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Integration of Artificial Intelligence Technologies in Tanzania's Academic Libraries: A SWOT Analysis

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Abstract

Artificial intelligence (AI) is one of the Fourth Industrial Revolution (4IR) technologies that are changing how sectors operate, including education. This study examined the integration of Artificial Intelligence (AI) in Tanzanian academic libraries using a SWOT framework. The study used semi-structured interviews with 36 librarians. The findings show that although several challenges limit the integration of AI, its use contributes to improving library services. A majority of respondents reported that AI has enhanced the speed of information retrieval and automated routine tasks (83%), improved access to digital resources (78%), and enhanced user experiences (72%). These results suggest that AI is helping libraries become more efficient and responsive to user needs. However, the study identified key challenges hindering AI integration. The most mentioned challenges are limited funding (86%), a lack of AI-related skills among librarians (81%), and inadequate ICT infrastructure (75%). Moreover, some resistance to change (50%) was observed among librarians. The SWOT analysis identified strengths such as efficiency and improved services, as well as weaknesses including financial, skill, and infrastructure constraints. The identified opportunities include training, technological advancement, and institutional collaboration, while threats include data privacy concerns, job security risks, and a lack of policies. The study recommends investing in capacity building, improving infrastructure, strengthening collaboration, and enhancing AI policies. It recommends integrating AI in a way that considers Tanzania's unique conditions, maximising opportunities while minimising threats.

Keywords: Fourth Industrial Revolution (4IR), Artificial Intelligence, SWOT Analysis, Academic libraries.

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Introduction

The Fourth Industrial Revolution (4IR) is driven by advancements in Information and Communication Technologies (ICTs), especially emerging digital technologies that merge physical, digital, and biological systems. Key digital technologies driving this revolution include AI, sensors (including the Internet of Things, IoT), Cloud Computing, big data analytics, Nanotechnology, Advanced Robotics, Blockchain, and 3D Printing. These technological developments have transformed traditional library processes, activities, and services, continuously adding value to libraries in various ways. Numerous instances demonstrate the integration of 4IR technologies into library systems, alongside many trends

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and opportunities arising from these emerging technologies and the distinctive features of 4IR (Echedom & Okuonghae, 2021; Okunlaya *et al.,* 2022).

AI encompasses a range of technologies, such as expert systems, artificial neural networks, speech recognition, fuzzy logic, natural language processing, evolutionary algorithms, case-based reasoning, image processing, and robotics, that enable computers to address problems more adaptively than previous methods (Moustapha, Atanda & Yusuf, 2023). AI seeks to mimic human intelligence by performing tasks, aiming to enhance human capabilities and deliver quicker, more accurate results. AI influences many aspects of daily life and offers users suggestions through mobile devices and other platforms.

As repositories of information, libraries house vast amounts of intellectual property acquired from numerous sources. Consequently, libraries rely heavily on ICT for their operations. In addition to intellectual property data, libraries also manage large volumes of user data. Libraries handle digital content from various sources, including social media and websites, in text, images, videos, audio, and numerical data (Harisanty *et al.*, 2023). Specialised applications are essential for managing and analysing this data effectively, efficiently, and reliably. These tools provide information for various purposes, such as decision-making, improving resource quality, and enhancing services. (A Subaveerapandiyan, 2023; Huang, 2024).

Various sectors are currently transformed by the use of digital technologies, such as Artificial Intelligence (Ajakaye, 2021; Okunlaya *et al.,* 2022). Thus, libraries and librarians need to understand not only their potential benefits but also the risks and opportunities they present. However, limited research has been conducted in academic libraries, particularly in the Tanzanian context, on the strengths, challenges, opportunities, and threats of AI (Bakiri *et al*., 2024; Mwandosya, 2022; Mwilongo & Mwageni, 2023). In response to this gap, this study aims to examine the current state of AI adoption in Tanzanian academic libraries, identify key challenges and opportunities, and propose future development strategies using the SWOT framework.

The objectives of this study include assessing how AI technologies improve academic libraries in Tanzania; identifying challenges faced by Tanzanian academic libraries when integrating AI; using the SWOT analysis to identify strengths, weaknesses, opportunities, and threats; and, lastly, determining strategies for AI integration in Tanzania's academic library services. The study surveys seven academic libraries from higher learning institutions and includes interviews with 36 librarians. The findings are crucial for library managers in Tanzania to assess their current level of integration and set future goals to avoid falling behind in technology. The insights gained will also help librarians adjust their strategies toward AI integration in Tanzanian academic libraries.

