

**International Journal of
Engineering Research and Science & Technology**



ISSN : 2319-5991

www.ijerst.com

Email: editor@ijerst.com or editor.ijerst@gmail.com

ENHANCE BANK BOT SYSTEM

¹M.Chandana, CSE Dept, CBIT, Proddatur, chandanamadduru067@gmail.com

²M.Usha, CSE Dept, CBIT, Proddatur, ushamediga239@gmail.com

³M.Pavithra, CSE Dept, CBIT, Proddatur, pavithamekala47@gmail.com

⁴M.Meghana, CSE Dept, CBIT, Proddatur, meghana.moppe123@gmail.com

⁵P.Vineetha, CSE Dept, CBIT, Proddatur, pagidelavineetha@gmail.com

⁶P.Sushma, CSE Dept, CBIT, Proddatur, panditisushma0@gmail.com

⁷Dr.P.Pavan Kumar, Professor, CSE Dept, CBIT, Proddatur, pavankumar.palla@gmail.com

ABSTRACT:

The "**Banking Powerful Bot**" project represents a groundbreaking advancement in the realm of online banking, seamlessly integrating state-of-the-art web development technologies with the transformative power of artificial intelligence (AI) to deliver an unparalleled user experience. This innovative solution is designed to address the inherent limitations of traditional machine learning-based systems, which often struggle with scalability, adaptability, and real-time responsiveness. By leveraging a robust tech stack that includes **HTML**, **CSS**, **ReactJS**, **NodeJS**, **Python**, **SQL**, and **PHP**, the project creates a dynamic, scalable, and highly intuitive platform that redefines the way customers interact with their banking services. At its core, the Banking Powerful Bot is an AI-driven chatbot that serves as a virtual banking assistant, capable of handling a wide range of tasks with remarkable efficiency and precision. Unlike conventional systems, which rely on static algorithms and predefined workflows One of the standout features of the Banking Powerful Bot is its **personalized dashboard**, which provides users with a comprehensive overview of their financial activities. Built using **ReactJS** and, the dashboard is not only visually appealing but also highly functional, offering customizable widgets, real-time notifications, and intuitive navigation.

LITERATURE SUREVY:

The Bank Information Retrieval Assistant (BIRA) is an innovative chatbot developed on the Retrieval Augmented Generation (RAG) framework, leveraging LangChain and Streamlit

technologies to offer real-time, intelligent customer assistance. Utilizing the OpenAI API, BIRA uses data (English & Armenian) scraped from the ConverseBank and InecoBank websites to provide precise, on-demand responses to customer inquiries. Designed to operate 24/7, BIRA significantly enhances customer experience by delivering immediate and accurate responses concerning bank services and products, thus eliminating the need for customers to navigate through complex website structures. By automating interactions with a chatbot that understands and responds to user needs effectively, BIRA offers personalized, swift, and effortless assistance. Initially launched in English, the successful implementation led to the subsequent integration of Armenian language support, replicating all developmental stages to fit multilingual interactions and broaden user accessibility. This paper outlines the main objectives of BIRA, addressing common issues such as inaccurate search functionalities and poor user guidance on bank websites, and reflecting on the system's ability to substantially reduce customer service overheads. Looking forward, continuous enhancements are planned through updates to ChromaDB and the potential integration of a user feedback mechanism to dynamically improve response accuracy. These advancements will ensure BIRA remains at the cutting edge of technology, continually evolving to meet user expectations and expanding its impact within the banking industry [1].

Banking Bot is an Artificial Intelligence-based Chatbot. It works like an imaginary Assistant e.g. Siri, Cortana, etc. This Banking bot is particularly designed for operations related to banks that can comprehend customer queries and then reply accordingly. The main objective of this project is to use Natural Language Understanding (NLU) for the training of Chatbot. Whenever we have any bank-related problem or questions we have to go to the bank to sort out our problem, it is so time-consuming and takes a lot of effort; On the other hand, sometimes the bank staff is also very busy to give us their time. To sort out this problem we proposed a banking bot which can understand the people's queries and give valuable responses to the customers, online which saves the valuable time of customers and banking staff both. Customers can directly chat with the bot online to solve their queries and perform the task which they want. Besides understanding queries this bot can also perform transactions, adding a beneficiary, check balance, view history of customers, mini statement, account detail, fund transfer [2].

