iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** V **Month of publication:** May 2023

DOI: https://doi.org/10.22214/ijraset.2023.52059

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue V May 2023- Available at www.ijraset.com

AI-Based Chatbot for College Management System

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Abstract: ***The days of solely engaging with a service through a keyboard are over. Users interact with systems more and more through chats and chatbots. A chatbot is a computer program that can converse with humans using Artificial Intelligence in messaging platforms. Every time the chatbot gets input from the user, it saves input and response which helps the chatbot with little initial knowledge to evolve using gathered responses. With increased responses, the precision of the chatbot also gets increases. The ultimate goal of this project is to add a chatbot feature and API for College. This project will investigate how advancements in Artificial Intelligence and Machine Learning technology are being used to improve many services.***
Keywords: Natural Language Processing, Sentiment Analysis, Deep Learning.

I. INTRODUCTION

A chatbot is a computer program designed to stimulate conversations with human users, especially over time. Chabot (also called Artificial Conversational Entity) mimics human conversations in their natural format including text or language using AI techniques like NLP (Natural language processing). Chatbots for institute management system projects are developed using AI algorithms that will analyze user queries. This technique is an internet application that can answer the users' analyzed queries. Users need to select the category for queries and ask the query to the bot which can be helpful for answering it. AI is employed to answer the user's queries. The users will get acceptable answers to their queries. The answers are given using bogus intelligence algorithms. Users don't need to visit the Institute personally for inquiry. A chatbot is a piece of technology that allows a computer program to communicate with people just like a conversation through text messaging, using a natural language, like English, to full fill specific tasks. A chatbot is also known as Artificial Conversational Entity (ACE), chat robot, talk bot, chatterbot, or chatterbox. The project focuses on creating a chatbot to be used by students to get their queries answered easily from the college website.

II. LITERATURE REVIEW

Tarun Lalwani [1] has described Context Identification where the Pre-processing is applied to the input text to standardize the input as per the system's requirement. Based on the keywords used in the text, appropriate context is recognized. Contextual AI takes a human approach to processing content. It allows AI systems, like chatbots and virtual assistants, to have a real-world interpretation of language, audio, video, and images so they can behave less like traditional computers and more like humans.

Shashank Bhalotia [2] concentrated on the Query Analysis and Response System so that when a user wants some information pertaining to college, the response will be provided through this module. If the input matches a pattern in the AIML files, the appropriate response will be sent to the user. If the AIML files have no entry for that particular query pattern, keywords are fetched from the input. An algorithm to check sentence similarity (NLP) is applied to the modified input to check its similarity with the questions of a predefined question set, whose answers are available. If a sentence is retrieved with confidence> 0.5, we return the answer to that question as the response. If no questions map to the user input, the input is saved in a log file for improvement of the system by the admin. The administrator can incorporate the answer to that query in the knowledge base if s/he finds it convenient. Also, a random response is sent to the user suggesting "Answer not available".

The author, N. Thomas, of [3] provided the way by which the chatbot is planned in a manner that for a single template, it gives irregular responses. LSA-based inquiries are giving the right reactions to random responses. AIML files are a subset of Extensible Mark-up Language (XML) that can store different text patterns in the form of tags. AIML is mainly used to implement Chatbots, a natural language software agent in which a user can ask questions to the robot and it can give an intelligent reply. This same technique is used in Chat Bot. Using speech recognition, the robot gets input text from the user and an AIML interpreter; a software program that can interpret AIML files and retrieve an intelligent reply from the AIML dataset.

Sri Ramya [4] has concentrated primarily on Pattern matching: It is the demonstration of checking a given grouping of tokens for the nearness of the constituents of some examples, in qualification to design acknowledgment, the match commonly must be definite: "it is possible that it will or will not be a match." The normally for the most part have the state of either arrangements or tree structures.

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Employments of example coordinating grasp yielding the areas (assuming any) of an example inside a token succession, to yield some piece of the coordinated example, and to substitute the coordinating example with some another token arrangement.

Dr. R. Regin [5] has discussed the main objective of the graphical user interface is to make interacting with the chatbot much simpler than just using the terminal. This is achieved using the Tkinter library and its modules. The interface they built for the chatbot is simple but elegant and very functional. The interface has no errors or bugs, making it hassle-free. There are two main components in the graphical interface. One is the Chat Log, which contains the entire conversation between the user and the bot. This makes it easier to follow the conversation if the user's query is too complex for the bot and is redirected to staff. The staff member has to just go through it once in order to reply. The second component is the message entry box and send button. This helps in taking the user's query in a proper format that is more appealing to the user. The send button is used to send the user-entered text as input to the bot.

