

AURA – AI CHATBOT

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ABSTRACT

The increasing need for real-time, interactive customer support and instant information access has fueled the rise of AI-powered chatbots. This paper explores the development of an intelligent Question-Answering (QA) chatbot that harnesses Google's Generative AI API, seamlessly integrated into a user-friendly Streamlit interface.

At its core, the chatbot is built on the powerful "Gemini Pro" model, enabling it to understand user queries and provide relevant, context-aware responses in a natural, conversational manner. It not only processes user inputs effectively but also maintains a conversation history, ensuring a smoother and more engaging interaction over time.

Designed for accessibility and efficiency, this solution enhances human-computer communication, making real-time support scalable across various domains. By leveraging modern generative AI, the chatbot transforms the way users interact with web-based applications, offering quick, reliable, and intuitive responses tailored to their needs.

INTRODUCTION

In today's digital landscape, chatbots have become an indispensable tool for providing instant, automated customer support. With the integration of artificial intelligence (AI), these systems have evolved to understand and respond to even the most complex queries, making interactions more seamless and intuitive. This project introduces an AI-powered Question-Answering (QA) chatbot designed to deliver real-time, intelligent responses using Google's Generative AI API. Built with Streamlit, a widely used framework for interactive web applications, the chatbot offers a user-friendly interface that ensures a

smooth and engaging experience. At its core, the chatbot leverages the advanced capabilities of the **Gemini Pro** model to process user inputs and generate meaningful, context-aware responses. The system doesn't just provide instant answers—it maintains a conversation history, allowing users to engage in more dynamic and coherent discussions. This feature ensures that follow-up questions are understood within the right context, enhancing the chatbot's responsiveness and accuracy. One of the key strengths of this chatbot is its real-time streaming capability. As users interact, responses are generated dynamically, creating a more fluid and natural conversation. The chatbot continuously processes inputs, refines its understanding, and delivers relevant answers without delays, making the interaction feel more human-like.

Beyond automating customer support, this project highlights the transformative power of AI in reshaping web-based communication. By integrating Google Generative AI with Streamlit, the chatbot showcases how modern AI models can simplify and enhance digital interactions. Whether used for customer service, information retrieval, or general assistance, AI-driven systems like this one can significantly improve user engagement, reduce response times, and elevate overall satisfaction.

IMPLEMENTATION

The implementation of the AI-powered QA chatbot begins with setting up a secure and well-structured environment. Ensuring the security of sensitive information, such as API keys, is a top priority, which is achieved using the **Dotenv** package. This allows the application to store environment variables in a `.env` file rather than hardcoding them in the source code, ensuring security while keeping the API key accessible throughout the application via `load_dotenv()`. Once the environment is set up, the chatbot's user

interface is built using **Streamlit**, a powerful framework for interactive web applications. The interface is designed to be intuitive, starting with a header and a welcoming message created using `st.header()` and `st.markdown()`, inviting users to interact. A text input field allows users to enter queries, and a submit button triggers the chatbot to process the input and generate a response, creating a smooth and user-friendly experience. To maintain conversation history and context, the chatbot utilizes **Streamlit's session state**, which enables it to store and track user interactions throughout the session. Each time a query is submitted, the chatbot updates the chat history by appending the user's question and the AI-generated response to a stored list. This feature ensures that users can engage in more dynamic and coherent conversations, as previous interactions are retained and displayed in an expandable section. The chatbot's intelligence is driven by **Google's Generative AI (Gemini Pro)**, which processes user queries and generates contextually relevant responses. Instead of making users wait for the full response to load, the chatbot incorporates a **streaming feature** that displays responses in real-time as they are generated. The chatbot fetches responses using the `get_gemini_response()` function, which communicates with the AI model and processes the returned data. Using `st.write()`, each chunk of the response appears progressively, ensuring a fluid and engaging conversation. At the same time, the chatbot updates the conversation history, allowing users to review past interactions easily.

A crucial aspect of the chatbot's design is **error handling**, ensuring that unexpected issues—such as API failures or processing errors—do not disrupt the user experience. If an error occurs, the chatbot displays a user-friendly message instead of crashing, helping users understand that the issue is temporary. The chatbot is also designed to be **flexible and customizable**, with the potential for future enhancements such as **multi-language support, personalized responses, or domain-specific adaptations**. These improvements would enable the chatbot to handle more complex interactions and cater to a diverse user base more effectively.

Once the core functionality is in place, the chatbot is deployed to a cloud platform such as **Heroku, AWS, or Google Cloud**, making it publicly accessible via a web URL. Deployment ensures that the chatbot is available around the clock, allowing users to interact with it whenever needed. To enhance accessibility, the chatbot is designed to be **fully responsive**, adapting seamlessly to different devices, including desktops, tablets, and mobile phones. This guarantees a consistent and user-friendly experience across all screen sizes. To give the application a polished and professional look, a **footer** is added using HTML and CSS. This footer, fixed at the bottom of the page, includes a credit line recognizing the developer or project creator, ensuring transparency and professionalism.

