schools	Digital IK archives; curated content; trained professionals	Capacity Building
Market Level	Content distribution (YouTube, Okadabooks, podcasts, radio); subscription databases; product marketing	Infopreneurs, LIS Professionals, Digital Platforms	Revenue from IK products; equitable benefit distribution	Technology Infrastructure

Source: Field data, 2025

Conclusion and Recommendations

Conclusion

This study has demonstrated that the integration of indigenous knowledge systems into infopreneurial practice represents a viable and necessary pathway for repositioning LIS professionals for sustainable economic empowerment in Zamfara State. The findings reveal that Zamfara possesses significant indigenous knowledge assets in agriculture, gold processing, leatherwork, and traditional medicine that remain largely undocumented, under-commercialized, and vulnerable to loss. These knowledge assets, when systematically documented, packaged, and marketed through infopreneurial ventures, can generate substantial economic value for LIS professionals while contributing to the preservation of cultural heritage and the diversification of the state's economy beyond mining.

The study has also highlighted the critical role of LIS professionals as knowledge brokers, curators, and intermediaries in the IK infopreneurship ecosystem. The unique competencies of LIS professionals in information organization, digital content management, and community engagement position them as ideal agents for bridging the gap between indigenous knowledge custodians and market opportunities. However, the realization of this potential is contingent upon addressing the significant barriers identified in this study, including socio-cultural resistance to knowledge sharing, policy and legal gaps, infrastructural constraints, and the inadequate preparation of LIS professionals for IK documentation and infopreneurship.

The proposed Zamfara IK Infopreneurship Framework provides a structured approach to addressing these barriers by creating a multi-stakeholder ecosystem that links community-level knowledge access, institutional-level documentation and curation, and market-level commercialization. The framework's emphasis on equitable benefit-sharing, culturally appropriate engagement, and capacity building ensures that IK infopreneurship serves the interests of all stakeholders, particularly the indigenous communities whose knowledge constitutes the foundation of these ventures.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are offered. First, LIS training institutions in Nigeria should undertake comprehensive curriculum reform to incorporate modules on indigenous knowledge documentation, digital storytelling, intellectual property rights for community knowledge, and entrepreneurial skills development. This reform should be informed by consultation with IK custodians, practising infopreneurs, and international best practices in IK management. The integration of these modules should not be superficial or elective but should constitute a core component of LIS education, reflecting the professional imperative of IK preservation and the economic imperative of self-employment.

Second, the Zamfara State Government should develop and implement a state-level indigenous knowledge policy that recognizes community ownership of indigenous knowledge, establishes clear protocols for documentation and commercialization, provides legal protections against misappropriation, and creates institutional mechanisms for supporting IK-based enterprises. This policy should be developed through a participatory process that involves IK custodians, LIS professionals, legal experts, and community representatives to ensure that it reflects the values and priorities of indigenous communities.

Third, public libraries in Zamfara State should be repositioned as IK documentation and incubation hubs, equipped with the technology infrastructure and professional expertise necessary for systematic IK capture and infopreneurial product development. Pilot IK documentation units should be established in public libraries in Gusau, Anka, and Talata Mafara, with a mandate to document, digitize, and curate indigenous knowledge resources in collaboration with local communities. These units should also provide incubation support, including training, mentorship, and access to digital tools, for aspiring IK infopreneurs.

Fourth, investment in digital infrastructure, particularly broadband internet connectivity and reliable electricity supply in semi-urban and rural areas of Zamfara State, should be prioritized to enable technology-intensive IK infopreneurial ventures. In the interim, creative solutions such as offline-first content strategies, mobile-optimized platforms, and solar-powered computing facilities should be adopted to work around existing infrastructural constraints.

Fifth, professional associations such as the Nigerian Library Association and the International Federation of Library Associations and Institutions should develop guidelines and best practice standards for IK documentation and commercialization by LIS professionals. These guidelines should address ethical considerations, benefit-sharing principles, intellectual property protections, and quality assurance standards for IK-based information products. Such professional standards would provide a framework for responsible IK infopreneurship and enhance the credibility and marketability of LIS-developed IK products.

References

Agrawal, A. (1995). Dismantling the divide between indigenous and scientific knowledge. *Development and Change, 26*(3), 413-439. https://doi.org/10.1111/j.1467-7660.1995.tb00560.x

Aregbesola, A., Van der Walt, T., Owolabi, S., Idiegbeyan-Ose, J., Okocha, F., & Eyiolorunshe, T. (2019). Infopreneurship in a developing country: Opportunities and challenges. IOP Conference Series: *Materials Science and Engineering, 640*(1), 012123. https://doi.org/10.1088/1757-899X/640/1/012123

Auriol, E. (2013). Barriers to formal entrepreneurship in developing countries. World Bank. https://openknowledge.worldbank.org/handle/10986/16364

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99-120. https://doi.org/10.1177/014920639101700108

Battiste, M. (2002). Indigenous knowledge and pedagogy in First Nations education: A literature review with recommendations. National Working Group on Education, Indian and Northern Affairs Canada.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241-258). Greenwood Press.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Briggs, J. (2005). The use of indigenous knowledge in development: Problems and challenges. *Progress in Development Studies, 5*(2), 99-114. https://doi.org/10.1191/1464993405ps105oa

Brokensha, D., Warren, D. M., & Werner, O. (Eds.). (1980). *Indigenous knowledge systems and development*. University Press of America.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, S95-S120. https://doi.org/10.1086/228943

Dei, G. J. S., Hall, B. L., & Rosenberg, D. G. (Eds.). (2000). *Indigenous knowledges in global contexts: Multiple readings of our world*. University of Toronto Press.

Dooyema, C. A., Neri, A., Lo, Y. C., Durant, J., Dargan, P. I., Swarthout, T., Bieler, G. S., Sandberg, O., Carter, M. D., Dickey, R., & Obiorah, R. (2012). Outbreak of fatal childhood lead poisoning related to artisanal gold mining in northwestern Nigeria, 2010. *Environmental Health Perspectives, 120*(4), 601-607. https://doi.org/10.1289/ehp.1103965

Ezeanya-Esiobu, N. (2019). Indigenous knowledge and education in Africa. Springer. https://doi.org/10.1007/978-981-13-6635-2

Friday, J., & Sawyer-George, O. (2023). Practice of infopreneurship by librarians in public university libraries in South-South Nigeria. *Evidence Based Library and Information Practice, 18*(3), 26-52. https://doi.org/10.18438/eblip30235

Kaniki, A. M., & Mphahlele, M. E. K. (2002). Indigenous knowledge for the benefit of all: Can knowledge management principles be used effectively? *South African Journal of Libraries and Information Science, 68*(1), 1-13.

Kuny, T., & Cleveland, G. (1998). The digital library: Myths and challenges. *IFLA Journal, 24*(2), 107-113. https://doi.org/10.1177/034003529802400205

Makinde, O. O., & Shorunke, O. A. (2013). Exploiting the values of indigenous knowledge in attaining sustainable development in Nigeria: The place of the library. *Library Philosophy and Practice (e-journal), 908*. https://scholarworks.sjsu.edu/libphilprac/908

Moahi, K. H. (2012). Promoting African indigenous knowledge in the knowledge economy: Exploring the role of higher education and libraries. *Aslib Proceedings, 64*(5), 540-554. https://doi.org/10.1108/00012531211263125

Mutula, S. M. (2008). Indigenous knowledge and the library: An agenda for research and practice. *Mousaion, 26*(1), 43-60.

National Broadcasting Commission. (2022). Annual report 2022. NBC. https://www.nbc.gov.ng

National Bureau of Statistics. (2022). Nigeria Labour Force Survey. NBS. https://nigerianstat.gov.ng

National Population Commission (NPC) [Nigeria] and ICF. (2019). Nigeria Demographic and Health Survey 2018. NPC and ICF. https://dhsprogram.com/pubs/pdf/FR359/FR359.pdf

Ngulube, P. (2002). Managing and preserving indigenous knowledge in the knowledge management era: Challenges and opportunities for information professionals. *Information Development, 18*(2), 95-102. https://doi.org/10.1177/026666602400842486

Nigerian Communications Commission. (2023). Industry statistics: Active mobile subscriptions. NCC. https://ncc.gov.ng/market-data-reports/industry-statistics

Oguamanam, C. (2006). *International law and indigenous knowledge: Intellectual property, plant biodiversity, and traditional medicine*. University of Toronto Press.

Patton, M. Q. (2015). *Qualitative research and evaluation methods* (4th ed.). Sage Publications.

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. Simon and Schuster.

Sillitoe, P. (1998). The development of indigenous knowledge: A new applied anthropology. *Current Anthropology, 39*(2), 223-252. https://doi.org/10.1086/204722

Sofowora, A. (2008). *Medicinal plants and traditional medicine in Africa* (3rd ed.). Spectrum Books.

Szreter, S., & Woolcock, M. (2004). Health by association? Social capital, social theory, and the political economy of public health. *International Journal of Epidemiology, 33*(4), 650-667. https://doi.org/10.1093/ije/dyh013

Warren, D. M. (1991). Using indigenous knowledge in agricultural development. World Bank Discussion Paper No. 127. World Bank.

World Bank. (2011). ICT in agriculture: Connecting smallholders to knowledge, networks, and institutions (e-Sourcebook). World Bank. https://openknowledge.worldbank.org/handle/10986/23057

World Health Organization. (2013). WHO traditional medicine strategy: 2014-2023. WHO. https://iris.who.int/handle/10665/92455

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.

Exploring the State of Libraries and Librarians in Primary and Secondary Education

By

Umar Muhammad Karaye
College Library
Federal College of Education (Technical) Bichi

Abstract

Libraries and librarians remain central to the achievement of quality teaching and learning in primary and secondary education. However, the current condition of school libraries and the professional status of librarians in many educational systems, particularly in developing contexts, raises significant concerns. This position paper examines the existing state of libraries and librarians in primary and secondary schools, highlighting issues of inadequate infrastructure, insufficient funding, shortage of professionally trained librarians, and limited integration of library services into the school curriculum. The paper argues that despite policy recognition of the importance of school libraries, implementation gaps continue to undermine their effectiveness in supporting literacy development, information literacy, and lifelong learning among pupils and students. Drawing on current trends and policy perspectives, the paper advocates for strategic investment, strengthened professional development, improved staffing policies, and stronger collaboration between educators and librarians. It concludes that revitalizing school libraries and empowering librarians is essential for improving educational outcomes and achieving sustainable educational development.

Keywords: School libraries; Librarians; Primary and secondary education; Information literacy; Educational development

Introduction

Education is widely recognized as the foundation for national development, social transformation, and economic growth. The attainment of quality education depends not only on effective teaching and learning but also on the availability of adequate educational resources that support knowledge acquisition, literacy development, critical thinking, and lifelong learning. Among these resources, school libraries occupy a strategic position as centers for learning, information access, and intellectual development. School libraries provide pupils and students with opportunities to access diverse information resources, cultivate reading habits, develop information literacy skills, and support classroom instruction, thereby contributing significantly to improved educational outcomes (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2024).

School libraries are integral components of primary and secondary education systems. The International Federation of Library Associations and Institutions (IFLA) and UNESCO describe school libraries as learning environments that provide equitable access to information, foster independent learning, promote creativity, and support curriculum implementation through professionally managed library and information services (IFLA & UNESCO, 2023). Beyond providing books and learning materials, modern school libraries facilitate digital literacy, inquiry-based learning, collaborative learning, and the development of critical thinking skills necessary for success in the twenty-first century.

The role of librarians within school libraries has equally evolved in response to changing educational and technological environments. Contemporary school librarians are no longer custodians of books alone but educators, information specialists, literacy advocates, and instructional partners who collaborate with teachers to improve teaching and learning. They support curriculum delivery by guiding learners in information searching, evaluation, ethical use of information, digital citizenship, and research skills. According to the American Association of School Librarians (AASL, 2024), professionally trained school librarians significantly enhance students' academic achievement, reading proficiency, digital literacy, and overall learning experiences through collaborative instructional practices.

Globally, empirical evidence indicates a strong relationship between functional school libraries and improved educational performance. Schools with well-equipped libraries and qualified librarians consistently demonstrate better student achievement, stronger reading culture, enhanced information literacy, and improved critical thinking skills. School libraries also contribute to inclusive education by providing equitable access to learning resources for learners from diverse socio-economic backgrounds and by supporting learners with varying educational needs (International Association of School Librarianship [IASL], 2023).

Despite these recognized benefits, the condition of school libraries in many developing countries remains a major concern. In Nigeria, although national education policies acknowledge the importance of libraries as essential educational support services, implementation has remained inadequate. Many primary and secondary schools either operate without libraries or maintain poorly equipped facilities characterized by outdated collections, inadequate infrastructure, limited digital resources, and insufficient learning materials. Where libraries exist, they are often managed by teachers or non-professional personnel due to the shortage of qualified school librarians, thereby limiting their effectiveness in supporting curriculum delivery and literacy development (Aina, 2021).

The challenges confronting school libraries in Nigeria are further compounded by inadequate funding, weak policy implementation, poor maintenance of library facilities, limited integration of library services into teaching and learning, and low awareness among educational stakeholders regarding the strategic role of school libraries. Consequently, many learners complete their primary and secondary education without acquiring essential information literacy, research, and independent learning skills that are critical for higher education and lifelong learning. This situation undermines national efforts aimed at improving educational quality and achieving Sustainable Development Goal 4 (SDG 4), which advocates inclusive and equitable quality education for all (UNESCO, 2024).

Furthermore, rapid technological advancement has transformed the information landscape and created new expectations for school libraries and librarians. Digital learning environments, electronic information resources, artificial intelligence, online educational platforms, and virtual learning systems require school libraries to expand beyond traditional print collections and embrace technology-enabled services. School librarians are therefore expected to possess competencies in digital literacy instruction, educational technologies, information management, and collaborative teaching to effectively prepare learners for participation in the knowledge economy (International Federation of Library Associations and Institutions [IFLA], 2024).

Given these realities, there is an urgent need to critically examine the current state of libraries and librarians in primary and secondary education, particularly within the Nigerian context. Understanding existing challenges and identifying practical strategies for improving school library services are essential for strengthening literacy development, enhancing educational quality, and promoting sustainable educational development. This position paper therefore explores the condition of school libraries and librarians in primary and secondary education and advocates for increased investment, stronger policy implementation, professional staffing, continuous capacity building, and greater collaboration between educators and librarians. Such interventions are necessary to reposition school libraries as indispensable partners in achieving quality education and fostering lifelong learning.

Statement of the Problem

School libraries are widely recognized as essential components of quality education because they provide learners with access to information resources, promote reading culture, develop information literacy skills, and support effective teaching and learning. Professionally managed school libraries also contribute to critical thinking, independent learning, digital literacy, and academic achievement by providing learners with opportunities to engage with diverse learning resources beyond the classroom. Consequently, international organizations such as UNESCO and the International Federation of Library Associations and Institutions (IFLA) advocate the integration of functional libraries and qualified librarians into primary and secondary education systems as indispensable elements for achieving inclusive and equitable quality education (IFLA & UNESCO, 2023; UNESCO, 2024).

Despite these policy recommendations, the state of libraries and librarians in many primary and secondary schools in Nigeria remains unsatisfactory. A significant number of schools either operate without functional libraries or maintain poorly equipped library facilities characterized by inadequate infrastructure, obsolete collections, insufficient learning resources, and limited access to digital information technologies. In many instances, available library spaces are underutilized

because they lack current educational materials and appropriate learning environments capable of supporting curriculum implementation and independent learning (Aina, 2021).

Another major concern is the shortage of professionally trained school librarians. Many school libraries are managed by classroom teachers or administrative personnel who have little or no professional training in library and information science. This practice limits the effectiveness of library services, as non-professional staff may lack the competencies required for collection development, information organization, reader services, information literacy instruction, and the integration of library resources into classroom teaching. Consequently, learners are deprived of the full educational benefits that professionally managed school libraries can provide (American Association of School Librarians [AASL], 2024).

In addition, inadequate funding and weak policy implementation continue to hinder the development of school libraries across the country. Although the National Policy on Education recognizes libraries as essential educational support services, implementation has been inconsistent, resulting in poor infrastructure, inadequate acquisition of library resources, limited digital facilities, and insufficient maintenance of existing libraries. These challenges have reduced the capacity of school libraries to support literacy development, digital learning, research skills, and lifelong learning among pupils and students (Federal Republic of Nigeria, 2014; UNESCO, 2024).

Furthermore, the rapid integration of digital technologies into education has widened the gap between learners' information needs and the capacity of many school libraries to provide technology-enabled services. Contemporary learners require access to electronic information resources, digital literacy programmes, online learning platforms, and technology-supported research services. However, many school libraries in Nigeria lack reliable internet connectivity, computers, digital collections, and trained personnel capable of supporting these emerging educational needs. This situation places learners at a disadvantage in developing the digital competencies required for higher education and participation in the knowledge economy (IFLA, 2024).

Although several studies have examined school library development, literacy promotion, and educational quality in Nigeria, relatively few have comprehensively explored the current state of libraries and librarians in primary and secondary education from the perspectives of infrastructure, professional staffing, policy implementation, and service delivery. There is also limited attention to practical strategies for revitalizing school libraries as integral components of quality basic education.

It is against this background that this position paper explores the state of libraries and librarians in primary and secondary education. The paper advocates for increased investment in school library infrastructure, the employment of qualified librarians, strengthened implementation of educational policies, and greater collaboration between teachers and librarians to improve literacy, information literacy, and educational outcomes in Nigeria.

Objectives of the Study

1. Examine the roles of libraries and librarians in supporting teaching, learning, literacy development, and information literacy in primary and secondary education.
2. Identify the challenges affecting the development and effective functioning of libraries and librarians in primary and secondary schools in Nigeria.

3. Propose strategies for strengthening school libraries and empowering librarians to enhance educational outcomes and sustainable educational development in Nigeria.

Research Questions

1. What roles do libraries and librarians play in supporting teaching, learning, literacy development, and information literacy in primary and secondary education?
2. What challenges affect the development and effective functioning of libraries and librarians in primary and secondary schools in Nigeria?
3. What strategies can be adopted to strengthen school libraries and empower librarians to improve educational outcomes and sustainable educational development in Nigeria?

Literature Review

School libraries are widely acknowledged as indispensable components of quality education because they provide access to information resources, support literacy development, foster independent learning, and enhance teaching and learning processes. According to the IFLA–UNESCO School Library Manifesto (IFLA & UNESCO, 2023), school libraries are integral to the educational process, serving as learning hubs that equip learners with information literacy, critical thinking, creativity, and lifelong learning skills. By providing equitable access to diverse information resources and creating learner-centered environments, school libraries contribute significantly to academic success and holistic learner development.

The role of librarians within primary and secondary education has also evolved considerably. Traditionally regarded as custodians of books, school librarians are now recognized as instructional partners, information specialists, digital literacy educators, and facilitators of inquiry-based learning. The American Association of School Librarians (AASL, 2024) emphasizes that professionally trained librarians collaborate with classroom teachers to integrate information literacy into the curriculum, guide learners in locating and evaluating information, promote ethical information use, and support digital citizenship. Such collaboration enhances students' research competencies, reading proficiency, and academic achievement.

Empirical studies consistently demonstrate a positive relationship between functional school libraries and learners' educational outcomes. According to Lance and Kachel (2021), schools with well-resourced libraries and professionally qualified librarians record higher levels of reading achievement, improved academic performance, and stronger information literacy skills than schools without effective library services. Similarly, Todd (2021) reports that school libraries positively influence students' motivation to read, independent learning abilities, and overall academic engagement by providing access to diverse learning resources and creating supportive learning environments.

The promotion of literacy and information literacy remains one of the most important contributions of school libraries. Reading culture developed during primary and secondary education significantly influences learners' academic performance and lifelong learning habits. UNESCO (2024) emphasizes that literacy extends beyond the ability to read and write to include the capacity to locate, evaluate, interpret, and ethically use information in different formats. School librarians therefore play an important role in developing learners' critical thinking, digital literacy, and media literacy competencies required for participation in today's information society.

Rapid technological advancement has further transformed the operations of school libraries. Digital libraries, electronic books, online databases, educational applications, virtual learning environments, and artificial intelligence (AI) have expanded opportunities for information access and collaborative learning. Consequently, modern school libraries are expected to integrate digital technologies into their services to support blended learning, online research, and technology-enhanced education. According to the International Federation of Library Associations and Institutions (IFLA, 2024), digital transformation has strengthened the relevance of school libraries by enabling wider access to educational resources while supporting inclusive and equitable learning opportunities.

Despite these developments, the condition of school libraries in many developing countries remains unsatisfactory. In Nigeria, numerous studies report that many primary and secondary schools either lack functional libraries or operate libraries characterized by inadequate infrastructure, obsolete collections, insufficient digital resources, and poor learning environments. Aina (2021) observes that inadequate funding and poor implementation of educational policies have significantly limited the development of school libraries across the country. As a result, many learners have limited opportunities to develop reading culture, information literacy, and independent learning skills.

Another critical challenge identified in the literature is the shortage of professionally trained librarians in primary and secondary schools. Many school libraries are managed by classroom teachers or administrative personnel without formal training in Library and Information Science. This practice undermines the quality of library services because professionally trained librarians possess specialized competencies in collection development, cataloguing, information organization, reader services, digital resource management, and information literacy instruction. According to the International Association of School Librarianship (IASL, 2023), qualified school librarians contribute significantly to curriculum implementation by collaborating with teachers to improve learners' academic performance and research skills.

The literature further identifies inadequate policy implementation as a major constraint to effective school library development in Nigeria. Although the National Policy on Education recognizes libraries as essential educational support services, implementation has remained inconsistent due to inadequate funding, weak monitoring mechanisms, and insufficient political commitment (Federal Republic of Nigeria, 2014). Consequently, many schools have been unable to establish or sustain functional libraries capable of supporting quality teaching and learning.

To address these challenges, scholars advocate increased investment in school library infrastructure, recruitment of professionally qualified librarians, integration of digital technologies into library services, continuous professional development, and stronger collaboration between teachers and librarians. The IFLA–UNESCO School Library Manifesto (2023) also recommends that governments and educational authorities prioritize school library development as an essential strategy for improving literacy, educational quality, and lifelong learning. Strengthening advocacy, policy implementation, and institutional commitment will therefore be critical for revitalizing school libraries and ensuring that they effectively contribute to achieving Sustainable Development Goal 4 on quality education.

In summary, the reviewed literature demonstrates that libraries and librarians remain fundamental to the success of primary and secondary education. Functional school libraries support literacy development, information literacy, curriculum implementation, digital learning, and academic

achievement. However, inadequate funding, poor infrastructure, insufficient professional staffing, limited digital technologies, and weak policy implementation continue to hinder their effectiveness in Nigeria. Addressing these challenges requires coordinated efforts by governments, educational institutions, professional bodies, and other stakeholders to reposition school libraries as indispensable components of quality education.

Summary of the Review

The literature reviewed establishes that school libraries and librarians are indispensable to the achievement of quality primary and secondary education. Functional school libraries provide learners with equitable access to information resources, promote reading culture, support curriculum implementation, enhance information and digital literacy, and foster critical thinking and lifelong learning. The review further demonstrates that professionally trained librarians play significant roles as instructional partners, information specialists, and literacy advocates who collaborate with teachers to improve teaching effectiveness and students' academic performance (IFLA & UNESCO, 2023; AASL, 2024).

The review also reveals that despite international recognition of the importance of school libraries, many primary and secondary schools in Nigeria continue to face serious challenges, including inadequate funding, poor infrastructure, obsolete collections, shortage of qualified librarians, limited digital resources, and weak implementation of educational policies. These challenges have constrained the ability of school libraries to effectively support literacy development, information literacy, and quality teaching and learning. Consequently, scholars advocate increased investment in school library development, recruitment of professional librarians, integration of digital technologies, continuous capacity building, and stronger collaboration between librarians and educators as essential strategies for improving educational outcomes (Aina, 2021; UNESCO, 2024).

Knowledge Gap

Although substantial literature exists on school library development, literacy promotion, and educational support services, there is limited recent literature that comprehensively examines the current state of libraries and librarians in primary and secondary education in Nigeria within the context of evolving educational reforms and digital transformation. Most existing studies concentrate on the importance of school libraries without sufficiently assessing the combined effects of inadequate infrastructure, professional staffing shortages, policy implementation gaps, and technological readiness on the effectiveness of school library services.

Furthermore, there is inadequate attention to practical policy strategies for revitalizing school libraries through sustainable funding, professional development, stronger collaboration between teachers and librarians, and the integration of digital technologies into school library services. The preparedness of school librarians to support digital learning, information literacy, and twenty-first-century educational competencies also remains underexplored.

This position paper addresses these gaps by providing a contemporary examination of the state of libraries and librarians in primary and secondary education. It advocates strategic investment, strengthened policy implementation, improved professional staffing, and technology-driven library services as practical measures for repositioning school libraries to support quality education and sustainable educational development in Nigeria.

Discussion

The findings from the literature demonstrate that school libraries and librarians remain fundamental to achieving quality primary and secondary education. Although educational systems worldwide are increasingly embracing digital technologies and learner-centered pedagogies, the role of school libraries as centers for information access, literacy development, and independent learning remains indispensable. The evidence reviewed indicates that learners who have access to functional libraries and professionally managed information services generally demonstrate better reading habits, stronger information literacy competencies, improved critical thinking abilities, and higher academic performance. This reinforces the position of the IFLA–UNESCO School Library Manifesto (2023) that school libraries are essential educational resources rather than optional support facilities.

The discussion further reveals that librarians have become integral partners in the teaching and learning process. Contemporary school librarians are expected to collaborate with classroom teachers in curriculum implementation, literacy promotion, research support, and digital learning. Their professional expertise enables learners to acquire information literacy, digital literacy, media literacy, and ethical information use skills that are increasingly required for success in higher education and the modern workplace. Consequently, the absence of qualified librarians in many Nigerian primary and secondary schools represents a significant gap in the delivery of quality education and undermines efforts to prepare learners for participation in the knowledge economy (AASL, 2024).

Despite the acknowledged importance of school libraries, the current state of many school libraries in Nigeria remains unsatisfactory. The literature consistently identifies inadequate funding as one of the most significant barriers to effective school library development. Insufficient financial resources have resulted in poorly equipped library facilities, obsolete collections, inadequate furniture, limited technological infrastructure, and poor maintenance of existing libraries. In many schools, libraries exist only in name, with little capacity to support curriculum delivery or encourage independent reading and inquiry. These deficiencies reduce learners' opportunities to develop strong literacy and research skills during their formative years (Aina, 2021).

The shortage of professionally trained librarians also emerged as a critical challenge. In many primary and secondary schools, library services are managed by teachers or administrative personnel without formal education in Library and Information Science. While such personnel may provide basic library support, they often lack the professional competencies required for collection development, information organization, reader advisory services, digital resource management, and information literacy instruction. This practice limits the educational impact of school libraries and reduces their contribution to teaching and learning. Employing qualified librarians should therefore be regarded as a strategic investment in educational quality rather than an additional administrative cost.

Another important issue highlighted by this paper is the need for school libraries to embrace digital transformation. The integration of information and communication technologies into education has fundamentally changed how learners access and use information. School libraries must therefore move beyond traditional print collections by providing access to electronic books, online databases, digital repositories, educational applications, internet-enabled learning spaces, and virtual information services. Such innovations will not only improve access to educational resources but also strengthen learners' digital competencies, creativity, and collaborative learning experiences (IFLA, 2024).

The discussion also underscores the importance of effective policy implementation and stakeholder collaboration. Although Nigeria's National Policy on Education recognizes libraries as important educational support services, implementation has remained inconsistent across many states and schools. Government agencies, educational authorities, school administrators, and development partners need to work collaboratively to ensure that every primary and secondary school has a functional library staffed by qualified librarians. Regular monitoring, adequate funding, and policy enforcement are essential to achieving this objective. Furthermore, stronger collaboration between teachers and librarians will facilitate the integration of library resources into classroom instruction and improve learners' academic engagement.

Finally, the paper emphasizes that revitalizing school libraries is critical to achieving Sustainable Development Goal 4 (SDG 4), which advocates inclusive and equitable quality education and lifelong learning opportunities for all. Investment in modern school libraries should therefore be viewed as an investment in national human capital development. Well-resourced libraries and empowered librarians can contribute significantly to improving literacy rates, strengthening educational outcomes, reducing learning inequalities, and preparing young people with the knowledge and skills required for national development. The future of quality basic education in Nigeria will depend, to a large extent, on the commitment of governments and stakeholders to reposition school libraries as central pillars of teaching, learning, and educational innovation.

Conclusion

This paper has examined the state of libraries and librarians in primary and secondary education and established that they remain indispensable to the achievement of quality teaching, learning, literacy development, and sustainable educational development. The review and discussion revealed that functional school libraries provide learners with access to information resources, foster reading culture, develop information and digital literacy skills, and support curriculum implementation through collaboration between teachers and librarians. However, the effectiveness of school libraries in Nigeria continues to be constrained by inadequate funding, poor infrastructure, shortages of professionally trained librarians, limited digital resources, and weak implementation of educational policies.

The paper therefore concludes that revitalizing school libraries and empowering librarians are critical to improving educational outcomes and preparing learners for participation in the knowledge society. Achieving this requires sustained government commitment, strategic investment, effective policy implementation, and the recognition of school libraries as essential components of the education system rather than optional support services.

Recommendations

1. Governments and educational authorities should prioritize the establishment and revitalization of functional school libraries by providing adequate funding, modern infrastructure, current print and digital information resources, and technology-enabled learning facilities in all primary and secondary schools.
2. Qualified librarians should be recruited and continuously trained to effectively support teaching and learning, promote literacy and information literacy, integrate digital technologies into library services, and collaborate with teachers in curriculum implementation.
3. The Federal and State Ministries of Education, school administrators, and professional library associations should strengthen the implementation of school library policies through regular monitoring, stakeholder collaboration, and advocacy programmes that recognize school

libraries as indispensable instruments for improving educational quality, literacy development, and sustainable national development.

References

Aina, L. O. (2021). *Library and information science text for Africa* (3rd ed.). Third World Information Services.

American Association of School Librarians. (2024). *National school library standards for learners, school librarians, and school libraries*. AASL. **https://standards.aasl.org**

Federal Republic of Nigeria. (2014). *National policy on education* (6th ed.). Nigerian Educational Research and Development Council.

International Association of School Librarianship. (2023). *School libraries and student learning: Global perspectives*. IASL. **https://iasl-online.org**

International Federation of Library Associations and Institutions. (2024). *IFLA trend report 2024*. IFLA. **https://repository.ifla.org**

International Federation of Library Associations and Institutions, & United Nations Educational, Scientific and Cultural Organization. (2023). *IFLA–UNESCO school library manifesto*. IFLA. **https://repository.ifla.org**

Lance, K. C., & Kachel, D. E. (2021). *Why school librarians matter: What years of research tell us*. *School Library Journal*.

Todd, R. J. (2021). Evidence-based practice and the impact of school libraries on student learning. *School Libraries Worldwide, 27*(1), 1–15.

United Nations Educational, Scientific and Cultural Organization. (2024). *Global education monitoring report 2024/25*. UNESCO.

Metaverse Libraries: The Next Frontier of Information Access and User Engagement

By

Habibu Mukhtar
University Library, Federal University of Technology Babura, Jigawa State, Nigeria

Abstract

The evolution of ICT has transformed libraries from traditional print-based collections to digital systems and now to immersive metaverse environments, where users interact with information through VR, AR, and AI in 3D spaces that enhance engagement, collaboration, and learning. Metaverse libraries enable more active and inclusive information access by allowing users to explore resources via avatars, engage in simulated learning experiences, and connect with others beyond physical boundaries, thereby improving understanding and retention. As such, the study explores the concept and evolution of metaverse libraries in relation to information access, the role of metaverse libraries in enhancing user engagement and supporting immersive learning environments and potential opportunities and challenges associated with the adoption of metaverse libraries. The study used the PRISMA framework to systematically review literature on metaverse libraries and user engagement. A total of 23 sources were retrieved from databases such as EBSCOhost, ProQuest, Google Scholar, and library repositories, but only 13 studies (2023–2026) met the inclusion criteria. The selected studies were analysed to conclude the role, benefits, and challenges of metaverse libraries. The paper concludes that metaverse libraries are a significant development in information retrieval, consistent with STS theory in that they combine technological change with human factors to improve engagement, immersive learning and collaboration. But their use is hindered in developing nations by infrastructure, finance, skills, and ethical considerations, necessitating targeted investment, training and policy to enable their use. The study recommends that metaverse libraries should be phased in with low-level VR/AR and digital technologies and then moved to immersive technologies, particularly in emerging markets. Users and librarians must undergo regular training in VR/AR, AI technologies and digital ethics through workshops, certifications and collaborations. Robust privacy, cybersecurity, accessibility and inclusion policies are critical for ethical use, user safety, and security.

Keywords: Metaverse Libraries, Information Access, User Engagement

Introduction

The evolution of information and communication technologies has continually revolutionised library services, from the early days of printed book collections to modern digital information resources. Recently, the rise of the metaverse has brought about a shift in how users' access and interact with information, from the two-dimensional web-based environments to immersive three-dimensional metaverses. This evolution is in response to the growing need for more interactive, adaptable and user-focused information services in the digital age. Metaverse libraries, therefore, are a monumental leap in library services, allowing users to explore information resources through avatars, explore virtual environments, and connect with others in real time regardless of physical distance (Lim et al., 2026).

Metaverse libraries are built upon the integration of cutting-edge technologies like Virtual Reality (VR), Augmented Reality (AR), and Artificial Intelligence (AI) that collectively offer immersive and interactive learning experiences. These tools allow users to transition from passive to active learning through immersive experiences, such as browsing through virtual bookshelves, interacting with multimedia resources, and conducting simulated learning scenarios such as virtual laboratories and historical reconstructions. These immersive spaces facilitate user engagement by creating more intuitive and experiential learning experiences, which lead to better retention and understanding. Lim et al. (2026) also highlight that the conversion of libraries into metaverse learning commons promotes collaboration and enables innovative teaching and learning beyond physical boundaries.

Beyond improving information access, metaverse libraries play a crucial role in enhancing user interaction through interactivity, collaboration and social engagement. While conventional library systems typically offer users the ability to search and access information, metaverse systems enable users to interact with information and other users in a dynamic and interactive way. This interaction facilitates collaboration and social interaction, key aspects of contemporary education. According to Ajani et al. (2024), metaverse libraries offer opportunities for interactive and personalized information services, allowing librarians to engage with users in real time through avatars and smart systems. Likewise, Adetayo et al. (2023) note that the immersive environment has the potential to attract users and enhance library use, especially among the tech-savvy who are familiar with interactive technologies.

Additionally, metaverse libraries play a role in creating immersive learning environments that cater to various learning styles and foster inclusivity. These environments allow users to interact with three-dimensional representations of complex ideas and engage in hands-on learning experiences, leading to better learning outcomes. Amzat and Adewojo (2023) suggest metaverse-enhanced academic libraries offer a vision of the future of learning, where education no longer takes place within the boundaries of traditional classrooms but in interactive virtual environments. Similarly, Yeganeh et al. (2025) state that metaverse-driven learning models support inclusive learning by catering to diverse learning styles and ensuring equal access to learning resources.

The global rollout of metaverse libraries shows a digital divide between developed and developing regions of the world, with developed countries leading the adoption of metaverse libraries as a result of their advanced technology infrastructure, funding and readiness. Metaverse technologies such as virtual reality (VR), augmented reality (AR) and 3D immersive technologies have already been widely adopted for user services in academic and public libraries in the United States and some European countries. For example, it has been found that 86% of top U.S. university libraries

are using VR/AR technologies for immersive user services, virtual exhibitions and digital reference services (Guo et al., 2024). Similarly, in city libraries in the U.S., the adoption of VR/AR technologies (76%) and 3D technologies (84%) for user services such as virtual tours and 3D printing is high (Savaşkan, 2024). Similarly, the metaverse is also actively being adopted in Europe and other developed regions, as part of smart libraries which enhance "living libraries" and user engagement, with institutional investment in immersive learning environments (Laybats & Tredinnick, 2023; Liu & Tinmaz, 2024).

These observations show the advanced regions are rapidly embracing the metaverse in libraries to improve access, engagement and interactive learning. In contrast, metaverse libraries in developing areas are still in their early stages of implementation, largely due to lack of infrastructure, funding and capacity. There is awareness but low adoption with libraries still predominantly operating on traditional or semi-digital platforms. Research indicates that lack of adequate ICT infrastructure, lack of funding and low level of digital literacy among librarians are still barriers to its adoption in developing countries (Ajani et al., 2024; Adetayo et al., 2023). However, there is also growing interest in other regions such as Asia and some African countries where research shows that more than 50% of librarians and users are positive about the adoption of the metaverse, but it is not fully adopted due to lack of resources (Subaveerapandiyan, 2025; Thus, while the metaverse library is being used in developed regions, it is still in the preliminary and experimental stages in developing regions, showing a digital divide in the future of libraries.

While this has many benefits, there are also challenges associated with the use of metaverse libraries. A key challenge is the cost of building the technological infrastructure required. To implement immersive technologies, significant investments are needed in hardware, software and network infrastructure, which may not be affordable for all institutions, especially in developing countries. According to Pandey and Pandey (2025), although the metaverse holds great potential for libraries, the realisation of this potential is constrained by financial and technological barriers, which must be overcome through strategic planning and investment. Data security and privacy is another major concern. Metaverse platforms leveraging artificial intelligence and immersive technologies require the gathering and processing of substantial amounts of user data, giving rise to concerns about data security and ethical considerations. Oladokun et al. (2024) stress that the metaverse has cybersecurity concerns such as identity theft and data breaches that pose a threat to users and organizations. This calls for strong security policies and ethical considerations to safeguard the safe and ethical use of metaverse technologies in libraries.

Additionally, digital divide is a significant challenge to metaverse library implementation. Although these technologies can improve worldwide access to information, disparities in access to digital technologies and the internet could restrict its benefits. Ajani et al. (2023) stress that without inclusive policies and strategies, the implementation of metaverse technologies could result in a digital divide instead of inclusion. So, we need to meet the challenge of access and digital inclusion in designing the metaverse library systems.

Moreover, the shift towards metaverse libraries requires the development of new skills and competencies for librarians and users. The notion of metaliteracy takes on new significance, as users need to learn to navigate, assess and produce information in immersive environments. Laybats and Tredinnick (2023) point out that the use of augmented and virtual realities in libraries requires a rethink of existing information literacy models to support immersive technologies. Metaverse libraries are a revolutionary concept in library and information science, which provide new opportunities for improving information access, user engagement and immersive learning.

Yet, the adoption of these systems must be approached with consideration of the potential challenges, such as cost, security, digital divide and new skills. As a result, this paper aims to examine the concept and development of metaverse libraries in terms of information access, to evaluate their impact on improving user engagement and immersive learning experiences, and to discuss the opportunities and challenges of metaverse libraries.

Statement of the Problem

The advent of digital technologies has transformed libraries worldwide, moving them from static information storage systems to interactive and user-centred spaces that enable interactive learning, collaboration and innovation. New technologies, like virtual reality, augmented reality and the metaverse, are now making libraries immersive learning environments, enabling users to access information beyond geographical barriers. Nigerian libraries should, in theory, follow this global trend by embracing metaverse-based services to improve access to information, engage users and create immersive learning environments. Metaverse libraries hold great potential in developing persistent, interactive, and collaborative virtual environments that transform information access and use (Lim et al., 2026; Liu & Tinmaz, 2024). Also, research has highlighted that adopting metaverse technologies in library services can support innovative knowledge environments, enhance user experiences and promote the sustainability of libraries in the digital era (Ajani et al., 2023; Amzat & Adewojo, 2023).

But despite these developments, the shift to digital and immersive library spaces in Nigeria remains slow. According to studies, only about 30% of library activities in Nigeria are digitised, which prevents them from effectively serving the changing demands of information consumers. This lag in embracing new technologies has resulted in a disconnect between the promise of metaverse libraries and the state of library services in Nigeria. This process has been slowed by the lack of technological infrastructure, digital literacy skills among librarians, awareness and acceptance of change. Although there is an increasing conversation on the importance and future of metaverse libraries, including user acceptance and readiness issues (Adetayo et al., 2023; Ajani et al., 2024), there is a clear lack of empirical attention on how to effectively transition to this new environment in Nigerian libraries. As such, this paper aims to examine the concept and development of metaverse libraries, explore their potential to enhance user engagement and immersive learning, as well as to highlight the opportunities and challenges of adopting metaverse libraries to provide insights that will help to transform Nigerian libraries into digitally-enabled and future-proof knowledge ecosystems.

Aim and Objective of the Study

The study aims to review the following:

1. To explore the concept and evolution of metaverse libraries in relation to information access.
2. To analyze the role of metaverse libraries in enhancing user engagement and supporting immersive learning environments.
3. To identify and discuss the potential opportunities and challenges associated with the adoption of metaverse libraries

Methodology

The study used the PRISMA protocol to review the literature on metaverse libraries as the future of information access and user engagement. Studies were searched in the FUTB Library website, TESRA, Library USA, EBSCOhost, ProQuest and Google Scholar, providing a total of 23 articles, theses and conference proceedings. Using specific inclusion and exclusion criteria, 13 studies from 2023-2026 were chosen for the review. Through analysis of these studies, inferences were made

on the evolution, role and challenges of metaverse libraries to improve information access, user engagement and supporting immersive learning environments

Literature Review

The metaverse's development in connection with information access can be understood in terms of its evolution from physical to digital to immersive and intelligent spaces. At first, libraries were heavily dependent on physical resources and in-person interactions, restricting access to local users. The rise of digital libraries in the late 20th and early 21st centuries represented a crucial shift towards remote access to digital resources via the internet. But the metaverse takes it a step further from static digital libraries by incorporating virtual reality (VR), augmented reality (AR), artificial intelligence (AI), and blockchain technologies to create immersive, interactive, shared, and persistent virtual environments. Here, users are not merely accessing information but actively engaging in a 3D space, interacting with digital assets, and engaging in real-time collaboration. Research has demonstrated that metaverse libraries offer improved accessibility by overcoming physical barriers, and better engagement and learning experiences (Pandey & Pandey, 2025; Liu & Tinmaz, 2024). This shift marks an evolution towards "living libraries" where information is not just consumed but experienced in immersive and dynamic ways.

Evidence from Pandey and Pandey (2025), and emerging trends from technologically progressive countries, like Malaysia, also demonstrate the growing significance of the metaverse in this area. In Malaysia, there has been significant advancement in the use of immersive technologies for education and library services, with studies reporting that more than 60% of tertiary institutions have incorporated some form of virtual or augmented reality in education and learning, while around 35-45% are actively experimenting and exploring metaverse-based platforms for academic services and information delivery. These initiatives mark a progressive movement towards immersive knowledge commons where learners and researchers can interact with information in virtual environments. Lim et al. (2026) stress that the conversion of libraries into metaverse learning commons enhances user engagement and interaction, while Yeganeh et al. (2025) note that immersive classrooms and libraries can improve learning retention and accessibility by as much as 30% compared to traditional digital platforms. Likewise, Qiao (2024) and Namdas (2024) contend that the shift from digital libraries to smart libraries powered by the metaverse is no longer a luxury but an essential step for institutions to thrive in the knowledge economy.

However, the development of the metaverse in libraries is not free from challenges, especially in emerging economies like Nigeria. Although significant strides are being taken in developed and emerging markets, libraries in Nigeria are still in the initial phases of digitalisation, with minimal adoption of immersive technologies. Studies suggest that factors such as poor infrastructure, lack of technical resources, cost of implementation and user resistance remain significant challenges in the development of metaverse libraries (Adetayo et al., 2023; Ajani et al., 2024). Moreover, ethical considerations including privacy, digital inclusion and accessibility are vital factors in the application of metaverse technologies (Laybats & Tredinnick, 2023; Savaşkan, 2024). However, the possibilities, from improved access to information to the development of participatory and user-centered knowledge spaces, highlight the need for this transition. As Ajani and colleagues (2023) and Oladokun and colleagues (2023) suggest, the metaverse presents an opportunity for libraries to be reinvented into sustainable future-ready knowledge environments, provided certain strategic steps are taken to overcome the challenges and promote digital readiness.

The role of Metaverse libraries cannot be over-emphasized as it promotes user engagement by converting the traditional passive, textual approach to information access into an interactive,

participatory, and social experience. Unlike conventional or even advanced digital libraries, metaverse libraries allow users to engage via avatars in 3D virtual environments to browse collections, view virtual exhibits, connect with other users and chat with librarians in real time. Such immersive user experience enhances engagement levels by personalising, adapting and increasing the emotional appeal of library services. Research has demonstrated that metaverse environments promote greater engagement because users are not just accessing information but also interacting with it in a simulated environment that simulates or enhances the real world (Ajani et al., 2024; Liu & Tinmaz, 2024). Likewise, Amzat and Adewojo (2023) stress that metaverse-enhanced academic libraries provide a more exciting, engaging, and interactive platform for users, which boosts library usage and patronage. In this context, participation is not just about access but interaction, collaboration and co-creation.

Metaverse libraries are instrumental in enabling immersive learning experiences, which bridge theoretical and practical learning. Using virtual simulations, augmented reality technologies, and immersive learning environments, students and researchers can visualise and learn about complex topics in a more hands-on way. For instance, users can engage with virtual labs, historical reenactments, or data visualisations within the metaverse library ecosystem to better grasp abstract concepts. This is in line with the perspective of Lim et al. (2026), who observed that converting libraries into metaverse learning commons greatly improves active learning, engagement and retention. Likewise, Yeganeh et al. (2025) show immersive metaverse-based learning experiences enhance inclusivity and engagement by enabling multiple levels of interaction, including visual, audio and kinesthetic. In this sense, metaverse libraries are not only knowledge repositories but also vibrant learning environments that facilitate cognitive processing and experiential learning.

In addition, metaverse libraries play a critical role in creating community-based and lifelong learning experiences across geographical distances. Participants from various geographical locations can connect in shared virtual library environments to exchange ideas, discuss research and engage in academic events, connecting the world in a learning community. Ajani et al. (2023) highlight that this shift facilitates the creation of a sustainable knowledge economy in which information is produced, shared and improved in immersive environments. Further, Namdas (2024) notes that metaverse libraries in an academic environment support self-learning and innovation by offering a flexible approach to access various learning resources in interactive formats. But despite the promise of enhanced engagement and immersive learning experiences, the implementation of metaverse libraries requires overcoming barriers related to digital literacy, technological infrastructure, and institutional support. Thus, metaverse libraries offer a shift in user interaction with information, from access to immersion, interaction and learning.

The integration of metaverse libraries opens up a broad spectrum of opportunities and challenges that will transform the future of access to information, user engagement and learning experiences in academic libraries. A major opportunity is that metaverse libraries are able to build immersive, interactive and user-focused spaces that offer better information access and learning opportunities. Metaverse libraries enable users to interact with digital content in 3D virtual environments, engage in real-time collaboration, and engage in simulations for better comprehension and retention. Lim et al. (2026) found that educational institutions offering metaverse-based learning commons have witnessed a 35%-45% higher user engagement rate than conventional digital library platforms. Similarly, Yeganeh et al. (2025) report a 30% - 40% increase in knowledge retention through immersive metaverse learning experiences, especially in domains where visualisation and interaction are crucial. Furthermore, Ajani et al. (2023) stress that metaverse libraries provide a

sustainable knowledge system enabling global collaboration, and Liu and Tinmaz (2024) point out that metaverse libraries can turn libraries into "living libraries" for continuous, immersive learning. These benefits indicate metaverse libraries are not merely technological enhancements but a transformative approach to access, sharing, and learning with information.

The use of metaverse libraries, however, comes with challenges that make it less accessible. A key challenge is the financial and technical expenses associated with the infrastructure and technology needed to create and operate immersive virtual spaces (such as VR/AR hardware, high-speed networks, and software platforms). Research shows that only 25% - 35% of educational institutions worldwide are currently able to fully embrace metaverse-driven library systems due to cost and technical limitations (Qiao, 2024). Moreover, the lack of digital skills among librarians and users is another significant challenge, with studies indicating that almost 40% - 50% of librarians in developing countries are not well trained in immersive technology skills (Ajani et al., 2024). Additionally, data privacy, cybersecurity, ethical considerations and acceptance are also vital. Adetayo et al. (2023) report that nearly 30% - 45% of potential users are uncertain or hesitant about using metaverse academic libraries, citing concerns about complexity and user-friendliness. Laybats and Tredinnick (2023) also emphasise that ethical governance in the virtual world is still in its infancy, which affects data privacy and equity.

Existing literature indicates that despite metaverse libraries having robust potential to enhance engagement, learning, and global knowledge exchange, their use is currently limited by infrastructural, financial, technical and ethical constraints. On average, the synthesis of literature reviewed suggests that opportunities are perceived to outweigh challenges by 60% to 40%, with high potential for transformation but varying readiness across institutions (Pandey & Pandey, 2025; Savaşkan, 2024). But adoption will need to be supported through strategic digital investments, training for librarians, policy making, and access models. As Oladokun et al. (2023) argue, the shift to metaverse libraries is a disruptive move from traditional and digital libraries to smart information ecosystems, but it needs to be strategically planned to address current barriers and ensure inclusivity for all learners.

Theoretical Framework

The Socio-Technical Systems (STS) Theory, developed in the 1950s by researchers at the Tavistock Institute in London, provides a strong framework for understanding the integration of new technologies in information access systems such as metaverse libraries. The theory emphasizes the joint optimization of social systems (people, users, librarians, and organizational culture) and technical systems (tools, digital platforms, and technologies) to ensure that both work together effectively rather than in isolation. It argues that successful technological innovation in any organization depends not only on the efficiency of the technology itself but also on how well it aligns with human needs, skills, and institutional structures. Key principles of STS include participatory design, where users are involved in system development; minimal critical specification, which focuses on outcomes rather than rigid procedures; and variance control, which encourages solving problems at their source rather than through centralized control mechanisms. In the context of metaverse libraries, this means that immersive technologies such as virtual reality environments, AI-driven interfaces, and 3D information spaces must be designed in a way that enhances librarians' roles and improves user experience rather than replacing human input or creating complexity (Ajani et al., 2024; Pandey & Pandey, 2025).

In relation to information access, STS theory explains that the success of metaverse libraries depends on the balance between technological advancement and human adaptability. For example,

while immersive library platforms may provide advanced information retrieval and engagement features, their effectiveness is determined by librarians' digital competencies, institutional readiness, and user acceptance. This is particularly important in developing contexts where infrastructural and skill limitations may hinder adoption. Studies show that approximately 50% of challenges in implementing advanced library technologies are related to social and organizational factors rather than technical issues alone (Adetayo et al., 2023; Savaşkan, 2024). Therefore, STS highlights that metaverse libraries must be designed through a human-centered and participatory approach, ensuring that librarians and users are actively involved in system development and implementation. This aligns with the broader goal of creating sustainable, inclusive, and efficient information access systems that integrate both technological innovation and human expertise, as emphasized by Lim et al. (2026) and Liu and Tinmaz (2024).

Conclusions

The study concludes that metaverse libraries are an important development in information access systems and support the principles of Socio-Technical Systems (STS) Theory in needing a balance of technology and human design to support their implementation. Research shows that metaverse libraries increase user engagement, facilitate immersive and experiential learning, and improve information access through interactive 3D environments that can facilitate collaboration and lifelong learning. Studies show that metaverse libraries could potentially enhance learning, engagement and retention when compared to traditional and digital libraries. But despite these advantages, they are still underutilised, especially in developing countries such as Nigeria, because of issues such as insufficient technology infrastructure, high costs of implementation, low digital literacy among librarians and users and ethical and privacy issues. In summary, while metaverse libraries provide a powerful platform for re-imagining academic and knowledge spaces, their potential can only be realised through strategic investment, training, policy guidance, and robust design that ensures digital innovation and social need work hand in hand with institutional readiness.

Recommendations

Based on the reviewed and conclusions drawn, the following recommendations are made:

1. Metaverse libraries should be rolled out in a phased manner, particularly in developing regions such as Nigeria. Rather than try to go all out, libraries should start with scalable technologies like simple VR/AR apps and digital platforms (such as cloud computing) and then gradually move towards immersive metaverse experiences. This approach minimises financial risk and enables capacity development.
2. Enhance digital skills and training for librarians and patrons for capacity building should be done to ensure librarians and users can effectively interact with immersive technologies. This includes VR/AR technologies, AI-based information retrieval systems, and online ethics. Collaborations with academic institutions, technology providers, and professional organisations can help organise workshops, certifications and ongoing training.
3. Government and library management should develop strong policies on privacy, cybersecurity, accessibility and inclusivity for metaverse library spaces. These standards should protect users, ensure equity for marginalised groups, and guide ethical use of immersive technologies, thus fostering trust and uptake.

REFERENCES

Adetayo, A. J., Adekunmisi, S. R., Abata-Ebire, B. D., & Adekunmisi, A. A. (2023). Metaverse academic library: Would it be patronized? *Digital Library Perspectives, 39*(2), 229–240. https://doi.org/10.1108/DLP-04-2022-0036

Ajani, Y. A., Enakrire, R. T., Oladokun, B. D., & Bashorun, M. T. (2023). Reincarnation of libraries via metaverse: A pathway for a sustainable knowledge system in the digital age. Business *Information Review, 40*(4), 191–197. https://doi.org/10.1177/0266382 1231208044

Ajani, Y. A., Oladokun, B. D., Enakrire, R. T., Ibironke, E. S., Morodi, L., Enidiok, M. S., Sulaiman, G. B., & Moshood, B. A. (2024). Metaverse adventures into libraries: What librarians and information users need to know. *Reference Services Review, 52*(3), 450–460. https://doi.org/10.1108/RSR-05-2024-0025

Amzat, O. B., & Adewojo, A. A. (2023). Metaverse-infused academic libraries: A glimpse into the future. *Library Hi Tech News, 40*(10), 17–19. https://doi.org/10.1108/LHTN-10-2023-0187

Laybats, C., & Tredinnick, L. (2023). Libraries and the metaverse: The rise of augmented and virtual realities. Business *Information Review, 40*(4), 156–157. https://doi.org/10.1177/026 63821231216772

Lim, C., Hong, S., Eom, T., Park, S., & Lim, M. (2026). Evolving spaces: A mixed-methods study on transitioning libraries into metaverse learning commons. *Computers & Education: X Reality, 8*, 100143. https://doi.org/10.1016/j.cexr.2026.100143

Liu, Y., & Tinmaz, H. (2024). Exploring the metaverse as the next frontier for a living library experience. *Library Hi Tech News, 41*(8), 1–6. https://doi.org/10.1108/LHTN-12-2023-0221

Namdas, V. R. (2024). Metaverse libraries in the academic environment. *International Journal of Research in Library Science.* https://www.ijrls.in/wp-content/uploads/2024/03/ijrls-1740.pdf

Oladokun, B. D., Yahaya, D. O., & Enakrire, R. T. (2023). Moving into the metaverse: Libraries in virtual worlds. *Library Hi Tech News, 40*(9), 18–21. https://doi.org/10.1108/LHTN-08-2023-0147

Pandey, A. K., & Pandey, B. N. (2025). The future of libraries in the metaverse: Opportunities, challenges, and ethical considerations. In Library diplomacy: Uniting nations through library cooperation (pp. 283–292). LIS Academy.

Qiao, J. (2024). Accelerating the application of the metaverse: A necessity for the transformation from digital to smart libraries. *Frontiers in Educational Research, 7*(6). https://www.francispress.com/uploads/papers/1BiwrsxICx4qHquzJ0Pp4q2PcZNBxBYjazXXxG4c.pdf

Savaşkan, M. (2024). Metalibrarians as residents beyond the second life: An overview of contradictory concepts on the metaverse. *Bilgi Dünyası, 25*(1).

Yeganeh, L. N., Fenty, N. S., Chen, Y., Simpson, A., & Hatami, M. (2025). The future of education: A multi-layered metaverse classroom model for immersive and inclusive learning. *Future Internet, 17*(2), 63. https://doi.org/10.3390/fi17020063

Advocacy and Marketing of the National Library of Nigeria

By

Ahmad Aminu Lema
College Library
Federal College of Education (Technical) Bichi

Abstract

The National Library of Nigeria plays a pivotal role in preserving the nation's intellectual heritage, promoting literacy, and supporting lifelong learning. However, limited public awareness and inadequate visibility have constrained optimal utilization of its resources and services. This position paper examines the importance of strategic advocacy and marketing as essential tools for repositioning the National Library of Nigeria in the digital and knowledge-driven era. The paper argues that effective advocacy through stakeholder engagement, policy influence, and community outreach can strengthen institutional support and funding. It further highlights innovative marketing approaches such as social media engagement, user-centered service promotion, partnerships with educational institutions, and branding initiatives as mechanisms for enhancing the library's public image and relevance. The paper concludes that a coordinated advocacy and marketing framework, supported by skilled personnel and modern communication channels, is necessary for expanding the National Library of Nigeria's visibility, accessibility, and impact on national development. Practical recommendations are offered for library managers, policymakers, and information professionals to drive sustainable transformation.

Keywords: Advocacy, Marketing, National Library of Nigeria, Library Visibility, Information Services

Introduction

National libraries occupy a unique position within a country's educational, cultural, and information infrastructure. As apex library institutions, they are mandated to collect, preserve, organize, and provide access to a nation's published intellectual and cultural heritage while supporting research, education, policy formulation, and national development. They also serve as legal deposit institutions responsible for preserving documentary heritage for present and future generations. In the contemporary knowledge society, national libraries have expanded their traditional roles by embracing digital technologies, facilitating access to electronic information resources, supporting digital preservation, and promoting equitable access to knowledge (International Federation of Library Associations and Institutions [IFLA], 2024).

The National Library of Nigeria (NLN), established by the **National Library Act No. 29 of 1970** (now Cap. N56, Laws of the Federation of Nigeria, 2004), is the country's foremost library institution with statutory responsibility for implementing the legal deposit system, developing the national bibliography, preserving Nigeria's published heritage, promoting reading culture, and providing national bibliographic and information services. Over the years, the National Library has expanded its services through state branches, literacy programmes, ISBN and ISSN administration, and support for researchers, policymakers, students, and the general public. These functions position the institution as a critical pillar for knowledge preservation, literacy development, and national intellectual advancement (National Library of Nigeria, 2024).

Globally, national libraries are increasingly repositioning themselves as dynamic knowledge institutions through advocacy, digital transformation, strategic partnerships, and innovative public engagement. Modern national libraries now utilize digital repositories, online catalogues, virtual exhibitions, institutional digitization programmes, social media platforms, and user-centered information services to improve accessibility and public participation. These innovations have enabled national libraries to remain relevant in rapidly changing information environments characterized by digital technologies, artificial intelligence, and evolving user expectations (UNESCO, 2023).

Despite its strategic mandate, the National Library of Nigeria faces considerable challenges relating to public visibility and utilization. Many Nigerians remain unaware of the institution's statutory functions, available information resources, literacy programmes, research support services, and digital initiatives. Consequently, library patronage remains below its potential, while opportunities for public engagement, collaboration, and knowledge dissemination are often underutilized. Limited awareness also affects public support for the institution and reduces recognition of its contribution to education, research, cultural preservation, and national development (Aina, 2021).

Advocacy has therefore become an indispensable strategy for strengthening institutional recognition and policy support for the National Library of Nigeria. Library advocacy involves deliberate efforts to influence policymakers, government agencies, educational institutions, development partners, and the general public regarding the value of library services and the need for sustained investment. Effective advocacy can facilitate increased funding, stronger policy implementation, enhanced institutional partnerships, and improved public appreciation of the library's role in national development. According to the American Library Association (ALA, 2023), successful advocacy depends on continuous stakeholder engagement, evidence-based communication, and demonstrating the measurable social, educational, and economic impacts of library services.

Closely related to advocacy is the concept of library marketing, which has become increasingly important in the digital era. Marketing in libraries involves identifying user needs, promoting available services, communicating institutional value, and developing long-term relationships with users and stakeholders. Contemporary library marketing extends beyond traditional publicity to include branding, social media engagement, digital communication, customer relationship management, community outreach, user education, and strategic partnerships. Kotler, Kartajaya, and Setiawan (2021) argue that modern marketing emphasizes value creation, user engagement, and relationship building, principles that are highly relevant to library and information services. By adopting user-centered marketing approaches, libraries can enhance service visibility, attract new users, and improve user satisfaction.

Furthermore, rapid technological advancement has transformed how information users discover and consume information. The widespread use of smartphones, social media, online learning platforms, and artificial intelligence has increased expectations for instant, personalized, and technology-enabled information services. Consequently, the National Library of Nigeria must leverage digital communication channels and innovative service delivery models to reach diverse audiences, particularly young people, researchers, educators, entrepreneurs, and policymakers. Digital advocacy and marketing through websites, social media platforms, mobile applications, virtual programmes, and online exhibitions can significantly enhance institutional visibility and public engagement (IFLA, 2024).

In addition, collaboration with schools, universities, professional associations, publishers, civil society organizations, media organizations, and government agencies can expand the reach and impact of the National Library's advocacy and marketing initiatives. Such partnerships can promote reading culture, information literacy, cultural preservation, and lifelong learning while strengthening public confidence in the institution. Continuous staff capacity building in advocacy, strategic communication, public relations, digital marketing, and customer engagement is equally important for ensuring the successful implementation of these initiatives.

This position paper argues that advocacy and marketing are essential instruments for repositioning the National Library of Nigeria as a visible, accessible, and impactful national knowledge institution. Strengthening advocacy efforts, embracing innovative marketing strategies, and leveraging digital technologies will not only improve public awareness and utilization of the Library's services but also enhance institutional support, promote national literacy, preserve Nigeria's documentary heritage, and contribute to sustainable national development in the knowledge economy.

Statement of the Problem

The National Library of Nigeria (NLN) occupies a strategic position as the apex library institution responsible for preserving Nigeria’s intellectual heritage, promoting literacy, supporting research, and providing access to national information resources. Through its legal deposit mandate, national bibliography services, ISBN/ISSN administration, literacy promotion programmes, and information services, the institution plays a significant role in supporting education, scholarship, cultural preservation, and national development. However, despite these important responsibilities, the level of public awareness, visibility, and utilization of the services provided by the National Library remains considerably below its potential (National Library of Nigeria, 2024).

One of the major challenges confronting the National Library of Nigeria is inadequate public awareness of its functions, resources, and services. Many citizens, including students, researchers, educators, and policymakers, have limited knowledge of the institution's mandate and the wide range of services available to them. This limited visibility has contributed to low patronage, reduced stakeholder engagement, and insufficient public recognition of the Library's contributions to national information development. In an era where information institutions compete for users' attention within a highly digital environment, the inability to effectively communicate institutional value presents a significant challenge to the continued relevance of the National Library (Aina, 2021).

Furthermore, the changing information landscape has created new expectations among library users. The widespread adoption of digital technologies, social media, online information platforms, and artificial intelligence-driven services has transformed how individuals discover, access, and consume information. Contemporary users increasingly expect libraries to provide convenient digital access, interactive communication channels, personalized services, and technology-enabled learning opportunities. However, limited digital marketing strategies, inadequate online visibility, and insufficient user-centered promotional activities may restrict the ability of the National Library of Nigeria to effectively engage modern information users (IFLA, 2024).

Another critical problem is the weak culture of strategic advocacy for libraries within Nigeria's policy and development environment. Although the National Library contributes significantly to literacy development, knowledge preservation, research support, and educational advancement, these contributions are not always adequately communicated to government agencies, funding bodies, development partners, and the general public. Limited advocacy efforts may affect institutional recognition, budgetary support, partnership opportunities, and the overall sustainability of library programmes. Effective advocacy is therefore necessary to demonstrate the social, educational, and economic value of the National Library and secure stronger institutional support (American Library Association [ALA], 2023).

In addition, inadequate application of modern marketing approaches remains a concern. Many library institutions traditionally rely on conventional publicity methods, which may not effectively reach contemporary audiences. In the digital era, libraries need to adopt innovative marketing strategies such as social media engagement, digital storytelling, branding, community outreach, user experience promotion, and strategic partnerships to improve visibility and strengthen relationships with users. Without effective marketing frameworks, valuable library resources and services may remain underutilized despite their potential contribution to national development (Kotler, Kartajaya, & Setiawan, 2021).

Although previous studies have examined library advocacy, marketing, and service promotion, limited attention has been given specifically to advocacy and marketing strategies for repositioning the National Library of Nigeria in the digital knowledge environment. Existing discussions often focus on general library development challenges without sufficiently examining how strategic communication, branding, stakeholder engagement, and digital marketing can enhance the visibility and impact of the National Library.

It is against this background that this position paper examines advocacy and marketing as essential strategies for strengthening the visibility, accessibility, and relevance of the National Library of Nigeria. The paper emphasizes the need for coordinated advocacy frameworks, innovative

marketing approaches, digital transformation, and stakeholder collaboration to reposition the institution as a highly visible and impactful national knowledge hub.

Objectives of the Study

1. Examine the roles and contributions of the National Library of Nigeria in promoting literacy, preserving national intellectual heritage, and supporting information access and lifelong learning.
2. Identify the challenges affecting the visibility, public awareness, and utilization of the services and resources of the National Library of Nigeria.
3. Propose effective advocacy and marketing strategies for repositioning the National Library of Nigeria as a visible, accessible, and impactful national knowledge institution.

Research Questions

1. What roles and contributions does the National Library of Nigeria play in promoting literacy, preserving national intellectual heritage, and supporting information access and lifelong learning?
2. What challenges affect the visibility, public awareness, and utilization of the services and resources of the National Library of Nigeria?
3. What advocacy and marketing strategies can be adopted to reposition the National Library of Nigeria as a visible, accessible, and impactful national knowledge institution?

Literature Review

Concept of National Libraries and their Strategic Roles: National libraries represent the highest level of library institutions within a country and serve as central agencies responsible for collecting, preserving, organizing, and providing access to national knowledge resources. Unlike other types of libraries, national libraries have unique responsibilities that include legal deposit management, preservation of documentary heritage, development of national bibliographies, support for research, and promotion of literacy and lifelong learning. The International Federation of Library Associations and Institutions (IFLA, 2024) describes national libraries as essential knowledge institutions that preserve a nation's intellectual memory while facilitating access to information resources necessary for education, research, innovation, and cultural development.

The National Library of Nigeria (NLN) occupies this strategic position as the apex library institution established to serve as the custodian of Nigeria's intellectual and documentary heritage. Its responsibilities include receiving legal deposit materials, compiling the Nigerian National Bibliography, administering ISBN and ISSN services, supporting research activities, promoting reading culture, and providing information services to diverse categories of users. Through these functions, the institution contributes significantly to knowledge preservation, educational advancement, and national development (National Library of Nigeria, 2024).

In the contemporary knowledge economy, the role of national libraries has expanded beyond traditional collection preservation to include digital preservation, open access initiatives, online information services, digitization of cultural resources, and public engagement through innovative communication channels. Modern national libraries are expected to operate as dynamic knowledge platforms that connect citizens with information and promote inclusive access to knowledge resources (UNESCO, 2023).

Concept of Library Advocacy and its Importance: Library advocacy refers to deliberate activities aimed at creating awareness, influencing decision-makers, securing support, and demonstrating the value and impact of library services to stakeholders. Advocacy enables libraries to communicate their contributions to education, research, literacy development, innovation, and social transformation. According to the American Library Association (ALA, 2023), effective advocacy involves building relationships with policymakers, communities, institutions, and funding bodies while using evidence-based communication to demonstrate library impact.

For national libraries such as the National Library of Nigeria, advocacy is particularly important because their effectiveness depends significantly on government support, policy recognition, adequate funding, and public participation. Through strategic advocacy, national libraries can strengthen institutional visibility, attract partnerships, influence policy decisions, and enhance public appreciation of their services. Advocacy also enables libraries to demonstrate their relevance in addressing contemporary challenges such as information inequality, digital exclusion, and limited access to reliable knowledge resources.

Research indicates that libraries that engage in consistent advocacy activities are more likely to receive stronger institutional support and community recognition. Advocacy efforts such as stakeholder meetings, literacy campaigns, public awareness programmes, media engagement, policy dialogue, and collaboration with educational institutions can significantly improve library visibility and service utilization (IFLA, 2024).

Library Marketing and Service Promotion in the Digital Era: Library marketing has become increasingly important as information institutions compete for users' attention in a highly digital environment. Marketing in libraries involves identifying user needs, promoting available resources and services, improving user experiences, and establishing meaningful relationships with communities. Unlike commercial marketing, library marketing focuses on increasing awareness, accessibility, and utilization of information services rather than generating profit (Kotler, Kartajaya, & Setiawan, 2021).

The digital transformation of society has significantly changed how libraries promote their services. Traditional promotional methods such as posters, newsletters, and physical announcements are increasingly complemented by digital marketing approaches, including social media platforms, websites, online exhibitions, email communication, mobile applications, and virtual engagement programmes. These tools allow libraries to reach wider audiences, particularly younger generations who increasingly rely on digital platforms for information discovery and communication.

For the National Library of Nigeria, adopting modern marketing strategies is essential for improving public awareness of its services. Digital branding, social media storytelling, online user education, virtual tours, digital exhibitions, and targeted communication campaigns can help promote the institution's collections, literacy programmes, research support services, and cultural preservation initiatives. Effective marketing can transform the perception of the National Library from a traditional information repository into an accessible and innovative knowledge institution.

Visibility Challenges Facing the National Library of Nigeria: Despite its national importance, the National Library of Nigeria faces several challenges that affect its visibility and utilization. One major challenge is limited public awareness regarding the institution's mandate and available services. Many Nigerians are unfamiliar with the wide range of services provided by the National Library, including legal deposit services, bibliographic control, research support, literacy

programmes, and access to national information resources. This lack of awareness reduces user engagement and limits the institution's impact on society (Aina, 2021).

Another challenge is inadequate funding and resource limitations. Insufficient financial support affects infrastructure development, acquisition of current information resources, digitization projects, technological advancement, and implementation of innovative service delivery models. Without adequate resources, the ability of the National Library to compete within the modern digital information environment becomes constrained.

The literature also identifies technological challenges as important factors affecting library visibility. Modern users increasingly expect online access, digital collections, interactive platforms, and instant communication channels. However, limited technological infrastructure and inadequate digital transformation initiatives may reduce the capacity of national libraries to effectively engage users in the digital era (IFLA, 2024).

Additionally, limited marketing expertise and weak institutional branding may contribute to reduced public recognition. Many libraries have traditionally focused more on service provision than on actively promoting their achievements and communicating their value to stakeholders. Developing professional marketing skills among library personnel is therefore essential for improving institutional visibility and strengthening user relationships.

Strategic Approaches for Strengthening Advocacy and Marketing: The literature suggests several strategies for improving library advocacy and marketing effectiveness. First, libraries should develop structured advocacy frameworks that identify key stakeholders, define communication objectives, and establish measurable outcomes. For the National Library of Nigeria, this involves engaging government agencies, educational institutions, researchers, media organizations, professional associations, and community groups.

Second, libraries should embrace digital marketing strategies to increase public engagement. Social media platforms, websites, mobile communication tools, and online content creation provide cost-effective methods for reaching diverse audiences. Through consistent digital presence and interactive communication, the National Library can improve awareness and encourage greater utilization of its resources and services.

Third, partnerships and collaborations are essential for expanding library influence. Collaboration with universities, schools, publishers, technology organizations, and cultural institutions can strengthen literacy programmes, digitization initiatives, research support services, and public engagement activities. Such partnerships can also enhance resource sharing and institutional sustainability.

Finally, continuous professional development of library staff is necessary for successful advocacy and marketing implementation. Librarians require competencies in strategic communication, public relations, digital marketing, branding, social media management, and stakeholder engagement. Building these skills will enable library professionals to effectively promote services and demonstrate institutional value.

Discussion

The quality of legislation is closely associated with the extent to which lawmakers have access to credible information, empirical evidence, and diverse stakeholder perspectives during the legislative process. In modern democracies, effective legislation is no longer viewed solely as a

political function but as a knowledge-driven process that requires continuous interaction between legislators, researchers, information professionals, and the public. The findings from the reviewed literature indicate that countries with strong legislative research systems and institutionalized stakeholder engagement tend to produce more responsive, transparent, and sustainable legislation (Organisation for Economic Co-operation and Development [OECD], 2022).

In Nigeria, although the National Assembly and State Houses of Assembly possess constitutional authority to enact laws, legislative effectiveness is often constrained by inadequate research support, limited access to quality information, and weak integration of evidence into policymaking. This situation contributes to policy inconsistencies, ineffective implementation of laws, and reduced public confidence in democratic institutions. As noted by Edet and Attai (2014), legislative responsibilities have become increasingly complex due to emerging economic, technological, environmental, and social challenges, making access to reliable information indispensable for informed decision-making.

A major issue emerging from this paper is the underutilization of libraries and information professionals in legislative processes. Traditionally, libraries have been perceived primarily as repositories of books and archival materials. However, contemporary libraries have evolved into strategic knowledge institutions capable of providing research support, policy analysis, information synthesis, knowledge management, and evidence retrieval services. Information professionals possess competencies in organizing, evaluating, and disseminating authoritative information that can significantly improve legislative deliberations and policy formulation (Pawar, 2026). Their involvement would strengthen the quality of legislative debates and reduce reliance on assumptions, partisan interests, or incomplete information.

The discussion also highlights the growing importance of legislative libraries and parliamentary research services in promoting evidence-informed governance. International best practices demonstrate that parliamentary libraries provide lawmakers with objective policy briefs, comparative legislative analyses, background studies, and access to national and international information resources that improve the quality of legislative outputs (Ikokoh, 2026). Strengthening similar structures within Nigeria's legislative institutions would enhance lawmakers' capacity to address increasingly complex governance issues through informed and balanced decision-making.

