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Implementing AI Chatbots in Academic Libraries*

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Contents

ABSTRACT

The rapid advancement of artificial intelligence (AI) is driving innovation across the field of information services, and academic libraries are increasingly adopting AI chatbots. The Web Services Team at the University of Oklahoma Libraries initially developed an in-house chatbot leveraging natural language processing based on question and answer data collected from interactions between librarians and users. They later transitioned the system to Ivy.ai. Through a semi-structured interview, this study presents an analysis of the development and implementation of the libraries' AI chatbot focusing on the adoption process, challenges, and internal organizational dynamics. The findings indicate that successful chatbot implementation requires not only technological development but also efforts to alleviate organizational concerns about change and to cultivate a collaborative culture. These results offer practical implications for libraries and institutions considering the adoption of AI chatbots and contribute to the theoretical foundation for understanding organizational acceptance of evolving AI technologies.

Keywords: Artificial Intelligence, Chatbot, Academic Library, Library Service, Challenge

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1. Introduction

The unprecedented advancement of artificial intelligence (AI) in recent years has generated innovations across diverse industries and sectors, fundamentally reshaping how problems are approached and solved. Academic libraries are no exception, as they increasingly explore ways to enhance services through AI applications. Cox et al. (2019) note that AI has the potential to impact multiple aspects of libraries, including search and recommendation systems, customization, and text and data analysis. Gujral et al. (2019) highlight AI's role in data curation, digital preservation, and improving scholarly communication, while Lund et al. (2020) emphasize librarians' growing interest in integrating AI into cataloging and discovery systems. Similarly, Wang et al. (2023) point out that AI's influence extends beyond user-facing services, offering opportunities to streamline routine operations such as cataloging, shelving, and sorting, thereby improving efficiency. Moreover, AI can enhance digitization efforts and retrieval precision, conserving resources and reducing reliance on physical storage and manual labor.

In today's rapidly changing information environment, academic libraries continue to face the challenge of providing user-centered services that meet evolving expectations. With proper attention to privacy and security, AI chatbots present a promising means of streamlining operations, enhancing service delivery, and improving user satisfaction. The introduction of ChatGPT in late 2022 has further intensified global interest in AI chatbot services, sparking a surge of research on their potential applications in libraries (Aithal & Aithal, 2023; Lund & Wang, 2023). In response to the global surge in AI innovation, an growing number of institutions, including academic libraries, are adopting AI chatbots.

Since 1890, the University of Oklahoma (OU) has been the state's flagship institution, offering more than 170 degree programs across its Norman, Tulsa, and Oklahoma City campuses. Serving more than 2,600 full-time faculty and 31,000 students across 20 colleges, OU Libraries, one of the leading academic libraries in the United States, provides essential support for teaching, research, and learning. Wheatley and Hervieux (2019) included OU as one of twelve American universities serving as AI hubs because it showed clear evidence of AI engagement and offered a meaningful case study for AI in academic libraries. In addition, OU Libraries played a pioneering role by adopting an AI chatbot as early as 2018, ahead of most academic institutions. Following Yin (2018)'s case study design, this study investigates the implementation of an AI chatbot in OU Libraries to trace its process and derive insights that may inform similar initiatives in other academic institutions. Although this study examines AI chatbot prior to the emergence of generative

AI, it offers valuable insights into how institutions navigate the process of adopting new technologies. The following research questions guide this study.

- RQ1. What processes did OU Libraries undergo in adopting an AI chatbot?
- RQ2. What challenges arose in implementing an AI chatbot, and how were they addressed?
- RQ3. What factors should academic libraries consider when implementing an AI chatbot?