Through the integration of secure environment configuration, an interactive UI with Streamlit, Google's Gemini Pro for AI-powered responses, session management for tracking conversations, robust error handling, and seamless cloud deployment, this chatbot offers an engaging, efficient, and scalable solution for real-time question-answering. With its ability to maintain context, provide dynamic responses, and support future enhancements, the chatbot demonstrates how modern AI can revolutionize digital interactions, making web-based communication more intelligent, accessible, and user-friendly.

RESULTS

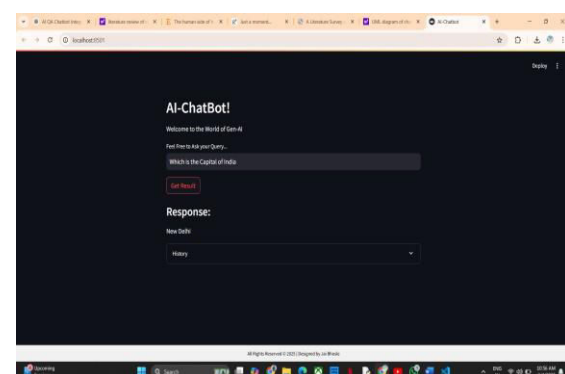


Fig – General Query

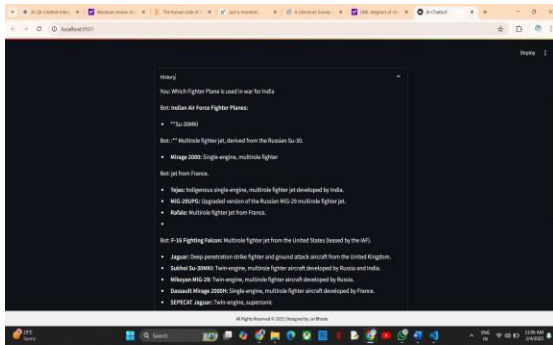


Fig – Stored History

CONCLUSION

The AI-powered QA chatbot has already demonstrated its ability to provide intelligent, real-time responses to user queries, but its true potential lies in future enhancements that could significantly improve its functionality and user experience. As technology advances, integrating features such as multi-language support, advanced natural language processing (NLP), personalization, and voice interaction will make the chatbot even more powerful, adaptable, and accessible to a wider audience. By customizing it for specific domains, incorporating external APIs, and adding visual elements, the chatbot could serve a variety of industries, from customer support to education and healthcare. Beyond improving its conversational abilities, strengthening error handling and implementing analytics would allow businesses to gain deeper insights into user behavior, helping refine and optimize interactions over time. These enhancements would not only elevate the chatbot's technical capabilities but also create a smoother, more intuitive, and engaging user experience. With continuous innovation, the chatbot has the potential to evolve into a sophisticated AI assistant, seamlessly assisting users across different contexts—whether as a customer service representative, a personal assistant, or an industry-specific knowledge resource. Looking ahead, the possibilities for growth and refinement are endless, positioning the chatbot as an essential tool in the ever-evolving landscape of AI-driven communication.

REFERENCES

- [1] **Caldarini, G., Jaf, S., & McGarry, K. (2022).** "A Literature Survey of Recent Advances in Chatbots." *Information*, 13(1), 41.
- [2] **Khosravi, H., Shafie, M. R., Hajiabadi, M., Raihan, A. S., & Ahmed, I. (2023).** "Chatbots and ChatGPT: A Bibliometric Analysis and Systematic Review of Publications in Web of Science and Scopus Databases." *arXiv preprint arXiv:2304.05436*.
- [3] **Gabashvili, I. S. (2023).** "The Impact and Applications of ChatGPT: A Systematic Review of Literature Reviews." *arXiv preprint arXiv:2305.18086*.
- [4] **Al-Amin, M., Ali, M. S., Salam, A., Khan, A., Ali, A., Ullah, A., Alam, M. N., & Chowdhury, S. K. (2024).** "History of Generative Artificial Intelligence (AI) Chatbots: Past, Present, and Future Development." *arXiv preprint arXiv:2402.05122*.
- [5] **Pérez-Soler, S., & Martínez-Monés, A. (2021).** "Are We There Yet? A Systematic Literature Review on Chatbots in Education." *Frontiers in Artificial Intelligence*, 4, 654924.
- [6] **Følstad, A., & Brandtzaeg, P. B. (2017).** "Chatbots and the New World of HCI." *Interactions*, 24(4), 38-42.
- [7] **Diederich, S., Brendel, A. B., & Kolbe, L. M. (2019).** "On Conversational Agents in Information Systems Research: Analyzing the Past to Guide Future Work." *Proceedings of the 40th International Conference on Information Systems (ICIS 2019)*.
- [8] **Fadhil, A., & Gabrielli, S. (2017).** "Addressing Challenges in Promoting Healthy Lifestyles: The AI-Chatbot Approach." *Proceedings of the 11th EAI International Conference on Pervasive Computing Technologies for Healthcare*, 261-265.
- [9] **Janssen, A., Passlick, J., & Breitner, M. H. (2020).** "Design and Evaluation of a Chatbot for Assisting Instructors in Higher Education." *Proceedings of the 28th European Conference on Information Systems (ECIS 2020)*.
- [10] **Smutny, P., & Schreiberova, P. (2020).** "Chatbots for Learning: A Review of Educational Chatbots for the Facebook Messenger." *Computers & Education*, 151, 103862.