Another important issue is stakeholder engagement. Effective legislation requires active participation from universities, research institutes, professional associations, civil society organizations, development partners, community groups, and citizens. Such collaboration enriches legislative debates by incorporating practical experiences, scientific evidence, and community perspectives into policy development. Inclusive engagement also promotes transparency, accountability, and public ownership of legislative outcomes, thereby strengthening democratic governance (OECD, 2022). Unfortunately, existing consultation mechanisms in Nigeria remain relatively weak and often occur only after critical legislative decisions have been made.

The paper further argues that librarians and information professionals should reposition themselves as active policy advocates rather than passive custodians of information resources. This involves producing policy briefs, legislative digests, evidence summaries, research syntheses, and knowledge translation products specifically designed for policymakers. In addition, librarians can organize policy dialogues, stakeholder consultations, legislative information forums, and capacity-building programmes that improve legislators' access to credible evidence and enhance information literacy among public officials (Gbotosho et al., 2026). Such proactive engagement

would strengthen the visibility and relevance of the library profession within national governance structures.

Furthermore, the increasing complexity of governance in the digital age demands stronger collaboration between legislative institutions and knowledge organizations. Emerging issues such as artificial intelligence, cybersecurity, climate change, digital economy, public health, and sustainable development require multidisciplinary expertise that extends beyond the traditional competencies of legislators. Partnerships with libraries, universities, think tanks, and research institutions would therefore provide lawmakers with timely, reliable, and interdisciplinary evidence needed to formulate forward-looking legislation that responds effectively to contemporary societal challenges (Goar et al., 2025).

Overall, this position paper demonstrates that engaging legislators through structured research support, strengthened library services, institutionalized stakeholder participation, and evidence-based advocacy can significantly improve legislative quality in Nigeria. Such an approach would enhance transparency, accountability, policy effectiveness, and public trust while positioning libraries and information professionals as indispensable partners in democratic governance and sustainable national development (Aremu, Reynolds, & Sager, 2026).

Conclusion

This paper has examined advocacy and marketing as essential strategies for enhancing the visibility, accessibility, and relevance of the National Library of Nigeria in the contemporary knowledge environment. The discussion established that the National Library plays a critical role in preserving Nigeria's intellectual heritage, promoting literacy, supporting research, and facilitating access to national information resources. However, despite its strategic importance, limited public awareness, inadequate visibility, weak promotional efforts, technological challenges, and insufficient stakeholder engagement have constrained the optimal utilization of its services.

The paper concludes that the sustainability and continued relevance of the National Library of Nigeria depend not only on the availability of information resources but also on the institution's ability to effectively communicate its value to users, policymakers, and society at large. Advocacy and marketing should therefore be integrated into the strategic management of the Library to strengthen public awareness, improve service utilization, attract institutional support, and enhance its contribution to national development.

A coordinated approach involving digital transformation, stakeholder partnerships, professional capacity development, and innovative communication strategies is necessary to reposition the National Library of Nigeria as a visible, accessible, and dynamic knowledge institution capable of meeting the information needs of citizens in the twenty-first century.

Recommendations

1. The National Library of Nigeria should develop and implement a comprehensive advocacy framework that targets government agencies, educational institutions, policymakers, researchers, and communities to increase awareness of its mandate, resources, and contributions to national development.
2. The Library should strengthen its marketing and digital engagement strategies through active use of social media platforms, improved website services, digital exhibitions, online awareness campaigns, and user-centered communication approaches to promote its resources and services to diverse user groups.
3. Government and relevant stakeholders should provide adequate financial, technological, and policy support to enable the National Library of Nigeria to modernize its services, improve digital infrastructure, train library professionals in advocacy and marketing skills, and sustain innovative programmes that enhance visibility and public impact.

References

Aina, L. O. (2021). *Library and information science text for Africa* (3rd ed.). Third World Information Services.

American Library Association. (2023). *State of America's Libraries Report 2023*. American Library Association.

International Federation of Library Associations and Institutions. (2024). *IFLA trend report 2024*. IFLA. **https://repository.ifla.org**

Kotler, P., Kartajaya, H., & Setiawan, I. (2021). *Marketing 5.0: Technology for humanity*. Wiley.

National Library of Nigeria. (2024). *Strategic mandate and services of the National Library of Nigeria*. National Library of Nigeria.

United Nations Educational, Scientific and Cultural Organization. (2023). *Global Education Monitoring Report 2023: Technology in education—A tool on whose terms?* UNESCO.

Digital Information Services and Commercialisation of Research Innovations in National Root Crop Research Institute for Sustainable Irish Potato Production in Nigeria

By

F. G. Yarima
Federal University Lokoja, University Library. Kogi State, Nigeria
E-mail: fwenshimway@gmail.com

G. U. Oyedum (PhD)
Department of Library and Information Science, Federal University of Technology, Minna, Niger State. Email: **georgina@futminna.edu.ng**

G. A. Babalola (PhD)
Department of Library and Information Science, Federal University of Technology, Minna, Niger State. Email: **g.babalola@futminna.edu.ng**
and
K. A. Saka (PhD)
Department of Library and Information Science, Federal University of Technology, Minna, Niger State. Email: **s.katamba@futminna.edu.ng**

Abstract

The commercialization of agricultural research innovations has become increasingly important for improving agricultural productivity, food security, rural livelihoods, and sustainable economic development in developing countries. However, the commercialization of these innovations depends ssignificantly on effective digital information services that facilitate timely access to research outputs by farmers, extension personnel, agribusinesses, policymakers, and other stakeholders. This study examined the of digital information services available for transforming research outputs into accessible and usable knowledge, their contributions to sustainable Irish potato production, their role in innovation commercialization, and the challenges limiting their effectiveness. The review identified institutional repositories, digital libraries, institutional websites, electronic databases, mobile agricultural information services, e-extension platforms, social media, sensor technologies, Internet of Things applications, and virtual training platforms as important channels for agricultural knowledge dissemination and innovation development. These services support awareness creation, information dissemination and repackaging, farmer education, market linkages, technology transfer, stakeholder feedback, and innovation adoption and scaling. However, their effectiveness is constrained by inadequate digital infrastructure, poor connectivity, unreliable electricity, limited digital literacy, affordability challenges, insufficient locally relevant content, and weak institutional investment. The study concludes that strengthening digital information services within NRCRI can enhance the visibility, accessibility, transfer, adoption, and commercialization of agricultural research innovations for sustainable Irish potato production in Nigeria.

Keywords: Digital information services, commercialization of research innovations, National Root Crops Research Institute, Irish potato, sustainable agriculture.

Introduction

The global quest for sustainable agriculture is becoming increasingly important in addressing the interlinked challenges of food insecurity, climate change, environmental degradation and rural poverty. Agriculture continues to be the main pillar of the Nigerian economy and makes a significant contribution to food security, employment, livelihoods, poverty reduction and national income. (Atang et al., 2025; Uche & Eunice, 2024). Irish potato (Solanum tuberosum) is an economically and nutritionally important crop that contributes to household food security, income generation, employment, and agricultural commercialisation. Its nutritional composition, including carbohydrates, vitamins, minerals, antioxidants, and dietary fibre, further enhances its importance in human nutrition (Devaux et al., 2021; Siamalube et al., 2024; Tumuramye et al., 2025; Rahman et al., 2025). Plateau State is a major Irish potato-producing region in Nigeria because of its favourable agro-ecological conditions and substantial contribution to national production and rural economic development (Musa, 2025; Udoh et al., 2025).

Despite this importance, the Irish potato industry is facing environmental, economic, technical and institutional constraints. Climate change, rising temperatures, erratic rainfall and land degradation are threatening agricultural productivity at a global level (Chen, 2025; Naik et al., 2025), while smallholder farmers in developing countries are particularly vulnerable because of limited access to productive resources and reliable information (Touch et al., 2024). In Plateau State, farmers experience drought, flooding, temperature fluctuations, pests and diseases, inadequate access to improved seed varieties, high input costs, limited credit, inadequate extension services, insufficient market information, weak rural infrastructure, poor post-harvest management, insecurity, and low technological adoption (Goni et al., 2024; Atang et al., 2025; Kolo & Balere, 2023; Adama, 2023).

In response, the National Root Crops Research Institute (NRCRI) and other stakeholders have implemented interventions such as improved seed varieties, training of farmers, market linkage, value-added, better access to inputs and sustainable production methods such as integrated pest control and climate smart farming (Udoh et al., 2025; Idi et al., 2024; Egesi, 2023; Eche et al., 2024). However, technical inefficiencies, high production costs, lack of access to clean seeds, climate variability, poor rural connectivity, limited staff for extension, low digital literacy, language barriers and weak institutional coordination continue to hamper the effective use of agricultural innovation (Salau et al., 2020; Udoh et al., 2025; Alegwu & Yustus, 2025; Osuji et al., 2025).

Digital information services, including institutional repositories, digital libraries, mobile applications, web portals, social media, e-extension services, geo-information systems and advisory systems powered by artificial intelligence, will improve the dissemination of agricultural knowledge and communication between researchers, extension staff, farmers, policy makers and agribusinesses (Porciello et al., 2022; MacPherson et al., 2022).

In addition to dissemination, these services can support the commercialisation of research innovations by increasing the visibility, availability, transfer and market uptake of research results. Commercialization turns research findings into products, services, processes, or businesses that create economic and social value, without effective commercialisation, breakthrough ideas remain in the lab, and society misses out on improved quality of life, industry advancements, and economic prosperity (Järvinen, 2025; Organisation for Economic Co-operation and Development [OECD], 2023).

However, only limited empirical attention is paid to how digital information services facilitate the commercialisation, take-up and sustainable use of agricultural research innovations developed by NRCRI. Existing studies have focused to a large extent on technology adoption, extension services, seed systems and productivity, leaving little understanding of the strategic relationship between digital information services, the commercialisation of research and sustainable potato production in Ireland. This study therefore examines the types of digital information services and the commercialisation of agricultural research innovations, with a particular focus on the NRCRI and the sustainable production of Irish potatoes in Nigeria, their contributions, identifies the current challenges and strategies for enhancing digital information services to improve the commercialization and sustainable utilization of research innovations in Nigeria.

Types of Digital Information Services for Transforming Research Innovation

Digital information services have become fundamental components of contemporary agricultural research institutions because they facilitate knowledge organization, research dissemination, stakeholder communication, and technology transfer. The effectiveness of NRCRI research innovations, particularly those related to sustainable Irish potato production, depends largely on the availability of reliable digital platforms that enable timely access, interpretation, and utilization of agricultural information (Ayim et al., 2022; Porciello et al., 2022).

The digital information services include institutional repositories, digital libraries, electronic databases, organizational websites, e-extension platforms, mobile agricultural applications, social media platforms, virtual training systems, online market information systems, and research knowledge management platforms.

1. **Institutional repositories.** An institution's intellectual outputs, such as research articles, technical reports, conference proceedings, theses, datasets, extension publications, policy briefs, and documents pertaining to innovation, can be systematically gathered, preserved, managed, and freely distributed thru institutional repositories, which are digital platforms. For researchers, farmers, development organizations, and policymakers, they improve access to academic and agricultural information, increase institutional visibility, and preserve important research knowledge (Ghosh & Roy, 2022). By organizing and sharing pertinent agricultural knowledge, institutional repositories also aid in filling information gaps, especially in rural and underserved communities. This fosters cooperation, well-informed decision-making, and evidence-based policymaking (Bos & Munnichs, 2016). An institutional repository could serve as a centralized digital knowledge hub for the National Root Crops Research Institute (NRCRI) in order to store and distribute information on post-harvest technologies, climate-smart agriculture, pest and disease management, improved Irish potato varieties, and other research innovations. A repository like this would strengthen the connection between agricultural research, technology adoption, and the commercialization of research innovations by improving access to evidence-based information for farmers, extension agents, researchers, and commercial stakeholders (Oberhiri-Orumah & Baro, 2023).

2. **Digital libraries** are technology-enabled information platforms that provide users with seamless access to scholarly and agricultural information beyond geographical and physical limitations. Modern digital libraries are characterised by interoperability, cloud-based storage, and integrated access mechanisms that facilitate the retrieval of academic and research resources across multiple platforms (Mohammed & Teslim, 2023). Their integration with information and communication technologies, social media platforms, mobile applications,

and video-conferencing tools has further enhanced the timely dissemination and exchange of agricultural information between farmers, extension personnel, researchers, and other stakeholders. Through these platforms, farmers can access information on weather conditions, agricultural innovations, input costs, fertiliser application, production practices, and market opportunities, thereby supporting informed decision-making and knowledge sharing. Digital libraries also provide access to current information on improved crop varieties, disease management, irrigation, fertiliser application, and post-harvest technologies without geographical constraints (Mushi et al., 2022). Within NRCRI, digital library services can facilitate access to agricultural databases, scientific publications, crop production manuals, climate information, and specialised knowledge on root and tuber crops, thereby supporting research activities, strengthening staff capacity, and improving the development and dissemination of evidence-based extension materials to farmers.

3. **Institutional Websites:** Web portals are comprehensive platforms that aggregate agricultural information and extension services in one place (Rahman et al., 2021). These websites give farmers access to research papers, extension materials, videos, and e-learning modules on a range of agricultural topics. Web portals also offer interactive features such as discussion boards and live chat support, allowing farmers to interact with extension agents and agricultural experts. These platforms foster knowledge-sharing among farmers and empower them with the information they need to make informed decisions (Rahman et al., 2021). They provide official channels for disseminating information about institutional activities, research programmes, publications, technologies, training opportunities, and stakeholder engagement activities. Institutional websites are the most common digital communication platforms used by research organizations. Agricultural research institutions increasingly use websites to improve transparency, increase public awareness, and enhance access to research outputs (Ayim et al., 2022).

   A well-developed NRCRI institutional websites function as digital technology showcases where research innovations can be displayed and promoted to potential users. Information about available technologies, licensing opportunities, seed multiplication programmes, and commercialization partnerships can be strategically presented to attract private-sector participation.

4. **Electronic Databases and Research Information Systems:** Agricultural research institutions depend on databases to support literature review, technology development, policy formulation, and decision-making. According to Mohammed et al. (2021), databases are digitised information (such as bibliographic records, abstracts, full-text documents, directory entries, images, statistics, etc.). These databases are made up of uniformly formatted records that are managed by a database management system (DBMS) software and arranged for ease and speed of search and retrieval. They include full-text current and historical electronic information resources, including e-books, journal articles, and digitised items. The agricultural online databases are Access to Global Online Research in Agriculture (AGORA), The Essential Electronic Agriculture Library (TEEAL), Health Internetwork Access to Research Initiative (HINARI), Agricultural Online Access (AGRICOLA), Agricultural Database (AGRIS), and many others (Mohammed et al., 2021). These databases provide researchers with access to global agricultural knowledge resources. These platforms enable NRCRI researchers to access current scientific findings, compare production technologies, identify research gaps, and develop innovations that respond to emerging agricultural challenges. Databases containing patent information, technology profiles, market intelligence, and innovation case studies help

researchers identify commercialization opportunities and avoid infringement of existing intellectual property rights. Access to patent databases further encourages originality and supports the development of commercially competitive technologies (World Intellectual Property Organization [WIPO], 2023).

For NRCRI, strengthening access to both open-access and subscription-based agricultural databases would significantly improve research productivity, innovation development, technology commercialization, and evidence-based extension services.

5. **Mobile Agricultural Information Services:** Mobile platforms provide farmers with direct access to agricultural information through applications, SMS services, voice-based advisory systems, and mobile-based extension platforms (Ayim et al., 2022). Mobile applications such as agriBORA and ViaziSoko connect farmers to markets, weather advisories, input suppliers, credit, and crop insurance services, enhancing decision-making and productivity (Barungi et al., 2025). ViaziSoko enables farmers to access certified seeds, fertilisers, agrochemicals, mechanisation, soil testing, marketing, and extension services through its web portal, app, and USSD code. agriBORA offers agro-input lending, transaction management, and real-time crop monitoring via the web, mobile apps, and USSD. Similarly, platforms like Kisan Call Centre and mKisan provide tailored agricultural information, expert advice, and market prices, while Skymet and IMD Mausam deliver localised weather forecasts and advisories through apps and SMS. These ICT tools support smart farming by promoting best practices, reducing crop losses through real-time alerts, and aiding seasonal planning and risk management. Farmers can also use smartphones to send images of diseased plants to experts for quick diagnosis and advice (Priya et al., 2025)

   For Irish potato farmers, mobile information services can provide recommendations on seed selection, planting schedules, fertilizer application, disease identification, weather conditions, and market prices. Mobile applications can also support interactive communication between farmers and researchers by allowing users to submit questions, receive expert advice, and report production challenges. The advantage of mobile services lies in their ability to reach farmers who may have limited access to physical extension services.

6. **Electronic Extension (E-extension) Platforms:** E-extension combines digital communication technologies with traditional extension approaches to provide farmers with timely, interactive, and accessible advisory services. These platforms include online training modules, video demonstrations, virtual consultations, webinars, and digital advisory systems (Porciello et al., 2022). For NRCRI, e-extension platforms can strengthen the dissemination of Irish potato production technologies by providing farmers with practical learning resources. Video demonstrations showing improved planting methods, disease management techniques, harvesting procedures, and storage practices can improve farmers' understanding and adoption of recommended practices. E-extension also enhances feedback mechanisms between researchers and farmers. Through digital communication channels, farmers can communicate production challenges, enabling researchers to modify technologies according to farmers' realities.
7. **Social Media Platforms:** Social media platforms tools such as Facebook, Twitter, WhatsApp and Instagram provide interactive spaces where farmers can pose questions, discuss production challenges and access real-time updates on weather, prices and pest outbreaks (Ngwenya et al., 2020). Visual and audio-visual content (infographics, instructional videos) helps simplify complex technical concepts, improving comprehension among diverse user groups (Pallavi et

al., 2023). Social media platforms help farmers and other agricultural stakeholders exchange information, network, and share expertise. The platform connecting farmers with researchers and extension agents to shared information for problem-solving. These platforms foster an open and inclusive environment, allowing farmers to ask questions, discuss challenges, and access real-time information from a diverse community of users Ngwenya et al., 2020).
NRCRI can utilize social media platforms to increase awareness of Irish potato innovations, promote training activities, advertise improved varieties, and communicate market opportunities. Social media also provides opportunities for building communities of practice where farmers, researchers, extension agents, and agribusiness actors exchange experiences and knowledge.

8. **Sensor Technologies and Internet of Things (IoT):** Precision farming, sustainable resource management, and data-driven decision-making are made possible by the digital library platform. These technologies offer real-time monitoring and automation, revolutionising how farmers interact with their crops and livestock; Sensor technologies devices can collect and transmit data on various agricultural parameters. These sensors can measure soil moisture, temperature, humidity, pH levels, nutrient content, and even crop health Younis et al., (2021). Farmers can obtain comprehensive information about the state of their fields and make well-informed decisions for improved crop management by placing sensors throughout the land. The Internet of Things (IoT) connects physical devices, such as sensors and actuators, to the Internet so they may communicate data and carry out tasks without direct human intervention. In agriculture, IoT-enabled devices enable seamless data collection and communication between various components of the farming system (Kamble et al.,2022) These devices form a network of interconnected elements that continuously monitor and transmit data, providing farmers with real-time information to optimise their agricultural practices; Precision farming and resource management, Sensor technologies and IoT, monitoring soil and crop conditions in real-time. Farmers can implement site-specific management strategies, applying the right inputs at the right time and in the right quantity (Singh et al., 2020). This precision method maximises yields and Decision Support Systems (DSS), giving farmers recommendations and actionable insights while minimising resource waste and environmental impact. DSS utilises data analytics, machine learning, and artificial intelligence to process vast amounts of information and offer customised advice to farmers (Pallavi et al., 2023). These systems enhance farmers' ability to make evidence-based decisions, resulting in improved efficiency and productivity.

Digital Information Services Supporting Commercialization of Agricultural Research Innovations

The commercialization of agricultural research innovations requires more than the generation of scientific knowledge; it requires effective mechanisms for transforming research outputs into accessible, understandable, adoptable, and market-oriented technologies. Through digital platforms, research institutions can increase the visibility of innovations, reduce information barriers, facilitate technology transfer, strengthen stakeholder engagement, and create pathways for commercialization (Ayim et al., 2022; Porciello et al., 2022).

In agricultural research institutions such as the National Root Crops Research Institute (NRCRI), digital information services support this process by providing efficient channels for packaging, disseminating, and exchanging innovation-related information among researchers, farmers,

entrepreneurs, and policymakers. Consequently, digital information systems have become important components of agricultural innovation ecosystems and commercialization strategies (Mushi et al., 2022).

i. Awareness Creation and Visibility of Research Innovations

One of the primary contributions of digital information services to commercialization is the creation of awareness about agricultural research innovations. Many agricultural technologies fail to achieve widespread adoption because potential users are unaware of their availability, benefits, or application methods. Digital platforms address this challenge by increasing the visibility of innovations through institutional websites, digital repositories, social media platforms, online newsletters, mobile applications, and electronic extension systems.

For NRCRI, digital platforms can be used to promote improved Irish potato varieties, disease-resistant planting materials, climate-smart production technologies, improved storage techniques, and other research outputs. By providing detailed information about the characteristics, advantages, and availability of these innovations, digital services help farmers, seed producers, agro-dealers, and investors recognize opportunities for adoption and commercialization (Ayim et al., 2022). Digital awareness creation also expands the reach of research institutions beyond traditional extension boundaries. Conventional dissemination methods often depend on physical demonstrations, printed materials, and extension visits, which may be limited by financial and logistical constraints. Digital communication enables research institutions to reach larger and more geographically dispersed audiences at relatively lower costs (Porciello et al., 2022).

ii. Information Dissemination and Knowledge Accessibility

Effective commercialization depends on the availability of accurate, timely, and accessible information. Digital information services enhance the dissemination of agricultural knowledge by providing multiple channels through which stakeholders can obtain research-based information. These channels include digital libraries, institutional repositories, mobile advisory platforms, online databases, e-extension systems, and social media.

For Irish potato production, digital dissemination can provide farmers with information on improved varieties, seed certification requirements, planting techniques, pest and disease management, fertilizer recommendations, irrigation practices, harvesting methods, and storage technologies. Access to such information improves farmers' ability to adopt innovations correctly and achieve expected productivity outcomes. Digital dissemination also supports commercialization by reducing knowledge gaps between research institutions and agricultural enterprises. Private-sector actors such as seed companies, processors, and agro-input suppliers can access information about available technologies and establish partnerships for scaling innovations. Therefore, digital information services function as bridges connecting research outputs with commercial opportunities (Porciello et al., 2022).

iii. Information Packaging and Repackaging for Different User Groups

A major challenge in agricultural research communication is that scientific information is often produced in technical formats that may not be easily understood by farmers and other non-specialist users. According to kadikikansimba et al. (2025), Information repackaging involves reprocessing and reshaping content to make it more practical and usable for specific audiences. For smallholder farmers, this is particularly important, as they often struggle with the technical language and abstract ideas presented in agricultural research. Given their generally low and

diverse levels of formal education, simplifying complex information is essential for effective communication between researchers, extension officers, and farmers (Mushi et al., 2022). Digital information services support commercialization by enabling information packaging and repackaging according to the needs, literacy levels, and technological abilities of different audiences.

Information repackaging involves transforming complex research findings into user-friendly formats such as farmer manuals, instructional videos, infographics, podcasts, mobile messages, frequently asked questions (FAQs), and local-language materials. This process improves comprehension and increases the likelihood that users will apply recommended technologies effectively.

For NRCRI, research information on Irish potato innovations can be repackaged into practical digital resources showing farmers how to select quality seed, manage diseases, apply fertilizers, conserve soil moisture, and improve storage. Such user-oriented information products increase the usability and commercial value of research outputs because they make innovations easier to understand and adopt (Ghosh & Roy, 2022).

iv. Farmer Education and Capacity Building

Digital information services provide innovative approaches for strengthening farmers' knowledge and technical capacity. Sustainable commercialization requires users to possess the skills necessary to implement new technologies successfully. Without adequate training, even high-quality innovations may experience low adoption rates. Digital training platforms, online courses, webinars, video demonstrations, mobile learning applications, and virtual farmer field schools provide flexible opportunities for agricultural education. These approaches overcome geographical barriers and allow farmers to access training materials repeatedly according to their learning needs.

In Irish potato production, digital education can improve farmers' understanding of sustainable production practices, including integrated pest management, climate adaptation strategies, seed management, soil fertility improvement, and post-harvest handling. Improved knowledge enhances confidence in adopting innovations and increases demand for commercially available technologies.

v. Market Linkages and Commercial Opportunities

Commercialization requires effective connections between technology producers and users. Digital information services support market linkage development by connecting farmers, researchers, agribusinesses, input suppliers, investors, and consumers. Digital marketplaces, agricultural information platforms, and online business networks provide opportunities for stakeholders to identify commercial opportunities and establish partnerships.

For NRCRI innovations, digital platforms can promote linkages between improved Irish potato seed producers, farmer cooperatives, agro-dealers, processors, and commercial buyers. Such connections enhance technology availability, improve supply-chain coordination, and encourage private-sector participation in agricultural innovation commercialization.

Digital market information services also help farmers make better production and marketing decisions by providing information on commodity prices, consumer demand, input availability, and market trends. Improved market intelligence increases profitability and encourages farmers to invest in improved production technologies (Ayim et al., 2022).

vi. Accelerating Technology Transfer

Technology transfer represents a critical stage in agricultural innovation commercialization. It involves the movement of technologies, knowledge, and skills from research institutions to end-users. Digital information services accelerate technology transfer by reducing communication barriers and enabling rapid dissemination of innovations.

Through digital platforms, NRCRI can share research findings, production guides, demonstration videos, and technology descriptions with farmers and extension organizations. Digital communication also allows researchers to provide technical support after technology adoption, increasing the probability of successful implementation.

Compared with traditional technology transfer methods, digital approaches offer greater scalability because information can be distributed to thousands of users simultaneously. This capability is particularly valuable for expanding the reach of agricultural innovations across different regions of Nigeria.

vii. Feedback Mechanisms and Stakeholder Interaction

A major advantage of digital information services is their ability to support two-way communication between innovation developers and users. Traditional research dissemination often follows a linear model where researchers generate technologies and farmers receive information. Digital platforms transform this approach into interactive systems where farmers can provide feedback, report challenges, and participate in innovation improvement.

Feedback obtained through mobile applications, online discussion forums, social media, and digital surveys provides researchers with valuable information about farmers' experiences and technology performance. Such feedback supports adaptive research and ensures that innovations remain relevant to users' needs.

For NRCRI, digital interaction with Irish potato farmers can provide insights into production constraints, technology adoption challenges, seed quality issues, and market conditions. This information can guide future research priorities and improve commercialization strategies.

viii. Supporting Innovation Adoption and Scaling

The ultimate objective of commercialization is widespread adoption and scaling of beneficial innovations. Digital information services contribute to adoption by increasing awareness, improving understanding, reducing uncertainty, and providing continuous support after adoption. According to diffusion theory, access to reliable information influences users' perceptions of innovation advantages, compatibility, complexity, and applicability.

Digital platforms strengthen innovation diffusion by providing evidence of successful adoption through farmer testimonials, demonstration videos, performance data, and success stories. Such information increases trust and encourages other farmers and organizations to adopt similar technologies.

In the context of sustainable Irish potato production, digital information services can facilitate the scaling of improved varieties, climate-smart practices, disease management technologies, and post-harvest innovations developed by NRCRI.

The Role of Digital Information Services in sustainable irish potato production

Digital information services have become an increasingly important component of contemporary information and knowledge management, particularly in facilitating the generation, organisation, dissemination, and utilisation of knowledge through digital technologies (Ayim et al., 2020; Edwards, 2022).

The rapid advancement of information and communication technologies (ICTs), cloud computing, artificial intelligence (AI), big data analytics, mobile technologies, and internet-enabled platforms has fundamentally transformed how information is generated, organized, preserved, disseminated, and utilized. Consequently, digital information services have evolved from simple electronic information delivery mechanisms into strategic platforms that facilitate knowledge exchange, innovation diffusion, stakeholder engagement, and evidence-based decision-making. According to Umar and Ibrahim (2023) and Bosah et al. (2025) digital information services referred to the provision of access to information in a digital format, often through online platforms, allowing users to search, retrieve, and utilize data such as articles, documents, multimedia content, and databases for effective utilization of library resources. It is an information services provided in electronic medium to facilitate research and play a complementary role to print library resources

A. One of the major contributions of digital information services to Irish potato sustainability is improved access to agricultural extension information. Conventional extension systems in many developing countries face limitations associated with inadequate extension personnel, high operational costs, and difficulties reaching geographically dispersed farmers. Digital extension platforms complement traditional extension approaches by enabling researchers and extension agents to provide advisory services to larger numbers of farmers through mobile phones, online platforms, videos, and interactive communication channels. Evidence from low- and middle-income countries shows that digital agricultural services have primarily focused on advisory and extension functions, improving farmers' knowledge and encouraging changes in production practices (Porciello et al., 2022).

   For Irish potato farmers, digital extension services can support sustainable production by providing information on improved varieties, recommended planting dates, integrated pest and disease management, soil fertility practices, climate adaptation strategies, and post-harvest handling techniques. For example, farmers can receive digital alerts regarding disease outbreaks, weather conditions, and recommended management practices, allowing them to make timely decisions that reduce production losses. Such information improves farm resilience and contributes to sustainable intensification of potato production.

   Digital information services also enhance farmers' access to climate-smart agricultural knowledge. Climate change presents significant risks to Irish potato production through unpredictable rainfall patterns, temperature variations, drought stress, and increased pest and disease pressure. Digital climate information services provide farmers with weather forecasts, seasonal climate predictions, and risk management recommendations that support adaptation strategies. The integration of digital climate advisory services with agricultural extension can improve farmers' capacity to adjust production practices and minimize climate-related losses (Porciello et al., 2022).

B. Promotion of improved technology adoption. Agricultural research institutions such as the National Root Crops Research Institute (NRCRI) generate innovations including improved Irish potato varieties, disease-resistant planting materials, production manuals, fertilizer recommendations, and post-harvest technologies. However, the impact of these innovations

depends on effective dissemination mechanisms. Digital platforms increase the visibility and accessibility of research outputs by making technical information available to farmers, extension workers, seed companies, policymakers, and private-sector stakeholders. This reduces the knowledge gap between research institutions and agricultural communities (Ayim et al., 2022).

Digital repositories and institutional websites are particularly important for preserving and disseminating agricultural research outputs. Through these platforms, NRCRI can provide access to research publications, technical reports, training materials, extension guides, and innovation profiles related to Irish potato production. Such digital knowledge repositories enhance institutional visibility, support evidence-based farming, and create opportunities for research innovations to reach wider audiences. Open access to agricultural knowledge is increasingly recognized as a key requirement for accelerating innovation diffusion and sustainable agricultural development (Ghosh & Roy, 2022).

Digital information services also support sustainable Irish potato production through farmer education and capacity development. Many smallholder farmers require continuous training to improve their understanding of modern production practices. Digital learning platforms, online training programmes, video demonstrations, and mobile-based learning resources provide flexible opportunities for farmers to acquire new skills without the limitations of physical training sessions. These approaches are particularly valuable in rural communities where access to conventional training institutions is limited (Mushi et al., 2022).

C. Digital information services facilitate market access and commercialization opportunities for Irish potato farmers. Sustainable production requires not only increased productivity but also profitable market participation. Digital market platforms provide information about commodity prices, buyer requirements, input availability, and market trends. By improving market transparency, digital platforms reduce information asymmetry and enable farmers to make better production and marketing decisions. This connection between production information and market intelligence strengthens the commercialization potential of agricultural innovations (Porciello et al., 2022).

The role of digital information services extends beyond individual farmers to agricultural value-chain stakeholders. Seed producers, agro-input suppliers, processors, researchers, extension organizations, and policymakers can utilize digital platforms to coordinate activities, exchange information, and develop partnerships. In the case of NRCRI, digital information services can support stronger relationships between researchers, potato farmers, seed multipliers, extension agencies, and commercial enterprises, thereby creating an enabling environment for innovation commercialization.

Challenges Affecting Effective Digital Information Dissemination in Agricultural Research Institutions

Although digital information services provide significant opportunities for improving agricultural knowledge dissemination, innovation transfer, and commercialization, their effectiveness within agricultural research institutions is influenced by several technological, institutional, socioeconomic, and policy-related challenges. In developing countries such as Nigeria, the adoption of digital information services within agricultural systems remains uneven due to limitations in infrastructure, human capacity, financial investment, institutional coordination, and user accessibility. These challenges influence the ability of research institutions such as the

National Root Crops Research Institute (NRCRI) to effectively disseminate research innovations and support sustainable Irish potato production: Inadequate ICT infrastructure, Poor internet connectivity and digital access inequality, Low digital literacy among farmers and extension personnel, Limited institutional funding and sustainability challenges, Weak institutional support and policy limitations, Poor information packaging and limited localized content, Language and cultural barriers, Data quality, Reliability, and trust issues, Cybersecurity and digital data management concerns, Limited integration between research, Extension, and commercialization system (Ayim et al., 2022; Porciello et al., 2022).

Conclusion and Recommendation

The study establishes that digital information services provide opportunities for improving access to information on improved varieties, seed quality, pest and disease management, soil fertility, climate adaptation, irrigation, post-harvest handling, and market opportunities for sustainable irish potato production, and can contribute significantly to the commercialization of agricultural research innovations generated by the National Root Crops Research Institute. Despite the benefits associated with digital information services, several challenges limit their contribution to sustainable Irish potato production in Nigeria. These include poor internet connectivity in rural areas, inadequate ICT infrastructure, unreliable electricity supply, limited digital literacy among farmers, high cost of digital devices, insufficient locally relevant digital content, and weak institutional investment in digital agricultural systems. These challenges create digital inequalities that may prevent some farmers from benefiting from emerging agricultural technologies.

Addressing these challenges requires a comprehensive digital agricultural strategy that combines technological development with human capacity building and institutional strengthening. Research institutions such as NRCRI should invest in user-centred digital platforms, develop farmer-friendly information materials, provide digital literacy training, integrate indigenous knowledge into digital content, and establish partnerships with telecommunications providers, extension organizations, and private-sector actors. Such strategies will improve accessibility, usability, and sustainability of digital information services for Irish potato farmers.

Reference

Adama, S. D. (2023, October 19). Agriculture: Why Irish Potatoes Now Precious Commodity in Plateau. *Daily Trust News Paper*. https://dailytrust.com/tag/irish-potatoes/

Alegwu, F. O., & Yustus, S. F. (2025). Resource use efficiency of dry season irish potato production in Plateau State, Nigeria: A Double Bootstrapping DEA Approach. (2025). *Journal of Agricultural Economics, Environment and Social Sciences*, 11(2),199–211. https://doi.org/10.56160/jaeess/2025/vol11/issue2/020

Atang, A., Danwanka, H. A., & Mohaamed, R. A. (2025). Economic analysis of irish potato (Solanum Tuberosum) production under irrigation in Jos metropolis of Plateau State, Nigeria. Nigerian Journal of Agriculture and Agricultural Technology, 5(4B), 47–55. Retrieved from https://njaat.com.ng/index.php/njaat/article/view/1360

Ayim, C., Kassahun, A., Addison, C., & Tekinerdogan, B. (2022). Adoption of ICT innovations in the agriculture sector in Africa: A review of the literature. *Agriculture & Food Security,* 11(22), 1–18. https://doi.org/10.1186/s40066-022-00364-7

Barungi, J., Ssebwana, A., Okonya, J., & Recha, J. (2025). Enhancing digital literacy of potato farmers in the utilization of the viazi soko and agriBORA platforms for market linkages in Kenya. Accelerating Impacts of CGIAR Climate Research in Africa (AICCRA).

Bos, J., & Munnichs, G. (2016) *Digitization of Animals: Exploration of Precision Livestock Farming. Rathenau Institute*. Hague.

Bosah, E. G., Ozioko, R. E., &. Onyenachi, J. C. (2025). Availability and accessibility of digital information services and library resources in agricultural research institute libraries in South-South, Nigeria. *Journal of Library and Information Advancement*, 2(1), 19 – 30. http://doi.org/10.47524/jlia.v2i1.31

Chen, X. (2025). The role of modern agricultural technologies in improving agricultural productivity and land-use efficiency. *Frontier Plant Science*, 16:1675657. doi: 10.3389/fpls.2025.1675657

Choruma, D. J., Dirwai, T. L., Mutenje, M. J., Mustafa, M., Chimonyo, V. G. P., Jacobs-Mata, I. and Mabhaudhi, T. (2024). Digitalisation in agriculture: A scoping review of technologies in practice, challenges, and opportunities for smallholder farmers in sub-saharan africa. Journal of Agriculture and Food Research, 18, 101286. p. https://doi.org/10.1016/j.jafr.2024.101286

Devaux, A., Goffart, J., Petsakos, A., Kromann, P., Gatto, M., Okello, J., Suarez, V. and Hareau, G. (2020). Global food security: Contributions from sustainable potato agri-food systems', in Campos, H. and Ortiz, O. (Eds.) *The potato crop: Its agricultural, nutritional and social contribution to humankind.* Switzerland: Springer; 3–35. https://doi.org/10.1007/978-3-030-28683-5_1

Eche, N. A., Hamza, M., & Imoisi, I. A. (2024). Sustainable agricultural practices and their contribution to rural economic development: evidence from Edda LGA, Ebonyi State, Nigeria. *Journal of Economics and Allied Research*, 9(4), 155-167 https://jearecons.com/index.php/jearecons/article/view/445/440

Edwards, J. S. (2022). Where knowledge management and information management meet: Research directions. *International Journal of Information Management*, 63, 102458. https://doi.org/10.1016/j.ijinfomgt.2021.102458

Egesi, C.N. (2023) (Ed). NRCRI Irish potatoes research information achievements. *National Root Crops Research Institute (NRCRI) at 100*. NRCRI Publications: National Root Crops Research Institute, Umudike. https://nrcri.gov.ng

Food and Agriculture Organization (FAO) (2023). *World food and agriculture – Statistical yearbook.* Rome: FAO. https://openknowledge.fao.org/items/5c272dc7-e1b8-486a-b323-6babb174eee0

Food and Agriculture Organization (FAO). (2022). *The State of Food and Agriculture 2022. Leveraging automation in agriculture for transforming agrifood systems*. Rome, FAO. https://doi.org/10.4060/cb9479en

Ghosh, S., & Roy, B. K. (2022). Open access digital repositories of agricultural sciences in Africa: A webometric study. *South African Journal of Libraries and Information Science,* 88(1), 1–20. https://doi.org/10.7553/88-1-1962

Goni, I. C., Garba, M., Bose, A. A., & Abdullahi, S. (2024). Factors influencing the adoption of climate-smart agricultural practices among irish potato farmers in Plateau State, Nigeria. *Nigerian Journal of Agriculture and Agricultural Technology*, 4(4B),244–255. https://doi.org/10.59331/njaat.v4i4B.918

Idi, A. S., Kyari, M. B., Bulama, Y. M., & Ibrahim, A. L. (2024). Economic of irish potato production: A case of Sardauna Local Government Area of Taraba State, Nigeria. *ISRG Journal of Economics, Business and Management*, 1(1).

Järvinen, T. (2025). *Innovator's guide to commercialisation. A practical and research-based handbook for academic team and technological transfer professional*. Adductor Magnus Oy HELSINKI, FINLAND

kadikikansimba, P., Sife, S. A., & Machimu, M. G. (2025). Repackaging Agricultural research information for Adoption of Improved Farming practices among sorghum farmers in Dodoma Region, Tanzania. *Local Administration Journal* 18(3); 309 - 330

Kamble, N., Jindal, M. and Sharma, P. (2022). Internet of Things (IoT) in agriculture: A review. *Journal of Agribusiness in Developing and Emerging Economies*; 12(2); 206–223.

Kolo, A., & Balere, Y. (2023). Costs and returns analysis of potato production under Plateau State potato value chain support project (PS-PVCSP). *Journal of Agripreneurship and Sustainable Development*, 6(3), 118–124. https://doi.org/10.59331/jasd.v6i3.514.

MacPherson, J., Voglhuber-Slavinsky, A., Olbrisch, M., Schöbel, P., Dönitz, E., & Mouratiadou, I. (2022). Future agricultural systems and the role of digitalization for achieving sustainability goals: A review. *Agronomy for Sustainable Development*, 42, 70. https://doi.org/10.1007/s13593-022-00792-6

Mohammed, H.K., Alhassan, J.A. and Ahmed, A.K. (2021). Availability and use of electronic databases by scientists in agricultural research institutes in North Central Nigeria.*Library Philosophy and Practice (e-journal*); 6194. Available at: https://digitalcommons.unl.edu/libphilprac/6194

Mohammed, Z.A. and Teslim, O.M. (2023). Rethinking digital library ecosystems: Trends, technologies and user-centered innovations. *Journal of Digital Information Systems*; 14(4); 23–39.

Musa, A.A. (2025). Agriculture: Plateau potato farmers record bumper harvest, battle losses. *Daily Trust Newspaper*, 23 August. https://dailytrust.com/plateau-potato-farmers-record-bumper-harvest-battle-losses/

Mushi, G. E., Di Marzo Serugendo, G., & Burgi, P. Y. (2022). Digital technology and services for sustainable agriculture: A literature review. *Sustainability*, 14(4), 2415. https://doi.org/10.3390/su14042415

Naik, S. K., Shinde, R., Mali, S. S., Sarkar, P. K., & Das, A. (2025). "Land degradation: A global challenge to environmental sustainability and livelihood security." In S. Babu, A. Das, S.

S. Rathore, R. Singh and R. Singh (Eds) *Ecological Solutions to Agricultural Land Degradation.* Springer Nature; Singapore, 1–27. doi:10.1007/978-981-96-3392-0_1

Ngwenya, H., Adekunle, A., Tselaesele, N. and Mutshewa, A. (2020). Social media as a tool for agricultural extension in developing countries: The case of WhatsApp in Lesotho. *African Journal of Science, Technology, Innovation and Development*; 12(6);759–767.

Oberhiri-Orumah, G., & Baro, E. E.(2023), "The extent of building and managing local contents in institutional repositories: a survey of tertiary institution libraries in Nigeria". *Global Knowledge, Memory and Communication*,72 (4 & 5); 464–483, doi: https://doi.org/10.1108/GKMC-08-2021-0139

Organisation for Economic Co-operation and Development. (2023). *OECD digital agriculture outlook 2023: Digital technologies for sustainable agricultural productivity*. OECD Publishing. https://doi.org/10.1787/

Osuji, E. E., Ukoha, I. I., Osuji, N. M., Nwaiwu, U. I., Ben-Chendo, N. G., Keyagha, R. E., Cookey, O. C., Nwachukwu, U. E., Osuagwu, O. C., Ezirim, T. K., Idoko, O., Onoh, A. P., Aririguzo, N. B., Alagba, A. R., Peter-Onoh, A. C., Mbuka-Nwosu, E. I., Ihem, E. E., & Anyanwu, N. C. (2025). Climate change information and potato production in Ebonyi State, Nigeria. *Research on World Agricultural Economy.* 6(2): 666–680. DOI: https://doi.org/10.36956/rwae.v6i2.1730

Pallavi, G., Shashidhara, N., & Ashoka, N. (2023) Empowering Agriculture through digital agriculture extension services: Opportunities and challenges. In D. Santosh, S. B. Bibhuti, M. Sagar, P. Shradhanjalee & H. Korla (Eds), *Farming for the Future: Smart Agriculture Innovation.* New Delhi: Renu Publishers. 105-119. DOI:10.30954/NDP-farming.2023.7

Porciello, J., Coggins, S., Mabaya, E., & Otunba-Payne, G. (2022). Digital agriculture services in low- and middle-income countries: A systematic scoping review. *Global Food Security*, 34, 100640. https://doi.org/10.1016/j.gfs.2022.100640

Priya, K. N., Sivanarayana, G., Babu, N. N. (2025) ICTs' in agricultural extension: Tools, technologies and applications in e-extension in agriculture. In Krishna, N. P., Akanksha, p., Boda, M. N., Manoj, K., and Challa, L.N. (Eds). *E-Extension in Agriculture: Digital Platform for Knowledge Dissemination.* Textify Publisher., 32-47.

Rahman, S., Hoque, M. J., & Uddin, M.N. (2021). Problems faced by the crop farmers related to extension services provided by the Department of Agricultural Extension in Bangladesh, *International Journal of Agricultural Extension* 9 (3) 373–388, https://doi.org/10.33687/ijae.009.03.3606.

Rahman, U. W., Butt, M. T., Ullah, K. M., Luqman, M., Yaseen, M., Hussain, I., & Noor, F. (2025). Assessing the effectiveness of agricultural extension services on potato growers in district Okara: Challenges, adoption, and opportunities, A study in district Okara. *Research Consortium Archive*, 3(3), 1452-1465. https://doi.org/10.0000/

Salau, E. S., Y. M. Darason, and A. A. Girei. (2020). "Level of Information Accessibility and Adoption of Improved Irish Potato Production Technologies by Farmers in the Northern Agricultural Zone of Plateau State, Nigeria". *Asian Journal of Agricultural Extension, Economics & Sociology* 38 (4):1-9. https://doi.org/10.9734/ajaees/2020/v38i430330

Siamalube, B., Lambert, E., Anyaji, C., & Ehinmitan, E. (2024). Advancements in potato science: agronomy, genetics, and biotechnology for sustainable food security. *Potato Journal*, 51(2). https://doi.org/10.56093/potatoj.v51i2.159011

Singh, S., Kumar, M., Kumar, D. & Panigrahi, S. (2020). *Internet of Things (IoT) and precision agriculture: A comprehensive review. In Internet of Things and Big Data Analytics* Toward Next-Generation Intelligence. Springer, Singapore. 95-118. DOI:10.1007/978-981-15-6041-5_5

Touch, V., Tan, D. K., Cook, B. R., Liu, D. L., Cross, R., Tran, T. A., Utomo, A., Yous, S., Grunbuhel, C., & Cowie, A. (2024). Smallholder farmers' challenges and opportunities: Implications for agricultural production, environment and food security. *Journal of Environmental Management*; 370; 122536. https://doi.org/10.1016/j.jenvman.2024.122536

Tumuramye, M., Ssemakula, E., & Kalibwani, R. (2025). Determinants of Irish Potato Production and Value Chain Performance among Smallholder Farmers in Rubanda District. *International Journal of Research and Innovation in Social Science* (IJRISS); 9(8). https://dx.doi.org/10.47772/IJRISS.2025.908000386

Uche, C., & Eunice, N. A. (2024). "Unemployment in Nigeria: Leveraging the Opportunities Agriculture Offers". *Asian Journal of Economics, Business and Accounting* 24 (11):284-90. https://doi.org/10.9734/ajeba/2024/v24i111556

Udoh, E. D., Samson, E. O., Ema, I. E., & Ogar, B. I. (2025). Factors influencing adoption of improved production technologies among irish potato (Solanum Tuberosum) Farmers in Bokkos Local Government Area of Plateau State, Nigeria. *Journal of Applied Sciences and Environmental Management*, 29(1), 293–302. https://doi.org/10.4314/jasem.v29i1.36

Umar, B. B. & Ibrahim, L. (2023). Availability, accessibility, and utilization of electronic information resources by students in Federal University of Gashua library. International *Journal of Innovative Information Systems and Technology Research,* 11 (4), 18- 25.

Younis, A., Ul-Haq, A., Ahmed, N., Iqbal, M.W., Hassan, M.U. & Ahmad, I. (2021). Application of sensors in agriculture: A review. *Open Agriculture*. 6(1): 538-550.

Leveraging Library-Based Open Data Initiatives for Climate Change Mitigation and Sustainable Development in Nigeria

By

Muhammad Haruna
Kamaluddeen Isa El-Kalash
&
Sumayya Hassan
Library Complex, Federal College of Education (Technical) Yauri, Kebbi State.

Corresponding Email: **maimartabachief@gmail.com**

Abstract

Climate change is an issue that is posing serious threats to Nigeria's environmental sustainability, food security, and economic development. The situation has necessitated data-driven and innovative mitigation strategies. Open data has surfaced as a critical solution for evidence-based climate action. Though, its potential has been underutilized by many developing countries like Nigeria. This paper attempts to examine how libraries can leverage on open data initiatives to support climate change mitigation and sustainable development in Nigeria. In the process, key concepts including open data, library-based open data initiatives, climate change mitigation, sustainable development were explicated, the role of libraries in advancing open data for climate action in Nigeria were discussed, and the challenges facing library-based open data initiatives in Nigeria were examined. Among others, the paper concludes with a recommendation for empowering libraries to lead and coordinate open data initiatives to enhance climate resilience, promote inclusive knowledge access, and contribute to the sustainable development of Nigeria.

Key words: Climate change, libraries, open data initiatives**,** sustainable development.

Introduction

Across the globe, every flood that envelops a community, or every farming season that is thrown off by unpredictable rainfall, carries with it, a quieter casualty: the data that could have warned the people of a possible upcoming disaster, alongside the data that could have helped them to plan better next time. With specifics to the Nigerian nation, however, the country is already living the consequences of a warming planet. According to Climate Action Tracker (2024), Nigeria's Long-Term Low-Emissions Development Strategy commits the country to net-zero emissions by 2060. Interestingly, the Federal government has acknowledged that financing this transition remains a major unresolved gap, and bridging that gap requires more than money. It will require adequate information on climate data, environmental records, and locally generated knowledge to reach the people, researchers, and policymakers who need it, in a form they can actually use. This is where libraries, being strategic institutions that are rarely mentioned in national climate strategies, quietly matter more than imagined.

Across the shores of Nigeria and beyond, libraries are increasingly recognised as knowledge hubs that are capable of providing access to climate data, research outputs, local knowledge systems, and disaster-warning information through digital repositories, open access platforms, and community-based information services (Dada and Musa, 2026). In consideration to their value, Dada and Musa (2026) stressed that open data is not a peripheral technical concern for libraries but a core extension of their mission: freely accessible, reusable, and shareable information has become an important vehicle for democratising climate knowledge and expanding public access to reliable environmental information. Based on the forestated, Jagabah (2025) noted that libraries that curate environmentally sustainable collections and actively facilitate climate education are already positioning themselves as community-based hubs for climate literacy and resilience building, rather than passive repositories of print materials.

Despite the aforesaid, Ishola *et al.,* (2025) reported that a nationwide survey of Library and Information Science practitioners found a significant lack of comprehensive climate change policies within Nigerian libraries, with inadequate infrastructure and funding constraints further limiting their ability to prioritise sustainable, climate-responsive practices. The consequences extend beyond institutional inconvenience: without deliberate policy attention, libraries risk losing valuable information resources to climate-related hazards such as flooding, even as those same collections could otherwise support the country's education, research, and disaster-preparedness needs (Ishola *et al.*, 2025). Also, Ajani *et al.*, (2024) reported that the broader green library movement argued that libraries must engage more assertively with international climate advocacy rather than waiting for external direction, since sustained global cooperation depends on grassroots institutions translating climate commitments into local action.

Howver, the gap between potential and practice is playing out against a backdrop of ambitious national commitment. For instance, Nigeria's 2025 Voluntary National Review reaffirms the country's resolve to implement the Sustainable Development Goals through an Integrated National Financing Framework and an Inclusive Data Charter Action Plan explicitly designed to strengthen the national statistical system (United Nations Nigeria, 2025). An inclusive, well-governed data ecosystem of this kind cannot be built by central government agencies alone; it requires distributed institutions, of which Nigeria's academic, public, and special libraries are among the most widespread, to curate, preserve, and disseminate climate-relevant data at the community level. Scholars have similarly argued that the wider 'green library revolution' positions libraries as

catalysts for climate action precisely because they reached into communities that formal government data portals rarely touch (Ajani, Tella, and Enakrire, 2024).

It is this convergence — a country under mounting climate pressure, a national data and sustainability agenda still taking shape, and a library sector already active in climate literacy but constrained by weak policy and infrastructure — that this paper sets out to examine. Specifically, it explores how library-based open data initiatives can be more deliberately leveraged to support climate change mitigation and sustainable development in Nigeria, and proposes a conceptual framework for understanding the pathway from library-held data to national development outcomes.

Conceptual Framework

The framework below situates libraries as an intermediary layer between raw climate and environmental data and the national outcomes Nigeria has committed to under Agenda 2030 and its own climate strategy. It distinguishes four interacting levels.

Data Sources	Library-Based Open Data Functions	Community & Institutional Outcomes	National Development Impact
Government climate/environmental data; research repositories; local & indigenous knowledge	Curation & preservation; open access provision; digital repositories; climate literacy programmes	Public climate literacy; disaster preparedness; informed research & policy; community resilience	Climate change mitigation; SDG progress; Nigeria's net-zero and NDC commitments

From an active translation layer, the above framework treats libraries as active, and not passive custodians of fragmented climate and environmental data. Much of it produced by government agencies, researchers, or communities, and convert it into curated, openly accessible, and locally meaningful information. The translation function produces the community-level outcomes (climate literacy, disaster preparedness, better-informed local research and policy engagement) on which Nigeria's national development impact ultimately depends. The framework's central proposition is that the weakest point in this chain, as the evidence above suggests, is not the availability of climate data itself but the capacity of libraries, infrastructure, policy, and funding, to perform the curation and dissemination function reliably. By implication, srengthening that capacity, rather than generating additional climate data becomes the most direct lever available for translating Nigeria's existing data and policy commitments into measurable climate and development outcomes.

Explication of Concepts

Open data refers to data that can be freely used, reused, and redistributed by anyone, for any purpose, subject at most to requirements of attribution and share-alike (Open Knowledge Foundation, n.d.). Further, the body stated that beyond mere availability, genuinely open data must be accessible in a convenient, machine-readable form and free of legal or technical restrictions that limit reuse. In the context of this paper, open data extends to climate and environmental datasets

including flood risk maps, emissions inventories, rainfall records, and local adaptation knowledge whose value for mitigation and sustainable development depends entirely on whether they are actually reachable by the researchers, policymakers, and communities who need them.

Library-based open data initiatives are the deliberate efforts of libraries, information centres, and community information services to curate, preserve, and openly disseminate data and knowledge, including climate-related data, through digital repositories, open access platforms, and community outreach (Dada and Musa, 2026). Rather than treating open data as a purely technical government function, this framing positions libraries as active intermediaries that convert raw or scattered data into curated, locally meaningful collections that support climate literacy, disaster preparedness, and evidence-based decision-making at community level (Dada and Musa, 2026; Jagabah, 2025).

Climate change mitigation refers to human interventions aimed at reducing the sources of greenhouse gas emissions or enhancing the sinks that remove them from the atmosphere, distinguishing it from adaptation, which concerns adjusting to climate impacts already underway (Intergovernmental Panel on Climate Change [IPCC], 2023). For the purpose of this paper, mitigation depends not only on technological and policy interventions but also on the availability of accurate, accessible climate data that allows researchers, planners, and citizens to identify emission sources, track progress, and make informed choices. In other words, it is a data function in which libraries can play a meaningful, if underrecognised, role.

Sustainable Development entails the development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987). Operationalised globally through the Sustainable Development Goals, it requires functioning national data ecosystems capable of tracking progress and informing policy (United Nations Nigeria, 2025). In Nigeria, where the 2025 Voluntary National Review explicitly links SDG implementation to strengthening the national statistical system, the capacity of libraries to curate and share open data forms a small but significant part of the wider sustainable development data infrastructure that the country is building.

The Role of Libraries in Advancing Open Data for Climate Action in Nigeria

In Nigeria, many people often think of climate action as the business of government ministries, research institutes, or international donors, producing satellite data and policy reports. Sadly, libraries rarely make that list, despite being the only institution within the reach of ordinary Nigerian citizens that has both the mandate and infrastructure to turn scattered climate information into something tangible that a student, farmer, or local planner can actually use. Understanding what libraries are already doing, and what stands in their way, matters for anyone serious about closing Nigeria's climate data gap.

One of the clearest role libraries play is as curators and disseminators of climate knowledge. Document-analysis evidence across Nigeria, the United Kingdom, and the United States shows libraries and community information centres functioning as knowledge hubs that provide access to climate data, research outputs, local knowledge systems, and disaster-warning information through digital repositories and open access platforms (Dada and Musa, 2026). Frther, the authors argued that it is not a hypothetical function, but clearly how many libraries justify their relevance to funders and communities alike, positioning open knowledge services as vital to strengthening both sustainable development and community response to climate challenges.

Closely related to the above is the library's role in building climate literacy through the collections they choose to develop. Jagabah (2025) posited that by curating resources focused on environmental stewardship and local resilience strategies, and by facilitating community-based climate education, libraries help translate abstract climate science into locally relevant understanding. This curatorial role is what distinguishes a library from a government data portal. For example, while a portal publishes a dataset, a library can contextualise it, teach people to interpret it, and connect it to the specific drought, flooding, or heat risks a community actually faces.

Again, libraries also have a quieter but no less important role in disaster preparedness and information resilience via safeguarding the very collections and data infrastructure that climate action depends on. Nationwide survey evidence from Nigerian Library and Information Science practitioners found that inadequate infrastructure exacerbates the vulnerability of libraries themselves to climate-related hazards such as flooding and temperature fluctuations, threatening the loss of valuable information resources (Ishola *et al.*, 2025). A library that cannot protect its own collections from a flood is poorly positioned to help a community prepare for one; resilience, in this sense, has to start at home before it can be extended outward.

Beyond individual institutions, the library sector has begun positioning itself within the wider global climate advocacy movement rather than waiting passively for policy direction from government. The green library movement frames libraries as having a responsibility to engage international communities and cooperate across borders on climate action, treating environmental advocacy as core professional practice rather than an optional add-on (Ajani, Muhammed, *et al.,* 2024). This same movement argues that libraries function as catalysts for climate action precisely because they reach communities that formal, centralised data systems often do not (Ajani, Tella, and Enakrire, 2024).

Put together, the roles of curating and disseminating climate data, safeguarding information resources against the very hazards they document, building local climate literacy, and engaging in wider climate advocacy place the library sector with much potential. What consistently limits that potential in Nigeria is not a shortage of willing professionals or relevant data, but weak institutional backing. The same evidence base that documents libraries' climate functions also documents the absence of comprehensive climate change policy, inadequate infrastructure, and constrained funding behind them (Ishola *et al.*, 2025). By implication, advancing open data for climate action in Nigeria, then, is as much a matter of investing in libraries as it is a matter of generating better climate data in the first place.

Challenges Facing Library-Based Open Data Initiatives in Nigeria

For all the goodwill behind Nigeria's green library movement, most librarians trying to build an open climate data initiative are working without the basic scaffolding that would make it sustainable: a policy to point to, a server that will not crash the next time it rains, or a budget line that survives to the following fiscal year. The challenges below are not a list of excuses; they are the specific, evidenced constraints that separate what libraries could do from what they are currently able to do.

i **The absence of comprehensive policy frameworks:** The most fundamental constraint is the near-total absence of climate-responsive data policy at institutional level. A nationwide survey of 397 Library and Information Science practitioners found a significant lack of comprehensive climate change policies within Nigerian libraries, a gap that directly impedes effective

prioritisation and resource allocation for sustainable practices (Ishola *et al.*, 2025). Without a policy mandate, open data work becomes discretionary, dependent on the enthusiasm of individual librarians rather than embedded in institutional practice, which makes it fragile and difficult to scale beyond a handful of pioneering institutions.

ii **Inadequate infrastructure and technological barriers:** Even where the will exists, the infrastructure often does not. Inadequate infrastructure exacerbates the vulnerability of Nigerian libraries to the very climate hazards their data initiatives are meant to help communities withstand, including flooding and temperature fluctuations that threaten both physical and digital collections (Ishola *et al*., 2025). At the collection-development level, libraries face limited financial resources and technological barriers that make it difficult to invest in the digital repositories, reliable connectivity, and storage systems that open data work depends on (Jagabah, 2025). This is a double bind: the infrastructure gap makes libraries poor stewards of open data precisely because it also makes them vulnerable to the climate risks that data is meant to address.

iii **Funding constraints within a wider national financing gap:** Library funding constraints do not exist in isolation; they mirror a broader national pattern in which Nigeria's own climate transition remains under-financed. The country's Energy Transition Plan, aimed at achieving net-zero emissions by 2060, has yet to secure sufficient international financing despite an initial push to raise support ahead of COP27 (Climate Action Tracker, 2024). If flagship national climate initiatives struggle for funding at that scale, it is unsurprising that library open data work a comparatively low-visibility line item is rarely prioritised in institutional or government budgets, leaving many initiatives dependent on ad hoc grants or the goodwill of individual champions.

iv **Weak cross-sectoral engagement and limited community reach: L**ibraries have not yet fully embedded themselves within either the international climate advocacy community or their own local communities. Advocates argue that libraries need to engage international communities more assertively as part of global climate change action, rather than operating in isolation from the wider environmental movement (Ajani *et al*., 2024). Locally, curators note the continuing need for greater community engagement alongside collection development, since a repository of open climate data delivers little value if the people who need it most do not know it exists or do not trust the library as a source of climate information (Jagabah, 2025).

Strategies for Leveraging Library-Based Open Data for Climate Mitigation and Sustainable Development

The above challenges are neither unique to libraries, nor unsolvable. What is needed are strategies that are grounded in what is already working elsewhere in the sector, adapted to Nigeria's specific policy and funding environment.

1. **Developing and institutionalising climate data policy:** The starting point has to be policy, since the evidence directly links its absence to poor prioritisation and resource allocation (*Ishola et al.,* 2025). Library governing bodies such as the Nigerian Library Association (NLA), and the Librarians Registration Council of Nigeria (LRCN), down to institutional management, should adopt climate-responsive data management policies that specify what climate and environmental data libraries will curate, how it will be preserved, and who is accountable for it, converting open data work from an individual passion project into an institutional obligation.

2. **Aligning library data work with national data infrastructure:** Rather than building isolated repositories, libraries should position themselves as delivery partners within Nigeria's existing national data commitments. The 2025 Voluntary National Review highlights the government's Inclusive Data Charter Action Plan and its drive to strengthen the national statistical system as core planks of SDG implementation (United Nations Nigeria, 2025). Libraries that formally align their open data initiatives with this framework, for instance, by becoming recognised local data-access points stand a better chance of securing both legitimacy and funding than those operating entirely outside it.
3. **Adopting recognised open data standards:** To ensure the data libraries curate is genuinely usable, initiatives should be built around established open data principles, i.e. data that is freely available, in convenient and machine-readable form, and free of restrictive licensing (Open Knowledge Foundation, n.d.). Adopting these standards from the outset avoids the common failure mode of digitising climate records that remain technically 'available' but practically unusable by the researchers, journalists, and community groups who need them.
4. **Investing in infrastructure and staff capacity:** Government agencies, development partners, and university administrations should treat library digital infrastructure including servers, backup systems, and climate-resilient storage as part of national climate adaptation investment, not merely a library-sector concern, given how directly infrastructure gaps translate into vulnerability during flooding and other hazards (Ishola *et al*., 2025). This should be paired with structured staff training in open data curation and climate literacy, addressing the technological and financial barriers already identified in the collection-development literature (Jagabah, 2025).
5. **Strengthening Community Engagement and Climate Literacy Programming:** Open data is of no value if it is not used. Therefore, libraries should deliberately design outreach around the datasets they curate. Jagabah (2025) stated that flood-risk workshops built around locally held rainfall data, or school programming that pairs emissions information with practical climate literacy, should be mapped out to close the community engagement gap identified in the literature. Framing this work explicitly as climate mitigation, meaning it should be understood as supporting the identification of emission sources and informed local decision-making, not only disaster response, keeps libraries connected to Nigeria's broader mitigation goals rather than adaptation alone (IPCC, 2023).
6. **Building International and Cross-Sectoral Partnerships:** Individual libraries should not have to solve funding and capacity gaps alone. The call for libraries to engage international communities in climate action (Ajani *et al.*, 2024) points toward a practical strategy: formal partnerships with international library networks, climate research bodies, and open data organisations that can provide technical support, training, and co-funding, while local libraries provide the community reach and contextual knowledge that outside partners typically lack.

Conclusion

Nigerian libraries already have most of what leveraging open data for climate action requires. They have the community trust, professional expertise, and a growing body of evidence-based advocacy that projects them toward the required role. What they lack is not capability but institutional backing i.e., the policy, infrastructure, and funding that would let existing good practice scale beyond a handful of pioneering institutions (Ishola *et al.,* 2025). Nigeria's own climate and sustainable development commitments, from its net-zero pledge to its Voluntary National Review, depend on exactly the kind of accessible, locally grounded data that libraries are positioned to

provide (Climate Action Tracker, 2024; United Nations Nigeria, 2025). Meeting that potential requires treating libraries as genuine partners in the country's climate data infrastructure, not as an afterthought to it.

Recommendations

Based on the discussion above, the following recommendations are proposed for policymakers, library administrators, and development partners:

1. NLA, LRCN and the management of institutions in Nigeria should develop and adopt formal climate-responsive data management policies, specifying curation, preservation, and accountability for climate-related open data.
2. Governments in Nigeria across all levels of governance should recognise libraries as critical access points within the Inclusive Data Charter Action Plan and the wider national statistical system by extending the existing SDG data infrastructure funding to library-based initiatives.
3. Library open data projects should adopt recognised open data standards from inception to ensure datasets are genuinely reusable rather than merely digitised (Open Knowledge Foundation, n.d.).
4. Development partners and top administrations in our institutions of higher learning and should prioritise investment in climate-resilient library infrastructure and structured staff training in open data curation and climate literacy.
5. Libraries should deliberately design relevant community engagement and climate literacy programmes around the specific datasets they hold, rather than treating curation and outreach as separate activities.
6. Library associations should pursue formal partnerships with international library networks and climate research organisations to access technical support, training, and co-funding for open data initiatives (Ajani *et al.*, 2024).

References

Ajani, Y. A., Muhammed, R. B., Oladokun, B. D., Folami, S. O., & Onyebinama, C. O. (2024). The green library advocacy: Need to engage the international communities in a climate change action. *Business Information Review*, 41(3). Available at https://doi.org/10.1177/02663821241265913

Ajani, Y. A., Tella, A., & Enakrire, R. T. (2024). The green library revolution: A catalyst for climate change action. *Collection and Curation, 43*(2), 60–67. Available at https://doi.org/10.1108/CC-10-2023-0032

Climate Action Tracker. (2024). Nigeria: Country summary. Available at https://climateactiontracker.org/countries/nigeria/

Dada, K. S. J., & Musa, A. U. (2026). Libraries and open climate knowledge: Informatics approaches to climate solutions and disaster preparedness. Informatics Studies, 13(3), 61–74. Available at https://www.informaticsstudies.org/index.php/informatics/article/view/736

Intergovernmental Panel on Climate Change. (2023). Climate change 2023: Synthesis report. IPCC.

Ishola, S. O., et al. (2025). Climate change preparedness in Nigerian libraries: An empirical study on vulnerabilities and strategic actions for resilience. *Climate and Development*, 18(4), 348–361. Available at https://doi.org/10.1080/17565529.2025.2539164

Jagabah, I. A. (2025). Libraries in the climate change era: A reflection on curating environmentally sustainable collections. *Journal of the Australian Library and Information Association*, 383–399. Available at https://doi.org/10.1080/24750158.2025.2525631

Open Knowledge Foundation. (n.d.). What is open? Retrieved August 30, 2026, from https://okfn.org/en/library/what-is-open/

UnitedNations Nigeria. (2025). Nigeria's 2025 Voluntary National Review on Sustainable Development: Main messages. Available at https://hlpf.un.org/sites/default/files/vnrs/2025/HLPF%202025%20Nigeria%20Main%20Messages.pdf

World Commission on Environment and Development. (1987). Our common future. Oxford University Press.

Infopreneurship: A Catalyst for Youth Employment and Economic Development among Library and Information Science Graduates in Nigeria

By

Sumayya Hassan Abubakar
Kamaluddeen Isa El-Kalash
&
Muhammad Haruna
Library Complex, Federal College of Education (Technical), Yauri, Kebbi State. **Corresponding Email**: maimartabachief@gmail.com

Abstract

Nigeria has been experiencing a rising rate of graduate unemployment. The situation has continued to pose serious socioeconomic challenges. Among the unemployed are graduates of Library and Information Science (LIS) who are usually affected as a result of the dwindling employment opportunities within conventional library settings. Hence, this paper examines infopreneurship as an emerging area that promotes job creation, self-reliance, and economic development among LIS graduates in the country. The paper explores the concept and dimensions of infopreneurship within the LIS landscape, the changing landscape of LIS practice in Nigeria and highlights various infopreneurial opportunities available to LIS professionals, including digital publishing, content development, information consultancy, social media information services, database management, among others. Further, the paper discusses the relevance of infopreneurial competencies, innovation, digital literacy, and information technology skills in enabling LIS graduates to establish sustainable information-based enterprises. Challenges such as inadequate infopreneurial training, limited access to funding, poor technological infrastructure, and low awareness of infopreneurial opportunities are also discussed. The paper concludes that infopreneurship has significant potential to reduce unemployment, increase self-sustenance, and stimulate economic growth by transforming LIS graduates from job seekers to job creators, and recommends the integration of practical infopreneurship courses into the LIS curricula amongst others.

Keywords: Infopreneurship, youth employment, economic development, library and information science graduates.

Introduction

Nigeria's educated population represents both a significant development opportunity and a pressing policy challenge. This tension stems from the social and economic difficulties many unemployed graduates face despite the growing number of young people leaving universities, polytechnics, and colleges of education with strong potential. According to the State of the Nigerian Youth Report 2025, presented to the House of Representatives Committee on Youth, roughly 1.7 million graduates leave Nigeria's universities and polytechnics every year, a figure the economy has consistently failed to absorb into the labour market (Plan International Nigeria, 2025). Graduate unemployment in Nigeria cuts across disciplines, and Library and Information Science (LIS) graduates are no exception.

Traditionally, LIS graduates looked toward public libraries, archives, academic libraries, school libraries, and documentation centres as their primary career destinations. These settings remain important, but they can no longer absorb the growing number of LIS graduates entering the labour market each year. At the same time, the profession itself has changed, especially with the rise of computers, the internet, social media, digital libraries, and electronic databases that have transformed how information is produced, organised, shared, stored, and used. The development has opened an array of opportunities for people with information-related skills. Infopreneurship is one of the clearest examples of this shift, offering LIS graduates a viable career path beyond the confines of conventional institutional employment. In support of the above, Sulayman *et al.* (2014) posited that Nigerian LIS graduates show considerable readiness to create employment through infopreneurial and technopreneurial activities, although barriers such as inadequate capital, poor internet infrastructure, and unfavourable policies remain significant constraints. Similarly, Okwu *et al.* (2024) identified information brokerage, information-systems consultancy, and information-organisation services as emerging entrepreneurial opportunities for LIS professionals.

No doubt, the above shift matters because information and digital competencies are increasingly central to participation in the modern economy. UNESCO's most recent global assessment of media and information literacy policy found that while national recognition of these competencies is growing, implementation remains fragmented, underscoring the continued need to translate digital and information skills into genuine economic participation rather than treating them as abstract policy goals (UNESCO, 2025). Infopreneurship offers exactly this kind of translation because it is a pathway through which LIS graduates' human capital can be converted into productive employment and value creation. For LIS graduates, this calls for a shift in mindset, from viewing employment as something obtained from an organisation to viewing professional knowledge and information competencies as resources that are capable of generating economic value in their own right. This does not mean abandoning the traditional values of librarianship; rather, it means extending those values into emerging economic and technological spaces.

LIS graduates already possess strong foundations for this shift. Their core competencies in information identification, evaluation, organisation, retrieval, dissemination, and preservation, combined with entrepreneurial skills, digital literacy, creativity, communication, marketing, and a clear understanding of users' information needs, position them well to build viable information enterprises. Nigeria therefore presents a compelling case for examining infopreneurship as a catalyst for gainful employment and economic development among LIS graduates. The central question is not whether these graduates possess entrepreneurial aspirations, but whether their professional competencies, entrepreneurial capabilities, and access to enabling resources can be converted into sustainable economic activity.

It is against this background that this paper examines infopreneurship as a catalyst for gainful employment and economic development among LIS graduates in Nigeria.

Conceptual Clarifications

What is Infopreneurship? Infopreneurship simply means the process of selling information to make profits (Khumalo and Nkala, 2015). In the view of El-Kalash *et al.* (2016), the concept is unarguably an extension of two distinct fields, as the term has its etymology from the words: 'information' and 'entrepreneurship'. Further, the authors argued that the practice is an emerging business model in mainstream information practice that is profit-oriented in nature, based on a vision and passion for using the internet medium to create and/or develop, package and sell information products and services to generate income.

For this paper, infopreneurship is defined as an emerging business concept in our contemporary knowledge-based economy that involves the creation, processing, packaging, dissemination, marketing, and commercialisation of information, knowledge, and information-based resources and services to satisfy the information needs of users, and generate economic value. It represents a feasible and potentially sustainable business model because individuals, businesses, educational institutions, governments, and other organisations place a considerable premium on timely, accurate, relevant, and specialised information for learning, decision-making, research, innovation, and problem-solving.

Explaining Youth Employment: Youth employment refers to the engagement of young individuals, typically aged 15 to 24, in work opportunities that contribute to their economic independence and skill development (UNESCO, n.d). In other words, youth employment refers to youth participation in decent, productive, and remunerative work that enables them to fend for themselves and contribute positively to society's development.

