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MEDICAL CHATBOT USING MACHINE LEARNING

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Abstract: The new healthcare delivery system is unaffordable complex, unreliable, and unsustainable. Machine Learning (ML) has revolutionized the way companies and individuals use data to increase system performance. Machine learning algorithms can be used by strategists to process a variety of organized, unstructured, and semi-structured data. This technology provides a virtual assistant who can communicate with patients in their native language to understand their symptoms, provide physician advice, and monitor health indicators. In addition, natural language processing algorithms and Machine learning analytics are used to analyze customer reviews and find the nearest specialist that can help with the user's illness. A deep bilinear similarity model is also proposed in the architecture to enhance the created SQL queries used in algorithms and predictions.

Keywords: Personal Health records, Natural Language Understanding, Speech recognition,Machine learning

I. INTRODUCTION

Technology has accelerated the shift to modern medicine in healthcare, where computer-generated analytics and the use of electronic medical reports can aid clinical and administrative activities. Regardless of process, retrieving data from a large database often necessitates the use of specialized IT knowledge and resources. As a result, health professionals often base their decisions on their own personal perceptions or the views of their colleagues. As a result, a question answering (QA) model-based information retrieval system can be especially helpful for health professionals when it comes to recognizing associated patients, predicting disease rates, and identifying effective treatments. Chat bots automate a variety of customer service functions, as well as business, institution, and organization websites. The customer responds to often requested questions in a timely manner. It has been proposed that a chat bot system with a patient-facing interface be created. Patients are most likely to be concerned with their illnesses, medications, and other programmers. Instead of calling an anonymous user for an immediate answer, they will use this chat bot device. A chat bot is computer software that can interact with humans and learns as it goes. The majority of chat bots use a graphical user interface similar to that of a messenger to allow user input and output to and from them. The chat bot comprehends and responds to the user's remarks. It might be a greeting, a conversation starter, or even a snapshot. User input is usually matched to a pre-programmed sequence of dialogues by most chat bots.

II. LITERATURE SURVEY

The use of electronic medical reports can aid clinical and administrative activities. Chat bots automate a variety of customer service functions, as well as business, institution, and organization websites. We studied some paper and we are introducing chat bot system with a patient-facing interface be created.

In 2020, a paper named Automatized Medical Chatbot (Medibot)was published by Prakhar Srivastava,Nishant Singh. