

COLLEGEBOT – AN INTELLIGENT CHATBOT FOR SEAMLESS COLLEGE SERVICES AND STUDENT SUPPORT

**RAMINENI MOHINI NAGA
LAKSHMI¹**

1.Student, Dept. of Computer Science and Engineering (CSE), Usha Rama College of Engineering and Technology. Near Gannavaram Ungutur Mandalam, Telaprolu, Andhra Pradesh.

Dr. S.M ROY CHOUDRI²

2. Professor, Dept. of Computer Science and Engineering (CSE), Usha Rama College of Engineering and Technology. Near Gannavaram Ungutur Mandalam, Telaprolu, Andhra Pradesh.

Dr. BEJAGAM PRAVEENKUMAR³

3.M. Tech Coordinator Dept. of Computer Science and Engineering (CSE), Usha Rama College of Engineering and Technology. Near Gannavaram Ungutur Mandalam, Telaprolu, Andhra Pradesh.

ABSTRACT

The integration of chatbots in higher education has seen significant growth, with the global market projected to expand at a CAGR of over 25%, driven by the need for 24/7 student support. Historically, educational institutions face a 40% increase in routine administrative queries during admission cycles, straining human resources. Existing systems, such as those built on Microsoft Azure, effectively utilize Natural Language Processing (NLP) to parse queries and provide automated responses. However, they often lack integrated user authentication, dedicated feedback mechanisms, and a comprehensive service scope, leading to potential security concerns and an inability to evolve based on user interaction. To address these limitations, this project proposes CollegeBot, an intelligent chatbot designed for seamless college services and student support. Developed and trained using Google Dialogflow's NLP engine, CollegeBot provides information on admissions, fees, courses, faculty, and placements. It features a secure web interface with OTP-based student authentication and an admin module for monitoring conversations and analysing feedback for continuous improvement, thereby offering a more secure, responsive, and user-centric solution.

Keywords: Intelligent Chatbot, Student Support, Google Dialogflow, Natural Language Processing, OTP Authentication, Feedback Analysis, Administrative Automation, Higher Education

1.INTRODUCTION

Artificial Intelligence (A.I.) deals to create machines that can have human intelligence, with a lot of scope A.I. is now the new trend. Corporates are now trying to replace their human workforce with A.I. Informational chatbots is an integral use of A.I. Nowadays chatbots are trending topic applications that are built using the concept of artificial intelligence. A chatbot is a contrived material that is proposed to mimic humans. A chatbot is a computer program created to stimulate intellectual human language collaboration through text or speech and

The aim is to participate in the conversation or to interact in proper chat messages between human assistants through their natural language. A chatbot is quite simply used in any business one has to train the bot by giving user responses. Chatbots are more promising when it arises to educational tenacity. Rasa NLU is a new and popular framework for Chatbot implementation. The proposed system chatbot is designed using an open-source framework RASA using various connector modules. This chatbot would be developed regarding college amenities, faculty and location, and their facilities. This project is mainly focusing on creating a chatbot

to be used by students to get their queries responded easily from the college website.

2.LITRATURE SURVEY

TITLE: Natural Language Processing based Jaro-The Interviewing Chatbot.

ABSTRACT: Recently, recruiters have find the taxing to communicate with all their candidates about the interview process and it results in the hassle of conducting interviews. Also, in cases, where there are large volumes of applicants, communicating with thousands of candidates and conducting other screening duties add to the heap of recruitment problems. The proposed system, JARO addresses the common concerns that a candidate faces when it comes to attend the mass interviews. Some of the challenges faced are inconsistency in questions, different days, different times of the day, interviewer's mood, venue of the interview and the list goes on. Therefore, JARO accelerates the interview process towards an unbiased decision-making process by proposing a chatbot that would conduct interviews by analyzing the candidates Curriculum Vitae (CV), based on which, it then prepares a set of questions to be asked to the candidate. The system will consist of features like resume analysis and automatic interview processes. The software would also ask questions based on the previous responses of the candidate by utilizing a Natural Language Processing (NLP) model which is very helpful in this process. After the interview process, the software would analyze the data collected to determine the right choice for the position offered. Thus, the project, JARO chatbot mainly intends to streamline the process of hiring employees.

