FAQ BOT IN BANKING USING ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

[1]**Prof. Anjana H S**, [2]**Niveditha S**, [3]**Rakshitha C**, [4]**Rakshitha L**, [5]**Sree Varsha A E**

Department of Information Science and Engineering

East West Institute of Technology, Bangalore, India

Abstract: A Chatbot is an AI application that imitates human conversation through text or voice communication channels. It employs NLP algorithms to comprehend and interpret user inquiries and furnish pertinent replies. A chatbot offers personalized aid, resolves routine queries, automates mundane tasks, and boosts customer engagement and satisfaction. It can be integrated into diverse platforms, including messaging apps, websites, social media, and voice assistants. In this project, we used both artificial intelligence and machine learning approaches to develop a chatbot system for the banking business. This is an automated conversational interface that is designed to mimic a human conversation in order to assist and support consumers in a variety of banking-related activities. Natural language processing (NLP) is used by the chatbot to understand consumer requests and offer relevant responses, such as checking account details, inquiring about location, and answering FAQs. Chatbots in banking can provide customer support 24 hours a day, seven days a week, minimize wait times, and increase client engagement and satisfaction. They are used many application in several fields, including but not limited to e-commerce, healthcare, education, and customer service.

Index Terms - ANN, chatbot, Machine Learning, NLP, queries, FAQ.

I. INTRODUCTION

Machine learning techniques are currently being studied across various fields, including banking which plays a vital role in the economic development of any country. In day-to-day life, banks are essential, but many people, particularly first-time users, struggle to understand the various procedures and processes required to use the bank's services. While banks provide web-sites, mobile applications, and facilities like internet banking and mobile banking, these sources can be overwhelming for users who are not well-versed with technology or in cases where information is scattered and difficult to find. Different banks provide various types of platforms, but users face problems accessing them. Although customer care centers are available, there are often long wait times and redirections, resulting in significant delays for customers.

Chatbots are revolutionising client interactions with financial firms in the banking sector. A chatbot can help in answering frequently asked questions, offering 24/7 customer care, helping clients provide account information, and more. Chatbots can understand and provide conversational, personalised responses to consumer inquiries by utilising natural language processing and machine learning techniques. Higher customer satisfaction levels and more effective handling of customer inquiries may result from this.

By automating repetitive operations and lowering the need for human customer service employees, chatbots in the banking sector can also help cut expenses. They can also provide useful information on client behavior and preferences, which can be utilised to improve products and services.

Overall, chatbots provide users with a comfortable and efficient way to connect with their financial institutions, while also bringing major benefits to banks and other financial institutions. Chatbots are becoming a crucial tool for providing improved customer service and engagement as their use in the banking industry grows.

NLP stands for Natural Language Processing, which is a branch of artificial intelligence (AI) that focuses on enabling computers to understand, interpret, and generate human language. NLP combines techniques from computer science, computational linguistics, and cognitive psychology to build algorithms and systems that can analyze and understand human language.

Some common applications of NLP include language translation, sentiment analysis, speech recognition, chatbots, and text summarization. NLP is used in various industries, such as healthcare, finance, e-commerce, and customer service, to automate and streamline various tasks that involve human language.

II. RELATED WORKS

A chat-bot is a software tool that uses text or text-to-speech to conduct an online chat conversation instead of providing direct contact with a live human agent. The proposed system in this paper learned the Chatbot by watching numerous user responses and requests and utilising a keyword matching technique using machine learning techniques [1]. This prototype chatbot analyses the

user context to prompt a response with a specified intent. Because it is a dynamic response, the user will receive the desired response. This type of web-based platform provides a large cognitive base that can be used to replicate human problem-solving.

The introduction of AI into the banking industry has spurred chatbots and changed the face of bank-customer contact. The most recent disruptive force that has revolutionised how customers connect is the rise of chatbots in the banking and finance industries. This study presents a new approach for dealing with artificial intelligence in addition to highlighting the capabilities of intelligent systems. The banking sector is crucial to any country's development [2]. It also looks into the chatbot's current usability to see if it can meet the ever-changing needs of customers.

In one of the previous study, the authors will discuss the role of chatbots in education and e-commerce, as well as describe chatbot classification and techniques. Chatbots are becoming increasingly popular in business, necessitating the implementation of novel approaches to providing 24-hour customer service. This type of business is especially important in these difficult Covid-19 times and its after affects. Chatbots powered by artificial intelligence can function as intelligent teaching systems, providing users with a personalized learning experience [3].

III. PROPOSED SYSTEM

The proposed system allows users to search for bank details through a web application. This system provides users with the ability to search for specific bank information, such as loan or account details, without the need to rely on friends or bank employees for assistance.

The user-friendly interface of the application makes it easy for users to find the information they need, and they can even search for multiple services provided by the bank, such as the nearest ATM or branch location. Overall, this application project streamlines the process of finding bank information, making it more convenient and accessible for users.

