

REVIEW PAPER

Adapting Artificial Intelligence in Library OPAC: A Chatbot

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Received: 22-02-2025

Revised: 14-04-2025

Accepted: 16-05-2025

ABSTRACT

A library's OPAC serves as a virtual junction and point of contact for patrons, offering access to library resources and Current Awareness Services (CAS). In this regard, the study aims to embrace the latest technological innovation to adjust to the evolving demands and expectations of users in today's fast-changing environment. This study's objective is to comprehend the viability of using a chatbot in a library's OPAC. According to the literature review, the use of artificial intelligence (AI) chatbots has expanded dramatically across all sectors. The study also discovers that Chatbot has been widely employed to give excellent services to patrons, not only for commercial objectives but also in many areas of library services. The library OPAC is one area where the Chatbot program can be developed to provide users with an interactive platform to get information 24×7, with no human intervention. This study strongly promotes the usage of chatbots for library services due to their numerous benefits for both users and library professionals. The study concludes that, while these bots have a lot of potential, they will only support and improve library performance and services, not replace library professionals.

HIGHLIGHTS

- ① Chatbots act as digital assistants that provide round-the-clock support.
- ② It manages tasks such as reference inquiries, catalog searches and circulation notifications.
- ③ It is a complementary tool that enhances library performance and services.

Keywords: Artificial Intelligence, Chatbot, Library OPAC, Library Professionals, Library Services, Users Community

Artificial intelligence (AI) is among the most prominent emerging technologies over the years and has become more rooted in our daily lives with the creation and analysis of intelligent software and hardware, called intelligent agents. It has become unstoppable with its ever-growing applications in fields such as finance, transportation, health, education, information retrieval, agriculture, and business. A chatbot is the typical example of an AI system and one of the most elementary

and widespread examples of intelligent human-computer interaction (HCI). Chatbots are also known as smart bots, which can mimic human conversation and entertain their users. They are regarded as a more potent technology for delivering information that is employed in a digital environment and can make it simple for

How to cite this article: Thangjom, E.Z. (2025). Adapting Artificial Intelligence in Library OPAC: A Chatbot. *Int. J. Soc. Sci.*, 14(01&02): 25-30.

Source of Support: None; **Conflict of Interest:** None



users to access the information they need by answering queries and requests from users via text, audio, or both without the need for further human assistance. The famous examples of these applications are 'Apple Siri', 'Google Assistant', 'Amazon Alexa', and so on.

What is a Chatbot?

A chatbot is a program or web interface that mimics human conversation through textual or voice interactions. Modern chatbots are powered by generative artificial intelligence that allows a natural language conversation with a user in a manner like the way humans would engage in conversational assistance. They come in a variety of forms, from basic programs that reply to a single query with a single line to more complex digital assistants that collect and analyze data and adapt to provide better personalized services. While not all chatbots have AI built in, modern chatbots are increasingly using conversational AI techniques such as natural language processing (NLP) to comprehend user queries and provide pre-programmed responses. They can be built in a variety of ways, ranging from fun and simple to more complicated ones that learn as they go.

A study on chatbots identifies both commercial and open source chatbots and discusses the potential application of chatbots in the fields of library and information science (Mukherjee & Patra, 2023). They have examined 17 chatbots that are available in the public domain and have been classified based on their ownership, year of launch as either free or commercial, key features, or website address. They mention several of the most well-known chatbots, including Bing Chat, Infobip, ChatGPT, Appy Pie Chatbot, Botsify, Bard, and so on.

Chatbots in Social Media Engagement

The use of chatbots has become an important technique for increasing engagement on social media platforms. They are used in banks, insurance companies, commerce businesses, airlines, hotels, retailers, health services, and government entities to provide simple queries, enhance customer engagement and advertisement, and provide more services for customers. These companies use their social media profiles to promote and sell their products and services, and they may receive and respond to

messages using various messaging apps on social media, like Facebook, Instagram, WhatsApp and X. One of the main benefits of using chatbots on social media is their ability to provide personalized user suggestions. They can also analyze past browsing and activities to regulate user preferences and provide relevant product recommendations.

Similarly, libraries also communicate with their patrons through social media platforms to offer high-quality services. Library professionals normally use YouTube, Facebook, Instagram, WhatsApp, LinkedIn, and X, among other platforms.