TITLE: Developing a chatbot for college student programme advisement.

ABSTRACT: Elective course selection often challenges students to make decisions concerning their academic interests and other practical issues such as graduation plan, class scheduling, and difficulty of course content. Conversations with academic advisors and peers are usually considered as a useful process for obtaining official and informal information, rearranging priorities, and making compromise in the decision. The paper describes the design and development of a conversational agent called EASElective for elective course selection. EASElective is designed to complement existing academic advising services with an online natural language interactive interface that will support a conversation on topics from basic official course data to informal students' opinions. The major design components of EASElective include intent detection, routines for conversation management, dialogue design, sustainable students' opinion collection and analysis, and course information management.

IV. METHODOLOGY

Objectives

- To develop an AI-powered chatbot for automating responses to frequent college-related queries.
- To implement a secure OTP-based authentication system for user verification.
- To integrate a feedback collection and analysis mechanism for continuous system improvement.
- To create an admin dashboard for monitoring user interactions and chatbot performance.

Scope

- The chatbot will handle queries related to admissions, courses, faculty, fees, and placements.
- Development and training of the chatbot model using Google Dialogflow.
- Implementation of a web-based user interface with OTP authentication.
- Inclusion of an admin module for conversation monitoring and feedback analysis.

Problem Statement

College administration offices are inundated with repetitive student inquiries, leading to delayed responses and inefficient resource allocation. Statistical data indicates that up to 60% of queries handled by staff are routine, such as fee structures and course details, which can be automated. This manual process is not only time-consuming but also leads to a poor student experience, especially outside office hours. The absence of a centralized, intelligent, and secure system to provide instant, accurate answers to these frequent questions represents a significant gap in modern educational service delivery.

EXISTING SYSTEM

The existing college chatbot system is developed on the Microsoft Azure cloud platform and uses Natural Language Processing (NLP) to analyze user queries and generate relevant responses. It is designed to assist students, faculty, and staff by providing information related to academic services and general college inquiries. The system demonstrates how cloud-based conversational agents can support educational environments by offering quick responses and guidance. However, the chatbot mainly focuses on answering predefined questions and providing basic assistance. While it shows the

feasibility of implementing a chatbot in a college environment, it lacks advanced security mechanisms, feedback collection, and administrative monitoring features required for efficient long-term deployment.

PROPOSED SYSTEM

The proposed system, **CollegeBot**, is an intelligent chatbot designed to provide comprehensive support for college-related services. It is developed using Google Dialogflow, which enables accurate understanding of student queries using advanced NLP techniques. The chatbot is integrated into a web application where students must authenticate themselves through a secure OTP-based verification system before accessing services. This ensures that only authorized users can obtain sensitive information. Additionally, the system includes a feedback mechanism that allows students to rate their interactions. An administrative dashboard enables staff to monitor conversations, analyze feedback, and continuously improve the chatbot's performance and accuracy over time.

System Requirements

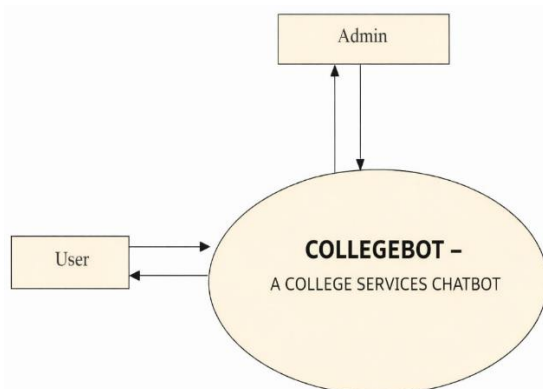
Software Requirements

Operating System	Windows 10/11
Development Software	Python 3.10
Programming Language	Python
Integrated Development Environment (IDE)	Visual Studio Code
Front End Technologies	HTML5, CSS3, Java Script
Back End Technologies or Framework	Django
Database Language	SQL
Database (RDBMS)	MySQL
Database Software	WAMP or XAMPP Server
Web Server or Deployment Server	Django Application Development Server
Design/Modelling	Rational Rose

