

AI CHATBOT IN BANKING SUPPORT

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Abstract

This paper describes *AI Chatbot in Banking Support*, a fully implemented conversational system designed to improve customer engagement and streamline banking services. The chatbot facilitates user interaction through natural language, backed by secure login and registration functionalities with data stored in a PostgreSQL database. Integrated with OpenAI's GPT API and powered by a Spring Boot backend, the system delivers intelligent, real-time responses. A web-based interface manages the interaction cycle, while conversation logs are securely maintained for analysis and service optimization. The deployed chatbot demonstrates high response accuracy, strong integration, and practical value in real-world banking operations.

Keywords: Conversational AI, Chatbot, Banking Assistant, Spring Boot, OpenAI GPT, PostgreSQL, Digital Banking, Intelligent Automation.

1. INTRODUCTION

Digital banking is rapidly evolving, but many users still face challenges when navigating traditional interfaces that lack personalization and real-time support. In response, *AI Chatbot in Banking Support* was developed and deployed to address these gaps using artificial intelligence and natural language processing.

By leveraging transformer-based models [1], [2], [5], the system enables intuitive, human-like communication between users and banking services. It eliminates long wait times by providing instant support, even outside standard service hours [3].

Built using Spring Boot for backend APIs, PostgreSQL for data storage, and OpenAI GPT for response generation, the system delivers intelligent support while ensuring secure data handling. The chatbot has proven effective in improving customer satisfaction and operational efficiency across live deployments.

2. Literature Review

Many studies have shown that AI chatbots are useful in improving banking services by making customer support faster and more accessible. Researchers like Sharma et al. and Tiwari and Mishra have highlighted how chatbots can handle routine queries and offer personalized assistance. Salehan and Kim discussed how using AI in customer service builds trust and increases user satisfaction. Other studies, such as those by Følstad and Skjuve, explored how natural language processing (NLP) helps create better conversations between users and banking systems.

Technical research has also focused on the performance and security of chatbot systems. Jain et al. presented chatbot models for secure financial transactions, while Kvale et al. discussed how to measure chatbot effectiveness in the banking sector. Ethical concerns like data privacy and fair AI use were explored by Sivarajah et al. and Singh and Kulkarni. These studies support the development of AI-powered banking assistants, showing their potential to improve digital services while keeping users' information safe.

3. Methodology

The chatbot system was developed step by step, starting with the design of a simple and user-friendly interface where users can easily log in and access services. A secure user management system allows individuals to register and authenticate safely. Once logged in, users are directed to a clean dashboard that displays banking options and provides access to the chatbot.

The backend was developed using Spring Boot to manage user interactions and connect with OpenAI's GPT API. When users type messages, the chatbot sends the queries to the backend, which forwards them to the AI model. The system then displays the AI-generated responses instantly. All conversations are stored securely in a PostgreSQL database for performance tracking and continuous improvement.

The chatbot also supports key banking functions such as checking balances, viewing transaction history, fund transfers, and general inquiries. These services are integrated into the system to provide quick, real-time responses while ensuring user data privacy and security. The entire setup was tested thoroughly to ensure smooth operation, accuracy, and a helpful user experience.

CONCLUSION

AI Chatbot in Banking Support has been effectively deployed to transform how users interact with banking services. By combining AI-driven communication with secure system architecture, the chatbot offers fast, reliable, and user-centric support. Future updates will focus on predictive personalization, multilingual support, and expanded transaction services to further enhance user experience.

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