

# Conversational Agent for Student Service and Support

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**Abstract:** A chatbot is nothing but a program that takes part in a conversation. These conversations are text based (typed) or spoken. Dialog systems typically use chatbots for various practical purposes including information acquisition and customer service. College Enquiry Chatbot project is built by using artificial intelligence algorithms and machine learning algorithms including natural language processing that will analyze the user's queries and be able to understand what user's message means. This chatbot is developed as a simple application which answers any and all queries that the students might have. Students will just have to use the graphical user interface provided by college to ask any query they might have to the bot. The chatbot will enable a free service from the college to get information easily.

**Keywords:** chatbot, artificial intelligence algorithms.

## 1. Introduction

Chatbots are typically used on local computers and phones, although most of the time they are accessed through the internet. Chatbots are typically perceived as engaging software entity which humans can talk to. These applications can be interesting, intriguing and even inspiring. Chatbots are used everywhere from HTML pages that are old and ancient to the social networking websites however new they are. Chatbots are very versatile and can therefore be used on standard computers as well as smart phones. Chatbots can be trained to converse in any language using NLP. Chatbots help in dealing with day to day problems in a very easy way.

Chatbots are built using machine learning algorithms including NLP to analyze the user's query and understand their message. The chatbot provides answers to the queries of the student. Students do not have to follow any specific format while asking a query. They can ask the query as if having an actual conversation. The chatbot uses Natural language processing to answer the query. These answers are appropriate to whatever the question the user has asked. The user can ask any query related to the college and get the appropriate answers. The system analyzes the questions asked by the user and answers them. These answers can be so flawless that it is hard to differentiate whether the answer was given by a human or a chatbot. The system helps the student to be updated about the college activities. Various algorithms can be used to get the chatbot to formulate the best possible answers.

## 2. Literature survey

Recent development in chatbots developed using artificial intelligence has led to a boom in the progress of communication with the machine, making it an easier process. In order to obtain the voice mode in the chatbot, various APIs can be used such as Kevin, Siri, Alexa. Chatbots are providing stateful services, memory previous commands which are provided by the users so as to produce practicality [1].

Chatting through any format based on the data that has been used to train the data, there's no specific format the user needs to follow. The system provides acceptable answers as per user queries. The system analyzes the question asked by the user and provides the correct answer to the user [2].

Empowering users to access knowledge bases and straightforward keywords, will relieve users from the steep learning curve of mastering a structured command language and understanding complicated and fast-evolving data schemas. [3].

To provide different ways to access the Chat-bots. A text-based computer program or a voice based system are generally preferred, permitting the user to sort commands and receive text or as text to speech response [4].

## 3. Frame work of conversational agent

The proposed system works using artificial intelligence algorithms. The input provided by the user is accepted and is recognized and sent through the message channel to the server.

This application uses a natural language processor which uses dialogue management method to interpret the provided input and identify the intents and entities of the query of the user. The input can be given in either voice mode or text mode at the same time the output also can be obtained in the required mode.

Once the intents and entities are identified they are treated as specific keywords which are matched to the data that is available on the server and provide output to the user accordingly.

For example, if a student requests for the details of the events that are taking place, "Event" is considered as an entity and it matches the details of the student and the information regarding the events and accordingly provide the output.

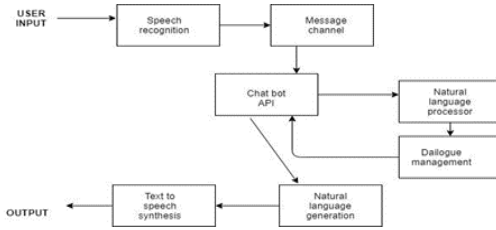


Fig. 1. System architecture

#### 4. Concept and working of the system

Conversational application is a chatbot provided to the user where the user can request any required information through a chat. Conversational agent application helps the students to access the university related information from anywhere with internet connection. This system reduces work of college administration providing information to students and also reduces the workload on the staff to answer all the queries of the students.

The main goal is to develop a generic query evaluator for the specific inputs taken, which would allow the user to obtain the required information for the query provided by the user in the simplest way possible. These inputs are taken and are evaluated in the back end in order to generate any subsequent answers that is needed. The chatbots validates the query and accordingly provide the answers to the user about any query regarding college activities. The admin can make the required changes that can reflect in the output obtained by the user.

The conversational agent uses an algorithm that will be used to identify answers related to user’s submitted questions. A database has to be developed containing all the information that can be provided to the students. The chatbot uses the information present in the database and matches the query with data present in the database asked by the user and accordingly provide the output to the user. The admin can make the required changes in the data and the project which will reflect in the output. The admin can alter, delete or add new information to the server and these changes will reflect in the output of the user

#### 5. Methodology of the system

- *Input unit-* The user has to login with his/her own credentials before using the application and provide all the required details while registering with the application. The query is accepted as an input from the user. The input can be given in both text mode and voice mode.
- *Processing unit-* The username and password are verified using the data stored in the server before the user can request information using the chatbot application. The query provided by the user has to pass through a message channel which identifies the intents and entities of the query and matches the details of the user and accordingly provide the output to the user.
- *Communication interface-* The server system and the client systems have to be connected to the same

wireless network for the client to use the application.

