Artificial Intelligence: A new Frontier for Cataloguing and Classification. A case of Selected Public Academic Libraries in Lusaka Province

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Abstract

This study will investigate the integration of Artificial Intelligence (AI) as a transformative tool in cataloguing and classification processes within selected academic libraries in Lusaka Province, Zambia. As AI technologies such as machine learning and natural language processing increasingly influence library operations globally, this research aims to assess their level of adoption, impact on cataloguing accuracy and consistency, and the challenges and opportunities associated with their use. Guided by a quantitative research design, the study employed stratified random sampling to gather data from librarians in registered public academic libraries using structured questionnaires. Findings are expected to highlight the extent of AI adoption, reveal infrastructural and capacity-related barriers, and inform strategies for effective and ethical integration of AI into library workflows. The results will contribute to the growing body of knowledge on AI in library science, providing evidence-based recommendations to enhance metadata practices and service delivery in Zambian academic libraries

Keywords: Artificial Intelligence (AI), Academic libraries and Quantitative research design

1.0 Introduction

Academic libraries play a crucial role in supporting teaching, learning, and research activities within educational institutions. With the rapid advancement of technology,

artificial intelligence (AI) has emerged as a potential tool to revolutionize library services and operations. AI application offer opportunities to streamline processes, personalize user experiences, and unlock insights from vast amounts of data. However, the integration of AI in academic libraries also presents challenges related to privacy, equity, and resource allocation. This study aims to examine the Artificial Intelligence as a new frontier for cataloguing and classification in selected academic libraries in Lusaka Province

1.1 Background Information

The integration of Artificial Intelligence (AI) into cataloguing and classification systems is transforming modern libraries, revolutionizing traditional practices, and paving the way for more efficient and sophisticated information management (Smith, 2021). As libraries increasingly adopt AI technologies, the impact on cataloguing and classification processes is becoming a critical area of study. This introduction explores the significant changes AI is driving in these systems, drawing on the latest literature to highlight current trends and future directions.

Liu (2010) provided a comprehensive literature review on the utilisation of AI and robotics to enhance the quality of services in university libraries. The applications highlighted include automated indexing and abstracting, expert system reference services, cataloguing, and classification. Building on this, Kadeyo (2025) posited that the adoption of artificial intelligence applications has helped university libraries mitigate threats posed by other retrieval systems and deliver services that surpass those of Google Search. AI provides libraries with a competitive edge and a method to deliver superior services to users in the current information age.

Kadeyo (2025) also noted that AI enables libraries to reach and attract users with high reading skills, creating opportunities for enhanced service offerings and improved user experiences. Chatbots, for example, can be employed in librarian reference activities or as part of readers' advisory services, while automated AI applications can perform tasks such as cataloguing, indexing, and abstracting tasks that are traditionally carried out by trained professionals.

De Sarkar (2023) asserted that artificial intelligence is set to transform the way various information service operations are conducted. An AI-powered online assistant may seamlessly integrate with library systems to support users in their search, discovery, and retrieval processes. AI systems can retrieve valuable information from a wide range of sources,

including information-rich graphical resources such as maps, and generate overviews to support learning and research.

The benefits of artificial intelligence in libraries appear to be substantial. Mogali (2014) highlighted that these benefits include assisting in the cataloguing and classification of library collections, handling stressful and complex tasks that humans may find difficult or impossible, completing tasks more rapidly than humans, reducing errors and defects, and offering virtually limitless functionality. To fully harness these benefits, Vysakh and Rajendra (2019) reported that many libraries have already deployed AI technologies and found them beneficial. While some libraries in both the developed and developing world have not yet adopted AI, many have included its deployment in their strategic plans, whereas others are yet to consider its implementation.

