

**Artificial Intelligence in Library Technical Services: Perceived Benefits and Challenges of
Its Application in Cataloguing and Classification at Gabriel Afolabi Ojo Central Library,
Abuja, Nigeria**

**Dr. Lucy Ndidiamaka OKONKWO (CLN), Faith Tinuola IGE
&**

Frances Ngozi NKENCHOR

National Open University of Nigeria

University Village, Plot 91,

Cadastral zone, Nnamdi

Azikiwe Express Way, Jabi, Abuja

fige@noun.edu.ng lnebeolise@noun.edu.ng nnkenchor@noun.edu.ng

Abstract

This study investigates the role of artificial intelligence (AI) in cataloguing and classification, focusing on its benefits and challenges as perceived by cataloguing librarians in National Open University of Nigeria (NOUN) called Gaberiel Afolabi Ojo Central Library, Abuja. A quantitative research design was adopted, and data were gathered through structured interviews. The population for the study consisted of eight cataloguing and classification librarians working in the university library. Four research questions guided the investigation. Findings revealed that the librarians are aware of AI applications in cataloguing and classification tasks. AI enhances automatic cataloguing processes through tools such as Optical Character Recognition (OCR), enabling faster completion of tasks and reducing human workload. It improves the accuracy and consistency of cataloguing, minimizes errors, saves time and resources, and supports the creation of metadata for digital resources ultimately increasing the speed and efficiency of metadata generation. Despite these benefits, the study identified several challenges to AI adoption. Key barriers include limited funding, unstable power supply, and a lack of skilled personnel to manage and operate AI technologies effectively. Furthermore, the findings indicate that the NOUN Library currently lacks a strategic plan to guide the integration of AI into cataloguing and classification workflows. The study recommends that a clear and well-structured strategic implementation plan be developed. This plan should focus on capacity building, infrastructure support, and long-term investment to enable the practical adoption of AI tools in cataloguing and classification processes.

Keywords: Artificial Intelligence, Cataloguing, Classification, Academic Libraries, Metadata

Introduction

Cataloguing and classification are central to effective library operations as they ensure systematic organization and easy retrieval of information resources. These processes involve creating metadata and arranging vast collections of library materials such as books, journals, audio-visual content, maps, digital files, and e-books for optimal access. Given the sheer volume of

information resources in libraries globally, lack of proper organization would severely limit users' access to relevant materials. Thus, libraries rely heavily on cataloguing and classification systems to provide fast and accurate information retrieval.

Historically, library cataloguing and classification have evolved through various technological eras. These include: The manual era, characterized by handwritten or typewritten catalogue cards; the automated era, featuring Machine Readable Cataloguing (MARC) formats and copy cataloguing; and now, the artificial intelligence (AI) era, which is the focus of this study.

The AI era according to Velarde (2020), has revolutionized how we work and think. AI is now a driving force across sectors such as industries, hospitals, banks, and educational institutions, including libraries. AI technologies have permeated various fields such as industries, healthcare, banking, education and libraries are no exception. As Emerald Publishing (2024) highlights, libraries are now applying AI through expert systems, natural language processing, deep learning, robotics, and knowledge reasoning. In both developed and developing countries, AI-driven tools are already making a visible impact. For example, the use of robots like "Bobbie" and "Robbie" at Temasek Polytechnic Library in Singapore to assist in delivering materials and scanning thousands of books per day, respectively. Such innovations demonstrate the increasing potential of AI in automating library operations (Obiozor , Okonkwo, et al.(2026))

The integration of AI in libraries offers significant advantages. Mogali (2014) identifies key benefits such as enhanced cataloguing and classification efficiency through automation, performing complex or repetitive tasks faster than humans, improving accuracy and reducing errors, generating metadata at higher speeds, and operating continuously with minimal downtime. AI is also capable of handling tasks that may be too stressful for humans while ensuring high operational efficiency.

