College Admission Enquiry Chatbot Using Machine Learning

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**Under the guidance*

Abstract: **-The college admission process can often be overwhelming for prospective students due to the abundance of information and the limited availability of staff to handle queries. To address this challenge, this paper proposes a College Admission Enquiry Chatbot powered by Machine Learning (ML) that can provide instant and accurate responses to frequently asked questions related to admissions. The chatbot is designed to simulate human-like interactions through both text and voice input, supporting multiple languages including English, Hindi, and Marathi, thereby ensuring inclusivity and accessibility.**

The system utilizes Natural Language Processing (NLP) techniques for intent recognition and response generation. Key technologies include speech recognition for converting voice input to text, the Google Translate API for multilingual support, and gTTS (Google Text-to-Speech) for generating audio responses. A bag-of-words model and a simple neural network are used for intent classification and dialogue management. The chatbot is integrated into a Django-based web application, offering a user-friendly interface for interaction.

This solution aims to reduce response time, minimize administrative workload, and enhance user experience by delivering prompt and accurate admission-related information. The proposed system demonstrates potential for scalability and adaptability to different institutions and domains, making it a valuable tool in educational technology.

Keyword: **- College Admission, Chatbot, Machine Learning, Natural Language Processing (NLP), Intent Classification, Multilingual Chatbot, Speech Recognition, Google Translate API, gTTS, Django, Voice Assistant, Text-to-Speech, Educational Technology, Student Support System, Artificial Intelligence (AI)**

I. INTRODUCTION

The college admission process is a crucial and often stressful phase for students and their families. Prospective applicants usually have numerous questions regarding eligibility criteria, application procedures, important dates, required documents, fee structures, available courses, and more. Due to the high volume of inquiries, educational institutions often face challenges in providing timely and accurate responses to every student. This leads to delays, confusion, and dissatisfaction among applicants.

To overcome this problem, technological solutions such as chatbots have emerged as an effective way to handle repetitive and frequently asked questions. Chatbots simulate human conversation and can interact with users in real time, offering instant support. When combined with Machine Learning (ML) and Natural Language Processing (NLP), chatbots become capable of understanding user intent and providing relevant responses.

This paper presents the design and implementation of a College Admission Enquiry Chatbot that uses machine learning techniques to assist students in obtaining accurate admission-related information quickly. The chatbot supports text and voice inputs and is capable of interacting in multiple languages, including English, Hindi, and Marathi. It leverages speech recognition to process voice queries, Google Translate API for language translation, and gTTS for generating voice responses.

The chatbot is deployed using the Django web framework to provide an accessible and interactive platform for students. The goal of this project is to enhance the efficiency of the admission process, reduce the workload of administrative staff, and improve the overall experience of prospective students through automation and intelligent response handling.

II. PROBLEM STATEMENT

- The traditional college admission process often

involves manual handling of student queries through phone calls, emails, and in-person visits. This approach is time-consuming, resource-intensive, and inefficient, especially during peak admission periods. Institutions struggle to provide timely and accurate responses to a large number of repetitive queries, leading to delays, miscommunication, and dissatisfaction among students.

- Furthermore, language barriers and limited availability of staff can prevent students from accessing critical information, particularly in multilingual regions. There is a need for an intelligent, scalable, and accessible solution that can assist students around the clock, respond instantly to their queries, and support communication in multiple languages through both text and voice.
- This project aims to address these challenges by developing a College Admission Enquiry Chatbot using Machine Learning that can understand natural language, classify user intent, and provide relevant admission-related information in real time.

III. LITERATURE SURVEY

In recent years, chatbots have gained popularity as effective tools for automating customer support and information dissemination across various domains, including education. Several research efforts and technological implementations have demonstrated the potential of chatbots in enhancing user interaction and improving service delivery.

1. Educational Chatbots:
A study by Winkler and Söllner (2018) highlighted the use of conversational agents in education for providing personalized learning experiences and academic support. These chatbots help reduce human workload while improving student satisfaction by offering 24/7 assistance.

2. NLP-Based Chatbots:
Natural Language Processing (NLP) is a key component in chatbot development. Research by Y. Huang et al. (2020) explored the application of NLP in chatbots to understand user queries and generate context-aware responses. Techniques such as tokenization, lemmatization, and intent classification are widely used to enhance chatbot performance.

