THE IMPACT OF AI ON LIBRARY INFORMATION SERVICE QUALITY

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ARTICLE INFO	ABSTRACT
	This research explores the transformative impact of Artificial Intelligence (AI) in library services. It investigates AI's potential to enhance efficiency, personalize service delivery, and improve library collection management. The study employs qualitative methods, including in-depth interviews and document analysis, with a focus on academic and public libraries that have integrated AI. The findings reveal positive acceptance of AI by library professionals, increased user satisfaction, and the potential for more dynamic library services. However, challenges such as staff training and data privacy issues exist. AI's role in collection management is also highlighted. This research contributes to understanding AI's implications for libraries and underscores the need for responsible AI implementation.

INTRODUCTION

The advent of Artificial Intelligence (AI) in the realm of library services marks a pivotal shift in the landscape of information management and dissemination. This transformative phase in library science is imperative to investigate due to a couple of key reasons: AI's potential in significantly elevating the efficiency and effectiveness of library services, facilitating a more personalized approach to service delivery, and enhancing the management of library collections; the necessity to comprehend how AI integration is reshaping the roles and interactions of library professionals with their patrons (Mallikarjuna 2024). Central to this investigation are theories of information services and technological innovation within libraries. Previous studies, particularly those by Hussain (2023) and Jha (2023), have delved into AI's applications in libraries, such as automating routine tasks and deploying chatbots for customer engagement. Furthermore, insights from Springer Nature suggest the transformative impact of AI on librarian services, altering the modalities of information access and management (Inawati and Sari 2022). This study aims to dissect the ramifications of AI

implementation in library services on the quality of information services and operational dynamics, and to scrutinize the challenges inherent in this technological integration.

Traditional library information services involve various activities such as reference, circulation, collection management, and the provision of scientific information to users (Nazar 2022). With technological advancements, libraries have transitioned from manual catalog systems to computer-based systems and are now moving towards a more advanced digital era with AI (Atika et al. 2023). With technological advancements, libraries have transitioned from manual catalog systems to computer-based systems, evolving through various stages of digital transformation. This progression has included the implementation of integrated library systems (ILS), the digitization of collections, and the development of online public access catalogs (OPAC). Now, libraries are moving towards a more advanced digital era with AI, embracing technologies such as machine learning, natural language processing, and data analytics (Araf Aliwijaya and Hanny Chairany Suyono 2023). These innovations are not only enhancing the efficiency of library operations but also enabling more personalized and intelligent information services, ultimately transforming the way libraries manage, curate, and disseminate knowledge (Nugroho, Anna, and Ismail 2023). In this context, libraries not only function as information providers but also as facilitators of efficient and effective access to knowledge. Advanced library information services can enhance the user experience by providing relevant and up-to-date information, as well as supporting research and education (Muliana 2021). The integration of AI into these information services is expected to offer intelligent solutions that are faster, more accurate, and more responsive to user needs, making libraries dynamic centers of innovation and knowledge.

The integration of AI into these information services is expected to offer intelligent solutions that are faster, more accurate, and more responsive to user needs, fundamentally transforming the role and capabilities of libraries (Ully et al. 2023). AI technologies, such as machine learning algorithms and natural language processing, can automate routine tasks like cataloging and indexing, freeing up librarians to focus on more complex and value-added services (Prasetio and Winanda 2023). Additionally, AI can enhance user interactions through personalized recommendations and virtual assistants that provide instant, relevant information based on user queries and behavior patterns. These AI-driven tools can analyze vast amounts of data to understand individual user preferences, making suggestions for books, articles, and other resources that align closely with their interests and research needs. Virtual assistants, powered by AI, can engage in real-time conversations with users, answering their questions,

guiding them through the library's catalog, and helping them locate specific materials quickly and efficiently.

By learning from each interaction, these systems continuously refine their responses and recommendations, becoming more adept at meeting the unique needs of each user. This personalized approach not only saves users time but also enhances their satisfaction and engagement with library services, creating a more intuitive and user-friendly experience (Sari, Masruri, and Rosalia 2023). Furthermore, these advanced AI capabilities can identify trends and patterns in user behavior, enabling libraries to better anticipate future needs and tailor their services and collections accordingly. This proactive approach ensures that libraries remain relevant and valuable resources in the digital age, capable of providing high-quality, customized information services that support academic and personal growth (Vidhate et al. 2019). By leveraging AI, libraries can proactively anticipate the needs of their patrons, offering tailored services and resources that support diverse research and learning objectives. Consequently, libraries are evolving into dynamic centers of innovation and knowledge, continually adapting to the changing landscape of information technology and user expectations (Pane 2023). This shift positions libraries as crucial hubs in the digital age, where advanced AI-driven services play a key role in fostering intellectual growth and access to information. With the implementation of AI technologies, libraries can offer a wide range of innovative services that cater to the evolving needs of their patrons (Hussain 2023). For instance, AI can support advanced research capabilities by enabling complex data mining and analysis, thus facilitating deeper insights and discoveries across various fields of study. Libraries can also use AI to enhance their digital archives, making historical documents and rare collections more accessible through improved digitization and search functionalities (Ajakaye 2021). Furthermore, AI can contribute to more effective knowledge management within libraries, optimizing the organization and retrieval of vast amounts of information. This ensures that users can easily find the resources they need, regardless of the complexity or volume of data involved (Al-Aamri and Osman 2022). AI-powered predictive analytics can help libraries anticipate future trends and user demands, allowing them to adapt their collections and services proactively. In this new role, libraries become dynamic centers for community engagement and lifelong learning, offering not just access to information, but also tools and resources that empower individuals to pursue their educational and professional goals (Subaveerapandiyan A 2023). By integrating AI, libraries can bridge the digital divide, providing equitable access to cutting-edge information technologies and fostering a culture of innovation and continuous learning (Olusegun Oyetola et al. 2023). As a result, libraries solidify their position as indispensable

institutions in the digital age, driving intellectual advancement and facilitating the seamless flow of information.

RESEARCH METHODOLOGY

This study adopts a qualitative approach with an exploratory research design to understand the impact of Artificial Intelligence (AI) on library information services. The primary data sources include in-depth interviews with library professionals and service users, as well as the analysis of relevant documents and publications in the field of AI and libraries. The research population consists of academic and public libraries that have integrated AI into their operations.

The research instruments include structured questionnaires for surveys, semi-structured interview guides, and templates for document analysis. Data collection techniques involve online surveys, face-to-face and virtual interviews, and secondary data collection from published sources. The form of data collected includes qualitative responses, interview notes, and texts from publications and official documents.

Data analysis will be conducted through thematic coding techniques to identify patterns and themes in qualitative data. This analysis includes open, axial, and selective coding stages. Furthermore, the interpretation of data will be assisted with qualitative data analysis software to strengthen the validity of findings. Document analysis will focus on identifying AI principles applied in the library context and their impact on information services.

RESEARCH RESULT
Acceptance of AI by Library Professionals

Interviews with library staff revealed a generally positive reception towards AI integration. The professionals acknowledged that AI facilitates the automation of routine tasks, thereby enhancing the efficiency of services. This positive sentiment highlights the supportive role AI can play in library operations, easing workload and streamlining processes.

AI's Impact on User Services

From the perspective of library users, the incorporation of AI tools such as chatbots and recommendation systems has led to a more personalized and responsive service experience. The surveys conducted indicated an uptick in user satisfaction, particularly regarding ease of access and the improved quality of information provided, demonstrating AI's potential in enriching the user experience.

Challenges in AI Implementation

Despite the benefits, the study identified significant challenges in AI implementation. A recurring theme was the need for additional training for library staff to effectively manage and utilize AI tools. Additionally, concerns were raised about data privacy and the potential for biases in AI-generated recommendations, pointing to the need for careful consideration in the deployment of AI technologies.

AI Integration into Library Service Strategies

Analysis of documents and publications showed that libraries integrating AI into their service strategies could offer more dynamic and innovative services. This integration helps in maintaining the relevance of libraries to the evolving needs of modern users, suggesting that AI can be a critical component in future library service planning.