More so, many libraries that have implemented AI report improved service delivery and operational outcomes (Okonkwo, Onuh and Ige (2024). Even institutions yet to deploy AI often include it in their strategic plans, reflecting a growing recognition of its potential benefits. However, some libraries both in developed and developing countries have neither implemented AI nor integrated it into their plans, possibly due to perceived challenges.

Despite these benefits, AI in libraries comes with challenges. Mahmud (2024), observed that: AI lacks human touch and intuition, It may lead to job displacement, It can malfunction or deviate from programmed tasks. AI remains dependent on human oversight, as emphasized by Velarde, (2020), who argues that AI cannot fully replicate human intelligence and requires a "human touch" to function effectively. In some academic libraries, particularly in India, resistance to AI adoption is evident among cataloguing librarians. This resistance may stem from uncertainty about AI's impact on professional roles and concerns over job security (Oname and Alex-Nmecha, 2020).

Regarding challenges, Mahmud (2024), identified issues such as lack of human touch, potential job displacement, and the risk of malfunction leading to unintended outcomes. Nevertheless, Mahmud observed that AI's practicability in cataloguing and classification is improving and could soon dominate technical services. Oname and Alex-Nmecha (2020) reported that, despite awareness and recognition of AI's benefits, many academic libraries in India still face internal obstacles in its adoption. They noted resistance among cataloguing librarians professionals responsible for creating and maintaining bibliographic and authority records for diverse library materials possibly due to their perceptions of AI's role in cataloguing.

Similarly, Midde (2024) argued that AI cannot match human intelligence, as it is a man-made tool requiring human oversight. Without active involvement from cataloguers, libraries may fail to maximize AI's potential in this technological era. In addition to these evolving trends and mixed responses, this study investigates cataloguing and classification in the era of artificial intelligence, examining both the benefits and challenges from the perspective of cataloguing librarians at Gaberiel Afolabi Ojo Central Library, Abuja . The study aims to assess cataloguers' awareness, perception, and readiness to adopt AI technologies in their professional practice. Insights from this study will inform library administrators, policymakers, and stakeholders on strategic planning and capacity building for AI integration in academic libraries.

Statement of the Problem

The rapid growth of information resources in academic libraries, particularly in the digital age, has created a pressing need for efficient, accurate, and sustainable cataloguing and classification processes. Traditional manual cataloguing methods are increasingly inadequate to cope with the speed, volume, and complexity of resources now being generated. Globally, Artificial Intelligence (AI) has been recognized as a transformative tool capable of enhancing metadata creation, automating repetitive cataloguing tasks, and ensuring consistency in bibliographic records. AI applications such as Optical Character Recognition (OCR) and automated metadata generation tools are already being deployed in advanced library systems to improve accuracy, reduce human workload, and enhance user access to information.

In Nigeria, however, the adoption of AI technologies in academic libraries remains slow and fragmented. At the National Open University of Nigeria (NOUN), Gabriel Afolabi Ojo Central Library, cataloguing librarians are aware of AI applications but face significant barriers to implementation. Despite the potential benefits of AI—such as faster cataloguing processes, reduction of errors, saving of resources, and improved efficiency—the practical application of these technologies is hindered by persistent challenges. These include limited funding to procure and maintain AI tools, unstable power supply, and a lack of skilled personnel to operate and manage AI systems effectively.

Furthermore, the absence of a clear strategic plan for AI integration at NOUN Library compounds the problem. Without a deliberate roadmap for capacity building, infrastructure investment, and policy development, the library risks lagging behind global trends in bibliographic control. This gap not only undermines the efficiency of cataloguing and classification processes but also threatens the library's ability to provide timely, accurate, and accessible resources to its academic community.

Therefore, the problem this study addresses is the contradiction between the recognized benefits of AI in cataloguing and classification and the persistent barriers technological, financial, and organizational that hinders its adoption at the Gabriel Afolabi Ojo Central Library, NOUN. Unless these challenges are strategically addressed, the library will remain constrained by traditional cataloguing methods, limiting its capacity to meet the growing information needs of users in a digital age.

