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A SMART AI CHATBOT FRAMEWORK FOR AUTOMATING COLLEGE MANAGEMENT PROCESSES

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ABSTRACT:

The increasing digitalization of higher education institutions has highlighted the need for efficient, responsive, and user-friendly systems to manage routine academic and administrative tasks. Traditional college management systems often require manual intervention, leading to delays, communication gaps, and reduced service effectiveness. This study proposes a **smart AI-driven chatbot framework** designed to automate and streamline key college management processes, including student queries, admission support, timetable access, fee information, attendance updates, and administrative services.The proposed chatbot integrates **Natural Language Processing (NLP)**, **Machine Learning (ML)**, and **rule-based decision modules** to understand user queries, generate context-aware responses, and provide real-time information retrieval. The system architecture includes a query-processing engine, knowledge base, database interfaces, and a conversational interface accessible via web or mobile platforms. Through continuous learning, the chatbot improves its accuracy and ability to handle diverse academic and administrative queries.This framework aims to reduce administrative workload, minimize response times, and improve overall communication within the institution. Initial testing indicates significant improvements in user engagement, accessibility, and operational efficiency. By implementing an intelligent chatbot system, colleges can enhance service delivery, promote digital transformation, and provide a more responsive and interactive experience for students, faculty, and administrative staff.The vast number of people who now use smartphones with a range of new applications is proof that technology is growing constantly. Chatbots utilise natural language to connect with human

users in the same manner that people do. The main objective in creating a chatbot is to imitate human interaction patterns in order to give users the feeling that they are conversing with a person. Nowadays, a wide range of enterprises, from those that produce products to those that offer customer service and public relations, are increasingly using artificial intelligence. Users can now employ chatbots and other artificial intelligence (AI) technologies that are widely available online to get appropriate response to their queries.

KEYWORDS: Artificial intelligence (AI), chat bot, knowledge base, lemmatization, natural language processing (NLP), semantic sentence similarity, wordnet.

INTRODUCTION

This paper aims to develop a chatbot that learners may utilize to quickly obtain responses to questions they have regarding the college. A chatbot is a computer programme that replicates real-world communication through text and or speech.Chatbots are computer software that use artificial intelligence to simulate human communication. AI chatbots get relevant data by analysing and concentrating on the users requests. The college enquiry chatbot aims to use natural language processing to answer enquiries because it allows users to ask questions and quickly receive the needed answers. The chatbot receives a query from the user and processes it to deliver the suitable response. This saves time by avoiding the need to visit institutions and gather the required details.

This paper aims to enhance the overall user experience and efficiency of the college management system by providing a user-friendly and interactive interface that allows students, faculty, and staff to perform various administrative tasks in a conversational manner.

There are several categories of chatbots based on their functionality and the level of human interaction they provide. Here are some common categories of chatbots:

Rule-based chatbots: These chatbots operate based on a set of pre- programmed rules that dictate their behavior. They can only respond to specific inputs or keywords and cannot handle complex queries or user inputs.

AI-powered chatbots: These chatbots are powered by artificial intelligence and machine learning algorithms that enable them to understand and respond to natural language queries. They can learn from user inputs and adapt their responses over time.

SCOPE OF THE PROJECT

- ✓ Any stack holder can utilize this chatbot to ask concerns.
- ✓ By employing chatbots, institutions may deliver rapid and effective support services.
- ✓ The individual using the application does not need to make a visit to the college office in person to ask a question.
- ✓ The student, the teaching staff, and non-teaching persons all benefits by saving time from this application.

LITERATURE SURVEY

AM Rahman, Abdullah Al Mamun, Alma Islam [1] proposed a system in concentrating on developing a chatbot that students may utilise to conveniently receive answers to their questions via the college web page. The College Chatbot can hold cordial conversations, respond to questions about courses and professors, provide a link to the academic calendar, address frequently asked queries, calculate costs based on the input of the student, and provide details about departmental hours, addresses, contacts, and details about partnership actions, organizations, and other things. The Text Data analysis, LUIS, and QnA Creator cognitive services from Microsoft are utilised to develop the chatbot in addition to the Azure cloud-based bot service. Despite the fact that sentimental analysis successfully distinguishes between the user's query's favorable, adverse, and neutral tones, the method only partially succeeded in making the chatbot more empathic.