Objectives of the study

1. To provide quick and personalized responses to library users' queries concerning information, resources, and services more efficiently.
2. To assist users, such as those with disabilities or linguistic barriers, who might find it challenging to use standard search features on library OPAC.
3. To make library services available to users round-the-clock to meet their requirements and queries even when staff members aren't around.
4. To reduce the workload of library professionals since chatbots are capable of answering common queries and basic duties, freeing up staff members to concentrate more on complex or specialized user requirements.
5. To promote library services and resources in response to user queries or interests.
6. To increase awareness and usage of library resources.

Scope of the study: The study's scope is limited to library OPAC, as many libraries do not have their websites and rely on OPAC as an alternative. As a result, the study focuses on the potential implementation of chatbot services for library OPAC.

Research Methodology: The study examined previous literature to develop an AI chatbot for library services. The study material relevant to the research has been accumulated from various online sources to be comprehensive.

Literature Review

Sanji, Behzadi, & Gomroki (2022), demonstrate that library personnel should be prepared to adapt to new technologies and acquire the essential skills to capitalize on their potential. Collaboration between librarians and chatbot experts will result in a better grasp of both user and library expectations for technology. Libraries can accurately identify their future planning horizons by applying this technological advancement to their medium- and long-term strategies.

According to Panda & Chakravarty (2022), chatbots strive to embrace the complexity of human connection, offering libraries a gratifying opportunity to connect with and respond to their user community in a realistic manner. Infobots can also dramatically increase and enrich information literacy by leveraging embedded technology breakthroughs. In today's environment, AI-powered intelligent information services (IIS) are considered more promising.

According to Ehrenpreis & DeLooper (2022), a chatbot, a type of artificial intelligence software, is one technology that helps make content discoverable. In their study, Lehman College implemented Ivy, a proprietary educational software chatbot on its library website, the first of its kind for an academic library. A chatbot has the potential to significantly improve a library's website. Libraries would be wise to accept the recommendations and considerations provided if they are given the chance to deploy a chatbot.

Maglogiannis, (2020), examined the reasons behind the use of chatbots across industries and emphasizes how social stereotypes affect chatbot design. They outline the general design of contemporary chatbots and discuss the primary platforms used in their development. They concluded that chatbots function more effectively manner as compared to humans and can reach a larger audience. As a result, they provide significant operational cost savings for the customer service division.

According to Nawaz & Saldeen (2020), we cannot rely solely on chatbots to answer customers' reference questions since they are unable to replicate human emotion and knowledge. On the contrary, the bot can

direct users to the appropriate contact channel so they can obtain the necessary service in an economical way and offer pre-made answers and responses for the most commonly asked reference questions.

(Shilpa & Prathibha, 2021) One example of disruptive technology is ChatGPT. It is employed as an additional tool to improve the entire library experience. It serves as an AI language model for several purposes, including content curation, research assistance, accessibility support, and reference assistance. But like any tool, technology like ChatGPT needs to be used wisely.

OPAC Services Through AI Chatbot

1. Reference Services: Users may be a little bit frustrated in trying to find a source of a specific piece of information, especially if it's their first visit to the library's web OPAC. Users may get frustrated and miss out on the services and important information available in the library due to their unfamiliarity with the processes involved. Chatbots can resolve this problem. Through a series of guided questions, it can quickly filter through all of the information available in the OPAC and find whatever content the user may need. It can help to provide instance-specific reference services like answering basic queries such as about the library, timing, working days, circulation rules, services, library rules and regulations, and so on.

2. Current Awareness Services (CAS): Chatbots can aid users in finding information about new arrivals, both in print and e-resources, including lists of donated books, articles, top-circulated books, and so on. Users can engage with chatbots in natural language conversations and ask questions on different matters. It can answer queries about the availability of the book and the bibliography of the book.

3. Selective Dissemination Information (SDI): SDI is also a type of current awareness service, an "alerting service" designed for individual users, particularly specialists, with a focus on their specialized field of interest. SDI involves the creation of user profiles or profiles based on specific subject areas, keywords, or other criteria. (Chatterjee, 2017).

Chabots can gather users' feedback from their experience accessing library OPAC, helping libraries improve their services based on user input. They can help libraries perform research and user surveys by guiding patrons through a short, personalized questionnaire. This way, the process will feel more human. Libraries can also install an in-app bot, just like some e-commerce sites have done to make ordering more streamlined for customers. Email alerts, RSS feeds, and social networking sites are included in this service.