2. Theoretical Background

2.1 History of Chatbots

In 1950, a mathematician and computer scientist Alan Turing posed the question “Can machines think?” and introduced what became known as the Turing test, or the “Imitation Game,” to evaluate whether a machine could be distinguished from a human (Turing, 1950). This idea was often regarded as the conceptual origin of chatbots. In 1966, Joseph Weizenbaum developed ELIZA, a simple program designed to simulate a psychotherapist by generating responses to user input (Weizenbaum, 1966). Since then, numerous chatbots have been created. Initially confined to main-frame systems, chatbots later transitioned to desktop computers and eventually became widely available as cloud-based applications on websites (Ehrenpreis & DeLooper, 2022). One notable example was ALICE, developed in 1995, which won the Loebner Prize, an annual Turing Test competition, in 2000, 2001, and 2004. Recognized as the “most human computer,” ALICE relied on a rule-based, pattern-matching algorithm built on the Artificial Intelligence Markup Language (AIML) (Wallace, 2009; Marietto et al., 2013).

Chatbot systems have generally been developed using two main approaches: scripted programming and natural language processing (NLP) (Pereira & Díaz, 2018). The scripted approach operated within a rule-based framework, which restricted the scope of conversation. In contrast, the NLP approach applied artificial intelligence principles to simulate human-like interaction, enabling engage-ment across a broader range of topics (Rivolli et al., 2019). Thus, chatbots aimed to replicate human conversation with end users, a goal advanced through NLP technologies that enabled computers to interpret text and speech in ways similar to human understanding (McNeal & Newyear, 2013).

2.2 Chatbots in Libraries and Higher Education

European countries played a leading role in adopting chatbots into library services, and Stella, developed in 2004 at the Bibliothekssystem Universität Hamburg, is recognized as the first library chatbot (Allison, 2012). Other chatbots in European libraries included Askademicus which began to support users on the library's website at the Technische Universität Dortmund around the same time, INA which has been in operation on the Bücherhallen Hamburg website since 2006, and Kornelia, the first public library chatbot, which has been at the Kornhaus Bibliotheken in Bern, Switzerland since 2010 as a virtual assistant (Ehrenpreis & DeLooper, 2022; McNeal & Newyear, 2013).

In the United States, Lillian, known as Chatbot 2.0, was introduced at the Online Computer Library Center (OCLC) in 2006. Yet, it remained a prototype intended to support the development of other chatbots, and whether Lillian was accessible to the public was not clear (Christensen, 2007; McNeal & Newyear, 2013). The Mentor Public Library in Mentor, Ohio, USA, provided an AIML-based chatbot service from 2009 to 2012. The chatbot, named Emma the cat, was well received by library staff and patrons. Emma answered general questions and searched library catalogs, other databases and websites, and eventually won the Public Library Association's Polaris Innovation in Technology John Iliff Award in 2011 (McNeal & Newyear, 2013).

The adoption of chatbots by academic libraries in the United States occurred at a slower pace relative to other regions. Pixel, the first chatbot, was developed in 2010 at the University of Nebraska-Lincoln. Pixel provided answers to questions written in natural language, and generated answers by matching keywords and their combinations in the AIML categories database. The categories provided responses to specific questions, and routed unresolved or complex inquiries to library staff for further assistance. The primary difference between Pixel and existing tools was that Pixel provided an interactive experience that simulated a reference interview, and gave immediate answers based on the syntax of the query that could bring library resources together (Allison, 2012).

The University of California, Irvine (UCI) developed its library chatbot in 2014 using Program-O, which offered features such as spell checking, customizable bot personality settings, SRAI lookup and easy management of botmaster account management (Kane, 2016). Its statistics on the resources and services that patrons requested from the chatbot provided useful resource information for library staff. In addition, chatbot programmers could continue to grow the system by analyzing how library users interacted with the chatbot.

The University of Oklahoma (OU) Libraries' chatbot, Bizzy, went live in July 2019 using Ivy.ai (University of Oklahoma Libraries, n.d.). Bizzy could process natural language and conduct conversations effectively because natural language processing was driven by a human-supervised deep learning algorithm. Using a vast and highly curated set of training data, Bizzy was able to predict user needs and deliver corresponding responses.

In 2019, Lehman College's Leonard Lief Library at the City University of New York initiated its chatbot implementation by participating in the Ivy chatbot software pilot in collaboration with the college's Information Technology (IT) department. They prepared to install Ivy, the same software used by OU Libraries, during the fall semester of 2019, and the chatbot was launched in November 2019 (Ehrenpreis & DeLooper, 2022).

