

Chatbot For Examination Query Using AI

Abstract: A chatbot is a computer program which controls a conversation through voice or textual methods. These programs are often structured to firmly copy how a human would behave like a conversational partner and thus passing the Turing test. Chatbots are typically used in dialogue systems for different practical purposes including customer service and information acquisition. Few chatbots use complex natural language processing systems. Many simpler chatbot scan for keywords within the input and then fetch a reply with the most matching keywords from a database. Chatbots are also known as smartbot, talkbot, chatterbot, Bot, IM bot, interactive agent, conversational interface, conversational AI, or artificial conversational entity. The objective of the project is to investigate the feasibility of using chatbot technologies to simulate examination query on the internet. A chatbot based conversational user interface fits into this space. The user can interact with them via graphical interfaces or widgets, and the trend is in this direction. They generally provide a stateful service i.e. the application saves data of each session. On a college's website, one often doesn't know where to search for some kind of information. It becomes difficult to extract information for a person who is not a student or employee there. The solution to these comes up with a college inquiry chat bot, a fast, standard and informative widget to enhance college website's user experience and provide effective information to the user. Chat bots are an intelligent system being developed using artificial intelligence (AI) and natural language processing (NLP) algorithms. It has an effective user interface and answers the queries related to examination cell, admission, academics, users' attendance and grade point average, placement cell and other miscellaneous activities.

Keywords:- Artificial intelligence, chat bot, knowledge base, lemmatization, natural language processing, semantic sentence similarity, wordnet.

Introduction: Now a days, we see the chat bots everywhere Chat bots are the source of answers to the users questions in any particular domain where it is operating. The most popular example today is the Amazon's Alexa. Chat bots are at almost every place, one can see it at every second website they visit. A bot is helpful in answering queries related to information which might be unreachable at that website easily. Most of the websites avail users with chat bots to aid them to go through what the websites facilitate. They are turning out to be our virtual assistants in everyday lives.

A. Basics of chat bot

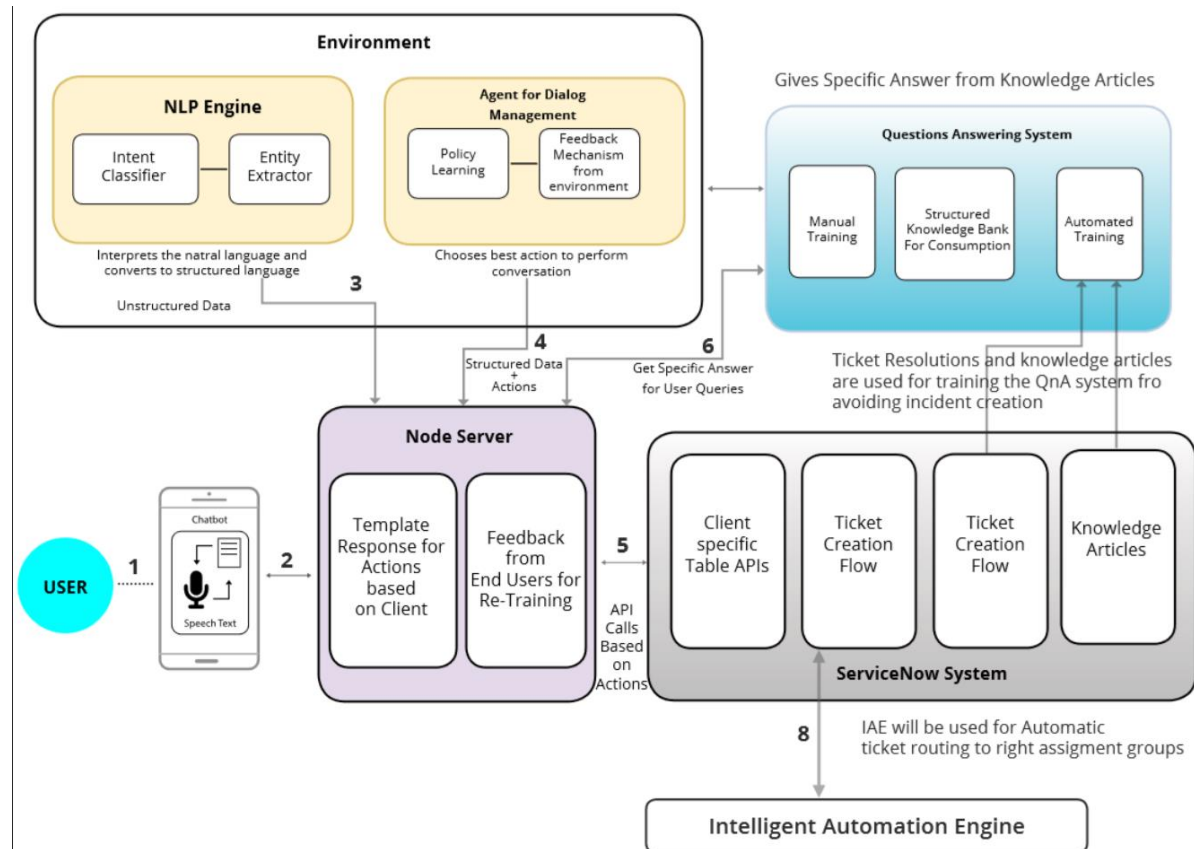
A chatbot is an artificially intelligent creature which can converse with humans. This could be text-based, or a spoken conversation (in case of voice-based queries). Chat bots are basically used for information acquisition. It can run on the local PCs and mobile phones, though most of the time it is accessed through the internet. It can be compelling, captivating and spell-binding. It is a conversational agent which interacts with users in a certain domain or on a particular topic with input in natural language sentences. Mainly a chatbot works by a user asking some question or initiating a new topic of discussion. Chat bots can be referred as software agents that pretend as human entity. These are the agents with AI embedded and using NLP they can answer to user questions. Predefined knowledge base helps develop a response to the query.

