



ChatGPT Potential for Improving Library Services

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Abstract. Artificial intelligence (AI) technology is now rapidly developing in various fields, such as healthcare, transportation, agriculture, and education. With these significant advancements, AI is becoming increasingly important in helping humans perform various complex tasks. One form of AI that is currently gaining public attention is AI-based chatbots such as ChatGPT, which has the ability to interact and produce textual content like humans. This research was conducted with the aim of examining the potential utilisation of ChatGPT for library services. The research method used was systematic literature review. Researchers collected and analysed 10 scientific articles obtained from Scopus indexed journals related to the topic of ChatGPT's potential for library services. The results showed that ChatGPT has the potential to assist library reference services with its ability to provide access to information in various languages without being limited by time, can personalise services by providing content recommendations according to user interests, and can support the research process. ChatGPT also has the potential to assist research by providing topic ideas, keywords, and literature summaries. In addition, ChatGPT can be used to assist with cataloguing, metadata, bibliography and collection development although the results still need to be verified by librarians. However, verification is still necessary as ChatGPT still has weaknesses in the validity and accuracy of the information it produces. By understanding the potential and challenges of ChatGPT, it is hoped that this technology can help improve library services in the future, although the important role of librarians is still needed to ensure service quality.

Keywords: Artificial Intelligence; Chatbot; Chatgpt; Library Services; Systematic Literature Review

1 Introduction

Artificial intelligence (AI) technology has recently undergone significant development. AI is a computer technology that allows computers to have the ability or function of thinking like humans [1]. AI can perform tasks that require understanding, decision-making, and learning based on existing data. AI has become very important in helping humans solve complex problems and improve efficiency in various fields, such as technology, health, transportation, and industry. Various AI implementations have been applied in various industrial fields such as health, transportation, agriculture, and education [1–4]. The application of AI in various sectors aims to improve efficiency, productivity, and service quality by utilizing the ability of machines to process data and information on a large scale. One form of AI technology is Chatbot, Chatbot is a

computer technology that applies artificial intelligence to communicate with users through conversation [5]. Chatbots work by analyzing and processing information provided by users, and providing relevant responses. One example of popular chatbot technology today is ChatGPT.

ChatGPT is an AI-based chatbot developed by OpenAI using Generative Pre-trained Transformer (GPT) and natural language processing (NLP) technology to generate human-like conversational responses in response to questions given [6,7]. ChatGPT can respond to various questions given and respond like a human conversation but ChatGPT's ability goes beyond that, ChatGPT can create something new such as writing poems, stories or even essays [8]. ChatGPT's ability to interact and create new content based on user requests has the potential to be utilized in various lines of life. ChatGPT has garnered tremendous response since its launch in November 2022, within 2 months, ChatGPT had reached more than 100 million active users [9]. This shows the high interest of the public in ChatGPT's advanced chatbot technology.

Various studies have been conducted to explore the application of ChatGPT in various fields. This is evidenced by more than 3000 literature published in various journals, conferences, newspapers, blogs, and media reports indexed on Google Scholar [10]. In the field of education, the implementation of ChatGPT has a positive impact on the teaching and learning process [11]. In another study conducted by Samaan et al. (2023), ChatGPT was shown to be able to answer questions regarding bariatric surgery with 86.8% accuracy, suggesting that ChatGPT could serve as a useful source of additional information for patients regarding bariatric surgery [12]. However, there is limited literature that specifically examines the utilization of ChatGPT in libraries.

ChatGPT's ability to provide fast and interactive information has potential in all fields, one of which is in library services. One example of a real implementation of ChatGPT in libraries is a chatbot named Aisha developed by Zayed University Library in the United Arab Emirates. Aisha is a ChatGPT API (Application Programming Interface) based chatbot that can answer basic library questions related to Zayed University library collections and services [13]. The implementation of Aisha shows the potential of implementing chatbots such as ChatGPT to improve library services in the future. Therefore, further studies are needed to determine the potential of ChatGPT's presence on library services. Through a systematic review, this research aims to comprehensively examine the potential utilization of ChatGPT in improving library services based on existing literature. The findings of this study are expected to provide valuable contributions in understanding the potential use of ChatGPT in library services, as well as providing appropriate recommendations for the development of better library services in the face of the evolving technological era.

2 Methods

The method used in this research is a qualitative method with a Systematic Literature Review (SLR) approach. SLR is a method for collecting, identifying, and analyzing available research (such as articles, conferences, books, and dissertations) through systematic procedures [14]. According to Mangas-Vega et al. (2018), SLR is useful for analyzing large amounts of data because it facilitates pattern identification and reference selection based on predefined criteria.