Chatbot implementation was also undertaken by San Jose State University and the Penn State University Libraries as part of their service innovations. In September 2020, San Jose State University Library released Kingbot, which was created with Kommunicate, a proprietary software, utilizing Google's Dialogflow. Kingbot was active from 7 PM to 9 AM on weekdays and from 5 PM to 1 PM on weekends (Rodriguez & Mune, 2021; Rodriguez & Mune, 2022). In February 2023, Penn State University Libraries launched its library chatbot, which utilized Springshare, and the chatbot was active when a live operator was not online (Reinsfelder & O'Hara-Krebs, 2023).

Although the exact launch dates were not available, the library websites of the University of South Florida Libraries, and Florida International University Libraries offered library chatbot services. Some libraries, such as the University of Delaware Library and the Georgia Southern University Libraries, have experimented with large language model (LLM) – based systems such as ChatGPT 3.5. The University of Delaware developed UDStax, a pilot chatbot designed to assist users with general inquiries and navigation of library resources. Similarly, Georgia Southern University Libraries launched GUS, a ChatGPT-based chatbot introduced as part of a broader exploration of AI in higher education (Li & Coates, 2024). Table 1 provides examples of chatbot implementations in academic libraries in the United States.

〈Table 1〉 Examples of Chatbot Implementation in Academic Libraries in the U.S.

Year/Month	Academic Library	Chatbot	Tool	State	Source
2011	University of Nebraska-Lincoln	Pixel	Program-O	Nebraska	Allison(2012)
2014	University of California, Irvine (UCI) Library	Ask a Librarian	Program-O	California	Kane(2016)

Year/Month	Academic Library	Chatbot	Tool	State	Source
2018	University of Oklahoma Libraries	OU Libraries' In-house Chatbot	API.AI	Oklahoma	Lee(2024)
2019/7		Bizzy	Ivy.ai		
2019/11	Leonard Lief Library at Lehman College (City University of New York)	Lehman Lightning Bot	Ivy.ai	New York	Ehrenpreis and DeLooper(2022)
2020/9	San Jose State University Library	Kingbot	Kommunicate utilizing Google's Dialogflow	California	Rodriguez and Mune(2022)
2023/2	Penn State University Libraries	Penn State University Libraries chatbot	Springshare	Pennsylvania	Reinsfelder and O'Hara-Krebs(2023)
-	University of Delaware Library	UDStax	ChatGPT 3.5	Delaware	UD Library, Museums and Press(n.d.)
-	University of South Florida Libraries	LINK AI Chatbot	-	Florida	University of South Florida Libraries(n.d.)
-	Georgia Southern University Libraries	GUS	ChatGPT 3.5	Georgia	Li and Coates(2024)
-	Florida International University Libraries	FIU Libraries Chatbot	-	Florida	Florida International University Libraries(n.d.)

Note. A dash (-) is used where the element is not applicable.

2.3 Advancements in AI Chatbots

Panda and Chakravarty (2022) state that chatbots hold promise for introducing a novel facet to virtual reference services, presenting libraries a reliable option to provide assistance to their users. Moreover, the advancement of chatbots has been accelerated by progress in machine learning and natural language processing (NLP), which has enabled the development of conversational and generative AI models capable of dynamic, context-aware, and human-like communication (Levy, 2023). Adetayo (2023) suggests that one solution can be ChatGPT because of its ability to generate vivid and various answers to user input and to provide relevant and interesting answers to user questions. ChatGPT represents a machine learning system capable of autonomously learning from data and generating advanced, intelligent writing following training on an extensive dataset of text (Van Dis et al., 2023). This sophisticated technology serves as a versatile conversational agent, rendering it highly desirable for customer service, chatbots, and various other applications

(Gilson et al., 2022).