Despite the potential benefits, the implementation of AI in cataloguing and classification in academic libraries within Lusaka Province faces several challenges. These include lack of technical expertise, inadequate funding, and limited infrastructure to support advanced AI systems. Kadeyo (2025) argues that while librarians are receptive to new technologies, the absence of targeted training and institutional support hinders the effective deployment of AI tools. Additionally, ethical concerns regarding algorithmic bias and data privacy raise critical questions about the reliability and fairness of AI-generated cataloguing decisions (Cox et al., 2021). These concerns necessitate a cautious and well-regulated approach to AI adoption in library environments.

To harness the full potential of AI in cataloguing and classification, academic libraries in Lusaka Province must invest in capacity-building, policy development, and collaborative frameworks. Partnerships with international library networks and AI developers can facilitate knowledge transfer and resource sharing. Moreover, integrating AI with existing cataloguing standards such as RDA (Resource Description and Access) and MARC 21 can ensure interoperability and consistency across systems. As noted by Ocholla and Shongwe (2019), embracing emerging technologies while preserving the professional judgment of librarians is key to sustaining quality metadata practices. Therefore, a hybrid model that blends human expertise with AI capabilities presents a promising direction for the future of cataloguing in Zambian academic libraries.

1.3 Statement of the problem

Despite the rapid advancements in Artificial Intelligence (AI) and its transformative potential in information management, many academic libraries in Lusaka Province have been slow to adopt AI technologies in their cataloguing and classification systems. Traditional cataloguing methods, which rely heavily on manual input and human judgment, are often time-consuming, prone to inconsistencies, and unable to cope with the growing volume and complexity of information resources (Smith, 2021). This has led to inefficiencies in information retrieval and access, thereby limiting the ability of libraries to meet the dynamic needs of their users. While global trends indicate a shift toward automated metadata generation, semantic indexing, and machine learning applications in cataloguing (Jones & Anderson, 2020), a significant gap exists in the implementation of such technologies in the Zambian academic context.

Furthermore, the lack of technical expertise, limited funding, and inadequate policy frameworks have further hindered the integration of AI in cataloguing and classification processes in selected academic libraries in Lusaka Province. According to Kadeyo (2025), many library professionals express uncertainty and resistance toward AI-driven tools due to fears of redundancy and ethical concerns related to data governance. This resistance, coupled with infrastructural challenges, raises critical questions about the readiness and capacity of academic libraries to embrace AI innovations. Therefore, there is a pressing need to investigate the challenges, opportunities, and implications of adopting AI technologies for cataloguing and classification in the Zambian academic library setting.

1.4 Research Objective

1. To examine the extent to which Artificial Intelligence (AI) technologies have been adopted in cataloguing and classification processes in selected academic libraries in Lusaka Province.
2. To assess the effect of AI tools on the accuracy and consistency of cataloguing and classification practices in academic libraries.
3. To identify the challenges and opportunities associated with the integration of AI in cataloguing and classification within the selected academic libraries.

1.5 Research Questions

1. To investigate the level of adoption of Artificial Intelligence (AI) technologies in cataloguing and classification processes in selected academic libraries within Lusaka Province.

2. To evaluate the effect of AI tools on the accuracy, consistency, and efficiency of cataloguing and classification practices in academic libraries.

3. To identify the challenges and opportunities associated with the integration of AI technologies in cataloguing and classification in the selected academic libraries.

1.6 Significance of the study

The significance of this study lies in its potential to provide valuable insights into how Artificial Intelligence (AI) is transforming cataloguing and classification practices in academic libraries within Lusaka Province. As libraries increasingly embrace digital transformation, understanding the impact of AI technologies can inform policy development, capacity building, and strategic planning in library services. This study will contribute to the body of knowledge by highlighting the benefits and challenges of AI adoption, thereby guiding librarians, educators, and decision-makers in optimizing resource organization and improving access to information. Ultimately, the findings may support the development of more efficient, accurate, and user-centred cataloguing systems that enhance the overall quality of academic library services.