Research Questions

1. What is the level of awareness of artificial intelligence application among cataloguing librarians at Gabriel Afolabi Ojo Central Library, Abuja?
2. What are the perceived benefits of artificial intelligence application in cataloguing and classification at Gabriel Afolabi Ojo Central Library, Abuja?
3. What challenges are associated with the application of artificial intelligence in cataloguing and classification at Gabriel Afolabi Ojo Central Library, Abuja?
4. What strategic plans are required for effective application of artificial intelligence in cataloguing and classification at Gabriel Afolabi Ojo Central Library, Abuja?

Literature Review

Artificial intelligence (AI) refers to the simulation of human intelligence in machines designed to perform tasks such as learning, reasoning, decision-making, and language processing (Frankenfield, 2020). Artificial intelligence (AI) is refers as a transformative technology in library and information science, particularly in cataloguing and classification processes. AI technologies such as machine learning, natural language processing, and expert systems are increasingly applied to automate metadata generation, subject indexing, and classification tasks, thereby enhancing efficiency, speed and accuracy in bibliographic control (Hasan, Saifullah, & Hashmi, 2024; Himayah, 2025). These technologies enable academic libraries to manage the rapid growth of both print and digital resources more effectively.

Cataloguing and classification are core technical services that ensure systematic organization and effective retrieval of information resources. Traditionally, these processes relied on manual efforts by cataloguing librarians to create bibliographic records and assign classification numbers using established standards and schemes. However, the rapid growth of print and digital

collections has made manual cataloguing increasingly time-consuming and less efficient. Recent studies indicate that AI technologies such as expert systems and natural language processing are now being used to automate cataloguing tasks, thereby improving productivity, consistency, and accuracy in bibliographic record creation (Ozioko & Ozioko, 2024). Similarly, AI enhances classification through pattern recognition, semantic analysis, and machine learning techniques that enable accurate grouping of resources according to subject content, reducing human workload while maintaining uniformity.

Academic libraries, as specialized information centres supporting teaching, learning, and research, are under increasing pressure to provide rapid and precise access to information resources. To meet these demands, many academic libraries have begun adopting AI solutions to support cataloguing, classification, and metadata management. Studies have shown that AI integration in academic libraries improves service quality, operational efficiency, and user satisfaction (Emezaiwakpor, Idiodi, & Urhiewhu, 2023; Gundakanal & Kaddipujar, 2019). Schreur (2020) observed that just as the shift from card catalogues to MARC formats transformed technical services, emerging technologies such as linked data and AI now offer similar opportunities for improving access to both structured and unstructured information in library collections.

Metadata creation is central to cataloguing and classification, as it enables the description, identification, and retrieval of library resources. AI tools support automated metadata generation by analyzing document content, extracting bibliographic elements, and linking related resources, thereby speeding up processing time and improving consistency across records (ALA, 2020). Through AI-driven metadata management, academic libraries are better positioned to manage large collections efficiently and enhance discoverability in online catalogues.

The literature also highlights several benefits associated with AI application in cataloguing and classification. AI systems are capable of performing repetitive and complex tasks faster than humans, reducing errors and operational costs while improving overall efficiency (Gundakanal & Kaddipujar, 2019; Oname & Alex-Nmecha, 2020). These advantages have encouraged many academic libraries to adopt AI technologies or include them in their strategic plans. However, despite these benefits, the adoption of AI in libraries is constrained by notable challenges. These include lack of trust in AI systems, shortage of skilled personnel, high implementation and maintenance costs, software malfunction risks, limited scope of AI applications, and data security concerns arising from reliance on large volumes of sensitive data (Dinesh & Kashmira, 2019; Oname & Alex-Nmecha, 2020).

The reviewed literature demonstrates that AI has become an important tool for improving efficiency and accuracy in cataloguing and classification within academic libraries. While AI offers significant benefits through automation and enhanced metadata management, its effective adoption remains influenced by infrastructural, financial, skill-related, and ethical challenges.

These mixed findings underscore the need for empirical studies that examine librarians' perceptions of AI benefits and challenges within specific institutional contexts, such as Gabriel Afolabi Ojo Central Library, Abuja.