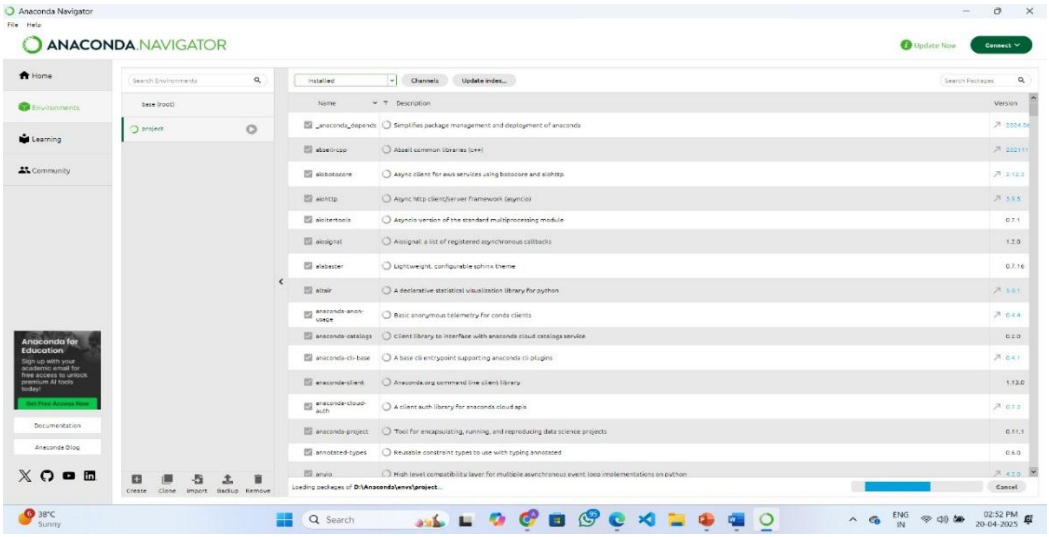
3. Multilingual Support in Chatbots:
Multilingual chatbots are essential in diverse regions. According to studies by Chatterjee et al. (2021), integrating translation APIs like Google Translate enables chatbots to interact with users in multiple languages, thereby improving accessibility and inclusivity.

4. Voice-Enabled Chatbots:
Voice interaction is another growing area of interest. The use of speech-to-text (STT) and text-to-speech (TTS) technologies such as Google Speech Recognition and gTTS allows users to interact hands-free and makes the system more user-friendly, especially for visually impaired users or those uncomfortable with typing.

5. Chatbots in College Admission Systems:
Previous systems have attempted to automate college admission queries using rule-based chatbots. However, these systems lacked flexibility and could not handle varied natural language inputs. Machine learning-based chatbots, as proposed in this project, offer greater adaptability and learning capabilities to handle diverse queries efficiently.
These studies and technologies form the foundation of this project, which integrates NLP, ML, voice input, and multilingual support to create a robust and interactive college admission enquiry chatbot.

IV. EXPERIMENT STEPS

Step 1: Create an environment:
We must first create an environment for our project model.



Step 2: Launch the editor:

After we are done with creating environment, we have to launch the editor in which we want to run the project.

Step 3: Open the code:

After we have launched the editor, we must open the folder in which we have written the code and run it one by one.

V. PROPOSED APPROACH

The proposed system aims to develop a smart, interactive, and multilingual College Admission Enquiry Chatbot that can handle student queries related to the admission process efficiently using Machine Learning and Natural Language Processing (NLP).

The chatbot is designed with the following key components:

1. User Input (Text/Voice):
   Users can interact with the chatbot either by typing their queries or speaking them. The system uses Google Speech Recognition to convert voice inputs into text.

2. Language Detection and Translation:
   To make the chatbot multilingual, it integrates the Google Translate API, allowing users to ask questions in English, Hindi, or Marathi. The input is translated into English (the processing language), and responses are translated back into the user's preferred language.

3. Intent Recognition:
   The chatbot uses an NLP-based Bag-of-Words model to convert text into numerical features. A feedforward neural network is trained to classify these inputs into predefined intents such as "Courses Offered," "Fees," "Admission Process," "Important Dates," etc.

