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The Role of Artificial Intelligence in Developing Reference Services at the IAIN Curup Library

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Abstract

Digital transformation in the Islamic Religious College (PTKI) environment encourages libraries to continue to innovate, including in the development of reference services. Artificial Intelligence (AI) is one of the potential technologies to improve the effectiveness and efficiency of these services. This study aims to examine the role of AI in reference services at the IAIN Curup Library and identify its benefits, challenges, and development strategies. Using a descriptive qualitative approach, data were collected through in-depth interviews, observations, and documentation of librarians and students as service users. Initial results show that the use of AI at the IAIN Curup Library is still limited to semi-automatic systems such as OPAC, online search guidance, use of reference management and digital short message services, but has opened up opportunities for the development of chatbot-based services and intelligent recommendation systems. Students show enthusiasm for easy access to information, but still face various digital literacy obstacles. On the other hand, librarians face challenges in terms of limited technological competence and the absence of institutional policies that support optimal AI integration. This study recommends the need for a roadmap for the development of AI-based reference services, technical training for librarians, and collaboration between units on campus to strengthen the library's digital transformation. With a gradual and contextual approach, AI is believed to be able to strengthen the role of librarians as information facilitators in the technological era.

Keywords: *artificial intelligence, digital libraries, information literacy, reference services.*

Introduction

The rapid development of information technology in the last two decades has changed the face of various institutions, including libraries. One of the most prominent innovations is the presence of artificial intelligence (AI) which offers various smart technology-based solutions to improve the efficiency and quality of information services (Apriani et.al 2019; Apriani et.al 2021; Apriani et.al 2022; Apriani et.al 2025). In a university environment, libraries are required not only to be providers of information sources, but also as facilitators of information literacy that is relevant to the needs of the times. One of the vital services in this context is reference services, namely guidance for users in finding and utilizing academic information sources effectively.

AI technology has evolved into various forms and applications that have great potential for use in libraries. Some of these include Natural Language Processing (NLP)-based chatbots to answer user questions, automatic reference recommendation systems that adapt to user search needs, to semantic analysis of documents to speed up the process of searching for scientific information (Chowdhury, 2020); Lamba & Dubey, 2020)). Even technologies such as ChatGPT and Google Bard, Gemini, Claude and others have become part of the academic ecosystem, used by students to find ideas, develop arguments, and conduct initial literature reviews. With the ability to learn from data, these systems can provide a more personal and contextual experience than conventional reference services.

However, the emergence of various AI applications cannot be utilized equally by all library users, especially in the Islamic Religious College (PTKI) environment such as IAIN Curup. One of the major challenges faced is the diverse abilities of students in using information technology, both in terms of digital literacy, understanding of AI concepts, and skills in independently searching for academic information. This is exacerbated by the inequality of access to technological devices and adequate training. A UNESCO study (2021) even emphasized that the success of AI integration in education is highly dependent on the readiness of human resources and institutional support in building digital literacy.(UNESCO, 2021)

On the other hand, librarians as the main actors in the provision of reference services also need to increase their capacity in understanding and managing AI technology. The change in the role of librarians from collection keepers to digital information facilitators requires a transformation of skills, including the ability to utilize and evaluate AI systems used in library services (Tammaro, 2022). Therefore, the implementation of AI in the development of reference services must be accompanied by a strategy for improving HR competencies, adjusting the information literacy curriculum, and an approach that takes into account the local context of users.

Based on this background, this paper aims to analyze the role of artificial intelligence in the development of reference services at the IAIN Curup Library. The focus of the discussion includes the current condition of reference services, the potential for integrating AI technology, and the challenges and adaptation strategies that need to be considered in the context of PTKI. It is hoped that this study can contribute to designing reference services that are more innovative, inclusive, and relevant to the development of today's information technology.

Reference Services in College Libraries

Reference services are one of the main components in the operation of a college library. Its main function is to assist users in finding, assessing, and using academic information effectively. According Wulandari (2021), reference services not only act as information providers, but also as partners in the process of searching for scientific literature, especially for research and writing scientific papers(Wulandari, 2021)

Along with the development of information technology, reference services have transformed from traditional forms, namely direct face-to-face services, to digital-based services. This can be seen from the emergence of various platforms such as email-based reference services, online forms, online chats, to automatic chatbots that facilitate interaction between users and librarians. According to Iqbal and Peramita (2023), the effectiveness of digital reference services is largely determined by the speed of response, accuracy of information, and the system's ability to understand the specific needs of users.(Iqbal & Peramita, 2023)

In addition, in the context of higher education, reference services have a strategic role in supporting the academic process, especially in building student information literacy. Librarians are not only tasked with answering questions, but also guiding users to understand how to access and assess the credibility of information sources, both print and digital (Munawwarah Ridwan et al., 2023). Therefore, reference services in the digital era need to be developed dynamically and adaptively to the development of user needs and advances in information technology.