The purpose of SLR is to summarize the existing evidence regarding a treatment or technology, such as the benefits and limitations of a particular method [16]. The stages of SLR include formulating research questions, searching, establishing study criteria, study selection, quality assessment, data extraction and analysis, and reporting results.

The SLR method was chosen to determine the potential of ChatGPT in library services through a systematic literature review, in accordance with the purpose of SLR to summarize existing evidence regarding a particular technology [16]. By applying SLR, this research is expected to summarize various evidence and findings related to the potential implementation of ChatGPT in library services. The stages of SLR include:

2.1 Research Question

The initial stage of SLR is to formulate a research question, which guides the literature search, selection and analysis. The researcher clearly identifies the research area and research objectives. The research question should be specific, focused and relevant to the topic,

RQ1	What is the potential of ChatGPT for library services?
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With this question, the researcher can explain the background, objectives and direct the SLR process to search and analyze relevant literature. The research question becomes the basis for the next stage.

2.2 Select Digital Library Source

At this stage, researchers determine the academic database used to conduct literature searches. The Scopus database was chosen because Scopus is an academic database subscribed to the Diponegoro University Library which covers a wide range of subjects to find relevant articles and on consideration of the initial searches that researchers have conducted on various other databases, as well as the ability of Scopus to provide better findings compared to other databases that researchers can access. The initial search was carried out with the aim of ensuring that literature relevant to the problem under study was available.

2.3 Inclusion and Exclusion Criteria

Inclusion and exclusion criteria are an important stage in determining the eligibility of research articles used. At this stage, the articles were screened based on the inclusion and exclusion criteria. The following are the criteria that determine the eligibility of research sources,

Table 1. Inclusion and Exclusion Criteria

Inclusion	Exclusion
Literature was obtained from Scopus indexed journals and literature search results accessible by researchers	Literature obtained from journals that are not indexed by Scopus and cannot be accessed by researchers.
Literature obtained in the form of research articles and editorials	Non-research literature and editorials
Literatur yang digunakan memiliki batasan terakhir rilis tahun 2022. ChatGPT sendiri dirilis pada tanggal 30 November 2022 (OpenAI).	The literature used has a last release date of 2022. ChatGPT itself was released on November 30, 2022 (OpenAI).

2.4 Quality Assesment (QA)

After searching for data based on the specified criteria, the next step is to evaluate the data using QA questions:

QA1	Does the literature address the potential of ChatGPT for library services?
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Each piece of literature was evaluated and assigned a category:

Yes (Y): The literature corresponds to the QA question.

No (X): The literature did not match the QA question.

This evaluation aimed to ensure that the literature analyzed was appropriate and relevant in answering the research question.

2.5 Data Collection

After determining the data criteria, the next step was data collection. The researcher formulated a search query based on the research question, namely "ChatGPT AND Library," and conducted a search on article titles, abstracts, and keywords in the Scopus database, resulting in 66 pieces of literature.

Table 2. Literature findings

No	Jurnal	Judul	Author	Tahun terbit
1	<i>Scientific and Technical Information Processing</i>	<i>Exploring the Potential of Applying the Artificial Intelligence Language Model ChatGPT-3.5 in Library and Bibliographic Activities</i>	Stepanov et al.	2023
2	<i>Journal of Web Librarianship</i>	<i>Aisha: A Custom AI Library Chatbot Using the ChatGPT API</i>	Lappalainen dan Narayanan	2023
3	<i>Internet Reference Services Quarterly</i>	<i>ChatGPT and Its Possible Impact on Library Reference Services</i>	Chen	2023
4	<i>Library Hi Tech News</i>	<i>Exploring the viability of ChatGPT as an alternative to traditional chatbot systems in library and information centers</i>	Panda dan Kaur	2023
5	<i>Technical Services Quarterly</i>	<i>Embracing ChatGPT: Implications of Emergent Language Models for Academia and Libraries</i>	Houston dan Corrado	2023
6	<i>Information Technology and Libraries</i>	<i>From ChatGPT to CatGPT The Implications of Artificial Intelligence on Library Cataloging</i>	Brzustowicz	2023
7	<i>College and Research Libraries News</i>	<i>ChatGPT Implications for academic libraries</i>	Cox dan Tzoc	2023
8	<i>Internet Reference Services Quarterly</i>	<i>ChatGPT and Librarians for Reference Consultations</i>	Adetayo	2023