2.0 Literature Review

The integration of Artificial Intelligence (AI) in library cataloguing and classification has emerged as a transformative trend in academic libraries worldwide. AI technologies such as machine learning, natural language processing (NLP), and semantic web tools are increasingly being adopted to automate metadata generation, enhance subject indexing, and improve bibliographic control (Ramos & López, 2021). These technologies have the potential to reduce manual cataloguing workloads and promote consistency and accuracy in bibliographic records, which are vital for resource discovery and user satisfaction.

Several studies have explored the impact of AI on traditional cataloguing practices. For instance, Luo (2020) found that AI-based cataloguing systems significantly reduce cataloguing time by automating subject headings and classification number assignments using pattern recognition and data mining techniques. Similarly, Park and Tosaka (2022) emphasize that AI can aid in detecting duplicate records, reconciling authority control inconsistencies, and linking related materials through advanced algorithms. This suggests a growing shift from rule-based to data-driven cataloguing environments in academic libraries.

Despite these benefits, the integration of AI in cataloguing is not without challenges. A study by Mbatha and Kilonzo (2023) in sub-Saharan Africa revealed that most academic libraries face limitations such as insufficient technical infrastructure, lack of skilled personnel, and resistance to change among cataloguers. These challenges are particularly pronounced in developing countries like Zambia, where technological adoption in libraries is still at a nascent stage. The digital divide and budgetary constraints further complicate the implementation of AI solutions in cataloguing workflows.

Moreover, ethical concerns surrounding AI in libraries have drawn scholarly attention. Questions have been raised about algorithmic transparency, data privacy, and the potential biases embedded in AI systems (Cox et al., 2021). There is an ongoing debate about the need for human oversight in AI-assisted cataloguing processes to ensure inclusivity, cultural sensitivity, and adherence to cataloguing standards such as RDA and MARC 21. Therefore, while AI offers considerable opportunities, it also demands careful consideration of its sociotechnical implications.

In the Zambian context, literature on AI in cataloguing remains limited, highlighting a gap that this study seeks to address. Preliminary observations by Kadeyo (2025) suggest that selected academic libraries in Lusaka Province are gradually exploring AI applications, though their integration remains uneven and experimental. This underscores the importance of contextspecific research to assess how AI can be effectively and ethically harnessed to enhance cataloguing and classification in Zambian academic libraries.

3.0 Methodology 3.1 Research Design

The study will adopt a quantitative design to examine the Artificial Intelligence as a new frontier for cataloguing and classification in selected academic libraries in Lusaka Province. This approach will enable the identification of patterns, relationships, and trends across large sample populations.

3.2 Study Sites

The study will be conducted in Lusaka Province in selected public academic libraries that are registered by higher education authority.

3.3 Study Population and Sample Size

The study population refers to the specific group of individuals or entities that a researcher is interested in studying and from whom data is collected to address the research questions

(Neuman, (2014). The selection of a study population is critical, as it directly impacts the generalizability and validity of the research findings. In this case, the study population will consist of librarians from selected public academic libraries that are registered by higher education authority.

3.4 Sampling Techniques

Bryman and Bell (2015) stated that "sampling is the process of selecting a subset of cases from a larger population" (p. 187). The choice of sampling technique depended on various factors, such as the nature of the study, the characteristics of the population, and the specific research objectives. Therefore, the study will employ a stratified random sampling technique to determine both the sample size and the respondents who would represent the entire population.

3.5 Data collection Instruments

The study will collect data using a standard questionnaire with closed-ended questions. Babbie and Mouton (2001) stated that closed-ended questions helped respondents better understand the meaning of the questions. These questions will be answered within the same framework, allowing responses to be compared more effectively

3.6 Data Analysis

The collected data, which is quantitative will be analysed using both descriptive and inferential statistics. Initially, the data will be checked for gaps and inconsistencies. Next, the questions will be coded, and responses will be assigned numbers in preparation for data entry. During the coding process, the responses to closed-ended questions will be grouped into categories, and numbers will be assigned to these categories. Once coding is completed, the data will be entered into SPSS Version 22 and analysed, with descriptive statistics generated for various questions.

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