A Survey On: "Chatbot for College Enquiry using NLP."

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Abstract

A chatterbot or Chatbot aims to make a conversation between both human and machine. The machine has been embedded knowledge to identify the sentences and making a decision itself as response to answer a question. The response principle is matching the input sentence from user. The present technical project consist of developing an expert System for college enquiry desk using an android based Chabot, through Artificial Intelligence technology and virtual assistance (Human-machine conversation), transmitting natural language to a server. The proposed system uses NLP i.e. Natural Language Processing Technique.

Keywords– Natural Language Processing, CHATBOT, Artificial Intelligence, Sentiment Analysis

Introduction

Nowadays, we see the chat bots everywhere Chat bots are the source of answers to the user's questions in any particular domain where it is operating. Chat bots are the source of answers to the user's questions in any particular domain where it is operating. 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.

The need for college inquiry 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 college inquiry system will provide the response by summarizing the query and then output answers, it also provides selective information what the user wants. A college 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:

- College admission 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.

College inquiry system will act as a fast, standard and informative widget to enhance college website's user experience and bestow users with righteous information. The bot will analyse user's queries and understand users' message and then reply accordingly. It uses AI & NLP. This way users' time and efforts will be saved and s/he will be equipped with effective answers.

Literature survey

[1] Smart College Chatbot Using Ml And Python

This project focuses on developing a chatbot feature and API for Matrusri Engineering
College's website, enabling users to interact naturally with the system using Artificial Intelligence and Natural Language Processing. The chatbot utilizes WordNet for matching responses and can evolve by learning from user interactions, improving precision over time. By incorporating Machine Learning techniques, the chatbot assists users by simulating human-like dialogue, with knowledge initially curated by experts but enhanced through AI-driven learning.

[2] College Enquiry Chatbot Using A.L.I.C.E Balbir Singh, Bani, Ajay Pratap Singh

ALICE uses simple patterns, templates to represent input and output transformation to represent a user input. This system does not have ability to give the derivation structure for a sentence using the grammatical analysis. The main inference point is it will be easier to build a machine learning for ALICE since it uses simple patterns, templates to represent input and output. Elizabeth uses more complex rules for which you need to write input transformation, Output transformation and keyword patterns to represent a user input and Elizabeth answer. You can do that by simple pattern template using ALICE.

[3] AI and Web-Based Human-Like Interactive University Chatbot

This system have manual developing of its knowledge. It does not have ability to give the derivation structure for a sentence using the grammatical analysis. The project is about interaction between users and Chatbot which can be accessed from anywhere anytime. The chatbot can be easily attached with any university or college website with few simple language conversions. Chatbot provides various information related to university or college and also students-related information. The chatbot can be used by anyone who can access the university's website. The project

uses the concept of Artificial Intelligence and Machine Learning. PHP Language is utilized for the development of Chatbot. User can ask university-related questions, then the query is applied as an input to algorithm, which processes the message and displays the corresponding response to the user.

[4] Natural Language Processing Future Chandhana Surabhi. M

Natural Language Processing is a technique where machine an become more human and thereby reducing the distance between human being and the machine can be reduced. Therefore in simple sense NLP makes human to communicate with the machine easily. There are many applications developed in past few decades in NLP. Most of these are very useful in everyday life for example a machine that takes instructions by voice. There are lots of research groups working on this topic to develop more practical are useful systems.

[5] Implementation of a Chatbot System using AI and NLP, Tarun Lalwani, Shashank Bhalotia, Ashish Pal, Shreya Bisen, Vasundhara Rathod

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-bounding. 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.

[6] B. Setiaji and F. W. Wibowo, "Chatbot Using a knowledge in Database: Human-toMachine Conversation Modelling," 2016 7th International Conference on ISMS (Bangkok).

A chatterbot or chatbot aims to make a conversation between both human and machine. The machine has been embedded knowledge to identify the sentences and making a decision itself as response to answer a question. The response principle is matching the input sentence from user. From input sentence, it will be scored to get the similarity of sentences, the higher score obtained the more similar of reference sentences. The sentence similarity calculation in this paper using bigram which divides input sentence as two letters of input sentence. The knowledge of chatbot are stored in the database. The chatbot consists of core and interface that is accessing that core in relational database management systems (RDBMS). The database has been employed as knowledge storage and interpreter has been employed as stored programs of function and procedure sets for pattern-matching requirement. The interface is standalone which has been built using programming language of Pascal and Java.

Models and Methodology

When a user wants some information pertaining to college, the response will be provided through this module

An algorithm to check sentence similarity (NLP) is applied to the modified input to check its similarity with the questions of a predefined question-set, whose answers are available.

If a sentence is retrieved with confidence> 0.5, we return the answer of that question as the response.

If no questions map to the user input, the input is saved in a log file for improvement of the system by the admin. The administrator can incorporate the answer to that query

The Processing algorithm–System uses NLP (Natural Language Processing) algorithm helps machines "read" text by simulating the human ability to understand language.