Artificial Intelligence in the Library Context

Artificial Intelligence (AI) is a branch of computer science that focuses on developing systems that can mimic human cognitive abilities such as thinking, learning, understanding language, and making decisions (S. Russell & Norvig, 2020) In the world of libraries, AI is starting to be used to automate various processes such as collection classification, information retrieval, metadata processing, and user interaction through chatbots or virtual assistants.

According to Aliwijaya and Suyono (2023), the integration of AI in libraries drives the transformation from traditional service systems to intelligent systems that are responsive and personal. Examples of the use of AI include the use of machine learning for collection recommendation systems based on user preferences, natural language processing (NLP) to understand user questions in digital question and answer services, and image recognition to help digitize ancient print or manuscript collections(Araf Aliwijaya & Hanny Chairany Suyono, 2023).

The report from the International Federation of Library Associations and Institutions (IFLA) in 2020 also emphasized that AI can expand the reach of library services by providing user data-driven services, facilitating inclusive access, and accelerating the process of informed decision-making. However, the success of implementing AI in libraries also depends on the readiness of technological infrastructure, data privacy policies, and increasing the capacity of librarians as users and system managers(IFLA, 2019).

With the growing capabilities of AI and the increasingly affordable implementation costs, the opportunities for libraries to implement this technology are increasingly wide open. In Indonesia, several academic libraries have begun to explore the use of chatbots and AI-based intelligent search systems as part of the digital transformation of their services.

Artificial Intelligence in Reference Services

Reference services are one of the areas in libraries that have the greatest potential to be improved through the application of artificial intelligence (AI). AI enables reference services to be more interactive, fast, and responsive, especially in answering user questions, recommending sources, and tailoring information to the specific needs of each user.

According to Kurniawan (2022), one of the most common forms of AI implementation in reference services is the use of intelligent chatbots. These chatbots are designed using Natural Language Processing (NLP) so that they are able to understand user questions in natural language and provide relevant answers, either in the form of references to information sources or search instructions. Examples of this use can be found in systems such as LibAnswers, Ask-

a-Librarian, and integration with AI platforms such as ChatGPT which are starting to be tested in several universities(Kurniawan, 2022).

Furthermore, AI is also used to develop a scientific literature recommendation system, which helps students and lecturers find relevant academic references based on search history or keywords used. According to Setiawan and Mulyani (2020), an AI-based recommendation system can increase the relevance of search results compared to manual searches, as well as significantly save time searching for literature(Setiawan & Mulyani, 2020).

However, the implementation of AI in reference services requires special attention to the accuracy of information and transparency of algorithms. This is important so that the system is not only fast but also trustworthy for users. In addition, the ability of AI to provide services still depends on the quality of the data used to train the system and the ability of librarians to manage and evaluate the system(Rahman, 2023).

Thus, AI does not replace the role of librarians, but becomes a technological partner that can increase the scope and efficiency of reference services, as long as it is balanced with a humanistic, ethical, and user-oriented approach.

Challenges of Artifical Intelligence Implementation in PTKI Libraries

Although artificial intelligence (AI) offers various opportunities to improve library services, its implementation in the Islamic Religious College (PTKI) environment such as IAIN Curup faces a number of complex challenges, both from technical and cultural aspects.

One of the main challenges is the varying levels of digital literacy of students. A study by Nurfadillah and Maulidiyah (2022) showed that although students are accustomed to using technology such as social media and the internet, not all of them have sufficient information and technology literacy skills to optimally utilize AI-based services. This has an impact on the low utilization of advanced digital features in libraries, including intelligent search systems and chatbots(Nurfadillah & Maulidiyah, 2022).

Another challenge is the availability of infrastructure and human resources. Many libraries in the PTKI environment still face limitations in terms of hardware, stable internet connections, and software that supports AI implementation (Hakim & Zulkarnaen, 2021). In addition, librarians as the spearhead of library services still need to increase their capacity in understanding the working principles of AI, data management, and supervision of automated systems to remain in line with ethical and academic values.