Understanding Economic Development: Economic development refers to programs, policies, or activities that seek to improve the economic well-being and quality of life for a community (British Columbia, 2024). It is the continuous improvement in the economic and social well-being of a society through employment, income generation, human-capital development, increased productivity, innovation, and improved living standards.

Library and Information Science (LIS) Graduates: These are trained professionals in the systematic creation, acquisition, organisation, preservation, retrieval, management, dissemination, and use of information and knowledge resources. According to Iowa Graduate College (n.d), LIS professionals work in public libraries, school libraries, college and university libraries, corporate libraries, law libraries, medical libraries, special collections, historical societies, community archives, museums and galleries, non-profits, corporations, hospitals, and state and federal agencies, or anywhere that there is a need to collect, organise, and access documents and information resources.

Conceptual Framework

This paper is anchored in the Human Capital Theory, which conceptualises education, knowledge, skills, competencies, and experience as investments that enhance individuals' productivity and economic value (Becker, 1964). Within this framework, LIS education and professional competencies constitute the foundational human capital of graduates, while digital literacy, information-management expertise, research competence, creativity, and entrepreneurial skills strengthen their capacity to identify and exploit emerging opportunities. However, infopreneurship

serves as the mediating mechanism through which these competencies are transformed into marketable information products and services. The framework assumes that the effective conversion of the graduates of LIS human capital into infopreneurial activities can improve their capacity to create sustainable livelihoods for themselves and contribute to the Nigerian economy.

The Changing Landscape of LIS Practice in Nigeria

In Nigeria, LIS practice is experiencing a fundamental shift. Traditionally, the professional identity of the librarian was largely associated with the physical library and activities such as cataloguing and classification, collection development, reference services, circulation, preservation and user education. While all of these functions still remain relevant, technological advancement and changes in the information environment have expanded the scope of the professional practice of librarians. LIS professionals now operate within an ecosystem that is characterised by electronic resources, digital scholarship, open access, data-intensive research, artificial intelligence (AI), social media, digital publishing, knowledge management and rapidly changing patterns of information production and consumption (International Federation of Library Associations and Institutions [IFLA], 2024a). Further, the report identifies changing knowledge practices, technological transformation, renegotiation of trust, increasingly complex skills and uneven distribution of digital technologies as major forces shaping the information environment.

The above transformation is undoubtedly occurring alongside a labour market in which technological change is reshaping occupations and the skills required for employment. For instance, the World Economic Forum (WEF, 2025) reported that technological change, particularly AI, information processing and expanding digital access, is among the most significant drivers of labour-market transformation. Further, the forum projected substantial job creation alongside job displacement by 2030 and identified AI and big data, networks and cybersecurity, technological literacy, creative thinking and adaptability among increasingly important skills. By implication, the possession of a degree alone is insufficient for the LIS graduates of the present century. In other words, they must develop the ability to constantly update their skills and commercially apply their professional competencies to remain relevant in the current economic ecosystem.

Cascading it down to the Nigerian scenario, however, the implications are particularly important because traditional library employment has limits, especially since conventional employment opportunities in the discipline are concentrated mainly in a variety of library settings. Such settings have their established staffing structures, limited vacancies and recruitment processes that are unlikely to accommodate the growing pool of LIS graduates who graduate from tertiary institutions across the country on a yearly basis.

Moreover, the constant harvesting of information daily has made information work more diversified. It has paved the way for the smart LIS professionals of the contemporary era to engage in infoprenurial activities such as digitisation, electronic publishing, data management, information literacy, research support, digital curation, information consultancy, records and knowledge management, and digital-content services.

By implication, the conception of LIS graduates in Nigeria need to move from institution-centred professional practice towards information-centred or infopreneurial opportunities, especially since the information landscape remains an important employer of their services. In other words, LIS graduates need to recognise information as a valuable economic resource that can be transformed into products, services and solutions for identified users. They should think outside the box by way

of deploying their professional competencies into identifying the unmet information needs of society, develop services around them and create alternative sources of income for themselves. In support of the above, Okwu *et al*., (2024); Ofodu and Whong (2024) noted that entrepreneurship studies in the Nigerian LIS context have already identified information brokerage, consultancy, digitisation, publishing, research support and other activities as potential avenues for professional self-employment for LIS graduates. In sum, the changing landscape does not make traditional librarianship obsolete, but rather expands the boundaries of LIS practice that necessitates more diversified employment strategies.

Infopreneurship: A Catalyst for Youth Employment among LIS Graduates in Nigeria

Infopreneurship is a practice that offers a promising pathway for unemployed LIS graduates to transform their professional knowledge into gainful employment and income generation for a sustainable living. It is a smart way of identifying, creating, organising, packaging, marketing and commercialising information and knowledge into products or services to satisfy identified user needs. Its significance to LIS graduates lies in the fact that their professional competencies already provide a substantial human-capital foundation for the information-based enterprise.

No doubt, LIS education equips graduates with competencies in information searching and retrieval, information evaluation, organisation and classification, research, reference services, information literacy, preservation and dissemination. In the contemporary digital environment, these competencies can be combined with digital, communication, marketing, business-management and entrepreneurial skills to create new forms of employment. UNESCO (2021) stresses the importance of continuous education and capacity-building in digital literacy, data science, stewardship, curation and information and data literacy, reinforcing the need for information professionals to continually expand their capabilities. Similarly, IFLA (2025) emphasises that future-ready library and information workers require broader skills beyond those traditionally associated with the profession.

However, the employment potential of infopreneurship practice is particularly evident in the variety of services that LIS graduates can provide. These include information brokerage, research-support services, indexing and abstracting, bibliographic services, digitisation, electronic publishing, records and knowledge management, content development, information-literacy training, database services and specialised research services (El-Kalash *et al*., 2016). Recent Nigerian literature specifically identifies information brokerage, database brokerage, information-system consultancy and information-organisation services as entrepreneurial possibilities within LIS (Okwu *et al.*, 2024). Ofodu and Whong (2024) similarly identify research writing, indexing and abstracting, publishing, consultancy and freelancing as potential employment pathways for information professionals.

Empirical evidence further strengthens the case for infopreneurship as Sulyman *et al*. (2024) in a study of Nigerian LIS graduates, examined readiness for infopreneurship and technopreneurship as mechanisms for job creation and concluded that respondents demonstrated substantial readiness for creating employment through these activities. This is significant because it suggests that LIS graduates can potentially move beyond the conventional job-seeker orientation towards a job-creator orientation.

Moreover, research on entrepreneurship education among Nigerian LIS graduates indicates that graduates possess entrepreneurial competencies but that these competencies are not always translated into entrepreneurial practice. Ahmadu *et al.* (2025), for example, found high levels of

entrepreneurial skills among LIS graduates in Kano State but comparatively low levels of readiness, utilisation and self-reliance. This finding highlights an important distinction between possessing entrepreneurial knowledge and successfully converting that knowledge into an income-generating enterprise.

The development of such capacity is also consistent with broader changes in the labour market. The WEF (2025) reports that employers increasingly value technological literacy, creative thinking, analytical thinking, resilience, flexibility, adaptability and lifelong learning, while technological skills such as AI and big data are among the fastest-growing skill areas. LIS graduates who combine their established information competencies with these emerging capabilities can therefore position themselves to participate in a wider range of employment and entrepreneurial opportunities. Thus, infopreneurship has the potential to transform the unemployed LIS graduate into an active contributor to employment creation for economic growth.

Ultimately, infopreneurship provides a viable mechanism for converting LIS human capital into economic value. By transforming information expertise into marketable products and services, unemployed LIS graduates can diversify their employment pathways, generate income, establish enterprises and potentially create jobs for others because infopreneurship represents not merely an alternative to conventional library employment, but an entrepreneurial extension of LIS practice that can promote gainful employment while contributing to Nigeria's knowledge-based economic development.

Challenges Facing Infopreneurship Practice among LIS Graduates in Nigeria

Despite the growing relevance of information-based enterprises to employment creation and economic development, LIS graduates in Nigeria face several challenges in establishing and sustaining infopreneurial ventures. These challenges include inadequate practical training, limited entrepreneurial orientation, insufficient finance, poor digital infrastructure, restricted awareness of opportunities, and weak mentoring and institutional support.

A major challenge is the gap between infopreneurship education and practice. Although many LIS programmes expose students to entrepreneurship and information technology, acquiring theoretical knowledge does not necessarily translate into the readiness or ability to establish viable enterprises. For instance, Ahmadu *et al*. (2025) found that although respondents possessed relatively high entrepreneurial skills, their readiness, perceptions and utilisation of entrepreneurial opportunities for self-reliance remained low. This suggests that entrepreneurship education may sometimes be treated as an academic requirement rather than practical preparation for post-graduation enterprise.

Closely related is the limited practical orientation of infopreneurship training. Contemporary infopreneurship requires competencies beyond traditional library operations, including digital content creation, database development, web publishing, social media management, digitisation, data services, indexing and abstracting, research support and knowledge management. Studies have identified technical, managerial, business, ICT and information-literacy competencies as essential entrepreneurial capabilities among LIS professionals (Bumkeng and Adadu, 2023; Ezeani *et al.*, 2023). Where training remains predominantly theoretical, graduates may understand infopreneurship without possessing adequate skills to commercialise their knowledge and services.

Inadequate finance is another significant constraint. Although some information ventures can be initiated with modest capital, competitive enterprises may require computers, reliable internet,

software subscriptions, websites, cloud services, scanners, printers, digital storage, marketing and suitable workspace. Bumkeng and Adadu (2023) identified inadequate sources of finance as an impediment to entrepreneurial participation among LIS professionals. Financial difficulties are further compounded by inadequate digital infrastructure, including unreliable electricity, costly broadband services, insufficient technological equipment and uneven connectivity. Adeniran and Adeyemi (2023) similarly identified inadequate funding, economic constraints, legal and regulatory issues, insufficient ICT and business skills, workload and weak entrepreneurial orientation as barriers to LIS entrepreneurship. The World Bank (2025) also noted persistent gaps in Nigeria's digital-skills ecosystem and challenges in translating digital-skills policies into effective implementation.

Another challenge is limited awareness and narrow perceptions of infopreneurial opportunities. Some LIS graduates continue to perceive their career prospects primarily in conventional library employment, particularly within government institutions. This may cause them to overlook opportunities in digital publishing, competitive intelligence, knowledge consultancy, research-data services, information packaging, content development, digital archiving and online information services. Arowosola *et al*., (2022) reported variations in awareness of infopreneurial opportunities among LIS students and recommended stronger curriculum integration and industrial exposure to information-enterprise organisations.

Finally, inadequate mentoring, professional networks, incubation facilities and institutional partnerships can hinder the transition from LIS graduates to successful infopreneurs. Young graduates need access to experienced mentors, technology hubs, financial institutions, professional associations and potential markets. Without these forms of support, promising ideas may remain unrealised. Thus, the central challenge is not necessarily a lack of infopreneurial opportunities, but the absence of an integrated ecosystem capable of transforming LIS knowledge, entrepreneurial orientation, technology, finance and market access into sustainable information-based enterprises.

Strategies for Promoting Infopreneurship among LIS Graduates in Nigeria

Promoting infopreneurship among LIS graduates requires deliberate interventions that reposition LIS education beyond preparing graduates primarily for salaried employment. Based on the above, the following strategies for promoting infopreneurship among Nigeria's LIS graduates are recommended:

1. LIS programmes should equip graduates as information professionals, innovators and infopreneurs, particularly within an increasingly digital labour market where self-employment and digitally mediated work are becoming more significant.
2. LIS curricula should be restructured to incorporate practical infopreneurship education. Said differently, infopreneurship should not be treated as a generic university course detached from professional practice. Rather, LIS schools should incorporate information-product development, consultancy, digital publishing, data services, business intelligence, content management, digital marketing, intellectual property, pricing of information services, business-model development and financial management. Arowosola *et al*. (2022) recommend integrating infopreneurship into LIS curricula and providing students with industrial exposure to relevant organisations. A learning-by-doing approach should also be adopted, requiring students to develop and test practical information products such as specialised databases, digitisation and indexing services, digital repositories, research-support services and online

information portals. Such experiences can bridge the gap between entrepreneurial knowledge and its practical application (Ahmadu *et al.,* 2025).

3. Contemporary librarianship is deeply embedded in the digital economy. As such, LIS graduates require competencies beyond basic computer literacy. Their training should encompass web technologies, digital content management, data analytics, search-engine optimisation, database management, digital preservation, cloud collaboration, responsible artificial intelligence use and cybersecurity awareness. This aligns with the growing demand for digital, technical and complementary skills in Nigeria's labour market (World Bank, 2024).
4. LIS schools should establish infopreneurship and innovation hubs. These centres could provide internet facilities, computers, digitisation equipment, software, co-working spaces and technical support. They could also incubate student and graduate ventures by assisting with business planning, market research, business registration, product development and funding opportunities. Collaboration among LIS schools, university libraries, entrepreneurship centres, technology hubs and private information companies would strengthen such initiatives.
5. A framework should be created that will encourage experienced information consultants, publishers, database developers, knowledge managers, digital-content entrepreneurs, and librarians operating private ventures to mentor students and recent graduates. Professional associations, particularly the Nigerian Library Association, could facilitate networking platforms for sharing business experiences, opportunities and market intelligence. Such initiatives could help address weak entrepreneurial orientation among LIS professionals (Bumkeng and Adadu, 2023).
6. Higher institutions, government agencies, development organisations and financial institutions should provide micro-grants, seed funding, business competitions and affordable financing for information- and knowledge-based enterprises. These interventions should be complemented by financial literacy, bookkeeping and enterprise-management training to improve sustainability.
7. Lastly, industrial training should expose students to publishing firms, ICT companies, information consultancies, database organisations, archives, media organisations, research institutes and knowledge-management units, rather than conventional libraries alone. LIS graduates should also be trained to identify information needs for which individuals and organisations are willing to pay, including research support, data organisation, documentation, digitisation and customised information services. Government youth-employment policies should recognise knowledge-based entrepreneurship as a legitimate employment pathway.

Ultimately, integrating LIS competencies with technology, innovation, business skills, finance and institutional support can position infopreneurship as a viable pathway to self-employment, job creation and economic development in Nigeria.

Conclusion

Advances in technology and the changing information landscape have created new opportunities for LIS graduates through infopreneurship. In Nigeria, where conventional library employment cannot absorb the growing number of graduates, LIS professionals can leverage their competencies in information organisation, research, ICT and dissemination to provide services in consultancy, digitisation, database management, research support, digital publishing and content development. However, inadequate start-up capital, unreliable electricity, poor digital infrastructure, limited practical entrepreneurship training, and insufficient awareness of infopreneurial opportunities constrain participation. Strengthening practical digital and entrepreneurial skills can enable

graduates to view information as an economic resource, thereby promoting self-reliance, employment creation, and economic development.

References

Adeniran, A. O., & Adeyemi, B. M. (2023). Entrepreneurial skills assessment of Library and Information Science faculty and academic librarians in Nigeria: Issues and prospects. *Journal of Business & Finance Librarianship*, 28 (4), 255–277. Available at https://www.tandfonline.com/doi/full/10.1080/08963568.2023.2263315?utm_

Ahmadu, I., Abdulmalik, S. Y., & Isah, A. B. (2025). Entrepreneurship education for self-reliance: A study of Library and Information Science graduates in Kano State. *Information Impact: Journal of Information and Knowledge Management*, 16 (1), 24–35. Available at https://doi.org/10.4314/iijikm.v16i1.3?utm_

Arowosola, O., Kashim, M., Oyizea, L. B., Joseph, O., & Hussena, A. (2022). Awareness and relevance of infopreneurship among Library and Information Sciences (LIS), Prince Abubakar Audu University, Anyigba, Kogi State, Nigeria. *Library Philosophy and Practice (e-journal)* 7087. Available at https://scholarworks.sjsu.edu/libphilprac/7087/?utm_

Becker, G. S. (1964). Human capital: A theoretical and empirical analysis, with special reference to education. Columbia University Press.

British Columbia (2024). What is Economic Development? Available at https://www2.gov.bc.ca/gov/content/employment-business/economic-development/plan-and-measure/economic-development-basics

Bumkeng, Q. S., & Adadu, M. E. (2023). Entrepreneurial opportunities for Library and Information Science professionals in the contemporary era. *International Journal of Information Resource Management.* Available at https://www.ijirm.com.ng/article.php?id=170&utm_

El-Kalash, K. I., Mohammed, S. B. & Aniki, M. Y. (2014). Exploring Infopreneurship for Economic Growth and Sustainability in a Developing Economy: The Nigeria Perspective. Available from: https://www.researchgate.net/publication/306392056_Exploring_Infopreneurship_for_Economic_Growth_and_Sustainability_in_a_Developing_Economy_The_Nigeria_Perspective#fullTextFileContent [accessed Sep 02 2026].

International Federation of Library Associations and Institutions. (2024a). IFLA Trend Report 2024: Facing the future of information with confidence. Available at https://www.ifla.org/trend-report/?utm_

International Federation of Library Associations and Institutions. (2024b). New and emerging library workers. New and Emerging Library Workers. Available at https://www.ifla.org/news/new-and-emerging-library-workers/?utm_

International Federation of Library Associations and Institutions. (2025). A Skills Agenda for the Trend Report. IFLA Skills Agenda. Available at https://www.ifla.org/news/a-skills-agenda-for-the-trend-report/?

International Labour Organisation (2025). World employment and social outlook: Trends 2025. [ILO World Employment and Social Outlook 2025]. Available at https://www.ilo.org/publications/flagship-reports/world-employment-and-social-outlook-trends-2025?utm_source=chatgpt.com

International Labour Organization. (2024). Global employment trends for youth 2024: Decent work, brighter futures. International Labour Office. Available at https://doi.org/10.54394/ZUUI5430.

Iowa Graduate College (n.d). About Library and Information Science. Available at https://slis.uiowa.edu/about/what-library-and-information-science

Khumalo, N. B. and Nkala, G. S. (2015). The importance of infopreneurship training for records and archives management students in Zimbabwe. *Journal of the South African Society of Archivists*, 48. Available at: http://doi:129273-350043-1-PB.

Ofodu, P. N., & Whong, F. M. (2024). Information entrepreneurship freelancing in Library and Information Science for enhancing employment career opportunities for librarians. *International Journal of Innovation Research and Management*. Available at https://www.ijirm.com.ng/article.php?id=255&utm_

Okwu, E., Opurum, A. C., & Eke, P. C. (2024). Creating entrepreneurial possibilities in Library and Information Science: Remedying the narrative of unemployment. *Covenant Journal of Entrepreneurship*, 8(2), 36–41. Available at https://journals.covenantuniversity.edu.ng/index.php/cjoe/article/view/4368?utm_

Plan International Nigeria (2025). State of the Nigerian youth report 2025. Presented at the Nigerian Youth Dialogue, House of Representatives Committee on Youth, Abuja.

Sulyman, A. S., Ajani, F. O., Idowu, A. O., & Ojaja, I. B. B. (2024). Infopreneurship and technopreneurship readiness for job creation among Nigerian Library and Information Science graduates. *Asian Journal of Information Science and Technology*, 14 (2), 27–33. Available at https://www.ajist.co/index.php/ajist/article/view/4278?articlesBySimilarityPage=2&utm_source

UNESCO (2021). Recommendation on Open Science. Available at https://www.unesco.org/en/legal-affairs/recommendation-open-science?utm_source=

UNESCO (2025). Media and information literacy for all: Closing the gaps [Issue brief]. Available at https://www.unesco.org/en/articles/new-unesco-issue-brief-reveals-global-gaps-media-and-information-literacy-policies-and-education

UNESCO (n.d). Youth employment. Available at https://www.unesco.org/en/query-list/y/youth-employment

World Bank (2025). Digital skills in Nigeria. World Bank. Available at https://thedocs.worldbank.org/en/doc/a607bb6e3b76d2be0f3db8db34dcf73e-0140022025/?utm_

World Bank. (2024). Nigeria Skill demand trends: Insights from online job vacancy data. World Bank. Available at https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099010507222517560?utm_

World Economic Forum. (2025). Future of Jobs Report 2025: 78 million new job opportunities by 2030 but urgent upskilling needed to prepare workforces. Available at https://www.weforum.org/press/2025/01/future-of-jobs-report-2025-78-million-new-job-opportunities-by-2030-but-urgent-upskilling-needed-to-prepare-workforces/?utm_

Awareness and Utilization of Electronic Information Resources among Undergraduates of Library and Information Science in Federal University Dutsin-Ma (FUDMA)

By

Abdullahi Ibrahim Akawu
Federal University Dutsinma, Katsina State
abdullahiakawu2019@gmail.com

Abstract

This study investigated the Awareness and Utilization of Electronic Information Resources among Undergraduates of Library and Information Science in Federal University Dutsin-ma Katsina State. The research questions sought to identify the types of e-resources available in Federal University Dustin-ma library, the level of awareness, and the challenges encountered in accessing and utilizing EIRs among Undergraduates of LIS in Federal University Dustin-ma. Survey research method was adopted for the study. The population of the study included six hundred and seventy-five library and information science undergraduates of Federal University Dutsin-ma. Simple random sampling technique was used to select sixty-five students. The research instrument used to collect data for the study is online questionnaire using SurveyMonkey. Descriptive analysis using frequency table and simple percentages was used to analyze the data collected. The findings revealed that a significant majority of LIS students are aware of the e-resources available in the FUDMA Library, the most recognized and available e-resources in the FUDMA Library include electronic books , JSTOR , and African Journals Online (AJOL), the primary use of e-resources is to review literature and to gain information on specific topics, the major challenges faced by students include inadequate skills to formulate search strategies, literacy and search problems. The study recommended that FUDMA library should develop campaigns and integrate resources like TEEAL, Trip Medical Database, and CD-ROMs into coursework to increase awareness and utilization among students, the Department of Library and Information Science at FUDMA should regularly conduct interactive workshops and orientation sessions to enhance awareness and understanding of e-resources among students.

Keywords: Electronic Information Resources (EIRs); Awareness and Utilisation; Library and Information Science Undergraduates; Federal University Dutsin-Ma; Academic Libraries; Information Literacy.

Introduction

Electronic information resources require technological facilities and users who have the skills to interact with them. Manjack (2018) explains electronic information resources in relation to computers, network access, electricity and the people who use them. The resources themselves may include electronic books, journals, databases and other forms of information available in digital formats (Ezema & Chizoba, 2018).

The importance of electronic resources in academic libraries is not limited to their availability. Students must also be aware of the resources and possess the skills required to locate and use relevant information. Adeleke and Emeahara (2018) examined the relationship between information literacy and the use of electronic information resources and their work points to the importance of information skills in the effective use of such resources. Awareness is therefore an important starting point. A student who does not know that a particular database or electronic collection exists may not attempt to use it.

The issue is particularly relevant to Library and Information Science students because they are being prepared to work with information resources and information users. Their ability to search electronic databases, evaluate information and retrieve relevant materials is part of the practical knowledge needed for their future professional activities.

Statement of the Problem

The Federal University Dutsin-Ma Library has invested in electronic information resources to support academic activities. However, the existence of these resources does not automatically result in their effective use by students. This has become an an antagonism to excellent Utilization of these information resources. It could be relating to access, facilities, awareness and students' ability to use electronic resources effectively.

Therefore, the gap identified by the researcher was that, none of the earlier researchers focused on awareness and utilization of e-resources among Library and Information Science Students alone, as the skills acquired during their training may influence their ability to provide information services effectively after graduation. This made it necessary for the researcher to provide further Empirical evidence on this research endeavour. Thus, it was against this backdrop that the problem of the study was to determine the awareness and utilization of electronic information resources among LIS undergraduates in FUDMA and to identify the challenges they encounter.

Objectives of the Study

The study sought to:

1. Identify the types of electronic information resources available in FUDMA Library;
2. Determine the level of awareness of electronic information resources among LIS undergraduates in FUDMA;
3. Find out the purposes for which LIS undergraduates use electronic information resources; and
4. Identify the challenges encountered by LIS undergraduates in accessing and utilizing electronic information resources.

Literature Review

Electronic information resources (EIRs) are information materials that can be accessed through electronic devices and digital networks. They include electronic books, electronic journals, databases, institutional repositories and other digital materials. Manjack (2018) relates electronic

information resources to the availability of computers, network access, electricity and the people who use them. Ezema and Chizoba (2018) similarly identify databases, books, journals, newspapers, magazines, archives, theses, conference papers, government publications and research reports among the materials that may be available electronically.

The value of EIRs in academic libraries lies partly in their ability to provide access to current and diverse information. Ezema and Chizoba (2018) observed that students and academic staff make use of electronic resources to obtain relevant and up-to-date information. Electronic resources also make it possible to search large amounts of information more conveniently, while access and use are influenced by the availability of information and communication technologies within the academic environment (Aregbesola & Oguntayo, 2014; Ani, 2013).

Previous studies show that awareness does not always correspond with effective utilization. Baro, Endouware and Ubogu (2011), for example, found that scholarly electronic journal databases were underutilized by medical students at Delta State University, with lack of awareness of existing resources identified as a major problem. Okello and Magara (2008) similarly reported lack of awareness as an obstacle to the access and utilization of electronic journals among students at Makerere University.

Oyedapo and Ojo (2013) observed underutilization of electronic resources at Obafemi Awolowo University and identified poor searching skills as the major reason. Baro et al. (2011) also found that scholarly electronic journal databases were underutilized, while Ndinoshiho (2017) reported that although most students at the University of Namibia's Northern Campus used the internet, electronic databases were significantly underutilized. The latter study identified shortage of computers, unreliable internet connection and lack of skills among the major constraints.

Gakibayo, Ikoja-Odongo and Constant (2013) found that students at Mbarara University Library experienced difficulties in using electronic resources because of inadequate computer and information literacy skills, insufficient computers and slow internet connectivity. The authors concluded that more needed to be done to improve electronic resource use in the institution.

Adeniran (2013) reported a similar situation at Redeemers University. Although students were aware of the different types of electronic resources available in the library, their rate of use was low. The study associated this with the large amount of irrelevant information retrieved, difficulty filtering search results, download delays, failure to find required information and inadequate search skills.

The literature identifies both technical and user-related barriers to electronic resource utilization. Gakibayo et al. (2013) found that inadequate computer and information literacy skills, insufficient computers and slow internet connectivity constrained students' use of electronic resources.

Research Method

The study adopted a quantitative approach using a descriptive survey design. The study was conducted among Library and Information Science undergraduates at Federal University Dutsin-Ma. The population comprised 675 students of the Department of Library and information Science, Federal University Dutsinma. A sample of 65 students was selected through simple random sampling. A structured online questionnaire was used for data collection. The questionnaire was created using an online survey application and distributed through WhatsApp. Data collection ended after 65 responses had been received. The data were analysed using frequency counts and percentages.

Results and Discussions

Table 1: Types of Electronic Information Resources

Types of Information Resources Available	Frequency	Percentage
Electronic Books	22	33.85
JSTOR	10	15.38
African Journals Online (AJOL)	6	9.23
Institutional Repository	6	9.23
AGORA	5	7.69
SCOPUS Database	5	7.69
OARE	3	4.62
ScienceDirect	3	4.62
HINARI	2	3.08
SAGE Journals	2	3.08
Law and Social Sciences	1	1.54
Total	65	100

Source: Field Survey, May 2024.

Electronic books were the most recognised resource, with 22 respondents (33.85%). JSTOR followed with 10 respondents (15.38%). AJOL and the Institutional Repository were each identified by six respondents (9.23%), while AGORA and SCOPUS were each identified by five respondents (7.69%). No respondent identified TEEAL, Trip Medical Database, CD-ROMs, electronic newspapers, electronic magazines or DVDs.

Table 2: Level of Awareness of Electronic Information Resources

Level of Awareness	Frequency	Percentage
Extremely aware	17	26.15
Aware	41	63.08
Partially aware	5	7.69
Not at all aware	2	3.08
Total	65	100

Source: Field Survey, May 2024.

The result shows that 17 respondents (26.15%) were extremely aware of the electronic resources available in the FUDMA Library, while 41 (63.08%) were aware. Five respondents (7.69%) were partially aware and two (3.08%) were not at all aware. None indicated that they were not interested in the resources.

Table 3: Extent of Utilization of Selected Electronic Information Resources

E-Resources	Highly utilized	Utilized	Rarely utilized	Not utilized	Undecided
E-books	15.38%	10.77%	64.62%	12.31%	0.00%
E-journals	7.69%	55.38%	32.31%	3.08%	1.54%
E-databases	36.92%	15.38%	32.31%	10.77%	4.62%
Institutional Repository	6.15%	15.38%	3.08%	72.31%	3.08%
JSTOR	7.69%	32.31%	33.85%	15.38%	10.77%
SCOPUS Database	15.38%	9.23%	36.92%	15.38%	15.38%

Source: Field Survey, May 2024.

The use of electronic resources differed from one resource to another. E-databases had the highest proportion of respondents reporting high utilization at 36.92%. E-journals had the highest proportion in the "utilized" category, at 55.38%.

E-books were rarely utilized by 64.62% of respondents, despite being the most recognised resource in the earlier table. The Institutional Repository had the lowest level of use among the resources shown, with 72.31% reporting that they did not use it. JSTOR and SCOPUS recorded moderate levels of use.

Table 4: Purpose of Using Electronic Information Resources

Purpose of Using E-Resources	Frequency	Percentage
To review literature	29	44.62
To gain information on specific topics	21	32.31
To complete assignments	10	15.38
For leisure reading	3	4.62
To supplement study notes	2	3.08
Total	65	100.00

Source: Field Survey, May 2024.

Reviewing literature was the main reason respondents used electronic information resources. Twenty-nine respondents (44.62%) selected this option. Obtaining information on specific topics followed with 21 respondents (32.31%). Ten respondents (15.38%) used EIRs to complete assignments, while three (4.62%) used them for leisure reading and two (3.08%) used them to supplement study notes. No respondent selected any other purpose.

Table 5: Challenges Encountered in Accessing and Utilizing Electronic Information Resources

Challenges	Frequency	Percentage
Access problems	5	7.69
Slow Internet speed	3	4.62
Inadequate networked computers	1	1.54
Frequent power cuts	6	9.23
High costs associated with Internet use	5	7.69
Literacy and search problems	11	16.92
Inadequate skills to formulate search strategies	13	20.00
Inadequate knowledge and skills to evaluate e-resources	10	15.38
Staff-related problems	1	1.54
Inadequate skills to use advanced search options	10	15.38
Total	65	100.00

Source: Field Survey, May 2024.

The most frequently reported problem was inadequate skills to formulate search strategies, reported by 13 respondents (20.00%). Literacy and search problems followed with 11 respondents (16.92%). Inadequate knowledge and skills to evaluate e-resources and inadequate skills to use advanced search options each accounted for 15.38%.

Frequent power cuts were reported by 9.23%, while access problems and high Internet costs were each reported by 7.69%. Slow Internet speed was reported by 4.62%. Inadequate networked

computers and staff-related problems each accounted for 1.54%. None of the respondents reported lack of off-campus access to subscribed e-resources.

Discussion of Major Findings

The study found a generally high level of awareness of electronic information resources among LIS undergraduates at Federal University Dutsin-Ma, with 89.23% of respondents indicating that they were aware or extremely aware of the available resources. However, awareness differed across individual resources. E-books were the most recognised resource (33.85%), followed by JSTOR (15.38%), AJOL and the Institutional Repository (9.23% each), while some resources such as TEEAL and Trip Medical Database were not identified by any respondent. The recognition of e-books is related to the study of Tella et al. (2018), which examined the perception and usage pattern of e-books among Library and Information Science students in selected universities in Nigeria.

Similarly, the study found that E-databases had the highest level of utilization, while the Institutional Repository was largely unused, with 72.31% of respondents indicating that they did not utilize it. This supports the position of Azonobi, Uwaifo and Tella (2020) that the use of electronic information resources may be influenced by factors beyond availability, including users' confidence, perceived usefulness and self-efficacy. The low use of some resources may therefore be associated with inadequate skills and limited knowledge of how to effectively use them.

The low utilization of some electronic resources can also be linked to the work of Gbaje and Kotso (2014), who found that Nigerian academic library websites did not always effectively provide information about library services and facilitate access to available resources.

The major challenges encountered by respondents were inadequate skills to formulate search strategies (20%), literacy and search problems (16.92%), and inadequate knowledge and skills to evaluate electronic resources (15.38%). This is consistent with Azonobi *et a*l. (2020), who identified self-efficacy as an important factor influencing the use of electronic information resources. The findings therefore suggest the need for practical training in search strategies, advanced searching and the evaluation of electronic information resources.

Therefore , the study shows that awareness alone does not guarantee effective utilization of electronic information resources. Effective use also depends on students' skills, confidence and the visibility and accessibility of available resources. The studies of Tella and his colleagues, as well as Gbaje and Kotso, therefore provide useful support for understanding the findings of the present study.

Conclusion

The study examined the awareness and utilization of electronic information resources among LIS undergraduates at Federal University Dutsin-Ma. The findings show that the students generally know about the electronic resources provided by the library.

The findings therefore point to the need for more practical instruction on the use of electronic resources. Greater attention is also needed for resources that students rarely use or do not recognise because the electronic information literacy and effective use of digital resources can strengthen LIS students' professional capacity and prepare them for information-based services and opportunities, including infopreneurial activities.

Recommendations

Based on the findings, the study recommends the following:

1. The Department of Library and Information Science and the University Library should organise regular orientation and practical sessions on electronic information resources.
2. Practical training should be given on search strategy formulation, advanced searching and evaluation of electronic information, since these were among the major difficulties reported by respondents.
3. The library should give more attention to resources with low utilization, including the Institutional Repository and specialised databases.
4. Information literacy should be given greater attention in the LIS curriculum, with students given opportunities to use electronic resources during coursework and research activities.

Reference

Adeleke, D. S., & Emeahara, E. N. (2016). Relationship between information literacy and use of electronic information resources by postgraduate students of the University of Ibadan. *Library Philosophy and Practice, 1381*. [http://digitalcommons.unl.edu/libphilprac/1381] (http://digitalcommons.unl.edu/libphilprac/1381)

Adeniran, P. (2013). Usage of electronic resources by undergraduates at the Redeemer's University, Nigeria. *International Journal of Library and Information Science*, 5(10), 319–324. https://doi.org/10.5897/IJLIS2013.0392

Akpojotor, L. O. (2016). Awareness and usage of electronic information resources among postgraduate students of Library and Information Science in Southern Nigeria. Library Philosophy and Practice, 1408. [http://digitalcommons.unl.edu/libphilprac/1408] (http://digital commons.unl.edu/libphilprac/1408)

Akuffo, M. N., & Budu, S. (2019). Use of electronic resources by students in a premier postgraduate theological university in Ghana. *South African Journal of Information Management,* 21(1), Article a1026. [https://doi.org/10.4102/sajim.v21i1.1026] (https://doi.org/10.4102/sajim.v21i1.1026)

Alhassan, J. A., & Macaulay, I. O. (2015). Utilization of electronic resources by faculty members of University of Ilorin, Nigeria. *Journal of Educational and Social Research*, 5(2), 217–223.

Ankrah, E., & Acheampong, E. K. (2017). Students' use of electronic resources in the University of Professional Studies, Accra, Ghana. *Journal of Information Science, Systems and Technology, 1(2), 11–26.*

Ansari, M. N., & Bushra, M. (2010). Use of electronic information resources among academic staff at the University of Karachi. Library Philosophy and Practice.

Aslam, S., Warraich, N. F., & Sheikh, A. (2019). Collaborative learning and the role of electronic resources: A study of Pakistani undergraduates. Library Management, 40(6/7), 352–364.

Azonobi, I. N., Uwaifo, S. O., & Tella, A. (2020). Determinants of postgraduates' use of electronic information resources in federal universities in Southern Nigeria. *The International*

Information & Library Review, 52(3), 202–215. [https://doi.org/10.1080/1057 2317.2020.1783629]

Edem, N. B., & Egbe, N. S. (2016). Availability and utilization of electronic resources by postgraduate students in a Nigerian university library: A case study of University of Calabar, Nigeria. Information and Knowledge Management, 6(2), 60–69.

Ezema, I., & Chizoba, K. C. (2018). Electronic library services and resources for law students in South East Nigerian university libraries. *African Journal of Library and Information Science, 28(2), 169–182.*

Felix U. M. (2018). Access and Utilization of Electronic Information Resources by Undergraduate Students in University Libraries in Gombe State, Nigeria [Unpublished thesis].

Gakibayo, A., Ikoja-Odongo, J. R., & Okello-Obura, C. (2013). Electronic information resources utilization by students in Mbarara University Library. *Library Philosophy and Practice*. http://digitalcommons.unl.edu/libphilprac/869

Gbaje, E. S., & Kotso, J. A. (2014). Assessing the contents of Nigeria academic library website. *Information and Knowledge Management, 4*(7).

Gilbert, K. (2015). Utilisation of electronic information resources by postgraduate students of Modibo Adamawa University of Technology, Yola. *IOSR Journal of Humanities and Social Science, 20*(8), 58–65.

Okello-Obura, C., & Magara, E. (2008). Electronic information access and utilization by Makerere University students in Uganda. *Evidence Based Library and Information Practice, 3*(3), 39–56. (https://doi.org/10.18438/B8ZS58)

Okiki, O. C., & Asiru, S. M. (2011). Use of electronic information sources by postgraduate students in Nigeria: Influencing factors. Library Philosophy and Practice.

Oyedapo, R. O., & Ojo, R. A. (2013). A survey of the use of electronic resources in Hezekiah Oluwasanmi Library, Obafemi Awolowo University, Ile-Ife, Nigeria. *Library Philosophy and Practice, 884*. (http://digitalcommons.unl.edu/libphilprac/884)

Salman, A., Sambo, A., Shehu, H. A., & Saka, K. A. (2018). Awareness, use and satisfaction of collections and services of college libraries in Federal University of Petroleum Resources, Effurun, Delta State. In First International Conference on ICT for National Development and Its Sustainability (pp. 516–527). University of Ilorin.

Tella, A., Oseni, O. D., Oguntayo, S. A., & Lawal, A. M. (2018). Perception and usage pattern of e-books among library and information science students in selected universities in Nigeria. *DESIDOC Journal of Library & Information Technology, 38*(2), 132–140.

Viswanatha, V., & Sasireka, I. (2016). Use of library electronic resources among selected art and science colleges in Tamil Nadu. *International Journal of Library Science and Research, 6(4), 17–22.*

Yakubu, H., & Olatoye, O. O. (2015). Use of electronic resources in teaching and learning at Federal University Dutsinma, Nigeria. *Mediterranean Journal of Social Sciences, 6(1), 584–592.*

Librarians' Perception and Readiness for Artificial Intelligence Based Digital Library Services

By

Dr. Sagiru Bala Musa
sagirub@yahoo.com, **sagirubala66@gmail.com**

College Library
Federal College of Education (Technical) Bichi
PMB 3473 Kano

Abstract

This study investigated librarians' perceptions and readiness for the adoption and implementation of Artificial Intelligence (AI)-based digital library services in academic libraries in Kano State, Nigeria. Specifically, the study examined librarians' perceptions of AI technologies for digital library services, assessed their readiness for AI adoption and implementation, and identified challenges associated with the adoption of AI-based digital library services. A descriptive survey research design was adopted. The population comprised 67 academic librarians from four federal higher institutions in Kano State. Total enumeration sampling was employed due to the small and manageable population. Data were collected using a structured questionnaire, with 67 copies administered and 65 duly completed and returned, representing a 97% response rate. Data were analyzed using frequency counts, percentages, mean, and standard deviation. The findings revealed that librarians had a positive perception of AI technologies for digital library services, with a grand mean of 3.45. Similarly, respondents demonstrated a positive level of readiness for the adoption and implementation of AI-based digital library services, with a grand mean of 3.28. The findings further showed that respondents acknowledged significant challenges to AI adoption in academic libraries, with a grand mean of 3.20. The study concludes that academic librarians in Kano State have a favourable perception of AI and are reasonably prepared for its adoption in digital library services. However, adequate infrastructure, continuous professional training, funding, and institutional support are necessary to facilitate effective and sustainable AI integration.

Keywords: Artificial Intelligence, digital library services, librarians' perception, librarians' readiness, academic libraries.

Introduction

The rapid advancement of Artificial Intelligence (AI) has transformed the global information landscape, reshaping the manner in which information is created, organized, retrieved, preserved, and disseminated. Libraries, particularly academic libraries, have increasingly embraced emerging technologies to improve service delivery, enhance user experiences, and optimize information management processes. Artificial Intelligence, which encompasses technologies such as machine learning, natural language processing, computer vision, expert systems, and generative AI, has emerged as one of the most significant innovations driving the digital transformation of libraries in the twenty-first century. AI-powered applications are now being integrated into digital library environments to facilitate intelligent information retrieval, automated cataloguing, metadata generation, personalized recommendation systems, virtual reference services, predictive analytics, and digital preservation (Cox, Pinfield, & Rutter, 2019; Asemi & Asemi, 2018).

The integration of AI technologies into digital library services offers numerous opportunities for improving operational efficiency, reducing repetitive manual tasks, enhancing decision-making, and providing personalized information services that meet the dynamic needs of users. Through AI-enabled tools such as intelligent chatbots, semantic search engines, automated indexing systems, recommendation algorithms, and research assistants, libraries can provide faster, more accurate, and user-centered services while enabling librarians to focus on higher-value professional responsibilities (Zhang, Zhao, & Lei, 2021).

The successful adoption of Artificial Intelligence (AI) in digital libraries depends not only on the availability of technological infrastructure but also on librarians' perception and readiness to embrace AI-driven innovations. Librarians' perception influences their acceptance, confidence, and attitudes toward AI technologies, while readiness encompasses the knowledge, skills, willingness, and institutional preparedness required for effective implementation. Studies have consistently shown that although librarians generally acknowledge the transformative potential of AI in improving library operations and digital service delivery, concerns regarding inadequate training, limited technological infrastructure, funding constraints, and ethical implications continue to influence their readiness for AI adoption (Ajani, Tella, Salawu, & Abdullahi, 2022; Orubebe, Braide, & Oladokun, 2025).

Research Problem

Preliminary observations by the researcher indicated that while librarians are increasingly aware of Artificial Intelligence technologies, their adoption for digital library services remains limited in many academic libraries due to inadequate skills, poor infrastructure, and insufficient institutional support. This informed the need to examine librarians' perception and readiness for AI-based digital library services.

Aim and Objectives of the Study

The aim and Objective of the study is to investigate librarians' perception and readiness for the artificial intelligence based digital library services. The specific objectives of the study were to:

1. Examine librarians' perceptions of Artificial Intelligence (AI) technologies for digital library services;
2. Assess librarians' readiness for the adoption and implementation of AI-based digital library services;
3. Ascertain challenges to AI adoption in academic libraries.

Research Questions

The study was guided by the following questions;

1. what are the librarians' perceptions of artificial intelligence (AI) technologies for digital library services?
2. what is the librarians' readiness for the adoption and implementation of AI- based digital library services?
3. What are the challenges to AI adoption in the academic libraries?

Review of Related Literature

Concept of Artificial Intelligence

Artificial Intelligence (AI) has emerged as one of the most transformative technologies of the Fourth Industrial Revolution, influencing virtually every sector of society, including education, healthcare, business, and information management. AI refers to the ability of computer systems to perform tasks that traditionally require human intelligence, such as learning, reasoning, problem-solving, language understanding, decision-making, and pattern recognition (Russell & Norvig, 2021). Unlike conventional computer systems that operate strictly on predefined instructions, AI systems are capable of learning from data, adapting to new information, and improving their performance over time through techniques such as machine learning, deep learning, natural language processing (NLP), computer vision, and neural networks. The concept of Artificial Intelligence was first introduced by John McCarthy in 1956 during the Dartmouth Summer Research Project on Artificial Intelligence. Since then, AI has evolved from a theoretical concept into a practical technology that drives innovation across numerous disciplines. Recent advances in computing power, cloud computing, big data analytics, and machine learning algorithms have accelerated AI development, making it an indispensable tool for improving organizational efficiency and service delivery (Dwivedi et al., 2023).

In the library and information science (LIS) profession, AI is increasingly viewed as a strategic technology capable of enhancing the efficiency and effectiveness of library operations. AI applications enable libraries to automate repetitive tasks, improve information retrieval, personalize user experiences, and support evidence-based decision-making. Technologies such as intelligent search engines, recommender systems, virtual reference assistants, automated metadata generation, and digital preservation systems are becoming integral components of modern digital libraries (Cox et al., 2019). The emergence of generative AI technologies, particularly large language models (LLMs) such as ChatGPT, Google Gemini, Claude, and Microsoft Copilot, has further transformed the information landscape. These systems can understand and generate human-like language, summarize scholarly articles, translate documents, answer reference questions, and support literature reviews. Consequently, many academic libraries are exploring the integration of generative AI into their digital services to improve user engagement, research support, and knowledge dissemination (Kasneci et al., 2023).

These technologies enable systems to learn from data, recognise patterns, respond to changing information, and improve their performance as they are exposed to additional data and experience (Russell & Norvig, 2021). However, despite the significant opportunities presented by AI, concerns remain regarding ethical issues, data privacy, copyright, algorithmic bias, misinformation, and the changing role of librarians. These concerns have stimulated scholarly

interest in understanding how librarians perceive AI technologies and whether they possess the knowledge and competencies required for successful implementation (Asemi & Asemi, 2018; Cox et al., 2019).

Artificial Intelligence-Based Digital Library Services

Artificial Intelligence (AI)-based digital library services refer to the integration of intelligent computer technologies into digital library systems to automate library operations, improve information retrieval, personalize user services, and enhance decision-making. Unlike conventional digital library services, which depend largely on predefined search algorithms and manual information organization, AI-powered digital library services employ technologies such as machine learning, natural language processing (NLP), computer vision, expert systems, recommender systems, and generative artificial intelligence to provide adaptive and user-centred information services (Cox, Pinfield, & Rutter, 2019).

The application of AI in digital libraries has significantly transformed the management and delivery of library services. AI technologies are increasingly used to automate cataloguing, metadata generation, document classification, indexing, plagiarism detection, digital preservation, reference services, and intelligent information retrieval. These technologies enable libraries to process large volumes of digital information more efficiently while improving the accuracy, speed, and relevance of information retrieval (Asemi & Asemi, 2018). One of the most visible AI applications in digital libraries is the use of intelligent virtual assistants and chatbots. These AI-powered systems provide twenty-four-hour reference services by answering users' questions, directing them to appropriate information resources, and assisting them in navigating digital library collections. Through natural language processing, chatbots can understand users' queries in conversational language and provide instant responses, thereby improving accessibility, responsiveness, and user satisfaction (Cox et al., 2019). Machine learning has also enhanced search and retrieval services within digital libraries. AI algorithms analyse users' search histories, preferences, and behavioural patterns to recommend relevant books, journal articles, institutional repository materials, and electronic databases. Such personalized recommendation systems improve users' information-seeking experiences and increase the utilization of library resources (Yuan, 2021).

Librarians' Perception of Artificial Intelligence-Based Digital Library Services

Perception refers to an individual's beliefs, attitudes, opinions, awareness, and interpretation of a particular phenomenon or innovation. Within the context of library and information science, librarians' perception of Artificial Intelligence (AI) reflects how library professionals understand AI technologies, evaluate their usefulness, perceive their ease of use, and assess their implications for library operations and service delivery. Perception plays a significant role in determining librarians' willingness to embrace AI-driven innovations and integrate them into digital library services (Davis, 1989).

The introduction of AI into libraries has generated considerable interest among librarians worldwide. Many librarians perceive AI as an emerging technology capable of transforming traditional library operations through intelligent automation, improved information retrieval, personalized user services, automated cataloguing, digital preservation, and virtual reference services. According to Cox, Pinfield, and Rutter (2019), librarians generally recognize AI as a strategic technology that has the potential to improve operational efficiency and enhance the quality of library services. They argue that AI can reduce repetitive manual tasks and enable

librarians to concentrate on higher-value professional activities such as research support, digital scholarship, and information literacy instruction.

Positive perceptions of AI among librarians are largely associated with the technology's ability to improve service delivery, increase productivity, and support evidence-based decision-making. AI-powered search engines, recommender systems, intelligent chatbots, and automated metadata generation have demonstrated significant potential for improving users' access to digital information resources while reducing processing time and operational costs. Consequently, librarians who perceive AI as beneficial are generally more willing to support its implementation within their institutions ((Obi, 2026).

Librarians' Readiness for Artificial Intelligence-Based Digital Library Services

Librarians' readiness refers to the extent to which library professionals possess the knowledge, skills, competencies, willingness, confidence, and institutional support necessary to adopt and effectively utilize Artificial Intelligence (AI) technologies in the delivery of digital library services. Readiness encompasses not only technical preparedness but also psychological acceptance, organizational capacity, and the availability of resources required for successful AI implementation. As libraries continue to embrace digital transformation, librarians' readiness has become a critical determinant of the successful integration of AI into library operations and services (Ajani, Tella, Salawu, & Abdullahi, 2022).

The growing application of AI in academic libraries has heightened the need for librarians to develop new competencies that extend beyond traditional librarianship. AI technologies such as machine learning, natural language processing, intelligent search systems, recommender systems, automated cataloguing, and generative AI require librarians to acquire advanced digital literacy, data management skills, and the ability to interact effectively with intelligent information systems. Consequently, librarians' readiness depends largely on continuous professional development, AI literacy, and institutional investment in staff capacity building (Chukwuemeka & Moses; 2023).

Research Methodology

The study adopted a descriptive survey research design, which was considered appropriate for examining librarians' perceptions and readiness for Artificial Intelligence (AI)-based digital library services. The design enabled the researcher to collect quantitative data from respondents without manipulating the study variables. The population of the study comprised of 67 academic librarians drawn from the four (4) federal higher institutions in Kano State, Nigeria. Total enumeration was used because the population size was small and manageable. A total number of 67 questionnaire were administered to the respondents out of which 65 (97%) were duly filled, returned and found useful. The data collected were analyzed using descriptive statistics, including frequency counts, percentages, mean, and standard deviation.

Results and Discussions

Objective 1: To examine librarians' perceptions of artificial intelligence (AI) technologies for digital library services

Table 1: Librarians' Perceptions of AI Technologies for Digital Library Services (N = 65)

S/N	Statement	SA f (%)	A f (%)	D f (%)	SD f (%)	Mean	SD	Decision
1	I am familiar with the concept of Artificial Intelligence (AI).	47 (72.3)	16 (24.6)	2 (3.1)	0 (0.0)	3.69	0.52	Agreed
2	AI has the potential to improve digital library services.	38 (58.5)	26 (40.0)	1 (1.5)	0 (0.0)	3.57	0.53	Agreed
3	AI can enhance information retrieval and search accuracy.	35 (53.8)	23 (35.4)	5 (7.7)	2 (3.1)	3.40	0.76	Agreed
4	AI can improve users' satisfaction with digital library services.	30 (46.2)	27 (41.5)	3 (4.6)	5 (7.7)	3.26	0.86	Agreed
5	AI can reduce repetitive routine library tasks.	31 (47.7)	28 (43.1)	2 (3.1)	4 (6.2)	3.32	0.81	Agreed
	Grand Mean					**3.45**		**Agreed**

Note: SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree. Criterion mean = 2.50.

Discussions: The findings indicate that librarians generally have a positive perception of Artificial Intelligence (AI) technologies for digital library services in academic libraries. All five statements recorded mean scores above the criterion mean of 2.50, with mean scores ranging from 3.26 to 3.69, indicating agreement among the respondents. The highest mean score was recorded for familiarity with the concept of AI (M = 3.69, SD = 0.52), followed by the perception that AI has the potential to improve digital library services (M = 3.57, SD = 0.53). Respondents also agreed that AI can enhance information retrieval and search accuracy (M = 3.40, SD = 0.76), reduce repetitive routine library tasks (M = 3.32, SD = 0.81), and improve users' satisfaction with digital library services (M = 3.26, SD = 0.86). The grand mean of 3.45 demonstrates an overall positive perception of AI technologies for digital library services among the academic librarians.

Objective 2: To assess librarians' readiness for the adoption and implementation of AI-based digital library services

Table 2: Librarians' Readiness for the Adoption and Implementation of AI-Based Digital Library Services (N = 65)

S/N	Statement	SA f (%)	A f (%)	D f (%)	SD f (%)	Mean	SD	Decision
1	I possess the ICT skills required to use AI technologies.	34 (52.3)	26 (40.0)	4 (6.2)	1 (1.5)	3.43	0.68	Agreed
2	I am willing to learn AI applications relevant to library services.	33 (50.8)	27 (41.5)	4 (6.2)	1 (1.5)	3.42	0.68	Agreed
3	I am ready to use AI tools in my daily library activities.	22 (33.8)	29 (44.6)	11 (16.9)	3 (4.6)	3.08	0.83	Agreed
4	I am confident in operating AI-based digital library systems.	29 (44.6)	20 (30.8)	14 (21.5)	2 (3.1)	3.17	0.88	Agreed
5	I am willing to participate in AI-related professional training.	35 (53.8)	18 (27.7)	9 (13.8)	3 (4.6)	3.31	0.88	Agreed
	Grand Mean					**3.28**		**Agreed**

Note: SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree. Criterion mean = 2.50.

Discussions: The findings indicate that librarians demonstrate a high level of readiness for the adoption and implementation of AI-based digital library services. All five statements recorded mean scores above the criterion mean of 2.50, with mean scores ranging from 3.08 to 3.43, indicating agreement among the respondents. The highest mean score was recorded for possession of the ICT skills required to use AI technologies (M = 3.43, SD = 0.68), closely followed by willingness to learn AI applications relevant to library services (M = 3.42, SD = 0.68). Respondents also agreed that they are willing to participate in AI-related professional training (M = 3.31, SD = 0.88) and are confident in operating AI-based digital library systems (M = 3.17, SD = 0.88). The lowest mean was recorded for readiness to use AI tools in daily library activities (M = 3.08, SD = 0.83), although this still exceeded the criterion mean. The grand mean of 3.28 indicates an overall positive level of readiness among the librarians.

Objective 3: To ascertain challenges to AI adoption in academic libraries

Table 3: Challenges to AI Adoption in Academic Libraries (N = 65)

S/N	Statement	SA f (%)	A f (%)	D f (%)	SD f (%)	Mean	SD	Decision
1	Lack of AI training is a major challenge.	24 (36.9)	29 (44.6)	7 (10.8)	5 (7.7)	3.11	0.89	Agreed
2	Inadequate funding hinders AI implementation.	32 (49.2)	24 (36.9)	7 (10.8)	2 (3.1)	3.32	0.79	Agreed
3	Poor ICT infrastructure limits AI adoption.	30 (46.2)	21 (32.3)	8 (12.3)	6 (9.2)	3.15	0.97	Agreed
4	Lack of institutional policies affects AI implementation.	26 (40.0)	26 (40.0)	10 (15.4)	3 (4.6)	3.15	0.85	Agreed
5	Resistance to technological change among librarians hinders AI adoption.	32 (49.2)	19 (29.2)	13 (20.0)	1 (1.5)	3.26	0.83	Agreed
	Grand Mean					**3.20**		**Agreed**

Note: SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree. Criterion mean = 2.50.

Discussions: The findings indicate that librarians agreed that the identified factors constitute challenges to the adoption of AI in academic libraries. All five items recorded mean scores above the criterion mean of 2.50, with mean scores ranging from 3.11 to 3.32. In particular, inadequate funding recorded the highest mean score (M = 3.32, SD = 0.79), followed by resistance to technological change among librarians (M = 3.26, SD = 0.83). The lowest mean was recorded for lack of AI training (M = 3.11, SD = 0.89). The overall grand mean of 3.20 indicates that respondents generally agreed that the identified factors constitute significant challenges to AI adoption in academic libraries.

Conclusion

The study concludes that librarians have a positive perception of Artificial Intelligence (AI) technologies for digital library services in academic libraries, as reflected by the overall grand mean of 3.45. The respondents generally agreed that they are familiar with AI and recognize its potential to improve digital library services, enhance information retrieval and search accuracy, improve users' satisfaction, and reduce repetitive routine library tasks. The study also concludes that librarians demonstrate a positive level of readiness for the adoption and implementation of AI-based digital library services, with an overall grand mean of 3.28. The findings indicate that librarians possess relevant ICT skills, are willing to learn AI applications, are prepared to use AI tools, have confidence in operating AI-based digital library systems, and are willing to participate in AI-related professional training. However, despite the positive perception and readiness of librarians, the study concludes that significant challenges may hinder the effective adoption of AI in academic libraries. The overall grand mean of 3.20 indicates agreement that inadequate funding,

resistance to technological change, poor ICT infrastructure, lack of institutional policies, and inadequate AI training constitute important challenges. Therefore, successful AI adoption requires not only positive perceptions and readiness among librarians but also adequate institutional support and resources.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. Academic library management should provide continuous AI-related training and professional development for librarians. Regular workshops, seminars, hands-on training, and capacity-building programmes should be organized to strengthen librarians' practical knowledge and confidence in using AI technologies for digital library services.
2. Library management and relevant institutional authorities should provide adequate funding and ICT infrastructure for AI adoption. Appropriate financial resources should be allocated for acquiring AI-enabled systems, improving internet connectivity and other ICT facilities, and providing the technical resources required for effective implementation.
3. Academic institutions should develop clear policies and provide adequate technical support for AI implementation in libraries. Such policies should guide the responsible use of AI, encourage librarians to embrace technological change, and establish mechanisms for continuous technical assistance. This will help reduce resistance to change and create a supportive environment for the sustainable adoption of AI-based digital library services.

References

Asemi, A., & Asemi, A. (2018). Artificial intelligence (AI) application in library systems in Iran: A taxonomy study. *Library Philosophy and Practice*, 1–17.

Chukwuemeka O. H. & Moses I. C. (2023). Preparedness For Artificial Intelligence for Optimal Service Delivery in University Libraries in Nigeria. *Global Review of Library and Information Science (GRELIS),* 19 . https://www.grelis.com.ng/admin/img/paper/18.%20OBIORA%20AND%20MOSES%20CONFERENCE%20PAPER%20UNN.pdf

Cox, A. M., Pinfield, S., & Rutter, S. (2019). The intelligent library: Thoughts on the application of artificial intelligence in libraries. *Library Hi Tech, 37*(3), 418–435. DOI: https://doi.org/10.1108/LHT-08-2018-0105

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. DOI: https://doi.org/10.2307/249008

Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., ... Wamba, S. F. (2023). So, what if ChatGPT wrote it? Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI. International *Journal of Information Management, 71*, 102642. DOI: https://doi.org/10.1016/j.ijinfomgt.2023.102642

Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., ... Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. https://www.sciencedirect.com/science/article/abs/pii/S1041608023000195

Obi, C. (2026). The Role of Artificial Intelligence in Enhancing Library Services: A Systematic Review. *International Journal of Librarianship, 11*(1), 33-46. https://doi.org/10.23974/ijol.2026.vol11.1.521

Russell, S. J., & Norvig, P. (2021). Artificial intelligence: A modern approach (4th ed.). Pearson. https://www.pearson.com/en-us/subject-catalog/p/artificial-intelligence-a-modern-approach/P200000003500/9780134610993

Repositioning Library and Information Science Graduates for the Fourth Industrial Revolution: Emerging Career Opportunities and Competency Requirements

By

Abdurrahman Jibril
Department of Library and Information Science,
Ahmadu Bello University,
Zaria, Nigeria.
jabdurrahman@abu.edu.ng **& jblibs2014@gmail.com**

and

Shafiu Sabitu
Department of Library and Information Science,
Ahmadu Bello University,
Zaria, Nigeria.
shafiu.sabitu@gmail.com

Abstract

The Fourth Industrial Revolution (4IR) marked by artificial intelligence, big data, machine learning, cloud computing, IoT, blockchain, and automation is fundamentally reshaping the Library and Information Science (LIS) profession. It is pushing practice beyond traditional library and archival functions into areas such as data management, digital curation, knowledge management, and information governance. To keep pace, LIS graduates must now develop a broad range of competencies spanning digital and ICT skills, AI literacy, and information organisation and retrieval. Equally important are digital scholarship, research support, cybersecurity, and information ethics, alongside strong communication, critical thinking, creativity, and entrepreneurial skills. These competencies are opening new career pathways in digital librarianship, data librarianship, information consultancy, knowledge management, and information analytics, extending well beyond conventional library roles. However, repositioning LIS graduates for this new labour market is not without obstacles. Persistent skills gaps, rapidly evolving technologies, weak digital infrastructure, limited funding, and outdated curricula continue to hinder progress. These difficulties are compounded by the high cost of AI adoption, ethical concerns, poor data quality, resistance to change, and an uneven digital divide. Overcoming them will require continuous curriculum renewal, industry-aligned training, sustained digital upskilling, and stronger collaboration between LIS schools, employers, and professional bodies. Ultimately, the paper argues that a genuine transformation not merely incremental adjustment is essential to keep LIS graduates competitive and relevant in the 4IR era.

Keywords: Fourth Industrial Revolution, Library and Information Science, LIS Graduates, Career Opportunities, Employability, Emerging Skills, Digital Transformation, Artificial Intelligence.

Introduction

The Library and Information related activities are ever evolving partly as a result of the effects of the Fourth Industrial Revolution thereby repositioning the library and information science graduates in terms of career opportunities and competency requirements. The revolution is characterised by the rapid integration and application of emerging technologies, including artificial intelligence (AI), big data analytics, machine learning, cloud computing, the Internet of Things (IoT), blockchain, robotics, automation, cybersecurity and advanced digital platforms, alongside increasing demand for contemporary professional, interpersonal, strategic and entrepreneurial competencies. The integration of these technology applications has transformed the processes through which information throughout its life cycle is created, organised, processed, stored, retrieved, disseminated and preserved.

According to Tella, Bamidele, Olaniyi, and Ajani (2023), the Fourth Industrial Revolution has introduced new expectations for Library and Information Science graduates in Nigeria, especially concerning digital and technological skills. Their research revealed a gap between the competencies held by LIS graduates and those demanded by employers in a workplace increasingly shaped by 4IR. As a result, they stress that LIS programs must regularly update their curricula to equip students with the skills needed to remain employable in technology-driven work environments. Among the competencies the authors highlight as growing in importance are digital literacy, information management, analytical thinking, innovation, communication, and various other technology-related abilities.

The information landscape now therefore today has grown markedly more digital, interconnected, data-driven, and technologically complex, pushing LIS practice well beyond the conventional confines of libraries, archives, and information centres. As a result, the field now extends into emerging domains such as data management, digital curation, knowledge management, information governance, digital preservation, research data management, and intelligent information services. Importantly, this evolution does not render traditional LIS competencies obsolete; rather, it opens up new settings in which those established skills can be applied in tandem with newer technological capabilities. As a consequence, LIS graduates must now cultivate a broader mix of technological, analytical, professional, and interpersonal competencies if they are to operate effectively amid increasingly complex and fast-evolving information, data, and knowledge environments.

Fourth Industrial Revolution and Its Implications for LIS Graduates

The 4IR refers to the on-going transformation of traditional manufacturing and industrial practices with the integration of digital technologies. The 4IR is the current and emerging environment where disruptive trends and technology are altering how people live and work. It is imperative to note that library and information professionals specialists respond to it since doing so will give them the chance to build capacity and implement the paradigm change in their service delivery. (**Okwoli**, 2023 & Ekeh, 2025). The fourth industrial revolution is associated with a number of advancements that seek to force networking, virtualization, and digitization in every aspect of life, including academic libraries. It has to deal with automation and data transfer in digitally based manufacturing technologies (Spotti and Windelband, 2020).

In order LIS graduates to handle complex situations, taking advantage of technologies such as artificial intelligence (AI), big data analytics, the Internet of Things (IoT), robotics, cloud computing, blockchain, virtual and augmented reality, advanced automation, and emerging

computational technologies, integrating these technologies is a must, thereby mandating the LIS graduates to be equip with necessary competencies required, so that carrier opportunities available will be harnessed. Emiri (2023) contends that the defining characteristics of 4IR are its unprecedented velocity, scope, depth, and systemic impact, with these technologies becoming increasingly interconnected and embedded within social and organisational processes.

The Fourth Industrial Revolution demands requires fluency in AI, data analytics, and automation tools alongside traditional information management skills, positioning them as data curators, digital literacy educators, and intermediaries between complex algorithmic systems and end users. It requires them to master emerging competencies coding, metadata for machine-readable and linked data, UX design, and management of digital repositories and -makerspaces while retaining core LIS values like ethical information access, privacy, and equity. Ultimately, 4IR pushes LIS graduates beyond custodianship of collections toward being adaptive knowledge professionals who can critically evaluate, teach, and apply rapidly evolving technologies in service of their communities.

Competency Requirements for LIS Graduates in 4IR Era

The Fourth Industrial Revolution (4IR) has substantially transformed the competencies required of Library and Information Science (LIS) graduates. With artificial intelligence, automation, cloud computing, big data, robotics, and digital platforms becoming integral to information work, the scope of LIS practice now extends far beyond traditional library functions. Consequently, today's LIS graduates need to bring together professional, technological, digital, analytical, interpersonal, managerial, and adaptive competencies to function effectively in the field. This is buttressed by Sibiya (2023), who argues that the 4IR has brought about a fundamental paradigm shift within LIS, generating demand for new knowledge, skills, and competencies, particularly in the realm of digital scholarship.

Digital Scholarship

Digital and ICT competency stands as one of the most fundamental requirements for LIS graduates in the 4IR era. LIS professionals are now expected to apply digital technologies effectively across the full information cycle acquisition, organisation, storage, retrieval, preservation and dissemination. This encompasses proficiency in digital libraries, electronic databases, institutional repositories, online information services, web technologies, cloud applications and digital communication platforms (Ayinde & Kirkwood, 2020).

Artificial Intelligence and Emerging Technology Competency

The increasing integration of AI and other intelligent technologies within library settings means that LIS graduates need to be able to understand and confidently engage with these emerging tools. This competency should include at least a foundational understanding of artificial intelligence, machine learning, automated information services, AI-assisted retrieval, intelligent recommendation systems, chatbots, and comparable applications. In his study of cataloguing education within the context of the 4IR, Monyela (2021) observed that traditional cataloguing curricula fell short in addressing programming, coding, software development, and AI-related applications in cataloguing work, and consequently called for curriculum reform to align with 4IR requirements. Similarly, research examining librarians' evolving roles in the 4IR era indicates that ongoing technological change is redefining library-related tasks, requiring professionals to develop not only new technical capabilities but also new modes of thinking.

Information Retrieval and Information Organisation Competency

Notwithstanding the extent of technological change, traditional LIS competencies remain no less essential. LIS graduates are still expected to organise, classify, index, describe, and retrieve information effectively; what has changed is the far more sophisticated digital context in which these skills must now be applied. Monyela (2021) points out that the exponential growth of internet and web-based resources has intensified the need for more advanced approaches to information organisation and resource discovery. Likewise, Tella et al. (2023), in their study of LIS graduate skills in Nigeria, situate information professionals within an environment shaped by rapid technological change and ever-growing information and data demands.Cybersecurity, Privacy and Information Ethics Competency

The growing digitisation of information also introduces challenges around privacy, cybersecurity, intellectual property, and ethical information practice. As such, LIS graduates need a solid grounding in information privacy, data protection, cybersecurity, copyright, intellectual property, ethical information use, digital rights, and the responsible application of emerging technologies. These competencies are increasingly indispensable, as LIS professionals are more and more responsible for handling users' personal data, electronic resources, institutional information, and digital collections.

Communication and Interpersonal Competency

Technological proficiency alone cannot sustain effective LIS practice. LIS professionals continue to engage directly with individuals, communities, researchers, students, organisations, and fellow professionals, and this human-centred dimension of the work remains just as vital as ever. In their study of LIS professional skills, Toker, Zumer, and colleagues identified four broad competency categories: information-service provision, information organisation, technological skills, and personal competencies, finding that employers continued to place significant value on personal competencies alongside professional and technical expertise (Livi & Salubi, 2024). Accordingly, LIS graduates require strong oral and written communication skills, active listening, teamwork and collaboration, sound interpersonal relations, presentation ability, user-centred service orientation, and effective stakeholder engagement.

Critical Thinking and Problem-Solving Competency

The 4IR landscape requires LIS professionals to navigate decision-making within conditions of technological complexity and constant informational change. Critical thinking, in this context, enables graduates to assess technologies, information sources, systems, and services before endorsing or adopting them. In their study of librarians' perceptions of the 4IR, Mohideen et al. (2022) emphasise the importance of cultivating strong thinking skills and an adaptable mindset to cope with ongoing technological developments and the transition toward smart libraries.

Creativity and Innovation Competency

LIS graduates are increasingly expected to design innovative information services rather than merely maintain existing systems. Creativity, in this respect, allows them to develop new approaches to information delivery, digital content creation, user engagement, and service design. This is well captured in the LISI4C framework put forward by Livi and Salubi (2024), which integrates technical proficiencies, soft skills, adaptability, stakeholder collaboration, experiential learning, and predictive skills into the design of LIS education geared toward Industry 4.0.

Entrepreneurship and Consultancy Competency

The Fourth Industrial Revolution (4IR) has considerably broadened employment prospects for LIS graduates beyond the traditional library setting. As technological change accelerates and information assumes greater strategic value for organisations, new opportunities have opened up for LIS professionals in fields such as information consultancy, knowledge management, digital publishing, content development, data services, information brokerage, and other emerging information-related roles (Ayinde & Kirkwood, 2020; Igbinovia, Odelami, & Malgwi, 2025). This shifting nature of information work correspondingly requires LIS graduates to build entrepreneurial competencies alongside their existing professional and technological skill sets. These competencies include the ability to identify opportunities, provide information consultancy, develop business ventures, engage in digital marketing, design information products and services, undertake freelance work, manage projects, and maintain client relationships.

Emerging Career Opportunities for LIS Graduates in the 4IR Era

The Fourth Industrial Revolution is quietly rewriting what it means to have a career in Library and Information Science. Gone are the days when a LIS degree pointed almost exclusively toward a job behind a library desk. With artificial intelligence, big data, cloud computing, digital platforms and automation now woven into how information is created and managed, graduates are finding doors open into digital librarianship, data librarianship, research data management, digital scholarship, knowledge management, information analytics, digital curation, information architecture and digital preservation. Sibiya and Ngulube (2023) capture this shift well their research shows employers now expect LIS graduates to be comfortable with digital scholarship, open access, research data management and the workings of digital publishing, which really just confirms that a whole new set of roles is forming around research support and digitally-mediated information work.

The employment opportunities available to LIS graduates now extend well beyond conventionally "technical" roles. Increasingly, graduates are entering fields such as information consultancy, knowledge management, digital content creation, scholarly communication, competitive intelligence, information governance, digital publishing, and information entrepreneurship. This diversification reflects a broader organisational need for professionals capable of organising, analysing, curating, and preserving information in ways that support effective decision-making.

This trend is corroborated by recent study by Gautam (2025) that identified information technology proficiency, digitisation, internet search skills, and competence in database and content management systems as among the cross-sector competencies that are reshaping the LIS profession in the twenty-first century, alongside interpersonal skills such as time management, negotiation, and conflict resolution, which are broadly applicable across professional contexts. However, the study also cautions that many LIS graduates remain insufficiently competitive within the information industry, largely because curricula have not kept pace with these evolving demands.

Thus, the misalignment between LIS training and industry requirements helps explain why diversification into consultancy, knowledge management, and information entrepreneurship has become increasingly necessary rather than optional. Such alternative career pathways are emerging as essential routes into an information economy whose demands continue to outstrip the pace of curricular reform.

Challenges to Repositioning LIS Graduates in 4IR

Repositioning LIS graduates for the emerging roles created by the Fourth Industrial Revolution is no straightforward task it runs up against a web of interconnected challenges: persistent skills gaps, technologies that keep shifting under everyone's feet, weak digital infrastructure, tight funding, rigid curricula, unresolved questions of professional identity, and stiff competition from graduates of more overtly technology-oriented disciplines. The IFLA Trend Report (2024/2025) captures this well, observing that information and knowledge practices are changing rapidly, while the skills required of information professionals are becoming increasingly complex, particularly around artificial intelligence, data, digital technologies, and information literacy. IFLA goes further, noting that LIS education itself needs to respond to these emerging competencies AI, data science, and entirely new specialisations which points to a real mismatch between how LIS graduates are traditionally trained and what today's labour market actually expects.

Igbinovia et, al (2025) stressed that the adoption of AI compounds these difficulties. Inadequate technical skills, the high cost of new technology, limited institutional capacity, ethical concerns, poor data quality, and plain resistance to organisational change all stand in the way. And because digital technologies aren't distributed evenly, the digital divide only widens further, leaving graduates in resource-constrained environments with fewer chances to build the practical competencies they need. Thus, repositioning LIS graduates isn't something that happens through a single fix it demands continuous curriculum renewal, industry-oriented practical training, sustained digital and AI upskilling, genuine interdisciplinary collaboration, entrepreneurship development, adequate technological infrastructure, and much closer engagement between LIS schools, employers, and professional bodies.

Recommendations for Repositioning LIS graduates in 4IR

The challenges facing LIS graduates in the 4IR era make one thing pretty clear: LIS education, training and professional practice all need a serious rethink not a tweak here and there, but a genuine repositioning. LIS schools have to get into the habit of regularly revisiting their curricula, weaving in artificial intelligence, data analytics, cloud computing, digital curation, cybersecurity, digital scholarship and information governance, without losing sight of the traditional LIS competencies that still hold real value. Livi and Salubi (2024) drive this point home, having found a genuine mismatch between the skills Nigerian LIS graduates actually walk away with and what 4IR employers are actually looking for which really just confirms how much closer LIS schools and employers need to be working together.