In academic libraries, ChatGPT has the potential to be an invaluable resource for students by supporting problem-solving, essay writing, and providing feedback on their work (Adetayo, 2023). Therefore, the capacity to generate narrative responses to user queries introduces novel possibilities, such as operating as a simulated reference librarian during reference interactions. According to Friedman (2022), the response of ChatGPT has been overwhelmingly favorable, with an increasing number of experts foreseeing that the technology will eventually supplant Google. Aithal and Aithal (2023) suggest that the integration of AI-based ChatGPT technology within higher education libraries yields both advantageous and detrimental outcomes. Positively, ChatGPT enables prompt and precise responses to student inquiries, thereby liberating staff resources for more intricate tasks. Furthermore, its utilization extends the library's accessibility to students beyond conventional operating hours, broadening its outreach. Nonetheless, the implementation also raises concerns, including potential workforce displacement among library staff and apprehensions regarding privacy and security in AI-driven systems. Moreover, the inability of ChatGPT to deliver personalized assistance at the same level as human counterparts may impinge upon the overall quality of the student experience. Panda et al. (2024) also note that while ChatGPT has the potential to transform various library functions, it carries risks related to misinformation, privacy, and data misuse.

According to Aboelmaged et al. (2025), research on chatbots in library contexts remains nascent yet rapidly expanding. This growth is evident in recent studies. Ehrenpreis and DeLooper (2025) show that upgrading Ivy.ai with the ChatGPT API improved accuracy and contextual responses. Hazarika and Konch (2025) also report similar improvements with LibraryGPT, though they emphasize the need for strong data quality and ethical oversight.

Although prior research has examined the potential applications of AI in libraries, much of the literature has focused on user-centered perspectives, with limited attention given to the institutional processes behind chatbot adoption and integration. Few studies have explored how libraries manage the practical challenges of implementing chatbots, particularly from the perspective of the library staff. Through an interview with the former Head of Web Services and Artificial Intelligence at OU Libraries, who played a central role in developing the in-house AI chatbot and later implementing Ivy.ai, this study addresses the gap by providing an insider perspective on the implementation process.

The findings of this study contribute practical guidelines for academic libraries and other institutions planning to adopt AI chatbots. By identifying the challenges of chatbot implementation and the

strategies used to overcome them, the study enables library administrators to better anticipate obstacles and prepare effective implementation plans. The recommended management practices also offer guidance for institutions already providing chatbot services, helping them to optimize performance and efficiency. Furthermore, this study lays a groundwork for future research on AI chatbot and their capacity to improve library services.

3. Method

3.1 Interview

In this study, an interview was used as a data collection method. The interview strategy was semi-structured, enabling the integration of both predetermined questions and those that evolved through the interview process. This flexible approach facilitated the exploration of topics in greater depth and allowed for follow-up inquiries whenever additional clarity was needed. With limited time available for Zoom interview, prepared questions were helpful in keeping the researcher focused on the topics to be covered. The interview questions, as shown in Table 2, were structured as follows: background of the AI chatbot implementation, process of AI chatbot adoption and integration, and future considerations. Given the limited availability of interview-based studies on AI chatbot implementation, the development of the interview protocol drew upon existing research on the adoption of emerging technologies, with particular reference to virtual reality applications in academic library environments. The sections addressing the background drew upon Suen et al. (2020)’s study, while the sections related to processes and future considerations were guided by Cabada et al. (2021)’s work.

Following Kari (2006)’s single case study approach, which emphasizes that focusing on a single participant enables a holistic and contextually embedded understanding in underexplored areas and can reveal developmental dynamics effectively, this study conducted an in-depth interview with a key individual involved in the development and implementation of the AI chatbot, allowing for a deeper understanding of the institutional context. The former Head of the Web Services and Artificial Intelligence at OU Libraries was contacted via email with an invitation to participate in an interview. This individual was considered the most suitable candidate for the study, having been directly involved in and overseeing all stages of the process since 2017, a period when AI chatbots were still very rare. With a strong background in software engineering and web

development, this person provided technical leadership and strategic oversight, coordinating the development and integration of the libraries' AI chatbot and related web services. After explaining the purpose of the study and obtaining informed consent, a one-hour interview was conducted using Zoom on January 18, 2024, and the entire session was recorded.