Institutionally, AI adoption must also consider the local religious and cultural context. According to Farid and Munawar (2020), PTKI has special characteristics that are different from general universities, both in terms of curriculum, scientific content, and communication style. Therefore, the AI system implemented needs to be contextually adjusted so that it can be accepted and utilized optimally by the PTKI academic community(Farid & Munawar, 2020).

The final challenge is ethical and data privacy concerns. AI in libraries often relies on user data to enhance personalization of services. This raises important questions about how student data is processed, stored, and used (Susanto & Handayani, 2023). PTKI needs to ensure that the use of AI is in line with Islamic principles, maintains data confidentiality, and does not diminish the role of librarians as information educators.

By identifying and anticipating these challenges, PTKI libraries can be better prepared in designing AI technology adoption strategies that are inclusive, effective, and still based on Islamic educational values.

Research methods

This study uses a descriptive qualitative approach with the aim of gaining a deep understanding of the role of artificial intelligence (AI) in the development of reference services at the IAIN Curup Library. This approach was chosen because it is appropriate for exploring

social phenomena, practices, and experiences of users and librarians in the context of implementing information technology in libraries.

1. Research Location
   The research was conducted at the IAIN Curup Library, as an information institution that is developing digital services and is adaptive to new technologies, including the implementation of AI-based systems.
2. Research Subjects
   The subjects in this study consisted of: a) Librarians who are directly involved in managing reference services and library information systems, b) Students as the main users of reference services, especially from the Faculty of Sharia, c) Library IT staff or parties who handle information technology systems at IAIN Curup (if any). Informants were selected using purposive sampling, namely selecting informants who were considered to know, understand, and be directly involved in the implementation or utilization of AI in libraries.
3. Data Collection Techniques
   Data collection was carried out using several techniques as follows: a) In-depth interviews: Conducted with librarians and students to find out their perceptions, experiences, and obstacles in using AI-based reference services, b) Participatory observation: Conducted to directly observe the reference service system and user interactions with the technology used, c) Documentation study: Reviewing related documents such as library digitization policies, service usage reports, and reference service communication archives.
4. Data Analysis Techniques
   The data obtained were analyzed qualitatively descriptively through the following steps: a) Data reduction: Sorting data that is relevant to the research focus, b) Data presentation: Arrange data in narrative and thematic form, c) Drawing conclusions: Formulating research findings based on patterns, relationships, and trends from the data that has been collected.
5. Validity of Data
   To maintain the validity of the data, researchers use source and method triangulation techniques, namely comparing interview data with observations and documentation, and checking the conformity of information from various informants.

Results and Discussion

From interviews with librarians, it is known that reference services at the IAIN Curup Library currently still focus on online search guidance, information literacy training, and the use of applications such as reference managers and online journal searches. This was also confirmed by students who stated that these services were quite helpful for them in completing academic assignments. This finding shows that libraries have begun a transformation towards digital-based reference services, although they are still conventional and manual. As stated by Kurniawan (2022), college libraries need to adopt a technological approach in their reference services to be more adaptive to the needs of digital generation users (Kurniawan, 2022).

Librarians state that AI is defined as artificial intelligence-based technology that can complete certain tasks automatically. One form of early implementation that has been used is a chatbot via WhatsApp, although it has not been fully developed as a comprehensive reference service.

From the students' side, some admitted to having known and used AI technology in a simple form, but still felt that this technology was relatively new to them. Students also showed high enthusiasm for the use of AI in libraries, especially if the technology could help in completing academic tasks, as long as it was accompanied by training in its use.

This indicates that both librarians and students have a positive initial understanding of AI, but their technological literacy levels are still diverse. This is in accordance with the findings of Nurfadillah & Maulidiyah (2022) that PTKI students show diversity in digital

literacy skills, so training is the key to the successful use of smart technology in academic environments.

Librarians revealed that the main obstacles in implementing AI at the IAIN Curup Library were: 1) Infrastructure and hardware limitations, 2) Lack of Human Resources competence, and 3) There is no institutional policy that supports the use of AI

This is in line with a study by Hakim & Zulkarnaen (2021), which states that the implementation of AI in the PTKI environment is often hampered by policy factors and technical readiness. Without support from institutional leaders and strategic planning, technological innovations such as AI will be difficult to realize optimally.

Both librarians and students expressed high hopes for the use of AI in library services, especially to improve access, speed, and accuracy of information. Librarians hoped for human resource training and institutional policy support, while students hoped for training in the use of AI so that they could use this technology effectively.

