Artificial Conversation Entity for an Educational Institute

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Abstract - *The College chat-bot project is a software built using Artificial Intelligence to address queries by the staff, students, the general public, et cetera, regarding the particular university. The chat-bot takes input from the user in the form of a text question. The response principle is matching the input string from the user. The user can ask any question related to college activities through the chat-bot without being physically available in the college for the inquiry. Keyword based human-computer dialogue system makes it possible for the user to be able to chat with the computer using a natural language that is English.*

*Key Words***:** NLP, Deep Neural Network, Chatbot, Artificial intelligence

1. INTRODUCTION

As a traditional method, the enquiries taking place in and regarding an educational institution takes place via actual human interactions. This would require a huge man power and time for the system to be capable of addressing and responding to each query. Due to this lengthy process, this system becomes inefficient. Chatbot, an Artificial Conversational Entity, uses Artificial Intelligence techniques such as Natural Language Processing (NLP) to mimic human conversations in its natural format. After observing a lot of systems using chatbots in various fields, we deduced that the work complexity was reduced to a significant extent. Similarly the chatbot for educational institute would reduce the time and make the information more easily accessible and it will also be more credible This system can be useful for the following people: students of the university, staff working in the university, parents of the students of the university, aspirants or general public. The aim of our project is to ease the process of college related enquiry and to reduce the channel of informal communication (such as whatsapp) which is time consuming and prone to being altered and also to reduce man power required to operate such a system. A user can use this system to gain some information by firing the appropriate queries.

2. RELATED WORK

1. A Tool of Conversation: Chatbot [1]

The program is implemented using Java programming language. Particularly Java applets are used. Applets are used because it is easy to create the dialog box required for the conversation between the user and the bot.

2. Chat-Bot For College Management System Using A.I [2]

Question-Answer system selects the most appropriate answers by using linguistic features available in natural language techniques. They differ mainly from the knowledge sources, the broadness of Dialog Systems (NLDS) is an appropriate and easy way to access information. Question-Answer system based on Semantic enhancement as well as the implementation of a domain-oriented based on a pattern-matching chat-bots technology developed within an industrial project (FRASI).

3. Android Based Educational Chatbot for Visually Impaired People[3]

In this method, user has to send the certain text to the Chatbot and it will prompt the user to enter the details for the reservation. The reservation will be made, once the detail has been given. In the concept of Natural Language Processing using AI (Artificial Intelligence) input and output of the system can be in speech/text/images. The input is handled by NLP (Natural Language Processing) techniques. Android application work as assistant for the student in their learning process. Students can search the topics related to their subjects and the system will provide a result about the topic. Student can search for particular topics in subjects, exam questions and answers. Web based Chatbot which is implemented in python with AIML language. It consists of the techniques of NLP and voice recognition. The output will be received in terms of voice using TTS (TextToSpeech).

4. Chatbot for Education System [4]

In the marketing field, the user has lots of questions related to projects whose answer is not present even in local database, to overcome this problem Prof. Yu Wo and Gongxiao Wang presented paper on automatic chat bot knowledge acquisition from online via rough set and ensemble learning. The concept of ensemble learning is used here which constructs classification results of the learner to get the final result. Multiple rough set, a classifier is constructed and trained first, then all replies are classified with these classifiers. The final results are drawn from voting to the output of these classifiers and finally it is selected as knowledge database. The disadvantage of this system is that not all replies are related to root message different forum have different styles and formats.

5. A Web Based College Inquiry Chatbot with Results[5]

In this paper bigram is used for calculating the sentence similarity. The machine has been embedded with the knowledge to identify the sentence and making a decision itself as response to answer a question. In this study of paper the statistics of pattern matching on the text data and statistics of compressed pattern matching on compressed form of same text data are compared. Here the information repository is in the form of a connected graph where the nodes contain information and links interrelates the information nodes. The design semantics includes AIML (Artificial Intelligence Markup Language) specification language for authoring the information repository such that chat bot design separates the Information repository from natural language interface component.

