

INTERACTIVE CHATBOT CREATION FOR COLLECTING THE ADMISSION QUERIES

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ABSTRACT

Educational institutions receive a large number of admission-related queries from students and parents every academic year, including information about courses, eligibility criteria, fee structure, admission procedures, and important deadlines. Traditional methods such as phone calls, emails, and manual help desks are often time-consuming, inefficient, and limited by staff availability. During peak admission periods, these approaches can lead to delayed responses, inconsistent information, and increased workload on administrative staff, ultimately affecting the overall student experience and decision-making process.

To overcome these challenges, an AI-Based Admission Query Support and Assistance System is proposed, which uses Natural Language Processing (NLP) and Machine Learning techniques to automatically understand and respond to user queries in real time. The chatbot operates 24/7, handles multiple users simultaneously, and provides instant, accurate, and consistent information through an interactive platform.

1.INTRODUCTION:

Admission processes are among the most critical and high-stakes operations in any educational institution. Every academic year, thousands of prospective students and their parents seek detailed information about available courses, eligibility criteria, fee structures, scholarship opportunities, hostel facilities, application deadlines, and general admission procedures. The sheer volume and diversity of these queries make manual handling both resource-intensive and practically inefficient for most institutions. In today's digital-first environment, where smartphone penetration and internet access are nearly ubiquitous, students expect quick, accurate, and round-the-clock responses from institutions they are considering for higher education.

A delay or unsatisfactory response during the admission inquiry phase can result in the loss of a prospective student to a competitor institution. This makes responsive and effective query management a strategic priority, not merely an administrative convenience. An interactive chatbot provides a smart, scalable, and cost-effective solution by automating the enquiry-handling process. Powered by Natural Language Processing (NLP), the chatbot understands user queries expressed in plain, conversational English and delivers relevant responses instantly. Unlike static FAQ pages or email-based support systems, a chatbot can engage in multi-turn conversations, remember context within a session, handle follow-up questions, and gracefully escalate complex or unanswered queries to human administrators. This project presents the design and development of a full-stack interactive chatbot application tailored for educational admission enquiries.

2.LITERATURESURVEY:

The literature survey on admission chatbot systems highlights the rapid evolution of AI-driven solutions in improving student support services. In 2022, IBM Watson introduced an AI-based Natural Language Processing (NLP) chatbot specifically designed for admission assistance, which significantly improved response time and reduced manual workload; however, its high licensing cost and limitation to English queries restricted its broader usability. In the same year, Kumar et al. proposed a hybrid chatbot combining rule-based techniques with machine learning, achieving 24/7 availability and an accuracy of around 82%, though it lacked an admin dashboard and had challenges in maintaining its knowledge base.

Moving forward, in 2023, Google Dialogflow enabled the integration of NLP chatbots with university websites, reaching a high intent accuracy of 91% and improving user engagement, but it introduced concerns such as usage-based costs and dependency on stable internet connectivity. In 2024, Sharma and Patel developed an FAQ automation system with form collection features, which improved query data quality by 78%; however, it did not support personalization or provide analytics dashboards for deeper insights. Most recently, in 2025, the Smart Admission Bot utilized transformer-based NLP along with analytics integration, achieving an impressive accuracy of 94.7% and offering real-time analytics, though it required high development and maintenance costs along with GPU resources.alternatives.

3.PROBLEM STATEMENT

The management of admission-related queries in educational institutions is a complex operational challenge, especially during peak admission seasons. Institutions of all sizes, from small colleges to large universities, face a high volume of repetitive queries, limited availability of administrative staff, inconsistent dissemination of information, and difficulty in providing support beyond regular working hours. In a typical admission cycle, a medium-sized engineering college in India may receive between 5,000 and 15,000 queries through various channels such as phone calls, emails, social media platforms, in-person visits, and official websites. This multi-channel influx makes it difficult to organize, monitor, and respond efficiently.