B. Chatbot for Examination query

The need for examination query system arises due to various reasons which include: the slow nature of college website, an outsider would not know where to search for a particular piece of information, difficult for the person outside college's domain to extract information. The smart solution for all the drawbacks lends to the need of the system. The examination query system will provide the response by summarizing the query and then output answers, it also provides selective information what the user wants. An examination system will dispense all answers relating to domains such as admission, examination cell, notice board, attendance, placement cell and other miscellaneous domains. The major features of the chatbot are:

- Examination related queries could be answered through it.
- Viewing user profiles and retrieves attendance and grade pointers.
- College students can get information about examinations to be held.
- College students can fetch particulars about placement activities.

Literature Review: Smart chat bots have the following components:



A. A review on Chat Interface

This unit is the front end of the system. It is responsible for collecting the user queries from the user which are the input to the system. It is also responsible for displaying the system generated results to the user. Therefore, it can be said that the chat interface is the face of the system through which the entire communication takes place. It is the mediator of conversation between the system and the user. The query that user fires on the chat interface is passed on to the chatting backend which acts as a message delivering system between the Chat interface and the Machine Learning Layer. This interface can be accessed either as a website or as a smart phone app. The type of interface depends on the requirements of the user that are to be satisfied by the system. If the system is accessed from a smartphone, the interface will be in the form of an app and if the system is accessed from a website, then the interface will be in the form of a website.

B. A review on NLU Engine NLU i.e. Natural Language Understanding

This is a subpart of NLP (Natural Language Processing) which enables the system to understand the natural language or the conversational language spoken by the users. The

conversational language used by humans for day to day conversations is not as perfect as the formal language. It does not focus much on the vocabulary and the grammar. Hence, it becomes difficult for a system to understand the intent of the sentence. The input received from the user is in unstructured text format which cannot be understood by the system directly. It understands input only in structured formats. The unstructured text received from the user is converted to structured format by extracting important words and patterns from the user text using the NLU techniques.

C. A review on Word Segmentation

Segmentation, also referred to as tokenization is the process of splitting text into smaller and meaningful units. These units could be paragraphs, sentences, clauses, phrases, words or letters. The smallest unit are the letters. Word segmentation is the splitting of sentences into individual words separated by blank spaces. The tokenized units of the sentences are called as tokens. The tokenizers split the sentences into words and punctuations marks as independent units. The most commonly used tokenizer is of space type, i.e. it splits the sentences into words at the blank spaces. It is also required that the tokenizer should consider abbreviations, acronyms, dates, numbers in decimal formats, etc., which cannot split at punctuations and blank spaces, as they will lose their meaning if done so. They include the gaps between letter, punctuations and the words. The algorithm functions on the basis of the amount of gap or character space between each unit in the sentence. After the calculation of character spaces, an average of the gaps is calculated to know the mean average between characters in the sentence. This average gap distance is then applied to the sentence which is to be segmented. The places at which the character space is more than the average character space are said to be the points of tokenization. The gap between words is always more than the average gap and hence tokenization takes place at the blank spaces between words in the sentences.

