College Enquiry Chatbot System

Nishmi Amin [1], Sweety Singh [2], and Ashwini Walavalkar [3]

Abstract

At the time of the admission process students and parents have a lot of questions in their minds for which they either call the administration or have to go to the college which may be miles away from them. Again, it would not be possible for one person to answer 500 calls at a time. The best solution to this problem is a Chatbot that answers all the questions. This project is based on developing a Chatbot that would be a saviour for the college staff at the time of admissions, upcoming exam details, date of release of the result etc.

Keywords : **Admissions, administration, Chatbot, college, staff, questions**

I. INTRODUCTION

In earlier days, it used to be a dream of many people to communicate with machines in the form of Chatbots, but now technology has made it possible for this fantasy to come true [1]. We are no longer educating humans how to convey messages to the system, instead we are training the system to communicate with humans.

Chatbots are usually used as a way to talk for various practical purposes including with customers, e-commerce site, health-sector, etc. A Chatbot can also be a helping hand for a therapist by detecting the level of depression and suggesting remedies [2].

Chatbots can be very helpful in the education sector where teachers can upload documents related to a subject and questions and answers of that subject can be generated with the help of pattern matching algorithm [3]. Similarly, for the HR recruitment process, candidates upload their resumes and a set of meaningful questions and answers can be generated using knowledge base and Artificial Intelligence Markup Language (AIML) [4].

Chatbot specifically performs these two tasks:

(1) User query analysis: First the Chatbot takes the input given by the user and tries to analyze it to interpret the useful meaning from it.

(2) Returning the response: The Chatbot finds the relevant answer to the user's question and displays the output. Based on the request the user gets the response.

In the current era, most of the businesses make use of Chatbot to increase user interaction. Thus, it is a challenge to develop an accurate interactive Chatbot.

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N. Amin[1], *Student (Bachelor of Engineering-IT),* Email : nishamin9@gmail.com ;

ORCID iD : https://orcid.org/0000-0002-6920-5261

S. Singh[2], *Student (Bachelor of Engineering-IT)*, Email : sweetysingh1609@gmail.com ;

ORCID iD : https://orcid.org/ 0000-0002-9388-0742

A. Walavalkar[3], *Student (Bachelor of Engineering-IT),* Email : itsashu5656@gmail.com ;

ORCID iD : https://orcid.org/0000-0002-1833-9585

[1,2,3] Vidyavardhini's College of Engineering and Technology, K.T. Marg, Vartak College Campus Vasai Road, Vasai-Virar - 401 202, Maharashtra.

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Imagine your life where a Chatbot can ease your pain and is available to help you out 24/7.

A. Problem Statement

A Chatbot communicates with humans via text. This communication happens via voice message and simple text message instead of humans replying to the user's query. The Chatbot is widely used in the areas of entertainment, e-commerce, transportation, education etc. In earlier days, developers focused on developing simple Chatbots. The main aim of those Chatbots was to respond to simple requests raised by the user, but in recent times, developers are developing interactive Chatbots and the goal is to achieve utmost accuracy.

B. Motivation

Those days are gone when alumni members would respond to every email from their university. Anyone would hardly get a second today because of such a fast-paced life. Teachers, educational departments, and the admission departments are facing a lot of difficulties [5]. So, in order to get the latest details, you can take the help of a Chatbot to do the work. Also, during the time of admission process, instead of hiring a number of help desk professionals to respond to the applicants, a Chatbot handles multiple user requests. It does all of this without deteriorating the quality of interactions, it improves the experiences of applicants, and keeps them engaged. So in this project, we will develop a Chatbot that can look after these concerns.

II. LITERATURE SURVEY

Chatbot gains knowledge that is being provided by the developer and using this knowledge the Chatbot replies to all the user queries [6]. Chatbots are usually of two types: rule based and machine based, which work on machine learning algorithms [7].

Chatbot can be used on existing platforms such as Telegram, shopping sites, and college websites making it easier for the user to get familiar with and understand a business or service [8].

There have been few well known existing Chatbots like the Alicebot, Mitsuku, and Chateful which primarily engage in discussions. ALICE bot uses AIML templates to produce responses [9] [10].

Static Chatbots only involve comparing of strings, whereas some bots use dynamic approach like preprocessing the message before searching for a response. The user types a question and on submitting the question, the message is preprocessed and the most relevant information from the database is provided as a response in similar way of messaging [11].