Additionally, the lack of a centralized query management system often leads to inconsistent responses, where different staff members provide varying answers to the same question, causing confusion and reducing trust among prospective students. At the same time, modern students expect 24/7 access to accurate information, regardless of their location or time of inquiry. For instance, a student in a rural area searching for admission details late at night should receive the same level of support as someone visiting the campus during office hours—an

expectation that traditional human-based support systems struggle to fulfill. Altogether, these challenges result in an inefficient and less effective admission process, ultimately impacting both student satisfaction and institutional performance.

4.PROPOSED SYSTEM

The proposed system focuses on the development of an interactive chatbot designed to handle admission-related queries in an automated and efficient manner. This system utilizes Natural Language Processing (NLP) techniques to understand user questions expressed in simple and natural language, enabling smooth and human-like interaction between users and the chatbot. The chatbot is capable of providing instant responses to both common and complex admission queries, ensuring that students and parents receive accurate information without any delay. Unlike traditional systems, the chatbot operates continuously and is available 24/7, allowing users to access information at any time and from any location.

In addition to answering queries, the system stores all user interactions and queries in a centralized database.By automating repetitive tasks such as answering common questions.

5.METHODOLOGY:

The proposed Admission ChatbotSystem will be an automatedsolution designed to handle student queries efficiently and provide real-time support system.

a. Data Collection

The system collects admission-related data from multiple sources such as institutional databases, official websites, FAQs, brochures, and previous query records. This data includes information about courses, eligibility criteria, fee structure, important dates, and application procedures. The collected data is organized into a structured knowledge base for easy access.

b. Data Monitoring

The chatbot continuously monitors user queries submitted through the website or application interface. It tracks incoming questions in real time and ensures that each query is processed without delay, maintaining a seamless user experience.

c. Data Processing and Analysis

The user queries are processed using Natural Language Processing (NLP) techniques. The system analyzes the intent behind each query and matches it with the relevant information stored in the knowledge base. This step helps in understanding user requirements accurately, even if the questions are asked in different formats.

d. Decision Making (Automation)

Based on the analyzed query, the chatbot automatically decides the most appropriate response. If the query

matches known intents, the system provides instant answers. In cases where the query is unclear or not available in the database, the system can either ask follow-up questions or escalate the query to human administrators.

e. Control and Notification System

After generating a response, the chatbot delivers the information instantly to the user through the interface. Additionally, the system can notify administrators about unresolved or complex queries. An admin dashboard may also be included to monitor interactions, update the knowledge base, and improve system performance. This entire process runs continuously, ensuring 24/7 availability and efficient management of admission-related queries.

6. ALGORITHM:

1. Start

2. Initialize the System

- Load chatbot application
- Connect to database/knowledge base
- Initialize NLP model and user interface

3. Set Threshold Values

- Define response rules and intents
- Set accuracy/confidence threshold (e.g., 80%)
- Define fallback response for unknown queries

4. Read Sensor Data

- User enters query through website/app
- System captures input in text format

5. Process Data

- Apply Natural Language Processing (NLP)
Extract keywords and user intent

6. Decision Making

- Match query with knowledge base
- If match found → Generate appropriate response
- If confidence < threshold → Ask clarification or fallback message
- If query not found → Escalate to admin or store for future learning

7. Control Action

- Send response back to user interface
- Log query and response in database

8. Display/Monitor Data (Optional)

- Show response instantly to user

9. Repeat Process

Continuously accept and process new queries

10. End (Continuous Loop System)

7. RESULTS:



This dual-access approach ensures flexibility and makes the system accessible to both registered users and casual visitors who may want to explore the chatbot before signing up.

The Register Screen serves as the entry point for new users who want to create a full account in the College Info Assistant system. The interface is designed with a visually appealing purple-to-blue gradient background that reflects the application's brand identity, while a graduation cap icon in the header emphasizes its educational purpose. The registration form includes three input fields: Username, which requires a minimum of four alphanumeric characters; Email, which is validated according to standard email format; and Password, which must be at least eight characters long and includes a show/hide toggle feature using a password-visibility eye icon for user convenience.