Methodology

This study adopted a descriptive survey research design. The descriptive survey approach is suitable for gathering detailed information about current practices, perceptions, benefits, and challenges related to cataloguing and classification in the era of artificial intelligence from the perspective of cataloguing librarians. This design enables the researcher to systematically collect and analyze data from a specific population to address the research objectives. The area of this study is Gabriel Afolabi Ojo Central Library, Abuja. The library serves as the central academic library of National Open University of Nigeria across other study centre libraries in Nigeria and is a hub for cataloguing and classification activities, making it an appropriate setting for investigating the integration of artificial intelligence in cataloguing practices. The population for this study comprises all the eight (8) academic cataloguing librarians working staff directly involved in Gabriel Afolabi Ojo Central Library, Abuja cataloguing and classification processes within the library. Given the typically small number of cataloguing librarians in academic libraries, no sample or sampling technique were employed. All the eight (8) cataloguing librarians in the library were used as the sample to ensure comprehensive coverage and to capture the full range of experiences and perspectives relevant to the study. The primary instrument for data collection was structured questionnaire, designed to elicit information on cataloguing practices, the application of artificial intelligence, perceived benefits, and encountered challenges. The questionnaire consisted of both closed-ended and open-ended questions to allow for quantitative analysis and the collection of in-depth qualitative insights. Data collected were analyzed using descriptive statistics particularly, the mean scores. Decisions were based on the cluster mean relative to the cut off mean using the options of: SA – Strongly Agreed; A – Agreed; D –Disagreed; SD – Strongly Disagreed **Decision Rule:** Mean score of 2.50 and above were accepted while any mean score below 2.5 were rejected.

Results and Discussions:

Research Question 1: What is the level of awareness of artificial intelligence application among cataloguing librarians?

Table 1: Mean and Standard Deviation of Cataloguing Librarians' Awareness of AI Application

S/N	Item Statement	Mean	SD	Decision
1	I am aware that AI can automate cataloguing and classification tasks in academic libraries.	3.38	0.52	Strongly Agree
2	I know that AI can improve the accuracy of metadata creation in cataloguing.	3.25	0.46	Strongly Agree
3	I am familiar with AI-based tools (e.g., NLP, machine learning) used in library cataloguing.	2.88	0.64	Agreed
4	I am aware that AI can assist in subject heading assignment and classification.	3.13	0.64	Strongly Agree
5	I have received training or orientation on the use of AI for cataloguing and classification.	2.75	0.71	Agreed
6	I am aware of challenges (e.g., funding, skills gap) in implementing AI for cataloguing in my library.	3.00	0.53	Strongly Agree
7	I am aware of the benefits of AI, such as time-saving and cost reduction, in library cataloguing.	3.38	0.52	Strongly Agree
Grand Mean		3.11		Strongly Agree

The results indicate that cataloguing librarians in Gaberiel Afolabi Ojo Central Library, Abuja generally Strongly Agree that they are aware of the application of artificial intelligence (AI) for cataloguing and classification, as reflected in the grand mean of 3.11. The highest mean scores (3.38) were observed for awareness of AI's ability to automate tasks and its benefits such as time-saving and cost reduction, suggesting strong recognition of AI's transformative potential. Moderate agreement (means between 2.75 and 2.99) was found on items related to familiarity with specific AI tools and training received, indicating some gaps in practical exposure and professional development. Overall, the findings reveal a high level of conceptual awareness but highlight the need for more targeted training and capacity building to deepen operational knowledge and implementation skills.

The study reveals that cataloguing librarians at Gabriel Afolabi Ojo Central Library, Abuja, exhibit a high awareness of AI applications in cataloguing and classification, particularly regarding automation and efficiency gains. However, familiarity with specific AI tools and hands-on proficiency remains moderate, underscoring the need for targeted training. This aligns with studies

in Nigeria and globally (Benahal, 2024; Midde, 2024) which affirm strong conceptual awareness but limited practical application due to inadequate training and infrastructure.