Bayu Setiaji, and Ferry Wahyu Wibowo [6] have discussed that this chatbot employs knowledge in a very Database for Human to Machine conversation modeling. The machine has embedded knowledge to spot the sentences and make a call itself as a response to answer a matter. It does not follow the speech recognition technique. Another drawback of this chatbot is that it provides only the information that is embedded in its database. It means it does not work intelligently on its own.

Grynberg Yann [7] In this paper Only 44 percent of computers, 32 percent of monitors, and 25 percent of printers were turned off at night, with energy-efficient appliances employed in office environments, occupants' energy-conscious behavior plays a vital role in monitoring plug load. In an attempt to involve the occupants in the building's energy management suite, a natural language-based plug management system is proposed. This article aims to develop a rule-based chatbot that helps users manage (schedule) their plugged-in appliances through smart plugs in an office environment. Considering the nature of the application and the accuracy of the intended operation, a rule-based chatbot is developed to schedule the smart plugs. It is developed using Python to be integrated with the instant messaging application Slack.

AMEY TIWARI [8] has concentrated primarily on keeping the bot incredibly simple. The Bot conversations should be bounded to very particular subjects and follow linear conversation routes avoiding complicated branching paths. They are not trying to create a general, self-aware A.I. here. It's okay to expose and explain limitations. Individual bot designers shouldn't have to account for tricky failure cases. Users will tire of complicated passages of dialogue.

RAHUL TALEKAR [9] has discussed that one advantage of smart messaging apps is that we can strip away a lot of apps and interfaces and reduce the interaction to a simple chat UI. It would therefore be pointless to turn around and drop an entire app directly into a conversation. Keep everything native to the conversational back-and-forth. Every bot interaction is about call and response, with the bot publishing comments into the chat thread and the end user responding in the reply area. Bots can't modify conversations in ways that humans can. At the same time, make use of conventions: rather than printing out an ungainly URL in a bot response, show a nicely-formatted card previewing the linked page.

Vasundhara Rathod [10] concentrated on AIML Response System, If the user is trying to make a normal conversation with the bot, the input is mapped to an appropriate pattern in Artificial Intelligence Modeling Language (AIML) files. If the response is available, it is sent to the user. If the pattern is not available in AIML files, a random response is sent suggesting "Invalid Input".

III. METHODOLOGY

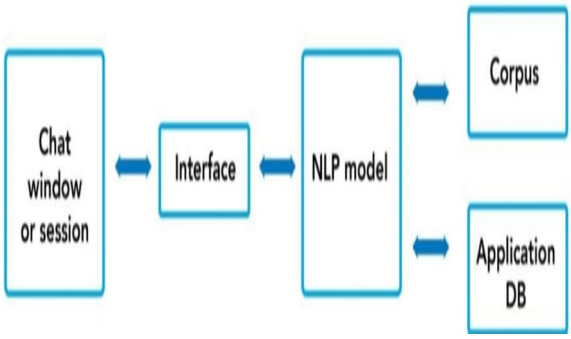


Figure 1 Methodology Diagram of Chatbot

1) *Chatbot Window:* A chatbot window is the graphical user interface (GUI) component where users interact with the chatbot. It provides a space for users to input their queries or messages and displays the responses generated by the chatbot.

2) *Interface:* The interface of a chatbot refers to the visual and interactive elements through which users interact with the chatbot. Some common components and features in a chatbot interface are:

a) *User Input Field*: This is where users can type their messages or queries to interact with the chatbot. It is a text input field where users can enter text and press "Enter" or click a send button to submit their message.

b) *Chatbot Responses:* After the user sends a message, the chatbot generates a response that is displayed in the chat window. Chatbot responses can appear as text messages, rich media content, or a combination of both, depending on the capabilities of the chatbot and the platform it's deployed on.

c) *Typing Indicators:* To provide a more engaging and realistic conversation experience, chatbot interfaces sometimes include typing indicators. These indicators show that the chatbot is processing the user's input and generating a response.

3) *NLP Model:* Natural Language Processing (NLP) models are computational models that enable computers to understand and process human language. These models are designed to analyze and interpret text or speech data, allowing machines to perform various language-related tasks.