Natural Language Processing (NLP) is a branch of AI, which deals with the interaction among machines and human spoken languages. NLP helps a computer to analyze and understand the user's input. Using NLP computers can perform various tasks like knowledge extraction, sentiment analysis, speech recognition, fake news detection. Natural Language Processing was developed based on a set of mathematical rules which in turn developed with Machine Learning algorithms for language processing.

The five phases of NLP involve lexical (structure) analysis, parsing, semantic analysis, discourse integration, and pragmatic analysis. Some well-known application areas of NLP are Optical Character Recognition (OCR), Speech Recognition, Machine Translation, and Chabot's.
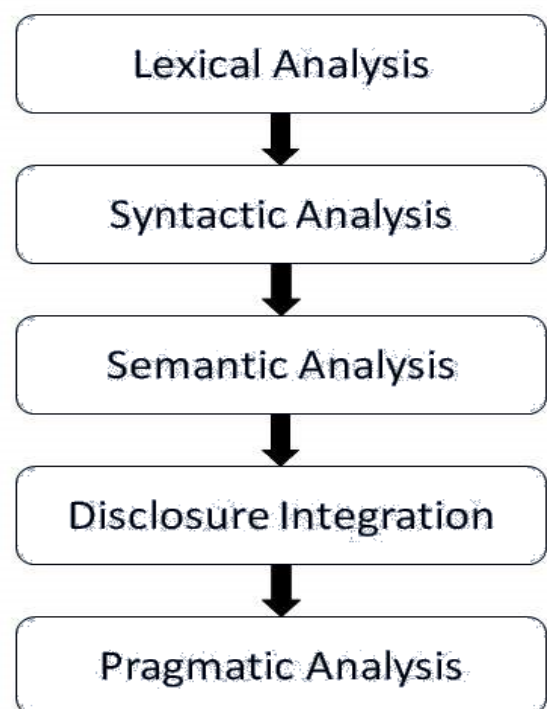

Fig. 1 NLP Algorithm Flow Diagram

Methodology

Chatbot analyses the queries requested by the user and recognizes the user intent to extract relevant data objects. This is considered to be the most crucial step of the entire working of the application because without intent the application will not return a righteous response.

The Steps of that flow system is:

- User asks any query, the Chabot will analyze the request, identify the intents and entities using Natural Language Processing.
- Using the knowledge base and semantic analysis, it builds a response and sends it back to the user.
- Based on sentiment analysis, the bot is trained to have empathy while answering to the user.
- If the query is not part of a predefined scripts, which interactively queries the user to obtain the desired output.
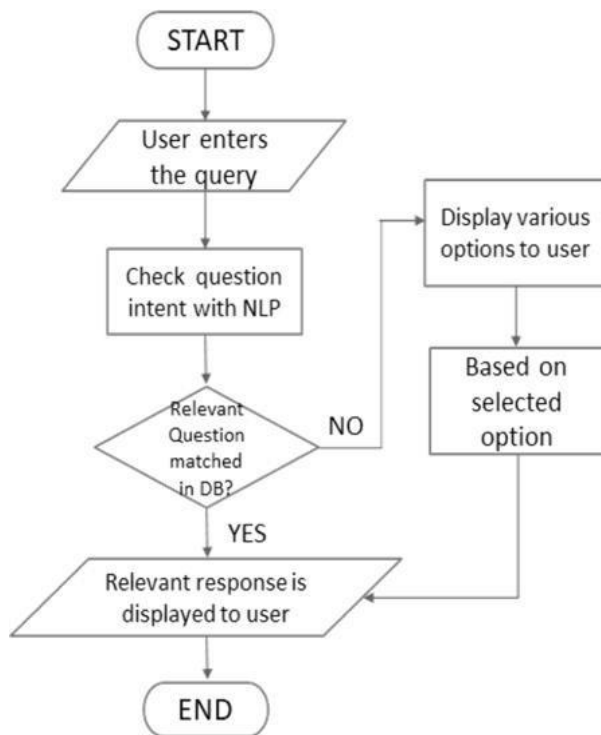

Fig. 2 Generalized Block Diagram for the System

The final Modules of system is:

- Creating bag of word database

- Reading & Pre-processing raw text
- Keyword matching
- Generating response

Advantages

1. Chatbot Application is time reducing and travelling avoidance for user like students and their parents for any enquiry
2. It enables the students to be updated with college activities.
3. It is providing us a readily available information source without taking any physical efforts.
4. It is easily accessible and saving time and money also.
5. It saves time for the student as well teaching and non-teaching staffs.

Conclusion

It is often impossible to get all the data on a single interface without the complications of going through multiple forms and windows. The college Chatbot aims to remove this 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.

The college student and employees can freely upload their queries. The Chatbot provides fast and efficient search for answers to the queries and gets the relevant links to their question. A background research took place, which included an overview of the conversation procedure and tries to find out the relevant keywords related to that query to provide the proper link. The database storage includes information about questions, answers, keywords, and logs. We have also developed an interface. The interface developed will have two parts, one for users and the other for the administrator.

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