III. OVERVIEW

A. Abbreviations and Acronyms

- NLP (Natural Language Processing): It interprets the sentence meaning.
- NLU (Natural Language Understanding): Helps NLP in taking decisions.
- NLG (Natural Language Generation): The system generates response and from these responses structured data is being generated. NLG helps in generating readable text from the data.
- Category is the basic unit in AIML. The category has input and output given by the developer.

B. Tools and Technologies

- AIML, NLP, Python, Pattern matching algorithm.
- Front-end -HTML, CSS, and Bootstrap.
- Python packages required: NLTK, Flask, SQLite.

C. Figures

The Chatbot is used not only for outsiders but also for college students. One of the features of the Chabot is that we can get the syllabus (Fig. 1) of any department we want. Here, important and key functionality of the Chatbot that needs to be noted is the feature of pattern matching. The user can enter just the word "Syllabus" or the proper sentence along with it containing the word syllabus. For example, "show me syllabus". Then the Chatbot goes into the specification by asking the user about the specific department. Once the user answers this, the Chatbot reverts back with the proper link which provides the desired department syllabus to the user.

Three tables were made: GPA DETAILS, LOGIN, and STUD INFO for storing the data in Sqlite3. GPA Details (Fig. 2) has data related to Semester 8 marks of the

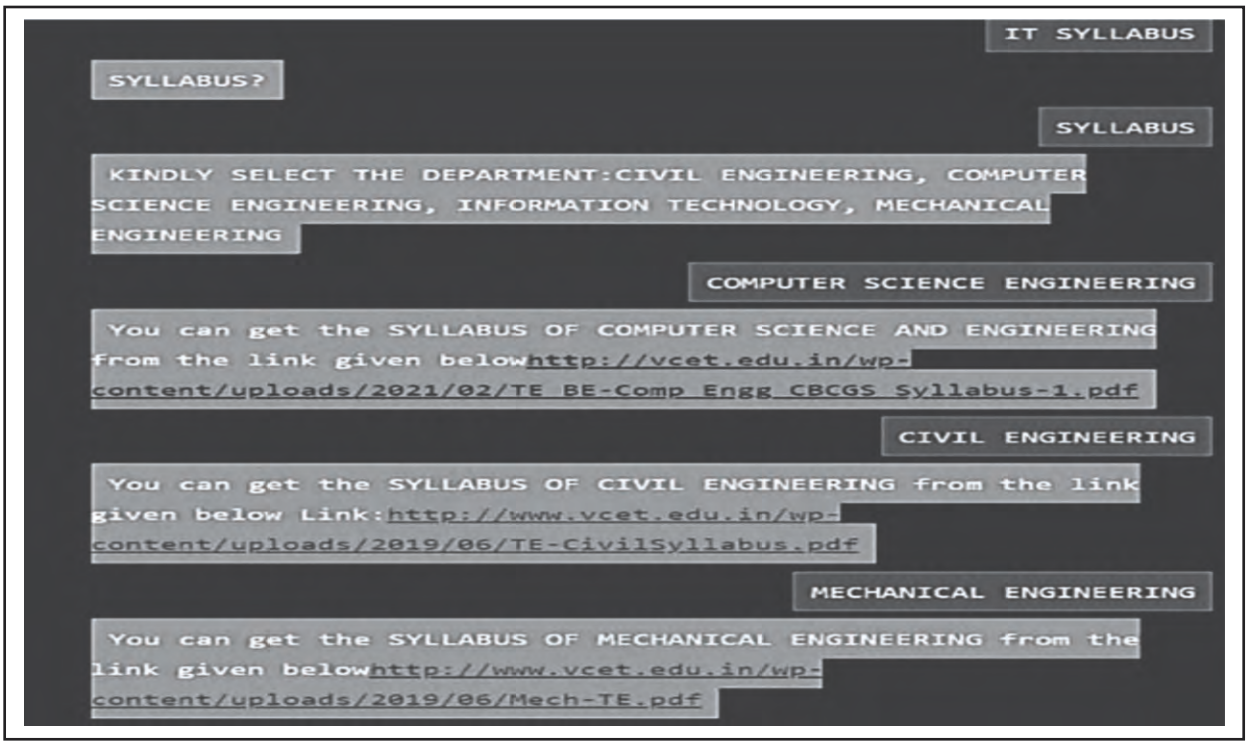

Fig. 1. Syllabus

i	id	sem1	sem2	sem3	sem4	sem5	sem6	sem7	sem8
1		8.9	8.3	8.6	8.5	8.4	0	0	0
2		8.9	8.3	8.6	8.5	8.4	8.9	0	0
3		8.9	8.3	8.6	8.5	8.4	8.5	9.2	0
4		8.9	8.3	8.6	8.5	8.4	0	0	0
5		8.6	8.3	9	8.5	8.4	8.9	0	0
6		8.4	8.3	9.4	8.9	8.8	9.5	9.2	0
7		8.4	8.3	7.9	8.5	8.4	8.9	9	0
8		8	8.3	0	0	0	0	0	0
9		8.8	0	0	0	0	0	0	0
10		8.1	8.4	0	0	0	0	0	0
11		8.7	8.7	8.6	8.5	0	0	0	0

Fig. 2. GPA Details

students. Login Table saves the email id and password of a student, whereas the Student Information table stores the student information.

This is the start of the conversation. Initially, the default message is displayed and later on, the conversation starts. The Chatbot first asks for the name of the person (Fig. 3).