〈Table 2〉 Interview Questions

Category	Question Asked
Background of AI Chatbot Implementation	① At what point did you first begin considering the implementation of an AI chatbot at OU Libraries? ② Whose idea was it to first introduce an AI chatbot at OU Libraries? ③ What were the goals of implementing an AI chatbot at the libraries?
Processes of AI Chatbot Adoption and Integration	① How long did it take to implement an AI chatbot? ② Could you explain the steps involved in the AI chatbot implementation? ③ How was the budget for the AI chatbot implementation covered? ④ Who participated in this chatbot project? ⑤ Why did you choose Ivy.ai instead of other chatbot options? ⑥ What were the challenges in implementing the AI chatbot?
Future Considerations	① What are your thoughts on the future of the AI chatbot? ② Do you have any suggestions for organizations looking to implement chatbots?

3.2 Data Analysis

The researcher repeatedly reviewed the recorded Zoom interview video to verify the transcripts, which was generated by the NAVER ClovaNote, and made necessary corrections if errors were found. First, descriptive analysis was employed to organize and summarize the interview. Second, thematic analysis was conducted following Braun and Clarke (2006)'s approach to extract major themes from the interview data through systemic reading, coding, and grouping.

3.3 Validity of the Study

Multiple strategies were employed to ensure the validity of this study. First, chatbot log data provided verifiable records of user interactions. These logs enabled the researcher to corroborate the interview participant's accounts with system activity and temporal information, reducing the risk of recall bias. Second, the researcher contacted a faculty member who had contributed to the chatbot's early development phase. Through a series of email exchanges and in-person discussions, detailed information was obtained about the extent of the professor's involvement. Third, the

researcher cross-checked information with multiple stakeholders. Members of the Web Services Team, including another web developer and a content specialist, worked together to verify uncertain dates. Additional library staff from various departments were also consulted to verify project milestones and institutional decisions. This triangulation and member‐checking process strengthened the credibility of the findings by ensuring consistency across data sources.

4. Findings

4.1 Descriptive Analysis

4.1.1 Background of AI Chatbot Implementation

The idea to implement an AI chatbot at OU Libraries emerged from the recognition of limitations in the existing live chat service through which librarians and help desk staff provided responses to incoming questions. Since the live chat was only available when the library staff members were working, OU Libraries needed a way to help users in the evenings and on weekends. The AI chatbot was implemented to provide continuous, real-time assistance, allowing students and faculty could get support around the clock.

The initial proposal to adopt an AI chatbot came from the former Interim Dean of the OU Libraries, whose forward-thinking vision aligned with the institution's commitment to innovative service delivery. As the main library within OU Libraries, Bizzell Memorial Library underwent a major renovation and modernization that transformed it from a traditional book-centered facility into a dynamic, user-focused research and support hub. Building upon this transformation, the library's leadership sought new ways to further advance user engagement. During collaborative brainstorming sessions, the concept of implementing an AI chatbot emerged as a progressive next step. At that time, chatbot technology was still novel, and no comparable solutions were identified in other university libraries, prompting the decision to develop an in-house system from the ground up.

The implementation of the AI chatbot was driven by two primary objectives. The first was to extend service hours beyond conventional library operating hours, ensuring timely assistance for users studying late or working outside regular service hours. The second was to support individuals who might feel uncomfortable seeking assistance from library staff in person. The chatbot project proved to be highly successful and widely used. Once it was launched, usage was consistent

around the clock, with no hour passing without questions being asked.

4.1.2 The Processes of AI Chatbot Adoption and Integration

Period. The implementation of an AI chatbot at OU Libraries took approximately eight months, with about six months devoted to building the technology. Since no ready-made solutions were available at the time, the Web Services Team started from scratch, leveraging existing tools to build a functional system. After the initial deployment, continuous adjustments and enhancements were made to improve performance and usability.

During this period, the following processes were undertaken, with each posing specific challenges that were overcome in turn.