- *Output unit-* The information requested by the user is provided as the output to the user in both text mode and voice mode. The user can choose the mode in which the user wants to communicate with the chatbot.

#### 6. Natural language processing algorithm

Natural language processing algorithm takes in the query given by the user as an input and performs various steps on the query and accordingly provide the required output to the user.

The query at first is tokenized into different words and the all the stop words from the sentence are removed for a better abstraction of the word. Three algorithm then searches for the keyword or intent in the sentences or its synonyms and the result is obtained using natural language processor by obtaining the data from database for the query asked by the user.

One advantage of formulating text using text processing algorithms is that the text or query given by the user is processed by the methods of machine learning and natural language processor to understand the query and accordingly provide the results to the user. One drawback in machine learning is that it requires training of data using class labels but it takes less skill and expense than building classification rules by hand

#### 7. Result

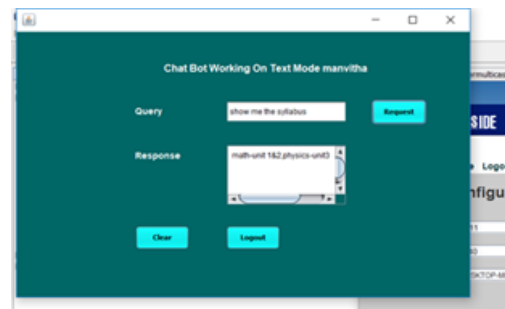


Fig. 2. Sample output

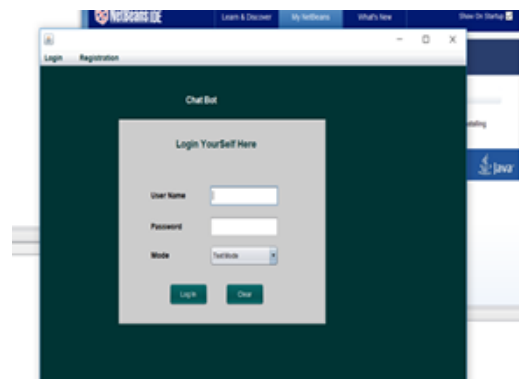


Fig. 3. User login page

The figures show the output of the system that has been developed using the login credentials of a user. Currently, the project has been made to answer all the questions regarding the

various clubs in the college, queries regarding test dates and syllabus and also queries regarding the calendar of events. The figures below are sample outputs obtained on the simple chat window. Even if the any of the information related to clubs or calendar of events changes, the system can still answer the set of questions provided the admin changes the details in the database. The table 1 below shows the response time recorded for answering multiple number of queries.

The admin can make the required changes like adding, altering or removing the data from the database that can be reflected in the output obtained by the user. The figures below depict the changes that can be done by the admin.

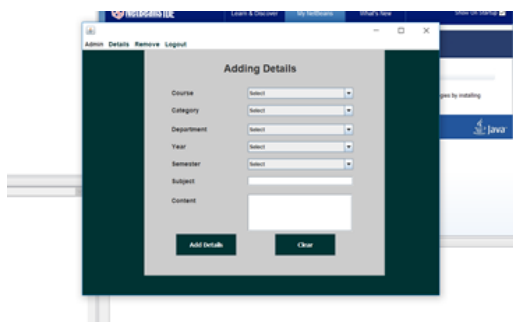


Fig. 4. Admin adding data page

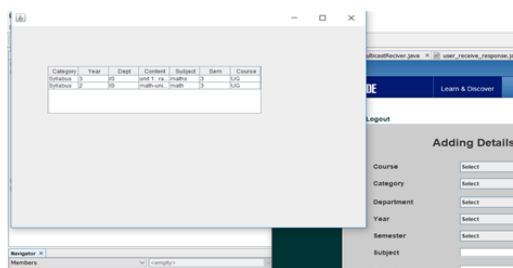


Fig. 5. Admin removing data page

Table 1  
Response time table

Items that was executed	Response Time in seconds	Number of outputs in 1 sec
1-line answer in 200 rows	1	1
2 lines answer in 200 rows	1	2
3 lines answer in 200 rows	1.5	2
3-10 lines answer in 200 rows	2	3
>10 lines answer in 200 rows	3	4

## 8. Conclusion

A conversational agent for student support and service proves to be a useful tool for students as it provides one stop solution for all their needs. Students who haven't joined the course can obtain information about the admission process and fee structure. This reduces the involvement of third-party brokers. Students who are new to the college can get more information about the campus, events happening and many more. For future enhancements this platform can also be used to gather details about an individual such as his academic process and CGPA which can be utilized by the placement department for providing the right opportunities for the students. This additional feature in the application will increase the user experience. Users get the required information instantly and thus it saves their time.

## References

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