Prof.K.Bala, Mukesh Kumar, Sayali Hulawale, Sahil Pandita [2] proposed the paper to create a communication between humans and machines the computer is programmed with the ability to recognize sentences and come to a conclusion as a response to an inquiry the user will be able to write commands and get text and text to speech responses from chat-bots since their whole user interface will be text-based chatbots are often stateful systems that retain information from previous orders to perform even more people can use it safely when chat-bot technology is combined with popular services on the internet The virtual assistants for college-related topics will be developed utilising artificial intelligence (AI) algorithms that evaluate user questions and understand user communications. Through the chatbot, a user may enquire about any college-related activities without spending time on the campus in individual. Once the system analyses the inquiry, it answers to the user by matching the user's input.

Harshala Gawade , Vedika Patil,Prachi Vishe and Sonali Kolpe[3] proposed the paper for a chatterbot, also known as a chatbot aims to establish interaction among an artificial intelligence and a human. The computer is equipped with the information necessary to distinguish words and draw an independent decision in answer to a query. The response principle describes how the person's input and the action are matched. The current technological entails creating a professional system for a college help desk employing an android-based chatbot, artificial intelligence technology, and virtual assistance (human-machine communication), then sending the natural language to a server.

M. Dharani, L. Jyostna, E. Sucharitha, R. Likitha and S. Manne [4] proposed the paper in public transit effectively. People frequently travel, and on sometimes they could feel entirely disoriented in a foreign location. Now our chatbot steps in to save the day. One of the most interesting method to human-machine interaction using artificial intelligence is often referred to as a chatbot. Neural learning and processing of natural languages are used by the piece of software to conduct text-based online chat interactions. It allows GUI-based real-time conversation with a real person assistant. This AI chatbot asks a few questions to confirm the user's location and planned destination.

S. S. Kanchana and K. Sangeetha [5] proposed the paper to design and create an AI-powered chatbot for online customer service. Real-time customer service is one of the goals of the chatbot, which is also intended to enhance the user experience. The natural language processing (NLP), decision-making, and answer generating modules are included in the chatbot's architecture, which the authors describe. The performance of the chatbot is also assessed in terms of accuracy and reaction time in this research.

PROPOSED SYSTEM

We are developing a chatbot for the institution that responds to user queries concerning college-related information. The bot is integrated to the college website. Users can ask the chatbot questions about the institution at the moment of enrolment or about any competitions hosted there.

Improved Student Engagement: By providing students with a convenient and interactive way to access information, the chatbot can improve student engagement and satisfaction with the college experience.

Reduced Staff Workload: The chatbot can handle routine inquiries, such as questions about course schedules and policies, freeing up staff time for more complex tasks.

Faster Access to Information: Students don't have to stand by and wait for a member of the staff to reply before getting answers to their queries. This might assist shorten wait times and increase the college's overall effectiveness.

Personalized Assistance: By collecting and analysing data on user interactions, the chatbot can provide personalized assistance to students based on their preferences and interests.

DESIGN

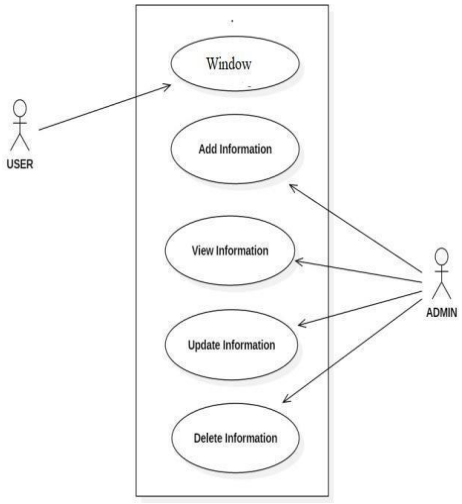

Fig. I. Use case diagram

WORKING

The working process of a chatbot can be broken down into several steps, which include:

User Input: The chatbot's working process begins with a user input.

Natural Language Processing (NLP):

The chatbot uses NLP algorithms to understand and interpret the user's input. This involves breaking down the input into its constituent parts, such as individual words and phrases, and analyzing the meaning behind them.

Intent Recognition:

Once the chatbot has analyzed the user's input, it uses intent recognition algorithms to determine the user's intention. For example, if the user asks for the admission process, the chatbot recognizes the intent as a request for admission information.

Data Retrieval:

After the chatbot has determined the user's intent, it retrieves the relevant data from its database or external sources such as APIs, web services, or databases.

Response Generation:

The chatbot generates a response based on the retrieved data and sends it back to the user. This response can be in the form of text formats.