IV. IMPLEMENTATION

As shown in the below fig 4.1 system architecture, the user inputs their questions via text, and natural language processing is used to process the text. The ANN algorithm is employed for machine learning, recognizing queries based on user interaction and mapping answers to specific queries to recommend the best option to the user.
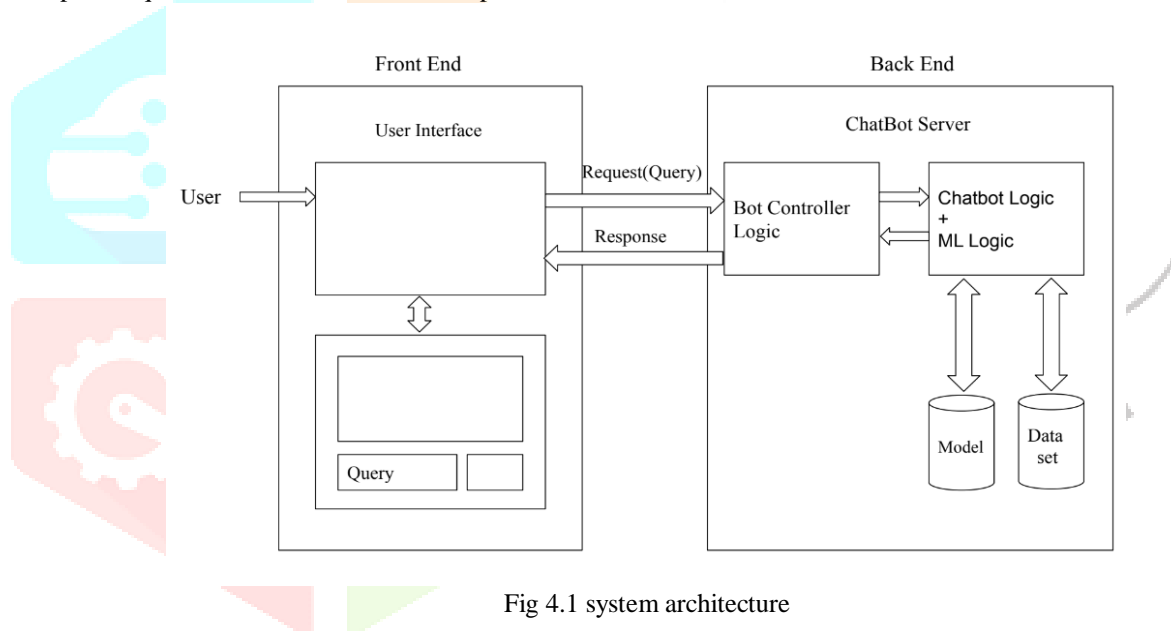

Fig 4.1 system architecture

The ANN is an Artificial Neural Network that mimics the network of neurons in the human brain to enable computers to understand things and make decisions in a human-like manner. The ANN is designed by programming computers to behave like interconnected brain cells. To create a dataset in JSON format, each question or user response is given a tag related to its answer, allowing for multiple questions with the same answer. The collected data related to banking transactions and customer queries is pre-processed to remove noise and irrelevant information.

In a chatbot context, the ANN algorithm can be trained on large datasets of text-based conversations to learn how to respond to user queries. The algorithm works by taking the user's input (in the form of text) and breaking it down into smaller units, such as words or phrases. These units are then processed through a series of layers in the neural network, where the algorithm attempts to identify patterns and connections between the input and the appropriate response.

The ANN algorithm adjusts its parameters and connections based on feedback from users, so it can continuously improve its responses over time. By using machine learning techniques, the chatbot can learn to recognize context, understand intent, and provide relevant responses to user queries. Once pre-processed, the data is fed into the ANN and the weights and biases of the neurons in the network are adjusted to optimize its performance. The chatbot then uses the ANN to understand the user's queries and generate responses based on the trained data.

Here we have used dataset in the JSON format where it contains set of queries having corresponding answers and flask is used to build the frontend of this work. To build the front-end for a chatbot using Flask, we first need to install Flask and its dependencies on our local machine. Once installed, we can define the routes that will handle the user's requests. For example, we can create one route for the user's initial message and another route for follow-up messages. After the user sends a message, Flask uses the appropriate HTML template to render the chatbot's response. The HTML template includes the necessary CSS, HTML, and JavaScript to render the chatbot interface.

To understand the user's intent and provide the appropriate response, we need to use a natural language processing (NLP) engine. When the user types a message, the chatbot processes it using the NLP engine and then sends the response back to the Flask

application. Finally, the Flask application renders the response in the appropriate template and sends it back to the user. By following this above process, we can create an interactive and responsive chatbot front-end using Flask.
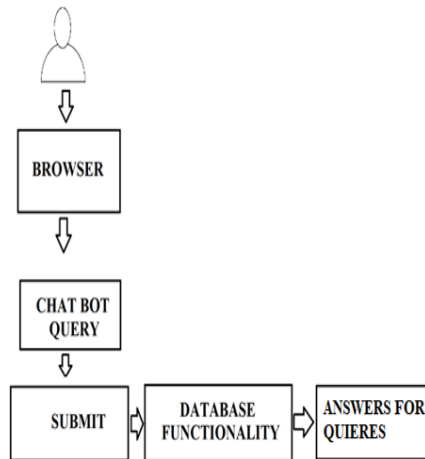

Fig 4.2 block diagram

The user's query is sent to the model via the Flask frontend. The text is first converted to lowercase before being matched to the database using the trained model. If a match is found for the query, the response is sent back to the user's frontend.

V. RESULTS

This project was implemented using ANN method on the given JSON dataset where when a user types a question/query that query is sent to the model to match with the database to get corresponding answer to the user query as shown in the below fig 5.1.

Fig 5.1 conversation with the Bot

VI. RESULTS

Banking Chatbot has demonstrated the potential of banking bots in streamlining customer service and improving the overall banking experience for customers. By providing a 24/7 customer support system, your banking bot can reduce waiting times, increase customer satisfaction, and free up valuable human resources for more complex tasks. A drawback of this system is that it can only provide responses from its stored dataset, which may not contain all possible responses.

To enhance the relevance and precision of the responses generated by the chatbot system, the administrator must train the system with additional information related to the banking and expand the knowledge base. Additionally, obtaining feedback from potential users can aid in the development of the banking chatbot system, ultimately improving its ability to address user queries.

In future work, the framework will be completed and a chatbot will be developed that supports both voice and text input. This new system will be a stepping stone towards implementing an intelligent question management program capable of not only responding to queries but also self-learning to improve its performance over time.

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