3. SCOPE

Accuracy improvement: We aim to increase accuracy of the answers of our chatbot system. Admission related inquiry: The users might inquire about the student strength, procedure for application, the documents required to submit the application. The system will also give the necessary information on the cutoffs needed by various types of students.

Fees information: Our system provides information about fees regarding the circular, start and last date of payment, where to make the payment. The system will also direct the users to get the form to be filled for the payment, provide them with the link to make payment, will handle issues in money transfer or guide users to appropriate staff that has been assigned to handle such problems. The chatbot will also answer enquiries regarding the modes of payment and procedure. Scholarships circulars: Notifications and information about the scholarships offered by the particular college, university or the government.

Library system: Users need information on the title and number of books available at a given point of time which our system will update regularly, the opening and closing timings. Users also often inquire about the fine system of the library of the university. Hostel facilities: Information about the availability of rooms, total capacity of the hostel, room sharing options available, facilities within the hostel like food and television, hostel timings and rules.

Canteen schedule: Shows today's special that changes everyday of the week, weekly schedule, displays menu which contains dishes available along with their prices. It also answers queries regarding the timings of the canteen on any particular day. Sports events: Upcoming events timing and location and eligibility, availability of sports grounds and equipment. Alerts: This is to alert students via alerts and notifications about due homework, assignments, et cetera to be submitted, along with the due date and the professor in charge. Placement notifications: Our system gives information to the users as required about the companies that come to the university, packages offered by them, their eligibility criteria for sitting for placements, bonds and the various job descriptions. Text to speech implementation: Here, users enter queries in the form of text and the chatbot responds via speech, that is a voice.
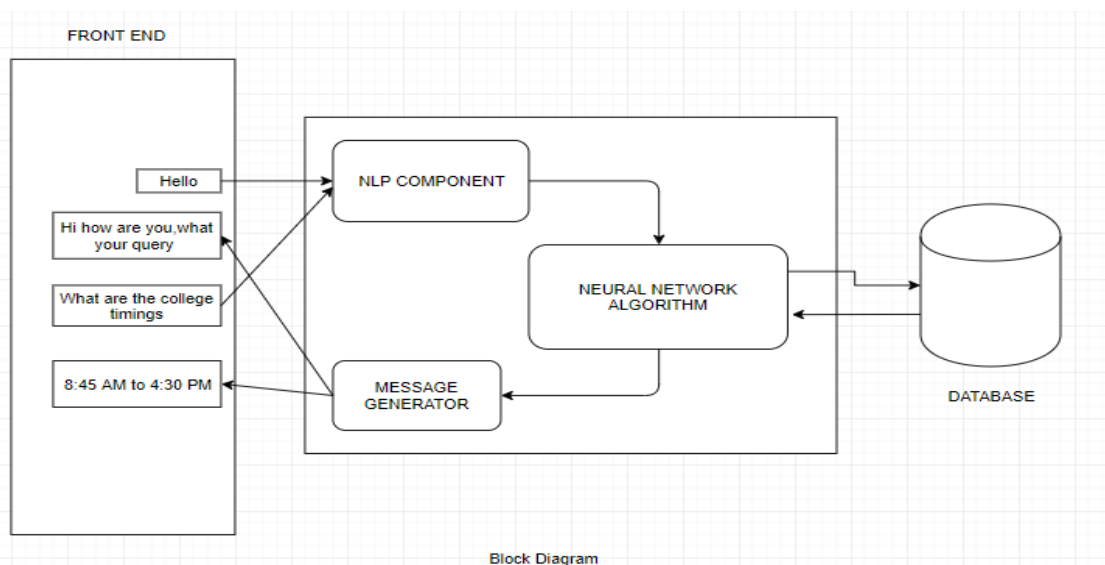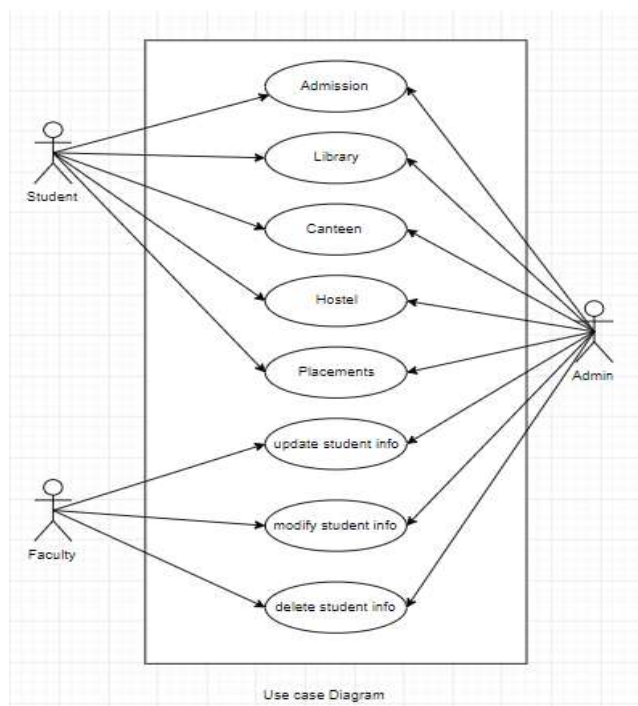
4. DESIGN

