Chatbot Using Natural Processing Language

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Abstract- *A Chatbot is a computer program which is used to interact with humans and fulfill their needs. Chatbot gives the response for the user query and sometimes they are capable of executing tasks also. In existing system, Chatbots are often seen to be complicated and require a lot of time to understand user's requirement. It is also the poor processing which is not able to filter results in time that can annoy people. Due to fixed programs, Chatbots can be stuck if an unsaved query is presented in front of them. This can lead to customer dissatisfaction and result in loss. It is also the multiple messaging that can be taxing for users and deteriorate the overall experience on the website. Chatbots are installed with the motive to speed-up the response and improve customer interaction. However, due to limited data-availability and time required for self-updating, this process appears more time-taking and expensive. Therefore, in place of attending several customers at a time, Chatbots appear confused about how to communicate with people.Early development of Chatbots became so difficult whereas recent Chatbots development is much easier because of the wide availability of development platforms and source code. In proposed system, A Chatbot can be developed using either Natural Language Processing (NLP) or Deep Learning. When compared to traditional Chatbots, bots designed using Deep Learning requires huge amount of data to train. NLP helps to provide context and meaning to text-based user inputs so that it can come up with the best response. Here we have proposed Chatbot like TNPSC Website.*

Keywords- Chatbot, Natural language processing, NLP-based bot entails, Machine learning

I. INTRODUCTION

A Chatbot is a service, powered by rules and sometimes artificial intelligence, that you interact with via a chat interface. It can be deployed on various platforms such as mobile apps, web apps, messaging apps, personal assistant and what not. It's job to provide human like interaction and assistance to the user. The best Chatbot in the world would be one in which the user would not be able to differentiate it from an actual human being.

Natural language processing (NLP)

It is a subfield of linguistics, computer science, information engineering, and artificial intelligence concerned with the interactions between computers and human (natural) languages, in particular how to program computers to process and analyze large amounts of natural language data.

NLP-based bot entails :

1. Lesser false positive outcomes through accurate interpretation.
2. Identify user input failures and resolve conflicts using statistical modeling.
3. Use comprehensive communication for user responses.
4. Learn faster to address the development gaps.
5. Achieve natural language capability through lesser training data inputs.
6. Ability to re-purpose the input training data for future leanings.
7. Provide simple corrective actions for false positives.

This operation is divided into three parts:

- User post the query on Chatbot
- Processing is done on the users query to match the predefined format by the developer
- Pattern matching is performed between user entered query and knowledge (pattern).

Natural Language Processing is an area of research and application that explores how computer can be used to understand and manipulate Natural Language text or speech to do useful things.NLP is multi-disciplinary, it is closely related to linguistics. It also has links to computer and information sciences, psychology, electric and electronic engineering. Of course, it is also related to Artificial Intelligence.

Applications of NLP include a number of fields of studies such as machine translation, speech recognition, text processing and summarization and so on. A Chatbot can interact with users in various formats such as text, speech and actions. Chatbots is one of the hottest topics out there. Tech giants like Microsoft, Amazon, Google, Facebook have been competing to roll out better Chatbots every day.

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Natural Language Processing (NLP) helps provide context and meaning to text-based user inputs so that it can come up with the best response.Here we have proposed Chatbot like TNPSC Website.

OBJECTIVE

The objective of this paper is to present, in what different ways the Chatbot can be developed and their classifications. This paper also makes a discussion about Chatbot could effectively answers College related queries with an added advantage that it also provides personal information like grades, etc. with proper user authentication.
So the user gets the desired information quickly without having to go through a series of webpages.

Motivation

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 chat bot 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 chat bot 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 paper is organized in 4 sections. Section 2 presents Literature Survey. Section 3 describes some of the works related to the proposed system.Section 4 discusses the proposed system and integrating of technologies to create the system. Further, section 7 discusses conclusion and future enhancement.

II. LITERATURE SURVEY

Chatbots are replacing some of the jobs that are traditionally performed by human workers, such as online customer service agents and educators. From the initial stage of rule-based Chatbots to the era of rapid development in artificial intelligence (AI), the performance of Chatbots keeps improving. Chatbots can nowadays "chat" like a human being and they can learn from experience. [1].

In this fast-moving data-driven world, it is vital that we draw the accurate insights to make the right decisions at the right time. In terms of online websites, there are many web analytics tools that will give us performance reports. However, it is tedious and time consuming to master the tools leave alone to derive insights to understand the business impacts [2].

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[3].

Chatbots are software used in entertainment industry, businesses and user support. Chatbots are modeled on various techniques such as knowledge base, machine learning based. Machine learning based Chatbots yields more practical results. Chatbot which gives responses based on the context of conversation tends to be more user friendly. [4].