4) *Corpus:* A corpus for a chatbot refers to a collection of textual data that is used to train and/or evaluate the chatbot's language model. The corpus provides the chatbot with a diverse range of example conversations and interactions, allowing it to learn patterns, understand user inputs, and generate appropriate responses.

5) *Application Database:* An application database (DB) can play a vital role in a chatbot by storing and retrieving data relevant to the chatbot's functionalities. It enables the chatbot to access and provide accurate and up-to-date information to users.

IV. IMPLEMENTATION

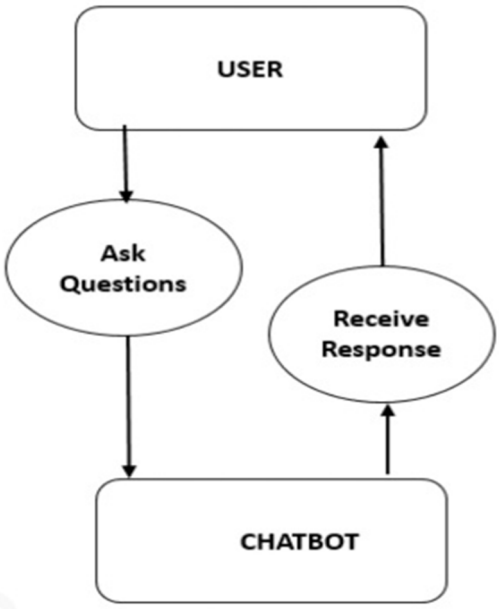


Figure 2 Use Case Diagram

In the above Use case diagram User: The "User" refers to the individual interacting with the chatbot. The user can be anyone who engages with the chatbot through a chat interface. The user interacts with the chatbot by sending messages or queries and expects relevant and helpful responses in return.

Ask Questions: The chatbot's purpose is to understand the user's input, process it, and generate appropriate responses based on the user's needs or requests. The user may interact with the chatbot to seek information, ask questions, perform tasks, make inquiries, or seek assistance.

Chatbot: A chatbot is a computer program or an artificial intelligence (AI) application designed to simulate human conversation and interact with users through a chat interface. It uses natural language processing (NLP) techniques to understand user inputs, process information, and generate appropriate responses.

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Receive Response: The chatbot delivers the generated response back to the user through the chat interface or communication channel.

The response is displayed or communicated to the user, continuing the conversation.

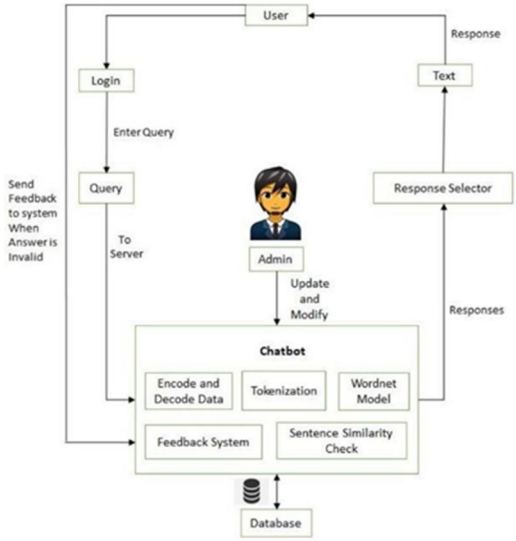
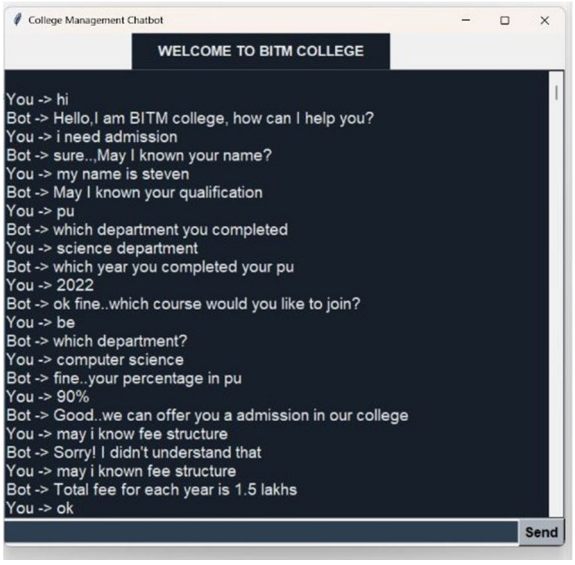