4. Response Generation:
   Once the intent is identified, a predefined response mapped to that intent is selected from the dataset and returned to the user. Responses are both displayed as text and spoken using gTTS (Google Text-to-Speech) for a voice-based experience.

5. Web Interface:
   The chatbot is deployed using the Django web framework, providing an easy-to-use and visually interactive interface where students can chat in real-time.

6. Training and Updates:
   The chatbot is trained on a custom dataset containing frequently asked admission-related queries. As the system collects more data, the model can be retrained to improve accuracy and add new features.

VI. SYSTEM ARCHITECTURE

The system architecture of the College Admission Enquiry Chatbot is designed to support multilingual, voice-enabled, and machine learning-driven interactions through a modular and scalable structure. The architecture consists of the following major components:

1. User Interface (Frontend)
   - Built using HTML, CSS, and JavaScript within the Django framework.
   - Provides options for text input and voice input.
   - Displays chatbot responses in both text and audio formats.
   - Offers language selection for English, Hindi.

2. Speech-to-Text (STT) Module
   - Utilizes Google Speech Recognition API to convert user voice queries into text.
   - Ensures support for Hindi, Marathi, and English voice input.

3. Language Translator Module
   - Uses Google Translate API to translate non-English inputs (Hindi/Marathi) into English for processing.
   - After response generation, the output is translated back into the user's selected language.

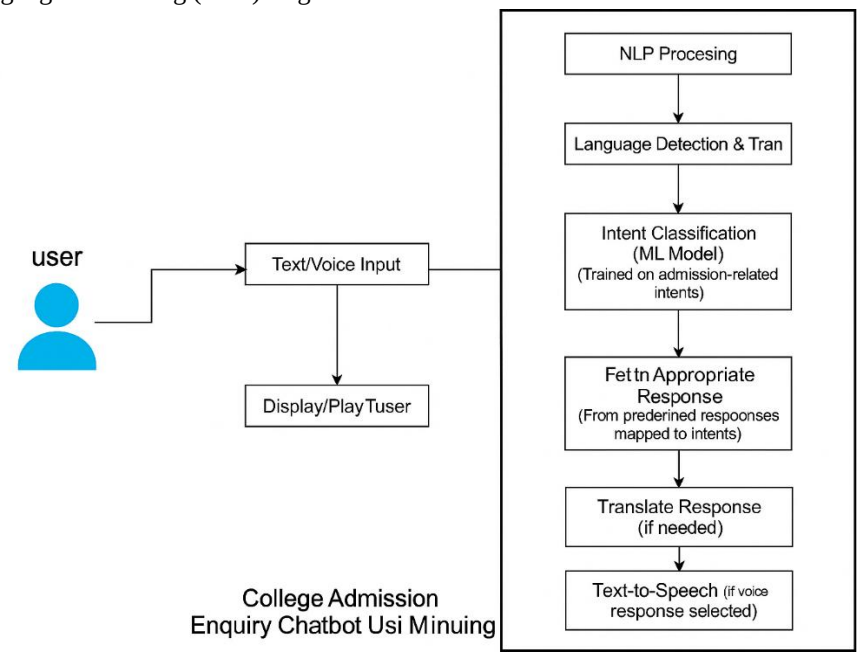
4. Natural Language Processing (NLP) Engine
   - Performs tokenization, lemmatization, and bag-of-words vectorization.
   - Converts the processed query into a format suitable for machine learning input.

5. Intent Classification Model
   - A feedforward neural network trained on labeled intents (e.g., courses, fees, deadlines).
   - Identifies the user's intent from the processed query and selects the most appropriate response.

