



Adoption of artificial intelligence tools in the improvement of daily library services in academic libraries

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Abstract

The rapid evolution of Artificial Intelligence (AI) has significantly transformed service delivery across various sectors, including the library and information science profession (LIS). This paper usually examines the adoption of AI tools in improving daily Academic library services, especially focusing on how intelligence systems enhance efficiency, enough user/client or customers' satisfaction, resource management in the Academic library and any other category of libraries. The study explores key AI application such as chatbots, recommendation system, automated cataloguing, digital reference services, and predictive analytics. It is also highlighting the benefits, challenges, and future implications of integration in Academic libraries environments. The paper also concludes that while AI present immense opportunities for effective service enhancement, successful adoption depends on infrastructure capacity, staff training engagement, ethical considerations, and institutional readiness.

Keywords: Artificial intelligence, academic libraries, library services, automation, chatbots, information retrieval, digital libraries

Introduction

The Academic libraries and any other types of libraries have traditionally served as gateways to knowledge, usually providing access to varieties of information resources and supporting learning, and research. In 21st Century, the integration of digital technologies has reshaped daily library operations and also highly Customers expectations. Artificial Intelligence (AI), In particular, is emerging as a transformative tool that enhances the library services delivery.

AI defined as the simulation of human intelligence processes by machines, especially computer systems. In Academic libraries, AI tools are increasingly utilized to automate the library routine services, improved information retrieval, and personalized service to clients. The adoption of AI in Academic libraries is driven by the need to improve efficiency, reduce operational workloads, and meet the evolving demands of digital users in the library environment.

Conceptual Framework

The study is grounded in the technology Acceptance Model (TAM), which explains how users come to accept and utilize technological tools. According to TAM, perceived usefulness and perceived ease of use are critical determinants of technology adoption. In Academic library settings, librarians' and users' acceptance of AI tools depends on their perceived benefits and usability.

AI Tools in Academic Library Services

Chatbots and Virtual Assistants in Academic Libraries and some other types of libraries, AI-powered chatbots usually provide 24/7 reference and information services, frequently enquiries and guiding users in real time. They reduce the workloads of librarians and improve response time.

Recommendation System

These are Systems usually analyse Users' behaviour and suggest relevant resources such as books, journals, or digital resources, thereby enhancing personalized Services.

Automated Cataloguing and Indexing

Artificial Intelligence (AI) tools assist in metadata generation, classification, and indexing, reducing manual cataloguing errors and improving efficiency.

Digital Reference Services in Academic Libraries

Artificial Intelligence (AI) supports virtual reference desks where users can communicate or interact with systems usually to obtain information without physical presence in the library.

Predictive Analytics Libraries

The Academic Libraries Use Predictive Artificial Intelligence (AI) Models to forecast the resource demand, optimize acquisitions, and Manage Circulation trends.

Benefits of Artificial Intelligence (AI) Adoption in Academic Libraries

The Adoption of Artificial Intelligence Tools in Academic Libraries Offers Several advantages which improved the efficiency in service delivery, enhanced User experience through personalization, reduced workloads for librarians, Faster information retrieval and processing and also improved decision-making through data analytics.

Challenges of Artificial Intelligence AI Adoption Despite Its benefits

Artificial Intelligence AI integration in Academic Libraries Faces Several Challenges Such as the followings. High Implementation and Maintenance Costs, Lack of technical

expertise among librarians, Ethical concerns regarding privacy and Data Security, Resistance to change from traditional library system, and Dependence on quality data for accurate Artificial Intelligence AI Output.

Research Methodology

This study adopts a quantitative survey research design aimed at examining the adoption of artificial intelligence (AI) tools in improving daily library services. The design also considered appropriate because it allows for the collection of measurable data from a defined population and enables statistical analysis of patterns, relationships and trends.

Population of the Study

The study of the population is comprising library professionals (Librarians, Library Assistants, and ICT Staff) and Registered Library Users (Students and Researchers) in Selected Academic Libraries. These include federal, state, and University Libraries with emerging digital service platforms.

Sample Size and Sampling Technique

A Sample Size of 250 respondents was determined for the study, consisting of 80 Library staff and 170 library Users. The sample size was derived using a simplified Cochran formula for large population to ensure representativeness and reliability.

A stratified random sampling technique was employed to ensure fair representation of different respondent categories. The population was divided into two strata: library staff and library users, and respondents were randomly selected from each stratum proportionally.

Research Instruments

The instruments for data collection is a structured questionnaire titled “Artificial Intelligence Adoption and Library Service Improvement Questionnaire (AIALSQ)”. The questionnaire is divided into Four Sections:

Section 1: Demographic Information of respondents.

Section 2: Awareness and Usage of Artificial Intelligence (AI) tools in Libraries.

Section 3: Perceived Impact of Artificial Intelligence (AI) on Library Service Delivery.

Section 4: Challenges inhibiting Artificial Intelligence (AI) Adoption in Libraries.

Responses were measured using a 5-point Likert Scale ranging from Strongly Agree (5) To Strongly Disagree (1).

Validity and Reliability of the instrument the instrument was subjected to face and content validity by experts in library and information science and education measurement. Their feedback was used to refine and improve the questionnaire items.

To ensure reliability, a pilot study was conducted with 20 respondents outside the main sample. Cronbach’s Alpha was used to test internal consistency, and a reliability coefficient of 0.82 was obtained, indicating high reliability.

Data Analysis Techniques

Data Collected were analysed using statistical package for social science (SPSS). Descriptive statistics such as frequency counts, percentages, mean, and standard deviation

were used to answer research questions. Inferential statistics, were employed to test the relationship between AI Adoption and improvement in library service delivery.

Discussion

Findings from the Literature indicate that Artificial Intelligence Crucially develops the library service delivery by automating repetitive tasks and improving user engagement. However, successful implementation required strategic planning, investment infrastructure, and continues training of library professionals. The role of librarians is also evolving from traditional custodians’ information to digital information managers and Artificial Intelligence (AI) System Supervisors.

Conclusion

The Adoption of Artificial Intelligence tools in libraries represents a major step towards modernizing library services. While Artificial Intelligence offers substantial benefits in terms of efficiency, its implementation must be very carefully managed to address ethical, financial, and technical challenges. Libraries that embrace Artificial Intelligence Strategically are likely to remain relevant in the evolving digital information landscape.

Recommendations

- Libraries should invest in staff training on Artificial Intelligence (AI) Technologies.
- Institutions should develop clear policies on Data Privacy and Ethics.
- Collaboration with Information Technology (IT) professionals is essential for successful implementation.
- Governments and Stakeholders should support funding for digital transformation in Libraries.

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