9	<i>College Research Libraries</i>	<i>and</i>	<i>How Well Does ChatGPT Handle Reference Inquiries? An Analysis Based on Question Types and Question Complexities</i>	Lai	2023
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10	<i>Library Hi Tech News</i>	<i>Hi Tech</i>	<i>How to incorporate artificial intelligence (AI) into your library workflow</i>	Paul R. Pival	2023
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2.6 Analysis and Reporting

At this stage, 10 pieces of literature that met the inclusion-exclusion and quality assessment criteria were analyzed and data extracted. The purpose of this data analysis and extraction was to gather important information and evidence from each piece of literature used to answer the research questions that had been formulated earlier. The information that has been extracted and analyzed from these 10 literatures is then synthesized and presented in the reporting section to develop answers to the research questions of this study.

3 Result and Discussion

Chatbots such as ChatGPT are now being researched for their utilization in library services. ChatGPT has a number of advantages in reference services. According to Panda and Kaur (2023), one of the main advantages of ChatGPT is its ability to provide users with quick access to information on various topics. Adetayo (2023) showed through a survey of 54 university students that ChatGPT saves time by responding quickly to questions and has an extensive knowledge base, allowing users to get answers without waiting for librarian availability. The study by Stepanov et al. (2023) compared ChatGPT with the State Public Historical Library (SPHL) reference service and found that ChatGPT provided comprehensive responses although it was less informative than SPHL. However, ChatGPT's response speed was superior as it provided instantaneous answers, while SPHL took up to two days to respond.

In addition, according to Cox and Tzoc (2023), the availability of ChatGPT at all times allows users to access reference services without being limited by library operating hours. ChatGPT is also capable of communicating in multiple languages.. Lai (2023) revealed that ChatGPT has multilingual capabilities which was evident when given

questions in French and English, where ChatGPT was able to respond in both languages. In addition, ChatGPT has the ability to personalize services according to the needs of its users [7]. Stepanov et al. (2023) showed that when asked to recommend books similar to L.N. Tolstoy's "Three Comrades", ChatGPT provided 10 relevant book recommendations in a short time compared to the Russian State Library and Russian National Library reference services which took two days to provide recommendations.

ChatGPT also has the potential to assist the research process and support research support services in libraries. Cox and Tzoc (2023) stated that ChatGPT can help the research process by providing topic ideas, keywords, and work summaries. Research by Stepanov et al. (2023) examined ChatGPT's ability to compile abstracts of scientific articles and found that 74.4% of respondents rated ChatGPT-generated abstracts as more informative than original abstracts.

4 Conclusion

ChatGPT can assist reference services by providing quick access to information in various languages without being limited by library operating hours. ChatGPT can also personalize the service by providing content recommendations that match the interests and needs of each user. In addition, ChatGPT has the potential to help provide research support by providing recommendations on databases, topic ideas, keywords, and summaries of works such as for example ChatGPT can create abstracts of scientific articles. ChatGPT can also assist reference services in the creation of supporting content such as book annotation and article creation. ChatGPT can also help with cataloging, metadata creation and bibliography although the results need to be verified by librarians. ChatGPT can also help with collection development with its ability to analyze data and provide recommendations based on it.

However, despite its potential, ChatGPT has limitations that need to be considered. The validity of the information provided still needs to be verified given the tendency of ChatGPT to produce inaccurate information, provide invalid references and links, not yet able to access real-time data, and still weak in handling complex questions. Verification and curation by librarians is still needed to ensure the validity of the information provided. Information accuracy and the potential for plagiarism and infringement also need to be considered in the implementation of ChatGPT in libraries.

Although this study has shown the various advantages of ChatGPT in library reference services, there are some aspects of library services according to Rochmah (2016) that are not covered in the results of this study. For example, this study did not in-depth discuss the role of librarians in the manual processing of library materials. It also did not comprehensively cover circulation services and administrative services, which are also important parts of library services according to Rochmah (2016). Circulation

services, which include borrowing, returning, extending loans, and creating collection utilization statistics, are one of the main services used by users. Administrative services are also not discussed in detail in this study. These services include internal library administration such as correspondence and library membership administration such as issuing library member cards [18]

ChatGPT has the potential to make a positive contribution in improving library services in the future. However, an important role of librarians is still needed to ensure the quality and validity of the information generated. Thus, proper integration between ChatGPT capabilities and librarian expertise will be the key to success in the implementation of useful AI in libraries.

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