Figure 3 College Chatbot system architecture

V. RESULT



VI. CONCLUSION

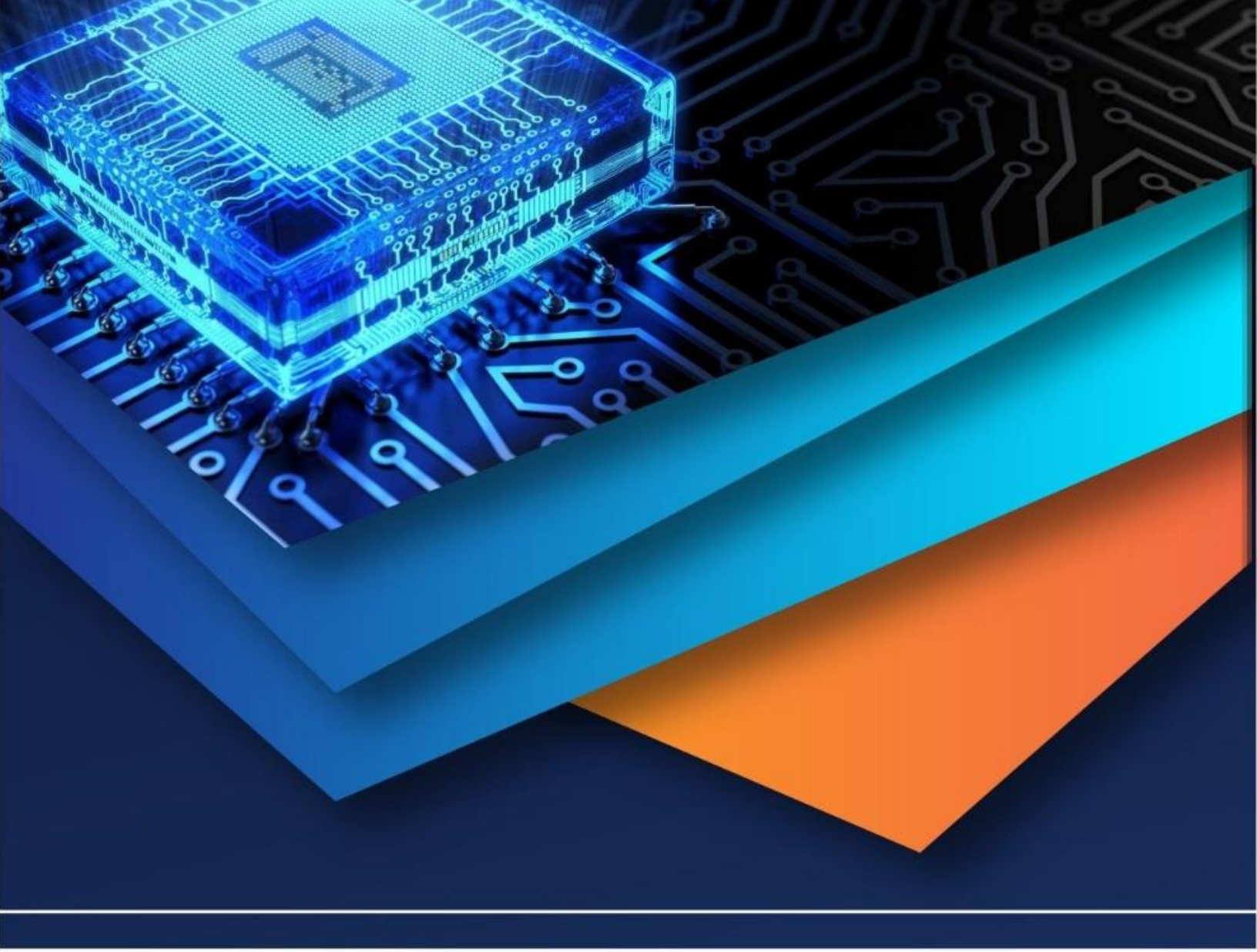
Implementing a chatbot for a college management system can bring numerous benefits to the institution, students, and faculty. The chatbot will provide quick and convenient access to information, automate administrative tasks, and improve the overall efficiency of the system. However, the implementation process requires careful planning and consideration of the needs of the institution and its users. The development and integration of a chatbot have been successful and resulted in a positive impact on the college management system.

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