Fourth Industrial Revolution

Advances in science, technology, and culture led to the emergence of various phases of the Industrial Revolution. Each phase has had distinct effects on communities. The First Industrial Revolution, which began at the end of the 19th century, was marked by mechanical production powered by water and steam. The Second Industrial Revolution emerged in the twentieth century with the advent of mass-production assembly lines that relied on labour and electricity. The Third Industrial Revolution, occurring in the mid-20th century, was characterised by the use of automated production through electronics and information technology (Manda & Dhaou, 2019; Oke & Fernandes, 2020)

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The 4IR has brought about a new interaction between humans and machines (Yoon *et al.,* 2022). Its key features include a range of products and technologies, such as IoT, cloud computing, big data, cybersecurity, artificial intelligence, Blockchain, and robotics. These innovations influence educational aspects, including learning control, opportunities, instructional activities, and social implications. They reduce the need for direct human instruction by enabling machines to learn and solve problems independently. Thus, the 4IR acts as a transformative force, altering how humans communicate, learn, behave, and interact with one another and with their environment (Okunlaya *et al.,* 2022).

Artificial Intelligence (AI)

AI is one of the technologies in the 4IR that involves the development and use of intelligent systems integrated with advanced digital technologies to perform human functions such as learning, reasoning, problem-solving, and decision-making (Yoon *et al.,* 2022). AI has become one of the most discussed topics in today's rapidly evolving information technology landscape, especially in library science. Libraries around the world are increasingly aware of how AI can improve their services and daily operations (Moustapha *et al*., 2023; Saghiri *et al*., 2022). Technologies such as machine learning, natural language processing, and data analytics help libraries deliver information more quickly, offer more personalised services, and work more efficiently. Technologies can easily manage many routine tasks, allowing libraries to improve the quality and efficiency of their work (Ajakaye, 2021; Gupta, 2022).

The integration of AI has raised ethical issues that must be considered (Shahzad et al., 2024). Existing research has identified concerns about privacy, data protection, and the handling of user information within AI-driven systems (Ikwuanusi *et al*., 2023; Khan, 2024). In addition, studies show that algorithms, especially those used in search engines, chatbots, and recommendation systems, can influence how users think, make decisions, and interact with information (Isiaka, 2023). Therefore, users need to understand how these systems work by understanding what is often called "algorithm literacy". This algorithmic literacy helps users better interpret and trust AI-based services. When users understand how AI tools function, they are more likely to use them to support better library service delivery (Ponera & Madila, 2024).

AI integration phases

AI integration in an organisation typically occurs in three stages: (1) the Emergence phase, (2) the Adoption phase, and (3) the Dispersion phase (Uren & Edwards, 2023; Haefner *et al*., 2023). While most sectors have reached the emergence phase, the progression to adoption and dispersion depends on organisational readiness. The banking, pharmaceutical, and defence sectors are at the forefront of AI utilisation (Al-Dosari *et al*, 2024). Developed countries, particularly the United States, China, and the United Kingdom, are adopting AI more rapidly than others (Harisanty *et al*., 2023).

In the emergence phase, AI is increasing in organisations, and the term has become commonplace. However, its application in business activities remains limited. While AI is often presented as a solution to existing challenges within companies, its adoption is limited, particularly for technologies that demand substantial investment and specialised expertise. Most AI integrations are still in the experimental phase, and numerous events, such as

seminars and training sessions, have been organised to explore the possible future of AI. (Bakiri *et al.*, 2024; Mwilongo & Mwageni, 2023).

The Adoption Phase occurs when organisations shift from exploring AI's potential to understanding how AI programs operate (Mwandosya, 2022). Organisations must know that investing in AI benefits the organisation and that determining the most suitable methods for their needs is essential. To obtain this proof, technology must first be implemented, a process that can be difficult for many organisations due to limited resources. Larger companies with resources, access to data science expertise, and extensive data are better positioned to test AI projects than smaller organisations (Ali *et al*., 2024; Dwivedi *et al*., 2021).

