ABSTRACT

This project is focusing on creating a chatbot based on cloud which is integrated into an android application. A chatbot is a virtual person that can effectively talk to any human being with the help of interactive conversion textual skills.[7] Every major business is required to respond to customers requests as soon as possible so that it can stay competitive and preserve its existing customers instant and easily accessible information can mean more user friendly design and efficient implementation. Chatbots are natural language processing programs which analyze user's requests, interpret them and cater to them. The advantages include supporting and scaling business teams in their relations with customers, 100% availability, instantaneous responses, reduction in manual human intervention, prevention of repeated monotonous questions and wide reach with easy accessibility. Nowadays there are many cloud-based platforms available for developing and deploying the chatbot such as Microsoft bot framework, IBM Watson, Kore, AWS lambda, Microsoft Azure bot service, Chatfuel, Heroku and many more[6]. Finally, the future work includes the increasing scope of the chatbot and integration with multiple channels such as phone call, SMS, and various social media platforms.

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1. INTRODUCTION

1.1 Introduction

Instead of providing direct communication with a live human agent, a chatbot may be a software application that conducts a web chat conversation through text or text-to-speech. Chatbot systems are normally designed to convincingly mimic the way an individual might act as a interlocutor, but those in development are still unable to converse adequately or pass the industry standard Turing test. A chatbot is an instance of emotional figuring system that mirrors human conversations to offer instructive, esteem based, and conversational organizations. Different problems, like flexibility, low-dormancy, and safety, must be addressed by chatbots. Today time has numerous electronic organizations like E-business, Entertainment, Virtual assistance and a few more. there's radical augmentation within the domain of web organization, where everything is true now getting related with web. it's very simple to utilize approach to manage benefit everything to doorstep. There are differing types of customer help open like live talk reinforce organization, phone (telephone) organizations. In any case, for all such assistance organizations given by human to human puts aside some push to reply to customer's question. because the amount of clients develops the holding time increases also , which realizes poor client satisfaction. one among the critical goals within the field of Human Computer Interaction (HCI) is that the system of run of the mill and natural affiliation modalities.

The world is moving towards the automation of human effort with the assistance of machine learning, AI and robotics. While there's an enormous scope of improvement, a number of the key areas which will be targeted for automation are responder system in education, healthcare etc. a man-made intelligence based bot can replace human efforts without compromising on the standard of response. Machine learning and AI is employed to implement chatbot along side python scripts. Today, most chatbots are found an honest pace of remote partners, as an example , Google Assistant an r WeChat, or through individual affiliations' applications and locales. Chatbots are often organized into usage classes, as an example , conversational business (online business by methods for talk), assessment, correspondence, customer help, structure, creator gadgets, preparing, beguilement, finance, sustenance, games, prosperity, HR, publicizing, news, singular, productivity, shopping, social, sports, travel and utilities. Most of the chatbots are provided with a task individual sort interface with a commitment from a customer and a yield from the d Amazon Alexa, by methods for illuminating applications, as an example , Facebook Messenger o chatbot. The chatbot structures the customer's data and yields a solution reliant on what the customer has as lately sent. It might be a welcome, conversation subject, or maybe a picture . Chatbots are normally utilized in return systems

for various sensible purposes including customer help or information acquisition.

Student data stored within the cloud. A chatbot system may be a computer algorithm that analyses the student's queries and messages. The responses are pertinent to the user's inquiries. to reply to the student's question, the Chatbot system retrieves the solution from a database stored within the cloud. The Chatbot system retrieves answers from the database employing a specific keyword. there's no format for the scholar to use when asking an issue to the Chatbot. Students can use the system to submit any questions they need about college activities. this technique responds to the user through a graphical interface , making it appear as if a true person is conversing with the scholar .

Chatbots are utilized in dialog systems for various purposes including customer service, request routing, or for operation . While some chatbots use complex AI, tongue processors, and comprehensive word classification systems, others simply search for general keywords and produce responses using common phrases from a library or database. The bulk of chatbots are accessed via website popups or virtual assistants.. The user can look for college-related events like the date and time of annual day, sports day, and other cultural events. this technique keeps students up so far on college activities.

Chatbots are being developed to alleviate the pain that today's businesses are experiencing. The aim of chat bots is to support and scale business teams in their relations with customers. [1]It may exist in any big messaging app, like Facebook Messenger, Slack, Telegram, Text Messages, and so on.