AI's Role in Library Collection Management

The study also found that AI has a significant impact on collection management. AI algorithms assist in classification, arrangement, and efficient management of library collections, highlighting AI's utility in backend operations and its contribution to the overall improvement of library services.

Tabel 1. Online Users Perpusnas Services

Year	Online Users of Perpusnas Services	iPusnas E-Book Loans
2019	7,111,746	**2,867,799**
2020	-	**4,378,753**
2021	15,734,566	**5,466,105**

Sumber: diolah dari *Perpustakaan Nasional Tahun 2021*

1. Significant Increase in Online Service Usage

    The data showed a remarkable increase in the number of online users accessing Perpusnas services. There was a growth from 7,111,746 users in 2019 to 15,734,566 users in 2021. This surge indicates a substantial shift towards digital platforms for accessing library services, a trend likely accelerated by the pandemic's impact on physical library access.

2. Growth in E-Book Lending

    The lending of e-books through the iPusnas platform also saw a substantial increase. Starting from 2,867,799 e-book loans in 2019, the number rose to 5,466,105 by 2021. This

trend highlights the growing preference of users for digital formats and their increasing reliance on remote access to library resources.

3. Effectiveness of Digital Transformation Initiatives

The significant yearly growth in both online user engagement and e-book lending demonstrates the successful impact of the digital transformation initiatives undertaken by Perpusnas. The data underscores the importance and effectiveness of digital services like virtual reference services, digital applications, and expanded digital repositories in meeting the evolving needs of library users.

DISCUSSION

The integration of Artificial Intelligence (AI) into library services has brought about a paradigm shift, significantly enhancing both the efficiency and effectiveness of these services. The groundbreaking research conducted by Hussain (2023) and Jha (2023) has shed light on the transformative impact of AI in the field of libraries, revealing its potential to revolutionize various aspects of library operations.

Hussain's comprehensive study provides compelling evidence of how AI has streamlined library processes through task automation. The research showcases how routine and time-consuming tasks, such as cataloging and indexing, can now be efficiently carried out by AI systems. This automation not only expedites these processes but also minimizes errors, ultimately leading to more efficient library operations. Hussain's work underscores the practical implications of AI in significantly reducing the workload of library staff, allowing them to focus on more value-added tasks.

Similarly, Jha's research explores the exciting realm of personalized services made possible by AI integration. By leveraging AI tools like chatbots and recommendation systems, libraries can offer users a highly tailored and responsive experience. Jha's findings indicate a remarkable increase in user satisfaction, particularly in terms of the ease of accessing resources and the quality of information provided. This personalized approach is in line with the evolving expectations of modern library users, who seek more user-centric and efficient services.

The surge in the utilization of online services and the substantial growth in e-book lending, as highlighted by both studies, signal a broader trend towards digitalization in libraries. This trend is not limited to a particular region but reflects a global shift in how library services are accessed and utilized. The studies point out that libraries have recognized the need to adapt to this digital era, where users increasingly rely on remote access to library resources.

Furthermore, the research conducted by Barsha and Munshi (2023) provides a broader perspective on the global landscape of AI implementation in libraries, emphasizing both its potential and the challenges faced, particularly in developing countries. Their work underscores the importance of adapting technology to meet the needs of modern library users while navigating the unique challenges posed by varying levels of technological infrastructure.

The growth in the use of online services and e-book lending indicates the importance of digitalization in library services. Research by Barsha and Munshi (2023) illustrates the potential and challenges of AI implementation in developing countries, highlighting technological adaptation to meet the needs of modern users.

The studies conducted by Hussain (2023) and Jha (2023) delve deeper into the realm of AI integration within library services, offering valuable perspectives on how AI can revolutionize various aspects of library management and user engagement. Their research goes beyond the basic applications of AI, exploring advanced methodologies for optimizing library services through technological innovation.