In the last phase of the Dispersion phase, AI is increasingly integrated into organisations' operations and is recognised as a viable solution. It becomes a tool that supports the work of all employees within the organisation. As AI becomes a standard technology everyone uses, it loses its distinction as a unique innovation and is seen as an ordinary part of the technological landscape. (Faggella, 2020; Harisanty *et al.*, 2023).

Theoretical Framework

To assess the various capacities and perceptions of AI technology, a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is considered an effective tool. (Harris, 2018; Kaushik, 2021; Ali *et al*., 2024). SWOT analysis is a framework that helps identify insights from different perspectives for a specific product, concept, project, place, or individual. As a result, it is beneficial for strategic planning, decision-making, and gaining insights to successfully understand, implement, and support a product, concept, or project. This study, therefore, conducts a SWOT analysis of AI to understand better, adopt, implement, utilise, and support AI technology within the library and information science field.

A SWOT analysis is a tool used to assess implemented services in terms of strengths, weaknesses, opportunities, and threats. SWOT identifies vital internal and external factors influencing the achievement of implemented service goals. Internal factors are elements within the business's control, while external factors are those outside its control (Harris, 2018; Saghiri *et al.,* 2022). Analysing a combination of strengths, weaknesses, opportunities, and threats can generate alternative strategies for a service. Notably, SWOT analysis is a common practice in library strategic planning and is used to evaluate library services. This tool is useful for assessing the strengths and weaknesses of library management. Numerous studies in the literature have explored the application of SWOT analysis to library services and systems. For instance, Pandya (2012) applied SWOT analysis to the challenges of implementing cloud computing in Indian libraries. Mapulanga (2013) discussed applications of information services and systems in a university library in Malawi. In 2018, Harris documented the SWOT of academic librarianship in Jamaica. Kaushik (2021) conducted a SWOT analysis of the Internet of Things in the Library and Information Science (LIS) domain. More recently, Ali *et al*. (2024) presented a brief SWOT analysis of the application of AI in Pakistani university libraries.

The SWOT analysis tool clarifies how strengths and weaknesses can align with opportunities and threats. Based on internal and external factors, managers can develop four strategic approaches: SO (strengths-opportunities), ST (strengths-threats), WO (weaknesses-

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opportunities), and WT (weaknesses-threats) (Harris, 2018; Ali *et al*., 2024). According to Ali *et al*. (2024), tools such as the external factors evaluation matrix, internal factors evaluation (IFE) matrix, and competitive profile matrix can also be used to construct the SWOT matrix. The SWOT matrix can be summarised as presented in Figure 1:

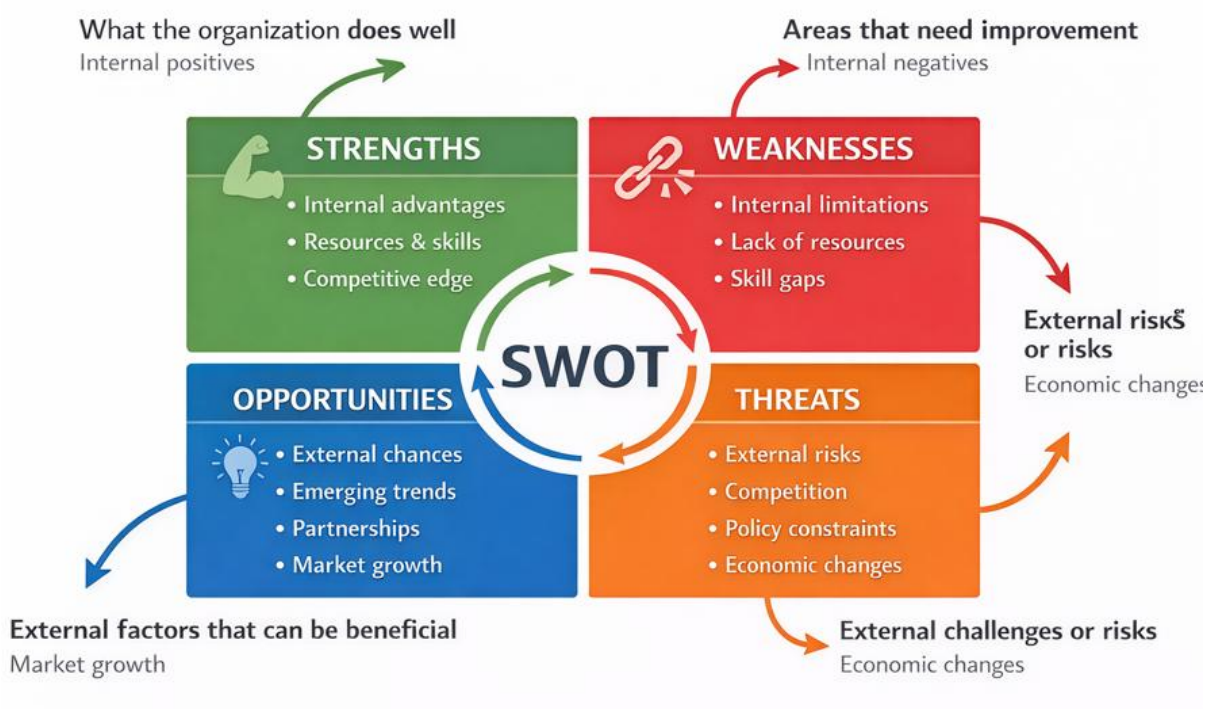


Figure 1: SWOT Analysis framework

Benefits of AI in Libraries

The integration of AI into libraries changes how tasks are performed. In an age of information overload, AI will provide users with access to information and facilitate a seamless connection between readers and libraries. (Hussain, 2023). AI can be easily applied across various library operations, including technical services such as categorisation and cataloguing; library services such as reference, information services, and information literacy; and library management tasks such as staffing and decision-making. All of these areas of academic libraries benefit from the adoption of AI in libraries and information centres (Harisanty *et al*., 2023).

AI enables libraries to share datasets with other libraries and institutions, facilitating unified data and research exchange across disciplines (Opele, 2023). AI can handle complex and difficult tasks that might be challenging for humans. Also, AI can minimise human errors and inefficiencies, leading to more efficient, accurate operations and enabling libraries to meet user needs without physical interaction. These help librarians to focus on higher-priority responsibilities, such as developing library collections and enhancing research sections. Ultimately, the goal is to simulate human intelligence using computers (Ajani *et al*., 2022). Moreover, AI fosters a global environment in which people collaborate and network to deliver library resources and services to users. It empowers academic libraries to efficiently design spaces and manage, store, preserve, and recover resources in a timely and cost-effective manner. Also, AI addresses challenges such as limited funding for printed materials, shortages of digital devices, and space limitations in libraries. Moreover, AI has transformed the

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attitudes and behaviours of library staff and users by simplifying their interactions (Echedom & Okuonghae, 2021; Hussain, 2023; Jha, 2023).

AI Challenges in Libraries

Libraries face various challenges when adopting and integrating AI technologies. These challenges include technical, ethical, operational, and social aspects that need careful consideration to ensure AI's effective and responsible use in library settings (Dwivedi *et al*., 2021). Financial problems are one of the major challenges associated with AI adoption (Vijayakumar & Sheshadri, 2019). AI requires advanced technology to operate effectively, and many libraries lack the necessary infrastructure. Also, inadequate infrastructure is another reason that hinders the successful integration of AI in library services (Ajani *et al*., 2022; Jha, 2023). Some librarians may be reluctant to embrace new technologies due to insufficient IT skills, which creates a negative perception and hinders AI adoption.

Other challenges that must be addressed before integrating AI into library operations include poor network connectivity, unreliable power supplies, a shortage of skilled staff, outdated technology, economic constraints, and the high cost of technical tools (Ajani *et al*., 2022; Jha, 2023). Despite these challenges, AI has the potential to make libraries more efficient by improving information delivery, saving time, reducing costs, and providing faster services to library users (Ali *et al*., 2024; Vijayakumar & Sheshadri, 2019).

Research Methodology

This study employed a qualitative research approach by using a multiple-case study design. This approach resulted in an in-depth understanding of respondents' experiences, perceptions, and institutional contexts (Creswell, 2014). The multiple case study design was used to compare across institutions while maintaining contextual richness (Yin, 2018). Seven academic institutions were purposively selected for their importance, the availability of established libraries, engagement in ICT initiatives, and institutional diversity, including both public and private universities (Bakiri *et al.,* 2024).