This expectation shows the alignment between service providers and users, which is an important asset in developing an AI-based reference service transformation strategy. As suggested by Mustofa (2023), the strategy for developing AI services in libraries must be adjusted to the local context and resource capacity of the institution(Mustofa, 2023).

1. Form of AI Implementation in Reference Services at the IAIN Curup Library
   Based on the results of initial observations and interviews with librarians, the application of artificial intelligence (AI) in the IAIN Curup Library is still in its early stages. The system used is not yet fully AI-based, but is starting to be directed towards a semi-automatic system, such as: a) Use of automatic search features in OPAC (Online Public Access Catalog), b) Implementation of web-based services and online question answering via social media or WhatsApp, c) Planning the development of a reference service chatbot, although it is still in the concept or trial stage. Librarians expressed enthusiasm for the potential use of AI, especially for time efficiency in answering routine questions and enhancing a more personalized user experience. However, most librarians acknowledged that they still need training and technical support to get the most out of this technology.
2. Benefits of Using AI in Reference Services
   Although not yet fully AI-based, reference services that are starting to be digital provide several real benefits for users, including: a) Faster and more flexible access to information, not limited to library working hours, b) Ease of searching for academic information sources, especially through online platforms, c) Librarian work efficiency, because simple questions can be diverted to automated systems (e.g. FAQ or autoresponders). If AI systems such as chatbots with Natural Language Processing are implemented well, the potential benefits can include: a) Increased interactivity and responsiveness of services, b) Ability to customize reference recommendations according to user needs, and c) Collection of user preference data for more targeted service development.
3. Challenges in AI Implementation
   Some of the main challenges that arise in implementing AI in the IAIN Curup library reference service are: a) Low digital literacy among students, especially in terms of searching for academic sources effectively. Students tend to be more accustomed to using Google or social media than OPAC or academic databases, b) Limited human resources and infrastructure, such as the lack of librarians who have expertise in AI technology or basic programming, and the absence of a special budget for developing intelligent systems, c) Lack of institutional support in the form of AI-based digitalization policies, which leaves libraries running on their own without a clear technology roadmap. These challenges demonstrate the need for a collaborative approach between libraries, campus information technology units, and lecturers to strengthen the information technology and digital literacy ecosystem.

4. AI-Based Reference Service Development Strategy
   Some strategies that can be developed by the IAIN Curup Library to optimize the use of AI include: a) Preparation of a library digitalization roadmap, which includes gradual AI integration, b) Librarian training on information technology, data literacy, and AI ethics, c) Improving students' information literacy, through workshops, literacy lectures, and online modules, d) Collaboration with local developers or third parties to develop reference service chatbots that are contextual to academic needs in the PTKI environment.

Conclusion

This study shows that the application of artificial intelligence (AI) in reference services at the IAIN Curup Library is still in its early stages and is limited to a semi-automatic form of service digitization. Nevertheless, the potential of AI to improve the quality, speed, and personalization of reference services is enormous. The benefits such as easy access to information, efficiency of librarians' working time, and the possibility of developing an AI-based recommendation system are a strong basis for the need to accelerate the integration of this technology in the PTKI environment. However, this process is not free from various challenges, including limited infrastructure, HR readiness, and the varying levels of digital literacy of students. Therefore, AI should not be seen as a replacement for librarians, but rather as a tool that can expand the reach of services and improve the user experience, provided it is applied ethically, contextually, and incrementally.

Suggestion

Based on the findings and discussions in this study, several suggestions that can be given are as follows:

1. For the IAIN Curup Library
   - Immediately prepare a roadmap for developing AI-based services by involving librarians, lecturers, and IT staff.
   - Provide training and technical assistance for librarians in terms of AI system management and the ethics of its use.
   - Developing a reference chatbot based on NLP (Natural Language Processing) that is adapted to the academic and cultural context of PTKI, especially IAIN Curup.
2. For Academic Community (Students and Lecturers)
   - Increase awareness and digital literacy skills, especially in searching, evaluating, and using academic information from valid sources.
   - Actively participate in digital service system feedback, so that the library can adjust its technology development to the real needs of users.
3. For Institutions and Policy Makers
   - Provide budget and policy support for the modernization of smart technology-based library services.
   - Develop data protection policies and ethics for the use of AI, so that their implementation remains in line with Islamic and academic values.

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