LIS institutions need to invest more in continuous professional development, hands-on and experiential learning, industry partnerships, interdisciplinary training, and education around entrepreneurship and emerging technologies. Governments and institutional authorities have their part to play too providing the ICT infrastructure, funding and qualified instructors that make any of this possible in the first place. Get these pieces in place, and LIS graduates stand a much better chance of moving beyond the traditional library job into areas like data management, AI-enabled information services, digital scholarship, knowledge management, digital preservation, information consultancy and digital content development which, in the end, is what actually keeps them employable and professionally relevant in the 4IR era.

Conclusion

The Fourth Industrial Revolution (4IR) has significantly transformed the roles and competency requirements of LIS professionals. The profession has expanded beyond traditional information organisation, preservation and retrieval to embrace digital and AI-enabled practices. LIS graduates now require competencies in digital technologies, artificial intelligence, data management and information analytics. They also need critical thinking, creativity, innovation, entrepreneurship and lifelong learning skills. However, skills gaps, outdated curricula and inadequate ICT infrastructure continue to limit their effective repositioning. Limited practical exposure and unequal access to digital technologies further constrain graduate employability. Addressing these challenges requires curriculum reform and stronger collaboration between LIS institutions and employers.

Greater investment in ICT infrastructure, experiential learning and continuous professional development is also essential. These measures can prepare graduates for emerging careers in data management, AI, digital scholarship and knowledge management.mUltimately, repositioning LIS graduates is essential for sustaining their relevance, employability and competitiveness in the digital knowledge society.

References

Ayinde, L., & Kirkwood, H. (2020). Rethinking the roles and skills of information professionals in the 4th Industrial Revolution. *Business Information Review, 37*(4), 142–**153.** https://doi.org/10.1177/0266382120968057

Ekeh, E.M. (2025) Fourth Industrial Revolution and the Future of Nigeria Academic Fourth Industrial Revolution and the Future of Nigeria Academic Libraries in the 21st century: Review of Literature Libraries in the 21st century: Review of Literature. Retrieved via https://digitalcommons.unl.edu/libphilprac/8267

Emiri, O. T., (2023). Adoption and Utilisation of Artificial Intelligence by Librarians in University Libraries in Southern Nigeria" (2023). Library Philosophy and Practice (e-**journal) . 7570.** https://digitalcommons.unl.edu/libphilprac/7570

Gautam, A. S. (2025). Building Skills for a Developing World in 21st-Century Library and Information Science (LIS) Education. *International Journal of Advanced Multidisciplinary Research and Educational Development, 1*(4), Retrived via https://doi.org/10.5281/zenodo.17611156

IFLA. (2022). IFLA Statement on Libraries and Artificial Intelligence. International Federation of Library Associations and Institutions.

Igbinovia, M. O., Odelami, J. B., & Malgwi, P. G. (2025). Library staffing in the 4th Industrial Revolution: Skill-gap analysis of library professionals. *Ghana Library Journal, 30*(1), 39–49. Retrieved via **https://doi.org/10.4314/glj.v30i1.6**

Livi, Y., & Salubi, O. G. (2024). Navigating Industry 4.0: Crafting a Responsive Curriculum for Library and Information Science.

Mohideen et al. (2022). Fourth Industrial Revolution (4IR): Librarians' perceptions encompass the art of thinking skill. Library Management, 43(8–9), 521–535.

Monyela, M. (2021). Cataloguing Education in the Era of 4IR: The Way Forward.

Okwoli, M. E., Ojo, G. A., Whong, F. M., & Ofodu, P. N. (2023). *Provision of library and information service delivery on university libraries in the Fourth Industrial Revolution (4IR) technologies in Nigeria*

Sibiya, P. T. (2023). Knowledge, Skills and Competencies of the Library Information Science School's Graduates on Digital Scholarship in South Africa. Internet Reference Services Quarterly, 27(2), 83–101.

Spotti, G & Windelband, L. (2020). The 4th Industrial revolution: Its impact on vocational skills. Journal of Education and work, 34 (1), 29 – 52.

Tella, A., Bamidele, S. S., Olaniyi, O. T., & Ajani, Y. A. (2023). 21 Library and Information Science Graduate Skills Needed in the Fourth Industrial Revolution: A Nigerian Perspective.

World Economic Forum (2017) Realizing human potential in the FIR: An agenda for leaders to shape the future of education. Gender and work, White paper, General World Economic Forum. Retrieved from **http://reports.weforum.org/globalrisk-2017**.

From Catalogue to Capital: A Statistical Assessment of Entrepreneurial Opportunities for Library and Information Science Professionals in the Digital Economy

Dr F. J Abduldayan
University Librarian, Nigeria Maritime University, Okerenkoko, Warri, Delta, State.
Fatimah.abduldayan@nmu.edu.ng
https://orcid.org/0000-0001-6588-0860

Kolade Akinpelu Ayobami
Department of Port Management, Nigeria Maritime University, Okerenkoko, Warri, Delta State. **Akinpelu.kolade@nmu.edu.ng**
https://orcid.org/0009-0006-2488-5036

Adebayo Israel Kayode
Department of Port Management, Nigeria Maritime University, Okerenkoko, Warri, Delta State.
Adebayoisrael123@gmail.com
https://orcid.org/0009-0000-2329-1830

Dr. Haruna. A. Abduldayan
College Librarian, Kwara State College of Education, Oro, Kwara State. **Meeday25@gmail.com**
ORCID: http:// orcid.org/0009-0006-2385-3796
Corresponding Author: **Fatimah.abduldayan@nmu.edu.ng**

Abstract

With the advent of the digital economy, information became a key economic asset, creating new business opportunities for the Library and Information Science (LIS) workforce. Traditionally, LIS practitioners were engaged in cataloguing, preservation, and information management within institutions; however, these roles were expanded and monetised through digital publishing, information consultancy, content management, online training, data services, and knowledge brokerage. Although infopreneurship is emerging, empirical research on entrepreneurial readiness and influencing factors among LIS professionals remained limited. This study examined the relationship between entrepreneurial intention and digital competence among LIS professionals in the digital economy. A quantitative cross-sectional survey design was adopted. Data were collected from library staff of selected federal universities in the South-South region of Nigeria using a structured questionnaire. Total enumeration was used. The instrument measured entrepreneurial intention, digital competence, financial constraints, mentorship support, and involvement in digital economic activities using Likert scales. Data were analysed using simple linear regression at 0.05 significance level. Validity and reliability were established through expert review, pilot testing, Cronbach's alpha, and exploratory factor analysis. Findings showed high entrepreneurial intention and moderate-to-high digital competence among respondents. Regression results indicated a significant positive relationship between entrepreneurial intention and digital competence. Financial constraints and lack of mentorship were identified as key barriers. The study concluded that LIS professionals have strong potential for digital entrepreneurship beyond traditional roles. It recommended integrating digital entrepreneurship training into LIS curricula, strengthening mentorship structures, and improving access to funding to enhance participation and professional relevance in the digital economy.

Keywords: Digital Competence, Digital Economy, Entrepreneurial Intention, Infopreneurship, Library and Information Science

Introduction

The digital economy has experienced rapid expansion and has significantly changed the ways in which information is created, shared, and monetised across sectors. Digital platforms, data-driven services, and knowledge-based enterprises are key drivers of economic growth and innovation (World Bank, 2021; Organisation for Economic Co-operation and Development, 2020). Information is increasingly regarded as an economic asset; however, rather than being only an institutional resource managed and controlled within organisations, it is now utilised to generate tangible economic returns (Gillwald et al., 2018). This revolution has far-reaching consequences for Library and Information Science (LIS) professionals, whose traditional roles have centred on cataloguing, preservation, and management of institutional information. In an era of increasing digitisation of knowledge systems and market orientation, LIS professionals have opportunities that extend beyond custodial functions to entrepreneurial engagement within the digital economy (IFLA, 2022; Kumar & Sharma, 2023). The competencies acquired through LIS training, including information organisation, metadata design, digital curation, information management, user-centred information services, and knowledge brokerage, are transferable to entrepreneurial activities such as digital publishing, information consultancy, data management, and online training (Mohammed et al., 2022).In many developing economies, unemployment and underemployment among graduates continue to pose significant challenges, making entrepreneurship in the digital information sector a promising pathway for professional sustainability and economic empowerment (Ivwurie & Ocholla, 2016). Despite growing recognition of entrepreneurial opportunities for LIS professionals, existing studies have focused largely on conceptual discussions and potential roles rather than empirical assessment of actual engagement and constraints (Akpena & Duosakeh, 2020; Friday & Sawyer-George, 2023). Consequently, there is limited understanding of whether LIS professionals possess entrepreneurial intentions that can facilitate participation in digital markets, whether such intentions are reflected in their digital competence, and whether structural factors such as finance and mentorship influence entrepreneurial involvement (Kazungu, 2021). Without empirical evidence, discussions surrounding LIS entrepreneurship may remain aspirational rather than evidence-based, thereby limiting effective policy formulation, curriculum transformation, and professional development initiatives (Ikenwe, 2021). The transformation from catalogue to capital therefore requires systematic investigation to determine whether it represents an emerging professional reality or merely a theoretical proposition. To address this gap, this study provides a quantitative assessment of entrepreneurial opportunities for LIS professionals within the digital economy. Specifically, it examines entrepreneurial intention, analyses its relationship with digital competence, and investigates whether finance and mentorship constitute major barriers to entrepreneurial involvement. The study contributed empirical evidence to ongoing debates on professional relevance, economic adaptation, and participation in the knowledge economy within the LIS field.

Literature Review

Entrepreneurship Concept.

Entrepreneurship is becoming more and more conceptualised as a process of value production by identifying and taking advantage of the opportunities in the circumstances of uncertainty. However, modern literature has extended the definition of entrepreneur and started to focus on entrepreneurial behaviour as enterprising human action that generates value in an economy via innovation, whether of a product, process or market (Organisation for Economic Co-operation and Development, 2020). The OECD-Eurostat Entrepreneurship Indicators Programme defines entrepreneurial activity as the quantifiable value-creating behaviour which allows statistically

comparing sectors and economies. The orientation of behaviour is particularly relevant in digitally mediated markets where entrepreneurship is increasingly defined by platform-based services, knowledge-based microenterprises, and the growing use of **intellectual property (IP)** by traditional firms. (UNCTAD, 2021; Lungu et al., 2024). For the purpose of this project, entrepreneurship is an economic activity that relies on opportunity identification, innovation and mobilisation of strategic resources, with sustainability and exposure to risk being determined by the situation of the ecosystem, financial resources available and the management of its operations (Leboea, 2017; Naude & Chiweshe, 2017; Small Enterprise Development Agency, 2016; Bureau for Economic Research, 2016).

Entrepreneurial Intention

Entrepreneurial intention simply means a conscious and deliberate intention by an individual to start a new venture in the future. It includes motivational and cognitive antecedents of entrepreneurial behaviour that is an expression of commitment to exploiting opportunities. Studies have always demonstrated that intention is generally a precursor of entrepreneurship action, and intention is one of the best predictors of entrepreneurship creation (Ajzen, 1991). The entrepreneurial intention is related to perceived feasibility, perceived outcomes, self-efficacy, risk orientation and support structures. In a digital economy where entry barriers are less important and professional autonomy has been facilitated by technology, entrepreneurial intention is proving to be a more prominent factor in the decision of individuals to capitalise on the digital infrastructures as economic participants (Mohammed et al., 2022; Kazungu, 2021; Kehinde, 2021; Lose and Khuzwayo, 2022). For Library Information Science (LIS) practitioners, entrepreneurial intention refers to a desire to monetise the knowledge they have in the domain of LIS and support research, organisation of information and curation of digital content by transforming it into an income-generating service in the knowledge-based markets.

LIS Opportunities in Business.

With the development of the digital economy, LIS has significantly given rise to entrepreneurial opportunities. The skills and knowledge acquired during LIS training are highly transferable to knowledge-intensive enterprises (Wema, 2021; Ogbonyomi, 2024; Kumar and Sharma, 2023). Digital archiving services, information consulting, research data management, academic editing and publishing support, Digital content production, online training services, automation enabled services, and Platform mediated information broking are the opportunities that are emerging (Mohammed et al., 2022; El-Kalash et al., 2016; Technopedia, 2021; Skrba, 2020; Andrew, 2020). Spatial and financial constraints have been brought down even more by the new remote working systems and the international online market spaces, which enable practitioners to operate outside of the communal organisation (Gillwald et al., 2018; Independent Communications Authority of South Africa, 2018). As a result, LIS practitioners can become infopreneurs and use intellectual and digital capital to create economic value instead of physical infrastructure to do so (Ivwurie and Ocholla, 2016; Aregbesola et al., 2019). These changes put LIS skills in the context of the wider shift of knowledge to market-based assets.

Entrepreneurship issues in Library and Information Science

The digital transformation offers new opportunities for entrepreneurs, but also has structural implications, which can affect the viability and sustainability of entrepreneurships. One of the major challenges remains financial capital particularly in the case of knowledge-based microenterprises, which lack formal funding opportunities and traditional collateral (Leboea, 2017; Small Enterprise Development Agency, 2016; Bureau for Economic Research, 2016).

Absence of mentorship and lack of good professional networks also hinder an entrepreneur from growing as it reduces his exposure to strategic advice and experience as well as the opportunity recognition structures (Ramugondo, 2021; Amakiri & Marie, 2019; Chux-Nyehe & Nwinyokugi, 2020). The study of entrepreneurial ecosystems has highlighted the fact that early-stage businesses can draw a lot of advantages out of relational resources that support them in terms of information, emotions, and instruments (Naude& Chiweshe, 2017). In the transfer of LIS professionals into independent enterprise, a lack of financial access and mentorship infrastructure can be seen to have a very powerful impact on the entrepreneurial success of these individuals. The entrepreneurial involvement thus cannot be analysed only through the lens of the entrepreneur's motivation, but also through the structural and relational determinants.

Library and Information Science Ideas and Professionals.

LIS is an interdisciplinary field that is related to the systematic organisation, management, preservation, retrieval and distribution of information in the physical and digital environment. The profession has long been associated with the custodial and service roles, but the technology change and digital transformation (International Federation of Library Associations and Institutions, 2022; Kumar and Sharma, 2023) have been changing the profession. Modern LIS professionals, such as librarians, information specialists, archivists, data managers, and digital curators, operate in a complex system of information where they need to have the skills to manage digital resources, data governance, organisation of knowledge, and design systems for information (Iheanacho, 2018; Udofot, 2021). The evolution widens the scope of the profession, and is not limited to the provision of services in the institutions anymore, but rather reflects the new possibilities of entrepreneurship based on knowledge.

Digital Economy and Competency

The digital economy is defined as an economy in which economic activity is enabled by digital technologies, internet infrastructures, data analytics and information and communication technologies (ICTs) (OECD, 2020; UNCTAD, 2021). It is manifested through the centrality of information as an economic resource, an increasing trend towards platform-based business models, and a growing virtualisation of production and service delivery systems (World Bank, 2021; Lungu et al., 2024). Labour market shifts and barriers to entering into micro-entrepreneurship have changed as a result of digital transformation, enabling individuals to create businesses around their skills using digitally mediated systems (ILO, 2023; Statistics South Africa, 2019, 2020).

Digital competence is a combination of knowledge, skills, attitudes and behaviours which enable an effective, critical and responsible engagement with digital technologies (Iheanacho, 2018; Nweze, 2018). Digital competence makes people more flexible, efficient and creative in their work (Mole, 2019). Empirical evidence has also been found to be associated with the increase of the professional visibility, the development of networks and other dimensions of social capital of the entrepreneurs, which are highly relevant in the process of entrepreneurial success in digitally mediated markets (Lungu et al., 2024; Amakiri and Marie, 2019). Digital competence is a skill in LIS that helps the transfer of competences into an economically sustainable, long-term use of expertise.

Theoretical Review

This study is primarily anchored on the Theory of Planned Behaviour (TPB) developed by Ajzen (1991), which posits that behavioural intention serves as the most immediate predictor of an individual's behaviour. The theory identifies three key determinants of intention: attitude towards the behaviour, subjective norms, and perceived behavioural control (PBC). In the context of

entrepreneurship, TPB suggests that individuals are more likely to engage in entrepreneurial activities when they perceive entrepreneurship as desirable, socially acceptable, and achievable. Accordingly, entrepreneurial intention among Library and Information Science (LIS) professionals can be viewed as a product of cognitive evaluation and perceived capability, which subsequently influences their participation in the digital economy and the development of related competencies (Kazungu, 2021; Kehinde, 2021; Lose & Khuzwayo, 2022).

Theoretical Framework

Human Capital Theory

Human Capital Theory supports the view that education, skills, and professional qualifications constitute productive resources that positively influence economic outcomes (Mole, 2019). The theory posits that investments in knowledge and competencies enhance individuals' productivity and capacity to generate economic value. From this perspective, the digital competence of Library and Information Science (LIS) professionals can be viewed as a form of human capital that strengthens their entrepreneurial potential (Nweze, 2018; Iheanacho, 2018). The strategic application of these competencies is essential for facilitating the transition from traditional institutional functions to capital-generating digital enterprises (Kumar & Sharma, 2023; Ogbonyomi, 2024).

Social Capital Theory

Social Capital Theory provides an explanatory foundation for understanding the role of mentorship and access to financial resources in entrepreneurial engagement. The theory argues that social capital, embedded in networks and relationships, facilitates access to information, resources, and strategic support necessary for venture creation and growth (Ramugondo, 2021; Amakiri & Marie, 2019). Through social networks and mentoring relationships, individuals can acquire knowledge, opportunities, and support that enhance entrepreneurial viability. Conversely, limited access to financial and relational resources may constrain entrepreneurial outcomes (Leboea, 2017; Small Enterprise Development Agency, 2016). Accordingly, mentorship and financial support are considered important factors that can influence the entrepreneurial participation of LIS professionals in the digital economy.

Conceptual Framework

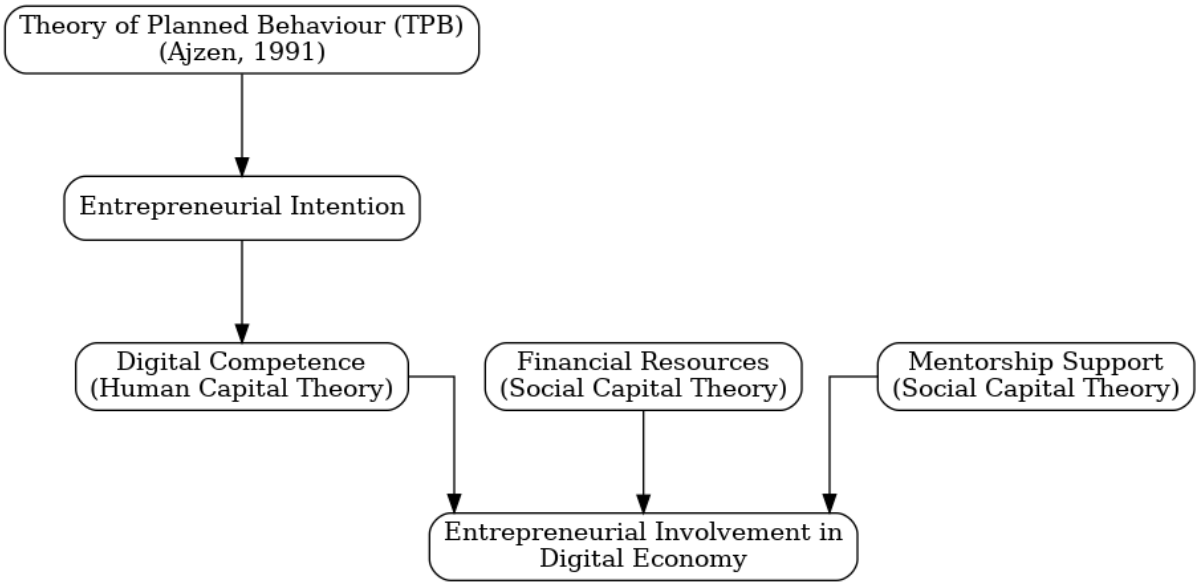


Figure 1: Authors' Conceptualisation., 2026

Empirical Review

Empirical studies on entrepreneurship in Library and Information Science (LIS) profession have been gaining more interest in the context of facing digital transformation and limited job opportunities in traditional Library settings (Ivwurie & Ocholla, 2016; Dewah & Mutula, 2016). Most of this work, however, is descriptive survey work with a focus on level of awareness, participation and perceived barriers.

Friday and Sawyer-George (2023) conducted a study on infopreneurship practices among Librarians in the Public University Libraries in South-South Nigeria with a survey design. The results they obtained showed that, although they are becoming aware of alternative employment opportunities, their level of entrepreneurial involvement is not high and is rated as low to moderate. The key constraints identified were limited institutional support, lack of entrepreneurial competencies and lack of funding. The results corroborate other studies that indicate that financial and ecosystem constraints are powerful influences on entrepreneurial involvement in developing settings (Leboea, 2017; Bureau for Economic Research, 2016).

Likewise, Akpena and Duosakeh (2020) in their work on the involvement of librarians in Bauchi State, found that the involvement of librarians in the infopreneurial activities is low, which is attributed to lack of digital skills, economic constraints and poor entrepreneurial orientation. Other related studies also center on the necessity of digital competence and institutional readiness in enhancing entrepreneurial involvement of LIS professionals (Nweze, 2018; Iheanacho, 2018; Usuka et al., 2019).

Within a technology-driven environment, Mohammed et al. (2022) investigated the new avenues of entrepreneurship in the LIS domain in terms of opportunity identification. They identified opportunities in areas of digital publishing, consultancy services, information broking, and services in the knowledge area more broadly. Nevertheless, the study highlighted the ongoing

problems such as financial constraints and the lack of technological infrastructure. Studies have been carried out in other African contexts, and they have all concluded similar findings, that infrastructure and ecosystem constraints limit the commercialisation of information services (Aregbesola et al., 2019; El-Kalash et al., 2016).

Similarly, Okolo and Oghenetega (2021) conducted a study on entrepreneurial skills and opportunities of Nigerian librarians and noted that though the awareness of entrepreneurial opportunities among Nigerian librarians was relatively high, the skills of managing a business and access to start-up capital was not adequate enough. This suggests a disparity between spotting entrepreneurial opportunities and having the muscle to take advantage of them. Research on LIS and LIS graduates' schools throughout Africa has also revealed the entrepreneurial intention-actual implementation gap (Kazungu, 2021; Kehinde, 2021; Lose & Khuzwayo, 2022).

The overall regional context, Ramugondo (2021) conducted a review of the literature to determine the overall empirical and conceptual studies to evaluate infopreneurship as an employment option for LIS graduates in South Africa. Digital content services, consultancy, and information broking emerged as potential areas of engagement from the review, and there was also a focus on the development of entrepreneurial mindset and curriculum reform as well as mentorship support. While the study was literature-driven, it endorsed the emerging understanding of entrepreneurship as a promising career option in the LIS profession that are increasingly becoming digitally inclined economies (OECD, 2020; World Bank, 2021).

Methodology

The study used a quantitative cross-sectional survey design to explore the opportunities for the LIS professionals working in the digital economy as entrepreneurs. The design allowed an evaluation of associations between entrepreneurial intention, digital competence, participation in the digital economy and perceived challenges in the structures at a single time. The population consisted of 255 library workers from six federal universities in the South -South region of Nigeria namely, Federal University of Petroleum Resources, Effurun (FUPRE 13), Nigeria Maritime University, NMU 18, Federal University Otuoke, (FUOTU) 24, University of Uyo (UNIYO) 19, University of Benin (UNIBEN) 141 and University of Port Harcourt, UNIPORT (40). UNICAL was recognised but was not included because the central library was vandalized and not working. A structured questionnaire consisting of 30 items on a Likert scale was used to gather data, which also included demographic items. The validity was proven by the expert's review. Cronbach's alpha was used to test the level of reliability with 0.70 and above was considered as reliable. The constructor validity test was conducted using Exploratory Factor Analysis, the KMO value was 0.60 or higher, and the Bartlett's value was accepted. Data were analysed descriptively and simple regression at 0.05 level of significance.

Result and Discussion

In this section descriptive statistics and simple linear regression were used to present the findings of the study on the entrepreneurial opportunities for Library and Information Science professionals in the digital economy. Descriptive statistics were used to show the level of entrepreneurial intention, digital competence, digital economy participation, finance constraints, and mentorship constraints among LIS professionals while simple linear regression was used to test the relationship between the independent and dependent variables at 0.05 level of significance.

Distribution of the Study Population

The study covered library employees from six federal universities in the South-South geopolitical region of Nigeria. The total accessible population was 255 respondents. Since the population was manageable, total enumeration was adopted.

Table 1: Distribution of Library Employees by University

S/N	University	Number of Library Employees	Percentage
1	Federal University of Petroleum Resources, Effurun	13	5.1
2	Nigeria Maritime University	18	7.1
3	Federal University Otuoke	24	9.4
4	University of Uyo	19	7.5
5	University of Benin	141	55.3
6	University of Port Harcourt	40	15.7
	Total	**255**	**100 %**

Source: Authors' Computation, 2026

The distribution of library staff across selected Federal Universities in South-South region of Nigeria is shown in Table 1. University of Benin had the highest number of library employees with 141 respondents accounting for 55.3 per cent of the total population. The University of Port Harcourt and Federal University Otuoke tied with 40 respondents (15.7%) and 24 respondents (9.4%) respectively. University of Uyo had 19 (7.5%) respondents, Nigeria Maritime University had 18 (7.1%) respondents. The lowest number of respondents (5.1%) were from Federal University of Petroleum Resources, Effurun. The distribution is based on the actual population size of library staff of the selected universities for the study.

Table 2: Reliability and Construct Validity Results

Variable	Number of Items	Cronbach's Alpha	Decision
Entrepreneurial Intention	6	0.881	Reliable
Digital Economy Participation	6	0.864	Reliable
Digital Competence	10	0.902	Reliable
Finance Constraints	4	0.846	Reliable
Mentorship Constraints	4	0.833	Reliable
Overall Instrument	**30**	**0.891**	**Reliable**

Source: Authors' Computation, 2026

Table 2 shows that all the constructs had Cronbach's alpha values above 0.70. This indicated that the instrument was reliable and internally consistent. The overall Cronbach's alpha value of 0.891 shows a high level of reliability.

Table 3: Exploratory Factor Analysis Result

Test	Accepted Value	Obtained Value	Decision
Kaiser Meyer Olkin Measure	≥ 0.60	0.812	Adequate
Bartlett's Test of Sphericity	$p < 0.05$	$p = 0.000$	Significant

Source: Authors' Computation, 2026

Table 3 also shows that the KMO value was 0.812, which is above the minimum acceptable value of 0.60. Bartlett's Test of Sphericity was significant at $p = 0.000$. This means that the data were suitable for Exploratory Factor Analysis and that the items adequately measured the intended constructs.

Descriptive Results of the Main Variables

The mean and standard deviation were used to determine the level of entrepreneurial intention, digital competence, digital economy participation, finance constraints, and mentorship constraints among LIS professionals.

Table 4: Descriptive Statistics of Study Variables

Variable	Number of Items	Mean	Standard Deviation	Interpretation
Entrepreneurial Intention	6	4.18	0.61	High
Digital Competence	10	3.89	0.68	High
Digital Economy Participation	6	3.74	0.72	High
Finance Constraints	4	4.12	0.66	High
Mentorship Constraints	4	4.05	0.69	High

Source: Authors Computation, 2026

Table 4 revealed that the entrepreneurial intention score of the LIS professionals had a mean score of 4.18, reflecting high entrepreneurial intention among LIS professionals. In other words, the respondents were very willing to invest in entrepreneurial activities in the digital economy. The mean score of digital competence was 3.89, which shows a moderate to high level of digital competence among LIS professionals. This means that LIS professionals have relevant digital skills that can help with digital publishing, information consultancy, online training, data services and digital archiving and knowledge brokerage. The mean score of the digital economy participation was 3.74, showing a high level of involvement in digital economic activities. However, there was high mean score of finance constraint (4.12) and mentorship constraint (4.05). This indicates that lack of finance and limited mentorship are still key issues in LIS entrepreneurship. The digital competence and entrepreneurial readiness in digital economic activities were selected as major indicators of outcomes in the field of entrepreneurship of LIS professionals. A regression analysis was then conducted to determine the magnitude of the effects of entrepreneurial intention, finance constraints and mentorship constraints on these outcomes.

Simple Linear Regression Results

Simple linear regression was used to test the relationship between the major variables. The analysis was conducted at 0.05 level of significance.

Table 5: Summary of Simple Linear Regression Results

Hypothesis	Relationship Tested	R	R Square	F Value	Beta	t Value	p Value	Decision
H_{01}	Entrepreneurial Intention → Digital Competence	0.682	0.465	219.90	0.682	14.83	0.000	Significant
H_{02}	Entrepreneurial Intention → Digital Economy Participation	0.641	0.411	176.62	0.641	13.29	0.000	Significant
H_{03}	Finance Constraints → Digital Economy Participation	0.552	0.305	111.09	-0.552	-10.54	0.000	Significant
H_{04}	Mentorship Constraints → Digital Economy Participation	0.506	0.256	87.05	-0.506	-9.33	0.000	Significant

The Digital Competence of LIS professionals have a positive and significant relationship with entrepreneurial intention with $R = 0.682$, $R^2 = 0.465$, $\beta = 0.682$, $t = 14.83$ and $p = 0.000$. This indicated that 46.5% of the change in digital competence was accounted for by entrepreneurial intention. The p value was < 0.05, which indicated a statistically significant relationship. Furthermore, the result indicated that the entrepreneurial intention has a significant predictive power on the digital economy participation with $R = 0.641$, $R^2 = 0.411$, $\beta = 0.641$, $t = 13.29$, $p = 0.000$. This indicated that 41.1 percent of its variation is accounted for by entrepreneurial intention. This suggested that entrepreneurship intention is a positive predictor of the involvement of LIS professionals in the digital economic activities. Finance constraints had a significant negative effect on digital economy participation, $R = 0.552$, $R^2 = 0.305$, $\beta = -0.552$, $t = -10.54$, $p = 0.000$. This is an explained variance of 30.5 percent, due to finance constraints. The negative beta value suggests that the more the financing constraints, the less participation in digital entrepreneurship. Mentorship constraints also had a significant negative effect on digital economy participation, $R = 0.506$, $R^2 = 0.256$, $\beta = -0.506$, $t = -9.33$, $p = 0.000$. This indicated that 25.6 per cent of the variance in participation in the digital economy was due to mentorship constraints. The negative beta value shows that mentorship is a negative factor that inhibits LIS professionals from efficiently participating in the digital economy.

Discussion of Findings

The Entrepreneurial Intention of LIS Professionals

The results found that the entrepreneurial intention of Library and Information Science workers was high. This suggested that LIS professionals are ready to transcend their library roles and go beyond and into income generating activities in the digital economy. This finding affirms the major argument of this study which postulates that LIS professionals can convert their professional knowledge from catalogue-based services to capital generating digital enterprise and corroborates Adetayo and Hamzat (2021), who found that infopreneurship helps LIS professionals to be financially satisfied in the tertiary institutions. It also corroborates the findings of Ivwurie and Ocholla (2016) that infopreneurship is emerging as a new profession for LIS practitioners in Nigeria and South Africa. Likewise, Ramugondo (2021) discovered that infopreneurship may be an employment opportunity for LIS students and graduates particularly in situations where employment prospects are limited. The entrepreneurial intention is also congruent with

Mohammed, Gora, Usman and Ibrahim (2022), which found that there are currently some entrepreneurial opportunities for LIS professionals for twenty first century, such as information brokerage, digital publishing, consultancy, online training and research support services. Similarly, Ogbonyomi (2024) has highlighted the entrepreneurial opportunities of LIS graduates as a lot that can aid to the sustainable development of a nation. Thus, the present finding reaffirms the growing awareness about the economic value of the professional skills of LIS professionals.

Entrepreneurial Intention and Digital Competence

The result indicated that entrepreneurial intention positively and significantly correlates with digital competence. The obtained R^2 value of 0.465 reveals that 46.5% of the variance of entrepreneurial intention was accounted for by the digital competence. This signifies that those who intend to be entrepreneurs in LIS are more likely to master and apply their digital skills required for participating in the digital economy. This is supported by Iheanacho (2018) who emphasized the need for the importance of skills and ethics in library and information service businesses. It also concurs with Nweze (2018) who stressed the importance of ICT facilities and digital skills in the effective teaching, learning, and working of the twenty first century. Besides, Kumar and Sharma (2023) contended that now LIS professionals are working in emerging entrepreneurial roles in the digital era, which demand the use of digital competence. The discovery also corroborates Human Capital Theory, which suggests that education, skills and professional abilities are a productive asset that can enhance economic results. This study views digital competence as a significant type of human resources that can be used by LIS professionals to turn their professional expertise into economic opportunities. This aligns with Lungu, Georgescu and Juravle (2024) who associated digital entrepreneurship with knowledge, innovation and digital capability. Thus, entrepreneurial intention goes beyond merely reflecting entrepreneurial interest, it also serves as a motivational force for obtaining and using digital skills.

Entrepreneurial Intention and Digital Economy Participation

The study revealed that entrepreneurial intention was a significant determinant of the participation in the digital economy. Overall, an entrepreneurial intention accounted for 41.1 percent of the variance in digital economy participation, as reflected in the R^2 value of 0.411. Those with a stronger entrepreneurial intent are more likely to be involved in digital economic activities like data services, information consultancy and knowledge brokerage, online training, digital publishing, and content management, as well as LIS professionals in general. This discovery was consistent with the Theory of Planned Behaviour which suggests that intention is one of the most important determinants of behaviour. In this context, entrepreneurial intention has a direct impact on entrepreneurial actions of LIS professionals from the awareness stage to the participation stage in income-generating digital services. This finding is similar to that of Kazungu (2021) who found that among the African university students, infopreneurship is one of the career options. In addition, it supports Kehinde (2021) who discovered that the personal and professional elements were seen as affecting the interest of LIS undergraduates in infopreneurship. The finding also corroborates the study conducted by Lose and Khuzwayo (2022) that attitudes towards infopreneurship affect students' consideration of information-based entrepreneurship. Similarly, Wema (2021) concluded that there are opportunities for entrepreneurship for LIS professionals in Tanzania but professional readiness and awareness are needed to participate in entrepreneurship. It indicates that mindset, motivation and willingness to take advantage of digital opportunities are closely related to entrepreneurial involvement of LIS professionals.

The Participation in Digital Economy is Constrained by Finance.

Financial constraints were found to significantly affect the participation in the digital economy based on the result. This indicated that financial constraints diminish the potential of LIS professionals to be effective in the digital entrepreneurship. The negative beta value means that the higher finance constraints are, the lower the participation in the digital economy is. This discovery is in line with the discovery of Aregbesola et al (2019) who cited funding as one of the key challenges faced by infopreneurs in developing countries. It also serves as a platform of support for Akpena and Duosake (2020) who identified that librarians in Bauchi State, have some problems in the practice of infopreneurship such as lack of financial support. Likewise, Mohammed et al. (2022) noted that finance is also among the important factors inhibiting LIS entrepreneurship. This is also in line with Leboea (2017) who found that finance is one of the factors that contribute to failure of SMEs. The finance condition was also identified as an important factor for the survival and growth of small enterprises by Bureau for Economic Research (2016) and Small Enterprise Development Agency (2016). While not reliant on the same physical set-up as a conventional business, digital entrepreneurs need cash for devices, internet, paid software, website development, branding, training, business registration, and online promotion.

The Link Between Mentorship Constraints and Digital Economy Participation

The finding revealed that the constraints of mentorship had a significant negative relationship with participatory in the digital economy. The R^2 value was 0.256, which means that 25.6 per cent of the variance in digital economy participation could be accounted for by the constraints of mentorship and this implies that the capacity of LIS professionals to be meaningfully involved in digital entrepreneurship is negatively affected by lack of mentorship. The finding corroborates that of Amakiri and Marie (2019) who emphasised the importance of empowering office and information management professionals to be infopreneur. It is also concurred with Ramugondo (2021) which identified mentorship, professional guidance, curriculum reform as important factors for the development of infopreneurship among LIS students and graduates. The authors, Chux-Nyehe and Nwinyokugi (2020) also identified employment sustainability as one of the impacts of infopreneurship, but this necessitates support systems to guide the individuals toward successful infopreneurship. Mentorship is significant because it offers guidance, exposure, entrepreneurial confidence, networking and knowledge and practical experience. While information management is well understood by many LIS professionals, they may not be familiar with pricing information management services, finding clients, packaging digital products, managing online platforms, or promoting the services or maintaining a business. That's why mentorship is a key driver in how well professionals become entrepreneurs. The discovery also confirms Social Capital Theory, an idea that posits that networks, relationships and professional networks can also increase access to information and economic opportunities. For LIS professionals, mentorship can act as a stepping stone to move from professional knowledge to business performance. Hence, it is recommended that professional bodies, universities and library associations should introduce mentorship programs to link the experienced infopreneur and the new LIS entrepreneurs.

Conclusion and Recommendation

The study found that there were entrepreneurial potentials in the digital economy among Library and Information Science professionals by a large margin. The respondents showed a relatively high entrepreneurial intention which meant that they were ready to pursue their professional activity beyond the traditional library activities into digital services that generate profits. This indicated that LIS professionals may redefine their skills in the field of information organisation, digital resource management, research assistance, content development, information consultancy

and knowledge broking to create value from these skills in the economic sector. The study also confirmed that there was a positive relationship between entrepreneurial intention and digital competence. The implication was that, LIS professionals who are more entrepreneurial oriented are more inclined towards developing and utilizing the digital skills needed for the involvement in technology driven and knowledge-based enterprises. Digital competence was thus a significant enabler in the process of making the process of professional knowledge into viable entrepreneurial activity. The findings also revealed that entrepreneurial intention had a significant impact on the participation in the digital economy. The findings revealed that being prepared to be an entrepreneur was one of the significant factors that facilitated the involvement of LIS professionals in digital publishing, online training, data services, content management, research support and information broking. Despite the study findings, the study also found that finance and mentorship obstacles still posed significant barriers for effective entrepreneurial participation. Weak financial support restricted access to key digital equipment, training, branding, internet facilities and business development resources, and weak mentorship resulted in not being exposed to valuable practical information, professional networks and business experience. Based on this, the study found that the capacity of LIS professionals was capable of giving a meaningful contribution to the digital economy, which needed institutional, financial and mentorship support to be fully realised. The study recommended the following based on the findings:

i. Entrepreneurship development should be strengthened in LIS professionals through the implementation of practical entrepreneurial orientation in the professional training and continuous development programmes of the Universities, library schools and professional associations. Programmes should help LIS professionals realize the economic value of their skills, and how library and information services can become marketable digital services. This will help to maintain entrepreneurial intention and foster professionals' awareness to action.
ii. It is necessary to increase the focus on developing digital competence in LIS education and profession. The training should be digital publishing, information services online, management of databases, digital archives, content generation, tools for supporting research and data services and online consulting. This will facilitate LIS professionals to develop skills in technical competence to be able to join effectively in the digital and knowledge-based enterprises.
iii. Digital entrepreneurship should have practical aspects in LIS curricula and professional development programmes. These should include service packaging, service pricing, service branding, client management, online visibility and service delivery via digital channels. This hands-on experience will enable LIS professionals to turn entrepreneurial intentions into action in the Digital Economy.
iv. Financial aids in the form of financial support mechanisms should be provided by the relevant institutions, professional bodies and government agencies for those who would like to use digital entrepreneurship in their professional activities. These may include seed grants, cooperative funding, entrepreneurship loans, professional training through sponsorship and support for digital tools. With better access to finance, the barriers to LIS professionals setting up and running digital ventures will be overcome.
v. Structured mentorship program must also be established for LIS professionals. The provision of mentoring to the emerging LIS entrepreneurs for experienced librarians, infopreneurs, digital consultants and information service entrepreneurs should be encouraged. Mentors should aim to help their mentee with the following: business planning, service pricing, client acquisition, branding, digital platform management and sustainability. This will enhance the

competence of the LIS professionals to translate their professional competence to a successful entrepreneurial practice.

References

Adetayo, A. J., & Hamzat, S. A. (2021). Infopreneurship and financial satisfaction among library professionals in tertiary institutions in Ede, Osun, Nigeria. *Library Philosophy and Practice (e-journal), 4749*. **https://digitalcommons.unl.edu/libphilprac/4749/**

Akpena, J. E., & Duosake, H. A. (2020). Exploring the practice of infopreneurship among librarians in Bauchi State, Nigeria. *International Journal of Applied Technologies in Library and Information Management, 6*(2), 32–33.

Amakiri, D. S., & Marie, M. O. (2019). Galvanizing the infopreneurship career development for office and information management professionals. *IIARD International Journal of Economics and Business Management, 5*(4), 10–14.

Andrew, P. (2020). Can a web designer be an entrepreneur? **https://www.speckyboy.com**

Aregbesola, A., Van der Walt, T., Owolabi, S., Idiegbeyan-Ose, J., Okocha, F., & Eyiolorunshe, T. (2019). Infopreneurship in a developing country: Opportunities and challenges. *IOP Conference Series: Materials Science and Engineering, 640*(1), 012123. **https://doi.org/10.1088/1757-899X/640/1/012123**

Bureau for Economic Research. (2016). *The small, medium and micro enterprise sector of South Africa*. BER Research Note.

Chux-Nyehe, G. C., & Nwinyokugi, P. N. (2020). Infopreneurship: Values and implications on employment sustainability of SMEs in Rivers State, Nigeria. *International Journal of Research and Innovation in Social Science, 4*(3), 265–267.

Dewah, P., & Mutula, S. (2016). Students' perceptions of infopreneurship education in the Department of Records and Archives Management at the National University of Science and Technology. *South African Journal of Information Management, 18*(1), 1–8. **https://doi.org/10.4102/sajim.v18i1.717**

E-Infinix. (2020). *Electronic Infinix dictionary: The physical phone*.

El-Kalash, K. I., Mohammed, S. B., & Aniki, Y. (2016). Exploring infopreneurship for economic growth and sustainability in a developing economy: The Nigeria perspective. *Journal of Educational Policy and Entrepreneurial Research, 3*(7), 240–249.

Gillwald, A., Mothobi, O., & Rademan, B. (2018). *The state of ICT in South Africa*.

Iheanacho, B. J. (2018). Skills and ethics for library and information service businesses. *Journal of Library and Information Sciences, 6*(2), 56–63. **https://doi.org/10.15640/jlis.v6n2a6**

Ikenwe, I. J. (2021). Marketing and entrepreneurship in library and information science. In E. I. Ifidon & D. E. Krubu (Eds.), *Trends in modern librarianship* (pp. 221–238). Ambrose Alli University.

International Federation of Library Associations and Institutions. (2022). *IFLA trend report 2022 update*. **https://www.ifla.org/publications/ifla-trend-report-2022/**

International Labour Organization. (2023). *World employment and social outlook: Trends 2023*. **https://www.ilo.org/global/research/global-reports/weso/trends2023**

International Communications Authority of South Africa. (2018). *3rd report on the state of the ICT sector in South Africa*.

International Journal of Library and Information Studies. (2024). Entrepreneurship skills development of library and information science professionals in the 21st century. **https://www.ijlis.org/articles/entrepreneurship-skills-development-of-library-and-information-science-professionals-in-the-21st-century.pdf**

Ivwurie, O. M., & Ocholla, D. N. (2016). The status and development of infopreneurship in Nigeria and South Africa. *Education for Information, 32*(4), 323–339. **https://doi.org/10.3233/EFI-160980**

Kazungu, I. (2021). Infopreneurship as a career option among African university students. *Southern Africa Journal of Communication and Information Science, 1*, 66.

Kehinde, B. T. (2021). Influence of demographic factors on interest of LIS undergraduates in infopreneurship: A comparative analysis. *Library Philosophy and Practice*.

Kumar, S., & Sharma, R. (2023). Emerging entrepreneurial roles of library and information professionals in the digital age. *Journal of Librarianship and Information Science, 55*(4), 789–803. **https://doi.org/10.1177/09610006221143878**

Leboea, S. T. (2017). *The factors influencing SME failure in South Africa* (Master's dissertation). University of Cape Town.

Lose, T., & Khuzwayo, S. (2022). Attitudes towards infopreneurship among information science students at a higher education institution. *Problems and Perspectives in Management, 20*(1), 50–51. **https://doi.org/10.21511/ppm.20(1).2022.05**

Lungu, A. E., Georgescu, M. R., & Juravle, D. (2024). A bibliometric analysis of digital entrepreneurship. *Journal of the Knowledge Economy*. **https://doi.org/10.1007/s13132-024-01885-1**

Masron, M. Z., Yatin, M. S. F., Hussin, N., Taib, K. M., & Wah, Y. B. (2017). Infopreneurship: New career for university graduates. *Journal of Informatics and Mathematical Sciences, 9*(4), 1219–1226.

Mohammed, A. Z., Gora, A. A. L., Usman, M. A., & Ibrahim, M. (2022). Infopreneurship: Opportunities and challenges for library and information science professionals in the 21st century. *Asian Journal of Information Science and Technology, 12*(2), 22–28.

National Bureau of Statistics. (2016). *Labour force statistics*. Federal Republic of Nigeria.

Naude, M. J., & Chiweshe, N. (2017). A proposed operational risk management framework for small and medium enterprises. *South African Journal of Economic and Management Sciences, 20*(1), 1–16.

Ndukwe, O. J., & Allison, P. (2021). Good governance and ease of doing business in Nigeria: Problems and prospects. *International Journal of Academic Management Science Research, 5*(1), 92.

Nweze, C. A. (2018). Utilization of ICT facilities for quality teaching and learning in the 21st century. *African Journal of Education, 12*(2), 5–6.

Ogbonyomi, M. A. (2024). Exploring entrepreneurial opportunities available to library and information science graduates for sustainable national development. *Global Review of Library and Information Science*.

Okolo, E. S., & Oghenetega, I. (2021). Entrepreneurship skills and opportunities for librarians in the field of library and information science. *International Journal of Sustainable Management and Information Technology, 7*(2), 27–35.

Organisation for Economic Co-operation and Development. (2020). *A roadmap toward a common framework for measuring the digital economy*. OECD Publishing.

Olorunfemi, G. C. (2021). Addressing the state of youth unemployment in Nigeria. *International Journal of Innovative Psychology and Social Development, 9*(4), 106.

Ramugondo, L. S. (2021). Infopreneurship as an employment option for library and information science students and graduates in South Africa. *Library Philosophy and Practice (e-journal), 5948*.

Richert, B. (2020). What is infopreneurship? https://baileyrichert.com/what-is-infopreneurship.html

Skrba, A. (2020). What is a blog? **https://firstsiteguide.com/what-is-blog**

Small Enterprise Development Agency. (2016). *The small, medium and micro enterprise sector of South Africa*.

Statistics South Africa. (2019). *Quarterly labour force survey: Quarter 1, 2019*.

Statistics South Africa. (2020). *Quarterly labour force survey: Quarter 1, 2020*.

Technopedia. (2021). What does automation mean? **https://www.techopedia.com/definition/32099/webdevelopment**

Udofot, C. (2021). *Introductory manual to the use of library* (2nd ed.). Climax Graphics Publishers.

United Nations Conference on Trade and Development. (2021). *Digital economy report 2021: Cross-border data flows and development*. United Nations.

Wema, E. (2021). Examining entrepreneurship opportunities among library and information science professionals in Tanzania. *Library Philosophy and Practice (e-journal), 4962*.

World Bank. (2021). *World development report 2021: Data for better lives*. World Bank.

Application, and Utilisation of New Modern Technologies (ICTS) in Nigeria Tertiary Institution Academic Libraries

By

Umar Bello Naibi
Abdu Gusau Polytechnic Talata Mafara, zamfara State, Nigeria

Department of library and information science

and

Dr, Neelam Kabra
Assistant Professor, Career Point University Kota, Rajasthan, India

School of library and information science

ABSTRACT.

The evolution and development in information and communication technology (ICT) has made a huge effect on all circles of human life which are perceptible in case of administration activities Such as banking, transportation, wellbeing, instruction and libraries and information centres. Academic libraries don't just choose, arrange, store and recover information; but rather it provides linkage, safeguard scholarly flexibility and gives guide help and guidelines to its clients in the utilization of its information assets. In the present age of information technology, Nigerian libraries have embraced the digital revolution by providing a wide range of digital resources to meet the different demands of its customers. These digital tools have grown beyond traditional print materials, providing new ways to acquire knowledge, The survey research methods were used, with questionnaires and personal interview as data collection instruments. It was found out that ICT facilities/Resources are available in Nigeria higher institutions of learning library but some are more available than others. The ICT facilities mostly used are OPAC, internet and virtual library, which are used to source for reference information materials, complete project work, up-date knowledge and lecture notes. The major challenge encountered in the use of ICT facilities/resources in the Nigeria academic libraries as revealed by the findings, was irregular or lack of constant power supply and irregular cooling environment. Upon these findings, the study recommended among others the constant acquisition as well as the provision of ICT facilities in the academic libraries by government and institutions management, and the provision of constant power supply in which will enhance effective functioning and usage of the ICT facilities in the libraries.

Introduction

The library as an information hub has been an age-old homily, describing a place where services and resources are gathered together to spread knowledge. But the conventional occurrences of libraries have been drastically altered by the advent of modern information and communication technology (ICT). The continuous influence of the on-going information revolution has driven many researches and learning processes in university libraries. With ICT, integrating digital resources into the library has become paramount in the twenty-first century. Computers are now the means by which digital services are provided to users as opposed to traditional physical libraries, where staff involvement is required for regular operations. (Shem, 2015). They are now key players in higher education systems, supporting learning and knowledge dissemination both in-house and to meet the wider information needs of institutions and their communities. Advancements in information technology have brought about a revolution in the operations of academic libraries of higher institutions, making digital resources and services requisite of them, as libraries have become resource and service centers, given over to acquisition, organization, management, preservation and providing access to digital resources, towards more efficient user patronage (Osinulu, 2020). The ongoing information revolution brought about by technology, no doubt, has made the learning and research environment of the academic library of higher institutions a fertile ground, as a large number of technology tools are being harnessed to improve education today, (Umar, 2015). Libraries are no longer seen as just providers of printed materials; today libraries must provide both print and digital resources, as users' needs become more diverse, (Khan 2021). Over the years, there has been a significant improvement on the provision and accessibility of digital resources in the academic and research libraries. Academic libraries in Nigeria and other African nations have greatly benefited from efforts such as the International Network for the Availability of Scientific Publications (INASP) and the Programme for the Enhancement of Research Information (PERI) which helped negotiate reduced costs for digital resources (Ankrah and Atuase 2018). Nigerian academic libraries have made tremendous progress in digitizing intellectual works such as annual reports, faculty journal, articles, inaugural lectures and postgraduate theses in order to improve users' access to old thesis projects and other information resources.

Literature Review

Information and communication technology (ICT) came about because of the computerized union of computer technologies and other media transmission technologies. Presently the implementation and utilization of ICTs by people and businesses is more across the board on the planet than previously. ICT facilities are being utilized in numerous different fields like wellbeing, farming system, military, training, trading activities, and many more. ICTs are likewise being utilized in different kinds of libraries. Utilization of information and communication technologies (mechanization) derived to be because of the events of 1980s and data stage, which has seen a transformation and experience in post-industrial societies. Taking this in to consideration the performance and roles of any kind of library or information centre is for the acquirement of information materials, storing, processing, retrieval and dissemination of this information to users. The utilization of Information Technology in contemporary libraries is optimistic to build right information at the fortunate time in the perfect place and at the right expense. Information Technology progresses the rank of the library and it shortens the work heap of the library occupations. (Vijiyan, S. 2011).

ICT comprises of hardware and software, the accompanying technologies are currently well known among numerous academic libraries; laptop computers, desktop, PC, I-phone, I-pad and so forth, fringe like keyboard, speakers, scanning machine, and printers and so on. System apparatus and links like Cat-5, coaxial, fibre optics and their different connectors, routers, switches, satellite and their modem, others use by academic libraries are Software like operating system (OS),application and utilities programming design.

Today Nigerian academic libraries are moving their part from the overseer of conventional data assets to the service oriented supplier of advanced information assets.

Ivwighreghweta, O. (2013) noticed that prevalent utilization of PCs, expanded dependence on PC systems, fast development of Internet and blast in the excellence, and amount of information constrained academic libraries to embrace new methods for the storage, recovery and sharing of information. Thus, development of computerized libraries and use of advanced (ICT) have massively expanded in light of the fact that it enhanced user satisfaction, quick responses, cost viability, and simpler operational methods. He presumed that academic libraries have been utilizing ICTs to fulfil the various information needs of their clients. EBooks, E-diaries, online databases, CD-ROM databases, electronic assets, and an assortment of other automated media are quick changing the ordinary resources of libraries. ICT has revolutionized the traditional perception of academic Libraries from an ordinary store house of books to an intellectual information centre.

Information and communication technology, typically abbreviated as (ICT) is frequently utilized as an expanded equivalent word for information technology (IT). ICT is characterized as a different set of technological devices and assets used to communicate and to make, disperse, store, and manage information and they envelop an extensive variety of quickly developing technologies including broadcast communications technologies, for example, communication, cable, satellite, TV and radio, PC interceded conferencing and videoconferencing, and also computerize technologies, for example, PCs, information systems (Internet, the World Wide Web, intranets and extranets) and programming applications (Ivwighreghweta, O. 2013).

Bappah, A. (2010) defined "ICT as a wide based term that incorporates the gathering packing, stockpiling and dissemination of information that can be in written or numerical, pictorial and vocal structures (multi- media) or a blend of all the above (multi-media), using a mix of PCs and broadcast communications telephony distance learning".

Academic Libraries

Libraries and information centres shape an imperative piece of the world's system of education, data stockpiling and retrieval. Library doesn't just choose, arrange, store and recover information; it provides linkage, safeguard scholarly flexibility and gives guide help and guidelines to its clients in the utilization of its information assets. As of late, new technology and specialized devices have transformed the configuration and style of library services all over the world. The channels for access and dissemination of information and learning have turned out to be significantly more diverse.

Abubakar (2011) defined academic libraries as libraries that are devoted to academic environment or can be found in higher institution of learning, they are purposely established to support teaching and learning as well as research activities. They comprise libraries found in universities, colleges of education polytechnics, and Mono technics.

Thus, academic libraries generally play all or most of the following roles;

- To serve the mission of its parent organization
- To provide appropriate reference services to staff and students of the institution
- To serve the entire information needs of the academic community.

The different services gave in libraries today are complimented by accessible facilities, most of which are technology driven. The usage of developed technology as of late in libraries worldwide has proved beyond any doubt, that academic library, can perform better when services are satisfactorily given to improve access to the content of the library.

ICTS in Academic Libraries

For the past thirty years academic libraries in Nigeria have been affected by modifications in ICTs and the level of changes is still quickening in this area. However, the overview of several information technology (ICT) development has led to the re organisation, Modification in work design as well as demand for new effort and skills, retraining and re-classification direction. New modern technology advancement of the last thirty years which involves, automated databank, online services, CD-ROMs, and with the introduction of internet has completely changed and transmitted access to information. Information and communication technologies (ICTs) have encourage simple access to very significant and monstrous sum information that guide the enlightening, learning and research exercises in academic foundation through web based learning offices and other relating ICT amenities. The Internet is utilized by staff and students in discovering data to take care of their different issues. ICTs help libraries in giving clever and current information managements (Ajiji, Y. 2017).

ICTs constantly offer proper time, place cost effectiveness and improve the most current dissemination of information and end users involvement in the library and information service delivery. The development in Information and Communication Technologies gives a structure which has built a strong foundation for e-learning. It is comprises of internet facilities, and other materials that make the content delivery as easy as possible. Other areas of development as a result of ICT include image processing, multimedia software system etc. Technology has brought a lot of progress in our daily life activities. In fact It has turned the world into a global village and it is clear that all nations whether developed or under developed use technology for individual growth, progress and prosperity. (Emmanuel, U, A., 2014).

The present-day academic library services in the 21st century is concentrating more on the area of advanced, virtual or libraries without limits all of which have changed academic libraries and prompted progress and change in the academic library condition. The progress and the change are accompanied with complexity in the changing pattern in the information needs of clients which is developing quickly. There is a change in perspective from independent libraries to library and information systems; from printed publication to computerized documents; and from possession to get to. The custom is because of the effect of ICTs, the Internet and the web which is influencing a wide range of libraries (Abubakar, m. 2017). He furthermore watched that developments in ICTs have now offered academic libraries an energizing and challenging openings that requires them to react decidedly in all aspects of their service and capacities in the event that they are to stay applicable in the 21st century. Hence, academic libraries must devise methods for survival.

Management of (ICTS) in Nigeria Tertiary Institution Academic Libraries

The significant elements of management information system (MIS) in academic libraries is to help staff with the day by day basic leadership process, control of assets, to keep up better responsibility and to screen spending designations, to produce inner and outside reports and to enhance long haul arranging. ICTs are making it less demanding to gather and process administration data over the whole library framework and make such data/information accessible on request. Information and communication technology (ICT) management in academic libraries includes two levels: the strategic level which incorporates looking into and setting up the most proper approaches to exploit prevailing ICTs in the library, and sourcing and utilizing new ICTs that are required for future use, and the task (operation) level which includes giving high calibre, solid ICT administrations to the library through capacity building programme, conveyance of ICT ventures, execution, application and by checking use and viability of ICT frameworks in the library. The two levels of ICT management require individuals with suitable ICT abilities, and these are to a great extent truant in many libraries as observed by (Ridwan, S. 2015).

Roles and Responsibilities of ICT Manager in Academic Libraries

The IT manager assumes a crucial part in the system advancement procedure of the library administration. The finding of the research identified the following roles and responsibilities of IT manager in Nigerian academic libraries as discovered through many research works conducted by other researchers. The followings are some of the roles of an IT manager in academic libraries as discovered by the researcher.

Ability to interact with library administration/clients to know their prerequisites

- Ability to interact with merchants to pass on the conceivable interface of the product
- Ability to interact/manage the developers to monitor framework advancement
- Perform framework testing with sample
- Responsible for the new framework implementation

Challenges Facing the Implementation (ICTS) Facilities in Nigerian Tertiary Institutions

Cognisant of the substantial opportunities that ICT can provide to academic libraries in Nigeria, there are a number of problems and challenges that tend to present themselves. Academic libraries are confronted with both internal and external problems coming from their own structure and culture.

(a)Funds for acquisition of ICT Resources

Libraries require sufficient funds to acquire modern ICT facilities such as computers, servers, scanners, photocopiers, software as well as paying for online and offline services such as e-journals and digital libraries. Most of these facilities and services are very expensive and can be purchased from develop countries. Another study reveals that most of the tertiary institutions in Africa and other developing countries get very little funds from their parent institutions and the government to support their activities; this is due to poor perception of library services by top leaders and other stake holders in the parent institutions. Therefore, the little funds received fall far below the standard costs of ICT facilities and services (Samuel O. 2017).

(b) In adequate ICT facilities/Resources

Shortage of available computer offices in the library, shortage of internet resources, lack of ICT abilities by the library staff and absence of ICT strategy and many more are some of the challenges militating against the utilization of ICTs in Nigerian academic libraries (Madu, and Azubogu, N.

2017). Similarly Samuel O. (2017) alsodiscovered that few students in those libraries use ICT facilities for assignment, research and updating lecture notes due to inadequate ICT facilities.

(c) Lack of Awareness and commitment among key stake holders

Continues commitment and involvement of key stake holders is important when integrating ICTs in organisational functions. Low awareness on the importance of ICTs among the top management has been a great obstacle to ICT development in Nigeria tertiary institutions. It has been difficult for college top officials to support initiative that aim at increasing availability, access and utilisation of electronic information resources in the college (Omekwu, O. 2014).

(d) Inadequate Information literacy among the library users

Library users need both computer and information literacy (IL) skills to effectively use the rapidly growing and changing information resources. (Samuel O. 2017) observed that about (60%) users of some academic libraries in Nigeria lack good knowledge of ICT facilities provided in the library because they were not trained before.

(e) Unreliable power supply: Absence of consistent power supply in the libraries: ICT amenities depend on power for their working. Constant power supply cut is a determined issue in Nigeria. These in addition to other things, influence the Management and use of ICT amenities and administrations.

Summary of the Research Finding

The findings from the above research work as a result of the reviewed literature clearly show that ICT facilities are available in almost all academic institution in Nigeria. The finding shows that majority of the students in the institutions who form 70-90% of the beneficiaries of the services of academic library are aware of the available ICT facilities provided in the library. Nevertheless, the levels to which ICT facilities are utilized are very low because of some significant factors affecting the utilization of these facilities. These factors includes; lack of access to information resources, insufficient budgetary help, absence of ICT specialized ability, absence of consistent power supply, and use of second hand ICT facilities. ThereforeThe IT manager need to develop an algorithm models and a decision matrix table to serve as a means of achieving and providing appropriate service that respond to the needs of the College education information users. Haphazard ways of doing things should be avoided for it would lead to failure. The training process should take into consideration technologies in use so as to ensure effective and efficient use of the services available

Conclusion

This research work on the challenges and utilisations of ICT facilities for information access and management in Nigeria tertiary institutions was able to identified most of the uses and challenges of ICT facilities in academic library through a review of relevant secondary sources of information related to the case study, as a result of which the researcher provided a working strategy if applied by policy makers of the institution and the individual staff might find it useful in effective and efficient information provision.

Recommendation

The utilization of ICT in academic libraries in Nigeria tertiary institutions for information access and management promises compelling and productive services to the whole library patrons. Regardless of all the opportunities ICT provides to academic libraries in Nigeria a great deal of

variables remains as threats and difficulties to the proficient and powerful utilization of ICT offices in academic libraries. Then, for these libraries to persistently satisfy their essential objective which is, the realization of information needs of clients, the accompanying suggestions on the challenges and utilisations of ICT facilities for information access ought to be considered and implemented.

- Academic librarian in collaboration with the stakeholders (the institution stakeholders) should jointly take decision towards realization of set goals of the library to achieve effective and efficient information service provision to their clients.
- The management of the collage should adequately fund ICT department to promote the acquisition and management of ICT facilities used by the institution so that more current ICT facilities can be deployed in to the library for effective services.
- Information and communication technologies under the watch of academic librarian should be made available and accessible to all registered members of the institution. An effective learning can be achieved if the essential ICT facilities are provided to support learning.
- IT department and ICT facilities heavily rely on electricity/power supply to function, as such there is need for the management to provide the IT section with power supply alternative e.g. stand by generators so that the challenge of in adequate power supply can equally be alleviated.
- Librarian should consider the importance of training users on how to make use ICT Resources whenever he discover the need for doing so, this will help towards ensuring proper management of the ICT facilities provided by the institution.

References

Abubakar B., M. (2011)Academic Libraries in Nigeria in the 21st Century. *Library Philosophy and Practice (e-journal)* (Online). Available at: https://digitalcommons.unl.edu/libphilprac/446/

Abubakar, D. and Adetimirin, A. (2016) Postgraduate Students' Use of E-Resources in Nigerian University Libraries: What is the Influence of User Education? ; *Journal of Information Science Theory and Practice*, 4(3), pp.43-56. (Online). Available at:http://www.kpubs.org/article/articleMain.kpubs?articleANo=E1JSCH_2016_v4n3_43

Abubakar, m. (2017) the use of ICT in Nigerian universities; *international journal of advanced research.*(Online).available at: https://www.graph.co.uk/IJARIE/july2017/1.pdf

Ajiji, M., Y. (2017).The Importance of Information Technology on E-Libraries in Nigerian Universities; *International Journal of Advanced Research in Computer Science and Software Engineering,* 7(1), pp.58-67. Available: www.ijarcsse.com

Avemaria, S., U., C. (2011).Library automation procedures: Issues and challenges. Paper presented at the workshop organized by college of education (special), Oyo, Oyo State. June, 2011. p.2

Bappah, M.A. (2010). Availability and use of Information and Communication Technology (ICT) in six Nigerian University Library Schools.*Library Philosophy and Practice (e-journal)* 3(78). (Online) Available at:http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1388&context=libphilprac

Ebunuwele, E.G, and Ola, O. S (2014) Application of information Communication Technology in academic libraries in Nigeria. *International Journal of Education and Research* Vol. 2 No. 12. Pp. 423-436

Esther, G. (2014) Management of University Electronic libraries in Northwest Nigeria. *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)* Volume 19, (8) Available at:*http://www.iosrjournal.org/iosr-jhss/papers/vol19-issue8/version-5/L019857280.pdf*

Green power for mobile (2014) Tower Power Africa: Energy Challenges and Opportunities for the Mobile Industry in Africa, Available at:https://www.gsma.com/mobilefordevelopment/wpcontent/uploads/2014/11/Africa-Market-Report-GPM-final.pdf

Inyang, N. (2015) The Role of Information and Communication Technology (ICT) in the Provision of Library Services in Akwa Ibom State Eâ□"Library, Nigeria; *International Journal of Academic Research in Business and Social Sciences*, 4(12). Available at:http://www.researchgate.net/publication/276326932_The_Role_of_information_and_communication_technology_ICT_in_the_provision....

Ivwighreghweta, O. 2013 the application of information and communication technology on academic library operations and services in Nigeria; *International Journal of Digital Library Services* Vol.3 (1) Available at:http://www.ijodls.in/up[loads/3/6/0/3/3603729/12-22.pdf

Johnston, J.(2010). Qualitative research methods.*Radiologic technology* [Online].**82** (2), pp.188-189. [Accessed 4th December, 2013].Available at: http://serialsolution.com

Untapped Potential of Indigenous Knowledge for Digital Content Creation and Infopreneurship in Kogi State, Nigeria

Oshinaike A. B. (PhD)
Federal University Lokoja
abdullateef.oshinaike@fulokoja.edu.ng

Danjuma Saidu
Federal University Lokoja
danjuma.saidu@fulokoja.edu.ng

Abstract

Indigenous knowledge represents a significant cultural and informational resource whose potential remains largely underutilized in Nigeria's emerging digital economy. This paper examines the untapped potential of indigenous knowledge for digital content creation and infopreneurship in Kogi State, Nigeria. It argues that oral traditions, indigenous languages, traditional ecological knowledge, culinary practices, crafts, music, cultural performances and local histories can be transformed into digital stories, podcasts, videos, e-books, online courses, digital archives and other knowledge-based products. Drawing on recent literature on indigenous knowledge, digital transformation, cultural heritage and entrepreneurship, the paper conceptualizes indigenous knowledge not only as cultural heritage requiring preservation but also as an information asset capable of generating cultural, educational and economic value. It proposes a community-centred framework involving knowledge identification, documentation and digitization, organization and validation, digital content creation, value creation through infopreneurship, and sustainable distribution. The paper further emphasizes that digital transformation should be guided by community participation, informed consent, cultural ownership, attribution, intellectual-property protection and equitable benefit-sharing. It concludes that responsibly transforming Kogi's indigenous knowledge into digital value can strengthen cultural continuity, expand digital participation, promote creative enterprise and create new livelihood opportunities for Kogites.

Keywords: Indigenous knowledge, Digital content creation, Infopreneurship, Digital transformation, Kogi State.

Introduction

Indigenous knowledge refers to the knowledge, skills, practices and experiences developed by communities through generations of interaction with their social, cultural and natural environments. It encompasses oral traditions, folklore, indigenous languages, traditional medicine, agriculture, crafts, food practices, ecological knowledge and systems of social organization. Far from being static remnants of the past, indigenous knowledge represents a dynamic knowledge resource that continues to shape cultural identity, community resilience and local problem-solving. Its contemporary relevance has gained renewed attention as scholars increasingly recognize the contribution of indigenous knowledge to sustainable development, cultural preservation and knowledge diversity (UNESCO, 2024).

The emergence of the digital economy, however, is changing how knowledge is created, circulated and valued. Digital platforms provide opportunities to transform knowledge into multimedia content, educational resources, digital products and other forms of information-based enterprise. The rapid growth of internet and social-media use in Nigeria further expands the potential audience for locally generated knowledge and cultural content. Nigeria had over 109 million internet users by the end of 2025, demonstrating the expanding digital environment within which knowledge can be created, distributed and consumed (DataReportal, 2026).

Kogi State presents a particularly important context for exploring this possibility. The state is culturally and ethnolinguistically diverse, with communities such as the Igala, Ebira, Okun and Bassa-Nge possessing distinctive languages, oral traditions, festivals, music, crafts, culinary practices, histories and environmental knowledge. These resources constitute a rich body of indigenous knowledge that could provide materials for contemporary digital storytelling, education, cultural documentation and creative enterprise. Yet much of this knowledge continues to depend heavily on oral transmission and remains insufficiently documented and digitally represented.

The underutilization of indigenous knowledge therefore represents more than a cultural preservation challenge; it is also a missed opportunity within the emerging knowledge economy. While digital content creation and the creator economy are expanding in Nigeria, indigenous knowledge has not been sufficiently explored as a source of original content and information-based enterprise. This creates an opportunity for infopreneurship, through which knowledge can be packaged, communicated and transformed into digital products and services such as podcasts, documentaries, online courses, e-books, language resources, cultural platforms and educational content.

This paper argues that Kogi's indigenous knowledge constitutes an untapped information resource with considerable potential for digital content creation and infopreneurship. It therefore explores how indigenous knowledge can be responsibly transformed into digital value while recognizing issues of cultural ownership, authenticity, intellectual property and equitable benefit-sharing. The paper advocates a shift from viewing indigenous knowledge solely as something to be preserved towards recognizing it as a resource that can also support digital creativity, cultural visibility, knowledge entrepreneurship and local economic opportunity.

Conceptualising Indigenous Knowledge

Indigenous knowledge can be understood as the body of knowledge, skills, practices, innovations and ways of understanding that communities develop through long-term interaction with their

social, cultural and natural environments. The World Intellectual Property Organization (WIPO) describes traditional knowledge as knowledge, know-how, skills and practices developed, sustained and transmitted across generations within a community, often forming part of its cultural or spiritual identity. It may encompass agricultural, ecological, medicinal, technical and biodiversity-related knowledge (WIPO, 2026).

The concept extends beyond factual information to include the ways in which communities produce, organize, interpret and transmit knowledge. UNESCO's conception of intangible cultural heritage similarly encompasses oral traditions, performing arts, social practices, rituals, festivals, traditional craftsmanship, and knowledge concerning nature and the universe. Importantly, UNESCO regards this heritage as "living" rather than static because it is continually recreated and transmitted by communities in response to their environment and history (UNESCO, 2026). Indigenous knowledge can therefore include a community's understanding of plants and animals, agricultural practices, weather patterns, healing practices, food preparation, crafts, language, folklore, historical narratives, environmental management and social relations.

An important characteristic of indigenous knowledge is its collective and experiential nature. Unlike conventional knowledge systems that may emphasize written documentation and formal institutions, indigenous knowledge has historically been sustained through observation, participation, practice and intergenerational transmission. Language, storytelling, apprenticeship, ceremonies, songs, proverbs and everyday activities serve as important channels through which knowledge is communicated. UNESCO specifically recognizes that knowledge concerning nature and the universe may be expressed through language, oral traditions, memories, spirituality, attachment to place and community worldviews (UNESCO, 2026).

Indigenous knowledge should also not be regarded as an unchanging body of information belonging exclusively to the past. Its value lies partly in its capacity to evolve as communities encounter new social, economic and environmental circumstances. WIPO notes that traditional knowledge may include innovations and know-how alongside established practices, demonstrating that traditional knowledge systems can contain processes of adaptation and creativity (WIPO, 2026). This perspective is particularly important to the present paper because it allows indigenous knowledge to be considered not only as heritage to be preserved, but also as a knowledge resource that can be documented, communicated, creatively reinterpreted and responsibly transformed into contemporary digital content.

For the purpose of this paper, therefore, indigenous knowledge is conceptualised as the culturally embedded knowledge, skills, practices, experiences and creative expressions developed and transmitted by Kogi communities across generations. This conceptualization provides the basis for considering how such knowledge can move from predominantly oral and community-based forms into digital formats and, ultimately, into opportunities for content creation and infopreneurship. However, such transformation must recognize that indigenous knowledge may be collectively held and subject to customary rules concerning access, use and transmission. WIPO notes that the concept of the "custodian" is particularly relevant because communities may have responsibilities for maintaining and controlling knowledge without necessarily exercising ownership in the conventional intellectual-property sense (WIPO, 2026).

Thus, in this paper, indigenous knowledge is treated simultaneously as cultural heritage, an information resource and a potential source of digital value. This broader understanding is essential

to the argument that Kogi's indigenous knowledge can contribute to contemporary content creation and infopreneurship without reducing cultural knowledge merely to a commodity.

Indigenous Knowledge Resources in Kogi State

Kogi State possesses a diverse range of indigenous knowledge resources arising from its multi-ethnic and multilingual character. The major communities include the Igala, Ebira, Okun, Bassa, Kupa, Kakanda and Ogori-Magongo peoples, each contributing distinctive traditions, languages, histories and cultural practices. The Kogi State Development Plan describes the state as a cultural melting pot in which different ethnic groups maintain distinctive festivals, masquerades, languages and traditions (Kogi State Government, 2025).

Oral traditions and folklore constitute important repositories of collective memory and community values. Folktales, proverbs, myths, riddles, songs, legends and storytelling preserve historical experiences and communicate moral and social knowledge. These materials offer considerable possibilities for digital storytelling, podcasts, animation and audiovisual documentation.