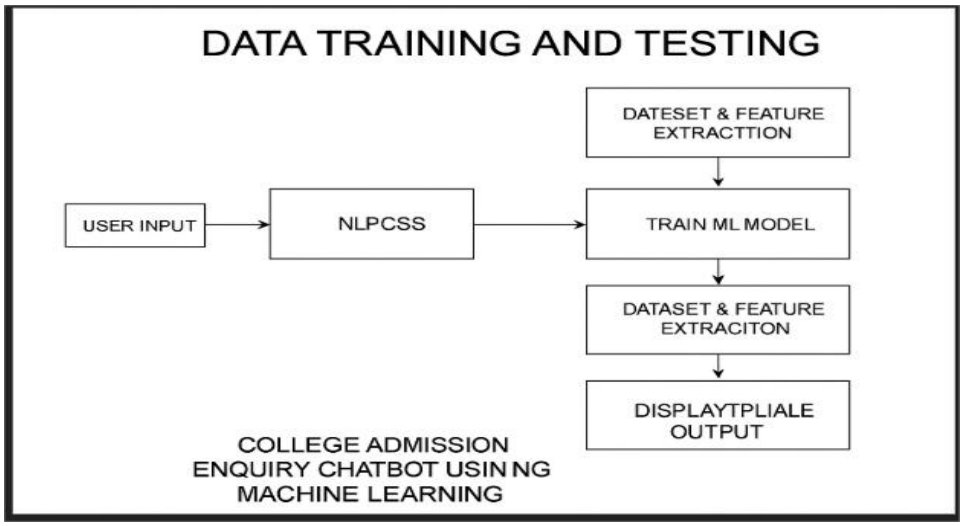
6. Response Generator
   - Matches the predicted intent to a predefined response stored in the system's database or JSON file.
   - Prepares a reply in English for translation and voice output.

7. Text-to-Speech (TTS) Module
   - Uses gTTS (Google Text-to-Speech) to convert the response into audio output.
   - Enhances accessibility, especially for visually impaired or non-text-friendly users.

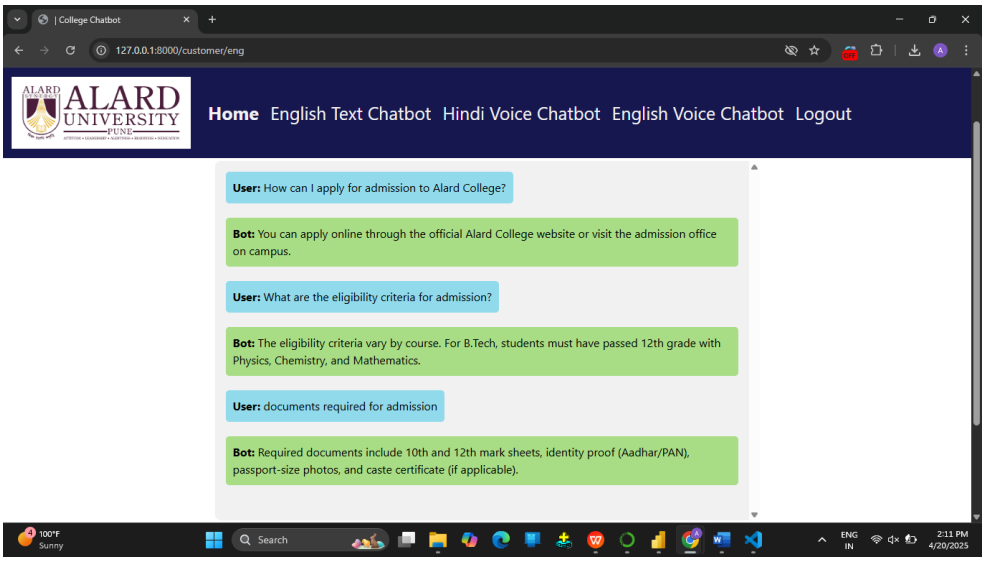
8. Backend Server
   - Developed in Python using Django.
   - Manages request routing, model execution, and API integration.
   - Handles session management and interaction logging for future improvements.