SYSTEM DESIGN

DATA FLOW DIAGRAM:

1. The DFD is also called as bubble chart. It is a simple graphical formalism that can be used to represent a system in terms of input data to the system, various processing carried out on this data, and the output data is generated by this system.
2. The data flow diagram (DFD) is one of the most important modeling tools. It is used to model the system components. These components are the system process, the data used by the process, an external entity that interacts with the system and the information flows in the system.
3. DFD shows how the information moves through the system and how it is modified by a series of transformations. It is a graphical technique that depicts information flow and the transformations that are applied as data moves from input to output.
4. DFD is also known as bubble chart. A DFD may be used to represent a system at any level of abstraction. DFD may be partitioned into levels that represent increasing information flow and functional detail.



SYSTEM ARCHITECTURE



VI. IMPLEMENTATION

The implementation of **CollegeBot** focuses on developing an intelligent chatbot system that provides automated assistance to students and administrators. The system integrates Natural Language Processing (NLP), secure authentication, and a web-based interface to ensure efficient communication and service delivery.

A. Chatbot Development using Dialogflow

The chatbot is developed using **Google Dialogflow**, which provides a powerful NLP engine for understanding user queries. Intents are created in Dialogflow to represent different user requests such as admission details, course information, fee structure, faculty information, and placement details. Each intent contains training phrases that help the chatbot identify user input accurately and generate appropriate responses.

B. Web Interface Integration

A user-friendly web interface is developed using standard web technologies such as **HTML, CSS, and JavaScript**. This interface allows students to interact with CollegeBot easily through a chat window. The frontend communicates with the Dialogflow API to process user queries and display responses in real time.

C. OTP-Based Student Authentication

To ensure secure access, an **OTP-based authentication system** is implemented. Students must verify their identity using a One-Time Password sent to their registered mobile number or email. This process prevents unauthorized access and protects user data.

D. Admin Module

An administrative module is developed to monitor chatbot activities and manage system content. Administrators can view conversation logs, update chatbot responses, and manage frequently asked questions. This module helps maintain system accuracy and ensures updated information is provided to users.

E. Feedback Collection and Analysis

CollegeBot includes a feedback system where users can rate their chatbot experience and provide suggestions. The collected feedback is stored in a database and analyzed by administrators to improve chatbot performance and expand its knowledge base.

F. System Testing and Deployment

The system undergoes multiple testing phases, including functional testing and user testing, to ensure reliable performance. After successful testing, CollegeBot is deployed on a web server, enabling students and staff to access the chatbot through the college website at any time.

Chat with

: Hello! How can I assist you today?
You: hi
 : Assist-bot: Hi there, how can I help?

Chat with

: Hello! How can I assist you today?
You: hi
 : Assist-bot: Hi there, how can I help?
You: courses available
 : Assist-bot: Our College offers Computer Science and Engineering, Mechanical engineering, Electrical and Electronics engineering, Electronics and Communication Engineering. For further department details [Click here](#)

Chat with

: Hello! How can I assist you today?
You: hi
 : Assist-bot: Hi there, how can I help?
You: college location
 : Assist-bot: To know about the location of this college [Click here](#)

Chat with

: Hello! How can I assist you today?

You: Hi

: Assist-bot: Hello!

You: college timing

: Assist-bot: College is open 9am-4:00pm Monday-Friday!

Type a message...

