Evidence Based Library and Information Practice

Academic Libraries Can Develop AI Chatbots for Virtual Reference Services with Minimal Technical Knowledge and Limited Resources

Rodriguez, S., & Mune, C. (2022). Uncoding library chatbots: Deploying a new virtual reference tool at the San Jose State University Library. Reference Services Review, 50(3), 392-405. https://doi.org/10.1108/RSR-05-2022-0020

Matthew Chase

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Evidence Summary

Academic Libraries Can Develop AI Chatbots for Virtual Reference Services with Minimal Technical Knowledge and Limited Resources

A Review of:
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Reviewed by:
Matthew Chase
Instructional Services Librarian
Cuyamaca College
Rancho San Diego, California, United States of America
Email: matthew.chase@gcccd.edu

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Abstract

Objective – To describe the development of an artificial intelligence (AI) chatbot to support virtual reference services at an academic library.

Design – Case study.

Setting – A public university library in the United States.

Subjects – 1,682 chatbot-user interactions.

Methods – A university librarian and two graduate student interns researched and developed an AI chatbot to meet virtual reference needs. Developed using chatbot development software, Dialogflow, the chatbot was populated with questions, keywords, and other training phrases entered during user inquiries, text-based responses to inquiries, and intents (i.e., programmed mappings between user

inquiries and chatbot responses). The chatbot utilized natural language processing and AI training for basic circulation and reference questions, and included interactive elements and embeddable widgets supported by Kommunicate (i.e., a bot support platform for chat widgets). The chatbot was enabled after live reference hours were over. User interactions with the chatbot were collected across 18 months since its launch. The authors used analytics from Kommunicate and Dialogflow to examine user interactions.

Main Results – User interactions increased gradually since the launch of the chatbot. The chatbot logged approximately 44 monthly interactions during the spring 2021 term, which increased to approximately 137 monthly interactions during the spring 2022 term. The authors identified the most common reasons for users to engage the chatbot, using the chatbot's triggered intents from user inquiries. These reasons included information about hours for the library building and live reference services, finding library resources (e.g., peer-reviewed articles, books), getting help from a librarian, locating databases and research guides, information about borrowing library items (e.g., laptops, books), and reporting issues with library resources.

Conclusion – Libraries can successfully develop and train AI chatbots with minimal technical expertise and resources. The authors offered user experience considerations from their experience with the project, including editing library FAQs to be concise and easy to understand, testing and ensuring chatbot text and elements are accessible, and continuous maintenance of chatbot content. Kommunicate, Dialogflow, Google Analytics, and Crazy Egg (i.e., a web usage analytics tool) could not provide more in-depth user data (e.g., user clicks, scroll maps, heat maps), with plans to further explore other usage analysis software to collect the data. The authors noted that only 10% of users engaged the chatbot beyond the initial welcome prompt, requiring more research and user testing on how to facilitate user engagement.

Commentary

There is growing LIS literature on the applications of library chatbots in library virtual reference services. Chatbots can help reduce user stress and anxiety as well as ease the workload of common and routine questions for library staff (McNeal & Newyear, 2013; Mckie & Narayan, 2019). However, AI is still an emerging and challenging trend for libraries, especially when it comes to usage, technical expertise, and resources. Despite the opportunity to automate library services, human management in a chatbot's development, training, and maintenance are essential (Kane, 2019). In this study, the authors offered an interesting approach to developing a chatbot for supporting a library's virtual reference services without requiring specialized experience or abundant resources.

The Glynn (2006) critical appraisal tool was applied to evaluate this study. While the authors clearly described the data collection methods, the authors did not address the possible subjectivity with the chatbot's interpretation of user inquiries based on which intents were triggered. The authors created the chatbot with the aim to assist students after live chat reference hours; however, they did not clearly identify inclusion and exclusion criteria, namely the user's affiliation with the university (e.g., student, faculty, alum). The authors noted that the chatbot collects data from suggestion chips (i.e., predefined options for users to select from an automated prompt), which can offer more in-depth analysis of user satisfaction. This study did not analyze the suggestion chip data, although the authors may plan to investigate in the future. Although the authors did not evaluate the results of user interactions with the chatbot, the study serves as a proof of concept regarding the development of a virtual reference AI chatbot at an academic library.

The authors addressed that one major area for additional research is user engagement with the chatbot. With only 10% of users engaging with the chatbot beyond an initial response, the authors noted the necessity to explore ways to understand user perceptions of chatbot services, cultivate users'

assurance of the chatbot's ability to meet their needs, and build the chatbot's natural language capabilities to deliver targeted content to users.

This study provided insights into how academic libraries can develop a chatbot with limited training, technical knowledge, and resources. The authors clearly outlined methods and practices for other libraries of nearly any type to incorporate chatbots in their virtual reference services. Successful chatbot developments could create a precedent for other libraries to follow, bridging the potential gaps and costs with chatbot adoption such as lack of technological familiarity among library staff (Guy et al., 2023). This study provided adaptable guidelines and considerations for other libraries to create and customize their own chatbots, making it possible for follow-up research across multiple institutions to investigate and apply the potential benefits and challenges of chatbot reference services.

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