D. A review on POS Tagging

POS Tagging is the process of assigning grammatical annotations to individual words in the sentences. These annotations include the Parts-Of-Speech Tags. They denote the grammatical importance of the word in the sentence based on the dependency of that word with other words in that phrase, clause, sentence, paragraph, etc. The common POS tags are noun, verb, pronoun, etc. There are number of ways which can be used to perform the POS Tagging.

E. A review on Synonym and Pattern Recognition

For information retrievals, no matter how big our data is, no sentence sent by the user can be perfectly same to any sentence in the database. But there can be sentences with the same intent. After understanding the intent of the user sentence, the database is checked for a sentence with the same intent. The matched sentences have difference of words which are used to express the same content. They use alternative words or synonyms. This makes synonym detection necessary for the system. Synonyms for a particular word may be domain independent or domain dependent. Domain independent synonyms are synonyms for a word in the entire vocabulary. But domain-dependent synonyms are synonyms for a word in that respective domain only. There are various algorithms used for the detection and extraction of synonyms.

Proposed Methodology: Our proposed system is a webpage based chatbot. The registered user can ask their queries and questions related to Exams. This chatbot takes the question as an input and provides it to the server. The questions or queries can be pertaining to any exams like date of the exams, fee structure, syllabus of the exams, payment options, enquiry about results and some Frequently Asks Questions (FAQs). Processing of the questions is done and server sends an appropriate output for the questions. Users can view answers to their respective questions. This is done by using chatbot. In the architecture, user registered and login into the system by using PLSQL database. After login into the application user can ask query in voice (audio) and in text format related to the exams- such as syllabus of particular exams, exam dates and registration process with the intended fee structure-using webpage based chatbot. API.AI do the interaction between human and computer which is based on natural language conversations. Also API.AI services used for speech recognition, natural language processing, and conversation management to quickly and easily differentiate their query. Intent gives the brief description of what operation should be perform. It also used to retrieve, create, update and delete the intent object. An intent filter specifies the types of intents to which a chatbot for examination query using AI. Then dialog flow API will compare the user query to the database and by pattern matching give the appropriate answer for the user query. At the end all the conversation will be mailed to user by system using static PLSQL and HTML for the proper alignment and also send the real time notification for upcoming events by admin using PLSQL.

1. Voice Input:

In this step an input file which needs to be summarized is given to the system. The file may either be in .wav or .mp3 format.

2. Speech Recognition and Transformation:

Here the input file is then processed and speech is recognized. If an .mp3 file is uploaded then it will be converted into .wav format which is further used for converting this audio file into text.

3. Convert into Text:

The audio file is then converted into a text file on which further processing will be done. This text file will be used to form tokens, word embedding, etc.

4. Summarize Text Using Neural Network:

In this step the processing of data is done. The text that is obtained after conversion is further processed. Where processing of the questions is done and server sends an appropriate output for those questions to the android application.

5. Output in User Requested format:

The summary thus obtained is then displayed to the user. The user can obtain the summary either in text format or audio format. The output is thus displayed as requested by the user.

CONCLUSION:

The college chatbot aims to remove some difficulty by providing a common and user-friendly interface to solve queries of college students and teachers. The purpose of a chatbot system is to simulate a human conversation. Its architecture integrates a language model and computational algorithm to emulate information online communication between a human and a computer using natural language. Thus, we can conclude that the webpage based (chatbot) will help us to give all the information about exams and answers all the FAQ's related to the exams. This system also reduces the time taken to manually search on internet. It helps in obtaining the real time notification about all the exams and other updates related to them.

References:

1. Rachit Kulkarni, Ankit Methvani, Nakul Pawar and Charmi Valecha, “College Chat-bot”, International Journal of Advance Research in Computer Engineering and Technology (IJARCET), vol. 6, Issue 4, pp. 2278-1323, 2017.
2. Dr.Ljabasheela, A.Kiruthiga, K.Kiruthika, K.Kowsalya, “Voice Based Chat-Bot for College Management System”, International Journal of Advance Engineering and Research Development, vol. 5, Issue 04, 2018.
3. Md.Shahriare Satu, Tajim Md. Niamat Ullah Akhund, and Mohammad Abu Yousuf , “Online Shopping Management System with Customer Multi-Language Supported Query handling AIML Chatbot”, Institute of Information Technology, Jahangirnagar University, 2017.
4. Emanuela Haller, Traian Rebedea, “Designing a Chat-bot that Simulates an Historical Figure”, IEEE Conference Publications, July 2013.
5. Yash Mehta, Shreya Sawkar, “The college chatbot”, International Journal of Computer Applications, Volume 173 - No. 7, September 2017.