A Chat-bot is a computer program that you can talk to through messaging apps, chat windows or increasingly by voice. The Chat-bot replies using the same application creating a back and forth conversation. Chabot can now allow 24/7 customer service on simple matters, initiating

fund transfers, set up recurring payments, check bank statements and figure out a customer's spending habits among other things. The main purpose of this project is to analyze the basic queries that a customer has and asks on daily or routine basis and to provide the bot with those set of queries [3].

BONIK allows users to securely submit transactions and perform financial tasks like asking for the current balance. BONIK can validate each request against pre-defined access control rules codified in intelligent contracts thanks to the integration with the blockchain. User requests are honored if they are validated. The blockchain platform, chatbot, and dApp (Decentralized Application) are the three main components of this architecture. A blockchain platform is used to connect BONIK's chatbot to several important features and security features. Every financial activity in the system, including balance queries and money transfers, is carried out by this bank, and it is assumed that every user of the system has an account with the bank. Two intelligent contracts in the system provide business logic for handling user requests. The first is provided by the system, which is in charge of user login and registration, and the second is provided by the bank, which stores the business logic for financial transactions. Fabric refers to a smart contract as a chain code, and it can use transactions to invoke it. A user operates a peer to submit a transaction sent to the endorsers. The user receives a response. Docker containers are used to deploy the blockchain platform, with each container acting as one of these entities. A channel into which the chain code is deployed connects these entities. Kafka, which uses two additional orderer nodes to create and disseminate blocks, serves as the foundation for the consensus [4].

EXISTING SYSTEM:

The existing system for online banking primarily relies on **machine learning (ML) models** to automate customer interactions and provide personalized services. These ML models are typically trained on historical banking data to perform tasks such as fraud detection, customer segmentation, and predictive analytics. For instance, a chatbot powered by ML algorithms can handle basic customer queries, such as checking account balances or providing transaction summaries. However, this system has several limitations. First, traditional ML models often require extensive training data and may struggle to adapt to new or unforeseen scenarios, leading to inaccuracies in real-time interactions. Second, these systems are typically backend-heavy, with limited integration into user-friendly interfaces, resulting in a disjointed customer experience. Third, the lack of real-time responsiveness and scalability in ML-based systems

can hinder their ability to handle high volumes of concurrent users, especially during peak banking hours. Additionally, the existing system often lacks advanced features such as location-based services, personalized dashboards, and seamless integration with modern web technologies, which are increasingly demanded by today's tech-savvy consumers.

EXISTING SYSTEM DEMERITS:

1. **Limited Adaptability:** Traditional ML models struggle to adapt to new or unforeseen scenarios, leading to inaccuracies in real-time interactions.
2. **Poor User Interface:** The existing system often lacks a user-friendly interface, resulting in a disjointed and frustrating customer experience.
3. **Lack of Real-Time Responsiveness:** The system's inability to handle high volumes of concurrent users during peak hours can lead to delays and inefficiencies.
4. **No Location-Based Services:** The existing system does not offer location-based features, such as nearby ATMs or currency exchange rates, which are increasingly demanded by users.
5. **Inadequate Security:** The existing system may lack advanced security features like **multi-factor authentication (MFA)** and **secure API integrations**, putting sensitive user data at risk.

EXISTING SYSTEM MERITS

- Simple account management features in a chatbot allow users to register, log in, and manage their profiles securely.
- A basic chatbot is designed to interact with users, process their queries, and provide relevant responses.

PROPOSED SYSTEM:

- The proposed system, the "**Banking Powerful Bot**," addresses the shortcomings of the existing ML-based system by integrating **web development technologies** with **AI-driven functionalities**. This system leverages a robust tech stack.
- Including **HTML, CSS, JavaScript, ReactJS, NodeJS, SQL, XAMPP server,** and **Apache server**, to create a dynamic, scalable, and user-friendly platform.