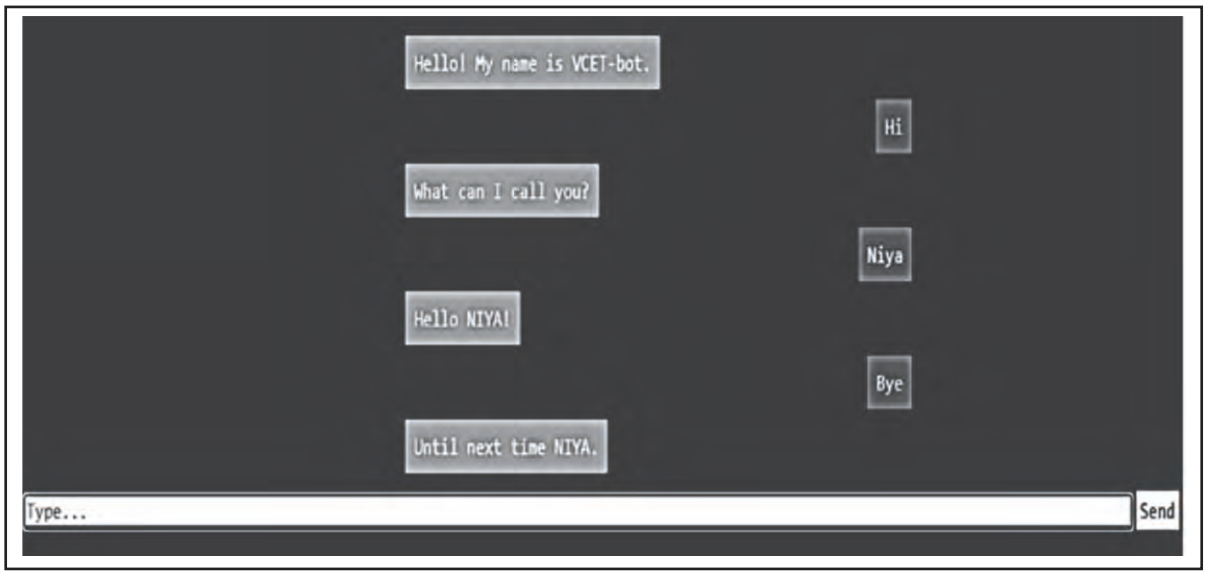

Fig. 3. Greetings

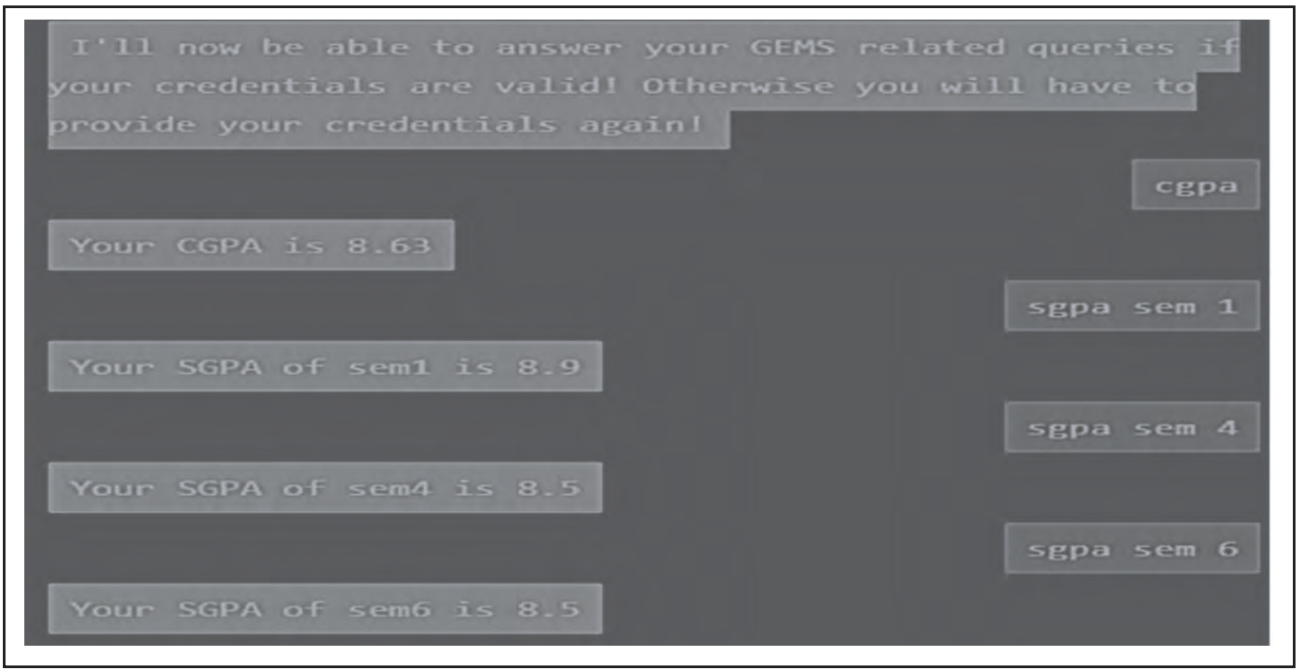

Fig. 4. Marks

This name is saved in the temporary variable and the name is displayed at the end while greeting goodbye. For example, the user had given the name Niya, so at the end, the user will get the name on the message saying "Bye Niya".

The Chatbot is not only for outsiders but also for college students. One of the features of the Chabot is that we can get the CGPA and SGPA of the students. The students can get the details about their marks from the Chatbot. The marks can be given in two forms, i.e., CGPA and SGPA. The Chatbot makes sure that a student's marks don't get displayed publicly to anyone outside or even inside the college.

This is ensured by giving the login credentials to individual students for the Chatbot. The process is very simple, yet very relevant and easy for the user. The student just needs to type login after which the Chatbot asks for username and the password of the student. The

password and username are checked with the help of the database and then only access is provided to the user. Students can get individual semester marks by asking for SGPA, for example, the student can type SGPA Sem 2 (Fig. 4). This command will help the Chatbot fetch the particular student's semester marks.

If a student wants the aggregate of all the semesters, it can be obtained by asking for the CGPA, the student can type *CGPA*. This command will help the Chatbot to redirect to the particular student's aggregate semester marks.

IV. IMPLEMENTATION

Steps for implementing Chabot:

- Collection of real time questions and answer datasets (AIML).
- Designing of the database (SQLite).
- Installing required (Python) packages/libraries (Chatter- bot, Corpus, NLTK).
- Designing the user interface for the bot [HTML, CSS, Bootstrap].
- Mapping of queries with answers.
- Analyze, iterate, and test the bot.
- Tracking the unanswered query.

V. METHODOLOGY

We developed a college Chabot using AIML along with NLP. This Chabot reverts back a users' query effectively. The Chatbot is capable of answering a student's personal details like college GPA (CGPA, SGPA), timetable, syllabus etc. Security is ensured for personal information. User authentication is checked for displaying personal grades. Since the Chatbot is not perfect, there might be a situation where the Chatbot would fail to answer questions. Such cases are taken into consideration and those questions are stored in the database. In this section, we present our methodology:

- The user gives input query to the Chatbot, the query is mapped using a pattern matching algorithm and most relevant answer of the query is displayed to the user.
- Then, based upon conditions satisfied, the Chatbot process is executed and a response is provided to the user.
- The interface is user-friendly and very interactive.
- The response time is very short.
- Most of the time the user gets the correct answers.