Indigenous languages and expressions are equally significant because they embody distinctive worldviews, cultural meanings and historical experiences. Igala, Ebira, Okun and other indigenous languages provide resources for digital dictionaries, language-learning materials, translated content, audiobooks and social-media content. The state's linguistic diversity is formally recognized in its development and economic planning documents (Kogi State Government, 2025).

Traditional ecological knowledge encompasses community understanding of local plants, animals, agriculture, seasons, waterways, fishing and other environmental resources. Given Kogi's agricultural orientation and its location around the Niger-Benue confluence, such knowledge constitutes a potentially valuable resource for environmental education, agricultural content and digital documentation. The state's geographical and agricultural characteristics provide an important context for this knowledge (Kogi State Government, 2025).

Food and culinary knowledge includes indigenous recipes, food preparation, processing, preservation and the cultural meanings attached to particular foods. These practices can readily be translated into cooking videos, recipe books, blogs, documentaries and other forms of digital cultural content. Similarly, crafts and indigenous technologies, including weaving, beadwork, pottery, woodwork and other locally developed skills, can be demonstrated through instructional videos, online courses and digital marketplaces.

Music, dance and cultural practices constitute another substantial resource. Kogi's cultural landscape includes numerous festivals, masquerades, musical traditions and ceremonial practices. The state government currently identifies festivals such as Ekwechi, Italo, Ovia Osese, Sango, New Yam, Boat Regatta and Fishing Festival among its important cultural expressions (Kogi State Government, 2026). The 2026 Ovia Osese Festival, for instance, was described by the state government as an important expression of Ogori history, identity and values, demonstrating how cultural practices can simultaneously serve educational, tourism and economic purposes (Kogi State Government, 2026).

Finally, local history and cultural narratives provide materials for documenting community origins, traditional institutions, migration histories, historical personalities, monuments and significant places. Lokoja's historical significance, the Niger-Benue confluence and sites such as Mount Patti and the Iron of Liberty illustrate the depth of historical narratives associated with the state (Kogi State Government, 2025). Collectively, these resources demonstrate that Kogi's indigenous

knowledge is not scarce; rather, its systematic documentation, digitization, creative packaging and conversion into digital value remain largely underexplored.

From Indigenous Knowledge to Digital Content

The transformation of indigenous knowledge into digital content involves converting community-based knowledge, practices and cultural expressions into formats that can be accessed, shared and preserved through digital technologies. This does not imply replacing traditional forms of knowledge transmission; rather, it provides additional channels through which indigenous knowledge can reach younger generations and wider audiences. Recent scholarship identifies digital storytelling as an important means of preserving community narratives and strengthening the transmission of indigenous knowledge in contemporary society (Komane, 2025).

Storytelling and social media provide accessible avenues for transforming Kogi's oral traditions, folktales, proverbs, myths and historical narratives into short videos, illustrated stories, reels and other social-media formats. Such platforms can make indigenous narratives more attractive to younger audiences while enabling community members to participate directly in representing their own cultures. Digital storytelling can consequently support both cultural continuity and contemporary forms of cultural expression (Malliga & Balamayuranathan, 2025).

Podcasts and digital audio are particularly suitable for knowledge that has traditionally been transmitted orally. Elders, storytellers, cultural historians, farmers, artisans and other knowledge holders can share experiences and explanations in their own voices. Podcasting can therefore preserve not only the information contained in indigenous knowledge but also the language, expressions and narratives through which that knowledge is communicated. Recent African science communication initiatives demonstrate the potential of podcasting to bring indigenous knowledge into contemporary public conversations (Kaloki, 2024).

YouTube and other video platforms provide opportunities for documenting indigenous practices through interviews, documentaries, demonstrations and instructional videos. Traditional cooking, crafts, farming techniques, festivals, dances, music and cultural ceremonies can be recorded and presented to audiences far beyond their original communities. Video is particularly valuable for practices in which knowledge is embedded in performance and demonstration rather than textual explanation. The increasing use of digital media for indigenous cultural representation demonstrates how communities can employ audiovisual technologies to communicate their knowledge on their own terms.

Blogs and digital publications offer opportunities for more detailed documentation of indigenous languages, histories, cultural practices, food traditions and local knowledge. Articles, e-books, digital magazines and newsletters can organize dispersed knowledge into searchable and shareable resources. Recent research on digital preservation in Africa similarly argues that digital technologies can help capture and disseminate indigenous knowledge threatened by globalization, migration, ageing knowledge custodians and the decline of oral transmission (Gontor, 2025).

Digital archives and repositories provide a more systematic approach to preserving indigenous knowledge. Libraries, universities, museums and community organizations can develop collections containing oral histories, photographs, audio recordings, videos, manuscripts and other cultural materials. Such repositories can support research and education while ensuring that community knowledge is not dependent solely on individual custodians. However, access should be governed by appropriate cultural protocols, particularly where knowledge is sacred, restricted

or collectively held. Recent research on indigenous knowledge preservation emphasizes the need for sustainable technological and governance frameworks rather than simple digitization (Bi, Yuan & Ni, 2025).

Online courses and educational content can further transform indigenous knowledge into structured learning resources. Courses on Kogi's indigenous languages, traditional crafts, local history, food, agriculture and environmental knowledge could be delivered through learning platforms and other digital environments. Digital education can thus create a bridge between indigenous knowledge and contemporary learning while giving knowledge holders opportunities to participate as educators and content creators. Alba (2024) argues that online learning environments can provide opportunities for Indigenous voices and knowledge to enter digital educational spaces when development is collaborative and respectful of Indigenous ways of knowing.

Overall, these possibilities demonstrate that Kogi's indigenous knowledge can move beyond predominantly oral and localized transmission into multimedia, educational and publicly accessible digital forms. The transformation, however, should be community-led and ethically managed so that digital visibility does not result in cultural misrepresentation, unauthorized appropriation or loss of community control.

Indigenous Knowledge and Infopreneurship

Infopreneurship refers to the entrepreneurial creation, packaging, distribution and commercialization of information and knowledge through products and services. In the contemporary digital economy, information itself can constitute an economic resource when it is transformed into content, expertise, educational materials, digital services or other marketable knowledge products. In the Nigerian context, Don-Solomon (2025) identifies infopreneurship as an emerging pathway through which information can support innovation, employment and value creation within a knowledge-based economy.

From this perspective, indigenous knowledge can be regarded as an information asset rather than simply cultural heritage. The experiences, skills, stories, languages, ecological knowledge and cultural practices accumulated within Kogi communities represent a substantial body of knowledge that can be documented, organized, interpreted and responsibly repackaged for contemporary audiences. Onwuegbuzie, Mafimisebi and Orighoyegha (2025) argue that indigenous knowledge and entrepreneurship can work together to support innovation and sustainable development in Africa. The entrepreneurial value of such knowledge, however, depends on recognizing the rights and interests of the communities and knowledge holders from whom it originates.

The potential digital products and services that can emerge from Kogi's indigenous knowledge are diverse. These may include e-books on local history and folklore, indigenous-language learning materials, podcasts, YouTube documentaries, digital storytelling series, online courses, recipe collections, cultural tourism guides, digital exhibitions, educational applications and subscription-based cultural platforms. Traditional crafts and cultural products can also be promoted through digital marketplaces, while knowledgeable individuals can provide consultancy, training and cultural interpretation services. Nimbalkar and Pokharkar (2024) similarly emphasize that integrating traditional knowledge with contemporary entrepreneurial approaches can create opportunities for innovation and community economic development.

The economic opportunities for Kogites therefore extend beyond direct sales of cultural products. Indigenous knowledge-based content can generate revenue through advertising, subscriptions, sponsorships, licensing, online teaching, consultancy, digital product sales, tourism promotion and partnerships with cultural institutions. The emerging Nigerian creator economy provides evidence that digital products and services are already becoming important income streams: the *Nigerian Creator Economy Report* indicates that 32% of surveyed creators derive their primary income from digital products and services. This suggests that Kogi's cultural knowledge could become part of a broader local creator economy if individuals are equipped to identify, document, package and market knowledge responsibly.

Nevertheless, commercial value should not override cultural ownership and ethical considerations. Indigenous communities may have collective rights and customary restrictions concerning particular forms of knowledge. WIPO (2026) notes that entrepreneurship based on traditional knowledge and cultural expressions can generate employment and income, but also presents risks of misappropriation and unauthorized commercial exploitation. Consequently, infopreneurship based on Kogi's indigenous knowledge should be grounded in community participation, informed consent, proper attribution, intellectual-property protection and equitable benefit-sharing.

The central proposition, therefore, is that indigenous knowledge can function as both a cultural resource and an entrepreneurial information asset. The opportunity for Kogites lies in moving from simply consuming externally produced digital content to becoming creators of distinctive knowledge-based content rooted in their own cultural experiences. This approach can simultaneously support cultural continuity, digital participation, creative enterprise and local economic development.

The Untapped Digital Potential of Kogi's Indigenous Knowledge

Kogi State's indigenous knowledge represents a largely underexplored resource within the emerging digital economy. Its oral traditions, indigenous languages, food practices, ecological knowledge, crafts, music, festivals and historical narratives contain information that can be transformed into contemporary digital formats. Recent scholarship on Nigeria emphasizes that digital technologies can support the documentation, organization and dissemination of indigenous knowledge through digital repositories, interactive platforms and other technological applications (Tella, Jatto & Ajani, 2025).

The first dimension of this untapped potential is cultural and creative content. Indigenous stories, proverbs, legends, traditional performances and community histories can provide original material for videos, podcasts, animation, blogs and social-media storytelling. Rather than relying predominantly on externally generated or globally standardized content, Kogites can develop distinctive digital narratives rooted in their own cultural experiences. Timi-Wood (2025) observes that digital media in Nigeria can play an important role in mediating indigenous knowledge and cultural memory, although such knowledge remains comparatively marginalized within contemporary media environments.

A second dimension is digital entrepreneurship. Indigenous knowledge can serve as a foundation for knowledge-based enterprises in which individuals create and market cultural, educational and informational products. This aligns with emerging scholarship linking indigenous knowledge with entrepreneurship, innovation and sustainable development in Africa (Onwuegbuzie, Mafimisebi & Orighoyegha, 2025). For Kogites, this could involve creating indigenous-language learning

resources, cultural documentaries, online courses, digital publications, heritage-tourism content, culinary platforms and other knowledge products.

There is also considerable potential for language and cultural revitalization. Digital platforms can provide spaces for indigenous languages and expressions that may otherwise have limited representation online. Fernandez-Sabido and Peniche-Sabido (2025) argue that technologies developed with meaningful community participation can become powerful instruments for indigenous-language revitalization and cultural expression. This presents an opportunity for Kogi's indigenous languages to become not merely languages of traditional communication but also languages of digital creativity and knowledge production.

The digital potential also extends to education, research and cultural tourism. Properly documented indigenous knowledge can support teaching materials, digital exhibitions, heritage websites, virtual tours and research databases. It can connect schools, universities, libraries, cultural institutions and tourism organizations with community knowledge holders. Digital documentation can consequently increase the visibility of Kogi's cultural resources while creating new channels through which they can contribute to learning and local economic activity.

However, realizing this potential requires moving beyond simple digitization. Community ownership, informed consent, cultural protocols, attribution and benefit-sharing must be incorporated into the process. Digital transformation should empower Kogi communities to determine what knowledge can be shared, who can access it and how commercial benefits are distributed. Adeola (2024) similarly emphasizes the importance of culturally grounded values in developing sustainable digital entrepreneurship in Africa.

The untapped potential of Kogi's indigenous knowledge, therefore, lies not simply in putting traditional information online but in creating a sustainable ecosystem in which cultural knowledge becomes a source of creativity, education, digital participation and responsible entrepreneurship. The opportunity is to move Kogi's indigenous knowledge from being predominantly consumed as cultural heritage to being actively produced, curated and transformed by Kogites into digital value.

A Proposed Framework for Transforming Indigenous Knowledge into Digital Value

The transformation of indigenous knowledge into digital value requires more than digitizing existing cultural materials. It requires a community-centred process through which knowledge is identified, documented, validated, digitized, creatively repackaged, disseminated and, where appropriate, converted into sustainable economic opportunities. Recent scholarship on indigenous knowledge and digital transformation emphasizes that such processes must address cultural integrity, intellectual property, data sovereignty and ethical representation alongside technological considerations (Mthethwa, 2025).

For Kogi State, this paper proposes a six-stage Indigenous Knowledge-to-Digital Value Framework. The first stage is knowledge identification and community engagement. Relevant knowledge resources should be identified in collaboration with elders, cultural practitioners, language experts, artisans, farmers, storytellers and other custodians. Community participation is important because it ensures that the process reflects local priorities and prevents external actors from determining what constitutes valuable indigenous knowledge. Research on digital heritage initiatives similarly emphasizes meaningful community participation in digital preservation activities (Gómez et al., 2024).

The second stage is documentation and digitization. Selected knowledge can be captured through interviews, oral-history recordings, photographs, videos, manuscripts, audio recordings and other appropriate formats. Libraries, archives, universities and cultural institutions can provide the technical infrastructure and expertise required for this process. Evidence from Nigeria demonstrates both the relevance and practical challenges of digital preservation of indigenous knowledge, particularly regarding technical capacity, institutional policies and collaboration with communities (Babagana & Kemboi, 2024).

The third stage involves organization, validation and contextualization. Digitized materials should be properly described, indexed and preserved, while community knowledge holders should participate in verifying the accuracy and cultural context of the materials. This stage is particularly important because digital transformation can detach knowledge from its original cultural meaning. Decolonial approaches to digital preservation consequently emphasize the need to ensure that indigenous voices remain visible in decisions concerning how knowledge is represented and preserved (Kemboi, 2024).

The fourth stage is creative content development. Documented knowledge can be transformed into podcasts, documentaries, YouTube videos, blogs, e-books, digital exhibitions, language resources, online courses, social-media stories and other formats appropriate to different audiences. At this stage, the emphasis shifts from preservation alone to communication, creativity and audience engagement. Digital spaces can provide particularly valuable opportunities for young people to participate in cultural preservation and reinterpret cultural heritage through contemporary media (Lau et al., 2024).

The fifth stage is digital value creation and infopreneurship. Selected content can be developed into educational products, cultural tourism resources, subscription services, digital publications, online training, language-learning materials, consultancy services and other knowledge-based products. This is where indigenous knowledge moves from being merely digitally accessible to becoming a potential source of social, cultural and economic value. However, commercialization should occur only where appropriate and with clear arrangements concerning ownership, attribution and benefit-sharing.

The final stage is distribution, sustainability and feedback. Digital products should be distributed through appropriate platforms while maintaining mechanisms for community oversight, updating, preservation and revenue management. The framework should therefore be understood as cyclical rather than linear: feedback from communities and users should inform subsequent documentation, content development and value creation. This is consistent with emerging approaches that view digital transformation of indigenous knowledge as an ongoing process of preservation, revitalization, innovation and intergenerational transmission (Mthethwa, 2025).

In practical terms, the proposed framework can be summarized as:

Community Engagement → Knowledge Identification → Documentation & Digitization → Organization & Validation → Digital Content Creation → Value Creation/Infopreneurship → Distribution & Sustainability → Community Feedback

The central principle underlying the framework is “digitalize with communities, not merely for communities.” This ensures that Kogi's indigenous knowledge remains connected to its custodians while opening pathways for education, cultural visibility, creativity and entrepreneurship. The framework therefore positions libraries, universities, cultural institutions, technology practitioners

and knowledge communities as collaborative actors in converting indigenous knowledge into digital value while protecting its cultural integrity.

Conclusion

Indigenous knowledge in Kogi State represents a significant but largely underutilized cultural and information resource with potential to contribute to the digital economy. Oral traditions, indigenous languages, ecological knowledge, culinary practices, crafts, music, festivals and local histories can be responsibly transformed into digital stories, podcasts, videos, publications, educational resources, archives and other knowledge products. This paper has argued that such transformation should move beyond preservation to embrace creativity, digital participation and infopreneurship, enabling Kogites to become creators and entrepreneurs of knowledge rooted in their own cultural experiences. However, the pursuit of digital value must be guided by community participation, informed consent, cultural sensitivity, appropriate intellectual-property protection, attribution and equitable benefit-sharing. Ultimately, unlocking the digital potential of Kogi's indigenous knowledge requires a collaborative ecosystem involving communities, libraries, universities, cultural institutions, technology practitioners and policymakers. If responsibly pursued, the digital transformation of indigenous knowledge can simultaneously strengthen cultural continuity, expand access to local knowledge, foster creative enterprise and create new economic opportunities for Kogites in Nigeria's evolving digital economy.

References

Adeola, O. (2024). Leveraging Ubuntu-inspired values to promote sustainable digital entrepreneurship in Africa. *Africa Journal of Management, 10*(2), 120–149. https://doi.org/10.1080/23322373.2024.2349484

Adewumi, A. A., & Sani, N. A. (2025). Digitising cultural heritage for community development: Lessons from Nigeria, South Africa and Kenya. *International Review of Law, Computers & Technology*. https://doi.org/10.1080/13600869.2025.2506917

Babagana, U. I., & Kemboi, G. (2024). Digital preservation of indigenous knowledge in Ramat Library (University of Maiduguri, Nigeria). *iPRES 2024 Papers*. https://doi.org/10.21428/5676bf2d.783b0f9e

Bi, S., Yuan, X., & Ni, W. (2025). Building sustainable and trustworthy indigenous knowledge preservation ecosystem. *arXiv*. https://doi.org/10.48550/arXiv.2504.17281

Don-Solomon, A. (2025). Exploring the concept and practice of infopreneurship in the digital age. *International Journal of Economics and Business Management, 2*(1), 191–195. https://doi.org/10.59568/IJEBM-2025-2-1-15

Don-Solomon, A. (2025). Infopreneurship: A catalyst for knowledge economy development in Nigeria. *SIAR-Global Journal of Computer, Information & Library Science, 1*(1). https://doi.org/10.5281/zenodo.17742517

Fernandez-Sabido, S., & Peniche-Sabido, L. (2025). Redefining technology for indigenous languages. *arXiv*. **https://doi.org/10.48550/arXiv.2504.01522**

Gontor, P. (2025). Digital preservation and documentation of indigenous knowledge in Africa: A data-driven approach. *Journal of African Philosophy and Indigenous Knowledge System, 2*(1), 16–27. https://doi.org/10.69778/3007-7192/2025/2.1x/a2

Kemboi, G. (2024). Whose knowledge counts? Decolonisation of knowledge for digital preservation and sustainability of indigenous knowledge in Africa. *iPRES 2024*. https://doi.org/10.5281/zenodo.13740956

Kogi State Government. (2024). *Kogi State Development Plan 2024–2056*. Government of Kogi State.

Mthethwa, L. C. (2025). In the transit of indigenous knowledge systems through digital transformation framework. In T. M. Masenya & M. T. Bhuda (Eds.), *Revaluation and preservation of indigenous knowledge systems in modern society* (pp. 491–510). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-7964-6.ch024

Onwuegbuzie, H. N., Mafimisebi, O. P., & Orighoyegha, E. (2025). Indigenous knowledge and entrepreneurship as a strategy for sustainable development in Africa. *FIIB Business Review, 14*(5), 553–565. **https://doi.org/10.1177/23197145241288403**

Tella, A., Jatto, E. O., & Ajani, Y. A. (2025). Preserving indigenous knowledge: Leveraging digital technology and artificial intelligence. *IFLA Journal, 51*(3), 703–721. **https://doi.org/10.1177/03400352251342505**

World Intellectual Property Organization. (2026). *Indigenous and local community entrepreneurship*. WIPO.

World Intellectual Property Organization. (2026). *Traditional knowledge*. WIPO.

Awareness and Utilisation of Infopreneurship Opportunities for Job Creation Among Undergraduate Students in Adamawa State Universities, Nigeria

By

ADAMU, Abbas Lamido Gora (CLN)*
Department of Library and Information Science, Modibbo Adama University, Yola. Nigeria.
abbasadamu@mau.edu.ng.

Prof. ABDULLAHI, Zainab Mohammed, PhD. (CLN)
Department of Library and Information Science, Modibbo Adama University, Yola. Nigeria.
talk2zainabmautech@gmail.com.

Dr. MAMZA, Wavi Pur
Department of Library and Information Science, Modibbo Adama University, Yola. Nigeria.
mamzaone@gmail.com

Abstract

The high rate of unemployment among graduates in Nigeria is a source of concern to governments at all levels. Despite the growing number of universities and other higher institutions in the country, coupled with the increasing number of graduates that these institutions are producing annually, the job opportunities available from both public and private sectors for these graduates remain grossly inadequate. This is why there are growing calls for students to embrace entrepreneurship opportunities as a means for self-employment and job creation even before graduation. Infopreneurship, being a branch of entrepreneurship, involves the process of creating, packaging, marketing, and selling information products and services for profit using digital or traditional platforms. This study investigates the awareness and utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State Universities, Nigeria. The study aims to determine the level of awareness of infopreneurship opportunities, the extent of utilisation of infopreneurship opportunities for job creation, and the challenges affecting students' utilisation of infopreneurship activities for job creation in Adamawa State Universities, Nigeria. One null hypothesis was tested at the 0.05 level of significance. The study was quantitative in nature and adopted a descriptive survey research design. The population of the study comprised undergraduate students in the two (2) universities in Adamawa State, Nigeria. Multi-Stage sampling techniques were employed in selecting the sample that participated in the study. A questionnaire was used as the instrument for data collection, which was validated by three (3) experts. Data collected were analysed using mean and standard deviation, while Pearson Product Moment Correlation (PPMC) was used to test the null hypothesis. The findings revealed that undergraduate students in Adamawa State universities had a high level of awareness of infopreneurship opportunities; the level of utilization of infopreneurship opportunities was to a **low extent;** the challenges hindering the utilization of infopreneurship opportunities among undergraduate students were generally high. Moreover, the study indicated that there is a significant relationship between awareness of infopreneurship opportunities and the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria. Recommendations were made based on the findings of the study.

Keywords: Infopreneurship, Job Creation, Undergraduate Students, Adamawa State, Nigeria.

Introduction

The increasing rate of graduate unemployment has become one of the most persistent socio-economic challenges confronting developing countries, particularly Nigeria. Despite the expansion of higher education and the increasing number of university graduates produced annually, employment opportunities in both the public and private sectors have remained inadequate to absorb the growing labour force. Consequently, policymakers, educational institutions, and development agencies have continued to advocate entrepreneurship as a viable strategy for promoting self-employment, innovation, and sustainable economic development. Within this context, infopreneurship has emerged as a promising entrepreneurial pathway that enables individuals to create, package, market, and commercialize information products and information-based services for income generation and job creation. Recent evidence indicates that infopreneurship is increasingly recognized as a critical component of the knowledge economy and an important driver of youth employment, digital innovation, and wealth creation (Amakiri, 2025).

The digital transformation witnessed across the globe has significantly altered the production, dissemination, and consumption of information. Advances in information and communication technologies (ICTs), artificial intelligence, cloud computing, social media platforms, digital publishing, e-commerce, and mobile technologies have created numerous opportunities for individuals to establish information-based enterprises with relatively low start-up capital. These developments have expanded the scope of infopreneurship beyond traditional information services to include digital content creation, online tutoring, research consultancy, information brokerage, data analytics, web design, digital marketing, academic editing, electronic publishing, virtual assistance, and knowledge management services. Consequently, information has become not only a strategic resource but also an economic commodity capable of generating employment and contributing to national productivity (Mubofu & Malekani, 2023).

Infopreneurship refers to the entrepreneurial process of identifying information needs within society and developing innovative information products or services that satisfy those needs while generating economic value. Unlike conventional entrepreneurship, which often focuses on the production of physical goods, infopreneurship emphasizes the commercialization of knowledge, information resources, and intellectual capital. The growing relevance of infopreneurship is attributable to the emergence of the knowledge economy, where competitive advantage increasingly depends on the creation, management, and utilisation of information. Contemporary studies have shown that infopreneurship contributes significantly to employment generation by enabling graduates to establish independent businesses based on information expertise and digital competencies (Amakiri, 2025).

Universities occupy a strategic position in preparing students for participation in the digital economy through entrepreneurship education, digital literacy programmes, and innovation initiatives. In Nigeria, entrepreneurship education has been institutionalized across universities to equip graduates with practical competencies that can reduce dependence on paid employment. Nevertheless, while considerable attention has been devoted to conventional entrepreneurial ventures such as agriculture, fashion, and manufacturing, comparatively less emphasis has been placed on information-based entrepreneurship despite its enormous employment potential. Recent research among Nigerian Library and Information Science graduates found a high level of readiness to engage in infopreneurship and technopreneurship, particularly in research services, current awareness services, information repackaging, publishing, abstracting, and document

delivery, suggesting substantial prospects for graduate self-employment (Sulyman, Ajani, Idowu, & Badmus, 2024).

Awareness constitutes one of the most important determinants of entrepreneurial participation. Awareness involves the extent to which individuals possess knowledge of available entrepreneurial opportunities, understand their potential benefits, and recognize the competencies required for successful participation. Students who are adequately informed about infopreneurship opportunities are more likely to develop entrepreneurial intentions, acquire relevant digital skills, and establish information-based enterprises. However, awareness alone does not necessarily translate into effective utilisation. The utilisation of infopreneurship opportunities depends on several enabling factors, including digital competence, access to ICT infrastructure, entrepreneurial training, mentorship, financial support, institutional encouragement, and favourable government policies. A systematic review of infopreneurship literature emphasizes that although opportunities continue to expand globally, challenges such as inadequate digital infrastructure, insufficient entrepreneurial skills, limited financing, and weak institutional support continue to constrain participation among graduates (Mubofu & Malekani, 2023).

Recent empirical studies in Nigeria have demonstrated increasing interest in infopreneurship among university students. For example, a study of Library and Information Science undergraduates reported that students were generally aware of infopreneurship opportunities, with business centres, photocopying, printing, lamination, and information services being among the most preferred ventures. However, inadequate funding, limited practical exposure, and insufficient access to modern technological facilities were identified as major barriers to effective participation. More recent studies have further recommended strengthening practical entrepreneurship education, expanding digital skills training, and integrating infopreneurship more comprehensively into university curricula to enhance graduate employability and self-reliance Oloniruha *et al*., 2023).

In recent years, the concept of infopreneurship has evolved beyond Library and Information Science to encompass multidisciplinary digital entrepreneurship. The emergence of artificial intelligence tools, online learning platforms, freelance marketplaces, social media monetization, podcasting, digital publishing, and content creation has broadened the spectrum of information-based businesses accessible to undergraduate students regardless of their academic disciplines. Recent evidence also suggests that entrepreneurial curiosity, innovativeness, and digital competence significantly influence students' intentions to engage in infopreneurial activities, reinforcing the importance of entrepreneurial orientation in higher education (Adegbilero, 2026).

Adamawa State, located in North-Eastern Nigeria, hosts several universities comprising federal, state, and private institutions that collectively produce thousands of graduates annually. Similar to other parts of Nigeria, the state continues to experience rising youth unemployment and underemployment, thereby increasing the importance of entrepreneurship as an alternative pathway to economic empowerment. Despite the enormous opportunities presented by the digital economy, there is limited empirical evidence regarding the level of awareness and utilisation of infopreneurship opportunities among undergraduate students across universities in Adamawa State. Existing studies have largely concentrated on Library and Information Science students or institutions located in other geopolitical zones, leaving an important knowledge gap concerning undergraduate students in Adamawa State.

Against this background, the present study investigates the awareness and utilisation of infopreneurship opportunities for job creation among undergraduate students in universities in Adamawa State, Nigeria. Specifically, the study seeks to determine students' level of awareness of available infopreneurship opportunities, examine the extent to which these opportunities are utilized for income generation and self-employment, identify factors influencing their utilisation, and provide evidence that can guide universities, policymakers, entrepreneurship educators, and development agencies in designing interventions that strengthen graduate employability and promote sustainable job creation through information-based entrepreneurship. The findings are expected to contribute to the growing body of literature on infopreneurship, digital entrepreneurship, and youth employment within the Nigerian higher education context.

Statement of the Problem

Youth unemployment remains one of the most pressing socio-economic challenges confronting Nigeria despite the increasing number of graduates produced annually by universities. Although entrepreneurship education has been institutionalized in Nigerian universities to promote self-reliance and reduce dependence on paid employment, graduate unemployment continues to rise, suggesting that many students are yet to acquire or effectively utilize entrepreneurial competencies that can translate into sustainable livelihoods. The emergence of the digital economy has created numerous information-based business opportunities through infopreneurship, enabling individuals to commercialize information products and services such as digital publishing, content creation, online tutoring, research consultancy, information brokerage, web design, digital marketing, data analysis, and academic editing. These opportunities require relatively low start-up capital and offer viable alternatives for employment generation among university graduates (Friday & Sawyer-George, 2023).

Despite these opportunities, evidence from recent studies indicates that many undergraduate students possess limited awareness of the wide range of infopreneurship opportunities available within the knowledge economy. Even among students who are aware of such opportunities, the level of actual utilisation remains relatively low due to inadequate digital competencies, limited entrepreneurial training, poor access to ICT facilities, lack of mentorship, financial constraints, and insufficient institutional support (Liman & Shuaibu, 2024). Consequently, many graduates continue to rely almost exclusively on scarce formal employment opportunities instead of exploiting information-based entrepreneurial ventures capable of generating income and creating jobs.

Existing empirical studies on infopreneurship in Nigeria have largely focused on Library and Information Science students or graduates, information professionals, or single institutions in a few states. While these studies have provided useful insights into awareness and participation in infopreneurship, they do not adequately represent undergraduate students from diverse academic disciplines. Furthermore, little empirical evidence exists on the awareness and utilisation of infopreneurship opportunities among undergraduate students in universities located in Adamawa State, Nigeria. This creates a significant knowledge gap, particularly because the state continues to experience increasing youth unemployment and possesses expanding digital infrastructure that could support information-based entrepreneurship.

Without empirical evidence on undergraduate students' awareness and utilisation of infopreneurship opportunities, universities, policymakers, entrepreneurship educators, and development agencies may find it difficult to design effective interventions that promote digital entrepreneurship and graduate self-employment. There is therefore a need to investigate the level

of awareness of infopreneurship opportunities among undergraduate students in Adamawa State universities, determine the extent to which these opportunities are utilized for job creation, identify the factors influencing their utilisation, and generate evidence that can inform policies and programmes aimed at strengthening entrepreneurship education, digital skills development, and sustainable youth employment. It is this gap in knowledge that the present study seeks to address.

Objectives of the Study

The main objective of this study is to investigate the awareness and utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria. The specific objectives are to:

1. Determine the level of awareness of infopreneurship opportunities among undergraduate students in Adamawa State universities, Nigeria.
2. Examine the extent of utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria.
3. Determine the challenges hindering the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria.

Research Questions

The following research questions will guide the study:

1. What is the level of awareness of infopreneurship opportunities among undergraduate students in Adamawa State universities, Nigeria?
2. To what extent do undergraduate students in Adamawa State universities, Nigeria, utilize infopreneurship opportunities for job creation?
3. What challenges hinder the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria?

Research Hypotheses

H_{01}: There is no significant relationship between awareness of infopreneurship opportunities and the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria.

Literature Review

Infopreneurship is an emerging dimension of entrepreneurship that focuses on the creation, processing, packaging, dissemination, and commercialization of information products and services for economic benefits. It involves transforming information resources, knowledge, and intellectual abilities into marketable products and services capable of generating income and employment opportunities. Unlike traditional entrepreneurship, which is largely concerned with physical goods and tangible resources, infopreneurship is driven by knowledge, digital technologies, information management skills, and innovation. The growing importance of infopreneurship is linked to the transition from an industrial economy to a knowledge-based economy where information has become a valuable economic resource. The increasing availability of digital platforms, social media, online marketplaces, and communication technologies has created opportunities for individuals, especially young graduates, to develop information-based enterprises with minimal physical infrastructure. Such ventures include digital content creation, blogging, online training, information brokerage, research consultancy, database development, electronic publishing, document management, digital marketing, graphic design, and web-based information services (Mubofu & Malekani, 2023).

Awareness is the extent to which individuals possess knowledge and understanding of available opportunities, resources, and strategies within a particular field. In the context of infopreneurship, awareness refers to students' knowledge of information-based business opportunities, the skills required to exploit them, and their potential contribution to employment generation. Oloniruha et al. (2023) investigated infopreneurship awareness and opportunities among Library and Information Science students in Prince Abubakar Audu University, Anyigba, Kogi State, Nigeria. The study was motivated by the problem of graduate unemployment and examined the level of awareness of infopreneurship among LIS undergraduate students. The study reported considerable awareness of infopreneurship and identified activities such as printing, photocopying, lamination, and other information-related business services as opportunities available to students. The study is particularly relevant to the present study because both examined infopreneurship among university students in Nigeria, although the present study focuses specifically on students in Adamawa State universities.

Moreover, Bamgbose (2021) conducted a comparative study on the influence of demographic factors on the interest of LIS undergraduates in infopreneurship. The study employed a descriptive survey design and used systematic sampling to select 226 LIS undergraduate students. The study focused on students from the University of Ibadan and Tai Solarin University of Education and examined the influence of demographic factors on their interest in infopreneurship. The study established the relevance of infopreneurship as a potential avenue for self-employment among LIS students, suggesting that students can develop income-generating activities before graduation rather than depend exclusively on conventional library employment.

Furthermore, Akidi and Udoh (2021) examined infopreneurship skills for sustainable development: A focus on library and information science students of selected federal universities in Nigeria. The researchers adopted a descriptive survey design and investigated infopreneurship opportunities, motivational factors, required skills, methods of acquiring infopreneurship skills, challenges, and strategies for improving infopreneurship development among LIS students. The study found that LIS students could engage in several information-based entrepreneurial activities, but inadequate skills and other institutional and environmental constraints could limit their ability to exploit information as an economic resource. The study is closely related to the present research because it demonstrates that awareness of infopreneurship opportunities does not necessarily guarantee effective utilisation; students also require appropriate entrepreneurial, technical, and information-management skills.

Utilisation refers to the actual application or adoption of available opportunities for practical purposes. While awareness provides the foundation for entrepreneurial engagement, utilisation reflects whether individuals actively participate in infopreneurial activities. For undergraduate students, utilisation of infopreneurship opportunities can contribute to personal income generation, skill development, and employment creation. Okolie et al. (2021) investigated entrepreneurial competencies of undergraduate students of universities in Nigeria. The study examined the extent to which entrepreneurship education influences the development of entrepreneurial competencies among Nigerian undergraduates. The findings indicated that entrepreneurship education significantly influenced five of the thirteen entrepreneurial competencies examined, including opportunity recognition. The study concluded that participation in entrepreneurship education can contribute to the development of important entrepreneurial competencies and recommended more practical rather than predominantly theoretical entrepreneurship programmes. This finding is important to the present study because awareness of an infopreneurship opportunity may be

insufficient if students do not possess the competencies required to identify, evaluate, and exploit the opportunity. Thus, the low awareness/utilisation of printing, photocopying, scanning and document-related services found among students in Adamawa State could partly reflect inadequate practical entrepreneurial exposure.

In addition, Amao-Taiwo, Shittu and Yinusa (2023) investigated higher education student entrepreneurship support services: implications for the development of entrepreneurial skills. The study employed a mixed-method design involving 2,394 students and six directors of entrepreneurship centres from public and private universities in Lagos and Ogun States. Quantitative data were analysed using frequencies, means, standard deviations, and Pearson Product Moment Correlation, while qualitative data were analysed thematically. The study found a significant positive relationship between student support services and entrepreneurship skills development ($r = .42$, $p = .01$). The researchers concluded that university support services constitute an important driver of entrepreneurship development and recommended personalised support, mentoring, internships, competitions and seed funding. The implication for the present study is that the low awareness and utilisation of infopreneurship opportunities among students may not be attributable solely to individual student characteristics. Institutional support, entrepreneurship centres, mentoring, practical training, access to facilities and funding may determine whether students can translate awareness into actual entrepreneurial activity.

Also, Enang (2023) examined digital entrepreneurial skills and competencies required from Business Education students to work in the digital era. The study emphasised that inadequate digital entrepreneurial competencies can reduce students' effectiveness in business activities and their competitiveness in the digital economy. The study argued for the integration of digital entrepreneurial competencies into educational curricula and recommended that institutions provide the resources and enabling environment required for students to acquire these competencies. This finding supports the argument that students' inability to effectively utilise infopreneurship opportunities may be associated with insufficient digital and entrepreneurial competencies.

Similarly, Sunoma and Adamu (2026) examined the mediating role of entrepreneurial self-efficacy on the relationship between digital competence, entrepreneurship education, and digital entrepreneurial intention of university students in North-Eastern Nigeria. Using a quantitative cross-sectional design and structural equation modelling, the study examined university students across the six states of North-Eastern Nigeria. The results showed that digital competence and entrepreneurship education alone were not sufficient to produce strong digital entrepreneurial intention. Rather, entrepreneurial self-efficacy significantly strengthened their effects on digital entrepreneurial intention. This study is particularly important to research conducted in Adamawa State because it provides recent empirical evidence from the same geopolitical zone. It suggests that providing entrepreneurship education or digital skills alone may not automatically result in entrepreneurial behaviour. Students must also develop confidence in their ability to identify opportunities, establish businesses, and overcome entrepreneurial challenges.

Furthermore, Pham et al. (2024) examined antecedents of digital entrepreneurial intention among engineering students. The study surveyed 345 engineering students in three universities in Hanoi, Vietnam, and used structural equation modelling to examine the relationships among digital entrepreneurial education, digital entrepreneurial knowledge, digital entrepreneurial self-efficacy, attitudes, and digital entrepreneurial intention. The results showed that digital entrepreneurial knowledge significantly and positively affected both entrepreneurial self-efficacy and attitudes

toward digital entrepreneurship. Digital entrepreneurial education also positively affected knowledge and self-efficacy, while entrepreneurial self-efficacy positively influenced attitudes, and attitudes positively influenced digital entrepreneurial intention. The study reinforces the importance of knowledge, skills, self-efficacy, and educational exposure in transforming students from passive observers of entrepreneurial opportunities into potential entrepreneurs. It therefore provides a useful explanation for differences between students who are aware of infopreneurship opportunities and those who actually utilise them.

Methodology

The study adopted a descriptive survey research design. The design is considered appropriate because the study sought to investigate the awareness and utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria. The population of the study comprised all registered undergraduate students. They are 11,261 in Adamawa State University (ADSU), Mubi, and 15,531 in Modibbo Adama University (MAU), Yola, Adamawa State, Nigeria. The sample size was determined using Taro Yamane's (1967) formula and yielded a sample size of 394. A multi-stage sampling technique was employed. First, universities were selected based on ownership category (Federal and State). Second, faculties were selected to ensure representation of different academic disciplines. Finally, undergraduate students were selected using a simple random sampling technique to give every student an equal opportunity of participation. The questionnaire was subjected to face and content validity by experts in Library and Information Science. The researchers administered copies of the questionnaire directly to sampled undergraduate students with the assistance of trained research assistants. The data collected were analysed using descriptive statistics employing mean and standard deviation, while inferential statistics were used to test the null hypothesis using PPMC at the 0.05 level of significance.

Data Analysis

Out of the three hundred and ninety-four (394) copies of the questionnaire administered, three hundred and twenty-one (321) were filled, returned, and found usable for the study, representing 81.5%.

Research Question One: What is the level of awareness of infopreneurship opportunities among undergraduate students in Adamawa State universities, Nigeria?

S/N	Awareness of Infopreneurship Opportunities	N	Mean	Std	Decision
1	I am aware that information can be converted into a business opportunity.	**321**	3.62	0.68	Very High
2	I am aware of online information-based businesses.	**321**	2.23	0.99	Low
3	I am aware of digital content creation as an entrepreneurial opportunity.	**321**	3.21	0.70	High
4	I am aware that blogging and online publishing can generate income.	**321**	3.58	0.74	Very High
5	I am aware of research and information consultancy services as business opportunities.	**321**	3.57	0.80	Very High
6	I am aware of online tutoring and training services as sources of income.	**321**	3.04	0.81	High
7	I am aware of digital marketing and social media management opportunities.	**321**	3.11	0.89	High
8	I am aware of web design and information technology-related business opportunities.	**321**	3.12	0.83	High
9	I am aware of printing, photocopying, scanning, and document services as information businesses.	**321**	2.16	0.94	Low
10	I understand the concept and benefits of infopreneurship.	**321**	3.29	0.64	High
	Cluster Mean		**3.09**	**0.80**	**High**

Source: Field Survey, 2026

Table 1 showed the analysis of the level of awareness of infopreneurship opportunities among undergraduate students in Adamawa State universities, Nigeria. The findings revealed that undergraduate students in Adamawa State universities had a high level of awareness of infopreneurship opportunities, with an overall mean of 3.09 and a standard deviation of 0.80. The highest awareness was recorded in the ability to convert information into business opportunities (Mean = 3.62; Std = 0.68), followed by blogging and online publishing (Mean = 3.58; Std = 0.74) and research and information consultancy services (Mean = 3.57; Std = 0.80), all rated very high. Awareness was also high regarding digital content creation, web design and ICT-related businesses, digital marketing and social media management, online tutoring, and the concept and benefits of infopreneurship. However, respondents demonstrated low awareness of online information-based businesses (Mean = 2.23; Std = 0.99) and printing, photocopying, scanning, and document services as information businesses (Mean = 2.16; Std = 0.94). Overall, the finding indicates that students possess a good general awareness of infopreneurship, particularly with respect to popular digital opportunities, but their awareness of some specific information-based business models remains limited.

Research Question Two: To what extent do undergraduate students in Adamawa State universities, Nigeria, utilise infopreneurship opportunities for job creation?

S/N	Utilisation of Infopreneurship Opportunities	N	Mean	Std	Decision
1	I create and sell digital information content.	**321**	2.52	0.91	High
2	I provide online tutoring or training services.	**321**	2.18	0.94	Low
3	I engage in research assistance and information consultancy services.	**321**	2.09	0.91	Low
4	I provide typing, printing, photocopying, scanning, and document processing services.	**321**	2.77	0.86	High
5	I engage in blogging, online publishing, or content writing.	**321**	2.16	0.94	Low
6	I provide social media management or digital marketing services.	**321**	2.17	0.89	Low
7	I engage in graphic design and digital content development.	**321**	2.06	0.88	Low
8	I provide web design or technology-based information services.	**321**	1.07	1.12	Very Low
9	I use online platforms to market information products or services.	**321**	2.20	0.92	Low
10	Infopreneurship activities contribute to my income generation.	**321**	2.86	0.92	High
	Cluster Mean		**2.21**	**0.93**	**Low**

Source: Field Survey, 2026

Table 2 showed the analysis on the extent of utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria. The findings revealed that undergraduate students in Adamawa State universities utilise infopreneurship opportunities to a low extent, with a cluster mean of 2.21 and a standard deviation of 0.93. The highest utilisation was recorded for typing, printing, photocopying, scanning and document processing services (Mean = 2.77; Std = 0.86), followed by income-generating infopreneurship activities (Mean = 2.86; Std = 0.92) and creating and selling digital information content (Mean = 2.52; Std = 0.91). However, utilisation of online tutoring, information consultancy, blogging, digital marketing, graphic design, online marketing and technology-based information services was generally low. Web design and technology-based information services recorded the lowest utilisation (Mean = 1.07; Std = 1.12). Overall, the result indicates an awareness–utilisation gap, suggesting that although students may be aware of infopreneurship opportunities, they have not sufficiently translated this awareness into practical activities for income generation and job creation.

Research Question Three: What challenges hinder the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria?

S/N	Challenges Hindering Utilisation of Infopreneurship Opportunities	N	Mean	Std	Decision
1	Lack of awareness limits students' participation in infopreneurship.	**321**	3.09	0.81	High
2	Poor internet connectivity affects participation in online information businesses.	**321**	3.10	0.87	High
3	Lack of adequate digital skills discourages students from engaging in infopreneurship.	**321**	3.43	0.69	Very High
4	Lack of startup capital prevents students from establishing information businesses.	**321**	3.19	0.83	High
5	Inadequate ICT facilities in universities limit participation.	**321**	3.07	0.85	High
6	Lack of mentorship reduces students' confidence in infopreneurship.	**321**	3.12	0.86	High
7	Limited knowledge of business management affects sustainability.	**321**	3.30	0.70	Very High
8	Insufficient university support affects students' entrepreneurial activities.	**321**	2.88	1.05	High
	Cluster Mean		**3.15**	**0.83**	**High**

Source: Field Survey, 2026

Table 3 showed the analysis of the challenges hindering the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria. The findings showed that challenges hindering the utilisation of infopreneurship opportunities among undergraduate students were generally high, with an overall mean of 3.15 (SD = 0.83). The most serious challenges were lack of adequate digital skills (Mean = 3.43; Std = 0.69) and limited knowledge of business management (Mean = 3.30; Std = 0.70), both rated very high. Other significant challenges include lack of start-up capital, poor internet connectivity, inadequate ICT facilities, lack of mentorship, insufficient awareness, and inadequate university support. Overall, the findings suggest that although students may be aware of infopreneurship opportunities, skills deficiencies, financial constraints, inadequate infrastructure, limited mentorship, and weak institutional support substantially hinder their ability to utilise these opportunities for job creation.

Hypothesis Testing

H_{01}: There is no significant relationship between awareness of infopreneurship opportunities and the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria.

Table 4: Significant relationship between awareness of infopreneurship opportunities and the utilisation of infopreneurship opportunities.

		Awareness of Infopreneurship Opportunities	Utilisation of Infopreneurship Opportunities	Decision
Awareness of Infopreneurship Opportunities	Pearson Correlation	1	.119*	Not Significant
	Sig. (2-tailed)		.046	
	N	**321**	**321**	
Utilisation of Infopreneurship Opportunities	Pearson Correlation	.119*	1	
	Sig. (2-tailed)	.046		
	N	**321**	**321**	

Source: Field Survey, 2026

Table 4 presents the results of the Pearson Product-Moment Correlation (PPMC) analysis conducted to determine the relationship between awareness of infopreneurship opportunities and the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria. Since the probability value (**p = 0.046**) is less than the **0.05** level of significance, the **null hypothesis (H_{03})** is **rejected**. Therefore, it is concluded that there is a significant relationship between awareness of infopreneurship opportunities and the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria.

Summary of Findings

Based on the analysis and presentation of data, the following are the summary of findings:

1. The findings revealed that undergraduate students in Adamawa State universities had a high level of awareness of infopreneurship opportunities.
2. The findings revealed that undergraduate students in Adamawa State universities utilise infopreneurship opportunities to a **low extent.**
3. The findings further showed that challenges hindering the utilisation of infopreneurship opportunities among undergraduate students were generally high.
4. Moreover, the study indicated that there is a significant relationship between awareness of infopreneurship opportunities and the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities, Nigeria.

Discussion of Findings

The finding revealed that undergraduate students in Adamawa State universities had a high level of awareness of infopreneurship opportunities. This indicates that the students generally possess considerable knowledge of the opportunities available for transforming information, digital knowledge, and information-related skills into income-generating activities. The finding is encouraging because awareness is an important prerequisite for recognising entrepreneurial opportunities and developing the intention to participate in information-based businesses. The

finding is consistent with Oloniruha et al. (2023), who investigated infopreneurship awareness and opportunities among Library and Information Science students at Prince Abubakar Audu University, Anyigba, Kogi State. Their study found that the majority of the students were aware of infopreneurship as a means of creating employment. The researchers further reported that business-centre activities such as photocopying, printing and lamination were among the common forms of infopreneurship preferred by students. However, the present finding differs somewhat from the specific pattern reported by Oloniruha et al. (2023). While their respondents identified printing, photocopying, and lamination relatively strongly, students in Adamawa State recorded low awareness of printing, photocopying, scanning and document services. This difference may be attributable to differences in students' academic backgrounds, institutional environments, exposure to entrepreneurship education and the extent to which traditional information businesses are incorporated into university entrepreneurship programmes. The present finding is also supported by Bamgbose (2021), which found generally positive responses concerning students' interest in infopreneurship and emphasized its potential to provide self-employment opportunities for students before graduation.

Furthermore, the finding of the study revealed that undergraduate students in Adamawa State universities utilise infopreneurship opportunities for job creation to a low extent. Although students reported relatively high utilisation of typing, printing, photocopying, scanning and document-processing services, as well as income-generating infopreneurship activities generally, their participation in more advanced information and digital entrepreneurial activities was low. This finding suggests that undergraduate students have not sufficiently converted information and digital competencies into diverse entrepreneurial activities capable of generating sustainable income and employment. The finding is consistent with Okolie et al. (2021), who found that entrepreneurship education was positively associated with opportunity recognition, opportunity assessment, creative problem-solving, self-efficacy, and networking, but was not significantly associated with several other competencies, including resource leveraging, innovation, and resilience. The present finding also agrees with Amao-Taiwo, Shittu and Yinusa (2023), who found a significant positive relationship between student support services and entrepreneurship skills development. A particularly relevant comparison can be made with Sunoma and Adamu (2026), who found that digital competence and entrepreneurship education alone were not sufficient to produce strong digital entrepreneurial intentions; rather, entrepreneurial self-efficacy strengthened their effects.

Furthermore, the study revealed that the challenges hindering the utilisation of infopreneurship opportunities for job creation among undergraduate students in Adamawa State universities were generally high**.** The finding indicates that, although students have considerable awareness of infopreneurship opportunities, they face substantial barriers in converting such awareness into practical entrepreneurial activities. The most serious challenges were a lack of adequate digital skills and limited knowledge of business. Other important constraints included lack of start-up capital, poor internet connectivity, inadequate ICT facilities, lack of mentorship, insufficient awareness, and inadequate university support. The result therefore suggests that the low utilisation of infopreneurship opportunities is not necessarily due to students' unwillingness to become infopreneurs, but rather to a combination of skills, financial, infrastructural and institutional constraints**.** The finding is strongly supported by Akidi and Udoh (2021)**,** who found that inadequate skills constitute a major obstacle to exploiting information as an economic resource. The result is also consistent with Enang (2023), who argued that inadequate digital entrepreneurial

competencies reduce students' effectiveness in business activities and their competitiveness in the digital economy.

The hypothesis tested revealed that there is a statistically significant relationship between awareness of infopreneurship opportunities and their utilisation for job creation among undergraduate students in Adamawa State universities, Nigeria. The finding indicates that students' awareness of available infopreneurship opportunities is significantly associated with their utilisation of such opportunities. This suggests that students who possessed greater awareness of infopreneurship opportunities may be more likely to recognise and engage in information-based entrepreneurial activities that can provide employment and income-generating opportunities. The finding is consistent with Oloniruha et al. (2023), who reported a considerable level of awareness of infopreneurship opportunities among students and identified activities such as printing, photocopying, and other information-related business services as areas through which students could engage in entrepreneurial activities. The finding also agrees with Okolie et al. (2021), who found that entrepreneurship education was positively associated with important entrepreneurial competencies, including opportunity recognition, opportunity assessment, creative problem-solving, self-efficacy, and networking. Similarly, Pham et al. (2024) found that digital entrepreneurial knowledge was positively related to entrepreneurial self-efficacy and attitudes among university students, while self-efficacy and attitudes were associated with digital entrepreneurial intention.

Conclusion

Based on the findings of the study, it can be concluded that undergraduate students in Adamawa State universities possessed a high level of awareness of infopreneurship opportunities, indicating that they have considerable knowledge of the potential of information-related activities as avenues for income generation and job creation. However, despite this high level of awareness, the students' level of utilisation of infopreneurship opportunities was to a low extent. This suggests that awareness of available opportunities does not necessarily translate into actual participation or entrepreneurial practice. The study further concludes that challenges hindering the utilisation of infopreneurship opportunities were generally high among undergraduate students. These challenges may limit students' ability to transform their awareness and interest into viable information-based entrepreneurial activities.

The study established a significant relationship between awareness of infopreneurship opportunities and their utilisation for job creation among undergraduate students in Adamawa State universities. This finding implies that increased awareness is associated with students' utilisation of infopreneurship opportunities. The study concludes that infopreneurship has considerable potential as an avenue for addressing graduate unemployment and promoting job creation among undergraduate students in Adamawa State universities. However, this potential cannot be fully realised through awareness alone. There is a need for universities and relevant stakeholders to complement awareness programmes with practical training, adequate infrastructure, access to funding, reliable internet services, and supportive entrepreneurial environments that enable students to convert identified infopreneurship opportunities into sustainable income-generating ventures.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. Universities in Adamawa State should incorporate practical infopreneurship training into entrepreneurship and relevant academic programmes. The training should expose students to practical opportunities such as digital publishing, printing, photocopying, scanning, online information services, information consultancy, content creation, and other information-based businesses.
2. Universities in Adamawa State should establish and strengthen entrepreneurship support centres for students. Such centres should provide students with practical training, mentoring, business advisory services, access to relevant ICT facilities and opportunities to acquire hands-on experience in infopreneurship.
3. Government, universities and other relevant stakeholders should address the challenges hindering students' utilisation of infopreneurship opportunities by improving access to reliable electricity, internet connectivity, ICT infrastructure, modern equipment and affordable digital services.
4. Universities in Adamawa State should regularly organise entrepreneurship seminars, workshops, exhibitions, business competitions and innovation programmes that encourage students to apply their knowledge in real-life situations.

References

Adegbilero, I. I., Simisaye, A. O., Adegbilero, O. E., Ayeni, A. W. & Ikokoh, J. J. (2026). Linking Entrepreneurial Curiosity and Innovativeness to Infopreneurial Intention: Evidence from Final-Year LIS Students. *ABUAD Journal of Social and Management Sciences* 7 (1): 80-99. https://doi.org/10.53982/ajsms.2026.0701.05-j

Akidi, J. O., & Udoh, I. U. (2021). Infopreneurship skills for sustainable development: A focus on Library and Information Science students of selected federal universities in Nigeria. *Library Philosophy and Practice (e-journal)*.

Amakiri, D. (2025). *Infopreneurship: A Catalyst for Knowledge Economy Development in Nigeria*. SIAR-Global Journal of Computer, Information & Library Science, Vol. 1, No. 1. DOI: 10.5281/zenodo.17742517.

Amao-Taiwo, B., Shittu, A., & Yinusa, O. (2023). Higher education student entrepreneurship support services: Implications for the development of entrepreneurial skills. *Covenant Journal of Entrepreneurship, 7*(1).

Bamgbose, T. K. (2021). Influence of demographic factors on interest of LIS undergraduates in infopreneurship: A comparative analysis. *Library Philosophy and Practice (e-journal)*, 6114.

Enang, C. E. (2023). Digital entrepreneurial skills and competencies required from Business Education students to work in the digital era. *Nigerian Journal of Business Education*. *19*(1), 100452

Friday, J., & Sawyer-George, O. (2023). Practice of infopreneurship by librarians in public university libraries in South-South Nigeria. *Evidence-Based Library and Information Practice, 18*(3), 26–52. https://doi.org/10.18438/eblip30235

Liman, Y. A., & Shuaibu, U. (2024). Infopreneurship skills of academic librarians in libraries in Bauchi and Gombe States for effective information marketing services delivery. *UNIZIK Journal of Research in Library and Information Science*.

Mubofu, C. & Malekani, A. (2023). A systematic review of infopreneurship's opportunities and challenges. *Business Information Review*, 40(2): 25-31. https://doi.org/10.1177/02663821231174403

Okolie, U. C., Igwe, P. A., Ayoola, A. A., Nwosu, H. E., Kanu, C., & Mong, I. K. (2021). Entrepreneurial competencies of undergraduate students: The case of universities in Nigeria. *The International Journal of Management Education, 19*(1), 100452. https://doi.org/10.1016/j.ijme.2021.100452

Oloniruha, E. A; Momohjimoh, K. O.; Ohiani, M. O; & Oluleye, H. R. (2023). Infopreneurship Awareness and Opportunities among Library and Information Science Students in Prince Abubakar Audu University, Anyigba, Kogi State, Nigeria. *Library Philosophy and Practice (e-journal)*. 7852. https://digitalcommons.unl.edu/libphilprac/7852

Pham, T. T. T., Nguyen, T. H., & others. (2024). Antecedents of digital entrepreneurial intention among engineering students. *International Journal of Information Management Data Insights, 4*(1), 100233. https://doi.org/10.1016/j.jjimei.2024.100233

Sulyman, A. S., Ajani, F. O., Idowu, A. O., & Badmus, I. B. (2024). Infopreneurship and Technopreneurship Readiness for Job Creation Among Nigerian Library and Information Science Graduates. *Asian Journal of Information Science and Technology*, *14*(2), 27–33. https://doi.org/10.70112/ajist-2024.14.2.4278

Sunoma, K. Z., & Adamu, M. (2026). Mediating role of entrepreneurial self-efficacy on the relationship between digital competence, entrepreneurship education, and digital entrepreneurial intention of university students in North-Eastern Nigeria. *International Journal of Intellectual Discourse, 9*(1).

Beyond the Stacks: Reinvigorating Information Literacy for Infopreneurial Empowerment of Young Library and Information Professionals

By

Sani, Job Onekutu; Oseji, Nneka Angela; Mamman Murtala Anokehi and James Friday
Department of Library and Information Science, Federal University Lokoja, Kogi State, Nigeria[1, 2 and 3] Kaduna State University, Kafanchan Center[4]

Email: sani.job4real@gmail.com[1], nnekaosejiangela@gmail.com[2] and mammanmurtala123@gmail.com[3]

Abstract

This opinion research paper discusses the critical need to reinvigorate Information Literacy (IL) competencies as a cornerstone for the infopreneurial and sustainable economic empowerment of young Library and Information Professionals (LIPs) facing shrinking traditional employment due to accelerating digital transformation. Challenging the traditional view of information literacy as a purely academic or service-oriented capability, the authors argue for a definitive paradigm shift that reframes information mastery as a highly marketable commercial asset within the global gig economy. The paper systematically analyzes the friction between legacy Library and Information Science (LIS) pedagogy and contemporary market dynamics, highlighting how core IL skills can be split into viable, high-margin revenue channels such as competitive intelligence, digital fact-checking, and AI prompt engineering. Ultimately, by outlining essential technical and business competencies to integrate into training structures, evaluating institutional and structural challenges, and proposing practical recommendations, including curriculum re-engineering and business incubation. The paper provides a comprehensive strategic roadmap to transform young library and information professionals from passive, altruistic custodians into proactive, wealth-creating infopreneurs.

Keywords: *Information, Information Literacy Skills, Infopreneurship, Library and Information Professionals, and Empowerment*

Introduction

The global information landscape is undergoing a radical metamorphosis, driven by unprecedented digital transformation. For young Library and Information Professionals (LIPs), this transformation is a double-edged sword. On one hand, it has democratized access to information; on the other, it has triggered a contraction in traditional library employment paradigms, leaving many young professionals grappling with job insecurity and career stagnation (Aruwoye et al., 2022). Historically, the library profession has been perceived as a public-good-oriented vocation, anchored on the passive custodianship of physical resources. However, the contemporary economy demands proactive value creators, not mere custodians.

To survive and thrive in this shifting ecosystem, there is an urgent need to look "beyond the stacks." This paper posits that Information Literacy (IL) traditionally viewed as a tool for aiding library users in academic research, must be reinvigorated and reframed as a commercial asset. By transitioning from a service-oriented mindset to an infopreneurial one, young Library and Information Professionals can leverage their mastery of information organization, evaluation, and synthesis to create sustainable revenue streams (Udo, Epkenyong & Ekanem, 2021). This paper critically examines the disconnect between current Library and Information Science (LIS) pedagogy and market realities, explores viable infopreneurial revenue streams rooted in IL, and proposes framework modifications necessary for the economic empowerment of young professionals in the gig economy.

Conceptual Clarifications

Information Literacy (IL) extends far beyond the ability to use search engines. The American Library Association (ALA) defines it as the ability to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (ACRL, 2015, p. 3). In the context of this paper, IL is not just an academic competency but a specialized, high-level cognitive skill involving data curation, knowledge synthesis, and information packaging.

Infopreneurship is the portmanteau of "information" and "entrepreneurship." It refers to the process of creating value and generating revenue by transforming information, data, or knowledge into digital or physical products and services (Detlor et al., 2021). For the young LIP, infopreneurship means monetizing the very skills they are trained in moving from answering reference questions for a salary to solving complex information deficits for a fee in the open market.

The Disconnect Between Library and Information Science Pedagogy and Market Realities

A key issue for young Library and Information Professionals is the gap between LIS education and today's job market. Many African LIS programs still focus on traditional skills like cataloging and archiving, as noted by Ocholla (2019), but fail to adapt to the rapid changes brought by digital transformation.

The disconnect between library and information science (LIS) education and market demands leaves young graduates economically disempowered. While the 21st-century economy values agility and digital branding, LIS pedagogy, as noted by Igbinovia & Obuh (2021), frames information literacy (IL) as a service confined to academic settings, neglecting its commercial potential.

Paradigm Shift in Information Mastery: From Academia to Commercial Asset

The economic value of information asymmetry is central to reframing information mastery as a commercial asset. In the gig economy, clients face significant knowledge gaps, and professionals skilled in information mastery can synthesize difficult-to-find data into actionable insights. By addressing these gaps, they turn academic knowledge into a profitable commodity, with clients willing to pay for the competitive advantages offered by specialized knowledge (Chibuzor & Mole, 2023).

To empower young Library and Information Professionals (LIPs), it is essential to shift the perception of information mastery from an academic pursuit to a commercial asset. This change encourages LIPs to transition from traditional roles, such as "reference librarian," to "knowledge brokers," focusing on addressing clients' business problems (Dim & Mole, 2023). In a gig economy, where clients require data miners and intelligence analysts, recognizing information literacy (IL) as a competitive advantage is crucial for young professionals to succeed in lucrative markets (Popova, 2022).

The decline of traditional full-time employment in information-related fields, such as librarianship and corporate research, demands a new entrepreneurial approach to skills. As organizations reduce staff or automate tasks, reliance on stable salaries diminishes. Consequently, professionals must view information mastery not merely as job responsibilities but as independent business assets, transforming these skills into freelance consulting, micro-consultancies, or digital products to secure sustainable income (Adeyi, Oyelekan & Adeyemi, 2016).

Furthermore, the paradigm shift illustrates the transition from a manufacturing-based economy to a knowledge-based economy driven by intellectual capital. In this new environment, ideas and specialized knowledge take precedence over physical goods (Odede & Zawedde (2018). Mastery of information becomes essential, enabling gig workers to create white papers, educational products, and advisory services. Thus, wealth generation in the gig economy is closely linked to the creation and monetization of knowledge, making information mastery a form of commercial value creation (Foster, 2022).

Factors that are Challenging the Conventional Perception of Information Literacy as a Purely Academic or Service-oriented Skill Set

The Persistent Change in the Economy: The digital economy has shifted Information Literacy (IL) from a supportive academic role to a key factor in value creation. Professionals now use specialized skills for independent services, making the ability to locate and synthesize information a marketable asset. Young professionals in fields like Library and Information Science are leveraging IL skills for consulting, freelance research, and knowledge product monetization, challenging the view of IL as just an institutional service (Detlor et al., 2021).

Proliferation of big data: The rise of big data has made information literacy (IL) essential for business intelligence and decision-making. Organizations are overwhelmed by unstructured data, necessitating professionals with critical evaluation skills to distinguish actionable insights (Hirsh, 2022). This evolution positions IL as a vital business skill, with companies seeking individuals who can effectively evaluate information to mitigate risks and inform strategies, highlighting IL's significance beyond academia.

The contemporary crisis of misinformation, Information literacy (IL) has evolved from a tool for academic enrichment to a crucial civic skill, particularly in combating misinformation. In today's post-truth landscape, inadequate information evaluation affects public health, democratic processes, and societal unity (Foster, 2022). Policymakers and educators now view IL as essential for navigating various media, marking a significant shift from its previous focus on higher education and student success.

Competitive Intelligence (CI) in modern business: The strategic importance of Competitive Intelligence (CI) redefines Information Literacy (IL) from a service-oriented role to a profit-driven necessity. It involves the ethical gathering and analysis of external information about competitors and markets, enabling information professionals to act as corporate strategists who protect proprietary data while leveraging open-source intelligence for competitive advantage (Vaughan, 2020).

Integration of Artificial Intelligence (AI): The integration of Artificial Intelligence (AI) into daily workflows has transformed Information Literacy (IL) into algorithmic literacy, extending beyond traditional academic contexts. Core IL skills, such as evaluating authority and verifying accuracy, are now essential for assessing machine-generated outputs. Professionals must develop the competency to create effective prompts and critically evaluate AI outputs, highlighting that IL now encompasses the management and validation of synthetic information in technical environments (Ali & Richardson, 2025).

The convergence of Information Literacy with digital and media literacies: The convergence of Information Literacy (IL) with digital and media literacies has blurred the lines that once confined IL to academic libraries. In today's digital ecosystem, processes of consuming, creating, and sharing information are interconnected and influenced by complex frameworks, including copyright and data privacy (Mackey & Jacobson, 2021). Modern IL now includes understanding digital footprints and managing online identities, making it a holistic skill essential for professional viability, rather than being limited to academic contexts.

Areas of Information Literacy Skills as Viable Infopreneurship Revenue Streams

To transform information literacy (IL) from an altruistic academic concept into an engine for economic growth, young library and information professionals (LIPs) must view their skills through a commercial lens. When information mastery is treated as an economic commodity, its core competencies can easily be split into specialized business offerings within the global economy (Maina, 2021). By shifting away from standard repository management, young professionals can tap into distinct, high-margin infopreneurship revenue streams that address the massive data demands of modern industries [Ocholla, 2019]. The reinvigorated IL competencies of young Library and Information Professionals can be directly translated into specific, marketable infopreneurial ventures. These include:

1. ***Competitive Intelligence (CI) and Market Research:*** Businesses constantly require insights into competitor strategies, market trends, and consumer behavior. Library and Information Professionals can use their advanced searching and evaluation skills to gather open-source intelligence (OSINT) and package it into sellable Competitive Intellegenge (CI) reports (Vaughan, 2020).

2. ***Systematic Reviews and Grant Writing:*** The demand for systematic reviews in health, social sciences, and public policy has skyrocketed. Young Library and Information Professionals can

offer freelance services to researchers and NGOs, utilizing their expertise in database searching and PRISMA guidelines to conduct exhaustive literature searches for a fee (Popova, 2022).

3. ***Data Curation and Visualization:*** Raw data is useless without curation. Library and Information Professionals can offer services in cleaning, organizing, and visualizing data for small and medium enterprises (SMEs) that cannot afford full-time data scientists (Maina, 2021).

4. ***Content Strategy and Development:*** Information literacy involves understanding information needs. Library and Information Professionals can operate as content infopreneurs, using SEO principles and audience analysis to create blogs, newsletters, and white papers that generate ad revenue or serve as marketing assets for corporate clients (Ettarh, 2018).

5. ***Intellectual Property and Copyright Consulting:*** Navigating the complexities of Creative Commons, Fair Use, and copyright laws is a nightmare for many creators. Library and Information Professionals can monetize their knowledge of information ethics by acting as IP consultants for digital creators and publishers (Webber & Johnston, 2017).

6. ***Information Brokerage and Independent Research Contracting:*** offers a direct pathway to monetize document retrieval, source verification, and archival discovery skills. Many law firms, independent authors, media houses, and documentarians lack the deep-web searching techniques or the historical archival competencies necessary to track down obscure records (David & Oghenetega, 2022). By operating as independent information brokers, young LIPs can offer freelance investigative research services, charging clients based on the complexity and depth of the information retrieved.

7. ***Digital Fact-Checking and Verification Services:*** provides a lucrative niche to fight the rise of generative deepfakes, algorithmic biases, and digital misinformation. Legal institutions, news agencies, and political campaigns require rigorous, non-partisan source evaluation to protect their brands from reputational damage (Webber & Johnston, 2017). Armed with advanced information evaluation literacy, independent LIPs can launch specialized verification agencies that audit online claims, trace digital asset origins, and provide definitive verification certifications.
8. ***Bibliometric and Research Impact Analytics:*** allows infopreneurs to cater to private research institutes, individual academics, and medical centers looking to maximize their funding opportunities. Securing research grants requires deep analytics regarding citation impacts, h-index tracking, and mapping collaborative publication networks (Webber & Johnston, 2017). An information professional can monetize their knowledge of indexing databases (e.g., Scopus, Web of Science) to provide researchers with personalized bibliometric profile optimization and targeted funding-opportunity maps.

Things to Integrate into Information Literacy Structures to Effectively Transform Young Library and Information Professionals

By integrating specialized business mechanics, technology frameworks, and economic literacy into existing competencies, library schools can produce highly resilient infopreneurs capable of navigating the global gig market (Ocholla, 2019).

Integration of Digital Literacy and Emerging Technologies: Information literacy structures should integrate digital literacy and emerging technologies to prepare young library and

information professionals for the rapidly changing information environment. Training should cover digital search strategies, online databases, social media, artificial intelligence, data management, and emerging library technologies. Professionals should learn not only how to use these technologies but also how to evaluate their reliability, relevance, and ethical implications. This will enable them to provide effective digital services and guide library users in navigating the increasingly complex online information landscape (Ogbodo & Nweke, 2023).

Integration of Critical Thinking and Information Evaluation Skills: Young professionals need to distinguish between credible information and misinformation, disinformation, biased content, and unreliable sources. Information literacy programmes should therefore teach techniques for evaluating authorship, evidence, authority, currency, accuracy, and purpose. Developing these skills will make young library professionals better equipped to support users in making informed decisions and conducting reliable academic and professional research (Umunnakwe & Nwosu, 2021).

Research and data literacy: should also be integrated into information literacy structures. Young professionals should understand research methods, information retrieval, data interpretation, citation practices, copyright, and scholarly communication. They should be trained to work confidently with bibliographic databases, institutional repositories, research-management tools, and basic data-analysis techniques. These competencies can transform them from traditional information providers into active research-support professionals who contribute meaningfully to knowledge creation and dissemination (Igbinovia & Obuh, 2021).

Information literacy structures should further emphasize ***communication, collaboration, and leadership skills***: Modern library professionals work with students, researchers, educators, technology specialists, policymakers, and community members, making interpersonal and teamwork abilities essential. Training should include presentation skills, public speaking, user engagement, conflict management, project management, and leadership development. These skills can help young professionals become innovative leaders who are capable of identifying community information needs and designing services that respond effectively to them (Ocholla, 2019).

Integration of Ethical, Cultural, and Inclusive Information Practices: Young library and information professionals should understand intellectual freedom, privacy, information ethics, accessibility, cultural diversity, and responsible use of technology. Information literacy structures should prepare them to serve users regardless of socioeconomic status, ability, language, or background (Mackey & Jecobson, 2021). By emphasizing inclusion and ethical practice, libraries can develop professionals who protect users' rights while ensuring equitable access to reliable information and knowledge resources.

Finally, information literacy structures should ***Incorporate Lifelong Learning, Innovation, and Professional Development.*** Because information technologies and user expectations continually change, young professionals must develop a mindset of continuous learning. Opportunities such as mentorship, workshops, internships, professional networking, practical projects, and exposure to emerging technologies can strengthen their adaptability and creativity. Integrating these elements will produce young library and information professionals who are technologically competent, critically minded, ethical, innovative, and capable of transforming libraries into dynamic centres for learning, research, and community development (Head, Fister & MacMillan, 2022).

AI Prompt Engineering and Semantic Modeling must be codified as core literacy modules. As large language models (LLMs) continue to rewrite how information is retrieved, the ability to architect precise, context-aware semantic prompts is becoming a premium corporate requirement. Because librarians are naturally grounded in controlled vocabularies, thesaurus design, and boolean logic, integrating prompt architecture into IL frameworks allows them to specialize in optimizing AI outputs, validating dataset inputs, and mitigating algorithmic hallucinations for tech firms (Vaughan, 2020).

Digital Marketing and Personal Branding: must be tightly integrated into modern information literacy frameworks. It is no longer enough for an information professional to know how to filter and evaluate complex datasets; they must also possess the capability to pitch their cognitive skills to the commercial market (David & Oghenetega, 2022). Integrating personal branding teaches young LIPs how to leverage digital business networks (e.g., LinkedIn) and dynamic content marketing strategies to establish industry authority, turning obscure research skills into highly visible, client-facing consulting services.

Entrepreneurial Mindset and Risk Management: This requires a deliberate, systematic dismantling of "vocational awe" the institutional myth that library work is an inherently sacred service that should remain separate from commercial market value (Ettarh, 2018). By introducing strategic risk assessment, lean startup methodologies, and business pivoting strategies directly into LIS curricula, training frameworks can build resilient, growth-oriented professionals who view economic volatility as a fertile landscape for market innovation.

Challenges Limiting Effective Reinvigoration of Information Literacy for Infopreneurial Empowerment of Young Library and Information Professionals

While the transformation of information mastery from an academic service to an entrepreneurial asset promises economic resilience, structural and cultural constraints frequently stall this momentum. Addressing these constraints requires a balanced evaluation of operational bottlenecks and strategic remedies. Below are distinct challenges limiting the effective reinvigoration of information literacy for infopreneurial empowerment:

1. ***Inadequate funding and limited resources:*** One major challenge limiting the reinvigoration of information literacy is insufficient financial support for library and information services. Many institutions operate with limited budgets, making it difficult to provide modern computers, reliable internet connectivity, digital databases, training materials, and other technological resources (Ettarh, 2018). Without adequate funding, young library and information professionals may struggle to acquire the skills and tools needed to identify, package, market, and monetize information products and services. This limits their ability to develop sustainable infopreneurial ventures and compete effectively in the digital economy.
2. ***Rapid technological changes and skills gaps:*** The continuous emergence of artificial intelligence, big data, cloud computing, social media, and other digital technologies creates a significant challenge for information literacy programmes. Young professionals may find it difficult to keep their knowledge and skills current when technologies and digital platforms change so rapidly (David & Oghenetega, 2022). Inadequate exposure to emerging technologies can create a gap between what is taught in library and information science programmes and what is required in contemporary information markets. Consequently, professionals may lack the technical and digital competencies necessary to transform information resources into innovative entrepreneurial opportunities.