A purposive sample of 36 librarians from the selected institutions was drawn, focusing on individuals with relevant knowledge and experience (Patton, 2014). The respondents included library directors (7), Heads (7), ICT specialists (7), and frontline staff (15) to ensure diverse perspectives. Data collection continued until no new information emerged, i.e., the saturation point (Glaser & Strauss, 2017). Semi-structured interviews were used for data collection as they provide flexibility while focusing on key research themes (Kallio *et al*., 2016). Consistent data collection procedures and pilot testing of the instruments were used to ensure data reliability. Data validity was ensured by aligning the research tools with the study objectives, conducting an expert review, and using multiple data sources, including observations and interviews.

Data analysis was conducted using thematic analysis guided by the SWOT framework. Thematic analysis is widely used to identify patterns in qualitative data (Braun & Clarke, 2006). This process involved understanding the data, coding, classifying it into strengths, weaknesses, opportunities, and threats, and developing themes. The findings were interpreted in light of the study objectives and the existing literature. Ethical principles, including

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informed consent, confidentiality, and voluntary participation, were observed throughout the study (Israel & Hay, 2006).

Sample Characteristics

The study was conducted through a total of thirty-six (36) interviews. The interviews were conducted as face-to-face sessions lasting 20-30 minutes. The respondents' demographic characteristics are summarised in Table 1:

Table 1: Demographic Characteristics

Variable	Options	Frequency	Per cent
Gender	Male	14	39
	Female	22	61
Age	< 30 years	7	19
	30 – 39 years	13	36
	40-49 years	11	31
	> 50 years	5	14
Academic Qualification	Undergraduate	20	56
	Postgraduate	16	44
Roles of Respondents	Directors	7	19
	Head of sections	7	19
	ICT specialists	7	19
	Frontline staff	15	43
Experience	<3 years	2	6
	4 – 5 years	5	14
	6 – 10 years	10	28
	11 – 15 years	12	33
	> 15 years	7	19

Current State of AI Applications in Tanzania's Academic Libraries

AI Applications in Tanzanian academic libraries are in the emergence phase, with AI gradually being integrated into library services to enhance efficiency and accessibility (Bakiri *et al*., 2024; Mwilongo & Mwageni, 2023). While there is growing attention to AI's capabilities, its integration remains limited due to infrastructural, financial, and expertise-related challenges. Five of the seven academic libraries surveyed have begun exploring AI through pilot projects, focusing on automating routine tasks such as cataloguing, classification, and resource management. These initiatives are primarily in larger institutions with better access to resources and infrastructure. Also, AI is being used to speed up cataloguing and classification. Machine learning algorithms assist in handling vast amounts of data, simplifying the process for organising and accessing information efficiently (Ali *et al*., 2024; Mwandosya, 2022).

Three out of seven academic libraries surveyed have introduced AI-powered chatbots to assist users with common queries. The queries include locating resources, understanding library services, and navigating the library's digital systems. These chatbots offer 24/7 support,

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enhancing the user experience with quick responses. AI-driven plagiarism-detection tools are also used to support academic integrity. These tools help check the originality of academic work submitted by students and researchers, contributing to higher educational standards. (Mwandosya, 2022; Mwilongo & Mwageni, 2023).

AI SWOT analysis

This section summarises the interviewees' responses to the four variables of the SWOT framework regarding the integration of AI in Tanzanian academic libraries. The five most identified factors for each variable in the SWOT analysis are listed in Table 2:

Table 2: SWOT analysis of AI application in Tanzanian academic libraries

Category	Theme	Description	Frequency (n=36)	Percentage (%)
Strengths (S)	Efficiency Improvement	Faster information retrieval	30	83%
	Cost Reduction	Reduced costs for printing and physical materials	24	67%
	Improved Access	Enhanced access to digital resources	28	78%
	Space Optimisation	Better use of library space through digitisation	22	61%
	User Satisfaction	Improved user experience and services	26	72%
Weaknesses (W)	Lack of Skills	Insufficient AI knowledge among staff	29	81%
	Infrastructure Limitations	Poor ICT infrastructure and systems	27	75%
	Financial Constraints	Limited funding for AI technologies	31	86%
	Resistance to Change	Staff reluctance to adopt AI	18	50%
Opportunities (O)	Collaboration	Partnerships and resource sharing	25	69%
	Technological Advancement	Availability of new AI tools	28	78%
	Capacity Building	Training and professional development	30	83%
	Policy Support	Government and institutional support	20	56%
Threats (T)	Job Displacement	Fear of job loss due to automation	26	72%