A. How does NLP Work

The main reason for NLP being an important part of the business is that it helps to analyze large volumes of valuable data related to online reviews, comments, reports, and gives suggestions by providing insights that make sense to human beings. These insights are more accurate and consistent than manually trying to figure out the logic over bulk data. It does not need manpower as the data is processed real time without inconsistency. In NLP, Tokenization, Lemmatization, Removal of stop words, and Regex Extraction steps take place [12]. NLP not only analyzes the data, but it is also capable of measuring and considering sentiments of people. It also helps businesses prioritize their task and organize things in a better way.

NLP includes separation of human language into segments. Segments help information of a grammatically correct structured sentence and meaning of words. These grammatical structures can further be manipulated and understood in context which helps computers and devices to communicate through reading and understanding oral or written text in the same way humans do. There are few of the fundamental NLP preprocessing tasks. Tokenization helps in breaking the text. It breaks the text into smaller sequences. The tags included are parts of speech. The marking is done with noun, adjectives etc. The tags included are stemming and lemmatization. It does the job of the reduction of the main sentence. Stop word removal is for the work of filtering the most common words. The NLP does the job of transforming the text into machine language. Preprocessing is the first step, next is building the NLP algorithm, and further training the NLP. This helps in training the NLP and further interpreting natural language. This would result in performing specific tasks.

There are two main algorithms using which one can solve the NLP problems:

(1) A rule-based approach : Here, the output is predefined on certain if-then rules set by the user. This basic approach was used in the early period and is still used today.

(2) Machine learning algorithms : This approach allows the program to learn and understand tasks on its own after being fed with some prior training dataset. Then the data gets segregated into labelled and unlabeled tags by making predictions on their own and therefore, it is more flexible.

B. Why Pattern Matching

Pattern matching was used in earlier Chatbots. This is also known as brute force, an instantaneous approach as the author of the system requires to describe each pattern for which there is a response. A standard way to structure these patterns is AIML. The process of pattern matching is using sentence similarity measurement scores. The AIML has a modular knowledge process. The chat patterns are language knowledge in the format of AIML stored in the database [13].

VI. CONCLUSION

These smart Chatbots with AI are the reason for the growth of business. Chatbots can reach out to a large audience through various applications like websites, application bots, messaging apps, and they are more effective than humans. In the coming future due to such a huge amount of information, Chatbot might develop into a capable information gathering technology. The problem and issues of the college system are overcome with the help of this Chatbot. It helps avoid burdening the office staff to know the college details. The user doesn't need to gather information by visiting colleges.

VII. FUTURE WORK

Further, we wish to use audio to text feature wherein the user can interact with bot through voice and the Chatbot will respond in the form of text using speech recognition.

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AUTHORS' CONTRIBUTION

Three authors have performed the work described in this paper. Sweety Singh has worked on the pattern matching algorithm. Ashwini Walavalkar has worked with the database. Nishmi Amin has run the various test cases on the model.

CONFLICT OF INTEREST

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in the manuscript.

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About the Authors

Nishmi Amin is pursuing Bachelor of Engineering from Vidyavardhini College of Engineering and Technology (Mumbai University). She is studying in the fourth year in IT (Information Technology) branch. She has good knowledge of Python, JAVA, SQL, HTML, CSS, and JS. Her interests also include Artificial Intelligence and Machine Learning.

Sweety Singh is pursuing Bachelor of Engineering from Vidyavardhini College of Engineering and Technology, Mumbai University. She is studying in the fourth year in IT (Information Technology) branch. She has good knowledge of JAVA, C/C++, and Python. Apart from these, she knows HTML, CSS, and JS. Her interests also include DBMS, SQL, and OS.

Ashwini Walavalkar is pursuing Bachelor of Engineering from Vidyavardhini College of Engineering and Technology (Mumbai University), and is studying in the fourth year in IT (Information Technology) branch. She has good knowledge of Python language, SQL, and has technical skills related to web development such as HTML, CSS, and JavaScript.

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