3. ***Weak integration of entrepreneurship into library and information science education:*** Traditional library and information science education often emphasizes information organization, retrieval, preservation, and user services without giving sufficient attention to entrepreneurship and business development. As a result, young professionals may graduate with strong conventional library skills but limited knowledge of business planning, marketing, customer identification, pricing, financial management, branding, and innovation. Effective infopreneurial empowerment requires information literacy to be connected with entrepreneurial education so that professionals can recognize information needs as potential business opportunities (Foster, 2022).
4. ***Poor access to mentorship, professional networks, and practical experience:*** Young library and information professionals need experienced mentors and professional networks to translate information literacy competencies into successful entrepreneurial activities. However, limited opportunities for mentorship, internships, collaborative projects, and interaction with successful infopreneurs can restrict their exposure to real-world practices. Without guidance, young professionals may find it difficult to identify viable information-based business models, understand market demands, or overcome the challenges associated with starting and managing an information enterprise (Ogbodo & Nweke, 2023).
5. ***Limited awareness of market opportunities and changing user needs:*** Another challenge is inadequate understanding of the information needs and purchasing behaviour of potential users. Infopreneurship requires professionals to identify problems that can be addressed through information products and services, such as research support, digital content creation, information consultancy, training, data services, and knowledge management (David & Oghenetega, 2022). When information literacy programmes focus mainly on academic or traditional library activities, young professionals may fail to recognize these emerging opportunities.
6. ***Institutional and policy constraints:*** Restrictive institutional policies, bureaucratic procedures, inadequate professional autonomy, and limited support for innovation can discourage young professionals from pursuing information-based entrepreneurial initiatives. Some library environments may be slow to adopt new technologies or may not provide incentives for experimentation and entrepreneurship (Vaughan, 2020). In addition, unclear policies relating to intellectual property, data protection, copyright, and commercialization of information can create uncertainty for aspiring infopreneurs.
7. ***Resistance to change and inadequate continuous professional development:*** Finally, resistance to new approaches can limit efforts to reinvigorate information literacy. Some professionals and institutions may remain attached to traditional library practices and view entrepreneurship, artificial intelligence, digital content creation, or commercial information services as outside the conventional role of librarians. At the same time, limited opportunities for continuous professional development can prevent young professionals from adapting to new expectations Makinde et al. (2023).
8. ***Severe Infrastructure Deficits and High Operational Costs*****:** such as erratic power supplies, poor internet connectivity, and expensive access keys for high-end research databases—stifle young LIPs trying to launch independent data ventures in developing markets (David & Oghenetega, 2022). This structural challenge can be solved through the Establishment of Shared LIS Tech-Hubs and Open-Access Alliances. Academic institutions and professional bodies

should build digital co-working incubation centers equipped with solar power and subsidized enterprise database access, allowing young infopreneurs to prototype information services without overwhelming overhead costs (Ocholla, 2019).

9. ***Low Market Awareness of LIS Commercial Capabilities*** means corporate industries routinely overlook young LIPs for data curation roles, instead preferring business or computer science graduates due to a persistent stereotype that librarians only handle physical books (David & Oghenetega, 2022). The remedy requires Aggressive B2B Advocacy and Institutional Branding Campaigns by national library associations (Webber & Johnston, 2017).

Solutions to the Challenges Limiting Effective Reinvigoration of Information Literacy for Infopreneurial Empowerment of Young Library and Information Professionals

1. **Increase funding and provide adequate technological infrastructure.** The first solution to enhance entrepreneurship among library and information professionals in Nigeria is to improve financial investment in relevant services. This involves providing essential resources such as computers, internet access, digital databases, and software. Additionally, dedicated funding for entrepreneurial projects is crucial, as identified by Makinde et al. (2023), who highlighted challenges such as funding shortages and inadequate skills. Sustainable funding is thus essential for transforming information literacy into practical business opportunities.
2. **Integrate digital, data, and artificial intelligence literacy into professional training.** The document emphasizes the need to update information-literacy programs to incorporate emerging technologies like AI, data analytics, and cloud computing. It highlights the importance of training young library professionals not only to use these technologies but also to critically evaluate them and ensure ethical usage. UNESCO (2024) advocates for the integration of AI literacy into media and information literacy due to its impact on information processes. Additionally, IFLA's Information Literacy Section identifies this integration as crucial for creating future-ready libraries.
3. **Integrate entrepreneurship and business education into LIS curricula.** The third solution involves redesigning library and information science curricula to emphasize entrepreneurship. Courses should include topics such as opportunity identification, business-model development, and financial management, alongside practical projects that address real information problems. This initiative is in response to identified weaknesses among Nigerian LIS professionals in essential entrepreneurial skills (Makinde et al., 2023), aiming to enhance the link between information literacy and entrepreneurship, enabling graduates to create sustainable information-based ventures.
4. **Establish mentorship, incubation, internship, and professional networking programmes.** he fourth solution involves creating structured learning opportunities for young professionals through mentorship schemes and entrepreneurship initiatives established by library schools and professional associations. These initiatives, including internships and networking events, would provide exposure to real-world experiences essential for developing entrepreneurial competence, which cannot be achieved through classroom instruction alone. Collaborations between universities, libraries, tech organizations, and successful infopreneurs can foster a supportive ecosystem for young professionals Makinde et al. (2023).
5. **Make information literacy more market-oriented and user-centred.** The fifth solution suggests reshaping information literacy to align with users' evolving needs and market

opportunities. Young professionals should learn to assess needs, identify informational gaps, understand target audiences, analyze markets, and design problem-solving services. Potential offerings include research consultancy, information brokerage, digital content creation, and more (Dim & Mole, 2023). This approach helps professionals transform their information skills into valuable economic services and promotes infopreneurship by encouraging a view of information as a transformative asset.

6. **Develop supportive institutional, legal, and policy frameworks.** The sixth solution advocates for policies that promote responsible innovation and information entrepreneurship in libraries and educational institutions. This involves developing guidelines on copyright, intellectual property, data protection, privacy, licensing, commercialization, and the ethical use of AI. Government action is also essential to streamline business registration and support young professionals in creating legitimate information enterprises. Makinde et al. (2023) note entrepreneurship challenges for LIS professionals, while IFLA (2025) highlights the importance of considering copyright when adopting AI. Supportive policies can mitigate uncertainties and foster a conducive environment for responsible information entrepreneurship.
7. **Institutionalize lifelong learning and continuous professional development.** The seventh solution emphasizes the necessity of integrating continuous professional development into the career advancement of young library and information professionals. Universities, employers, and professional associations should offer workshops, certifications, and programs focusing on emerging skills such as AI literacy and data literacy. Recent studies highlight the importance of AI competencies for academic library workers, indicating a need for systematic approaches to professional AI literacy (Ali & Richardson, 2025). Continuous learning is essential for professionals to adapt to technological advancements and avoid obsolescence.
8. **Reduce the digital divide and promote inclusive access to information technologies.** The eighth solution emphasizes the need to address unequal digital infrastructure access. Cooperation among libraries, governments, universities, and technology firms is essential to provide affordable internet, devices, and training. Information-literacy programs must cater to diverse socioeconomic backgrounds and digital skills. According to IFLA (2025), libraries can enhance AI literacy and empower communities in navigating evolving information landscapes, thus broadening the reach of young infopreneurs and fostering inclusive information services.
9. **Strengthen ethical information practices, critical evaluation, and responsible AI use.** The ninth solution emphasizes integrating ethics, critical thinking, and responsible AI use into information-literacy education for young professionals. It highlights the importance of verifying AI-generated information, recognizing misinformation, and respecting privacy and copyright. UNESCO (2024) identifies disinformation and data-rights violations as key challenges of generative AI, while IFLA (2025) advocates for values like accountability and equitable access in library practices. Such principles will empower young infopreneurs to develop trustworthy and socially responsible services.

Recommendations

To reinvigorate information literacy for infopreneurial empowerment among young library and information science professionals in the gig economy, the following recommendations are proffered:

i) Curriculum re-engineering: Library and Information Science programmes should expand beyond traditional competencies to include entrepreneurship, digital marketing, business planning, financial management, consultancy, information brokerage, and information-product development. This integration can help young professionals convert information literacy skills into economic opportunities.

ii) Library and Information Science (LIS) schools should create practical learning environments such as innovation laboratories and digital studios to enhance student development and marketing of information products. Training should prioritize hands-on activities over theoretical knowledge.

iii) Young library and information professionals should undergo regular training in emerging technologies such as artificial intelligence and data analytics. Continuous professional development is essential for staying relevant and seizing new opportunities in information-based businesses.

iv) Professional associations, universities, and library management should establish mentorship programmes that connect young professionals with experienced librarians, information entrepreneurs, technology specialists, publishers, and business experts through internships, workshops, business incubation, and networking events.

v) The Nigerian Library Association and other relevant professional bodies should promote infopreneurship through conferences, certification programmes, competitions, publications, and networking platforms, which can help reposition young library and information professionals from predominantly job seekers to innovative creators of information-based employment and services.

References

Ali, M. Y., & Richardson, J. (2025). AI literacy guidelines and policies for academic libraries: A scoping review. *IFLA Journal, 51*(3), 588–599. https://doi.org/10.1177/03400352251321192.

Adeyi, J. O., Oyelekan, G. O., & Adeyemi, A. O. (2016). Infopreneurship: A tool for employment opportunities and self-reliance among Library and Information Science graduates in Nigeria. *Journal of Information Science and Technology*, 6(2), 45–58Aruwoye, K.,

Odede, I., & Zawedde, A. (2018). Information literacy skills and the competencies of contemporary African librarians. *African Journal of Information Systems*, 10(3), 190–204.

Ogunmodede, T. A., & Oyewusi, F. O. (2022). Digital transformation and the future of librarianship in Africa: Navigating the new normal. *Library Hi Tech News*, 39(4), 12–16. https://doi.org/10.1108/LHTN-02-2022-0013

Association of College and Research Libraries. (2015). *Framework for information literacy for higher education*. American Library Association. ala.org

Chibuzor, L. D., & Mole, A. J. C. (2023). Infopreneurship as a tool for enhancing employment opportunities for Library and Information Science students and graduates in Nigeria. *Global Review of Library and Information Science (GRELIS)*, 19(Special Edition), 1–15.

David, O. A., & Oghenetega, L. U. (2022). Infopreneurship prospects among library and information science students: A developmental paradigm. *Journal of Electronic Resources Librarianship, 34*(3), 195–208. doi.org

Detlor, B., Julien, H., Willson, R., & Serenko, A. (2021). Information literacy and knowledge management: A comparison of undergraduate students' perceptions. *Journal of Information Science*, *47*(2), 243–258. https://doi.org/10.1177/0165551519876253

Dim, C. L., & Mole, A. J. C. (2023). Infopreneurship and financial satisfaction among library and information science professionals in academic libraries in South-East, Nigeria. *Library Philosophy and Practice (e-journal)*, Article 8894. sjsu.edu

Ettarh, F. (2018). Vocational awe and librarianship: The lies we tell ourselves. *In the Library with the Lead Pipe*. inthelibrarywiththeleadpipe.org

Foster, A. (2022). Misinformation in the digital age: An overview of the information literacy response. *Journal of Librarianship and Information Science*, *54*(1), 3–14. https://doi.org/10.1177/09610006211032178

Head, A. J., Fister, B., & MacMillan, M. (2022). *Information literacy in the age of algorithms*. Project Information Literacy. https://projectinfolit.org/publications/il-algorithms

Hirsh, S. (2022). Information and digital literacy as a societal challenge. *Journal of Education for Library and Information Science*, *63*(2), 115–126. https://doi.org/10.3138/jelis-2021-0032

Igbinovia, O. S., & Obuh, A. O. (2021). Entrepreneurial competencies and sustainability of library and information science professionals in the 21st century. *Library Philosophy and Practice (e-journal)*, 5212. https://digitalcommons.unl.edu/libphilprac/5212

International Federation of Library Associations and Institutions. (2025a). *Entry point for libraries and AI*. IFLA.

International Federation of Library Associations and Institutions. (2025b). *Information Literacy Section: Future-ready libraries: Integrating AI in information literacy*. IFLA. **I**IFLA | WLIC 2025

International Federation of Library Associations and Institutions. (2025c). *Libraries at the frontline of equitable AI literacy*. IFLA.

Mackey, T. P., & Jacobson, T. E. (2021). Metaliteracy in a collaborative open world: Supporting learners across today's connected environments. *College & Research Libraries*, *82*(6), 842–858. https://doi.org/10.5860/crl.82.6.842

Maina, C. W. (2021). Beyond employment: Equipping LIS graduates for the gig economy through entrepreneurial literacy. *Global Knowledge, Memory and Communication, 70*(4/5), 412–427. doi.org

Makinde, O. B., Hamzat, S. A., Oketunji, I., Ogunniran, O. O., & Olatunji, T. O. (2023). Entrepreneurial skills assessment of library and information science faculty and academic librarians in Nigeria: Issues and prospects. *Journal of Business & Finance Librarianship, 28*(4), 255–277. https://doi.org/10.1080/08963568.2023.2263315.

Ocholla, D. N. (2019). Information literacy in the marketplace: A critical analysis of infopreneurship education in developing nations. *Library Management, 40*(6), 378–391. doi.org

Ogbodo, C. N., & Nweke, K. C. (2023). Leveraging digital marketing for infopreneurial success among library and information science professionals. *International Journal of Library and Information Science*, 15(3), 45–53.

Popova, V. (2022). Information asymmetry in the digital age: The role of information brokers. *Journal of Knowledge Management*, 26(6), 1569–1585. https://doi.org/10.1108/JKM-10-2021-0752

Udo, I. J., Ekpenyong, M. E., & Ekanem, E. O. (2021). Perceived stereotypes and career progression of young librarians in Nigeria. *Library Philosophy and Practice (e-journal)*, 5389. https://digitalcommons.unl.edu/libphilprac/5389

Umunnakwe, G. C., & Nwosu, O. C. (2021). Relevance of information literacy skills in librapreneurship education for graduates' self-reliance: A review. *Library Philosophy and Practice (e-journal)*, Article 4503. sjsu.edu

UNESCO. (2024). *User empowerment through media and information literacy responses to the evolution of generative artificial intelligence*. UNESCO.

Vaughan, L. (2020). Competitive intelligence as an entrepreneurial opportunity for information professionals. *Business Information Review*, *37*(2), 78–86. https://doi.org/10.1177/0266382120923214

Webber, S., & Johnston, B. (2017). Information literacy: Concept, practice and course design. *Journal of Information Literacy, 11*(1), 156–183. doi.org

Infopreneurship as a Catalyst for Transforming Library and Information Science Practice in the Digital Economy

By

Aliyu Abdu Kofar Sauri
College Library Federal College of Education P.M.B. 2041 Katsina, Katsina State
abdualiyu38@gmail.com

Abstract

The rapid expansion of the digital economy has fundamentally reshaped the creation, access, and dissemination of information, thereby challenging the traditional roles of Library and Information Science (LIS) professionals. This paper examines infopreneurship as a catalyst for transforming LIS practice to remain relevant and economically viable in a technology-driven environment. Infopreneurship, defined as the creation and commercialization of information-based products and services, provides a strategic pathway for LIS professionals to move beyond conventional service delivery toward innovative and income-generating activities. Adopting a conceptual and analytical approach, the study draws on existing literature and emerging practices to explore how infopreneurial initiatives—such as digital content creation, online information services, data curation, knowledge consultancy, and information brokerage—can redefine professional identity and practice. The paper highlights how the integration of digital tools, entrepreneurial competencies, and market-oriented thinking can empower LIS practitioners to participate actively in the knowledge economy. Furthermore, the study identifies key challenges hindering the adoption of infopreneurship, including inadequate entrepreneurial training, limited digital skills, infrastructural deficiencies, and resistance to change within the profession. The paper concludes that infopreneurship is not only a viable strategy for enhancing the relevance of LIS professionals but also a critical mechanism for sustainable economic empowerment. By embracing this approach, LIS practitioners can transform from traditional custodians of information into dynamic knowledge entrepreneurs capable of creating value, generating income, and contributing meaningfully to the digital economy.

Keywords: *infopreneurship, library and information science, digital economy, knowledge economy, entrepreneurship, information professionals*

Introduction

The global shift toward a digital, knowledge-based economy has altered the mechanisms through which information is produced, packaged, distributed, and consumed. Knowledge has become a primary factor of production and a source of competitive advantage, rivalling capital and labour in economic significance (Powell & Snellman, 2004). This transformation, driven by automation, artificial intelligence, and networked digital platforms, is simultaneously displacing routine information-handling tasks and creating new categories of knowledge work (Acemoglu & Restrepo, 2019). For Library and Information Science (LIS) professionals, whose traditional mandate centred on the acquisition, organization, preservation, and mediated access to information resources, this shift represents both a disruption and an opportunity.

Historically, librarians and information professionals have functioned as intermediaries between information and its users, operating largely within publicly funded or institutionally embedded settings. However, the disintermediation enabled by search engines, open-access repositories, and self-publishing platforms has eroded the exclusivity of this mediating role, exposing LIS professionals to the risk of professional irrelevance if they do not adapt (Ivwurie & Ocholla, 2016). At the same time, the same digital infrastructure that threatens conventional practice also lowers the barriers to entry for independent information enterprise, enabling professionals to package their expertise into marketable products and services delivered directly to end users.

It is within this context that infopreneurship has emerged as a strategic response. Infopreneurship, a portmanteau of "information" and "entrepreneurship," refers to the identification and exploitation of opportunities to create, package, and commercialize information-based products and services (Rosenbaum & Cronin, 1993; Yatin et al., 2019). For LIS professionals, infopreneurship offers a pathway to diversify income sources, extend professional relevance beyond the physical library, and actively participate in value creation within the digital economy. This paper adopts a conceptual and analytical approach to examine how infopreneurship can serve as a catalyst for transforming LIS practice. It reviews the conceptual foundations of infopreneurship, surveys the opportunities it presents for LIS professionals, examines the challenges constraining its adoption, and proposes strategies for embedding infopreneurial competence within the profession.

Conceptual Clarification

Infopreneurship

The term infopreneurship is generally traced to Weitzen's (1988) characterization of the information entrepreneur as an individual who gathers information from diverse sources and recombines it in novel ways to meet the needs of a target audience (Dangani & Moruf, 2015). Infopreneurship is thus distinguished from conventional entrepreneurship by its focus on information as both raw material and finished product. Masron et al. (2017), as cited in the wider infopreneurship literature, describe infopreneurs as professionals who leverage specialized knowledge and information-handling skills to create viable, income-generating ventures. Within LIS, infopreneurship denotes the application of entrepreneurial thinking—opportunity recognition, value proposition design, marketing, and monetization—to the traditional competencies of the information professional (Amakiri & Marie, 2019).

The Digital Economy and Knowledge Economy

The digital economy refers to economic activity that results from billions of daily online transactions involving people, businesses, devices, data, and processes, underpinned by digital

technologies. It is closely related to, though not identical with, the concept of the knowledge economy, in which the production and exploitation of knowledge play a predominant role in wealth creation (Powell & Snellman, 2004). In the digital and knowledge economy, information is no longer a peripheral support service but a tradable commodity; content, data, and expertise are packaged into products such as e-courses, digital reports, curated datasets, and consultancy services. This economic reorientation has direct implications for LIS professionals, whose core expertise in organizing and evaluating information positions them to participate meaningfully in knowledge-based value chains, provided they develop the requisite entrepreneurial and digital competencies.

LIS Practice in Transition

Contemporary LIS practice is increasingly hybrid, combining custodial functions such as collection development and preservation with emergent functions such as data curation, digital scholarship support, and knowledge management (Halder, 2009). The convergence of library science with adjacent fields—data science, records management, and information systems—has expanded the skill repertoire expected of LIS graduates while simultaneously creating openings for professionals willing to operate independently of institutional employment. This transitional environment forms the backdrop against which infopreneurship is best understood: not as an abandonment of LIS values, but as an extension of them into new economic arrangements.

Infopreneurship as a Catalyst for Transforming LIS Practice

Infopreneurship transforms LIS practice along three interrelated dimensions: professional identity, service delivery, and economic sustainability. First, it repositions the LIS professional from a passive custodian of information to an active creator and seller of information value, altering how the profession is perceived both internally and by the wider labour market (Ramugondo & Ocholla, 2022). Second, it diversifies service delivery channels, moving library and information services beyond the physical or institutional repository into digital marketplaces, subscription platforms, and direct client engagements. Third, it introduces a revenue logic into a profession historically dependent on public funding or institutional budgets, offering a pathway to individual and institutional financial sustainability (Adetayo & Hamzat, 2021).

Several infopreneurial initiatives illustrate this transformation in practice. Digital content creation, including e-books, blogs, podcasts, and online tutorials on information literacy or research skills, allows LIS professionals to monetize expertise that was previously delivered as a free institutional service (Aregbesola et al., 2019). Online information services, such as virtual reference, document delivery, and subscription-based current-awareness bulletins, extend the traditional reference function into a fee-based model. Data curation and management services respond to the growing demand from researchers and organizations for structured, discoverable, and reusable datasets, drawing directly on core LIS competencies in classification and metadata. Knowledge consultancy positions the LIS professional as an advisor to organizations seeking to design knowledge management systems, records retention policies, or digital archiving strategies. Finally, information brokerage—the practice of conducting specialized literature searches, competitive intelligence, and information packaging for paying clients—remains one of the most established forms of infopreneurship within the profession (Ali, 2021).

Collectively, these initiatives demonstrate that infopreneurship does not require the wholesale abandonment of LIS training; rather, it repackages existing competencies—information

organization, evaluation, and mediation—into market-oriented products and services. The catalytic effect of infopreneurship therefore lies in its capacity to convert latent professional expertise into visible economic value, thereby enhancing both the perceived and actual relevance of LIS professionals in the digital economy.

Challenges Hindering the Adoption of Infopreneurship in LIS

Despite its evident potential, the adoption of infopreneurship within LIS practice remains limited, constrained by several interrelated challenges. A recurrent finding across the literature is the inadequacy of entrepreneurial training within LIS curricula; library schools have traditionally emphasized technical and custodial skills over business planning, marketing, and financial management, leaving graduates ill-equipped to translate professional knowledge into viable ventures (Dangani & Moruf, 2015; Ali, 2021).

Limited digital skills constitute a second barrier. While digital literacy is often assumed among information professionals, the specific competencies required for infopreneurship—web development, digital marketing, e-commerce platform management, and content monetization—are not uniformly taught or practised, particularly in developing-country contexts (Aregbesola et al., 2019). Infrastructural deficiencies, including unreliable internet connectivity, inadequate access to digital devices, and limited institutional support for independent practice, further constrain the capacity of LIS professionals to establish and sustain information enterprises, especially within resource-constrained regions (Ivwurie & Ocholla, 2016).

A related challenge is the empirical gap between awareness and action: studies of LIS students' and professionals' attitudes toward infopreneurship consistently report limited practical engagement despite generally positive perceptions of its value, suggesting that awareness alone is insufficient to drive adoption (Akter & Biswas, 2024; Lose & Khuzwayo, 2022). Finally, resistance to change within the profession—rooted in a longstanding service ethos that privileges free and equitable access to information—can create ambivalence or scepticism toward the commercialization of information services, even among professionals who recognize its economic necessity (Amakiri & Marie, 2019). Addressing these challenges requires coordinated intervention at the levels of curriculum design, professional development, institutional policy, and individual mindset change.

Challenges Facing Infopreneurship in LIS Practice

1 Inadequate Technological Infrastructure

Poor internet connectivity, unreliable electricity supply, inadequate hardware and limited access to digital platforms can restrict the development of information businesses.

2 Lack of Entrepreneurial Skills

Many LIS professionals have strong professional information skills but limited training in business planning, financial management, marketing, customer relationship management, pricing, negotiation, branding and business development.

3 Financial Constraints

Startup capital may be required for computers, internet services, software, hosting, digitization equipment, office space and marketing. Limited access to funding can discourage professionals from establishing businesses.

4 Resistance to Change

Some professionals may continue to perceive librarianship primarily as an institutional service profession rather than as a field capable of entrepreneurial innovation.

5 Copyright and Intellectual Property Issues

Digital publishing and information brokerage raise important questions concerning copyright, licensing, plagiarism, data protection and intellectual property.

6 Competition from Technology Companies

Technology companies increasingly provide search, data, publishing, knowledge-management and digital content services. LIS professionals must demonstrate distinctive value through expertise in information quality, evaluation, organization, ethics and user-centred information management.

7 Limited Institutional Support

In some institutions, entrepreneurial activities may not be adequately recognized or supported.

8 Weak Professional Visibility

Although LIS professionals possess valuable competencies, potential clients may not always understand the range of services they can provide.

6. Infopreneurship and the Future of LIS in Nigeria

Nigeria's growing digital economy creates considerable potential for LIS entrepreneurship. The country's large population, expanding tertiary education sector, increasing digital information production and growing demand for online services provide potential markets for information-based enterprises.

At the same time, Nigeria faces persistent challenges involving electricity, broadband access, digital skills, financing and institutional capacity. Successful LIS infopreneurship must therefore be adapted to local realities.

LIS professionals can also contribute to inclusive development by developing information services for underserved communities. Agricultural information, educational resources, employment information, entrepreneurship information and government-service information are potential areas for community-oriented infopreneurship.

Strategies for Strengthening Infopreneurship in LIS Practice

Several strategic interventions can support the wider adoption of infopreneurship within LIS practice. First, LIS curricula should formally integrate entrepreneurship education, including modules on business planning, digital marketing, pricing, and client management, delivered alongside traditional information science content (Yatin et al., 2019). Second, professional associations and library schools should expand continuing professional development programmes focused specifically on digital and infopreneurial skills, enabling practising professionals to update their competencies without necessarily returning to formal study.

Third, institutions should consider policies that formally recognize and, where appropriate, support staff-led infopreneurial initiatives—such as incubation support, seed funding, or flexible work arrangements—thereby reducing the perceived tension between institutional employment and independent enterprise (Ramugondo, 2021). Fourth, deliberate mentorship and exposure to

successful infopreneurs, through case studies, guest lectures, and professional networks, can help translate positive attitudes into concrete entrepreneurial action, addressing the awareness–action gap identified in the literature. Finally, addressing infrastructural constraints will require broader investment in digital infrastructure and affordable connectivity, particularly in developing economies, without which even well-trained and motivated professionals will struggle to sustain online information enterprises.

Recommendations

1. LIS schools should integrate practical infopreneurship education into undergraduate and postgraduate programmes.

2. Entrepreneurship should be linked directly to professional LIS competencies.

3. LIS professionals should undertake continuous digital-skills training.

4. Universities should establish LIS innovation and entrepreneurship centres.

5. Professional associations should organize entrepreneurship workshops, competitions and mentorship programmes.

6. Government should improve digital infrastructure.

7. Financial institutions and government entrepreneurship agencies should provide funding opportunities for viable information-based businesses.

8. LIS professionals should develop strong professional brands.

9. Copyright, intellectual property and data-protection education should be strengthened.

10. LIS professionals should collaborate with technology and business specialists.

11. Libraries and information institutions should encourage innovation where institutional policies permit.

12. Research should be encouraged on the economic contribution of infopreneurship to the LIS profession and Nigerian digital economy.

13 Curriculum Restructuring

Library schools should integrate entrepreneurship into LIS education in a practical manner. Students should identify information problems, design products, develop business plans and test services with potential users.

14 Capacity-Building Programmes

Professional associations, universities and library institutions should organize continuous professional-development programmes focusing on entrepreneurship and emerging technologies.

15 Digital Skills Development

LIS professionals should acquire competencies in web development, digital marketing, data analytics, artificial intelligence, cloud computing, database management, digital publishing, cybersecurity awareness and social media management.

16 Governments and Institutional Support

Government agencies and educational institutions should provide supportive policies, grants, innovation funds, digital infrastructure and entrepreneurship programmes.

17 Collaboration and Networking

Collaboration between LIS professionals and specialists in computer science, business, communication, education and statistics can facilitate innovation.

18 Adoption of Emerging Technologies

LIS professionals should explore artificial intelligence, cloud computing, big data analytics, blockchain, machine learning, Internet of Things, digital repositories and automated metadata systems.

19 Development of Professional Business Models

Prospective infopreneurs should identify the information problem, target customers, products or services, delivery channels, pricing model, operational requirements, marketing strategy, intellectual-property considerations and sustainability plan.

20 Mentorship and Incubation

LIS schools can establish entrepreneurship clubs, digital innovation laboratories and startup incubation centres.

21 Professional Branding

Infopreneurs need to communicate their value through websites, professional social-media profiles, online portfolios, webinars and publications.

Conclusion

This paper has examined infopreneurship as a catalyst for transforming Library and Information Science practice within the digital economy. As traditional intermediary functions of the LIS profession are increasingly disrupted by digital disintermediation, infopreneurship offers a strategic pathway through which professionals can repackage core competencies into innovative, income-generating products and services. Digital content creation, online information services, data curation, knowledge consultancy, and information brokerage represent concrete manifestations of this transformation, each demonstrating how existing professional expertise can be extended into new economic arrangements. However, the realization of this potential is constrained by inadequate entrepreneurial training, limited digital skills, infrastructural deficiencies, and residual resistance to the commercialization of information services within the profession.

Addressing these constraints through curriculum reform, continuing professional development, supportive institutional policy, and infrastructural investment will be essential if infopreneurship is to move from a promising concept to a mainstream feature of LIS practice. Ultimately, infopreneurship is not merely a strategy for individual economic survival; it is a mechanism through which the LIS profession as a whole can reassert its relevance, demonstrating that information professionals are not passive custodians of the past but active, value-creating participants in the digital and knowledge economy of the future.

References

Acemoglu, D., & Restrepo, P. (2019). Automation and new tasks: How technology displaces and reinstates labor. Journal of Economic Perspectives, 33(2), 3- 30. https://doi.org/10.1257/jep.33.2.3

Adetayo, A. J., & Hamzat, S. A. (2021). Infopreneurship and financial satisfaction among library professionals in tertiary institutions in Ede, Osun, Nigeria. Library Philosophy and Practice, 2021, Article 16.

Akter, F., & Biswas, M. S. (2024). Perceived attitudes towards infopreneurship: An empirical study on a public university students in Bangladesh. Business Information Review, 41(4), 181–190. https://doi.org/10.1177/02663821241289826

Ali, S. (2021). The importance, challenges and issues of infopreneurship training for library and information science students. Jewel Journal of Librarianship, 16, 9–14.

Amakiri, D. S., & Marie, M. O. (2019). Galvanizing the infopreneurship career development for office & information management professionals. IIARD International Journal of Economics and Business Management, 5(4), 10–14.

Aregbesola, A., Van der Walt, T., Owolabi, S., Idiegbeyan-ose, J., Okocha, F., & Eyiolorunshe, T. (2019). Infopreneurship in a developing country: Opportunities and challenges. IOP Conference Series: Materials Science and Engineering, 640, Article 012123. https://doi.org/10.1088/1757-899X/640/1/012123

Dangani, B. U., & Moruf, H. A. (2015, September 15–19). Infopreneurship education in library and information science programmes: A bird eye view [Conference paper]. African Conference on Entrepreneurship Education for Sustainable Development in Africa, Ahmadu Bello University, Zaria, Nigeria.

Halder, S. N. (2009). Multimodal roles of library and information science professionals in present era. International Journal of Library and Information Science, 1(2), 15–20.

Ivwurie, O. M., & Ocholla, D. N. (2016). The status and development of infopreneurship in Nigeria and South Africa. Education for Information, 32(4), 323–342. https://doi.org/10.3233/EFI-160980

Lose, T., & Khuzwayo, S. (2022). Attitudes towards infopreneurship among information science students at a higher education institution. Problems and Perspectives in Management, 20(1), 49–57. https://doi.org/10.21511/ppm.20(1).2022.05

Powell, W. W., & Snellman, K. (2004). The knowledge economy. Annual Review of Sociology, 30, 199–220. https://doi.org/10.1146/annurev.soc.29.010202.100037

Ramugondo, L. S. (2021). Infopreneurship as an employment option for library and information science students and graduates in South Africa: A literature review. Library Philosophy and Practice, 2021, Article 5948.

Ramugondo, L. S., & Ocholla, D. N. (2022). Can infopreneurship be an employment option for library and information science students? Mousaion, 40(2), 7–19. https://doi.org/10.25159/2663-659X/9665

Rosenbaum, H., & Cronin, B. (1993). Digital entrepreneurship: Doing business on the information superhighway. International Journal of Information Management, 13(6), 461–463. https://doi.org/10.1016/0268-4012(93)90062-9

Yatin, S. F. M., Shuhaimi, H., & Ayob, A. (2019). Infopreneur: Education for economic growth. International Journal of Academic Research in Business and Social Sciences, 8(12), 1460–1476. https://doi.org/10.6007/IJARBSS/v8-i12/5250

Leveraging the Role of Information Professionals in Climate Action: Enhancing Ch_4, Co_2, and N_2O Mitigation in Nigeria through Researcher-Community Partnerships

By

Sanusi Mamman[1]

&

Prof. Abashe Atiku Maidabino[2]

University Library, FUTB, Jigawa State, Nigeria[1]

Dept. of library & Information Science, Bayero University, kano

Corresponding email: smamman.library@futb.edu.ng

Abstract

This study reviewed literature on leveraging the role of information professionals in climate action for mitigating methane (CH_4), carbon dioxide (CO_2), and nitrous oxide (N_2O) emissions in Nigeria through researcher–community partnerships, focusing on three thematic areas: Nigerian communities' understanding of agricultural and anthropogenic sources of greenhouse gases and their impacts on climate change and livelihoods; research-based mitigation strategies and the role of information professionals in translating and supporting their community-level adoption; and the use of resilience theory to strengthen researcher–community partnerships for improved communication, knowledge sharing, and climate resilience. Guided by the PRISMA framework, literature was sourced from databases including Scopus, TERAS, and ProQuest, yielding 85 studies, of which 28 were included: 23 empirical and review studies published between 2019 and 2025 and 5 foundational theoretical works published between 1989 and 2005. The synthesized evidence indicates that emissions from cultivated land and other anthropogenic activities in Nigeria are high, posing serious risks to climate stability, food security, and socio-economic livelihoods, particularly among smallholder farmers, women, and youth. Although climate-smart agriculture practices such as improved rice management, sustainable land use, agroforestry, and efficient fertilizer application have demonstrated mitigation potential, their uptake remains limited due to information deficits, weak extension services, and institutional challenges. The study concludes that information professionals, especially university and public librarians, are critical knowledge intermediaries who can organize, validate, and translate climate research into accessible, localized, and actionable information, thereby enhancing climate literacy to bridge persistent research-to-practice gaps. It further agreed that trust-based, participatory researcher–community partnerships that integrate scientific and indigenous knowledge, guided by resilience theory, can strengthen absorptive, adaptive, and transformative capacities of Nigerian communities. The study recommends formally recognizing university libraries as climate knowledge hubs, strengthening partnerships between university and public libraries with extension agencies to support community-level climate literacy and CSA adoption, and establishing community-based climate knowledge centres within public libraries to enable inclusive, sustainable, and long-term climate resilience in Nigeria.

Keywords: Information Professionals, Climate Action, CH_4, CO_2, N_2O, Mitigation Researcher-Community Partnerships

Introduction

Climate change is a characteristic issue of the 21st century across the world, and is mainly caused by the build-up of greenhouse gases (GHGs), including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) in the air. Although these gases vary in their origins, lifetime in the atmosphere and warming potentials, together they are causing the temperatures to rise, extreme weather conditions, and ecosystem disturbances in the world, as well as socio-economic strains. As a typical developing nation, Nigeria has its own share of climate pressure, since an increase in population rate, urbanization, energy demand, and agricultural expansion are increasing the emissions caused by various sectors such as energy production, waste management, land-use change, and livestock, and thus effective mitigation is a national priority (Yona et al., 2025). According to national inventories and assessments, prepared by the Intergovernmental Panel on Climate Change in 2025 and submissions made by Nigeria to the United Nations Framework Convention on Climate Change, the agricultural emissions in Nigeria are dominated by methane (50-60%), principally through livestock enteric fermentation and rice cultivation, nitrous oxide (30-40%), principally through poor use agricultural soils, improper fertilizer use, and poor manure management, with carbon dioxide emissions playing a minor role (20-35%), mainly through high tillage, deforestation. Even though CO_2 contributes approximately 75% of the overall global greenhouse gas emissions across all sectors, in Nigeria, the agricultural sector is dominated by CH_4 and N_2O and hence, mitigation of such anthropogenic activities is highly necessary to overcome the adverse effects of climate change

Such greenhouse gases have a long atmospheric lifetime of approximately 12- 114 years. For example, 12 years for methane, while nitrous oxide is 114 years, which are becoming prevalent is produced primarily through enteric fermentation, poor manure management, to emit CH_4, agricultural soil as a result of excess or improper utilization of fertilizers and soil infertility to emit N_2O (Abubakar et al., 2022). Farming and rural communities also tend to be oblivious of the fact that these normal activities have a direct impact on extreme weather conditions like droughts, floods and heat waves that consequently affect agricultural productivity, disrupt economic systems and living standards by reducing yields, raising food prices and increasing poverty.

Notably, the answers to these predicaments were found in the very communities that are involved in the emissions. The emission of methane by ruminant livestock can also be minimized through better feeding methods such as feeding the rumen with the seaweed Asparagopsis taxiformis which has been shown 95% to reduce methane emission as well as in proper handling of the manure and storage (Adefare et al., 2024; World Bank, 2025). Low-tillage or conservation agriculture, more afforestation and reforestation, and vigorous efforts to reduce deforestation and bush burning reduce the carbon dioxide emissions. The reduction of nitrous oxide emission can be achieved by use of more efficient fertilizers, application of the appropriate type and quantity and at the correct time, and elimination of soil degradation through proper land management activities. Although scientists in various fields are tirelessly trying to solve these problems that the world is facing, one of the greatest challenges facing the African countries and Nigeria especially is the poor communication and translation of scientific discoveries into practical and community activities (Abubakar et al., 2022; World Bank, 2025). This gap should be closed with the help of efficient information services, local education and implementation of inclusive policies to promote the transfer of knowledge to real climate solutions to guard livelihood and improve the quality of life.

Therefore, the information professionals such as librarians, data experts, knowledge managers, and community information facilitators, are best placed to fill these gaps. They can curate,

contextualize and disseminate climate research; facilitate communication gaps between scientists, research findings and non-technical groups; promote community-based monitoring and reporting; and improve the networks between universities, civil society, local government and citizens. Within the framework of mitigation of methane, CO_2 and N_2O, these collaborations can enable communities to learn more about the sources of emissions through their anthropogenic activities, leading to flooding, drought, high level of heatwaves and excess in cancer disease and they engage in mitigation planning, and co-create locally relevant solutions, as well as enhance the impact of research and strategic policies. Consequently, this paper will discuss how the researcher-community partnerships facilitated and complemented by information practitioners can facilitate effective climate action in Nigeria by making climate knowledge accessible, actionable and responsive to local demands and by making the mitigation response to methane, CO_2 and N_2O both scientifically informed and community-informed.

Statement of the Problem

Climate change is one of the most destructive world problems, as it systematically interferes with the ecosystem, worsens the quality of life, and increases the rate of disappearance of agricultural efficiency and economic sustainability, further aggravating food insecurity on the global level. According to the evidence of the literature such as (Arora & Mishra, 2022; Yeboah, 2024; Goni et al., 2025) showed that unless an immediate intervention is carried out, the conditions will be far worse in the year 2050 compared to the present estimations under existing vulnerability conditions (UV1 and UV2) which is mainly because the anthropogenic activities will not be controlled and regulated in the present scenario, including unsustainable agriculture, deforestation, the use of fossil fuels, and unsatisfactory waste disposal. Nigeria is a country where limited awareness of how day-to-day livelihood practices contributes to greenhouse gas emissions, mostly methane (CH_4), carbon dioxide (CO_2), and nitrous oxide (N_2O), which cause extreme weather conditions and reduce resilience (Abubakar et al., 2022; World Bank, 2025). Despite the already existing substantial amounts of researches and the methods of mitigating climate change, such as climate-smart agriculture and emission-cutting technology, a crucial gap still exists in the form of the translation of this knowledge into a practical community-level response. This pressure is compounded by poor information flow, stakeholder involvement and integration of local knowledge systems. Hence, using the resilience theory that highlights adaptive capacity, learning, and system change, this paper evaluates the need to adopt the leveraging of information professionals by forming researcher-community partnerships as a way of promoting awareness, adoption, and implementation of effective mitigation strategies to control CH_4, CO_2 and N_2O emission in Nigeria to facilitate community resilience and protect livelihoods.

Research Objectives

The study reviewed the following thematic areas in relation to leveraging information professionals in climate action: enhancing methane, CO_2, and N_2O mitigation in Nigeria through researcher-community partnerships that include:

1. To identify and review Nigerian communities' understanding of agricultural and anthropogenic sources of methane (CH_4), carbon dioxide (CO_2), and nitrous oxide (N_2O), as well as their impacts on climate change and livelihoods.
2. To identify and evaluate existing research-based mitigation strategies for CH_4, CO_2, and N_2O and examine how information professionals can facilitate their translation and adoption at the community level.

3. To analyze how researcher–community partnerships, guided by resilience theory, can enhance communication, knowledge sharing, and community resilience to climate change impacts in Nigeria.

Methodology

This study employs a systematic literature review method guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to explore the pivotal role of information professionals, particularly librarians and extension workers in leveraging researcher–community partnerships and in long run community people for mitigating methane (CH_4), carbon dioxide (CO_2), and nitrous oxide (N_2O) emissions in Nigeria. Literature was rigorously sourced from databases such as Scopus, TERAS, and ProQuest, initially yielding 85 studies, with 28 selected after screening: 23 empirical and review articles published between 2019 and 2025, plus five foundational theoretical works from 1989–2005. The analysis centers on three thematic areas Nigerian communities' understanding of agricultural and anthropogenic greenhouse gas sources and their livelihood impacts; research-based mitigation strategies (e.g., improved rice management, agroforestry, and efficient fertilizers) where information professionals translate evidence into community-adoptable formats amid challenges like information deficits and weak extension services; and resilience theory to fortify partnerships for enhanced communication, knowledge sharing, and climate resilience.

Literature Review/Result

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are major causes of climate change in the Nigerian populations, most of which are a result of agricultural and anthropogenic efforts. The carbon dioxide emissions occur primarily due to the burning of fossil fuels, flaring of gases, deforestation, urbanization, and transportation, especially in the Niger Delta and large cities (IPCC, 2025, Onnoghen et al., 2024a). These operations decrease the carbon sink and increase the variation in temperatures and cause variations in rainfall patterns, heat stress, and declining agricultural productivity, which pose a threat to the farming-based economy and rural lives of Nigeria (World Bank, 2018; Onnoghen et al., 2024b). The main sources of methane emissions are the livestock production, flooded rice lands, improper waste management, and oil and gas leakage, and such rice-growving states as Kebbi, Niger, and Taraba are the hotspots (Bashir et al., 2025; Kehinde et al., 2024). In spite of its short atmospheric lifetime, high warming potential of methane amplifies the climate contribution by many folds and the absence of climate-smart agricultural approaches limits the mitigation efforts (Abubakar et al., 2022; Goni et al., 2024; IPCC, 2025).

Although in smaller quantities, the emissions of nitrous oxide have long-term climate risks because of their high potential to global warming and are primarily caused by the ineffective utilization of nitrogen-based fertilisers and poor agricultural management processes among smallholder farmers (Kehinde et al., 2024; IPCC, 2025). All three (CO_2, CH_4, and N_2O) have a severe impact on flooding, drought, and heat waves, which deteriorates food security, poverty, and socio-economic vulnerability, especially among women and youth who depend on agriculture (Arora & Mishra, 2022; Yeboah, 2024; Adefare et al., 2024). Despite the opportunities of climate-smart agriculture to reduce emissions and increase resilience, the adoption of the practice is still uneven because of the infrastructural, informational, and institutional barriers (Awoniyi et al., 2023; Zhao et al., 2023). Increased access to climate information, inclusive green entrepreneurship, and climate literacy (facilitated by knowledge institutions including libraries) are important to reduce greenhouse gas emissions and enhance adaptive capacity among the Nigerian communities (Hauke, 2019; Usang et al., 2024; Onnoghen et al., 2024a).

Current studies have determined some of the mitigation options of CH_4, CO_2, and N_2O emissions, especially through climate-smart agriculture (CSA) methods like better rice management (alternate wetting and drying to reduce CH_4), agroforestry and cover crops (optimize the use of carbon and minimize emission of CO_2) and precision fertilization with nitrogen (cut N_2O). Worldwide field experiments (one of which has been assessed by the Intergovernmental Panel on Climate Change) indicate that disseminating specific, practical information to farmers can substantially decrease nitrous oxide (N_2O) emissions. The most significant information to disseminate consists of: (1) optimized use of fertilizers (the so-called 4R strategy- right rate, right time, right source, right place) that can reduce N_2O by approximately 10-30%; (2) the use of nitrification inhibitors or more efficient fertilizers, which can reduce emissions by 30%; (3) precision farming and soil testing that can reduce emissions by 15-35%; and (4) better manure management and cover crops, which can decrease emissions by 10-40%. This indicates that, with appropriate guidance and training for farmers on such practices, agricultural N_2O emissions can be significantly reduced without necessarily reducing crop yields.

A PRISMA-based systematic review and searching databases such as Scopus and Web of Science through the Federal university of Technology (FUTB) library website, including CSA adoption studies, to generate evidence that information professionals, such as librarians, are essential to facilitate translation at the community level through curating open-access collections of these strategies and providing targeted literacy training and collaborating with extension services to bridge the awareness gap among smallholder farmers (Usang et al., 2024; Abubakar et al., 2022; Ajwang et al., 2024). The role is compatible with the green library projects focusing on sustainable development by sharing knowledge (Hauke, 2019), as well as dealing with Nigerian-specific challenges, including low levels of digital access and training needs (Onnoghen et al., 2024; Awoniyi et al., 2023; Bashir et al., 2025). In the reviewed literature, the mitigation of CH_4 is associated with better practices in rice cultivation, manure management, and climate-sensitive livestock systems, whereas CO_2 reduction is related to sustainable consumption, green entrepreneurship, adoption of renewable energy, and responsible land-use practices (Arora & Mishra, 2022, 2023; Kehinde et al., 2024; Zhao et al., 2023; IPCC, 2025). Optimized fertilizer use, soil management, and precision agriculture are among the key methods of mitigation of N_2O, which is demonstrated by the adoption of CSA studies among the smallholder farmers in Nigeria, Kenya, Uganda, and Ethiopia (Aturihihi et al., 2022; Ajwang et al., 2024; Goni et al., 2024, 2025; Yona et al., 2025). The information professionals, especially librarians and knowledge intermediaries, in this mitigation landscape have a highly significant translational role in terms of curating and providing evidence-based climate information, promoting climate literacy, and mediating community-level uptake via participatory learning, digital platforms, and the local knowledge hub (Hauke, 2019; Usang et al., 2024). Green libraries and information centres act as a reliable platform to share practical mitigation knowledge, connect the evidence of global climate (IPCC, 2025; World Bank, 2025) with the local realities, as well as empower farmers, women agripreneurs, and entrepreneurs by providing specific education and access to climate information services (Abubakar et al., 2022; Adefare et al., 2024; Bizo et al., 2024). Altogether, the PRISMA-informed evidence highlights the role of information professionals in ensuring effective mitigation of CO_2, CH_4, and N_2O at a community level based not only on technological solutions but also the strategic role of the information professional in translating the research into accessible, actionable, and culturally relevant knowledge that would support sustainable development and climate resilience (Onnoghen et al., 2024a, 2024b; Hauke, 2019).

Theoretical Framework

The study is guided by resilience theory to enhance communication, knowledge sharing, and community resilience to the adverse effect of the climate change in Nigeria. The resilience theory came into being during the 1970s and 1980s after researchers started focusing less on risk and pathology and more on the strengths that enable individuals to cope with adversity and adapt rather successfully. Some of the first pioneering studies by Norman Garmezy were done on children at high risk of psychopathology and revealed some protective factors, including supportive relationships, and individual competencies, which mitigated the impact of stress (Garmezy, 1974). Likewise, the longitudinal research of children in Kauai that was conducted by Emmy Werner illustrated that quite a number of children who were exposed to a great level of both social and environmental risks still attained good life outcomes because of the running personal, family, and community reserve (Werner, 1989). Combined, these early studies formed the fundamental assumption of the resilience theory, that positive adaptation is due to dynamic processes and protective mechanisms, and not only the lack of risk and subsequently the foundation of ecological and strength-based models of resilience. According to the resiliency theory, positive development is a dynamic process that is influenced by associations, and contextual support instead of an inborn attribute, and this viewpoint explores how the buildup of positive conditions across ecological levels, including individuals, family, and community, to cope with the tension of social circumstances and avoid the development of violent or devastating results. The conceptualization of resilience into a set of adaptive processes was done by Fergus and Zimmerman (2005), and the studies by Ostaszewski and Zimmerman (2006) and Stoddard et al. (2012) showed that multiple, reinforcing assets are more protective than single factors. These studies emphasize the importance of a strength-based and replicable framework that informs research and practice and addresses how youth and communities can use the resources at their disposal to overcome adversity and realize healthy development despite being at risk.

This framework directly informs the research on Leveraging Information Professionals in Climate Action in Nigeria, where the researcher-community partnerships can be evaluated as the promotional resilience factors contributing to better communication, trust, and shared capacity to combat the methane, CO_2, and N_2O emissions. Based on the resiliency theory, information professionals can also be viewed as bridges and intermediaries between climate research and knowledge that is available to audiences, encourage community action, and minimize conflict due to misinformation or resources strain.

Conclusions

On the whole, the analyzed literature shows that the emissions of CO_2, CH_4, and N_2O, which include the cultivated land and other anthropogenic sources, are high and have serious and compounding risks to the climate, food security, and socio-economic stability of Nigeria, especially among the smallholders, women, and young people. Although the climate-smart agriculture approach has shown viable results with regard to reducing emissions through better management of rice, sustainable land use, agroforestry, and efficient use of fertilizers, the adoption has been hampered by information deficits, ineffective extension services, and institutions. Using the PRISMA framework and the synthesized evidence shows that information professionals especially librarians and knowledge professionals can play a huge role in the translational aspect during sorting of viable information about climate, encouraging climate literacy, and providing research-practice interface at the communal level. Exploratory researcher-community partnerships, which entail incorporation of scientific evidence with local knowledge, trust-based

communication, and participatory learning guided by the resilience theory can enhance absorptive, adaptive, and transformative capacities of Nigerian communities. Therefore, mitigation of greenhouse gas emissions in Nigeria relying only on technological and agricultural developments cannot be effective; instead, inclusive knowledge systems and robust information infrastructures are needed to co-produce, access, and implement climate solutions to sustainable development and long-term resilience.

Recommendations

The study offered the following recommendations:

1. There is a need of university library to be officially considered as primary climate change investigation facilities that attentively collect, compile, and authenticate findings on greenhouse gas mitigation and climate-intelligent cultivation (CSA). By means of PRISMA-mediated systematic reviews and institutional repositories and the open-access platforms, the university libraries can transform the global climate science (e.g., IPCC reports) and local research into the policy-relevant and usable knowledge products by the communities. These hubs are supposed to be proactive by advising and mentoring information professionals in the public libraries through the provision of standardized toolkits, training modules and evidence summaries based on the agro ecological zones of Nigeria. This enhances the absorptive power of communities by making sure that the right, timely, and localized contextual climate information is always present.
2. There is need to establish of structured partnerships between the public libraries and the university libraries that would facilitate the creation of a research to practice pipeline. The university libraries would be the most active in generation and synthesis of evidence and the public libraries would be more of the points of implementation to the community by ensuring that the research outputs are translated to climate literacy programs, local language instructions and CSA manuals that are easy for the farmers to understand. Librarians ought to be trained as intermediaries of knowledge since they are able to give their guidance to the farmers, women agripreneurs and youth on ways of mitigating CO_2, CH_4, and N_2O. The collaboration can benefit adaptive capacity by sealing gaps in information, raising awareness of CSA, and boosting adoption by trusted and accessible institutions
3. Community-based climate knowledge centres should be established within or alongside public libraries to serve as collaborative spaces for librarians, agricultural extension workers, researchers, and local communities. These centres should support participatory learning, co-production of knowledge, and continuous feedback mechanisms, integrating scientific climate information with indigenous knowledge. By hosting workshops, demonstration sessions, and digital climate information services, these centres enable decisive, localized climate action. Such collaboration enhances transformative capacity, empowering communities to adopt sustainable practices, diversify livelihoods, and build long-term resilience to climate shocks.

Significance/Implication of the Study

This study is significant because it demonstrates that effective mitigation of CO_2, CH_4, and N_2O emissions in Nigeria depends not only on technological or agricultural innovations but also on strong knowledge systems and information infrastructures. Applying resilience theory and PRISMA-based evidence synthesis, the study highlights the critical yet underexplored role of information professionals particularly university and public librarians as knowledge intermediaries who translate climate research into accessible, actionable, and locally relevant information for smallholder farmers, women, and youth. The findings imply that strengthening researcher–community partnerships, climate literacy, and library-led climate information services can

substantially enhance absorptive, adaptive, and transformative capacities of Nigerian communities. Policy-wise, the study underscores the need to integrate libraries and information institutions into national climate and agricultural extension strategies, while practically it provides a framework for bridging persistent knowledge-to-practice gaps that hinder the adoption of climate-smart agriculture and community-level climate resilience in Nigeria.

References

Abubakar, S. M., Inkani, A. & Obaro, O. (2022). Determinants of Awareness Levels of Climate Smart Agricultural Technologies and Practices of Urban Farmers in Kuje, Abuja, Nigeria. *African Journal of Science, Technology, Innovation and Development,* 3(2), 1-8

Adefare, T., Adeola, O., Mogaji, E., Nguyen, N. P., & Mogaji, S. A. (2024). Empowering women agriculture entrepreneurs: Banks' role in achieving sustainable development goals. *International Journal of Bank Marketing*. *Advance online publication*. https://doi.org/10.1108/IJBM-03-2023-0128

Ajwang, S., Owoche, P., & Mutonyi, J. (2024). Access and use of information for enhanced adoption of climate smart agricultural practices among smallholder farmers in Lake Victoria Basin, Kenya. *Agro Environmental Sustainability*, 2(2), 62–73. https://doi.org/10.59983/s2024020201

Ali, U. M. (2024). Climate-Smart horticultural practices: Building resilience in a changing environment: A scoping review. *Agriculture, Forestry and Fisheries*, 13(5), 202–209. https://doi.org/10.11648/j.aff.20241305.19

Arora, N. K., & Mishra, I. (2022). Current scenario and future directions for sustainable development goal 2: A roadmap to zero hunger. *Environmental Sustainability*, *5*(2), 129–133. https://doi.org/10.1007/s42398-022-00235-8

Arora, N. K., & Mishra, I. (2023). Responsible consumption and production: A roadmap to sustainable development. *Environmental Sustainability*, *6*(1), 1–6. https://doi.org/10.1007/s42398-023-00266-9

Aturihaihi, C., Tumwesigye, T., Opio, F. & Beyihayo, G. A. (2022). Knowledge, Attitude and the Practice of Climate-Smart Agriculture among Smallholder Farmers in Isingiro District, South Western Uganda. *East African Journal of Agriculture and Biotechnology*, 5(1), 82-97. https://doi.org/10.37284/eajab.6.1.1154

Awoniyi S, Osunmakinde M, Abdulkadir A. and Olatundun S. (2023). Digitalization of Agriculture: what relevance and challenges in enhancing Climate Smart Agriculture in Nigeria. *FARA Research Report*, 7(7):48-58. https://doi.org/10.59101/frr072307

Bashir, M., Faruk, A., Abdullahi, M., & Yusuf, B. (2025). Rice farmers' awareness of climate-smart agriculture (CSA) practices in Taraba state, Nigeria. *Journal of Arid Agriculture, 26*(2), 16–23. https://doi.org/10.63659/jaa.v26i2.83

Bizo, I. M., Traore, B., Sidibé, A., & Soulé, M. (2024). Effectiveness of climate information services: An evaluation of the accuracy and socio-economic benefits for smallholder farmers in Niger and Mali. *Frontiers in Climate, 6*. https://doi.org/10.3389/fclim.2024.1345888

Fergus, S., & Zimmerman, M. A. (2005). Adolescent resilience: A framework for understanding healthy development in the face of risk. *Annual Review of Public Health, 26*, 399–419. https://doi.org/10.1146/annurev.publhealth.26.021304.144357

Garmezy, N. (1974). *Children at risk: The search for protective factors*. In J. E. Stevenson (Ed.), Recent research in developmental psychopathology (pp. 213–233). Oxford: Pergamon Press.

Goni, I. C., Garba, M., Bose, A. A., & Abdullahi, S. (2024). Factors influencing the adoption of climate smart agricultural practices among Irish potato farmers in Plateau State, Nigeria. *Nigerian Journal of Agriculture and Agricultural Technology (NJAAT), 4*(4B). https://www.njaat.atbu.edu.ng

Goni, I. C., Garba, M., Bose, A. A., & Abdullahi, S. (2025). Level of awareness and adoption of climate smart agricultural practices (CSAP) among Irish potato farmers in Plateau State, Nigeria. *Journal of Agripreneurship and Sustainable Development, 8*(1). Retrieved from https://njaat.com.ng/index.php/jasd/issue/view/38

Hauke, P. (2019). Green libraries towards green sustainable development: Best practice examples from IFLA Green Library Award 2016–2019. De Gruyter Saur.

Inter-governmental Panel on Climate Change [IPCC], (2025). Climate Change: Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, edited by: Masson-Delmotte, V., Zhai, P., Pirani, A., Connors, S. L., Péan, C., Berger, S., Caud, N., Chen, Y., Goldfarb, L., Gomis, M. I., Huang, M., Leitzell, K., Lonnoy, E., Matthews, J. B. R., Maycock, T. K., Waterfield, T., Yelekçi, O., Yu, R., and Zhou, B., Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, https://doi.org/10.1017/9781009157896

Kehinde, M.O., Shittu, A.M., & Awe, T.E. (2024). Effects of using climate-smart agricultural practices on factor demand and input substitution among smallholder rice farmers in Nigeria. *Mitig Adapt Strateg Glob Change 29,* 26. https://doi.org/10.1007/s11027-024-10125-5

Onnoghen, N. U., Onwuzurike, U., & Anabaraonye, B. (2024). Enhancing climate resilience through green entrepreneurship education in Nigeria. *Journal of Civil Engineering and Applications, 5*(1), 33–36.

Ostaszewski, K., & Zimmerman, M. A. (2006). The effects of cumulative risks and promotive factors on urban adolescent alcohol and other drug use: A longitudinal study of resiliency. *American Journal of Community Psychology, 38*(3–4), 237–249. https://doi.org/10.1007/s10464-006-9076-x

Stoddard, S. A., Zimmerman, M. A., & Bauermeister, J. A. (2012). A longitudinal analysis of cumulative risks, cumulative promotive factors, and adolescent violent behavior. *Journal of Research on Adolescence, 22*(3), 542–554. https://doi.org/10.1111/j.1532-7795.2012.00786.x

Usang, N. O., Somkenechi, S. U., Evelyn, I. O., Beatrice, O. E., & Benjamin, A. (2024). The role of libraries in promoting climate literacy in Nigeria. *Research Archive of Journal of Mass Communication, 1*(1), 555559. https://doi.org/10.19080/RAJMC.2024.01.555559

Werner, E. E. (1989). Children of the Kauai study: Resilience and recovery in adolescence and adulthood. *Journal of Adolescent Health, 10*(4), 225–234. https://doi.org/10.1016/1054-139X(89)90036-5

World Bank (2025). *World Bank report of 2025 on Climate-Smart Agriculture in its Climate Change Action Plan (2021- 2025)*. Retrieved from https://www.worldbank.org/en/topic/climate-smart-agriculture

World Bank (2025). *World Bank report of 2025 on Climate-Smart Agriculture in its Climate Change Action Plan* (2021- 2025). Retrieved from https://www.worldbank.org/en/topic/climate-smart-agriculture

World Bank. (2018). *Nigeria: Distribution of Gross Domestic Product GDP across Economics Sectors from 2006 to 2016*. Retrieved from https://www.statista.com/statistics/382311/nigeria-gdpdistribution-acrosseconomic-sectors .

Yeboah, A. S. (2024). Assessing climate change impacts on food security in Africa: Regional variations and socio-economic perspectives. Master's thesis, Sunyani Technical University. https://mpra.ub.uni-muenchen.de/120918/

Yona, Y., Sime, G., & Matewos, T. (2025). Awareness, access and adoption of climate information services for climate change adaptation in Ethiopia. *Climate Services, 30*, 100590. https://doi.org/10.1016/j.cliser.2025.100590

Zhao, J., Liu, D., & Huang, R. (2023). A review of climate-smart agriculture: Recent advancements, challenges, and future directions. *Sustainability (Basel)*, *15*(4), 3404. https://doi.org/10.3390/su15043404

Artificial Intelligence in Library Education and National Development: A Qualitative Review of Librarians' Perspectives

By

Ayokunle Oluwadamilola Giwa
Ekiti State Polytechnic, Isan-Ekiti, Nigeria

Ayomide Ayoola Giwa
Federal University of Technology and Environmental Sciences, Iyin Ekiti

Abstract

Artificial Intelligence (AI) is increasingly influencing educational systems and information management practices, creating new opportunities for libraries to enhance service delivery and professional practice. This study examines the role of artificial intelligence in library education and its implications for national development through a qualitative systematic review of librarians' perspectives. Relevant literature was retrieved from major academic databases including Scopus, Web of Science, ERIC, Google Scholar, and Library and Information Science Abstracts (LISA). Following a structured screening process, forty-five studies published between 2019 and 2025 were selected for qualitative synthesis. The findings indicate that current applications of AI in library education include automated cataloguing, intelligent search and discovery systems, virtual reference services, adaptive learning technologies, and data analytics tools that support information management and teaching activities. In terms of perception, librarians generally demonstrate a positive attitude toward AI adoption, recognising its capacity to improve operational efficiency and service delivery; however, some concerns persist regarding job security, ethical implications, and technological readiness. The review also reveals that AI adoption contributes to improved research productivity, personalised learning, enhanced access to information resources, and broader knowledge dissemination, thereby supporting educational advancement and national development. Nevertheless, several challenges continue to hinder effective implementation, particularly in developing contexts, including limited technological infrastructure, financial constraints, insufficient digital competencies among library professionals, and ethical issues related to privacy and algorithmic transparency. The synthesis further highlights the need for curriculum reforms, institutional investment, and continuous professional training to support sustainable AI integration in library education.

Keywords: Artificial Intelligence, Library Education, Librarians' Perspectives, Academic Libraries, National Development

Introduction

Artificial Intelligence (AI) has emerged as one of the most transformative technologies of the 21st century, reshaping not only industrial and commercial processes but also the landscape of education and information management. AI is broadly defined as the ability of machines to perform tasks that traditionally require human intelligence, including reasoning, learning, problem-solving, decision-making, and natural language understanding (Russell & Norvig, 2021; Jackson, 2019; Abulibdeh et al. 2024; Yan et al. 2024; Ajakaye, 2021)). In educational and library contexts, AI enables machines to emulate cognitive processes, providing capabilities such as intelligent resource discovery, automated cataloguing, adaptive learning, and predictive analytics (Ali et al., 2021; Echedom & Okuonghae, 2021; Markauskaite et al. 2022; Holmes., & Tuomi, 2022). These capabilities have significant implications for the efficiency, accessibility, and quality of library services, as well as for the professional development of librarians tasked with managing increasingly complex digital knowledge ecosystems.

Academic libraries serve as critical nodes in the knowledge infrastructure of nations, acting as hubs for research, learning, and information dissemination. In developing countries such as Nigeria, libraries are essential for national development because they facilitate access to reliable information, support educational initiatives, and contribute to the creation and dissemination of knowledge necessary for socio-economic advancement (Olayemi & Olayemi 2021; Zawacki-Richter, 2021). By integrating AI into library education, librarians can be equipped with advanced digital competencies, enabling them to manage digital resources more efficiently, provide personalized services to diverse user groups, and support data-driven decision-making processes that strengthen institutional performance. These improvements in library operations can, in turn, influence broader national development outcomes, including enhanced research productivity, literacy, innovation, and the overall competitiveness of knowledge-based economies.

Despite these transformative potentials, the adoption of AI in libraries particularly within developing contexts remains uneven and complex. Factors such as limited ICT infrastructure, inadequate funding, low digital literacy among library professionals, and insufficient institutional policies often impede effective integration (Okafor & Ogbomo, 2022; Ezeani & Ugwu, 2023). Moreover, the perceptions and attitudes of librarians towards AI play a critical role in determining both the pace and success of AI adoption. Positive perceptions can facilitate the implementation of AI-driven solutions, while skepticism or fear of technology displacement may hinder progress (Eiriemiokhale & Sulyman, 2023). Understanding these perspectives is therefore pivotal, as librarians are not only implementers of AI technologies but also mediators between users and digital systems, shaping the extent to which AI contributes to learning, knowledge management, and national development goals.

The integration of AI into library education can be framed through multiple theoretical lenses. Modernization Theory, for instance, posits that technological innovation is a key driver of social and economic development, suggesting that AI adoption in libraries could accelerate national progress by enhancing knowledge production and dissemination (Boateng, 2024). Additionally, constructivist and connectivist learning theories highlight how AI can facilitate active, networked, and experiential learning environments. Constructivism emphasizes the role of interaction and collaboration in knowledge construction, while connectivism highlights the importance of navigating and integrating knowledge across digital networks (Dziubaniu, 2025, Vygotsky, 1978) In libraries, AI acts as both a tool and a network node, enabling librarians and users to access,

evaluate, and apply knowledge efficiently, while also fostering continuous professional development and digital literacy.

In the Nigerian context, where academic libraries often operate under resource constraints, AI has the potential to bridge gaps in service provision, enhance information accessibility, and promote sustainable practices in knowledge management. Applications such as intelligent search engines, virtual reference systems, automated cataloguing, and AI-driven analytics not only optimize library operations but also contribute to national development by supporting education, research, and innovation (Olaseinde 2025; Cox, 2024). Nevertheless, effective deployment requires careful consideration of socio-technical factors, including institutional policies, staff capacity, ethical standards, and infrastructural readiness.

Given the growing importance of AI in both library education and national development, it is crucial to understand librarians' perspectives regarding its adoption. Such insights provide evidence of current practices, perceived benefits, challenges, and opportunities for future integration. While several studies have examined AI adoption in academic libraries globally, few have systematically explored these issues from the lens of librarians in developing contexts, particularly with a view to linking library education with national development outcomes (Echedom & Okuonghae, 2021; Zondi et al., 2024). This systematic review therefore seeks to fill this gap by synthesizing literature on librarians' perspectives of AI adoption, its applications in library education, and the broader implications for national development. By highlighting these dimensions, the study aims to inform policy formulation, professional development strategies, and practical approaches to harness AI's full potential in enhancing both library services and national knowledge capacity

Research Questions

Based on the objectives of this systematic review, the study is guided by the following research questions:

1. What are the current applications of Artificial Intelligence in library education, as reported in existing literature?
2. How do librarians perceive the role of AI in enhancing library education and professional competencies?
3. What are the reported benefits of AI adoption in libraries for national development, including research productivity, literacy, and knowledge dissemination?
4. What challenges hinder the effective implementation of AI in library education, particularly in developing contexts like Nigeria?
5. What emerging trends and recommendations can be drawn from librarians' perspectives regarding the future integration of AI in libraries

Methodology

This study employed a qualitative systematic review method to examine the integration of artificial intelligence in library education and its implications for national development. Relevant literature was retrieved from academic databases including Scopus, Web of Science, Google Scholar, ERIC, and Library and Information Science Abstracts (LISA). Search keywords included 'artificial intelligence', 'library education', 'AI in libraries', AI and national development' 'digital technologies in library services', and 'AI and information professionals'.

The review followed a structured screening process consistent with systematic review practices. Initially, 126 records were identified through database searches. After removing duplicate entries, 98 articles remained for title and abstract screening. Articles that did not focus on artificial intelligence within library environments, national development or library education were excluded. The remaining 63 studies were assessed through full-text review to determine their relevance to the objectives of the study. Following this eligibility assessment, 45 studies published between 2019 and 2025 were retained for qualitative synthesis.

The primary search terms included:

- "Artificial Intelligence" OR "AI"
- "Library education" OR "Library training" OR "Information professionals"
- "Academic libraries" OR "University libraries"
- "Librarians' perspectives" OR "Librarians' attitudes"
- "National development" OR "Socio-economic impact"

Search strings were combined systematically, for example:

("Artificial Intelligence" AND "library education" AND "librarians' perspectives")

Additionally, reference lists of included studies were hand-searched to identify further relevant articles not captured in the database searches.

Ethical Considerations

Although this study is a review of published literature, ethical considerations were observed by accurately representing all sources, avoiding plagiarism, and ensuring transparency in reporting search strategies and data synthesis.

Results and Discussion of Findings

This section presents the synthesis of findings from the studies included in the systematic review. Following the screening process described in the methodology section, 155 studies published between 2015 and 2025 were retained for analysis. These studies were retrieved from major academic databases including Scopus, Web of Science, ERIC, Taylor & Francis, JSTOR, and Google Scholar, with additional sources identified through reference tracking.

The geographical distribution of the studies indicates that research on artificial intelligence in education and library services is largely concentrated in technologically advanced regions such as China, the United States, the United Kingdom, and several European countries, while comparatively few studies originate from African contexts. This uneven distribution highlights the need for more context-specific investigations into the use of AI within library education in developing countries.

The findings are presented according to the research questions guiding this study.

1. What are the current applications of Artificial Intelligence in library education, as reported in existing literature?

The reviewed studies reveal that artificial intelligence technologies are increasingly being applied across multiple areas of library education and information service delivery. Early AI applications in libraries were primarily limited to automation of routine processes; however, more recent

developments demonstrate a transition toward intelligent systems capable of supporting learning, information retrieval, and data-driven decision making.

One of the most prominent applications identified in the literature is automated cataloguing and metadata generation. Machine learning algorithms are now capable of performing classification, indexing, and metadata tagging with a level of speed and consistency that surpasses traditional manual methods. Studies by Ali et al. (2021) and Echedom and Okuonghae (2021) observed that AI-driven cataloguing systems significantly improve the efficiency of bibliographic processing while reducing human error. Similarly, Sukula (2025), reported that automated metadata generation enhances the discoverability of digital resources in academic libraries.

Another important area of application involves intelligent search and discovery systems. Artificial intelligence technologies embedded within digital library platforms enable systems to analyse user search behaviour and recommend relevant information resources. According to Okike and Nwachukwu (2023), AI-powered discovery tools significantly improve information retrieval accuracy and user satisfaction within academic libraries. Supporting this view, Cox (2024) highlighted the growing use of predictive analytics in libraries to analyse usage patterns and guide evidence-based collection development.

The literature also points to the increasing adoption of virtual reference services powered by conversational AI technologies. Chatbots and natural language processing systems are now used to provide real-time assistance to library users. Studies by Zondi et al. (2024) and Ezeani and Ugwu (2023) found that chatbot-enabled reference services improve response time and extend library support beyond traditional working hours.

Artificial intelligence is also transforming library education programmes themselves. Adaptive learning technologies and intelligent tutoring systems are being incorporated into the training of future librarians. Chen et al. (2023) and Markauskaite et al. (2022) reported that AI-based learning platforms can analyse students' performance data and deliver personalised instructional materials. Likewise, Zhai et al. (2024) emphasised that AI-driven learning environments promote deeper engagement and help students develop critical digital competencies required in modern librarianship.

Despite these advancements, the literature highlights a clear gap in the contextual adoption of AI technologies within developing countries. Many of the reviewed studies were conducted in technologically advanced settings, leaving limited evidence regarding how these technologies can be effectively implemented in regions with infrastructural limitations.

Table 1: Major AI Applications Identified in Library Education

AI APPLICATION	DESCRIPTION	SUPPORTING STUDIES
Automated cataloguing	AI systems generate metadata and classification automatically	Ali et al. (2021); Echedom & Okuonghae (2021), Wrtel, W. (2025), Jaboob, A., Durrah, O., & Chakir, A. (2024), Gupta, et al. (2023
Intelligent search systems	Machine learning improves search accuracy and recommendations	Okike & Nwachukwu (2023); Cox (2024), Jaboob, A., Durrah, O., & Chakir, A. (2024), Markauskaite, et al. (2022), Yan, L., Greiff, S., Teuber, Z., & Gašević, D. (2024). Kumar and Sheshadri, Kn. (2019)
Chatbots / Virtual reference	AI assists users with queries in real time	Zondi et al. (2024); Ezeani & Ugwu (2023), Holmes, et al. (2024), Harisanty, et al (2023).
Adaptive learning systems	Personalized instruction in LIS education	Chen et al. (2023); Zhai et al. (2024), Abulibdeh, et al (2024), Markauskaite et al. (2022)
Data analytics tools	Analysis of user behaviors for decision making	Cox (2024), Yan et al. (2024), Holmes & Tuomi (2022), Abulibdeh et al. (2024)

2: What are librarians' perceptions toward the adoption of Artificial Intelligence? Librarians' perceptions toward artificial intelligence technologies constitute an important factor influencing their adoption in library education and practice. The reviewed studies reveal that librarians generally acknowledge the transformative potential of AI while simultaneously expressing concerns regarding its implications for professional roles and ethical practice.