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Category	Theme	Description	Frequency (n=36)	Percentage (%)
	Ethical Issues	Data privacy and security concerns	23	64%
	Sustainability Challenges	Long-term maintenance and costs	27	75%
	Policy Gaps	Lack of clear AI regulations	21	58%

Findings from interviews with 36 respondents from Tanzanian academic libraries indicate that Tanzania is in the emergence phase of integrating Artificial Intelligence (AI) technologies. This indicates significant benefits of AI adoption, particularly in enhancing efficiency, improving access to information, and increasing user satisfaction. 83% of respondents reported that AI tools have improved the speed of information retrieval and routine library operations. Similarly, 78 per cent emphasised improved access to digital resources, while 72 per cent noted enhanced user experiences through personalised and responsive services. These findings suggest that AI is transforming the functions of the library and helps align with global trends in digital library innovation.

Despite these strengths, the study identified several weaknesses within the organisation that hinder the real integration of AI. The most frequently cited weakness was financial constraints, reported by 86 per cent of respondents, indicating limited institutional budgets for acquiring and maintaining AI technologies. Additionally, 81 per cent of respondents reported a lack of suitable AI-related skills among library staff, while 75 per cent reported infrastructural limitations, including unreliable internet connectivity and insufficient technological systems. Resistance to change was also identified by 50 per cent of respondents, suggesting that while some staff are uncertain, some are open to technological transformation. These weaknesses show the need for investment in capacity building and infrastructure development.

The findings identify the future potential for integrating AI into academic libraries. 83% of respondents identified capacity-building initiatives, such as training and professional development, as key opportunities for AI adoption. Furthermore, 78 per cent indicate the need for ongoing technological advancements, whereas 69 per cent indicate the need for collaboration and resource sharing among institutions. Also, 56 per cent of respondents identify Policy support as an emerging area requiring further emphasis. These opportunities show that AI integration can be significantly enhanced in the Tanzanian academic library context with the right support systems.

Respondents also identify several threats that affect the sustainability of AI integration in academic libraries in Tanzania. Job displacement was mentioned by 72 per cent of respondents, reflecting fears that AI may reduce the need for human labour. Also, 64 per cent of respondents identified ethical issues, particularly regarding data privacy and security, emphasising the need to establish ethical guidelines. Furthermore, 75 per cent pointed to sustainability challenges, including the high costs of maintaining AI systems, while 58 per cent identified gaps in policy and regulatory frameworks. These threats show that AI

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initiatives may not succeed without proper governance, protections, and long-term success planning.

Generally, the results show that AI offers significant advantages for improving library services and operations. Successful AI integration in Tanzanian academic libraries depends on addressing key weaknesses related to funding, skills, and infrastructure. AI adoption can also be enhanced by providing appropriate training, collaboration, and technological improvements. A balanced approach that moderates threats while maximising strengths is therefore important for sustainable AI integration. The respondents' results based on the SWOT framework variables are summarised in Figure 1:

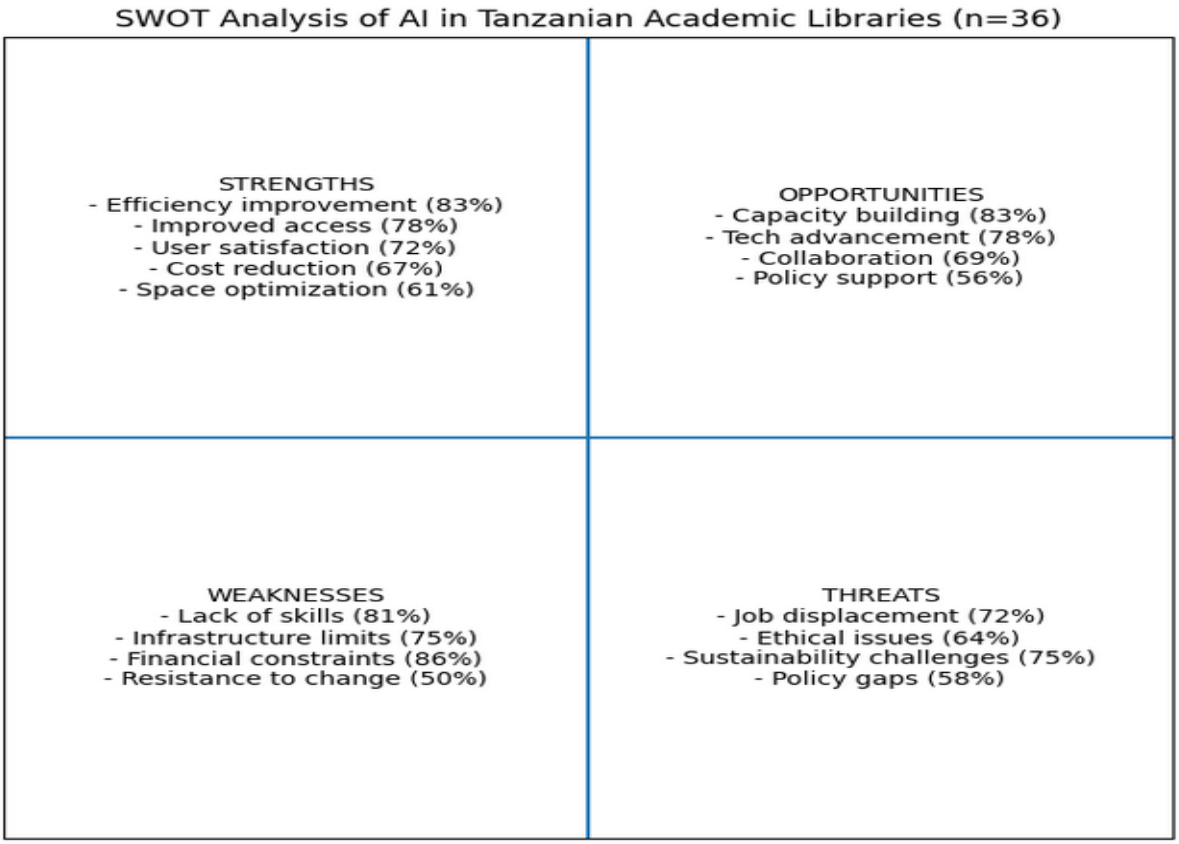


Figure 1: SWOT analysis of AI integration in Tanzanian academic libraries (n = 36).

Discussion

The study explored the integration of Artificial Intelligence (AI) in Tanzanian academic libraries by using a SWOT framework. The study shows that AI has great potential to transform academic libraries in Tanzania by improving efficiency, access to information, and user satisfaction. Most respondents (83%) showed that AI has improved the speed of information retrieval and routine tasks. The results also show that 78 per cent of the respondents noted better access to digital resources and improved user experiences (72%), particularly through more personalised and responsive services. These results suggest that AI is helping libraries become more efficient and better aligned with users' expectations. Other African academic libraries also experience similar trends, where AI tools are widely used to support cataloguing, searching, and user interaction (Concha, 2024; Kalbande *et al*., 2024).

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These findings indicate that Tanzanian academic libraries are part of a broader trend toward integrating AI.

The study also identifies several weaknesses that hinder successful AI integration in academic libraries. The most reported weakness is limited funding, identified by 86 per cent of respondents, which hinders libraries' ability to adopt and maintain AI technologies. In addition, 81 per cent of respondents reported lacking the necessary AI-related skills. The situation became more complicated due to Infrastructure challenges, such as unreliable internet and limited technological systems, reported by 75 per cent of respondents. Also, 50 per cent of respondents expressed resistance to change due to the identified weaknesses. These findings are also supported by existing research from many African countries, where financial constraints, limited expertise, and weak infrastructure continue to slow the integration of technology in academic libraries (Cox, 2023; Modiba & Chisita, 2025).