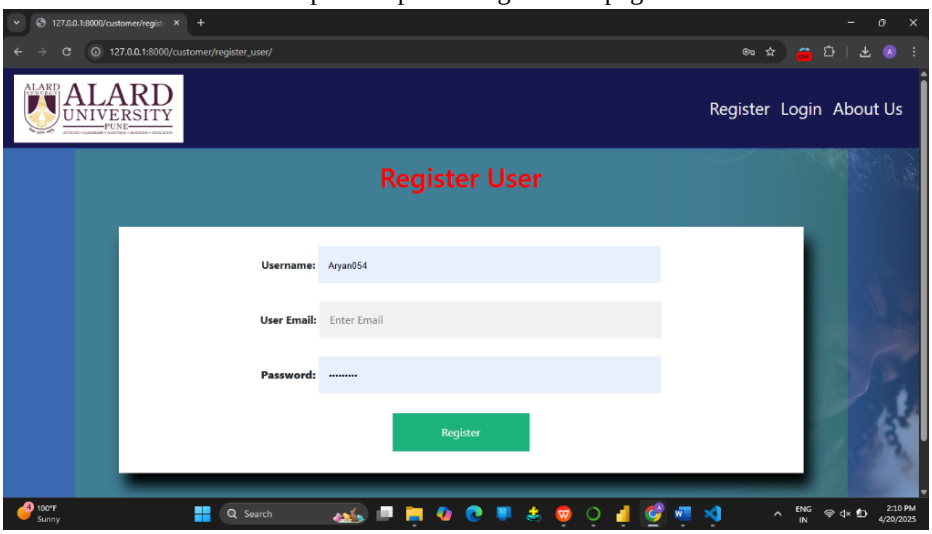
VII. DATA TRAINING



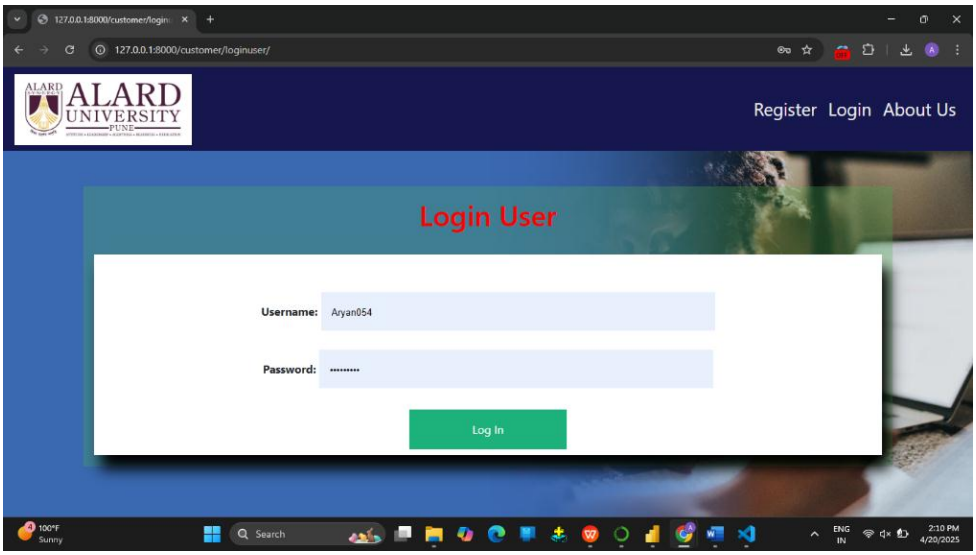
VIII. RESULTS



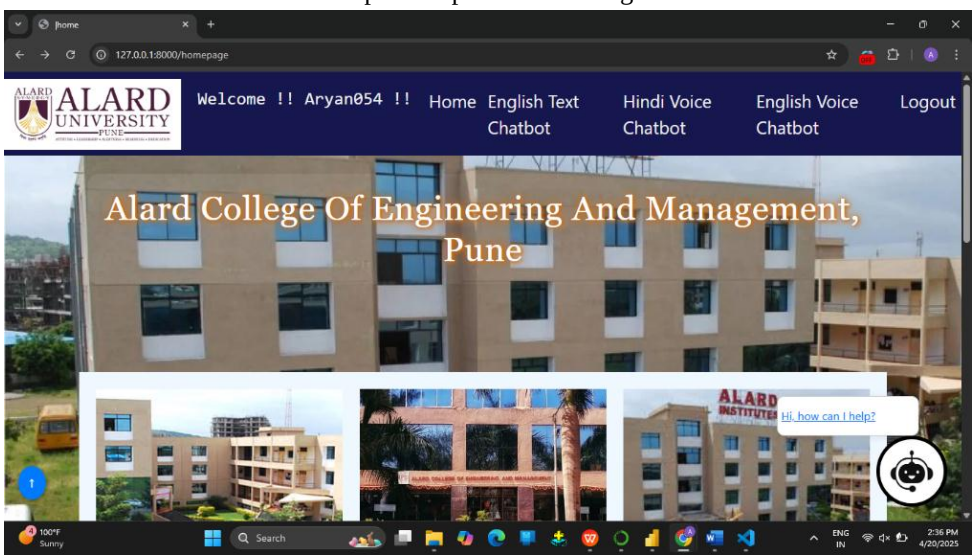
Step 1: Output of Registration page



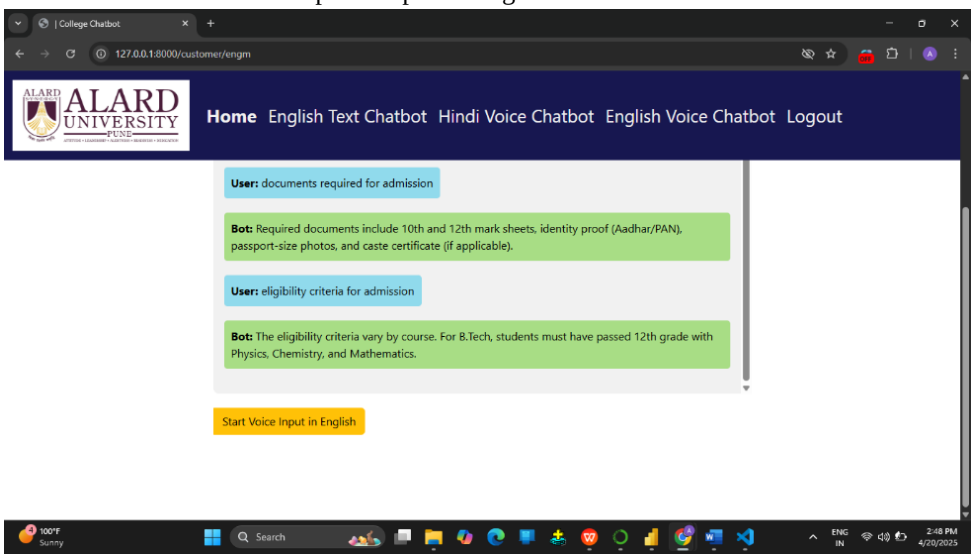
Step 2: Output of login page



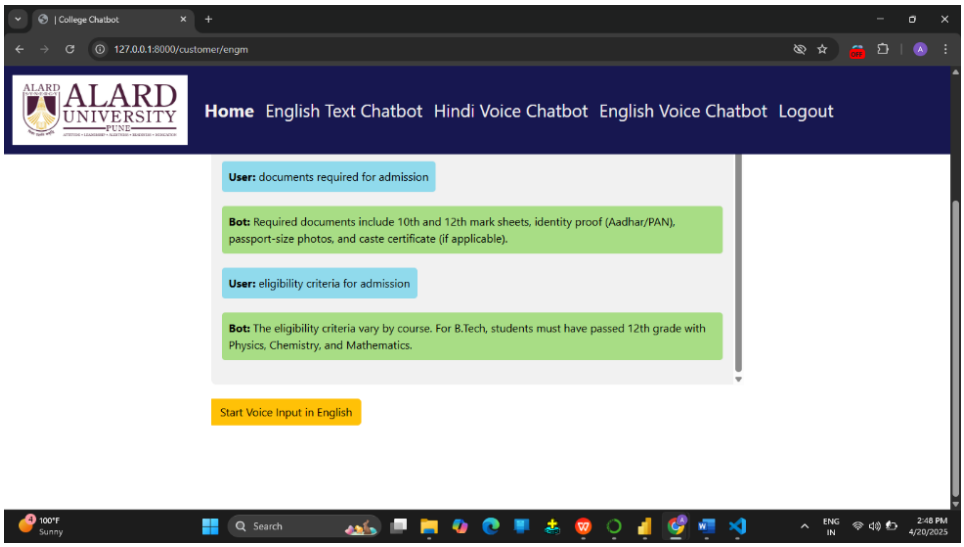
Step 3: Output of Home Page



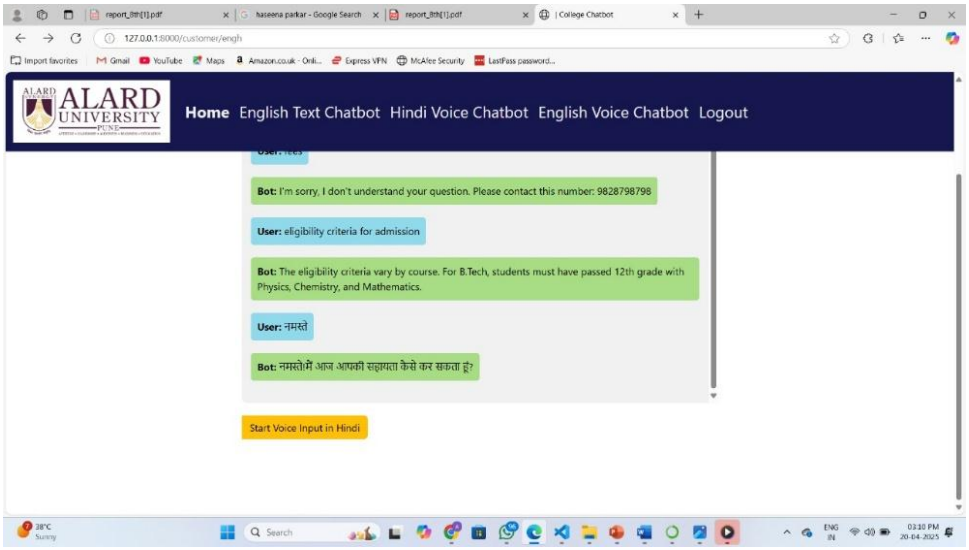
Step 4: Output of English Text chatbot



Step 5: Output of English Voice Chatbot.



Step 6: Output of Hindi Voice Chatbot



IX. FUTURE SCOPE

The proposed College Admission Enquiry Chatbot lays the foundation for an intelligent and user-friendly system that simplifies the admission process. However, there are several areas where the chatbot can be enhanced in the future to increase its effectiveness and usability:

1. Integration with Live Databases:
   Currently, responses are based on a predefined dataset. In the future, the chatbot can be integrated with the institution's live admission database and ERP systems to fetch real-time data such as seat availability, admission status, and application progress.

2. Support for More Languages:
   The existing system supports English, Hindi, and Marathi. Future versions can be expanded to include additional regional and international languages to improve accessibility for a wider audience.