- The frontend, built with **ReactJS** and **ViteJS**, offers a visually appealing and highly responsive interface, featuring a **personalized dashboard** that allows users to track expenses, set savings goals, and monitor investments in real-time.
- The backend, powered by **NodeJS** and **ExpressJS**, ensures secure and efficient communication between the frontend and the database, which is managed using **SQL** and hosted on an **XAMPP server**.
- The integration of **Apache server** ensures high performance and reliability, even under heavy user loads.
- The AI-driven chatbot, powered by **Python** and **natural language processing (NLP)**, enhances the system's capabilities by enabling real-time, context-aware interactions. Unlike the existing ML-based system, the proposed system is designed to handle a wide range of tasks with precision, from answering customer queries to providing personalized financial advice.
- Additionally, the system incorporates **location-based services**, which use geolocation data to offer tailored recommendations, such as nearby ATMs or currency exchange rate

PROPOSED SYSTEM MERITS:

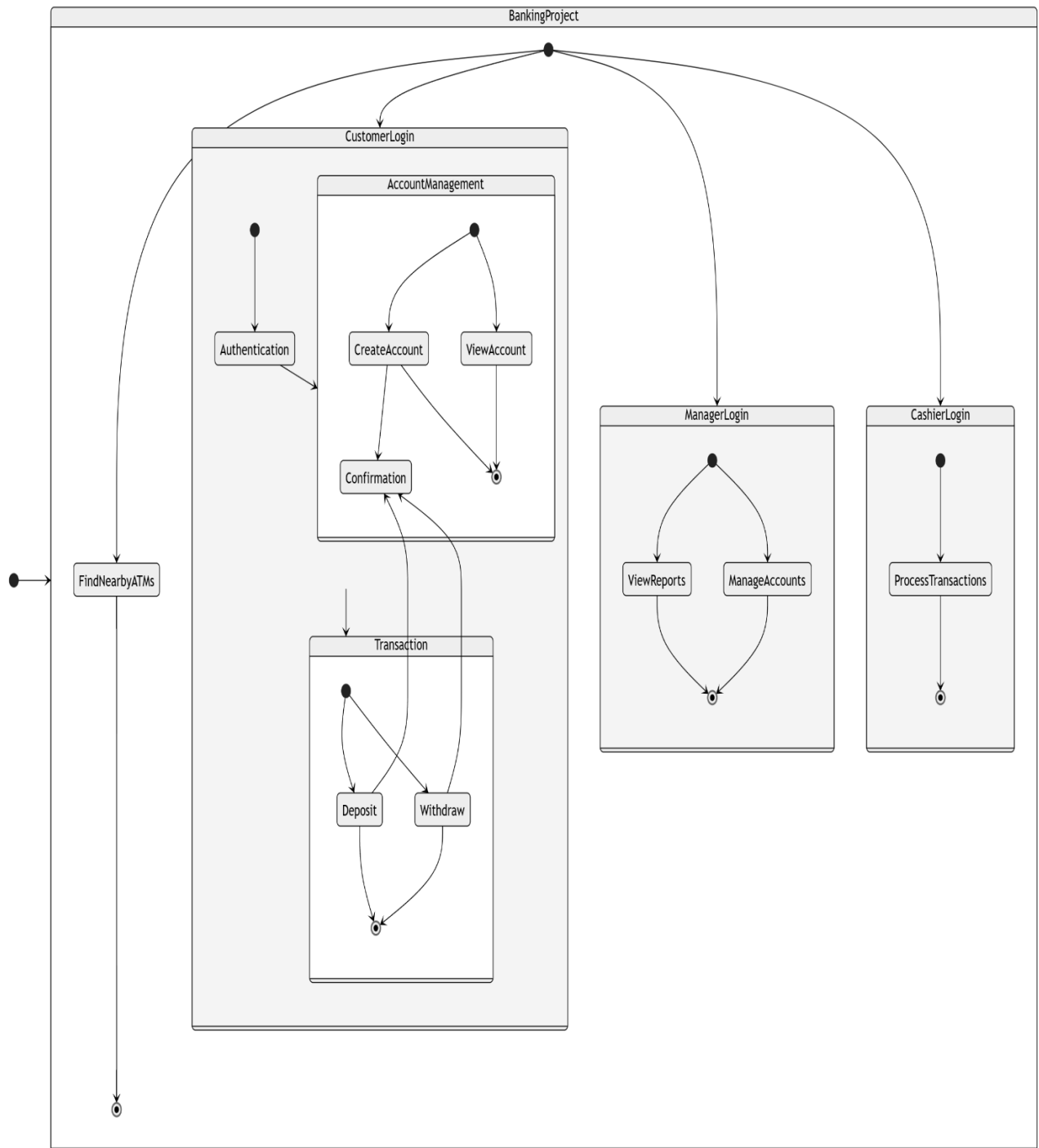
1. **Enhanced User Experience:** The proposed system offers a visually appealing and highly responsive interface, with features like a personalized dashboard and real-time notifications, making it easier for users to manage their finances.
2. **Real-Time Responsiveness:** Unlike the existing system, the proposed system leverages AI and NLP to provide instant, accurate, and context-aware responses to customer queries.
3. **Scalability:** Built with **NodeJS** and hosted on an **Apache server**, the system is designed to handle high volumes of concurrent users without compromising performance.
4. **Advanced Security:** The integration of **multi-factor authentication (MFA)**, **encryption protocols**, and **secure API integrations** ensures the safety of sensitive user data.
5. **Location-Based Services:** The system uses geolocation data to provide tailored recommendations, such as nearby ATMs or currency exchange rates, enhancing convenience for users.