The system provides real-time validation feedback below each field, helping users correct errors instantly. Additionally, the screen offers two main action buttons: a "Register" button, styled as the primary call-to-action to create a new account, and a "Continue as Guest (5 questions)" button, designed in a secondary outlined style, allowing users to access the chatbot without registration. This dual-access approach ensures flexibility and makes the system accessible to both registered users and casual visitors who may want to explore the chatbot before signing up.



The College Location Feature is an additional utility integrated into the chatbot's left sidebar, adding a geospatial dimension to the admission information system that was not present in the previously reviewed literature. This feature allows users to search for a college by entering its name in the "Enter college name" input field and clicking the "View on Google Maps" button. The system then sends the query to the Google Maps Places API, which processes the request, converts it into Maps.

The map shows multiple geo-pins across the relevant region, with labeled markers representing matched institutions. Each marker provides useful details such as the institution's name, Google rating, number of reviews, website link, and a "Get Directions" option. Additionally, the embedded map supports standard interactions like zooming, panning, and switching between satellite and street views, making it easy for users to explore locations and plan visits effectively.

8. CONCLUSION:

The Interactive Chatbot for Collecting Admission Queries presents a comprehensive and practical solution to a common challenge faced by educational institutions in India. The project demonstrates how modern web technologies combined with accessible Natural Language Processing techniques can significantly improve the way institutions manage student enquiries. Developed through all phases—from requirement analysis and system design to implementation, testing, and documentation—the system successfully delivers all intended functionalities, including 24/7 availability, NLP-based query understanding, dual user access for guests and registered users, an admin dashboard, query analytics, and Google Maps integration. All functional test cases were successfully validated, and the system meets performance standards in terms of response time, concurrent user handling, and security. By automating responses to frequently asked questions, the chatbot reduces the workload on administrative staff, allowing them to focus on more complex tasks, while also providing students and parents with instant, accurate, and consistent information regardless of time or location.

Technically, the project highlights the feasibility of building a cost-effective, production-level AI application using open-source technologies such as Python/Flask, NLTK, React.js, and MySQL, making it suitable even for institutions with limited budgets.

Its multi-tier architecture, modular design, and RESTful APIs ensure scalability, maintainability, and flexibility for future upgrades, such as integrating more advanced NLP models. Additionally, the project offers valuable insights for further enhancement, particularly in improving the handling of ambiguous queries and expanding the analytics dashboard with predictive features, paving the way for future research and development.

9. FUTURE SCOPE:

The Admission Chatbot System offers significant scope for future enhancements to further improve its functionality and user experience. One potential extension is the development of a dedicated mobile application, enabling users to access the chatbot conveniently from their smartphones, thereby increasing accessibility. The system can also be upgraded with voice-based interaction, allowing users to communicate through speech instead of text, making it more interactive and user-friendly, especially for those who prefer voice communication. Another important improvement is the inclusion of multilingual support, which would enable the chatbot to respond in multiple languages and make it accessible to a broader and more diverse audience.

Integration with college ERP systems can further enhance the system by providing personalized services such as application status tracking, admission results, and document verification updates. Additionally, incorporating advanced machine learning models can improve response accuracy and enable personalized recommendations based on user queries. Overall, the system is designed to ensure efficient interaction, quick responses, and easy navigation, making it a reliable solution for managing admission-related queries, while the Login Screen ensures secure and convenient access for registered users.

Further enhancements may include the implementation of an AI-powered recommendation system that suggests suitable courses or colleges based on user preferences, academic background, and interests. The system can also be integrated with notification services such as email or SMS alerts to inform users about important deadlines, application updates, and admission announcements. Another improvement is the addition of sentiment analysis to understand user satisfaction and adjust responses accordingly for a more human-like interaction. Security features can be strengthened by implementing multi-factor authentication and data encryption to protect user information.

Moreover, the admin dashboard can be enhanced with advanced analytics and visualization tools to track user behavior, frequently asked questions, and system performance.

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