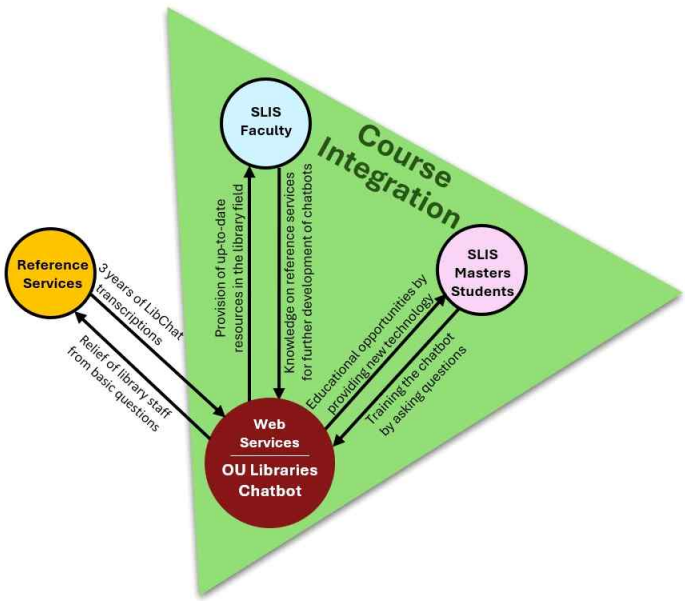
Decision-Making Process. The decision-making process for adopting AI chatbot involved considerable deliberation, because library staff showed resistance to it. Their hesitation was heightened after the interviewee's 2018 American Library Association (ALA) Midwinter presentation, where discussions of artificial intelligence in libraries sparked negative feedback on social media and raised concerns about potential job displacement. These reactions spread among OU library staff and amplified apprehension toward the project. To overcome this resistance, the library leadership emphasized transparency and trust-building. They organized multiple rounds of meetings, from one-on-one discussions to large group sessions, to clarify the chatbot's purpose, the scope of data collection, and its limitations. These meetings also included participatory decisions such as naming the chatbot "Bizzy" and conducting polls on acceptable practices for question-answer scenarios. Such collaborative efforts helped build trust, secure institutional consensus, and ensure that the chatbot was perceived as enhancing rather than replacing human labor.

> "We wanted to make sure everybody was on board, so there was a series of meetings with the librarians and those that would be involved or affected."

Initial Development. OU Libraries initially developed its own AI chatbot using API.AI (later renamed Dialogflow after Google's acquisition in 2017), as no ready-made solution was available at the time. Lacking advanced natural language processing (NLP) resources, the team began with a limited API.AI database capable of handling only simple conversational exchanges. To enhance the system's relevance to library users, three years of LibChat transcripts were reformatted into JSON files and incorporated into the brain of the chatbot. This process required extensive customization and technical effort, but through continuous refinement, OU Libraries successfully built

an AI chatbot tailored to the institution's specific information and reference service needs.

Before the official launch, the AI chatbot was operated for approximately six months in a restricted environment accessible only to authorized individuals, including library staff and master's students in the School of Library and Information Studies (SLIS) at the University of Oklahoma. During this pilot phase, continuous testing and improvements were conducted through close collaboration between the library's Web Services Team, SLIS faculty, and students. In several master's courses, the Web Services Team demonstrated the chatbot under development, illustrating how AI technologies could be applied in library contexts. These sessions encouraged SLIS students to actively engage in training activities by posing questions to the chatbot, thereby expanding its knowledge base and improving its responsiveness. Collaboration with SLIS faculty further enhanced the chatbot's reference functions by integrating their subject expertise. Collectively, these joint initiatives between OU Libraries and SLIS members not only facilitated the chatbot's successful development but also supported its ongoing refinement and performance improvement (Figure 1).



〈Figure 1〉 Collaboration in Developing OU Libraries' AI Chatbot

Changing to Ivy.ai. OU Libraries adopted Ivy.ai, a third party solution after operating the in-house AI chatbot. The experience of building the system internally served as an important foundation for the integration of this external platform. The move to Ivy.ai was largely motivated by the

increasing maintenance demands of the in-house system, which required frequent manual updates to keep pace with user inquiries. Ultimately, Ivy.ai's ability to offer a customizable, privacy-conscious, and less labor-intensive platform made it a preferable long-term solution despite its financial cost.