Fig -1: Block Diagram

Fig -1: Use Case Diagram

Block diagram is a diagram showing in schematic form the general arrangement of the parts or components of a complex system or process. In the above diagram, we have represented our system in a very simplified block diagram. It majorly consists of three parts: front end, processing unit, and the database. We first take the input from the user using a dialogue box from our website. The text input is further broken down and keywords are extracted which are processed using NLP. The output of NLP is then given to the neural network algorithm. The keywords after being derived, are matched with the appropriate outputs from the database. The output is generated to the output window using Message Generator. The user enters a text in the dialogue box and this text is sent to the NLP component. In order to implement the NLP component in our system, we need to import nltk library. In NLP component we implement tokenization and stemming for the given input.

Tokenization is the process of tokenizing or splitting a string, text into a list of tokens. One can think of token as parts like a word is a token in a sentence, and a sentence is a token in a paragraph. In our code, when the user gives an input such as "How are you", then the tokenization module will break down the entire string into "how", "are", and "you". We also use stemming in NLP component. Stemming is the process of producing morphological variants of a root/base word. Stemming programs are commonly referred to as stemming algorithms or stemmers. A stemming algorithm reduces the words "chocolates", "chocolaty", "choco" to the root word, "chocolate" and words like "likes", "likely", "liking" are reduced to the root word "like". These stemmed words are given to the neural network. In our project we're using deep neural networks to implement the neural network algorithm. Now this neural network algorithm takes the stemmed words and matches with the appropriate responses in the database. Now, in this database, there is a response for each pattern. The actual dataset is in json format. The appropriate response is given to the message generator which displays the response as the output on the output screen.

Neural Networks (DNNs) are typically Feed Forward Networks (FFNNs) in which data flows from the input layer to the output layer without going backward. The links between the layers are one way which is in the forward direction and they never touch the same node twice. The outputs are obtained by supervised learning with datasets of some information based on what is required by the user through back propagation. We use two hidden layers, each consisting of two nodes, and the output consisting of six nodes, which are the total number of tags in our json file. After determining the tag the response is fetched from the particular tag. The students can access the system and fire their queries regarding admission process, library and canteen facilities, hostel rules and availability and placements. Faculty members can use the system and update, modify and/or delete the information regarding the students. The admin manages the database and has access rights to all above mentioned components of the system.

5. CONCLUSION

Chatbot systems or smart assistants with artificial intelligence are dramatically changing businesses, especially in a college institution for college purposes. There is a wide range of chatbot building platforms that are available for various enterprises, such as e-commerce, retail, banking, leisure, travel, healthcare and so on. We have, in our project, explored its uses as a university enquiry system.

Chatbots can reach out to a large audience on messaging apps and be more effective than humans. The neural network algorithms for the implementation is done to increase the efficiency and also helps increase the accuracy of obtained model. The chatbots may develop into a capable information-gathering tool in the near future. They may also incorporate a vast dataset in the linked databases. The accuracy can be improved and more efficient algorithms can be used in future.

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