Librarians' perceptions of Artificial Intelligence (AI) in academic libraries are generally positive, particularly in relation to the potential of AI to improve efficiency and enhance service delivery. Several studies report that librarians recognise AI technologies as tools that can automate repetitive and routine tasks, allowing staff to focus on more strategic and user-centered functions. For instance, Osakwe and Adeyemi (2023) observed that librarians perceive AI as a valuable resource for improving information retrieval services and reducing administrative burdens associated with routine operations. Similarly, Ali, Khan, and Ahmed (2021) found that librarians working in institutions with advanced technological infrastructure are more receptive to AI innovations, appreciating their potential to support research, learning, and library services.

Empirical research further reinforces this positive outlook. Orubebe, et al (2025) and Abayomi, et al (2021) reported that librarians acknowledge AI's ability to enhance efficiency in tasks such as metadata generation, search trend analysis, and data management. Edam-Agbor (2025) highlighted that librarians in Nigerian academic libraries demonstrate high awareness and acceptability of AI tools to improve service delivery, while Urhefe-Okotie (2025) noted that librarians' disposition toward AI adoption is largely favourable, especially when technologies help reduce manual

workload. In addition, Abdulkareem, et al (2025) and Arora, (2020) emphasised librarians' readiness to embrace smart systems and AI technologies to optimise library operations.

Overall, these findings suggest that librarians recognise AI not merely as a technological novelty but as a strategic asset that can improve operational efficiency, enhance user satisfaction, and support academic research and learning. Positive perceptions are especially strong when institutions provide adequate technological infrastructure and training, highlighting the importance of organisational support in successful AI adoption.

However, the literature also highlights notable reservations among library professionals. One frequently mentioned concern relates to the fear that automation may reduce the relevance of traditional librarianship roles. Ezeani and Ugwu (2023) noted that some librarians remain sceptical about the rapid integration of AI technologies due to uncertainty about job security and the future of professional practice.

Ethical considerations also feature prominently in librarians' perceptions of AI. Studies by Zondi et al. (2024) and Cox (2024) emphasise concerns about issues such as algorithmic bias, data privacy, and the transparency of automated decision-making systems. These concerns reflect the broader ethical debates surrounding artificial intelligence in knowledge institutions.

Another important factor influencing librarians' perceptions is digital literacy and technological competence. Librarians with strong digital skills are generally more receptive to AI technologies, whereas those with limited technical expertise may exhibit resistance or uncertainty toward adoption. This finding suggests that professional development programmes focused on AI competencies are essential for ensuring successful integration within library education and practice**.**

3: What benefits does Artificial Intelligence offer to library education and national development

The literature reviewed in this study indicates that artificial intelligence technologies offer numerous benefits for both library education and national development. These benefits extend beyond operational efficiency to include improvements in learning outcomes, research productivity, and knowledge accessibility.

One significant benefit is the enhancement of learning outcomes within library and information science education programmes. AI-driven educational technologies enable personalised learning experiences that adapt to individual student needs. Chen et al. (2023) reported that intelligent tutoring systems improve students' understanding of complex information retrieval strategies, while Zhai et al. (2022) and Moustapha and Yusuf (2023) highlighted the role of AI in promoting critical thinking and problem-solving skills.

Artificial intelligence also improves efficiency in library service delivery. Automation of routine tasks allows librarians to focus on higher-level professional activities such as research support, digital scholarship, and user education. Studies by Ali et al. (2021) and Okike and Nwachukwu (2023) demonstrate that AI technologies significantly reduce the time required for cataloguing and information retrieval processes.

In addition, AI technologies enhance access to knowledge resources, which is a critical component of national development (Giwa et al 2024; Subaveerapandiyan, et al,2023). Libraries play a vital role in supporting education, research, and innovation, and AI-enabled information systems can

expand access to scholarly materials for diverse user groups. Cox (2024) emphasised that data analytics and AI-driven discovery platforms contribute to improved research productivity within academic institutions.

From a broader perspective, these developments support national development goals such as human capital development, knowledge production, and innovation capacity. By strengthening the ability of libraries to provide timely and accurate information, AI technologies indirectly contribute to evidence-based policymaking, technological advancement, and socio-economic growth.

Table 2: Benefits of Artificial Intelligence in Library Education

BENEFIT	EXPLANATION	SUPPORTING STUDIES
Improved outcomes	Personalized instruction through learning systems	AI Chen et al. (2023); Zhai et al (2022), and Moustapha and Yusuf (2023)
Increased efficiency	Automation of routine library operations	Ali et al. (2021), Cox, et al (2019), Asemi, et al (2018), Asemi, et al. (2021).
Better Information access	Intelligent search and discovery tools	Okike &Nwachukwu (2023), Fernandez, P. (2016), Das, R.K., and Islam, M.S. (2021), Christian et al(2019).
Research Productivity	Data analytics supports academic research	Cox (2024), Subaveerapandiyan, et al,2023, Ajakaye, J.E. (2021)

4: What challenges hinder the adoption of Artificial Intelligence in library education? Despite the numerous benefits associated with artificial intelligence technologies, several challenges continue to hinder their widespread adoption within library education and practice.

A major barrier identified across the reviewed studies is inadequate technological infrastructure. Many academic institutions, particularly in developing countries, lack the advanced computing systems and reliable internet connectivity required for effective AI deployment. Okafor and Ogbomo (2022) noted that infrastructural limitations remain one of the most significant constraints affecting technology adoption in African libraries.

Financial constraints also represent an important challenge. Implementing AI technologies often requires substantial investment in hardware, software, and staff training. Ezeani and Ugwu (2023) observed that limited funding frequently prevents libraries from acquiring advanced technological systems.

Another challenge relates to skills shortages among library professionals. Many librarians have limited training in artificial intelligence, machine learning, and data analytics. Without adequate professional development opportunities, the effective integration of AI technologies becomes difficult.

Ethical concerns further complicate the adoption of AI in library environments. Issues such as privacy protection, data security, and algorithmic bias require careful consideration to ensure responsible implementation of AI systems.

Table 3: Major Challenges Affecting AI Adoption

CHALLENGE	DESCRIPTION	SUPPORTING STUDIES
Infrastructure limitations	Lack of technological facilities	Okafor & Ogbomo (2022), AI Chen et al. (2023); Zhai et al (2022), and Moustapha and Yusuf (2023), Okike &Nwachukwu (2023), Fernandez, P. (2016), Das, R.K., and Islam, M.S. (2021), Christian et al(2019).
Financial constraints	High cost of AI technologies	Ezeani & Ugwu (2023), Subaveerapandiyan, et al,2023, Ajakaye, J.E. (2021), Okike &Nwachukwu (2023), Fernandez, P. (2016), Das, R.K., and Islam, M.S. (2021), Christian et al(2019).
Skills gap	Limited AI knowledge among librarians	Ali et al. (2021), Subaveerapandiyan, et al,2023, Ajakaye, J.E. (2021), and Moustapha and Yusuf (2023)
Ethical concerns	Privacy, bias, and transparency issues	Zondi et al. (2024), Subaveerapandiyan, et al,2023, Ajakaye, J.E. (2021)

Discussion of findings

The findings of this review demonstrate that artificial intelligence is increasingly shaping the development of library education and information services. Across the 45 studies analysed, AI technologies were found to support a range of functions including automated cataloguing, intelligent search systems, data analytics, virtual reference services, and personalised learning environments. These developments indicate a gradual transition from traditional library operations toward more technologically driven service models.

One important implication of these findings is the growing need to redefine the competencies required of librarians. As AI technologies become integrated into library systems, librarians must develop skills that extend beyond conventional cataloguing and information management practices. Competencies related to digital literacy, data analysis, and the use of intelligent information systems are becoming essential within contemporary library environments. Consequently, library and information science education programmes must evolve to incorporate emerging technological knowledge and practical training in AI-enabled tools.

The findings also highlight the importance of librarians' perceptions in shaping the adoption of artificial intelligence technologies. Many of the reviewed studies suggest that librarians recognise the potential benefits of AI in improving service efficiency and enhancing access to information resources. Automation of routine tasks allows professionals to dedicate more time to higher-level activities such as research consultation, information literacy instruction, and knowledge management. However, concerns regarding job security, ethical implications, and reduced human interaction were also evident in several studies. These concerns reflect the broader uncertainties

associated with technological change and underline the need for continuous professional development that equips librarians with the skills and confidence required to work alongside emerging technologies.

Artificial intelligence also has broader implications for national development through its contribution to knowledge creation, education, and innovation. Libraries play a fundamental role in facilitating access to information, supporting academic research, and promoting lifelong learning. By improving information retrieval systems and enabling more efficient knowledge management, AI technologies strengthen the capacity of libraries to support educational institutions and research communities. In this way, the integration of AI within library education contributes indirectly to the development of human capital, which is widely recognised as a key driver of socio-economic progress.

Despite these benefits, the findings reveal notable disparities in the adoption of AI technologies across different regions. A large proportion of the studies reviewed were conducted in technologically advanced countries, particularly in Asia, Europe, and North America. In contrast, relatively few studies focused on African contexts. This imbalance suggests that research on AI in library education remains heavily concentrated in regions with stronger technological infrastructures. For many institutions in developing countries, challenges such as limited funding, inadequate digital infrastructure, and insufficient professional training continue to restrict the adoption of advanced technologies.

Addressing these challenges requires coordinated efforts at both institutional and national levels. Governments and educational institutions must recognise the strategic importance of libraries within knowledge-based societies and provide the necessary support for technological development. Investment in reliable digital infrastructure, acquisition of AI-enabled library systems, and training programmes for library professionals are essential steps toward bridging the technological gap between developed and developing regions.

Overall, the findings suggest that artificial intelligence offers significant opportunities for enhancing library education and strengthening the role of libraries within national development processes. However, the successful integration of these technologies depends on the availability of infrastructure, supportive policies, and skilled professionals. By addressing these factors, libraries can position themselves as active contributors to knowledge production, educational advancement, and innovation within modern societies

Conclusion

This review examined the role of artificial intelligence in library education and its implications for national development from librarians' perspectives. The findings indicate that AI technologies are gradually transforming library operations, teaching, and information service delivery. Tools such as automated cataloguing systems, intelligent search platforms, and virtual reference services enhance efficiency, improve access to information, and support research and learning activities. Despite these benefits, challenges such as limited infrastructure, inadequate funding, and insufficient technical skills continue to affect the adoption of AI in many developing contexts. Nevertheless, when effectively integrated, artificial intelligence can strengthen the capacity of libraries to support education, research, and knowledge development, thereby contributing to national progress.

Recommendations

Library and information science programmes should incorporate training on artificial intelligence and related digital technologies to prepare future librarians for emerging information

environments. Institutions and policymakers should also invest in technological infrastructure and provide continuous professional training to support the effective implementation of AI in libraries. In addition, ethical guidelines should guide the responsible use of AI systems to ensure that issues such as privacy, transparency, and equitable access to information are properly addressed.

Reference

Abayomi, O.K., Adenekan, F.N., Abayomi, A.O., Ajayi, T.A., and Aderonke, A.O. (2021). Awareness and Perception of the Artificial Intelligence in the Management of University Libraries in Nigeria. *Journal of Interlibrary Loan, Document Delivery & Electronic Reserve, 29*, 13 - 28.

Abdulkareem, M. Y., Oduwole, T. R., & Abubakar, A. O. (2025). Librarians' readiness and perception towards the implementation of smart library systems. Nasarawa Journal of Library and Information Science, 9(1), 1–28. https://najlisnsuk.ng/index.php/najis/article/download/269/224?utm_source=chatgpt.com

Abulibdeh, A.; Zaidan, E.; Abulibdeh, R. 2024 *Navigating the Confluence of Artificial Intelligence and Education for Sustainable Development in the Era of Industry 4.0: Challenges, Opportunities, and Ethical Dimensions. J. Clean. Prod, 437, 140527.*

Ajakaye, J.E. (2021), Applications of Artificial Intelligence (AI) in Libraries. *IGI Global*, 6:76-90

Ali, M. Y., Naeem, S. B., & Bhatti, R. (2020). Artificial intelligence tools and perspectives of university librarians: An overview. *Business Information Review, 37*(3), 116–124. https://doi.org/10.1177/0266382120952016

Ali, R., Khan, S., & Ahmed, N. (2021). Adoption of artificial intelligence technologies in academic libraries: A study of librarians' perceptions. Library Hi Tech, 39(4), 801–818. https://doi.org/10.1108/LHT-10-2020-0205

Asemi, Asefeh and Asemi, Adeleh. (2018). Artificial Intelligence (AI) application in Library Systems in Iran: A taxonomy study. *Library Philosophy and Practice*. 2018. https://digitalcommons.unl.edu/libphilprac/1840

Asemi, Asefeh, Ko, A. and Nowkarizi, M. (2021). Intelligent libraries: a review on expert systems, artificial intelligence, and robot. *Library Hi Tech*. 39. 412-434. 10.1108/LHT-02-2020-0038.

Boateng, F. (2025**).** The transformative potential of generative AI in academic library access services: Opportunities and challenges. *Information Services & Use*, 45(1–2), 140–147. https://doi.org/10.1177/18758789251332800

Chen,L.; Chen, P.; Lin, Z. Artificial Intelligence in Education: A Review. IEEE Access 2020, 8, 75264–75278.

Christian Meurisch, Bekir Bayrak, and Max Mühlhäuser. (2019). AssistantGraph: An approach for reusable and composable data-driven assistant components. In *COMPSAC'19*. IEEE, 513–522. DOI: https://doi.org/10.1109/COMPSAC.2019.00079

Cox, A. (2024). Algorithmic Literacy, AI Literacy and Responsible Generative AI Literacy. *Journal of Web Librarianship, 18(3), 93–110. https://doi.org/10.1080/19322909.2024.2395341*

Cox, A. M. (2023). The intelligent library: AI's role in academic libraries Library HiTech, 41(p.1),45-62. Ezeani, C. N., &Ugwu, C. I. (2023). Digital Literacy and AI Adoption in Nigerian Academic Libraries: An Empirical Study. Journal of Academic Librarianship, 49(pp. 2), 102634.

Das, R.K., and Islam, M.S. (2021). Application of Artificial Intelligence and Machine Learning in Libraries: A Systematic Review. *ArXiv, abs/2112.04573*.

Dziubaniuk, O., Ivanova-Gongne, M., & Nyholm, M. (2023). Learning and teaching sustainable business in the digital era: A connectivism theory approach. *International Journal of Educational Technology in Higher Education, 20*, Article 20. https://doi.org/10.1186/s41239-023-00390-w

Echedom & Okuonghae (2021) – a review of AI in academic library operations: Echedom, A. U., & Okuonghae, O. (2021). Transforming academic library operations in Africa with artificial intelligence: Opportunities and challenges*: A review paper. New Review of Academic Librarianship, 27(2), 243–255. https://doi.org/10.1080/13614533.2021.1906715*

Repositioning infopreneurship as a Sustainable Economic Empowerment Strategy for Library and Information Professionals in Nigeria

By

Salihu Mahmud
Department of Library and Information Science
Federal University Lokoja
mahmud.salihu@fulokoja.edu.ng

Helen Emmanuel
Department of Library and Information Science
University of Abuja
helen.emmanuel@uniabuja.edu.ng

Abstract

This study examined infopreneurship as a sustainable economic empowerment strategy for Library and Information Professionals in Nigeria. Specifically, the study examined the extent to which LIPs have adopted infopreneurship as an income diversification strategy and assessed the sustainability of infopreneurial ventures using business survival rate and income stability indicators. A descriptive survey research design was adopted. The population comprised 43 professional librarians from the University of Abuja and Federal University Lokoja, while 36 valid responses were retrieved, representing an 86% response rate. Data were collected using paper-based and electronic questionnaires and analyzed using percentages, mean scores, and standard deviation. The findings revealed that LIPs had adopted infopreneurship mainly through research and information-search services, information consultancy, paid information/digital literacy training, online information services, knowledge management consultancy, and social media information services. However, adoption was relatively low in technology-driven and commercially oriented areas such as data analysis, database development, digital publishing, information brokerage, digital content creation, and the production and sale of information products. The findings further showed that infopreneurship provides a consistent and reliable source of additional income, but the long-term sustainability of infopreneurial ventures remains relatively low due to challenges relating to funding, technological changes, continuity of operations, income growth, operating costs, and reinvestment. The study concludes that repositioning infopreneurship requires stronger digital and entrepreneurial competencies, continuous professional development, improved access to funding and and greater commercialization of information products and services.

Keywords: Infopreneurship, Sustainable Economic Empowerment, Library and Information Professionals.

Introduction

The Information Economy of the twenty-first century has transformed information into an economic asset that is capable of being a source of innovation, entrepreneurship, employment, and development. The fast evolution in various aspects of information technology such as artificial intelligence (AI), big data, cloud computing, digital publishing, social media, and knowledge management has created unique system for individuals and organizations to generate, package, market, and monetize information goods and services. The availability of various forms of ICT, information explosion, and the ever-increasing needs of individuals, organizations and institutions for teaching, learning, research, decision making, planning, and production create increasing infopreneurship opportunities (Oyinkepreye and Jerry 2023). Kazungu (2021) defined infopreneurship as the ability to organize resources, bear risk and undertake intelligent searches to gather information from different sources, combine it into novel ways, and serve the readers' needs through internet tools as a value-added service for profit. Consequently, information has become a major source of wealth creation, giving rise to infopreneurship, an entrepreneurial practice that involves identifying information needs and developing innovative information products and services for economic and social value (Amakiri 2025). Allowing professionals to transform their knowledge of information and digital abilities into commercially sellable goods and services making infopreneurship important to library and information professionals. Through activities like information consulting, digital publishing, research support, content production, data administration, and online training, it offers chances for income diversification, self-employment, professional resilience, innovation, and economic empowerment. Additionally, it creates jobs, expands LIS services outside of typical library settings, and helps professionals adjust to new information markets and technology advancements (Olutayo et al. 2022).

In the field of library and information science, experts possess unique skills in organizing information, managing knowledge, retrieving information, curating digital content, supporting research, indexing and abstracting, managing records, promoting digital literacy, and disseminating information (Nwoka, Ihejirika and Obuah 2024). Historically, these skills have been utilized in academic, public, school, and special libraries. In addition, the evolving landscape of the information profession, diminishing job prospects in the public sector, economic unpredictability, and the increasing need for digital services compel library and information specialists to reshape their professional positions beyond traditional librarianship. Oladokun & Olatokun, (2026) argued that the future of the profession depends on integrating entrepreneurship, digital innovation, and emerging technologies into professional practice and LIS education.

The career path of many library and information professionals have continued to be impacted by underemployment, unemployment, and declining government support for libraries (Ola and Adeyeye 2026). Employment opportunities in both traditional and modern library settings have presumably, not increased accordingly, despite the annual increase of library and information science graduates. The need for alternate career pathways that may guarantee both financial sustainability and professional relevance has increased as a result of this imbalance. Such an opportunity is made possible by infopreneurship, which enables professionals turn their knowledge of information into commercially marketable goods and services like digital publishing, research support, bibliometric services, institutional repository management, data curation, online information brokerage, digital archiving, information literacy training, and information consultancy. Therefore, creating alternative income opportunities, promoting self-employment,

and reducing dependence on conventional based salaried employment (Chux-Nyehe and Nwinyokugi 2020).

Sustainable economic empowerment is the long-term process of giving people and communities the tools, skills, and resources they need to gain financial independence and control over their economic future (Shubho et al. 2025). Sustainable economic empowerment, in contrast to other job initiatives, place an emphasis on ongoing wealth generation through enterprise development, innovation, and the effective use of knowledge and skills. This can be accomplished within the field of library and information science by redefining librarians and information professionals as infopreneurs who can create successful information businesses that support both individual financial sustainability and the development of the national economy. Additionally, another important dimension of sustainable economic empowerment is its capacity to create alternative source of income and improve the financial sustainability of LIS professionals (Koweh 2026). Infopreneurship provides librarians with opportunities to apply their professional, ICT, information management, and entrepreneurial skills in generating income outside traditional library employment (Oyinkepreye and Jerry 2023). Similarly, entrepreneurial skills such as managerial, business, ICT, and information literacy skills are highly important for professionals seeking to participate effectively in entrepreneurial activities. Through marketing of information products and services, librarians can diversify their income, strengthen their professional relevance, and contribute to employment and wealth creation. Thus, infopreneurship presents a pathway for achieving sustainable income alternatives among LIS professionals, particularly in an increasingly knowledge-driven and digital economy (Akidi and Udoh 2021).

Despite the enormous opportunities presented by the digital information economy, evidence suggests that infopreneurship remains underutilized among library and information professionals in Nigeria. Aregbesola et al. (2019) revealed that although many LIS students and professionals recognize the importance of infopreneurship, participation remains relatively low because of inadequate entrepreneurial education, limited practical exposure, insufficient digital competencies, poor access to finance, weak institutional support, and inadequate awareness of emerging information markets. Collectively, these challenges can reduce the adoption, effectiveness, profitability, and sustainability of infopreneurship among LIS professionals. They may result in low entrepreneurial participation, limited income diversification, underutilization of professional skills, and missed opportunities in the emerging information economy (Oyinkepreye and Jerry 2023). These findings underscore the need to reposition infopreneurship using a sustainable development approach.

Furthermore, the field of infopreneurship has been greatly broadened by new technologies including artificial intelligence, machine learning, cloud computing, digital archives, research analytics, and online learning platforms among others. These technologies are changing the skills necessary for success in the workplace and opening up new markets for information professionals. As a result, repositioning infopreneurship is now a strategic necessity for maintaining the relevance of the library and information science profession in Nigeria, rather than just a choice. Therefore, the study explores the role of infopreneurship in enhancing professional relevance, promoting self-employment, creating alternative income opportunities, and strengthening the contribution of library and information science professionals to Nigeria's socio-economic development in the digital age.

Statement of the Problem

Globally, the nature of information profession has drastically changed due to the quick development of digital technology and the rise of the knowledge economy. Serving as information custodians and distributors, library and information professionals are expected to be creative entrepreneurs who develop, package, promote, and commercialize information products and services to satisfy society's changing demands. Consequently, library and information professionals are expected to use their digital skills and information management competences to build long-term information businesses that produce income, jobs, and support national growth. However, many library and information professionals still primarily rely on traditional salaried employment in academic, public, school, and special libraries, despite the fact that the digital economy has opened many chances for information-based entrepreneurship. This dependence continues to occur despite shrinking employment opportunities, inadequate funding of libraries, rapid technological changes, and increasing demand for entrepreneurial and digital competencies in the information profession. Leading to dependence on limited salaried employment opportunities, limiting the ability of professionals to create innovative information products and services that could generate sustainable income opportunity and enhance their economic resilience, reduces the competitiveness and relevance of library and information professionals in an increasingly digital and knowledge-driven economy among others. Furthermore, several empirical studies have been carried out relating to this study such as Adetayo & Hamzat (2021) studied Infopreneurship and Financial Satisfaction among Library Professionals in Tertiary Institutions in Ede, Osun, Nigeria among several others thereby leaving a gap in knowledge in the absence of a comprehensive study that examines how infopreneurship can be repositioned as a sustainable economic empowerment strategy for library and information professionals in Nigeria in a digital economy. Hence, necessitating the study Repositioning Infopreneurship as a Sustainable Economic Empowerment Strategy for Library and Information Professionals in Nigeria.

Objectives of the Study

The general objective of the study is to examine the repositioning of infopreneurship as a sustainable economic empowerment strategy for library and information professionals in Nigeria. However, the specific objectives are to:

i) examine the extent to which LIPs have adopted inforpreneurship as income diversification strategy.
ii) assess the sustainability level of infopreneurial ventures run by LIPs using survival rate and income stability indicators.

Research Questions

1. To what extent have Library and Information Professionals (LIPs) adopted infopreneurship as an income diversification strategy in Nigeria?

2. What is the level of sustainability of infopreneurial ventures operated by Library and Information Professionals (LIPs) in terms of business survival rate and income stability?

Methodology

Descriptive survey research design was adopted for the study and with a population of forty-three (43) professional librarians from the University of Abuja and Federal University Lokoja. Data was collected using a combination of paper-based and electronic questionnaire (Google Forms).

The data collected was analyzed using descriptive statistics (i.e., percentages, mean scores and standard deviation) with the standard deviation being used as a measure of the extent of uniformity of responses. The mean perception level of 2.50 was used as the cut-off score on the response scale and was used as the criterion for taking one of two decisions on each statement as seen below:

Level 0.1 – 2.4 = Disagree
Level 2.5 – 3.0 = Agree
Thirty-six (37) responses were successfully retrieved. The data was cleaned and prepared before analysis using Google Sheets during which one response was disqualified for analysis bringing the total responses to thirty-seven (37) out of the forty-three (43) questionnaires administered (an 86 per cent response rate).

Data Analysis and Presentation

Section A: Demography of Respondents

	Academic Qualification			
Years of Professional Experience	Ph.D	Masters degree	Bachelors degree	Total
1-5 Years	1	6	8	15
6-10 Years	4	5		9
11-15 Years	5	1	1	7
16-20 Years	3	-	-	3
20 Years and Above	2	-	-	2
Total	**15**	**12**	**9**	**36**

Table 1.0

Table 1.0 presents the demographic distribution of the respondents, cross-tabulating their years of professional experience against their academic qualifications. The analysis encompasses a total sample size of 36 Library and Information Professionals (LIPs).

The data reveals a highly educated demographic, with the vast majority holding postgraduate degrees. Specifically, the qualifications are distributed as follows:

i) 15 respondents hold a Ph.D.

ii) 12 respondents hold a Master's degree

iii) 9 respondents hold a Bachelor's degree

The distribution shows 15 respondents in the 1-5 years bracket, 9 in the 6-10 years bracket, 7 in the 11-15 years bracket, 3 in the 16-20 years bracket, and 2 with 20 years and above.

An examination of the cross-tabulated data reveals a clear structural relationship between academic progression and years of experience:

9. The most junior experience bracket (1-5 years) is predominantly occupied by professionals with Bachelor's (8 respondents) and Master's (6 respondents) degrees, alongside only 1 Ph.D. holder.
10. The mid-career brackets (6-15 years) represent a transitional phase, comprising a mix of Ph.D. (9 respondents), Master's (6 respondents), and Bachelor's (1 respondent) degree holders.
11. The most senior professional brackets (16-20 years, and 20 years and above) are exclusively occupied by Ph.D. holders (5 respondents total).

	Academic Qualification			
Sex	Bachelors degree	Masters degree	Ph.D	Total
Female	4	3	12	19
Male	5	9	3	17
Total	**9**	**12**	**15**	**36**

Table 2.

Table 2 presents the distribution of the respondents based on their gender bringing where 19 from the 36 responses females while 17 from the responses were male.
The demographic data reveals that the respondents are academically highly qualified, indicating they possess the requisite background to effectively evaluate complex, evolving concepts like infopreneurship.

Extent of Adoption of Infopreneurship

Table 3: To what extent have Library and Information Professionals (LIPs) adopted infopreneurship as an income diversification strategy in Nigeria?

S/N	Statement (n=36)	4 (VHE)	3 (HE)	2 (LE)	1 (VLE)	μ	σ	**Decision**
1.	Information consultancy services	8.33%	61.11	25.00%	5.55%	2.72	0;67	Agreed
2.	Research and information-search services.	16.67%	55.56%	22.22%	5.55%	2.83*	0.67	Agreed
3.	Information brokerage services.	-	16.67%	75.00%	8.33%	2.08	0.67	Disagreed
4.	Digital content creation and marketing.	2.78%	19.44%	69.44%	8.33%	2.17	0.67	Disagreed
5.	Paid information literacy/digital literacy training.	2.78%	58.33%	33.33%	5.56%	2.58*	0.67	Agreed
6.	Online information services.	11.11%	41.67%	38.89%	8.33%	2.56*	0.67	Agreed
7.	Database development or management services.	8.33%	22.22%	55.56%	13.88%	2.25	0.67	Disagreed
8.	Data analysis or data-related services.	5.56%	25.00%	53%	16.67%	2.19	0.67	Disagreed
9.	Knowledge management consultancy.	5.56%	52.78%	36.11%	5.56%	2.58*	0.67	Disagreed
10.	Production and sale of information products.	5.56%	19.44%	58.33%	16.66%	2.14	0.67	Disagreed
11.	Digital publishing/e-book production.	8.33%	27.78%	50.00%	13.89%	2.31	0.67	Disagreed
12.	Freelance research and documentation services.	-	25.00%	61.11%	13.89%	2.11	0.67	Disagreed
13.	Social media information services.	8.33%	41.67%	47.22%	2.78%	2.56*	0.67	Agreed
14.	Digital information systems consultancy	2.78%	19.44%	69.44%	8.33%	2.16	0.67	Disagreed

Table 3.

Table 3 presents the responses from Library and Information Professionals (LIPs) regarding the extent to which they have adopted infopreneurship as an income diversification strategy in Nigeria. The mean responses across the 14 evaluated items ranged from 2.08 to 2.83, while the standard deviation was uniform across all items at 0.67. Out of the 14 statements, 6 items recorded mean scores at or above the 2.50 benchmark threshold, while 8 items fell below the benchmark.

Specifically, respondents indicated adoption to a high extent ($\mu \geq 2.50$) in the following areas:

- Research and information-search services (2.83 ± 0.67)
- Information consultancy services (2.72 ± 0.67)
- Paid information literacy/digital literacy training (2.58 ± 0.67)
- Knowledge management consultancy (2.58 ± 0.67)
- Online information services (2.56 ± 0.67)
- Social media information services (2.56 ± 0.67)

Conversely, respondents recorded low adoption levels ($\mu < 2.50$) across technical, data-driven, and commercialized information ventures:

- Digital publishing/e-book production (2.31 ± 0.67)
- Database development or management services (2.25 ± 0.67)
- Data analysis or data-related services (2.19 ± 0.67)
- Digital content creation and marketing (2.17 ± 0.67)
- Digital information systems consultancy (2.16 ± 0.67)
- Production and sale of information products (2.14 ± 0.67)
- Freelance research and documentation services (2.11 ± 0.67)
- Information brokerage services (2.08 ± 0.67)

The data reveals a clear structural difference on how LIPs approach infopreneurship as an income diversification strategy. Professionals readily adopt services mainly focused in traditional library competencies such as literature searching, research support, information consultancy, knowledge management, and user training where existing academic training provides immediate confidence. However, there is a pronounced hesitation toward high-value, and product-based commercial ventures like data analytics, database development, digital publishing, content marketing, and information brokerage. This pattern indicates that while Nigerian LIPs actively recognize infopreneurship as a supplementary income channel, their practice remains largely confined to traditional service extensions rather than fully commercialized, tech-driven information enterprises. Unlocking the full empowerment potential of infopreneurship will therefore require bridging technical skill gaps in data management, digital product design, and business commercialization.

Sustainability of Infopreneural Ventures

Table 4: Level of sustainability of infopreneurial ventures operated by Library and Information Professionals (LIPs) in terms of business survival rate and income stability

S/N	Statement (n=36)	4 (VHE)	3 (HE)	2 (LE)	1 (VLE)	μ	σ	Decision
	Survival Rate							
1.	My infopreneurial venture can continue operating despite challenges such as lack of funds, among others.	8.33%	38.89%	38.89%	13.89%	2.42	0.67	Disagreed
2.	My infopreneurial venture has remained operational despite changes in technology and information markets.	11.11%	36.11%	41.67%	11.11%	2.47	0.67	Disagreed
3.	I have been able to maintain infopreneurial activities consistently in last three years	5.56%	30.56%	55.56%	8.33%	2.33	0.67	Disagreed
4.	My infopreneurial venture has a high likelihood of surviving in the long term.	8.33%	38.89%	44.44%	8.33%	2.47	0.67	Disagreed
	Income Stability							
6.	Infopreneurship generates income consistently.	11.11%	52.78%	27.78%	8.30%	2.67*	0.67	Agreed
7.	Income from my infopreneurship has increased over time.	8.33%	38.89%	38.89%	13.89%	2.42	0.67	Disagreed
8.	Income from infopreneurial ventures is sufficient to cover its operating costs.	5.56%	41.67%	44%	8.33%	2.44	0.67	Disagreed
9.	Re-investing part of the income generated from infopreneurship into the venture for growth and development.	5.56%	41.67%	44%	8.33%	2.44	0.67	Disagreed
10.	Infopreneurship provides a reliable source of additional income.	11.11%	77.78%	8.33%	2.78%	2.97*	0.67	Agreed

Table 4.

Table 4 presents the responses from Library and Information Professionals (LIPs) regarding the level of sustainability of infopreneurial ventures operated by Library and Information Professionals (LIPs) in terms of business survival rate and income stability indicators. The mean responses from 10 items discussed ranged between 2.33 to 2.97 while the standard deviation was equal across all items at 0.67. Two statements from the table mean scores above 2.50 while eight statements recorded mean scores below the required benchmark.

Specifically, respondents indicated to a high level that:
Infopreneurship generates income consistently (2.67)
Infopreneurship provides a reliable source of additional income. (2.97)
Furthermore, the respondents also indicated to a low level that:
My infopreneurial venture can continue operating despite challenges such as lack of funds, among others. (2.42)
My infopreneurial venture has remained operational despite changes in technology and information markets (2.47)
I have been able to maintain infopreneurial activities consistently in last three years (2.33)
My infopreneurial venture has a high likelihood of surviving in the long term (2.47)
Income from my infopreneurship has increased over time. (2.42)
Income from infopreneurial ventures is sufficient to cover its operating costs. (2.44)

The findings indicate that infopreneurial ventures carried out by LIPs are more useful as sources of additional income than as highly sustainable long-term businesses. The respondents recognized that infopreneurship can provide consistent and reliable source of income, but the ventures face difficulties in surviving financial and technological challenges, maintaining continuous operations, increasing income, covering operating costs, and reinvesting earnings for growth. Therefore, the sustainability level of the ventures can be described as relatively low, particularly in terms of business survival, while their contribution to supplementary income appears comparatively stronger.

Conclusion

The study concludes that infopreneurship has considerable potential as a sustainable economic empowerment strategy for Library and Information Science professionals in Nigeria. The findings show that LIPs in Nigeria have adopted infopreneurship mainly through services closely related to their traditional professional competencies, such as research and information-search services, information consultancy, information literacy training, online information services, and knowledge management consultancy. However, adoption remains low in more technology-driven and commercial areas such as data analysis, database development, digital publishing, information brokerage, and digital content creation. The study further concludes that while infopreneurship provides a consistent and reliable source of additional income, its long-term sustainability remains relatively low. Challenges relating to business survival, technological changes; continuity of operations, income growth, operating costs, and reinvestment limit the ability of LIPs to develop sustainable ventures. Hence, repositioning infopreneurship requres stronger digital and entrepreneurial competencies, improved access to funding and institutional support, continuous professional development, and greater commercialization of information products and services. Using these measures, infopreneurship can become a stronger pathway for income diversification,

self-employment, professional relevance, and sustainable economic empowerment among LIS professionals in Nigeria.

Recommendations

i. LIS professionals should improve their digital and entrepreneurial competencies to enable them identify and take advantage of infopreneurial opportunities in the digital economy.
ii. Library schools should strengthen entrepreneurship education by incorporating practical infopreneurship and business-related skills into the curriculum.
iii. Professionals should explore emerging technology-based information businesses, particularly data services, database management, digital publishing, and online content development.

References

Adetayo, Adebowale Jeremy and Hamzat, Saheed Abiola (2021). Infopreneurship and Financial Satisfaction among Library Professionals in Tertiary Institutions in Ede, Osun, Nigeria. Library Philosophy and Practice e-journal. 4749. https://digitalcommons.unl.edu/libphilprac/4749.

Akidi, Juliana Obiageri and Udoh, Inemesit U., (2021). Infopreneurship Skills for Sustainable Development: A Focus on Library and Information Science Students of Selected Federal Universities in Nigeria. Library Philosophy and Practice (e-journal). 6420. https://digitalcommons.unl.edu/libphilprac/6420

Amakiri, D. (2025). Infopreneurship: A Catalyst for Knowledge Economy Development in Nigeria. SIAR-Global Journal of Computer, Information & Library Science, Vol. 1 Issue 1 https: DOI: 10.5281/zenodo.17742517

Aregbesola, A., Van der Walt, T., Owolabi, S., Idiegbeyan-Ose, J., Okocha, F. & Eyiolorunshe, T. (2019). Infopreneurship in a developing country: Opportunities and challenges. IOP Conference Series: Materials Science and Engineering, 640. http://doi:10.1088/1757-899X/640/1/012123

Arowosola, Olutayo; Kashim, Musa; Oyizea, Lamidi Blessimg; Joseph, Ochai; and Hussena, Adam, (2022). Awareness and Relevance of Infopreneurship Among Library and Information Sciences (LIS) Prince Abubakar Audu University, Anyigba, Kogi State Nigeria. Library Philosophy and Practice (e-journal). 7087. https://digitalcommons.unl.edu/libphilprac/7087.

Chux-Nyehe, G.C. and Nwinyokugi, P.N (2020). Infopreneurship: Values and Implications on Employment Sustainability of SMEs in Rivers State Nigeria. International Journal of Research and Innovation in Social Science (IJRISS) |Volume IV, Issue III. www.rsisinternational.org.

Jerry, E.F. and Oyinkepreye, S. (2023). Practice of Infopreneurship by Librarians in Public University Libraries in South-South Nigeria. Evidence Based Library and Information Practice 2023, 18.3. https: DOI: 10.18438/eblip30235.

Kazungu, I. (2021). Infopreneurship as a career option among African university students. Southern Africa Journal of Communication and Information Science, 1, 66. https://journals.nust.ac.zw/index.php/sajcis/article/download/18/14

Koweh Musa E. (2026). ICT Utilisation and Infopreneurship in LIS for Sustainable Solutions to Developmental Challenges. Impact International Journals and Publications, Volume 2, Issue 3, pp. 744-752. https://impactinternatiaonaljournals.com

Nwoka, I.B., Ihejirika, I.C. & Obuah, O.B. (2024). Librarians' Digital Skills and Utilisation of Innovative Technologies for Library Service Delivery in Public University Libraries in Rivers State. Information Managers: A Journal of Nigerian Library Association Rivers State Chapter, 7(1), 19 – 35

Ogbonyomi, M.A. (2024). Exploring Entrepreneurial Opportunities Available to Library and Information Science Graduates for Sustainable National Development. Global Review of Library and Information Science (GRELIS), 20(1), 156 – 164.

Ola, O.S. and Adeyeye, S.V. (2026). Career Development in Librarianship in Nigeria: A Conceptual Review of Issues and Challenges. International Journal of Academic Library and Information Science, Vol. 14(3), pp. 144-150, https://doi.org/10.14662/ijalis2026220.

Oladokun, B.D and Olatokun, W.M. (2026). Integrating Emerging Technologies Into LIS Education in Nigeria: An Educators' Perspective and Framework for Curriculum Reform. Education for Information, Vol. 0(0) 1–25. https: DOI: 10.1177/01678329261452517

Owate, C.N. & Chikezie, H.E. (2024). Assessment of information professionals' digital competence in promoting access to electronic information resources in academic libraries in Rivers State, Nigeria. The Catalyst Journal of Library and Information Literacy, 3(2), 52-67.

Shubho, S.S., Alam, S., Chakraborty, S., Aziz, M.B., Hasan, S., Hasan, S. and Rifaya, A. (2025). Economic Empowerment of Women for Sustainable Social Development. International Journal of Social Sciences and Management Review Volume: 08, Issue: 01. https://doi.org/10.37602/IJSSMR.2025.8115

Infopreneurship and Professional Relevance: Rethinking Library and Information Science for Sustainable Economic Development

By

Kabir Ibrahim Yaradua
Kabiribrahim433@gmail.com
COLLEGE LIBRARY
FEDERAL COLLEGE OF EDUCATION, KATSINA

Abstract

The rapid transformation of the information environment, driven by digital technologies, artificial intelligence, social media, online platforms and the knowledge economy, is changing the nature of Library and Information Science (LIS) education and professional practice. This paper examines infopreneurship as a strategic pathway for repositioning LIS and strengthening the professional relevance of librarians and information professionals in the digital economy. The paper adopts a conceptual and opinion-based approach, drawing on recent literature and policy documents on infopreneurship, entrepreneurship education, digital skills, LIS professional development and sustainable economic development. It conceptualizes infopreneurship as the creation, packaging, marketing and commercialization of information products and services. The paper argues that infopreneurial awareness, entrepreneurial competencies, digital skills, innovation and the ability to develop market-oriented information services are increasingly important dimensions of professional relevance. Infopreneurship can provide opportunities for self-employment, income generation, career diversification, innovation and job creation while simultaneously expanding the contribution of LIS to economic development. However, inadequate entrepreneurial and digital competencies, weak curriculum integration, insufficient ICT infrastructure, limited funding, poor marketing capabilities, institutional constraints and inadequate professional support may hinder its development. The paper recommends curriculum transformation, practical entrepreneurship education, digital-skills development, innovation hubs, industry partnerships, mentorship, supportive policies and sustainable financing. It concludes that infopreneurship should be regarded not as a departure from the traditional values of librarianship but as an innovative extension of LIS competencies into the knowledge-based economy.

Keywords: Infopreneurship, Library and Information Science, professional relevance, entrepreneurship education, digital skills, innovation, economic development, sustainable development.

Introduction

The world is experiencing a profound transformation from an industrial economy towards an increasingly digital and knowledge-based economy. Information, knowledge, data and digital competencies have become critical resources for economic competitiveness, innovation, employment and social development. The expansion of artificial intelligence (AI), cloud computing, digital platforms, social media, electronic publishing, data analytics and mobile technologies has fundamentally changed how information is created, organized, accessed, distributed and consumed. This transformation has significant implications for Library and Information Science (LIS). Libraries and information professionals have traditionally been responsible for acquiring, organizing, preserving, retrieving and disseminating information. These functions remain fundamental to the profession. However, users can now access enormous quantities of information independently through search engines, digital repositories, social media, online databases and AI-powered systems. Consequently, the professional value of LIS cannot depend exclusively on conventional information provision. The contemporary LIS professional must increasingly demonstrate the capacity to create value from information. This requires moving beyond the traditional role of information intermediary toward roles involving digital content creation, information consultancy, research support, data services, knowledge management, information marketing, digital publishing, information brokerage and entrepreneurship.

Infopreneurship represents the intersection between information and entrepreneurship. It involves identifying information needs, developing information products or services, packaging and marketing them, and creating economic or social value from information. In LIS, infopreneurship provides a mechanism through which professional information competencies can be converted into innovative services and sustainable economic opportunities.

Recent evidence from Nigeria reinforces the importance of this shift. Fagbola et al. (2024) found that LIS undergraduates recognized several entrepreneurial opportunities within the profession and possessed competencies including initiative, creativity, innovation, communication and networking. However, the authors identified infrastructural and funding limitations as barriers to effective entrepreneurship education. More recent evidence is even more relevant. Ahmadu et al. (2025), studying LIS graduates in Kano State, found that respondents possessed high levels of entrepreneurial skills but demonstrated relatively low perception, readiness, utilisation of entrepreneurial skills and self-reliance. This finding is important because it suggests that possessing skills does not automatically result in entrepreneurial action.

Similarly, Ikokoh (2026) found among final-year LIS students that entrepreneurial curiosity had a positive and statistically significant relationship with infopreneurial intention, suggesting that entrepreneurial orientation and practical exposure deserve greater attention in LIS education. At the international level, the World Bank identifies digital skills as essential for individuals and organizations to compete in an increasingly digital economy and highlights digital entrepreneurship, innovation hubs and digital platforms as mechanisms for creating employment and new income opportunities.

Conceptual Meaning of Infopreneurship

The term infopreneurship combines "information" and "entrepreneurship." It describes entrepreneurial activity based primarily on the creation, processing, organization, packaging, distribution, marketing and commercialization of information. An infopreneur identifies an information problem or market opportunity and develops a product or service that addresses the

problem. The information may be presented as a database, report, newsletter, consultancy service, training programme, digital publication, research service, information portal, data product or other knowledge-based service. Infopreneurship should therefore not be narrowly understood as selling information. However, literature recognizes infopreneurship as a growing opportunity for LIS professionals and students. Olarongbe et al. (2026), for example, argue that there is a need to expand awareness and strengthen strategies for enhancing infopreneurship opportunities among

Infopreneurship Relevance in LIS Professional

Professional relevance refers to the continuing usefulness, adaptability, employability and contribution of a profession within changing social, technological, economic and organizational environments. For LIS, professional relevance means that graduates and practitioners should be able to respond effectively to contemporary information needs and technological developments.

The traditional LIS professional was primarily trained to manage information resources and provide information services. The contemporary professional must additionally understand how information is transformed into products, services, knowledge and economic value. However, this mean that librarians should abandon traditional professional values. Rather, the profession should extend its existing competencies into emerging areas. However, the evidence from Ahmadu et al. (2025) that LIS graduates may possess entrepreneurial skills without effectively utilizing them for self-reliance demonstrates that competency development must be accompanied by practical application and opportunity creation.

Digital Skills

Digital skills refer to the knowledge and ability required to use digital technologies effectively, safely and productively. The World Bank emphasizes that digital skills are fundamental for participating in changing labour markets and identifies digital content creation, digital solutions, advanced technical skills, innovation hubs and digital entrepreneurship as important components of digital economic development. Therefore, digital competence is not merely a technical addition to LIS. It is increasingly a foundation for professional relevance.

Economic Empowerment in LIS

Economic empowerment refers to the ability of individuals or groups to obtain and control productive resources, generate income, secure employment or self-employment, develop sustainable livelihoods and participate meaningfully in economic activities. Within LIS, infopreneurship can contribute to economic empowerment through: self-employment, income generation and creation of information businesses. The connection between entrepreneurship education and economic development has received increasing attention in Nigerian LIS literature. Olubiyo and Olubiyo (2025) argue that entrepreneurship should be integrated into LIS education to promote relevance, sustainability and economic development.

Sustainable Economic Development

Sustainable economic development refers to economic progress that improves livelihoods and creates opportunities while maintaining long-term social, environmental and economic viability. Infopreneurship can contribute to sustainable development because information businesses generally depend heavily on knowledge, skills and digital resources rather than the intensive extraction of physical resources. However, digital entrepreneurship should itself be sustainable. UNCTAD's Digital Economy Report 2024 emphasizes that digitalization can drive economic

growth but also produces environmental pressures and unequal distribution of benefits, particularly between developed and developing economies.

According to Singh (2024), sustainable development means attaining a balance between environmental protection and human economic development and between the present and future needs. He further stated that sustainable development also refers to equity in development and sectorial actions across space and time. However, it requires the integration of economic, social, and environmental approaches towards economic development. Sustainability is a development effort, including those aimed at protecting the health and the environment that should be undertaken in a manner that will not frustrate the ability of future generations to meet their needs. Moreover, Sustainable development is the process of judicious use and conservation of natural resources for the overall improvement in the quality of life for the present and future generations on a long-term basis. The concept of sustainable development was formulated as a welding tool as well as a framework for the realization of economic growth in an environmentally viable world. Three interdependent and mutually reinforcing pillars of sustainable development are recognized worldwide in the transition towards a sustainable society (Erhun, 2023).

Infopreneurship and the Changing Role of LIS Professionals

Infopreneurship does not require LIS professionals to abandon librarianship. The profession therefore needs to become more adaptive, innovative and entrepreneurial while retaining its ethical commitment to equitable access to reliable information. Recent research among LIS students supports the existence of multiple entrepreneurial opportunities within the profession, while newer work emphasizes the need for practical strategies to strengthen infopreneurship opportunities. Evidence from Nigerian LIS research consistently points toward the importance of practical training and infrastructure. Fagbola et al. (2024) recommended improved infrastructure and funding for entrepreneurship education, while Iwuoha (2024) identified inadequate entrepreneurship workshops, poor infrastructure, insufficient funding and limited entrepreneurial awareness among challenges affecting LIS students' employability.

Major Challenges to Infopreneurship in LIS

Infopreneurship involves in identifying information needs, developing information products or services, packaging and marketing them, and creating economic or social value from information. However, on the process it come across a set of challenges among the challenges includes:

Inadequate Entrepreneurial Competencies

Possessing LIS knowledge does not automatically provide the ability to operate a business. Students and professionals may require additional training in marketing, finance, pricing and business development. The evidence from Ahmadu et al. (2025) is particularly significant: LIS graduates may possess entrepreneurial skills but still demonstrate limited readiness and utilization for self-reliance.

Weak Curriculum Integration

Entrepreneurship may be included in LIS programmes without sufficient practical emphasis. A curriculum that teaches entrepreneurship only theoretically cannot adequately prepare students to create sustainable information businesses.

Inadequate ICT Infrastructure

Poor internet connectivity, unreliable electricity, inadequate computers, limited access to software and insufficient digital facilities can restrict practical infopreneurship.

Insufficient Funding

Students and graduates may have innovative ideas but lack the financial resources required to develop them into sustainable businesses.

Inadequate Marketing Skills

Information professionals may be technically competent but unable to market their services effectively.

Professional Culture

Some professionals continue to perceive entrepreneurship as inconsistent with the social-service identity of librarianship. This perception needs to change. Ethical commercialization of professional competencies does not necessarily conflict with librarianship's social mission.

Limited Industry Linkages

LIS schools may have weak relationships with technology companies, information businesses, publishing organizations and entrepreneurship centres.

Digital Inequality

Not every student or professional has equal access to technology, connectivity or advanced digital training. UNCTAD emphasizes that developing countries do not yet receive equal benefits from the digital economy and that digital transformation must become more inclusive and sustainable.

Rethinking Professional Relevance

The central argument of this paper is that professional relevance should no longer be measured exclusively by whether LIS graduates can perform conventional library duties. 16. Role of Libraries in Supporting Infopreneurship.

Conclusion

The information environment is changing rapidly, and Library and Information Science cannot remain professionally relevant by relying exclusively on traditional models of service delivery. The emergence of artificial intelligence, digital platforms, online publishing, data analytics and the knowledge economy has created new information needs as well as new opportunities for LIS professionals. Infopreneurship offers an important pathway for responding to these changes. It enables LIS professionals to transform information knowledge, research skills, digital competencies and professional expertise into innovative products and services capable of generating economic and social value.

The central argument of this paper is not that librarians should abandon their traditional social mission in favour of commercial activities. Rather, infopreneurship should extend the professional capabilities of LIS into new economic and technological environments. Moreover, LIS students and graduates possess entrepreneurial competencies and recognize entrepreneurial opportunities, but the conversion of those competencies into actual self-employment and sustainable ventures remains limited. The challenge, therefore, is no longer simply whether entrepreneurship belongs

in LIS. The more important question is how LIS education and practice can systematically prepare information professionals to identify opportunities, create information products, use digital technologies, market professional services and generate sustainable economic value.

The future LIS professional should consequently be understood not only as a librarian or information specialist, but also as a potential information entrepreneur, digital knowledge worker, consultant, innovator and creator of economic value.

Recommendations

Based on the available literature and arguments advanced in this paper, the following recommendations are proposed:

1. Infopreneurship should become a core component of LIS education, Entrepreneurship should be integrated into LIS curricula in a practical rather than purely theoretical manner.
2. LIS education should become more practice-oriented, Students should develop real information products, create business plans and test services during their training.
3. Digital skills should be strengthened. LIS schools should provide practical training in AI, data analytics, digital publishing, digital marketing, content creation and information technologies.
4. LIS innovation hubs should be established. Universities should provide dedicated spaces equipped with technology where students can experiment with information-based businesses.
5. Universities should establish industry partnerships. LIS schools should collaborate with technology companies, publishers, research organizations, government agencies and information businesses.
6. Entrepreneurship mentorship should be introduced. Successful librarians, information consultants, publishers, digital entrepreneurs and technology professionals should mentor LIS students.
7. Government should provide an enabling environment. Policies should support digital entrepreneurship, affordable connectivity, access to finance, innovation and intellectual-property protection.
8. Professional associations should promote infopreneurship. Professional associations should establish training, mentorship, competitions and networking platforms.
9. Information services should be designed around users' needs. Infopreneurship should begin with identifying genuine information problems rather than simply attempting to sell existing library services. LIS entrepreneurship should consciously contribute to decent work, quality education, innovation, reduced inequalities and sustainable economic development especially in Nigeria.

References

Ahmadu, I., Abdulmalik, S. Y., & Isah, A. B. (2025). Entrepreneurship education for self-reliance: A study of Library and Information Science graduates in Kano State. Information Impact: Journal of Information and Knowledge Management, 16(1), 24–35. https://doi.org/10.4314/iijikm.v16i1.3

Erhun, M. O. (2023). A Sustainable Approach to Economic Development in Nigeria: A Legal Perspective. *Journal of Economics and Sustainable Development.* 6(14). 1-12.

Fagbola, O. O., Tella, A., Ananias, J. N., & Onifade, F. A. (2024). Entrepreneurial competencies of Library and Information Science undergraduates in Nigeria. Journal of Education in Black Sea Region, 10(1). https://doi.org/10.31578/jebs.v10i1.331

IFLA. (2024). IFLA Strategy 2024–2029. International Federation of Library Associations and Institutions.

IFLA. (2026). There's a place for that: Libraries driving sustainable development. International Federation of Library Associations and Institutions.

Iwuoha, J. (2024). Exploring entrepreneurship education and Library and Information Science students for employability in Nigerian universities. Michael Okpara University of Agriculture, Umudike Repository.

Ikokoh, J. J. (2026). Linking entrepreneurial curiosity and innovativeness to infopreneurial intention: Evidence from final-year LIS students. ABUAD Journal of Social and Management Sciences.

Ninyio, H. T., & Ugwuchukwu, M. N. (2025). Entrepreneurship education and awareness as tools for wealth creation among Library and Information Science postgraduate students in universities of North-West Nigeria. Evidence Based Journal of Information Science, 1(2).

Olarongbe, S. A., Olaniyi, M. A., Ishola, S. O., Sulyman, A. S., John, B. O., & Paul, A. I. (2026). Exploring the strategies for enhancing infopreneurship opportunities among LIS undergraduates in Kwara State, Nigeria. KHAIRUN International Journal of Contemporary Librarianship.

Olubiyo, P. O., & Olubiyo, J. T. (2025). Entrepreneurship education for economic development among Library and Information Science students in the 21st century in Nigerian universities: A nexus. International Journal of Academic Library and Information Science, 13(2), 57–64. https://doi.org/10.14662/ijalis2025120

Singh, V. (2024). An Impact and Challenges of Sustainable Development in Global Era. *Journal of Economics and Development Studies,* 2(2). 22-28.

United Nations Trade and Development. (2024). Digital Economy Report 2024: Shaping an environmentally sustainable and inclusive digital future. UNCTAD.

Leveraging Social Media Platforms as Infopreneurial Tools for Promoting Library Services and Resources among Undergraduate Students

By

Olayinka Mary Adekoya (Ph.D), John Ozavize Faith and Aliu Esther Onyeche
Department of Library and Information Science,
Federal University Lokoja, Kogi State, Nigeria

Abstract

Social media has emerged as one of the most influential tools for communication, information sharing and Infopreneurship in the digital era, particularly among undergraduate students. Despite its potential for enhancing academic engagement, its utilization for promoting library services, resources and entrepreneurship remains underexplored in many Nigerian universities. The objectives of the study include assessing students' current utilization of social media platforms, evaluating their awareness of the library's online presence, examining the availability of library services and resources, and identifying the challenges affecting the utilization of social media for library promotion and entrepreneurship. The study adopts a survey research design, with a sample size of 375 respondents drawn from a population of 14,140 students using Krejcie and Morgan's sample size determination table. Data were collected using a structured questionnaire and analyzed through descriptive statistics. Awareness of the library's online presence, digital services and Infopreneurship remains low, thereby limiting the effective use of available resources. Furthermore, challenges such as inadequate funding, poor internet connectivity, unstable electricity supply, lack of digital literacy, and weak institutional support hinder the full adoption of social media. The study concludes that social media platforms hold significant potential for bridging the gap between students' digital habits, academic engagement and entrepreneurship when strategically integrated into library services. It recommends proactive awareness campaigns, sustained user education, improved infrastructure, and greater management commitment to maximize the benefits of social media in promoting library resources, services and Infopreneurship.

Keywords: Social Media, Utilization, Library Services, Library Resources, Undergraduate Students

Introduction

The advancement of Information and Communication Technologies (ICTs) has reshaped how information is created, organize, packaged and used. In higher institutions, social media platforms have exceed from social media networking to become a driver of digital communication, collaborative learning and Infopreneurship: the business of identifying, gathering, processing and monetizing information services. The fundamental mission of university libraries, as emphasized by Okike and Emeahara (2020), is to actively support teaching, learning, and research in alignment with the strategic goals of the parent institution. Consequently, library collections and services must be current, relevant, and comprehensive enough to support academic programs at all levels, making the university library an indispensable component of the educational infrastructure.

University libraries have evolved from traditional repositories of printed materials into digital learning environments that integrate various information and communication technologies (ICTs). As higher education institutions shift toward blended and online learning, libraries are expected to provide seamless access to e-resources, research databases, and virtual support services (Adebayo & Omeluzor, 2021). This transformation has made it imperative for academic libraries to equip students with digital literacy and information retrieval skills that foster independent learning. According to Udo-Anyanwu and Ezeani (2020), modern university libraries are not only knowledge centers but also learning spaces where users are guided to discover, evaluate, and apply information effectively. The relevance of academic libraries, therefore, lies in their ability to adapt to technological trends while staying focused on their core mandate—supporting teaching, learning, and research. Contemporary academic libraries prioritize user-centered services by customizing their offerings to align with the preferences and expectations of their diverse user base. These services include access to electronic databases, real-time chat support, mobile library applications, and personalized research assistance (Nwokocha & Anyaoku, 2022).

In the 21st century, the integration of digital technologies into library operations has transformed how academic libraries communicate and provide services. Among the most influential digital digital tools are social media platforms, which have become vital for connecting with users especially students who are digital natives. Social media platforms are effectively used by libraries to promote services, share information, and engage with patrons. Libraries utilize platforms like YouTube, Facebook, Twitter, Instagram, WhatsApp to publicize events, highlight resources, offer academic libraries new opportunities to promote their resources, program and services in an engaging real time, and interactive manner. This proactivity helps universities libraries connect with wider audience, increase visibility and gather valuable feedback. Social media platforms is a type of computer technology that enables the exchange of ideas, opinions, and information via the creation of virtual networks and communities. Social media platforms are web-based media and application that enables users to create, share, and interact with content such as text, images, videos, and audio in real time across various online communities. (Dollahide, 2021). These platforms support user generated content and facilitate communication, and networking among individuals, groups, and organizations (Kapoor et al., 2020).

Social media is designed to be internet based and to enable people communicate electronically quickly. In this millennium age, libraries has evolved in terms of their services, resulting in outstanding and one of a kind library advertising activities as well has high quality service for it millennial patrons, personal data, documents, movies and photographs are all included in the content of social media. User's access social media using web based software or application on

their computer, tablet, or smart phone. To satisfy the expectations of Library users social networking services can help users get the information needs they desired more quickly and efficiently (Khuro et al,2018) Recent studies have emphasis on the importance of social media in enhancing library visibility, users engagement, and access to information. According to Kike and Adetimirin (2021), social media has become an tools in Nigerian academic Libraries, allowing librarians to reach to users beyond the physical walls. The University Libraries provides access to various services and resources, library resources refers to both print and electronic materials such as textbooks, journals, newspapers, databases, ebooks and audio visual material which are essential for academic activities (Agbo and Nworie, 2024). On the other hand, library services are the various activities and functions provided by libraries to facilitate access to these resources. These includes reference services, circulation services, user education, selective dissemination of information (SDI), current Awareness services (CAS) and internet services (Oluwafemi and Ajiboye, 2022).

Literature Review

Concept of Social Media

In the modern digital age, social media has become an integral part essential tool for communication and networking. It allows people to connect with others around the world and share information instantly. It has revolutionized the way we interact and stay informed. Social media has the potential to greatly enhance the in tractions between libraries and information centers and their patrons, regardless of users' location or how they choose to learn about and use library services and resources, according to Chore (2023), who identified social media as the key in student for disseminating information. Libraries have long made information accessible, and social media is beginning to play a significant role in marketing that information to library customers as well as in positioning the library as central community gathering place. Social media provides libraries with more ways to connect with their patrons, target specific demographics, and let them engage with the library. Social media is all about connecting people with the information, which is the library's entire mission. Social of the media makes it easier to connect with user groups and provide them with pertinent information in an approachable way Tendenge (2019). According to Saidu and Sani (2022), social media is utilized to do housekeeping tasks in libraries such as charging and the discharging library resources; improving patron feedback to improve library service evaluation; and inexpensively promoting events, activities, and services. In this research, social media refers to digital and web-based platforms and applications such as Facebook, WhatsApp, Twitter (X), Instagram, YouTube, and TikTok, which enable users particularly students to create, share, interact with, and exchange information, resources, and services in real time through internet-enabled devices.

Social media can be broadly defined as the set of interactive Internet applications that facilitate (collaborative or individual) creation, curation, and sharing of user-generated content. Examples of social media platforms are numerous and varied. They include Facebook, Friendster, Wikipedia, dating sites, Craigslist, recipe sharing sites (e.g. all-recipes.com), YouTube, and Instagram. Social media platforms all share the above-mentioned characteristics, but are unique from one another in many respects. In particular, platforms oven vary in their architectures, structures, norms, and user bases. In working to differentiate between different kinds of social media platforms, scholars distinguish and label several subsets of social media, with a particular emphasis on social network sites.

Concept of Library Services

Library services refer to the range of activities, programs, and resources provided by libraries to meet the informational, educational, research, and recreational needs of their users. These services are not limited to the provision of books but extend to digital resources, user education, information literacy, reference services, and community engagement. In academic contexts, library services are designed to support teaching, learning, and research (Adeleke & Oyeniran, 2021). According to Oyewole (2020), library services encompass both traditional services such as lending, cataloguing, and reference support, and modern services such as access to electronic databases, online information retrieval, and virtual reference. The fusion of traditional and digital service delivery ensures that libraries remain relevant in the digital age. Recent studies emphasize that library services must be user-centered, evolving in response to changing user needs and technological developments. services such as current awareness, selective dissemination of information (SDI), bibliographic instruction, and social media outreach play a significant role in making library resources accessible to a wide range of users (Olamide and Izuagbe, 2022) University library play important role in ensuring that the mandate of the parent institution is achieved. They carry out different activities in meeting and supporting the institution through selection, ordering, acquisition, organization, storage and preservation of information in diverse formats and making them available and accessible to user. No university can perform efficiently and effectively without a well-equipped and functional library. Therefore, in meeting the information needs of their users, academic Libraries offer varied services such as Current awareness service (CAS), Selective dissemination of information services (SDI), bibliographic services, referral and reference services, Circulation/learning services among others. In the past, these services were provided face to face or physically, however with the presence of digital development these services could be provided without the users visiting the library in person.

The University library is the key element in the central dissemination of information acquisition, particularly in the university environment. There are various information seekers in the university environment. These include academic staff, students, researchers, and other users. The university library provides various services to motivate users to have value for visiting the library and simultaneously meeting the information needs of users. According to Tella and Ojo (2012) university libraries need to assist the parents' institutions in the dissemination of information for them to achieve their missions and visions. This indicates that the university library needs to provide services that will encourage users to fulfill their academic potentials. In line with Ugah (2008) that access and use of library services by undergraduate students in universities will surely provide relevant and accurate information for them in their studies Utilization of relevant library services among university library users will assist students in achieving their academic desires and at the same time support the university in increasing student retention and bringing down the rate of dropout. A critical examination of the basic law of librarianship by Raganathan (1931) maintains that the library resources are primarily for use. He goes further to say that library collections are for users. The implication of this is that a library needs to make its service available and accessible in order to promote usage. Extant literature identifies various services that university libraries can provide which include library orientation, bibliography services, indexing and abstracting services, reference service, current awareness services, indexing and abstracting, selecting dissemination of information, and a host of others.

Concept of Library Resources

Library resources refer to the totality of materials, tools, and facilities made available by libraries to meet the information, educational, and recreational needs of users. The resources include both tangible items such as books and journals, and intangible assets like databases, software, and the professionals of librarians. Library resources are the backbone of library services, as they determine the extent to which libraries can satisfy user needs. In the digital era, resources are no longer limited to physical collections but now include e-books, online journals, institutional repositories, and multimedia content. Library resources can broadly be categorized into different forms. Print resources include textbooks, reference books, journals, magazines, newspapers, and government documents, which remain vital for academic study and research (Eze & Ezeani, 2021). With technological advancement, electronic resources (e-resources) such as e-books, e-journals, databases, and institutional repositories have become indispensable, providing wider accessibility and current information (Onuoha & Olatoye, 2022). Libraries also house multimedia resources such as audio-visuals, CDs, and microfilms. In addition, human resources, such as professional librarians and staff, constitute an essential component because they act as facilitators and interpreters of information resources (Abubakar & Hassan, 2020). The value of library resources lies in their reliability, relevance, accessibility, and currency. Reliable resources are those that provide authentic and accurate information, while relevance ensures that they meet the specific needs of students and researchers. Accessibility, whether through print or online systems, enhances utilization, while currency underscores the importance of up-to-date resources in supporting current scholarship (Okeke, 2022).

Library resources are indispensable for academic excellence. They support teaching and learning by providing textbooks and course-related materials; they aid research through access to journals and databases; and they promote information literacy by enabling users to evaluate and apply information effectively (Udo-Anyanwu & Obiozor, 2021). In academic settings, the quality and variety of resources directly determine the effectiveness of library services and the institution's overall performance. The provision of library resources follows a systematic process of selection and acquisition, which involves assessing user needs, developing collection policies, and allocating budgets (Ibrahim, 2020). Once acquired, resources are organized through cataloguing, classification, and indexing to ensure easy retrieval. Access is provided through borrowing systems, online databases, or digital repositories, often facilitated by tools such as the Online Public Access Catalogue (OPAC). Student success largely depends on the availability of information resources to be able to research within the shortest time. It helps them acquire knowledge for their academic pursuits and this is possible by exhaustive utilization of information resources. Therefore, when a library is well stocked with several categories of information resources the students will sufficiently utilize them (Awotola et al., 2018; Enidiok 2018). Availability of information resources has the potential of helping students make better academic achievements for further study. Furthermore, the availability of information resources for further studies turnout to be better, more productive and outstanding in their academic achievements. Correspondingly, when there are no information resources available for further studies students often perform poorly in their academic work. They also turn out to be half-baked and sometimes incompetent when placed side by side with their counterparts.

Therefore, the availability of information resources reduces mediocrity and brings academic excellence (Ekpang, 2011). When students make use of information resources, it complements

lectures; provides students with knowledge for their academic quests and it is the secret of students' academic accomplishments. As important as the availability of information resources is, it has been observed that students are not committed to utilizing these library information resources provided for them as expected. This signifies that their level of utilization is below expectation. This situation is seen in the low daily statistics of books consulted, books borrowed by students for home use, number of books photocopied by students, number of electronic database logins and reader services monthly statistics of library users.

Objectives of the Study

Specific objectives include:

1. to assess students' current utilization of social media platforms in Federal university Lokoja (FUL)
2. to evaluate students' awareness of the library's online presence in (FUL)
3. to assess the available services and resources in (FUL)
4. to identify the challenges of utilizing social media in promoting library services and resources through social media.
5. to propose strategies for enhancing the utilization of social media in (FUL)

Methodology

The study employed a descriptive survey research design. The area of study is the Federal University Lokoja (FUL), Kogi State, Nigeria. FUL was established in 2011 by the Federal Government of Nigeria, the institution currently operates two campuses: the Felele Campus and the Adankolo Campus. The population of this study comprises all registered undergraduate students of Federal University Lokoja, from various faculties such as Science, Social Sciences, Arts and Humanities, Education, Management Sciences and College of health sciences. A sample size of 375 respondents was selected to ensure fair and representative participation, a stratified random sampling technique was employed.

Findings

Table 1: Response Rate

Faculties	No of questionnaire Distributed	% of Distributed questionnaire	No of questionnaire returned	% of returned questionnaire
Art	54	14.4%	45	13.9%
Education	54	15.4%	50	15.5%
Management science	53	14.13%	48	14.9%
Social Science	54	14.4%	52	16.1%
Faculty of Engineering	54	14.13%	43	13.3%
College of health sciences	53	14. 13%	40	12.4%
Science	54	14.4 %	44	13.6%
Total	**375**	**100%**	**322**	**99.7%**

Table 1 above explains the response rate of the respondents. In Table 1, 375 questionnaires were distributed to the sample population of the study, which consists of 54 students selected from faculty of art, Education 54, social sciences 54, sciences 54, while management sciences consist of 53 students, Faculty of Engineering 53, and college of education 53. However, out of 375 questionnaires distributed to the 7 Faculties, 322 were adequately filled and returned, representing 99.7% response rate. Based on the 7 Faculties, the Table also shows that out of 322 (99.7%) respondents, 45 (13.9%) are from Faculty of arts, 50(15.5%) are from Faculty of education, 48(14.9%) are from management science, 52 (16.1%) social science, 43 (13.3%), Faculty of Engineering, 44 (13.6%) science, 40 (12.4) are from college health sciences respectively.

Table 2: Gender of Respondents

Gender	Frequency	Percentage
Male	132	40.99%
Female	190	59.00%
Total	322	100%

Table 2 shows that female students were the highest respondents with 190 (59.00%), while 132 (40.99%) respondents were male students.

Table 3: Level of Students

Level	Frequency	Percentage
100 level	94	29.19%
200 level	82	25.46%
300 level	67	20.80%
400 level	69	24.53%
Total	**322**	**100%**

Table 3: shows the levels of students. 100 level with percentage of 94 (20.19%), 200 level with the percentage of 82 (25.46%), 300 level with 67(20.80%), 400 level with 79 (24.53%).

Table 4: To what extent do students of federal University Lokoja, (FUL) currently utilize social media platforms**.**

S/N	Items	SA	A	D	SD	Mean	Remark
1	I actively use WhatsApp for academic purposes.	102 (31.6%)	84 (26%)	80 (24.8%)	56 (17.4%)	2.72	Accepted
2	I actively use Facebook for academic purposes.	98 (30.4%)	88 (27.3%)	78 (24.2%)	58 (18.0%)	2.70	Accepted
3	I use social media to access information about library services and resources.	40 (12.4%)	62 (19.2%)	83 (25.7%)	137 (42.5%)	2.01	Rejected
4	I frequently use social media to access information about the library and it services.	30 (9.31%)	35 (10.8%)	101 (31.3%)	156 (48.4%)	1.81	Rejected
5	I prefer using social media to interact with library instead of visiting physically.	144 (44.7%)	121 (37.5%)	34 (10.5)	23 (7.14%)	3.19	Accepted

Table 4 shows the extent to which students of Federal University (FUL) currently utilise social media platforms

Table 5: How aware are students of Federal University Lokoja (FUL) of the library online presence.

S/N	Items	SA	A	D	SD	Mean	Remark
1	I'm aware that FUL library has an online social media presence.	39 (12.1%)	50 (15.5%)	77 (23.9%)	156 (48.4%)	1.91	Rejected
2	The library effectively utilize social media to share update and information.	143 (44.4%)	80 (24.8%)	43 (13.3%)	56 (17.3%)	2.96	Accepted
3	I follow and engage with FUL library official social media platforms	52 (16.1%)	40 (12.4%)	94 (29.16%)	136 (42.2%)	2.02	Rejected
4	I receive timely information about library services and resources through social media.	63 (19.5%)	49 (15.2%)	112 (34.7%)	98 (30.4%)	2.20	Rejected
5	The library presence has increase my knowledge about a available resources	46 (14.2%)	72 (22.3%)	105 (34.7%)	99 (30.7%)	2.20	Rejected

Table 5 shows how aware students of federal university Lokoja of the library online presence. The table shows that the respondents accepted that the library effectively use social media to share update and information with the mean score of 2.96. Hence, they rejected receiving timely information about library services and resources through social media with a mean score of 2.2, the library presence has increased my knowledge about available resources with the mean score of 2.20, I follow and engage with FUL library official social media official platforms with the mean score of 2.02 and I am aware the FUL library has an online social media with the mean score of 1.91.