Research Question 2: What are the perceived benefits of artificial intelligence application in cataloguing and classification?

Table 2: Mean and Standard Deviation of Perceived Benefits of AI for Cataloguing (n = 8)

S/N	Item Statement	Mean	Std. Dev.	Decision
1	AI increases the efficiency and speed of cataloguing processes.	3.38	0.52	Strongly Agree
2	AI enhances the accuracy and consistency of metadata creation.	3.25	0.46	Strongly Agree
3	AI reduces the workload and repetitive tasks for cataloguing librarians.	3.13	0.64	Strongly Agree
4	AI enables better resource discovery and user access through improved classification.	2.88	0.64	Agreed
5	AI helps in cost-saving for cataloguing operations in the library.	3.00	0.53	Strongly Agree
6	AI facilitates multilingual cataloguing and supports diverse user needs.	2.75	0.71	Agreed
7	AI allows for the automation of error detection and correction in cataloguing records.	3.13	0.52	Strongly Agree
Grand Mean		3.07		Strongly Agree

The Table 2, shows that cataloguing librarians strongly agree on the benefits of artificial intelligence for cataloguing, with a grand mean of 3.07. Items with the highest agreement (mean 3.38, 3.25, 3.13) reflect strong recognition that AI increases efficiency, enhances metadata accuracy, and reduces repetitive workload, aligning with current literature on AI's transformative role in library workflows. Moderate agreement (means between 2.75 and 2.99) was observed for AI's benefits in multilingual cataloguing and improved resource discovery, indicating that while these advantages are acknowledged, they may be less directly experienced or fully realized in the current context. Overall, the results suggest that librarians perceive AI as a valuable tool for improving cataloguing operations, though some benefits are more prominent than others.

Perceptions of AI's benefits focus primarily on efficiency, accuracy, and workload reduction, with more modest recognition of its potential for multilingual support and enhanced resource discovery. Similar observations were made by Mahmud (2024), Turul and Nasir (2025), and the Encyclopedia of Libraries, Librarianship, and Information Science (2024), which

collectively emphasize AI's role in improving speed, accuracy, cost-effectiveness, and catalogue diversity.

Research Question 3: What challenges are associated with the application of artificial intelligence in cataloguing and classification?

Table 3: Mean and Standard Deviation of Challenges of AI Application for Cataloguing and Classification (n = 8)

S/N	Item Statement	Mean	SD	Decision
1	Inadequate technical infrastructure for implementing AI solutions in cataloguing.	3.13	0.64	Strongly Agree
2	Lack of specialized skills and training among cataloguing librarians for AI tools.	3.25	0.46	Strongly Agree
3	Data privacy and security concerns related to AI-driven cataloguing systems.	2.88	0.64	Agree
4	High cost of acquiring and maintaining AI technologies for cataloguing.	3.00	0.53	Strongly Agree
5	Risk of algorithmic bias and misclassification in AI-powered cataloguing.	2.75	0.71	Agree
6	Difficulty integrating AI with existing library management systems.	2.88	0.52	Agree
7	Ethical concerns regarding transparency and accountability in AI cataloguing decisions.	2.88	0.52	Agree
Grand Mean		2.97		Agree

The Table 3, reveals that cataloguing librarians generally agreed on the presence of several challenges in applying AI to cataloguing and classification, with a grand mean of 2.97. Items with means between 2.50 and 2.99 such as data privacy and security concerns, algorithmic bias, integration difficulties, and ethical concerns show moderate agreement, indicating that these issues are widely recognized but may not be universally experienced at the highest intensity. Items with means of 3.00 or higher such as inadequate technical infrastructure, lack of specialized skills, and high costs reflect stronger agreement, highlighting these as the most pressing challenges perceived by the librarians. Overall, the results suggest that while librarians acknowledge a broad range of obstacles to AI adoption, infrastructural, financial, and skills-related barriers are viewed as especially significant.