4. **Catalogue Service:** A chatbot can help users find resources available in the library by describing their requirements. Based on user queries, chatbots can provide direct assistance by providing relevant information or guiding them through the search process. Integrating a chatbot with the library OPAC will enable users to access information about available resources, borrowing statuses, due dates, and other relevant data. They can also answer queries based on the title, author, subject, ISBN, ISSN, series, and call number of the book.

5. **Circulation Service:** Chatbots can assist users in managing their library account by sending notifications to them about due dates, overdue items, or keeping them informed about their borrowing activities. This may include paying fines and fees, maintaining holds, checking borrowing history, and updating contact information.

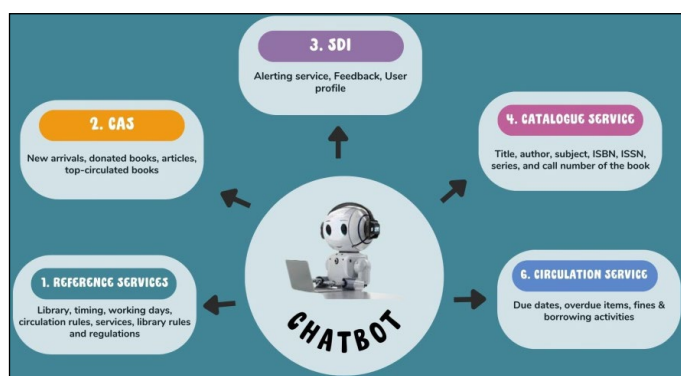


Fig. 1: Application of chatbot in library OPAC

Benefits of Chatbot

1. **Round-the-clock service:** They can help and answer questions around the clock, making library

services easier for users regardless of time zone or working hours.

2. **Competency:** They can help and answer questions all the time, saving the time of users by providing access through familiar messaging like websites, web OPAC, social media, or mobile apps, without having to physically visit the library.
3. **Ready Information:** Users can discover what they require more quickly since they can swiftly get information about the library's location, hours, resources, policies, and services.
4. **Customized Service:** They can filter users' queries and likes; they can suggest books, articles, or other resources on the basis of user's needs and areas of interest.
5. **Promotion of Library Resources:** They can increase users' participation and promote awareness of library resources, events, and workshops in a dynamic fashion.
6. **Cost-effective:** Deploying a chatbot for library reference services can be inexpensive rather than engaging new staff, particularly in libraries with limited resources.

Limitations

1. **Incomprehension:** They may not be fully familiar with the involvement of users' queries or requirements, which could result in inaccuracy or lacking solutions.
2. **Lack of human touch:** Some users may prefer speaking with a real person rather than a chatbot, as they may feel more understood and supported. Chatbots may malfunction or have technological issues, which can frustrate users when they can't get the help they need.
3. **Potential technical issue:** Speaking with a real person instead of a chatbot may be preferred by many users since they feel more recognized and aided. Users may be irritated and incapable when they are unable to get the assistance, they require from chatbots due to malfunctions or technical problems.

4. **Limited capabilities:** The information and assistance that they offer might be limited, especially when contrasted with professionals in libraries, who have a wealth of expertise and knowledge.
5. **Misinterpretation:** They may have the potential to misinterpret users' queries or provide imprecise particulars leading to confusion and discontentment.
6. **Security concerns:** Some users may be concerned about their security and privacy, as they may be reluctant to share sensitive or personal information with an automated system.

RESULTS AND DISCUSSION

The study provides helpful information regarding the basic services of chatbots in a library OPAC. Library professionals can gain a better understanding of chatbots to create and use them effectively for the purpose they have in mind.

Further studies of chatbots are required to determine their efficiency in adapting to library services, considering user satisfaction, functional capabilities, and cost-effectiveness. As many libraries do not have websites, a detailed analysis of their features and significance for library OPAC would be beneficial.

CONCLUSION

A chatbot can be an effective tool for improving a library's OPAC services. Various kinds of chatbots have been introduced and used in libraries because of their ability to improve service quality and support users in a variety of ways. Like any other technology, chatbots have several advantages and disadvantages. As a result, to make it effective, it eventually depends on how exactly and successfully we apply this technology to libraries. Libraries should give priority to the creation of proper standards for the use of chatbots, with an emphasis on inclusion, data security, and privacy.

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