Conversation Flow:

The chatbot maintains a conversation flow, where it keeps track of the previous conversation with the user to provide a seamless user experience. This involves storing information about the user's previous queries.

The chatbot's working process is iterative, meaning that it continuously receives and processes new user inputs, retrieves data, generates responses, and learns from its interactions with users to improve its performance over time.

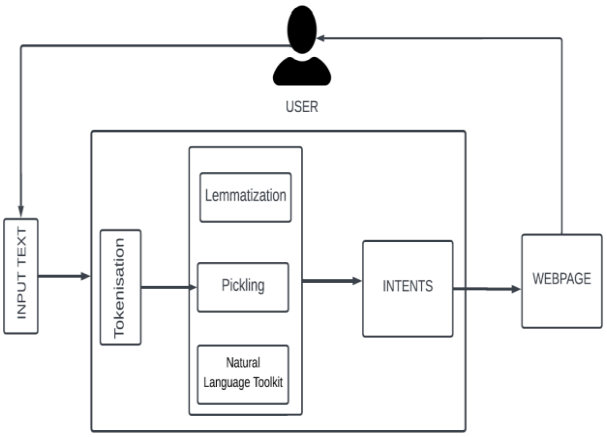

Fig. II. Process diagram

APPLICATIONS

- ✓ The students may stay informed about college events by utilizing it.
- ✓ It saves time for both teaching and non- teaching staff members as well as students.
- ✓ It offers an instantly accessible information source without requiring any physical exertion.
- ✓ It is simple to use and efficient in terms of time and money.

RESULT PAGE

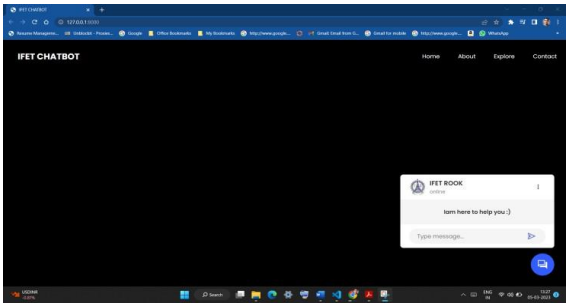

Fig. III Result page 1

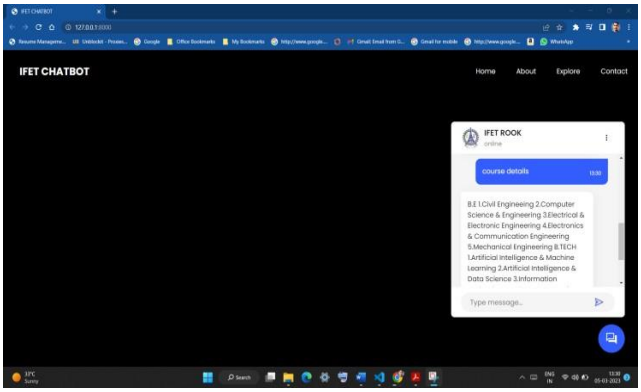

Fig. IV. Result page 2

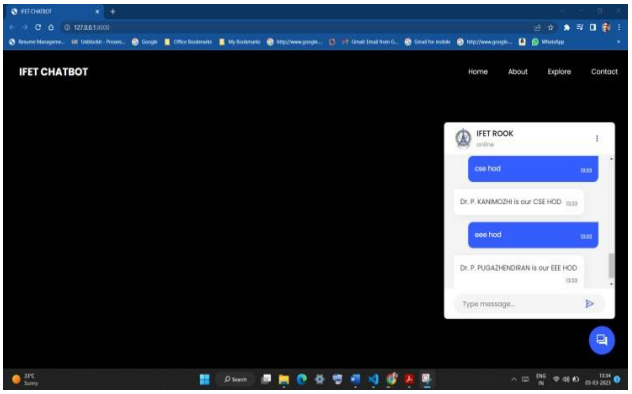

Fig. V. Result page 3

CONCLUSION

In response to user input, the presented method is provided to deliver response. This system will react to requests submitted by users. The primary goal of this project is to provide an interface and a database with information on queries, answers, keywords, and invalid inquiries. One portion of this interface is for users, while the other is for administrators. The College Enquiry Chatbot assists in guiding students to the most reputable and up-to-date information sources as part of a functional system. To turn it into a fully functional app, the process of gathering commonly asked questions and replies is already underway. It is advantageous for international applicants to inquire about issues like paying fees and academic challenges.

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