Chatbots and talkbots are intelligent programs that can establish written and oral communication with human beings, usually with the purpose of helping them achieve a specific goal. More and more companies are now implementing bots in order to reduce operational costs. [5].
Chatbot can be described as software that can chat with people using artificial intelligence. These software are used to perform tasks such as quickly responding to users, informing them, helping to purchase products and providing better service to customers [6].

A Chatbot is an example of cognitive computing system that emulates human conversations to provide informational, transactional, and conversational services. Despite their widespread adoption, Chatbots still suer from a number of performance issue due to limitations with their programming and training [7].

In the e-commerce model that has online customer service, such as email or live chat, customers mostly use live chat because it is fast and comfortable. Thus, a company needs to hire and pay for admins. However, this incurs the problem that admins need to spend an extensive amount of time for writing an answer and customers have to wait for the answers[8].

Affective computing explores the development of systems and devices that can perceive, translate, process, and reproduce human emotion. It is an interdisciplinary field which includes computer science, psychology and cognitive science. An inspiration for the research is the ability to simulate empathy when communicating with computers or in the future robots [9].

Over recent years, we've seen various customs for conversational agents. Chatbot is a conventional agent which is capable to communicate with operators by using natural languages. As numerous Chatbot platforms already exist, there are still some problems in building data-driven system because a huge amount of data is required for its development[10].

III. PROPOSED SYSTEM

Creating a database two dimensional string arrays are applied to build a database. Rows in the array are used for request and response. All the even rows contain the request or questions and all the odd rows contain the response or answers. Columns in the array are applied to save different types of questions that could asked by the user and responses that a Chatbot can answer. There is one row in the array which contains default responses which is used when the matching question is not found in the array.

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 has similarity calculation in this paper using bigram which divides input sentence as two letters of input sentence. The knowledge of Chatbotare 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.

3.1. ARCHITECTURE

The system Architecture of Chatbot is shown in Fig. The following functions of each component are given below.
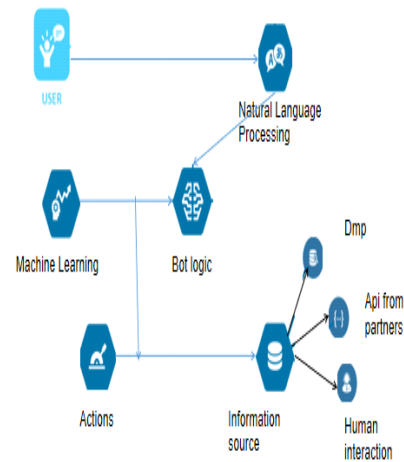

Fig. System Architecture of Chatbot

1. Users interact through a device on a messaging platform, his message is processed through NLP.
2. Then the bot can launch an action, answer with realtime information from a database/API, or handover to a human.
3. The more message he receives, the more the bot improves : it's called machine learning. Sometime a human helps the bot, it's called supervised learning.
4. Human language is complicate to interpret for a computer .this makes it difficult for NLP to implement it accurately .therefore developers create software using NLPalgorithms that help NLP devices and systems understand human language.
5. Machine learning algorithms use statistical methods .they learn to perform more data is processed using a combination of machine learning ,deep learning and neural networks ,natural language processing algorithms hone their own rules through repeated processing and learning.
6. The powerful pre-trained models of the natural language API empowers   developers to easily appily natural language understanding (NLU)their application with features including sentiment analysis,entity analysis,entity sentiment analysis,content classification, and syntax analysis
7. Machine learning is focused on creating a software system that can learn from their own observation and past experience .

Context Identification:

Pre-processing is applied to the input text to standardize the input as per the system's requirement. Based on the keywords used in the text, appropriate context is recognized.

Personal Query Response System

Upon receiving personal queries like CGPA, attendance, etc., the authenticity of the user is checked through user-id and password. If the user detail is invalid, an appropriate response is sent. If the user authenticates successfully, the input text is processed to extract keywords. Based on the keywords, information required by the user is understood and the information is provided from the database.

IV. CONCLUSION AND FUTURE ENHANCEMENT

Chatbots are extremely valuable for businesses and the value will only increase as time goes by. While the technology to simulate conversation with a computer has been around for decades, bots are adaptable version with a powerful integration of Artificial Intelligence and Natural Language Processing. It creates an assisting guide to all users. It increases the efficiency by maintaining known standard responses. Improved question responsiveness and accuracy. Increased ability to track and monitor queries, highlighting gaps in available information. The impact of NLP by machine will be greater than the impact of microprocessor technology in the last 20 years, because Natural Language is fundamental to almost all business, military & social activities. Therefore, the application of NLP has no end. In future the proposed system will be able interpret the textual description in a much better way.

4.1 FUTURE ENHANCEMENT

In future the Image recognition can be enhanced with much more details about the image captured through the camera. Enhancement to this system can be done by adding the features of currency recognition. We can make a Chatbot which is blend of AIML and LSA. This will enable a client to interact with Chatbot in a more natural fashion.

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