This study also used the SWOT framework to observe the opportunities and threats associated with AI integration. Many respondents identified training (83%), ongoing technological advancements (78%), and collaboration between institutions (69%) as ways to strengthen AI integration. These opportunities are also supported in the literature, which emphasises the role of corporations and continuous learning in enhancing innovation (Concha, 2024; Kalbande *et al*., 2024). On the other hand, the study identifies concerns about job security, data privacy, sustainability, and the lack of strong policies as threats that hinder the integration of AI in academic libraries in Tanzania.

The study suggests the following to support the successful integration of AI in Tanzania's academic libraries. First, investing in capacity building is important, as librarians need the right skills to work effectively with AI technologies. Second, for these technologies to function properly, ICT infrastructure in Tanzania's academic libraries should be enhanced. Third, sharing knowledge and experience among academic libraries is also important to reduce costs and learn from each other's experiences. Finally, policies and guidelines should be strengthened to address ethical issues, including data protection and job security (Ponera & Madila, 2024). Addressing these concerns helps build trust and encourage wider acceptance of AI among library staff and users.

Conclusion and Recommendations

Conclusion

This study shows that Artificial Intelligence (AI) could transform academic libraries in Tanzania by improving efficiency, enhancing access to digital resources, and delivering more personalised user services. Librarians reported improvements in information retrieval and overall service delivery, indicating that AI play a significant role in updating library operations and supporting teaching and research.

The study also found several weaknesses that limit the effective integration of AI in academic libraries in Tanzania. The most significant weaknesses include limited funding, inadequate AI-related skills among library staff, and insufficient ICT infrastructure. While some

resistance to change exists, it is less critical compared to these structural issues. These suggest that most librarians are willing to adopt AI if the necessary support is provided. Therefore,

the successful integration of AI in academic libraries will depend on how well libraries address key challenges related to funding, skills, and infrastructure.

The study suggests using strategic planning tools such as the SWOT framework to identify strengths, weaknesses, opportunities, and threats. Tanzanian academic libraries should adopt a strategic and balanced approach to benefit from AI and remain relevant in the digital world. To successfully integrate AI, libraries need to invest in training, improve infrastructure, strengthen collaboration, and enhance AI policies and guidelines. Tanzanian academic libraries can overcome current challenges and derive greater benefit from AI technologies by adopting a strategic and balanced approach.

Recommendations

Successful integration of Artificial Intelligence (AI) into Tanzanian academic libraries requires a specific approach that balances technical readiness and human capacity. The study identifies important strategies, including investing in continuous training for librarians and improving ICT infrastructure. Addressing financial constraints through funding and partnerships is also important. Promoting collaboration among institutions and stakeholders is essential for resource sharing and sustainability. Additionally, it is important to enhance policies and ethical guidelines, with a human-centred approach that supports librarians rather than replacing them. Libraries should emphasise change management, continuous evaluation, and alignment with user needs to ensure successful AI integration.

To effectively support AI integration in academic libraries, librarians need a combination of foundational digital and ICT skills, AI-specific knowledge, and advanced competencies. These competencies include the ability to manage digital systems, use AI tools such as chatbots and automated cataloguing, and apply data management and analytical skills. Training in information ethics and data privacy is also essential to ensure responsible use of technology. Additionally, capacity building should emphasise change management and continuous professional development, enabling librarians to adapt to emerging technologies, foster innovation, and sustain effective AI integration through ongoing learning and collaboration.

Institutions and policymakers can support AI adoption in academic libraries by providing adequate funding and investing in essential infrastructure, including reliable internet access, modern hardware, and digital systems. They should also establish strong policies and regulatory frameworks that address data privacy, security, and ethical use of AI while aligning initiatives with national education and ICT strategies. In addition, promoting capacity building through continuous training and professional development will equip librarians with the skills needed to use AI technologies effectively. Furthermore, encouraging collaboration among academic institutions, technology providers, and government agencies can enhance resource sharing and innovation. At the same time, ongoing monitoring and evaluation will ensure that AI initiatives remain sustainable, scalable, and responsive to user needs.

The future of AI in Tanzania's academic libraries is bright, with strong potential to enhance services through improved efficiency, automation, and user experience. However, progress is likely to be slow due to limited funding, inadequate infrastructure, and a shortage of skilled personnel. Addressing ethical concerns, data privacy, and staff acceptance will also be

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essential. AI can significantly transform academic libraries by enhancing librarians' roles through sustained investment, capacity building, supportive policies, and a human-centred approach.

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