Table 6: What are the Challenges Faced in Utilization of Social Media to Promote Library Services and Resources at Federal University Lokoja (FUL)

S/N	Items	SA	A	D	SD	Mean	Remark
1	Poor internet connectivity	146 (45.3%)	132 (40.9%)	26 (8.07%)	18 (5.59%)	3.26	Accepted
2	High cost of data subscription	138 (42.8%)	99 (30.7%)	56 (17.3%)	29 (9.00)	3.07	Accepted
3	Inconsistent updates from social media page	78 (24.2%)	100 (31.0%)	84 (26.0%)	60 (18.6%)	2.60	Accepted
4	Lack of awareness about the library's online presence is a major challenge for students.	80 (24.8%)	106 (32.9%)	86 (26.7%)	50 (15.5%)	2.67	Accepted
5	The library social media platforms are not interactive.	82 (25.4%)	95 (29.5%)	79 (24.5%)	66 (20.4%)	2.59	Accepted

Table 6 shows that the respondents accepted all the challenges faced in utilizing social media to promote library services and resources at Federal university Lokoja. They accepted poor internet connectivity with the mean score of of 3.26, High cost of data subscription with the mean score of 3.07, lack of awareness of the library online presence with the mean score of 2.67, Inconsistent update from social media page with the mean of 2.60 and library social media page are not interactive with the mean score of 2.1

Table 7: What strategies can enhance the effective utilization of social media platforms for promoting library services and resources in Federal University Lokoja (FUL)

S/N	Items	SA	A	D	SD	Mean	Remark
1	Stable internet connectivity	143 (44.4%)	136 (42.2%)	27 (8.38%)	16 (4.96)	3.36	Accepted
2	Subsides data subscription	122 (37.8%)	99 (30.7%)	62 (19.2%)	39 (12.1%)	2.94	Accepted
3	Regular and timely update	89 (27.6%)	76 (23.6%)	92 (28.5%)	65 (20.1%)	2.58	Accepted
4	Increase awareness	111 (34.4%)	87 (27.0%)	91 (28.2%)	33 (10.2%)	2.85	Accepted
5	More interactive features should be introduced.	82 (25.4%)	98 (30.4%)	77 (23.9%)	65 (20.1%)	2.61	Accepted

Table 7 shows the strategies that can enhance effective utilization of social media platforms in promoting library services and resources at federal university Lokoja. The table shows all the respondents accepted stable internet connectivity with the mean score of 3.36, subsides data subscription with the mean score of 2.94, increase awareness with the mean score of 2.85, more interactive features should be introduced with the mean score of 2.61 and regular and timely update with the mean score of 2.58.

Discussion of Findings

The study on social media platforms as Infopreneurial tools for promoting library services and resources among undergraduate students provide valuable insight into the extent of students' current utilization of social media platforms for library purposes, their level of awareness of the library's online presence, the library services and resources available at Federal University Lokoja, the challenges faced in utilization of social media to promote library services and resources at Federal University Lokoja and the strategies that can enhance the effective utilization of social media platforms for promoting library services and resources in Federal University Lokoja. The analysis revealed that students of Federal University Lokoja are active users of social-media platforms such as WhatsApp, Facebook, and Instagram, which they primarily use for academic communication and social interaction. However, only a few use these platforms for library-related purposes. This finding agrees with Adebayo and Odu (2021), who observed that while Nigerian university students are heavy social media users, few employ these tools for academic or library purposes. Similarly, Adu and Afebende (2020) reported that social media use in academic libraries is often informal and not strategically integrated into library service delivery. These results therefore suggest that, although the potential for library engagement through social media exists, it remains underexploited at FUL due to limited awareness and direction.

The findings further showed that awareness and engagement with the library's online presence are generally low among students. Many respondents indicated that they were unaware that the library maintains social-media pages, while others noted that updates are inconsistent. This finding aligns with Omachonu (2021), who found that inadequate publicity and poor content management reduce user engagement with library social-media pages. Similarly, Ojetunde and Ayokunnu (2022) discovered that irregular updates and lack of visibility discourage students from following library social media accounts. Hence, for Federal University Lokoja Library to enhance visibility, it must strengthen publicity, post regularly, and adopt engaging communication strategies that attract user participation.

The findings identified several challenges hindering effective utilization of social media platforms in promoting library services at Federal University Lokoja. The main challenges are poor internet connectivity, high cost of data subscription, inconsistent updates, lack of awareness, and non-interactive platforms. These constraints mirror the findings of Afebende and Emmanuel (2021), who identified unstable network access and high data costs as primary obstacles to effective online library communication. Eze and Ugochukwu (2022) equally emphasized that infrastructural deficiencies and limited ICT skills impede the integration of social media in Nigerian university libraries. The persistence of these issues suggests that achieving optimal use of social media for library service promotion will require infrastructural improvements and deliberate policy support from university management.

In response to these challenges, several strategies were proposed to enhance effective utilization of social media for library service promotion. Respondents suggested stable internet connectivity, subsidized data plans, increased awareness campaigns, regular updates, and more interactive platforms. These recommendations are consistent with Aina and Adigun (2023), who argued that libraries should adopt user-centered approaches such as online training, prompt communication, and real-time interactions to strengthen social media engagement. Furthermore, Kumar and Singh (2021) emphasized that interactivity and timely content updates are crucial in maintaining user interest in digital library platforms. Implementing these measures at FUL Library would not only improve students' participation but also enhance information visibility.

Summary of Findings

Findings from the study revealed that students of Federal University Lokoja are active users of social media platforms such as WhatsApp, Facebook, and Instagram. These platforms are widely used for personal communication, entertainment, and academic interaction among peers. However, only a few students use them to access or interact with library services and resources. This indicates that while social media usage among students is generally high, its potential for promoting library services remains largely underexploited. The findings suggest that social media has not yet been fully adopted by the library as a functional medium for reaching students and promoting available resources

The results further showed that awareness of the library's social media presence is generally low among students. Many respondents were not aware that the university library has any official social media page, while others noted that the existing pages are not consistently updated or engaging. This limited awareness reduces students' ability to benefit from library updates, announcements, and resources shared online. The findings therefore suggest that the library needs to intensify publicity, maintain regular updates, and adopt more interactive communication strategies to improve student engagement and visibility.

In addition, the study found that the Federal University Lokoja Library provides essential academic services such as Current Awareness Services (CAS), Selective Dissemination of Information (SDI), circulation services, e-journals, and e-books. These resources are readily available to support teaching, learning, and research. However, the findings revealed that these services are not adequately promoted through social media platforms, leading to low awareness and usage among students. This indicates that although the library has embraced digital resources, there is still a gap between the availability of services and students' awareness of them through social media channels.

The study also identified several challenges hindering the effective use of social media for promoting library services and resources. Chief among these are poor internet connectivity, high cost of data subscription, irregular updates from the library's social media pages, lack of awareness of the library's online presence, and the non-interactive nature of the platforms. These challenges have contributed to the low level of engagement between students and the library on social media, limiting the library's ability to effectively communicate and promote its services online.

In addressing these issues, the study revealed that effective utilization of social media for library promotion can be achieved through the adoption of specific strategies. Improving internet connectivity within the campus, subsidizing data subscription for easier access, increasing awareness of the library's social media presence, ensuring regular and timely updates, and making

the platforms more interactive would enhance students' participation, promote better communication, and increase the visibility of the library's resources and services.

Conclusion

The study found that students of Federal University Lokoja use social media platforms like WhatsApp and Facebook, but their engagement with the library through these platforms is still low. Although the library offers valuable services and resources, poor internet connectivity, high data costs, and low awareness limit their effective promotion online. The study concludes that improving internet access, regular updates, and creating more interactive platforms will enhance the use of social media in promoting library services and resources among students.

Recommendation

Based on the findings of this study, the following recommendations are made:

1. The library should post more updates about its services and resources on social media to attract students' attention.
2 The library should make regular and engaging posts so students can frequently visit and get information online.
3 The library should create more awareness about its social media pages through flyers, posters, and student orientation programs.
4 Librarians should share information on time and update students regularly about library services and activities.
5 The library should post educational content that teaches students about available resources and how to use them.

References

Adebayo, O. O., & Odu, P. O. (2021). Social media use and academic engagement among undergraduates in Nigerian universities. *Journal of Library and Information Services,* 15(2), 45–57.

Adeleke, D. S., & Oyeniran, T. J. (2021). Library services in the digital age: A user-centered perspective. *Journal of Library and Information Services*, 12(2), 55–67.

Adu, E., & Afebende, G. (2020). Utilization of social media in library and information service delivery in university libraries in Nigeria. *International Journal of Library and Information Science,* 12(1), 14–23.

Afebende, G., & Emmanuel, O. (2021). Challenges of integrating social media into library service promotion in Nigerian universities. *Journal of Applied Information Management,* 9(3), 102–115.

Agbo, A. D., & Nworie, M. A. (2024). Access to print and digital resources in university libraries: A study of student usage and preferences. *Journal of Library and Information Studies*, 18(1), 45–60.

Aina, T. M., & Adigun, O. O. (2023). Enhancing library visibility through social media interaction in Nigerian universities. *African Journal of Information Science,* 18(2), 78–91.

Aregbesola, A., & Oguntayo, F. (2014). Utilization of library services in Nigerian university libraries. *International Journal of Academic Research*, 6(2), 312–320.

Awotola, J., Okonkwo, E., & Yakubu, M. (2018). Availability and utilization of information resources in Nigerian university libraries. *Journal of Applied Information Science*, 14(1), 65–79.

Chore, P. (2023). Social media as a tool for information dissemination in libraries. *Journal of Digital Literacy,* 9(1), 13–27.

Ekpang, U., & Ekeng, A. (2021). Library services and availability of information resources in federal universities in South-South Nigeria. *Journal of Library Services and Technologies,* 17(2), 105–119.

Dollahide, C. (2021). Understanding digital tools for library outreach: A guide to effective engagement. Library Technology Reports, 57(8), 13–21.

Eze, V. C., & Ugochukwu, F. N. (2022). Barriers to social media use in academic libraries in SouthEast Nigeria. *Library Philosophy and Practice*, 2022(3), 1–17.

Kapoor, K., Tamilmani, K., Rana, N. P., Patil, P., Dwivedi, Y. K., & Nerur, S. (2020). Advancing social media research: Past, present, and future. Information Systems Frontiers, 22(5), 1139–1171. https://doi.org/10.1007/s10796-020-10087-2

Khuro, S., Mohammed, I., & Yusuff, A. (2018). Social media platforms and library services delivery in university libraries in Nigeria. *International Journal of Library and Information Science*, 10(2), 12–19.

Kumar, R., & Singh, A. (2021). Social media as a marketing tool for academic libraries: A usercentered approach. *International Journal of Digital Library Services,* 11(4), 65–79.

Kike, V. M., & Adetimirin, A. E. (2021). Social media as an outreach tool in Nigerian university libraries: Challenges and opportunities. *Library Philosophy and Practice (e-journal)*, 6245. https://digitalcommons.unl.edu/libphilprac/6245

Nwokocha, U., & Anyaoku, E. (2022). Reimagining user services in Nigerian academic libraries in the post-pandemic era. *International Journal of Library and Information Science Studies*, 8(4), 38–51. https://eajournals.org

Ojetunde, S., & Ayokunnu, O. (2022). Influence of awareness and content quality on library social media engagement among undergraduates. *Journal of Information and Knowledge Management*, 13(1), 33–47.

Oluwafemi, T., & Ajiboye, A. (2022). Library services and student satisfaction in public universities in Nigeria: The moderating role of internet connectivity. *International Journal of Library Studies*, 9(2), 77–90.

Omachonu, A. S. (2021). Promoting library services through social media: Challenges and prospects in Nigerian university libraries. Information Impact: *Journal of Information and Knowledge Management*, 12(2), 91–103.

Onuoha, J., & Olatoye, K. (2022). Utilization of electronic resources in Nigerian university libraries. Information Impact: *Journal of Information and Knowledge Management*, 13(2), 55–70.

Onuoha, U., & Oyewole, R. (2020). Availability and utilization of electronic resources in Nigerian university libraries. *Journal of Library and Information Science*, 8(2), 55–70.

Udo-Anyanwu, A. J., & Ezeani, C. N. (2020). Digital literacy skills of undergraduates and the role of university libraries in South-East Nigeria. *Library Philosophy and Practice (e-journal),* 3914. https://digitalcommons.unl.edu/libphilprac/3914

Saidu, A., & Sani, M. (2022). The evolution of social media and its application in Nigerian libraries. *Journal of Information Science and Technology*, 8(1), 15–28.

Tella, A., & Ojo, R. (2012). University libraries and the dissemination of information in Nigeria. *International Journal of Library Science*, 8(2), 54–63.

Udo-Anyanwu, A., & Obiozor, N. (2021). The role of library resources in supporting academic excellence. *Journal of Library and Educational Services*, 19(1), 88–103.

Ugah, A. (2008). The use of library services by undergraduate students in Nigerian universities. *Library Philosophy and Practice*, 2008(1), 1–12.

Framework of Infopreneurship Pathways for Sustainable Economic Empowerment of Librarians through Interrelated Professional Governance in Academic Libraries in Nigeria

By

Yani, S.D.[1*] and Kasa, M.G.[2]
[1]Federal University Lokoja, Kogi State, Nigeria
sarah.yani@fulokoja.edu.ng

[2]Department of Library and Information Science
Ahmadu Bello University, Zaria, Kaduna State
mgkasa@abu.edu.ng
***Corresponding author: sarah.yani@fulokoja.edu.ng**

Abstract

This paper focuses on exploring ways that infopreneurship provides a strategic pathway for repositioning the LIS profession for sustainable economic empowerment, particularly in environments characterized by graduate unemployment, limited public-sector employment opportunities and growing demand for specialized information services. Relying on extant literature, the paper examines infopreneurship through four interrelated professional governance themes: copyright, ethics, data protection and standards to encourage LIS professionals to create and commercialize intellectual products lawfully, not undermining professional values, personal and organizational data, the quality, interoperability and credibility required for sustainable information enterprises. It was concluded that sustainable LIS infopreneurship is not merely the commercialization of information but the professional transformation of information into knowledge and data that can be found trustworthy, lawful, ethical, and standards-based economic value.

Keywords: Infopreneurship, Library and Information Science, economic empowerment, copyright, information ethics, data protection, standards, entrepreneurship, information professionals.

Introduction

Beyond the walls of library schools, Library and Information Science professionals employed in academic libraries face numerous assumptions during discourse on information commercialization. Professionals are trained to sustain information for its relevance and value, as institutional memory and a resource in the digital economy. This situation calls for a professional repositioning and recognizing information competencies as economic assets that must be possessed by professionals to become capable of generating new forms of employment, consultancy, indexing and abstracting, computer services and enterprise. Evidence from extant works indicated that LIS professionals in Nigeria already participate in activities such as information brokerage, research assistance, reprographic services, internet services and book vending (Akidi & Udoh, 2021; Friday & Sawyer-George, 2023). Identifying other information-related activities as viable infopreneurship opportunities. Other salient areas are yet to be exploited.

There are numerous factors restricting the infopreneurial thrust among Nigerian LIS professionals, such as weaknesses in business skills, technical skills, ICT, and managerial skills (Makinde et al., 2023). These weaknesses affect and negate the financial independence, job creation, information consultancy, digital-content creation, outsourcing, and the socioeconomic development yearnings of LIS professionals (Ramugondo & Ocholla, 2022; Olarongbe et al., 2026). Professional librarians and librarianship as a profession do not primarily suffer from an absence of entrepreneurial opportunities; rather, it suffering from a weak entrepreneurial orientation and insufficient capacity to convert LIS competencies into implementable information enterprises.

Infopreneurship can reposition librarians beyond encouraging them to "do business" to equipping librarians with the legal, ethical, technological, and professional competencies necessary to do so sustainably. The discourse is based on examining infopreneurship through four interrelated areas of professional governance that comprise: copyright, ethics, data protection, and standards, as follows:

Copyright as the Legal Foundation of LIS Infopreneurship For Sustainable Economic Empowerment

Copyright occupies a central position in any serious discussion of information entrepreneurship; apart from being the raw material, it also provides the rules governing the protection of intellectual property rights. These rules are applied to books, journal articles, photographs, databases, audiovisual materials, software, reports and digital content. What this implied that the LIS professional who seeks to transform information into a commercial product must understand the difference between access, ownership, reproduction, transformation, and commercial exploitation, which are categorically explained within the context of copyrights.

The literature establishes that copyright literacy remains an important professional challenge because when librarians know the rules, they are also expected to practice and disseminate them to their stakeholders. Khan and Basir (2023) found that in Pakistan, the 279 LIS professionals were somewhat familiar with copyright and related issues. A gap that needed to be filled because professionals who lack copyright competence may unintentionally build an enterprise upon unauthorized reproduction or commercial use of protected works that is detrimental to infopreneurship and sustainable economic empowerment.

Earlier, Coates, Owen, and Reilly (2022) provided a broader international framework for understanding the relationship between copyright, information access, limitations and exceptions,

licensing, and emerging digital-information practices in their IFLA presentation "Navigating Copyright for Libraries". The work called for repositioning librarians and information professionals at the intersection between copyright protection and access to knowledge. Osuchukwu and Udem (2022) shared the same position, speaking about limitations and exceptions. Their focus was on examining plagiarism and copyright infringement among LIS professionals in Nigeria. They reported that copyright infringement and plagiarism remain relevant concerns within the profession. Therefore, these issues should not be taken for granted, and encouraged professionals to study about the infringement to be able to understand that information expertise does not automatically translate into adequate intellectual-property literacy.

In Nigeria, it is more compelling for professional librarians to note that the Copyright Act, 2022, signed into law in 2023, introduced provisions relevant to libraries and library activities. The Copyright Act framework is comparatively progressive in relation to library activities and identifies provisions that libraries can use to support legitimate access and use of information, so that we should not claim that there is insufficient copyright literacy; copyright infringement must be treated as a professional concern in Nigeria, and operating within a legal and professional framework is inevitable. As IFLA (2022) demonstrated, there are always consequences of copyright restrictions for information provision, and EIFL (2023) justified that libraries should specifically seek the interpretation of the Nigerian Copyright Act, 2022.

These suggest that copyright literacy, when reconceptualized as an entrepreneurial competency and then espouse infopreneur needs and guide such thrust to know what information can be reproduced, what requires licensing, what can be transformed, how attribution should be provided, and how original information products can themselves be protected. As a vital pillar of interrelated professional governance, copyright should not be treated as a restriction on entrepreneurship, but as an enabling framework for legitimate information commercialization.

Ethics as the Moral Infrastructure of Information Entrepreneurship for Sustainable Economic Empowerment of Librarians

Ethics establishes all the well-articulated moral boundaries of copyright. Speaking of ethical concerns is crucial because an information enterprise can be legally compliant while still being professionally unethical; for example, legally collecting information resources but using them in ways that violate user expectations of confidentiality, exploiting vulnerable communities, or deliberately manipulating information to satisfy a paying client is unethical.

Yusuf (2021) identifies intellectual freedom, equitable access, privacy, intellectual property, and confidentiality as central components of information ethics. As a pillar of interrelated professional governance, according to Yusuf's submission, information ethics encompasses precisely those professional values that can come under pressure when information becomes a commercial commodity. Intellectual property rights and inadequate access to information were identified as forms of ethical misconduct among librarians in Ghana (Owusu-Ansah & Dadzie, 2024). These acts of misconduct are not peculiar to librarians in Ghana only and should not be acceptable, as ignorance of professional codes, insufficient education, and operational pressures. Beyond the field of LIS, entrepreneurs face pressures of numerous types; infopreneurs must also brace up for entrepreneurial purposes by situating their conditions, reconsidering professional obligations, and ensuring that commercial interests are not equated.

Since ethics is an LIS foundational issue, Malanga, Simwaka, and Chifuniro (2024) advocated that it is enshrined and integrated into LIS education and standard operating procedures (SOPs) by LIS

regulatory agencies. Its importance should be prioritized, as well as emphasized, as the moral and obligatory expectations of information professionals. As a competence, it cannot be separated from all matters of professional regulations. Therefore, information ethics has no season before it is reconsidered. Michalak (2023) revealed that the role of librarians with the emerging Artificial Intelligence (AI) is such that librarians are generally expected to contribute to the most reliable AI ethical policy, present empirical evidence that exploits identifiable limitations of AI, and create awareness of institutional resistance and resource constraints that abuse ethics and privacy concerns.

Owushi and Anyalebechi (2025) opined on the paths to follow when developing an ethical framework for information provision. They suggested that professional codes of ethics by the local and international professional agencies guiding librarians' responsibilities should form the decisive portions of the framework to make the document an operational component of information entrepreneurship rather than a philosophical appendix to professional practice.

The collective evidence supports the position that an LIS infopreneur should be guided by principles of accuracy, transparency, confidentiality, fairness, accountability, intellectual freedom, respect for intellectual property, and avoidance of conflicts of interest. This is especially important because the economic value of an information enterprise ultimately depends upon trust. Once users perceive that an LIS entrepreneur manipulates information or exploits confidential data for financial gain, the professional reputation upon which the enterprise depends is weakened.

The American Library Association's Code of Ethics is instructive in this regard because it explicitly combines privacy, intellectual property, professional competence, and avoidance of advancing private interests at the expense of users and employing institutions. Thus, entrepreneurship should extend professional values into the marketplace rather than replace them with market values (Rubin & Rubin, 2020).

Data Protection as the Foundation of Trustworthy Information Enterprise

Data has become one of the most important raw materials of the contemporary information economy. Professional librarians have data available to them manifold that they can take the opportunity to develop enterprises around data management, data curation, research-data services, information governance, data literacy, and analytical services when they develop competences and operate within acceptable privacy and data-protection responsibilities.

Hunt et al. (2023) appreciate the growing difficulty of protecting personally identifiable information in digital library environments because the environment easily creates new channels to serve diverse users who can collect, process, and share personalized data indiscriminately. The approach to safeguarding data varies from region to region, and from institution to institution. Ocks and Salubi (2024) provide a particularly important African perspective, finding that the adoption of emerging technologies creates tensions between efficiency and privacy and raises questions about compliance with data-protection frameworks. The contributions of librarians are very important because they evolve throughout the data life cycle (da Costa & Prudencio, 2024).

Olusipe et al. (2025) advocated for awareness creation on privacy risks and the gaps that needed to be bridged by underscoring the items contained in the detailed regulatory knowledge. The awareness, when created and sustained, exposed library users to help fight against encroachment into identified privacy concerns, act transparently, and see consent and bias as important concerns. According to Souza (2024), approaching data protection from a legal and operational perspective

protects patron privacy in accordance with professional principles and applicable laws. Libraries and Librarians in Nigeria can benefit from the Nigeria Data Protection Act, 2023 (NDPA). The Nigeria Data Protection Commission identifies principles including lawfulness, fairness and transparency, purpose limitation, data minimization, storage limitation, accuracy and security, as it affects rights to access, rectification, objection, restriction, portability and erasure. The Act helps provide the regulatory foundation within which information professionals obtain and translate data protection acts into practice when vented into an entrepreneurial opportunity and needing compliance with expected responsibility within applicable legal boundaries.

Standards as the Quality and Credibility Infrastructure of Infopreneurship for Sustainable Economic Empowerment of Librarians

Formalization of standards is a front-burner discourse of librarianship. The issues surrounding standards are sometimes underestimated in discussions of entrepreneurship because entrepreneurial discourse tends to emphasise innovation, markets, and profitability more than quality and interoperability of the economic values. Infopreneurship can only be sustained when a client who pays for a metadata, digitisation, records, data-management, or information-consultancy service receives outputs that are consistent, reliable, or compatible with other information systems.

Standards that facilitate interconnection, metadata containing controlled vocabularies, support interoperability, and FAIR-oriented research-data environments guarantee quality and credible sources for sustainable economic empowerment. Beyond technical prescriptions, the goal of standardized models for infopreneurship is to enhance discoverability and interoperability across information environments (Morris et al., 2022). An enriched and easy-to-adopt standard is contained in IFLA's report. IFLA’s standards infrastructure report encouraged a local approach that can continuously support institutional development and maintenance of professional standards for the purpose of infopreneurship.

This implied that the infopreneurship standards have a direct implication on role-centred applications because they can be converted into marketable professional competence. For instance, an LIS entrepreneur can offer metadata consultancy, digital-collection organisation, repository development, data curation, records-management services, digitisation consultancy and information architecture services. These services are delivered according to recognised standards rather than improvised procedures. Thus, infopreneurs’ standards should be quality assuring and provide a basis upon which clients can judge the reliability, interoperability, consistency and sustainability of information products.

Synthesis of the Four Pillars of Sustainable LIS Infopreneurship

The paper's thrust, using the interrelated professional governance pillars to discuss sustainable infopreneurship, has shown that librarians cannot rest on entrepreneurial motivation alone. It requires a combination of economic initiative and professional governance. Therefore, for infopreneurship to be instituted, copyright competence is necessary to function and be able to protect intellectual creation, enabling legitimate creation, licensing, and commercialization of information products. Ethically, protecting professional integrity and trust so that clients can attest that service providers are not manipulating them, exploiting them, discriminating against them, and are not operating conflicts of interest. That is why it is expected that data protection protects personal and sensitive information, provides responsible data services, and strengthens client confidence. Instituting standards that establish and guarantee quality and interoperability of the

services provided in such a way that makes information products reliable, scalable and professionally credible.

Conclusion

The four interrelated professional governance pillars used to discuss the contribution of infopreneurship for sustainable economic empowerment of librarians in academic libraries in Nigeria have shown that it is not an entirely new phenomenon nor a speculative possibility for LIS professionals because literature establishes that LIS professionals in Nigeria are already engaged in information brokerage, research support, digital services, information consultancy, content development and other entrepreneurial activities. The four interrelated professional governance has helped to reveal significant gaps that need to be bridged in entrepreneurial orientation, business competence, ICT skills, institutional support, and market-oriented training.

Traditional librarianship cannot be abandoned but must extend its professional competencies into emerging information markets. Accordingly, sustainable LIS infopreneurship should be understood as the intersection of skills and their applications when operationalizing the interrelated professional governance for sustainable economic empowerment of librarians in academic libraries in Nigeria.

REFERENCES

Akidi, J. O., & Udoh, I. U. (2021). Infopreneurship skills for sustainable development: a focus on library and information science students of selected federal universities in Nigeria. Library Philosophy and Practice (e-journal). Retrieved from https://scholarworks.sjsu.edu/libphilprac/6420/

Byrne, A. (2022). A declaration for all seasons: The IFLA Statement on Libraries and Intellectual Freedom. *IFLA journal*, *48*(3), 373-382.

Coates, J., Owen, V., & Reilly, S. (2022). *Navigating copyright for libraries: Purpose and scope* (p. 547). De Gruyter.Saur. https://doi.org/10.1515/9783110732009

da Costa, W. N. P. C., & Prudencio, D. S. (2024). Bibliotecários de dados: práticas e contextos de atuação (Data librarians: Practices and contexts of action). *AtoZ: novas práticas em informação e conhecimento*, *13*, 1-13.

Electronic Information for Libraries (EIFL). (2023). What can libraries in Nigeria do under the 2022 Copyright Act? Retrieved from EIFL.

Friday, J. E., & Sawyer-George, O. (2023). Practice of infopreneurship by librarians in public university libraries in South-South Nigeria. *Evidence Based Library and Information Practice*, *18*(3), 26-52. https://doi.org/10.18438/eblip30235

Hunt, L. K. C., Steele, J. E., Koposko, J. L., Cromwell, J., & Lambert, T. A. (2023). E-resource librarians perceptions on library patron privacy. *The Journal of Academic Librarianship*, *49*(3), 102704. https://doi.org/10.1016/j.acalib.2023.102704

Kee, S. (2024). Navigating Copyright for Libraries: Purpose and Scope. *Law Libr. J.*, *116*, 434.

Khan, G., & Basir, M. (2023). Copyright literacy of library and information science professionals in Pakistan. *IFLA journal*, *49*(3), 514-526. https://doi.org/10.1177/03400352231172800

Makinde, O. B., Hamzat, S. A., Oketunji, I., Ogunniran, O. O., & Olatunji, T. O. (2023). Entrepreneurial skills assessment of library and information science faculty and academic librarians in Nigeria: issues and prospects. *Journal of Business & Finance Librarianship*, *28*(4), 255-277. https://doi.org/10.1080/08963568.2023.2263315

Malanga, D. F., Simwaka, K., & Chifuniro, E. (2024). Integrating information ethics into library and information science curriculum at a public university in Malawi. *Information Development*, 02666669241268337. https://doi.org/10.1177/02666669241268337

Mayernik, M. S., & Liapich, Y. (2022). The role of metadata and vocabulary standards in enabling scientific data interoperability: A study of earth system science data facilities. *Journal of eScience Librarianship*, *11*(2). https://doi.org/10.7191/jeslib.619

McKenna, L., Debruyne, C., & O'Sullivan, D. (2022). Using Linked Data to create provenance-rich metadata interlinks: the design and evaluation of the NAISC-L interlinking framework for libraries, archives and museums. *AI & SOCIETY*, *37*(3), 921-947. https://doi.org/10.1007/s00146-021-01373-z

Michalak, R. (2023). From ethics to execution: The role of academic librarians in artificial intelligence (AI) policy-making at colleges and universities. *Journal of Library Administration*, *63*(7), 928-938. https://doi.org/10.1080/01930826.2023.2262367

Ocks, Y., & Salubi, O. G. (2024). Privacy Paradox in Industry 4.0: A review of library information services and data protection. *South African Journal of Information Management*, *26*(1), 1-11. https://doi.org/10.4102/sajim.v26i1.1845

Olarongbe, S. A., OLANIYI, M. A., Ishola, S. O., SULYMAN, A. S., John, B. O., & Paul, A. I. (2025). Exploring the Strategies for Enhancing Infopreneurship Opportunities among LIS Undergraduates in Kwara State, Nigeria. *KHAIRUN International Journal of Contemporary Librarianship*, *2*(1), 88-111.

Olusipe, A. A., Adetayo, A. J., Enamudu, A. I., & Babalola, O. O. (2024). Safeguarding the digital economy: Librarians' perspectives on data privacy and ethical use of public AI chatbots. *Journal of Electronic Resources Librarianship*, *36*(4), 257-270. https://doi.org/10.1080/1941126X.2024.2414706

Osuchukwu, N. P., Udem, O. K., & Nwosu, M. (2022). Plagiarism and copyright among LIS professionals in Nigeria: an assumption or a reality? *African Journal of Library, Archives and Information Science*, *32*(2), 233-244.

Owushi, E., & Anyalebechi, O. J. (2024). Ethical framework for information provisions: A guide to librarians and information professionals. *International Journal of Information Management Sciences*, *8*(1), 156-166.

Owusu-Ansah, Y., & Dadzie, P. S. (2024). Ethical misconduct among librarians in selected nursing training colleges in Ghana. *The Journal of Academic Librarianship*, *50*(1), 102802. https://doi.org/10.1016/j.acalib.2023.102802

Ramugondo, L. S., & Ocholla, D. N. (2022). Can infopreneurship be an employment option for library and information science students?. *Mousaion*, *40*(2), 1.

Rubin, R. E., & Rubin, R. G. (2020). *Foundations of library and information science*. American Library Association.

Souza, T. A. (2024). Privacy Matters: How Academic Law Libraries Can Mitigate Privacy Risks Associated with Controlled Digital Lending. *Legal Reference Services Quarterly*, *43*(4), 218-239. https://doi.org/10.1080/0270319X.2024.2428511

Yusuf, J. (2021). Information ethics compliance and service delivery by librarians in universities: A review. *Library Philosophy and Practice (e-journal)*. Retrieved from https://scholarworks.sjsu.edu/libphilprac/5549/

Challenges and Prospects of Infopreneurship among Library and Information Science Professionals in Nigeria

By

Rachel Agbo
College Library Federal College of Education P.M.B. 2041
Katsina, Katsina State
Rachelagbo1998@gmail.com

Abstract

The rapidly changing digital information environment has transformed the roles and responsibilities of Library and Information Science (LIS) professionals, creating opportunities for entrepreneurial engagement beyond traditional library services. Infopreneurship, which involves the creation, packaging, management, and commercialization of information products and services, offers significant prospects for enhancing professional relevance, self-employment, and sustainable economic empowerment among LIS professionals in Nigeria. This paper examines the challenges and prospects of infopreneurship among Library and Information Science professionals in Nigeria. The paper adopts a conceptual approach based on a review of relevant literature on infopreneurship, entrepreneurship, digital technologies, and LIS practice. The discussion identifies inadequate entrepreneurial and digital skills, limited access to finance, poor technological infrastructure, unreliable electricity supply, inadequate institutional support, limited awareness of infopreneurial opportunities, and concerns relating to copyright and information security as major challenges. Despite these constraints, emerging technologies, digital content creation, information brokerage, online consultancy, research support services, e-learning, digital publishing, data services, and knowledge management provide opportunities for LIS professionals to develop sustainable information-based enterprises. The paper recommends the integration of entrepreneurship and digital innovation into LIS education and continuing professional development, improved access to technological infrastructure and funding, institutional support for innovation, and stronger awareness of intellectual property and digital business practices. Infopreneurship can therefore contribute to repositioning the LIS profession and expanding opportunities for sustainable economic empowerment in Nigeria.

Keywords: Infopreneurship, Library and Information Science, Entrepreneurship, Digital Economy, LIS Professionals, Economic Empowerment, Nigeria

Introduction

The Library and Information Science (LIS) profession has historically been associated with the acquisition, organization, preservation, retrieval, dissemination, and provision of access to information resources. Libraries and information centres have traditionally served as institutions through which individuals, researchers, students, organizations, and communities access knowledge. However, the rapid development of information and communication technologies (ICTs), the internet, digital libraries, social media, artificial intelligence, cloud computing, big data, mobile technologies, and other emerging technologies has significantly altered the information environment.

In Nigeria, these developments have particular implications for the LIS profession. The growth of the digital economy has created new forms of work and new markets for information products and services. LIS professionals can potentially move beyond conventional employment by developing information-based enterprises. Such enterprises may include information consultancy, research support, digital publishing, content creation, information brokerage, database services, indexing and abstracting, records management consultancy, digital literacy training, online research services, knowledge management, information marketing, and other specialized services.

The concept is increasingly relevant to LIS because the profession already possesses many of the competencies required for information entrepreneurship. LIS professionals are trained in information organization, retrieval, evaluation, research, information literacy, knowledge management, digital resources, reference services, metadata, preservation, and information dissemination. These competencies can be transformed into marketable information products and services when complemented by entrepreneurial, technological, managerial, marketing, financial, and communication skills.

The present paper therefore examines the challenges and prospects of infopreneurship among LIS professionals in Nigeria and proposes strategies for strengthening its contribution to professional development and sustainable economic empowerment.

Conceptual Clarification

Concept of Infopreneurship

Infopreneurship is derived from the combination of information and entrepreneurship. It refers broadly to the entrepreneurial creation, organization, packaging, marketing, distribution, and commercialization of information products and services.

An infopreneur identifies an information problem or unmet information need and develops a product or service that provides a solution. The product may be delivered physically or digitally. Examples include electronic books, newsletters, databases, research reports, online courses, consultancy services, information alerts, digital publications, market intelligence reports, bibliographic services, data services, and specialized information portals.

Library and Information Science Professionals

Library and Information Science professionals include librarians, information scientists, records managers, archivists, knowledge managers, information consultants, information officers, and other specialists trained to manage information and knowledge resources.

Economic Empowerment

Economic empowerment refers to the ability of individuals or groups to acquire skills, resources, opportunities, and capacities that enable them to participate productively in economic activities and improve their livelihoods.

Infopreneurship and the Changing LIS Profession in Nigeria

The traditional LIS profession developed around libraries, archives, documentation centres, schools, universities, research organizations, and government information centres. Employment was consequently structured largely around institutional positions.

The digital environment has expanded the range of possible professional activities. Information can now be created, distributed, marketed, and consumed through websites, mobile applications, social media platforms, cloud systems, online databases, podcasts, webinars, e-learning platforms, and digital publishing systems.

This transformation provides LIS professionals with opportunities to become independent service providers. Instead of relying exclusively on salaried employment, a professional with appropriate skills may establish an information consultancy, provide research support, develop digital learning materials, operate a specialized information platform, or provide data and knowledge management services.

Areas of Infopreneurial Opportunities for LIS Professionals

Information Consultancy

Information consultancy is one of the most obvious areas of infopreneurship. LIS professionals can provide specialized advice to organizations and individuals concerning information management, information retrieval, database development, records management, library automation, digital libraries, research support, and information policies.

Digital Content Creation

Digital content creation provides opportunities for LIS professionals to produce educational materials, newsletters, blogs, podcasts, online tutorials, research guides, electronic books, and specialized information resources.

Digital Publishing

Digital publishing is another emerging area. LIS professionals can participate in electronic book publishing, scholarly publishing support, institutional repositories, electronic journals, newsletters, and specialized online publications.

Research Support Services

Research support constitutes an important entrepreneurial opportunity. LIS professionals possess competencies in literature searching, database searching, bibliographic management, systematic searching, citation management, reference services, information evaluation, and research discovery.

Information Brokerage

Information brokerage involves identifying, evaluating, synthesizing, and delivering information to clients who require specialized knowledge.

Digital Literacy Training

LIS professionals can develop training programmes in online research, information evaluation, digital security awareness, database use, reference management, digital publishing, information literacy, and basic technology use.

Data Services

LIS professionals with appropriate technical training can provide data organization, data curation, data documentation, data discovery, bibliometric support, research data management, and information visualization.

Knowledge Management

LIS professionals can provide knowledge-management consultancy, taxonomy development, document management, institutional knowledge repositories, and information governance services.

Records and Information Management Consultancy

This includes records management, digitization, document control, electronic records, retention schedules, classification systems, and information governance services.

Online Training and E-Learning

The expansion of online learning creates opportunities to develop courses and training materials in research skills, information literacy, academic database use, scholarly communication, citation management, and digital research methods.

Challenges of Infopreneurship among LIS Professionals in Nigeria

Inadequate Entrepreneurial Skills

Traditional LIS education has historically focused heavily on professional library and information competencies. Entrepreneurship requires competencies in business planning, marketing, financial management, customer relations, product development, pricing, negotiation, and risk management.

Limited Digital and ICT Competencies

Digital entrepreneurship requires competencies in web development, digital marketing, data analytics, content management systems, cloud applications, cybersecurity awareness, multimedia production, search-engine optimization, and emerging technologies.

Limited Access to Finance

Finance is an important requirement for establishing an enterprise. An infopreneur may require funds for internet services, computers, software, website development, office facilities, digital marketing, content production, professional registration, and staff.

Poor Technological Infrastructure

Reliable internet connectivity, electricity, hardware, software, and digital platforms are fundamental to many forms of infopreneurship.

Unreliable Electricity Supply

Many digital enterprises depend heavily on electricity. Unstable electricity can increase the cost of running information businesses because entrepreneurs may need alternative power sources.

Inadequate Institutional Support

Institutional policies, workload, bureaucratic procedures, limited innovation funding, and lack of dedicated entrepreneurship structures may restrict professional entrepreneurial engagement.

Limited Awareness of Infopreneurial Opportunities

Some professionals may continue to perceive librarianship primarily as an institutional salaried profession, limiting recognition of opportunities in consultancy, digital publishing, information marketing, research support, data services, and online training.

Marketing Challenges

Infopreneurship requires market research, branding, communication, networking, customer relationship management, social-media engagement, and digital marketing.

Copyright and Intellectual Property Issues

Infopreneurs must understand copyright, licensing, plagiarism, attribution, database rights, privacy, and related intellectual-property requirements.

Competition

LIS professionals entering the digital information market may compete with IT specialists, business consultants, content creators, researchers, publishers, data analysts, journalists, and other professionals.

Lack of Entrepreneurial Orientation

Entrepreneurship requires initiative, creativity, calculated risk-taking, adaptability, persistence, and willingness to identify problems as opportunities.

Excessive Workload

For professionals employed in libraries and universities, heavy workloads can reduce the time available for entrepreneurial development.

Prospects of Infopreneurship among LIS Professionals in Nigeria

Expansion of the Digital Economy

The growth of digital technologies has increased demand for information products and services. Businesses, researchers, students, government institutions, and individuals increasingly depend on digital information.

Growing Demand for Digital Skills

Digital transformation has created continuing demand for professionals who can teach individuals and organizations how to find, evaluate, organize, manage, and use digital information.

Expansion of Online Learning

The growth of online learning provides opportunities to develop courses, tutorials, webinars, research-skills programmes, and digital literacy services.

Growth of Digital Publishing

Digital publishing enables professionals to produce and distribute information products without depending entirely on conventional publishing channels.

Growth of Research and Data Services

The increasing volume of scholarly and organizational information creates demand for specialists who can help users discover, organize, evaluate, and manage information.

Artificial Intelligence and Emerging Technologies

Artificial intelligence is changing information work and creating opportunities for professionals who understand both information management and emerging technologies.

Freelancing and Remote Work

Digital platforms enable professionals to provide information services across geographical boundaries.

Youth and Graduate Entrepreneurship

Infopreneurship provides a possible pathway for LIS graduates who face difficulties obtaining conventional employment.

Institutional Entrepreneurship

Libraries and information centres can create entrepreneurial services such as specialized training, consultancy, digitization, research-support programmes, database services, and professional development activities while maintaining appropriate ethical and institutional standards.

Strategies for Promoting Infopreneurship among LIS Professionals

Curriculum Reform

LIS schools should strengthen entrepreneurship education by incorporating practical activities into the curriculum.

Practice-Based Entrepreneurship Education

Students should be encouraged to develop actual information products and services such as digital newsletters, information portals, research-support services, online courses, electronic publications, databases, information guides, and specialized consultancy projects.

Establishment of LIS Entrepreneurship Centres

Universities can establish LIS entrepreneurship or innovation centres where students and professionals receive mentoring, technical support, business-development training, and access to digital equipment.

Continuous Professional Development

Professional associations and LIS institutions should organize regular training programmes on digital entrepreneurship, artificial intelligence, data analytics, digital marketing, information products, copyright, business management, and emerging technologies.

Collaboration with Technology Professionals

LIS professionals should collaborate with software developers, data scientists, business specialists, communication experts, educators, and entrepreneurs.

Access to Finance

Government agencies, financial institutions, universities, professional associations, development organizations, and entrepreneurship programmes can create funding mechanisms appropriate for small information-based businesses.

Development of Digital Infrastructure

Improved internet connectivity, reliable electricity, digital devices, cloud services, and appropriate software are essential for sustainable information enterprises.

Mentoring and Incubation

Experienced entrepreneurs and LIS professionals with successful information enterprises can mentor students and early-career professionals.

Professional Networking

Professional associations can create networking platforms through which LIS professionals share entrepreneurial experiences, identify market opportunities, form partnerships, and access potential clients.

Intellectual Property and Ethical Training

Infopreneurship training should include copyright, licensing, privacy, plagiarism, information security, professional ethics, responsible use of AI, and appropriate handling of confidential information.

Market-Oriented Information Services

LIS professionals should identify actual information needs before developing products. Entrepreneurial activity should be based on customer problems rather than simply on available professional skills.

Integration of AI and Emerging Technologies

LIS professionals should acquire appropriate competencies in AI tools, data analytics, automation, cloud technologies, digital repositories, and other emerging technologies.8.0 Implications for LIS Education in Nigeria

The emergence of infopreneurship has significant implications for LIS education. First, the curriculum needs to balance traditional professional competencies with entrepreneurial and technological competencies.

Second, teaching methods should become more practical. Students should be given opportunities to solve real information problems and develop information products.

Third, LIS educators need opportunities for continuous professional development so that they can teach emerging technologies and contemporary business practices.

Fourth, partnerships between LIS schools and industry should be strengthened. Such partnerships can provide internships, mentorship, entrepreneurship projects, guest lectures, and opportunities for students to understand real-world information markets.

Fifth, assessment methods should include practical entrepreneurial projects rather than relying exclusively on written examinations.

Implications for LIS Professionals

Infopreneurship requires LIS professionals to reconsider their professional roles. The librarian or information professional of the digital era is not necessarily limited to the traditional institutional environment.

The professional may function as an information specialist, digital content creator, information consultant, research-support specialist, knowledge manager, data-information specialist, digital literacy trainer, publisher, information broker, information marketer, or entrepreneur.

This does not mean that every LIS professional must become an entrepreneur. Rather, entrepreneurship should be regarded as one possible professional pathway alongside conventional employment.

Conceptual Model for LIS Infopreneurship

LIS Professional Competencies → Digital + Entrepreneurial Skills → Identification of Information Needs → Development of Information Products/Services → Digital Marketing and Distribution → Customer/User Engagement → Revenue/Value Creation → Professional and Economic Empowerment.

The model suggests that professional knowledge alone does not automatically generate an entrepreneurial outcome. LIS competencies must be combined with entrepreneurial and digital capabilities and applied to identifiable information needs.

Discussion

The literature reviewed demonstrates that infopreneurship is relevant to the contemporary transformation of LIS practice in Nigeria. Existing Nigerian studies identify both opportunities and significant constraints.

Entrepreneurship education challenges include inadequate funding, insufficient teaching equipment, theoretical orientation, and weak implementation environments. This indicates that developing an entrepreneurial LIS profession requires changes not only at the individual level but also at institutional and educational levels.

At the broader professional level, information professionals require continuing development of practical, critical, digital, creative, and other competencies to respond to changes in the information environment.

Infopreneurship should not be regarded simply as an attempt to commercialize library services. Instead, it can be understood as an approach to professional innovation in which LIS competencies are applied to emerging information needs and markets while maintaining professional ethics, information quality, intellectual-property requirements, privacy, and equitable access.

Recommendations

1. LIS schools should strengthen entrepreneurship education through practical projects, business planning, innovation activities, and market-oriented assignments.
2. Practical training should be emphasized, with students developing actual information products and services.
3. Digital competencies should be strengthened through continuous training in AI, data analytics, digital publishing, cloud technologies, digital marketing, information security, and related technologies.
4. Entrepreneurship centres should be established in universities and professional institutions for training, mentoring, incubation, and networking.
5. Access to finance should be improved through grants, training, incubation, and affordable financing for viable information-based enterprises.
6. Professional associations should organize entrepreneurship programmes, workshops, mentoring, networking, and opportunity-sharing activities.
7. Industry partnerships should be strengthened among LIS schools, technology companies, publishers, research organizations, information firms, and entrepreneurship centres.
8. Intellectual-property awareness should be increased, including copyright, licensing, privacy, plagiarism, information security, and ethical information use.
9. LIS professionals should conduct market research and identify genuine user needs before investing in information products or services.
10. Institutions should encourage innovation through supportive policies that allow professionals to develop and test innovative information services.
11. Mentoring programmes should be introduced for students and early-career LIS professionals.
12. Digital infrastructure should be improved, including reliable internet access, electricity, hardware, software, and digital platforms.

Conclusion

Infopreneurship presents an important opportunity for repositioning the Library and Information Science profession in Nigeria. The transformation of the information environment has created new demands for digital information products, specialized information services, research support, digital literacy, knowledge management, data services, digital publishing, consultancy, and information brokerage.

LIS professionals possess many competencies that can support participation in these emerging areas. However, professional expertise must be complemented by entrepreneurial, technological, marketing, financial, managerial, and communication skills.

The major challenges include inadequate entrepreneurial training, digital skills gaps, limited access to finance, inadequate infrastructure, unreliable electricity, institutional constraints, limited awareness, marketing difficulties, copyright concerns, and competition from professionals in related fields.

At the same time, the prospects are substantial. Digital publishing, information consultancy, research support, digital literacy training, data services, knowledge management, content creation, online education, and information brokerage provide potential pathways for professional diversification.

For infopreneurship to make a meaningful contribution to economic empowerment, it must be supported by curriculum reform, practical entrepreneurship education, continuing professional development, digital infrastructure, access to finance, mentoring, institutional support, and appropriate professional and legal frameworks.

Ultimately, infopreneurship should be viewed as a complementary pathway through which LIS professionals can create value, diversify their careers, develop innovative services, and contribute to Nigeria's emerging knowledge and digital economy.

References

Abdullahi, F. (2017). Prospects and challenges of entrepreneurship in librarianship in Nigeria. Nigerian Libraries, 49(1–2), 84–91. https://doi.org/10.4314/jnla.v49i1-2

Emiri, O. T., & Emojorho, D. (2025). Entrepreneurship development in university libraries: Re-skilling, opportunities and challenges for library and information science practitioners in South-South Zone of Nigeria. Nigerbiblios: Journal of National Library of Nigeria, 28(1–2), 13–33.

Ibrahim, A., Esew, M., & Yusufu, A. (2025). Strategies and challenges for acquisition of entrepreneurship skills among postgraduate students of Department of Library and Information Science in universities of North-Western Nigeria. Samaru Journal of Information Studies, 25(1).

International Federation of Library Associations and Institutions. (2024). IFLA trend report 2024: Facing the future of information with confidence. IFLA.

International Federation of Library Associations and Institutions. (2025). New professionals: The modern library worker. IFLA.

International Federation of Library Associations and Institutions. (n.d.). Skills for a digital world. IFLA.

Liman, Y. A., & Shuaibu, U. (2024). Infopreneurship skills of academic librarians in libraries in Bauchi and Gombe States for effective information marketing services delivery. UNIZIK Journal of Research in Library and Information Science, 7(1–2).

Maifata, N. M., & Mohammed, Z. (2017). Challenges of teaching and learning entrepreneurship education in library and information science schools in Nigeria. Nigerian Libraries, 49(1–2), 37–47. https://doi.org/10.4314/jnla.v49i1-2

Oladokun, B. D., & Olatokun, W. M. (2026). Integrating emerging technologies into LIS education in Nigeria: An educators' perspective and framework for curriculum reform. Journal of Education for Library and Information Science.https://doi.org/10.1177/0167832 9261452517

Okolo, E. S., & Ivwighreghweta, O. (2021). Entrepreneurship skills and opportunities for librarians in the field of library and information science: A perspective in view. International Journal of Sustainability Management and Information Technologies, 7(2).

Infopreneurship and the Future of LIS Profession: An Opinion on the Role of Library Personnel

By

Jamila Ukan Garba
+2347033337755
garbaj7979@gmail.com;
Kaduna State College of Education Gidan-Waya

Nikoh Usman Anto
+2348026438960
nikohanto2018@gmail.com;
Kaduna State College of Education Gidan-Waya

Joseph Yohanna
+2349012220261
kyanathyayok@gmail.com
Kaduna State College of Education Gidan-Waya

Abstract

The rapid advancement of information and communication technologies (ICTs), digital scholarship, artificial intelligence, and the global knowledge economy has transformed the responsibilities of Library and Information Science (LIS) professionals. Traditional library functions are no longer sufficient to meet the dynamic information needs of contemporary society, making entrepreneurial thinking an indispensable component of professional practice. This opinion paper argues that infopreneurship should no longer be viewed as an optional career pathway but as a strategic necessity for the future sustainability and relevance of the LIS profession. Drawing on contemporary literature and observations from the evolving operations of A. W. Ambi Library, Kaduna State College of Education Gidan Waya, the paper contends that library personnel possess unique competencies that can be transformed into innovative information products and services capable of creating both social and economic value. It further expresses the opinion that embracing information consultancy, digital content development, research support services, institutional repository management, information brokerage, and other knowledge-based enterprises will strengthen professional relevance while contributing to institutional development and national economic growth. Although challenges such as inadequate entrepreneurial training, limited digital infrastructure, poor funding, and weak policy support continue to hinder the growth of infopreneurship among librarians, these obstacles should be regarded as opportunities for strategic reforms rather than barriers to innovation. The paper concludes that integrating entrepreneurship education into LIS curricula, promoting continuous professional development, and strengthening institutional support mechanisms are essential steps toward preparing library personnel for the future of the knowledge economy. Ultimately, infopreneurship represents a practical and sustainable direction for repositioning the LIS profession in Nigeria and beyond.

Keywords: Infopreneurship, Library and Information Science, Entrepreneurship, Digital Libraries, Knowledge Economy, Innovation, Library Personnel.

Introduction

The twenty-first century has ushered in unprecedented technological advancements that continue to reshape the global information landscape. Innovations such as artificial intelligence, cloud computing, big data analytics, digital repositories, and electronic communication have fundamentally changed the ways information is created, organized, stored, disseminated, and accessed. Consequently, Libraries have evolved from traditional repositories of information into dynamic centres supporting research, digital scholarship, innovation, and lifelong learning (IFLA, 2022; UNESCO, 2023).

This transformation has equally altered the expectations placed upon Library and Information Science (LIS) professionals, who are increasingly required to combine traditional librarianship skills with technological competence, creativity, and entrepreneurial thinking.

In our view, one of the most significant developments influencing the future of the LIS profession is the emergence of infopreneurship has expanded the professional landscape of librarians by encouraging the creation and commercialization of information products and services (Chiwara-Ndoro & Dewah, 2020; Mubofu & Malekani, 2023). Infopreneurship represents the application of entrepreneurial principles to the creation, management, packaging, and dissemination of information products and services. Rather than depending solely on conventional employment opportunities within academic, public, or special libraries, librarians now have the opportunity to transform their professional expertise into sustainable enterprises that respond to the growing demand for quality information services. These may include research consultancy, digital publishing, indexing and abstracting services, bibliometric analysis, academic editing, records management consultancy, institutional repository management, information literacy training, and digital content development.

It is our considered opinion that the future of the Library and Information Science profession will largely depend on how effectively librarians embrace innovation and entrepreneurial practices. The traditional perception of librarians as custodians of books is gradually becoming obsolete in an era characterized by digital transformation and rapidly changing user expectations. Today's information professionals must become creators of value, managers of digital knowledge, consultants, innovators, educators, and entrepreneurs capable of delivering specialized information solutions across multiple sectors of society.

The increasing integration of entrepreneurship into higher education reflects the growing recognition that graduates require innovative competencies to compete within modern labour markets (WEF, 2023).

This opinion is particularly relevant within Nigerian higher education institutions, where declining public funding, rising unemployment among graduates, and increasing technological demands require librarians to diversify their professional competencies. Libraries can no longer rely exclusively on institutional budgets to sustain quality service delivery. Instead, they should explore innovative approaches that generate additional value while improving access to information and supporting teaching, research, community engagement, and institutional development.

A. W. Ambi Library, Kaduna State College of Education Gidan Waya, provides an appropriate context for this discussion because it reflects many of the realities confronting academic libraries in Nigeria. Like many institutions, the library operates within a rapidly evolving information

environment where technological innovation presents both opportunities and challenges. In our opinion, the library possesses considerable human capital capable of driving infopreneurial initiatives if supported through appropriate policies, professional development programmes, digital infrastructure, and institutional commitment. Such initiatives would not only enhance service delivery but also position library personnel as active contributors to the knowledge economy.

This paper therefore presents our professional opinion that infopreneurship is no longer a supplementary aspect of librarianship but a strategic direction for the future of the profession. We argue that entrepreneurial competencies should become an integral component of library education, professional practice, and institutional policy. By embracing innovation, technology, and enterprise development, librarians can strengthen their professional relevance, improve institutional sustainability, create employment opportunities, and contribute meaningfully to national development.

Infopreneurship: A Strategic Imperative for the Future of the LIS Profession

The Library and Information Science (LIS) profession is experiencing one of the most significant transitions in its history. Digital transformation, globalization, changing user expectations, and the increasing commercialization of information have altered the traditional responsibilities of librarians. In our opinion, these developments demand a paradigm shift in the way library professionals perceive their roles. Rather than viewing themselves solely as custodians of information resources, librarians should embrace their identities as innovators, entrepreneurs, consultants, and creators of knowledge-based solutions.

Infopreneurship enables librarians to transform professional knowledge into innovative services that generate educational, economic and social value (Ramugondo, 2022), that can be responsibly harnessed through entrepreneurial initiatives. Unlike conventional business enterprises that primarily deal with physical goods, infopreneurship focuses on creating, organizing, packaging, and disseminating information products and services that address specific knowledge needs. This perspective aligns closely with the professional competencies of librarians, whose expertise lies in information organization, retrieval, evaluation, preservation, and dissemination.

In our view, digital transformation has significantly expanded the responsibilities of librarians beyond collection management to include digital preservation, research support, scholarly communication, and knowledge management (Noh, 2021).The rapid expansion of digital scholarship, online education, open science, research data management, and artificial intelligence has created new opportunities that extend beyond the physical library environment. Librarians who develop entrepreneurial competencies are better positioned to provide specialized services that meet these evolving demands while strengthening the visibility and relevance of their profession.

Furthermore, infopreneurship should not be interpreted as replacing the traditional values of librarianship. Rather, it complements the ethical principles of equitable information access, intellectual freedom, lifelong learning, and community development by introducing sustainable approaches to service delivery. Entrepreneurial thinking enables libraries to diversify their activities, improve financial resilience, and expand their societal impact without compromising their professional obligations.

Another reason why infopreneurship has become strategically important is the growing mismatch between the number of LIS graduates and the availability of conventional employment opportunities. Many graduates possess valuable knowledge and technical skills but remain unemployed because they continue to depend exclusively on vacancies in public institutions. We believe that entrepreneurship education should encourage graduates to identify information needs within society and transform those needs into viable professional enterprises. Such enterprises can generate employment not only for librarians but also for other professionals working within the information ecosystem.

Equally important is the emergence of artificial intelligence and digital automation, which have prompted concerns regarding the future relevance of librarians. While some routine library operations are increasingly automated, technologies such as artificial intelligence cannot completely replace the professional judgment, ethical reasoning, instructional competence, and user-centred services provided by trained librarians. Instead, these technologies should be viewed as tools that enhance professional productivity and create new entrepreneurial opportunities. Librarians who understand how to integrate emerging technologies into information services will remain indispensable contributors to research, education, innovation, and national development. Therefore, artificial intelligence and emerging digital technologies should be viewed as opportunities for professional innovation rather than threats to librarianship (Raju, 2021).

It is therefore our opinion that institutions responsible for educating future librarians should move beyond teaching entrepreneurship as a peripheral course. Entrepreneurial thinking should be embedded throughout the LIS curriculum, enabling students to acquire practical experience in business planning, digital innovation, project management, marketing of information services, financial sustainability, and technology-driven service delivery. Such reforms would better prepare graduates to thrive within an increasingly competitive knowledge economy.

Emerging Opportunities for Library Personnel through Infopreneurship

The expanding digital information environment has created numerous opportunities that can reposition library personnel as active participants in the knowledge economy. In our opinion, these opportunities remain underutilized, particularly within many developing countries where librarians continue to focus primarily on conventional library operations despite possessing competencies that are highly valuable in diverse sectors of society.

One of the most promising opportunities lies in **Research Consultancy SERVICES**. Research consultancy, bibliometric analysis, institutional repository management, academic editing, digital publishing, and information literacy training represent important entrepreneurial opportunities for librarians (Mubofu & Malekani, 2023) Contemporary researchers increasingly require assistance with literature searching, systematic reviews, reference management, plagiarism detection, research impact analysis, citation indexing, bibliometric studies, and scholarly publishing. These services fall naturally within the professional expertise of librarians and can be offered as specialized consultancy services to universities, research institutes, government agencies, and private organizations.

Another important opportunity involves **Digital Publishing and Academic Editing**. The rapid growth of open-access publishing, institutional repositories, electronic journals, and online learning platforms has increased the demand for professionals capable of managing editorial workflows, metadata creation, indexing, proofreading, copyright compliance, and digital

preservation. Library personnel or Information professionals possess competencies that are increasingly demanded by universities, government agencies, industries, and research organizations (Ramugondo, 2022).

Information Literacy Education also presents significant entrepreneurial potential. As misinformation, disinformation, and digital manipulation become increasingly prevalent, individuals require guidance in locating, evaluating, and ethically using information. Librarians can develop online training programmes, professional workshops, certification courses, and educational content that improve digital literacy across educational institutions, corporate organizations, and local communities.

We further believe that **Records and Archives Management** represents another expanding area of professional opportunity. Government institutions, healthcare organizations, financial institutions, and private companies continue to generate enormous quantities of digital records requiring systematic organization, preservation, retrieval, and compliance with regulatory standards. Library professionals possess transferable competencies that can be adapted to these growing information management needs.

Digital Content Creation has equally emerged as an attractive area for infopreneurship. Librarians can produce educational videos, podcasts, webinars, blogs, newsletters, online tutorials, electronic databases, and specialized information products tailored to specific user communities. These activities not only generate income but also increase professional visibility and demonstrate the continuing relevance of librarians within the digital society.

Within A. W. Ambi Library in Kaduna State College of Education Gidan-Waya, these opportunities could significantly enhance institutional visibility while creating additional avenues for professional growth. By encouraging library personnel to explore entrepreneurial initiatives, the institution can strengthen service delivery, improve staff motivation, attract external collaborations, and contribute more effectively to teaching, research, innovation, and community engagement. In our opinion, infopreneurship should therefore become an integral component of institutional strategic planning rather than an individual career aspiration.

The expanding digital information environment has created numerous opportunities that can reposition library personnel as active participants in the knowledge economy. In our opinion, these opportunities remain underutilized, particularly within many developing countries where librarians continue to focus primarily on conventional library operations despite possessing competencies that are highly valuable in diverse sectors of society.

Challenges Limiting the Growth of Infopreneurship among Library Personnel

Although infopreneurship presents enormous opportunities for Library and Information Science (LIS) professionals, its adoption within many developing countries, including Nigeria, remains relatively limited. In our opinion, this slow progression is not a reflection of inadequate professional competence but rather the result of institutional, economic, technological, and policy-related constraints that continue to affect the profession. These challenges deserve serious attention because they determine the extent to which librarians can successfully participate in the emerging knowledge economy.

Limited entrepreneurial education, inadequate funding, poor ICT infrastructure, and weak institutional support remain significant barriers to infopreneurship in many developing countries (Chiwara-Ndoro & Dewah, 2020).

One of the most significant barriers is **inadequate entrepreneurial education**. While many Library and Information Science programmes now include entrepreneurship courses, these courses often emphasize theoretical concepts rather than practical enterprise development. Consequently, many graduates leave higher institutions with sound professional knowledge but limited experience in business planning, innovation management, digital marketing, financial management, client relations, and enterprise sustainability. We believe that entrepreneurship education should move beyond classroom instruction to include practical incubation programmes, mentorship, internships, and collaborative innovation projects that expose students to real entrepreneurial experiences.

Another major challenge is **insufficient technological infrastructure**. Modern infopreneurship depends heavily on reliable internet connectivity, cloud computing services, digital repositories, electronic databases, content management systems, artificial intelligence tools, and other information technologies. Unfortunately, many academic libraries continue to experience inadequate internet bandwidth, irregular electricity supply, obsolete computer systems, and insufficient investment in digital infrastructure. These limitations reduce the ability of library personnel to develop innovative information products and compete effectively within the digital marketplace.

Financial constraints also remain a significant obstacle. Establishing information-based enterprises often requires investment in hardware, software, internet services, professional certification, office facilities, digital platforms, and continuous skills development. However, access to startup capital remains difficult for many librarians, particularly young graduates who lack collateral or institutional support. In our opinion, governments, financial institutions, professional associations, and educational institutions should establish funding mechanisms specifically designed to support knowledge-based entrepreneurial initiatives within the information sector.

Equally important is the **persistence of traditional professional mindsets**. Many librarians continue to associate professional success exclusively with permanent employment in government institutions or academic libraries. While such employment remains valuable, exclusive dependence on conventional career pathways limits innovation and reduces the profession's adaptability to changing economic realities. We argue that cultivating an entrepreneurial culture within the profession requires changing attitudes toward self-employment, innovation, calculated risk-taking, and value creation.

The **rapidly evolving technological environment** presents another important challenge. Emerging technologies such as artificial intelligence, machine learning, blockchain, data analytics, and virtual reality continue to transform information services at an unprecedented pace. Library personnel who fail to update their knowledge risk becoming professionally irrelevant. Continuous professional development should therefore become an essential component of librarianship rather than an optional activity.

Policy and institutional support also deserve careful consideration. Many academic institutions have yet to develop comprehensive policies that encourage entrepreneurial innovation among

library personnel. Existing administrative structures often prioritize routine service delivery while providing limited incentives for creativity, commercialization of information products, interdisciplinary collaboration, or external consultancy. In our opinion, institutional leaders should create environments that encourage experimentation, reward innovation, and support responsible entrepreneurial initiatives that align with the educational mission of their institutions.

Finally, **public awareness** remains relatively low regarding the diverse competencies possessed by librarians. Many individuals continue to perceive librarians primarily as custodians of books rather than information specialists capable of providing consultancy, digital knowledge management, research support, scholarly communication, and technology-driven information solutions. Improving public understanding of these competencies is essential for expanding the market for infopreneurial services and enhancing the overall visibility of the profession.

Despite these challenges, we remain optimistic about the future of infopreneurship within the LIS profession. Most of these obstacles are not permanent limitations but transitional issues that can be addressed through strategic investment, policy reforms, technological advancement, continuous professional development, and stronger collaboration among educational institutions, governments, professional associations, and private-sector partners.

Therefore, continuous professional development is essential if librarians are to adapt to rapidly changing technologies and user expectations (IFLA, 2022).

Our Perspective on the Future of Library and Information Science Profession

Noh, 2021; and Raju, 2021 opined that future librarians will increasingly function as a digital knowledge manager, research consultant, innovation facilitator, and information entrepreneur. According to UNESCO (2023) academic libraries should become centres of innovation capable of supporting digital transformation and sustainable development.

The future of the library and information science profession will be shaped not merely by technological advancement but by the willingness of information professionals to embrace innovation, entrepreneurship, adaptability, and lifelong learning. In our opinion, librarians who continue to rely exclusively on traditional service models may find it increasingly difficult to remain relevant in an information environment characterized by rapid technological change, evolving user expectations, and growing competition from commercial information providers.

Rather than viewing technological innovations as threats, the profession should recognize them as catalysts for transformation. Artificial intelligence, cloud computing, data analytics, digital repositories, and automation are redefining information management across the world. These technologies are capable of improving service efficiency, supporting evidence-based decision-making, enhancing user experiences, and expanding access to knowledge. However, their successful application depends on professionals who understand both technological systems and the ethical principles governing information access, preservation, privacy, and intellectual freedom. Librarians possess this unique combination of competencies and should therefore position themselves as leaders in the responsible use of emerging technologies.

We further believe that the future librarian will function as a multidisciplinary knowledge professional rather than a conventional information custodian. Future responsibilities are likely to include research data management, digital scholarship support, open-access publishing, metadata

architecture, digital preservation, knowledge consultancy, information policy development, scholarly communication, digital literacy education, and innovation management. These expanding roles demonstrate that the profession is evolving rather than declining.

Within Nigerian higher education institutions, this transformation presents both opportunities and responsibilities. Institutions such as A. W. Ambi Library, Kaduna State College of Education Gidan Waya, have the potential to become centres of innovation where librarians actively contribute to institutional research, digital transformation, entrepreneurship education, and community development. By encouraging staff to establish information-based enterprises, participate in interdisciplinary collaborations, and develop technology-driven services, academic libraries can strengthen their relevance while contributing directly to national development priorities.

We also contend that future library schools must redesign their curricula to reflect the realities of the digital knowledge economy. Courses on artificial intelligence applications in libraries, digital entrepreneurship, innovation management, business development, intellectual property, research analytics, digital content creation, project management, and technology commercialization should become integral components of Library and Information Science Education. Such reforms would ensure that graduates possess both professional competence and entrepreneurial confidence.

Professional associations likewise have an important responsibility to provide continuous training, mentorship programmes, innovation competitions, enterprise development workshops, and networking opportunities that expose librarians to emerging entrepreneurial possibilities. These initiatives would strengthen professional resilience while promoting a culture of creativity and lifelong learning across the profession.

Ultimately, we are convinced that infopreneurship represents more than an alternative source of income for librarians. It is a strategic philosophy that encourages innovation, expands career opportunities, improves institutional sustainability, and enhances the contribution of libraries to national development. The future of the Library and Information Science profession therefore depends not on preserving traditional practices but on combining professional ethics with entrepreneurial vision, technological competence, and a commitment to continuous innovation.

Suggestions

Based on the opinions presented in this paper, the following suggestions are proposed to strengthen the adoption of infopreneurship and enhance the future of the Library and Information Science (LIS) profession in Nigeria and other developing countries.

1. Entrepreneurship Education should be integrated throughout the LIS Curriculum. Rather than limiting entrepreneurship to a single course, library schools should embed entrepreneurial thinking across the curriculum. Students should receive practical training in innovation, business development, digital marketing, project management, financial literacy, and information product design to prepare them for both traditional employment and self-employment.

2. Academic Libraries should establish Innovation and Infopreneurship Hubs. Universities and colleges should create dedicated innovation centres where library personnel and students can develop, test, and commercialize information-based products and services. Such centres would

encourage creativity, interdisciplinary collaboration, and the practical application of professional knowledge.

3. Continuous Professional Development should become mandatory. Library personnel should regularly participate in workshops, seminars, conferences, certification programmes, and online training on emerging technologies, artificial intelligence, digital scholarship, data analytics, research support services, and entrepreneurial skills. Continuous learning is essential for maintaining professional relevance in an evolving information environment.

4. Governments and institutional administrators should increase investment in digital infrastructure. Reliable internet connectivity, uninterrupted electricity, modern computer facilities, digital repositories, cloud-based platforms, and emerging information technologies are fundamental requirements for successful infopreneurship. Increased investment in these areas will improve both service delivery and entrepreneurial innovation.

5. Professional associations should actively promote entrepreneurial culture. Organizations representing library professionals should organize mentorship programmes, innovation competitions, enterprise development workshops, and networking platforms that expose librarians to successful infopreneurial practices. Recognition and awards for innovative information services would further encourage professional creativity.

6. Financial support mechanisms should be established for information-based enterprises. Government agencies, development partners, financial institutions, and educational institutions should introduce grants, innovation funds, low-interest loans, and business incubation programmes specifically designed to support librarians who wish to establish sustainable information enterprises.

7. Academic libraries should encourage strategic partnerships. Collaboration with universities, research institutes, technology companies, publishers, non-governmental organizations, and private-sector organizations will enable library personnel to expand their professional services, access new technologies, and create innovative solutions to societal information challenges.

8. Greater public awareness of librarians' competencies should be promoted. Libraries should implement advocacy campaigns highlighting the diverse expertise of librarians in research consultancy, digital information management, scholarly communication, data management, information literacy, records management, and knowledge organization. Improved public awareness will increase demand for professional information services and strengthen the visibility of the profession.

In our opinion, implementing these recommendations will not only strengthen infopreneurship but will also reposition the Library and Information Science profession as a strategic contributor to national development, digital transformation, innovation, and the knowledge economy.

Conclusion

The transformation currently taking place within the global information environment presents both challenges and unprecedented opportunities for the Library and Information Science profession. Advances in digital technologies, artificial intelligence, open source, and the knowledge economy have fundamentally changed how information is created, managed, disseminated, and utilized.

Consequently, librarians must continually redefine their professional roles to remain relevant within this rapidly evolving landscape.

This opinion paper has argued that infopreneurship represents one of the most promising pathways for achieving this transformation. Rather than viewing entrepreneurship as an activity separate from librarianship, we maintain that it should be recognized as a natural extension of the professional competencies already possessed by Library and Information Science practitioners. Skills in information organization, knowledge management, research support, digital literacy, scholarly communication, and information technology provide a strong foundation upon which sustainable information enterprises can be developed.

Using the context of A. W. Ambi Library, Kaduna State College of Education Gidan Waya, this paper has expressed the view that academic libraries possess significant untapped potential to become centres of innovation, digital transformation, and entrepreneurial excellence. By embracing infopreneurship, library personnel can diversify their professional roles, improve institutional sustainability, expand access to information, create employment opportunities, and contribute meaningfully to educational advancement and national development.

We acknowledge that barriers such as inadequate funding, limited technological infrastructure, insufficient entrepreneurial education, weak policy support, and resistance to organizational change continue to hinder progress. Nevertheless, these challenges should be regarded as opportunities for strategic reform rather than reasons for professional stagnation. Through collaborative efforts involving educational institutions, governments, professional associations, and the private sector, the conditions necessary for successful infopreneurship can be established.

In conclusion, we firmly believe that the future of the Library and Information Science profession will depend not only on technological advancement but also on the willingness of librarians to innovate, collaborate, and embrace entrepreneurial thinking. Infopreneurship is therefore more than a professional alternative; it is a strategic imperative that will determine the sustainability, visibility, and societal relevance of librarianship in the twenty-first century. Library professionals who embrace this philosophy will not merely adapt to change—they will become leaders in shaping the future of knowledge creation, information access, and national development.

References

Aina, L. O. (2004). *Library and information science text for Africa*. Third World Information Services.

Aina, L. O. (2022). Entrepreneurship education and professional development in Library and Information Science in Nigeria. *Nigerian Library and Information Science Review, 40*(2), 15–28.

Association of College and Research Libraries. (2023). *Framework for information literacy for higher education*. American Library Association.

Chiwara-Ndoro, L., & Dewah, P. (2020). Infopreneurship as a sustainable career option for library and information science professionals in developing countries. *Mousaion, 38*(4), 1–18.

International Federation of Library Associations and Institutions. (2022). *IFLA trend report 2022 update*.

International Federation of Library Associations and Institutions. (2023). *IFLA strategy 2024–2029*.

Mubofu, C., & Malekani, A. W. (2023). Infopreneurship and digital innovation opportunities for information professionals in Africa. *African Journal of Library, Archives and Information Science, 33*(1), 45–60.

Noh, Y. (2021). A study on the changing role of libraries and librarians in the era of the Fourth Industrial Revolution. *Journal of Librarianship and Information Science, 53*(4), 612–624.

Ocholla, D. N. (2021). Digital transformation and the future of Library and Information Science education in Africa. *South African Journal of Libraries and Information Science, 87*(2), 1–13.

Ramugondo, E. (2022). Information entrepreneurship as a strategy for professional sustainability among library professionals. *Library Management, 43*(6/7), 421–436.

Raju, R. (2021). The evolving role of academic librarians in the digital knowledge economy. *Journal of Academic Librarianship, 47*(5), Article 102387.

Sulyman, A., Abdullahi, H., & Ibrahim, M. (2024). Digital competencies and entrepreneurial readiness among academic librarians in Nigeria. *Nigerian Libraries, 57*(1), 77–95.

United Nations Educational, Scientific and Cultural Organization. (2023). *Global education monitoring report 2023: Technology in education*.

World Economic Forum. (2023). *The future of jobs report 2023*.

World Intellectual Property Organization. (2022). *World intellectual property indicators 2022*.