3. AI-Based Dynamic Response Generation:
   The current chatbot uses predefined responses. Implementing advanced NLP techniques such as transformer models (e.g., BERT or GPT) can enable the system to generate more dynamic, personalized, and context-aware responses.

4. Chatbot Analytics Dashboard:
   An admin panel can be developed to provide analytics on frequently asked questions, user feedback, and chatbot performance.

This data can be used to retrain the model and improve accuracy over time.

5. Mobile Application Support:
   The chatbot can be integrated into a dedicated mobile app for Android and iOS platforms, making it more accessible and convenient for students to interact with anytime, anywhere.

6. Live Human Hand-off Feature:
   In complex cases where the chatbot cannot handle the query, a live chat option can be introduced, allowing students to connect with a human representative for further assistance.

7. Form Submission and Document Upload:
   Future updates may allow users to directly submit admission forms, upload required documents, and track their application status through the chatbot interface.

X. CONCLUSION

In this paper, we proposed and developed a smart, multilingual, and voice-enabled chatbot system designed to assist students with college admission-related queries using machine learning and natural language processing techniques. The chatbot provides an efficient and interactive platform for students to obtain instant responses to common questions, thereby reducing the workload on administrative staff and enhancing the overall admission experience.

By integrating tools such as speech recognition, Google Translate API, and gTTS, the chatbot supports both voice and text-based interactions in English, Hindi, and Marathi, making it accessible to a diverse student population. The use of a neural network-based intent classification model ensures accurate understanding and categorization of user queries.

The implementation using the Django web framework offers a simple yet effective user interface, enabling real-time communication between students and the system. While the current version addresses frequently asked questions with predefined responses, the chatbot demonstrates strong potential for future enhancement, including real-time database connectivity, AI-generated responses, and mobile integration.

Overall, this chatbot serves as a valuable step toward digital transformation in educational institutions, improving communication, accessibility, and efficiency during the admission process.

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