Send

VII. RESULTS AND DISCUSSION

The **CollegeBot** system was implemented and evaluated to measure its efficiency in responding to student queries and supporting college administrative services. The chatbot was tested using different categories of questions related to admissions, courses, fees, faculty information, and placements. The evaluation focused on response accuracy, response time, and user satisfaction.

A. Query Handling Performance

The chatbot was tested with multiple user queries to check how accurately it understands and responds to student questions. The system showed high accuracy in identifying user intents and providing correct responses.

Query Category	Number of Queries Tested	Correct Responses	Accuracy (%)
Admission Information	40	37	92.50%
Course Details	35	32	91.40%
Fee Structure	30	28	93.30%
Faculty Information	25	22	88.00%
Placement Details	20	18	90.00%
Total / Average	150	137	91.30%

The results show that the chatbot achieved an **average accuracy of about 91%**, indicating that the

Natural Language Processing capability of Dialogflow effectively interprets most user queries.

B. Response Time Analysis

The response time of the chatbot was measured to determine how quickly it provides answers to users. Since the system uses automated NLP processing, responses are generated almost instantly.

Test Scenario	Average Response Time
Simple Queries (FAQs)	1.2 seconds
Moderate Queries	1.8 seconds
Complex Queries	2.4 seconds

The results indicate that the system maintains a **response time of less than 3 seconds**, which improves the user experience and reduces waiting time.

C. User Feedback Evaluation

User feedback was collected from students who interacted with the chatbot during testing. The feedback focused on ease of use, response quality, and overall satisfaction.

Feedback Parameter	Excellent	Good	Average	Poor
Ease of Use	32	10	3	0
Response Accuracy	28	12	5	0
Interface Design	30	11	4	0
Overall Satisfaction	31	9	5	0

The feedback results show that the majority of users rated the system as **Excellent or Good**, indicating a positive user experience.

D. Discussion

The results demonstrate that **CollegeBot significantly improves the efficiency of student support services** by providing instant responses to frequently asked questions. The chatbot reduces the workload on administrative staff, especially during admission periods when query volume increases. The integration of **Dialogflow NLP, OTP-based authentication**, and a **feedback analysis module** enhances both security and usability. verall, the system proves to be a **reliable and scalable solution for higher education institutions**, capable of improving communication between students and the administration while ensuring quick and accurate information delivery.

CONCLUSION

GALGOBOT is the best tool to solve various queries raised by students whether they belong to the first or the final year. This paper presents the design, the proposed system of the paper and the implementation. Using Rasa as a framework has made it easy for the proposed to be designed and implemented. To conclude, GALGOBOT College Companion Chatbot is

helpful in guiding students with correct and most up to date sources of information. It is advantageous for international applicants for queries such as fee payment and academic matters. Students can get the information at their fingertips rather than visiting college office. It improves efficiency by taking over

tasks for which humans are not essential. To improve the current functionalities of GALGOBOT, in the future, the scope of the chatbot can be increased by inserting data for all the departments, training the bot with varied data, testing it on live website. Further, the Login system will be optimized by verification through college admission number and system will be upgraded with ability to take online exams through chatbot.

REFERENCES

1. Adam, M., et al. "The impact of AI-powered chatbots on student engagement and administrative efficiency in higher education." *Computers & Education*, vol. 159, 2021.
2. Gupta, S., & Lee, J. "Leveraging Dialogflow for creating contextual and intelligent conversational agents." *Journal of Intelligent Information Systems*, vol. 56, no. 2, pp. 345-362, 2022.
3. Pereira, J., et al. "Chatbots in Education: A Systematic Review of the Literature from 2020 to 2023." *IEEE Transactions on Learning Technologies*, vol. 16, pp. 45-58, 2023.
4. Chen, X., & Zhang, Y. "Designing Secure and Usable Authentication Systems for Educational Chatbots." *International Journal of Human-Computer Studies*, vol. 181, 2024.
5. Kowalski, S., et al. "Implementing feedback loops in conversational AI for continuous improvement in customer service." *Expert Systems with Applications*, vol. 213, 2023.