Adoption challenges identified include insufficient infrastructure, high costs, lack of AI expertise, and concerns over privacy, bias, and ethics. These findings mirror those of Turul and

Nasir (2025), Mahmud (2024), and the BPAS Journal of Library Science (2024), highlighting the complex interplay of technical, financial, and ethical barriers.

Research Question 4: What strategic plans are required for effective application of artificial intelligence in cataloguing and classification?

Table 4: Mean and Standard Deviation of Strategic Plans for AI Application in Cataloguing (n = 8)

S/N	Item Statement	Mean	Std. Dev.	Decision
1	Developing a phased implementation plan for integrating AI into cataloguing processes.	3.13	0.64	Strongly Agree
2	Organizing regular training and capacity-building workshops for cataloguing staff on AI tools.	3.25	0.46	Strongly Agree
3	Establishing collaborative partnerships with technology providers and other academic libraries.	2.88	0.64	Agree
4	Securing dedicated funding and budgetary allocations for AI adoption and maintenance.	3.00	0.53	Strongly Agree
5	Creating policies and guidelines for ethical and transparent use of AI in cataloguing.	2.75	0.71	Agree
6	Upgrading technical infrastructure to support AI-driven cataloguing and classification.	2.88	0.52	Agree
7	Implementing continuous monitoring and evaluation mechanisms for AI applications in cataloguing.	2.88	0.52	Agree
Grand Mean		2.97		Agree

The Table 4, reveals that cataloguing librarians generally agree on the importance of several strategic plans for AI application, as shown by the grand mean of 2.97. Items with means between 2.50 and 2.99 such as establishing partnerships, creating ethical guidelines, upgrading infrastructure, and monitoring AI applications show moderate agreement, indicating these strategies are recognized as necessary but may face practical or resource-related constraints. Items with means of 3.00 or higher such as phased implementation, regular training, and securing funding reflect stronger agreement, highlighting these as the most prioritized and actionable strategies among the librarians. Overall, the results suggest that while a range of strategic plans are valued, immediate emphasis is placed on structured implementation, staff development, and financial planning.

Strategic priorities identified by respondents phased implementation, capacity building, funding, partnerships, ethical frameworks, and ongoing evaluation reflect a holistic but still evolving approach to AI integration. This is consistent with recommendations by Emezaiwakpor,

Idiodi, and Urhiewhu (2023), Whong (2024), and Ozioko and Ozioko (2024), who stress structured planning, collaborative networks, and ethical oversight as essential for sustainable AI adoption in Nigerian libraries.

Implications for the Study

The findings highlight three critical actions for effective AI integration in cataloguing operations:

1. Capacity Building as a Priority – Librarians require sustained, hands-on training in AI tools, data management, and ethical use to move from conceptual awareness to practical proficiency.
2. Strategic, Phased Implementation – Adoption should follow a stepwise plan that aligns infrastructure upgrades, funding mobilization, and policy frameworks to ensure sustainable and scalable AI use.
3. Collaborative Ecosystems – Partnerships with technology providers, academic institutions, and policy bodies are essential for technical support, knowledge exchange, and securing resources for continuous innovation.

Recommendations

1. Deliver regular training programs and workshops to enhance AI competencies in cataloguing.
2. Produce practical guides and online resources on AI applications for librarians.
3. Upgrade ICT infrastructure and ensure reliable internet access for AI operations.
4. Establish continuous professional development in AI tools, data ethics, and privacy.
5. Develop a phased AI integration roadmap with clear milestones and resource allocations.
6. Foster partnerships with technology vendors and academic institutions for training and funding.
7. Implement ethical AI policies to ensure transparency, data protection, and fairness.
8. Create a monitoring and evaluation framework to track performance and address emerging challenges.

Conclusion

The findings confirm that while cataloguing librarians at Gabriel Afolabi Ojo Central Library, Abuja, are highly aware of AI's capabilities and benefits, adoption is hindered by infrastructural gaps, limited technical skills, and funding constraints. Strategic integration requires phased implementation, ongoing capacity building, ethical policy frameworks, and resource mobilization. Optimism about AI's transformative potential is evident, but success depends on overcoming these structural and skill-based barriers.

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