> "We chose Ivy.ai because, they took a lot of our input...and would change things on their end to fit what we needed. Being an early adopter of their platform, we were able to make some changes to fit something specifically for us...And we were impressed by the privacy. Privacy was so important to the libraries, and Ivy.ai offered us a solution that we could keep the same requirements as far as regarding how much data was being collected."

Maintenance. When the chatbot could not answer the questions, several approaches were used to address the issues. If the answers could be easily given, the library staff provided responses immediately. If prompt replies were needed but the answers were unknown, the questions were posted to the Web Services Team via Slack, a cloud-based collaboration and communication platform designed for teams and organizations, where colleagues either answered the questions themselves or directed to the appropriate person who could provide accurate answers. For the questions that were not urgent, unanswered questions were discussed during the Weekly Web Services Team Meeting, and answers were provided afterward.

> "Once it was launched and running smoothly, the entire Web Services Team essentially had a role in maintaining it. In particular, one of our team members handled much of the work—monitoring the system, ensuring that questions were being answered correctly, and doing spot checks."

Budget. The development phase initially required no external funding, as the work was handled internally. However, when the decision was made to adopt Ivy.ai, the necessary budget was drawn from the library's technology budget.

Team. The project team consisted of six members: the Interim Dean, who also served as the Chief Technology Officer (CTO) of OU Libraries; the Head of Web Services; two web developers; a content specialist; and the researcher, who contributed to the project as a graduate research assistant. Responsibilities were distributed across the Web Services Team, with team members overseeing tasks such as adding new questions, checking response accuracy, and monitoring the chatbot's performance.

4.1.3 Future Considerations

Future Considerations for OU Libraries. In envisioning the future of AI services at OU Libraries, the Web Services Team considered several expansions beyond the initial chatbot project. One of the initiatives involved developing a voice-search tool using Amazon Alexa. This tool aimed to allow users to verbally query library platforms such as Primo and LibGuides using natural language. The pilot project, which translated spoken input into search intents through NLP and connected to vendor APIs, was positively received during student testing. Despite this, the library ultimately chose not to pursue further due to broader concerns surrounding the use of Alexa in campus settings. Another potential enhancement involved integrating the chatbot with the library's room and equipment reservation systems. Since the necessary infrastructure already existed on the website, this integration required minimal additional effort. However, shifting priorities such as a full website redesign led to the postponement of that feature.

Future Prospects. Looking ahead, the evolution of user behavior and preferences continues to shape the direction of library services. Generational shifts suggest a movement from traditional text-based searches toward voice-driven and conversational interfaces. Younger users, who are increasingly comfortable with voice assistants and natural language interaction, are likely to expect similar experiences from library systems. With the rise of generative AI technologies like ChatGPT, Gemini, and Dolly, there is growing potential to enhance chatbot responsiveness and make interactions feel more intuitive and human-like. In addition, video-based content is becoming more dominant in online search ecosystems. Although not yet fully leveraged within academic libraries, video responses may represent a future direction for user engagement, especially as conversational platforms evolve toward more multimedia-rich communication.

Recommendations for Effective Chatbot Implementation. For institutions planning to implement AI chatbots, it is important to align development with organizational goals. A thoughtful, needs-based approach is essential, involving collaboration with subject matter experts who possess institutional memory and insights into user behavior. This ensures that the chatbot can evolve alongside changing demands and provide meaningful support.

4.2 Thematic Analysis

4.2.1 Enhancing Library Accessibility and Service Efficiency

The central rationale for developing the AI chatbot was to provide equitable, around-the-clock access to library assistance. The participant explained that the existing live chat, while effective

during library opening hours, failed to serve students conducting research late at night. The interviewee noted:

> "We wanted something that everybody could participate in, whether they were doing research at two in the afternoon or two in the morning."

The introduction of the chatbot service allowed students to access assistance without time limitations. Its 24/7 availability was regarded as a major improvement in service efficiency and inclusivity.