Hussain's study particularly focuses on how AI can transform routine tasks into automated processes, there by streamlining library operations and freeing up valuable resources. This study not only looks at the practical applications of AI but also delves into the theoretical underpinnings that support its integration in library systems. Hussain discusses the implications of AI in enhancing the speed and accuracy of tasks like cataloging and information retrieval, which are pivotal in library management.

Jha, on the other hand, examines the impact of AI on user interaction within libraries. This research explores how AI tools such as chatbots and personalized recommendation systems can revolutionize the way users interact with library services. Jha's work underscores the importance of AI in creating a more engaging and tailored experience for library users, catering to their specific informational needs and preferences.

The integration of Artificial Intelligence (AI) into library services represents a paradigm shift that has significantly improved the efficiency and effectiveness of these services. This transformative impact of AI has been extensively explored in research conducted by renowned scholars such as Hussain (2023) and Jha (2023), shedding light on its potential to revolutionize various aspects of library operations.

Hussain's comprehensive study provides compelling evidence of how AI has simplified library processes through task automation. The research demonstrates how time-consuming and routine tasks, such as cataloging and indexing, can now be efficiently performed by AI systems. This automation not only expedites these processes but also reduces errors,

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Furthermore, research conducted by Barsha and Munshi (2023) provides a broader perspective on the global landscape of AI implementation in libraries, emphasizing its potential as well as the challenges it poses, especially in developing countries. Their research underscores the importance of adapting to technology to meet the needs of modern library users while navigating the unique challenges posed by varying levels of technological infrastructure.

In conclusion, the collective research by scholars like Hussain, Jha, and others collectively emphasizes the pivotal role of AI in reshaping library services. AI not only enhances efficiency and personalization but also ensures that libraries remain relevant in the digital age. While these advancements hold promise, it is crucial for libraries to address challenges related to staff training, data privacy, and algorithmic bias to ensure responsible and ethical AI implementation in library operations. The research conducted in this domain serves as evidence of the transformational potential of AI in libraries and paves the way for a future where libraries continue to be vital centers of knowledge dissemination in an increasingly digital world.

CLOSING

Conclusion

The emergence of Artificial Intelligence (AI) in library services marks a significant milestone in information management and dissemination. This research reveals the positive impact of AI on library service efficiency and user experience. Library professionals generally embrace AI as a tool that can automate routine tasks, enhance efficiency, and reduce workloads. From the user's perspective, AI integration has resulted in more personalized and responsive services, increasing user satisfaction.

However, challenges remain in AI implementation, including staff training and issues related to data privacy and algorithmic bias. Nevertheless, the integration of AI into library

service strategies promises more innovative services, ensuring the relevance of libraries in the digital age.

Furthermore, AI also plays a crucial role in library collection management by assisting in the efficient classification and arrangement of collections.

The findings of this research provide valuable insights into the potential and challenges of AI in library services. The use of AI can bring about positive changes in how libraries operate and serve their users in the digital era. However, careful attention to related issues is necessary for successful and ethical AI implementation. This research makes a valuable contribution to understanding the impact of AI in libraries and paves the way for libraries to remain relevant knowledge dissemination centers in an increasingly digital world.

Advice

1. To Libraries

- It is recommended to continue integrating AI technology into library operations to enhance service efficiency and collection management.

- It is important to provide adequate training to library staff so that they can effectively utilize AI technology.

- Libraries need to pay attention to data privacy and algorithmic bias issues in the implementation of AI technology and take steps to mitigate these risks.

2. To Researchers

- It is recommended to conduct further research on the use of AI technology in the library context, especially in terms of collection management and user experience.

- Further research can also explore ethical and sustainability aspects of using AI technology in libraries.

3.To Decision-Makers

- Decision-makers in the library and education fields should consider long-term investments in AI technology to ensure that libraries remain relevant and efficient in the digital age.

- Dialog and collaboration between libraries, stakeholders, and policymakers are needed to address data privacy regulations and AI-related policies.

4. To Library Users

- Library users can better utilize services enhanced by AI technology and provide constructive feedback to libraries for continuous improvement.

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