MODULES:

1. **User Management:** Secure login and profile management
2. **AI Chatbot:** NLP-powered customer assistance

- 3. **Transaction Services:** Fund transfers, balance inquiries
- 4. **ATM Finder:** Location-based search for nearest ATMs
- 5. **Branch Locator:** Search for branches with directions
- 6. **Admin Dashboard:** Manage users, transactions, and analytics

ARCHITECTURE:



CONCLUSION:

The **Banking Powerful Bot** represents a groundbreaking step in the evolution of digital banking, seamlessly integrating AI and modern web technologies to deliver a highly efficient, secure, and scalable banking experience. At its core By bridging the gap between traditional banking systems and cutting-edge AI-driven solutions, the **Banking Powerful Bot** sets a new benchmark for digital banking, ensuring a seamless, intelligent, and secure financial experience for users worldwide. to provide real-time, context-aware interactions, enabling users to perform banking tasks such as balance inquiries, fund transfers, and financial planning with ease. The combination of **HTML, CSS, ReactJS, JavaScript, NodeJS, PHP, Python, and SQL** ensures a high-performance system capable of handling large-scale transactions while maintaining efficiency and responsiveness. The **customizable dashboard** enhances user engagement by offering real-time financial insights, intuitive navigation, and personalized widgets, empowering users to take control of their financial activities. With **advanced encryption protocols, multi-factor authentication (MFA), and secure API integrations**, the platform prioritizes data protection, ensuring a safe banking environment for users. The use of AI enables the bot to **continuously learn and adapt** to user behavior, improving its responsiveness and accuracy over time, making it a long-term, sustainable solution for modern banking.

REFERENCES:

- [1] Avagyan, Artur, and Davit Davtyan. "Enhancing Bank Website Accessibility and User Experience through an AI-Driven Information Assistant."
- [2] Nagi, Capt Musa. *BANKING BOT BASED ON RASA FRAMEWORK*. Diss. College of Signals, National University of Sciences and Technology, Islamabad, 2022.
- [3] Singh, Meghna, et al. "Chat-bot for banking industry." *International Conference on Communication, Security and Optimization of Decision Support Systems (ICCSOD 2018)*. 2018.
- [4] Ambika, N. "Enhanced Security in Chatbot." *Conversational Artificial Intelligence* (2024): 219-236.
- [5] S. S. Alghamdi, "Designing an intelligent chatbot for banking customer service using natural language processing." *International Journal on Recent Trends in Business and Tourism*, vol. 1, no. 1, pp. 1-10, 2019.
- [6] Automatic Extraction of Chatbot Training Data from Natural Dialogue Corpora, Bayan AbuShawar, Eric Atwel