4.2.2 Managing Organizational Resistance

Initial organizational resistance rooted in concerns about automation and role displacement. Library staff feared that automation could undermine the value of human service.

> "Some librarians were worried that the chatbot might replace part of their work or make human interaction less valued."

Over time, staff who were initially skeptical came to view the chatbot as a complementary tool rather than a threat to human roles. This gradual shift was supported by clear communication, mutual trust, and opportunities for shared engagement throughout the implementation process.

4.2.3 Organizational Learning and Adaptation

The implementation process operated as a learning environment, with continuous experimentation fostering progressively greater staff engagement.

> "We let librarians use the AI chatbot for six months...so they could get familiar with it and help shape it."

Through repeated testing and collaborative engagement, library staff improved their digital literacy and adaptability.

4.2.4 Building and Transitioning Toward Sustainability

While initial in-house development demonstrated innovation, system maintenance required con-

stant manual updates. Ultimately, the team partnered with Ivy.ai to ensure stability.

> "We built it ourselves...later we moved to Ivy.ai so we could take a more hands-off approach going forward."

The transition demonstrated a practical balance between innovation and sustainability by outsourcing maintenance while continuing to uphold privacy standards. This change allowed the small team to devote more attention to improving the library's web-based services.

4.2.5 Innovation Diffusion

The chatbot project not only benefited OU Libraries but also had a broader impact, as the Web Services Team supported other academic libraries and public libraries in initiating their own chatbot projects and thereby contributed to the wider community.

> "We helped other universities...We walked them through how we did it and helped them get their own off the ground."

5. Conclusions

This study examined the implementation of an AI chatbot at OU Libraries, tracing its evolution from an in-house chatbot to a sustainable system supported by Ivy.ai. The adoption process reflected both technological innovation and organizational learning within an academic library setting. Findings show that the adoption of an AI chatbot at OU Libraries followed a multi-stage process that began with identifying limitations in its live chat service and developing an internal system using API.AI trained on three years of interaction data. A six-month internal pilot testing involving library staff and master's students in the SLIS enabled iterative refinement and expanded collaboration. The transition to the Ivy.ai platform ensured privacy protection and sustainability. The implementation also confronted both technical and organizational challenges: staff concerns about automation and job displacement, and technical constraints related to limited NLP capacity and data preparation. These challenges were addressed through transparent communication and collaborative problem-solving, which fostered trust and enhanced system performance.

Institutions planning to implement AI chatbots should align development with organizational

goals and adopt a needs-based approach grounded in collaboration and continuous evaluation. Successful implementation requires forming a dedicated project team composed of developers, information studies majors, and senior administrators to ensure effective development, monitoring, and organizational support. Clear accountability structures are also essential for managing unanswered questions and routing user inquiries efficiently, thereby maintaining service reliability and user trust. Moreover, analyzing chatbot interaction data can guide improvements in website navigation, content organization, and chatbot functionality, helping libraries keep these systems aligned with user needs and strengthening overall service quality.

This study has several limitations. First, the findings are drawn from a single institution, OU Libraries, which may limit the generalizability of the results to other contexts. Second, since the interview was conducted approximately six years after the initiation of the chatbot project, the study relied in part on the interviewee's recollection. Nevertheless, several strategies were employed to enhance the validity of the study. Chatbot log data provided verifiable records, enabling the researcher to cross-check the participant's accounts and thereby reduce recall bias. Triangulation was further strengthened through consultations with a faculty member, Web Services Team members, and other involved library staff to verify project details.

Based on an interview, this study provides an early stage of AI chatbot adoption at OU Libraries. Future research should include additional perspectives from staff, administrators, and users, as well as comparative studies across institutions, to build a broader understanding of chatbot implementation. Further studies can also utilize user surveys and chatbot log data from generative AI to evaluate user experiences more comprehensively. While limited in scope, the study offers practical insights that can guide other institutions in adopting AI chatbots and lays a foundation for future research as these technologies continue to evolve and shape the landscape of library services.

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