1.1.1 Cloud Computing

Cloud computing is the providing of on-demand computing services through the internet and on a pay-as-you-go basis, ranging from apps to storage and processing power. Companies can rent access to anything from applications to storage from a cloud service provider rather than owning their own computing equipment or data centres. One advantage of cloud computing is that businesses can avoid the upfront costs and complexity of building and maintaining their own IT infrastructure by paying only for what they use, when they use it.

that developers will need to construct applications on top of: middleware, database management, operating systems, and development tools are just a few examples.

3. **Software-as-a-service**

SaaS (Software-as-a-Service) is the delivery of applications-as-a-service, and it's arguably the type of cloud computing that most people are familiar with. The end user, who will access the service via a web browser or app, is unconcerned about the underlying hardware and operating system; it is frequently purchased on a per-seat or per-user basis.

1.1.2 Natural Language Processing

Natural Language Processing (NLP) is a sort of "software" that allows computers to read, analyse, comprehend, and derive valuable meaning from natural human languages. It is used to decipher the meaning and intent of strings of text. In a word, NLP is a technique for assisting machines in comprehending human language.

Finalizing the type of chatbot architecture is crucial in chatbot creation. As part of this, selecting the appropriate NLP Engine is critical because it is highly dependent on company priorities and goals. Developers and organisations are frequently perplexed as to which NLP to utilise. The decision between cloud and in-house storage is determined by the characteristics required by the company. You could choose to build your own engine if your company requires a highly powerful chatbot with specific dialogue capability and security. While in-house NLP engines can deliver mature natural language understanding components in some circumstances, cloud vendors aren't as good at dialogue management.

The speech commands are converted into text even with a speech chatbot or voice assistant, and the NLP engine is used again. As a result, the architecture of NLP engines is critical, and the NLP architecture for chatbots differs depending on customer needs. There are numerous components, all of which work together to meet the user's intentions/problems.

- Understanding Speech: The chatbot should be able to depict what the user is saying and what his objective is when he speaks. The chatbot should react accordingly as a result of this.

- Maintaining Context: Chatbots should be smart enough to figure out what the user's context is. The user may use the same terms in many contexts at times. This is a very typical requirement.

- Custom Question and Answer System: Let's imagine a user inquires for a dynamic knowledge bank. When the user's enquiry necessitates the chatbot searching through company documentation, policies, CRMs, ticketing information, and so on.

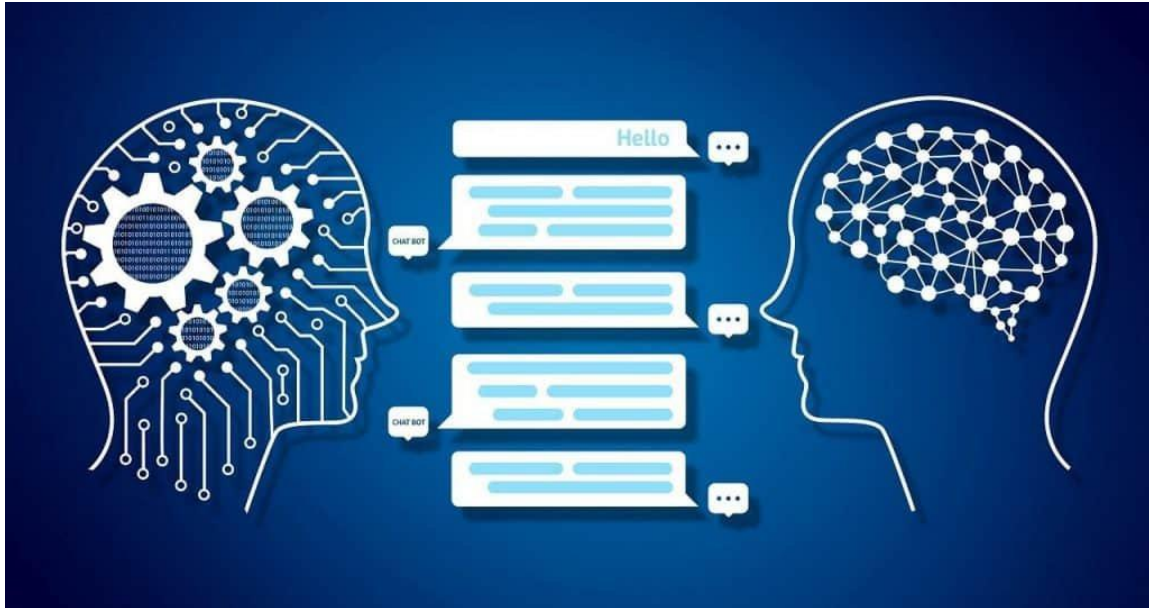The architecture of the NLP Engine has two components:

Figure 1.1.2 Natural Language Processing

1. **Intent Classifier**

The intent classifier takes the user's input, deciphers its meaning, and associates it with one of the chatbot's supported intents. This is referred to as intent classification. A classifier is a tool for categorising data - in this case, a text - into multiple categories. Chatbots will classify each piece of a sentence into broken down categories to comprehend the intention behind the input it has received, similar to how people classify objects into sets, such as a violin is an instrument, a shirt is a piece of apparel, and happiness is an emotion. Developers have a number of alternatives in this regard:

    i. **Pattern matching:** Pattern matching is the process of identifying patterns in incoming text and categorising it into different intents.

    ii. **Machine Learning Techniques:** Creates a multi-class classification using a variety of machine learning algorithms.

    iii. **Neural Networks:** These networks use fine word embedding to learn from text.

treatment affected by psychological issues. Nonetheless, Eliza couldn't provide anything like therapy with a person's therapist. the disadvantage of Elizabot is to stay a conversation going. Besides, Eliza is incapable of learning new patterns of speech or words, discover context through interaction and logical reasoning capabilities.

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Welcome to
                EEEEEE  LL        IIII   ZZZZZZ   AAAAA
                EE      LL         II        ZZ  AA   AA
                EEEEE   LL         II       ZZZ  AAAAAAA
                EE      LL         II      ZZ    AA   AA
                EEEEEE  LLLLLL   IIII  ZZZZZZ    AA   AA

    Eliza is a mock Rogerian psychotherapist.
    The original program was described by Joseph Weizenbaum in 1966.
    This implementation by Norbert Landsteiner 2005.


ELIZA: Is something troubling you ?
YOU:   Men are all alike.
ELIZA: What is the connection, do you suppose ?
YOU:   They're always bugging us about something or other.
ELIZA: Can you think of a specific example ?
YOU:   Well, my boyfriend made me come here.
ELIZA: Is it important to you that your boyfriend made you come here ?
YOU:   He says I'm depressed much of the time.
ELIZA: I am sorry to hear that you are depressed.
YOU:   It's true. I am unhappy.
ELIZA: Can you explain what made you unhappy ?
YOU:
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Figure 1.1.5.1 Elizabot

ii. Alicebot: Artificial Linguistic Internet Computer Entity also mentioned as ALICE. it had been inspired and developed. Alicebot is predicated on the updated version of Eliza's pattern or architecture. Nevertheless, Alicebot remains purely supported pattern matching and depth-first search technique to user's input. it's a sort of XML dialect that encodes rules for questions and answers. It uses a group of AI terminology (AIML) templates to supply responses given to the dialogue history and user utterance. At first, AIML receives the user sentence as input and stored in referred to as a category. Each category consists of a response template and set of conditions that give aiming to the template know as context. Then the model prepossesses it and matched against nodes of the choice tree. When user input is matched, the chatbot will response or execute an action. The AIML templates repeat the user's input utterance using recursive techniques and it's not always meaningful responses. Therefore, string-based rules are required to work out if the response creates an accurate or meaningful. the disadvantage of Alicebot is modelling of personality to define the chatbot behaviour like traits, attitudes, mood, emotions and physical states. The botmaster must integrate personality elements within the AIML.

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However, this is often not an easy task. Alicebot is additionally incapable of generating appropriate responses, no reasoning capabilities and unable to get human-like responses (Turing test). It requires an outsized number of categories to make a strong bot and should cause unfeasible, difficult to take care of or time-consuming application. Alicebot doesn't have intelligence features like NLU, sentiment analysis and grammatical analysis to structure a sentence. additionally , if an equivalent input repeats during the conversation, Alicebot gives same answers at the most of the time.

Figure 1.1.5.2 Alicebot

iii. IBM Watson: Watson is rule-based AI chatbot developed by IBM's DeepQA project. it's designed for information retrieval and question-answering system that comes with tongue processing and hierarchical machine-learning method. Watson uses a broad range of mechanisms to spot and assign feature values like names, dates, geographic locations or other entities to generated response. The machine learning system then learns the way to combine the values of those features into a final score for every response. supported that score, it ranks all possible answers and selects one as its top answer. Watson incorporates a spread of technologies including Hadoop, Apache Unstructured Information Management Architecture (UIMA) framework to examines the syntax and therefore the grammar of the question to raised gauge what's being asked. Watson's fundamental cognitive computing technology has nearly limitless applications. Because it can process text mining and sophisticated analytics on huge volumes of unstructured data and handle enormous quantities of knowledge . because the application gains experience with more input, it can find enough patterns to form accurate predictions. Besides the benefits of Watson, it's some major drawback like it doesn't process structure data directly, no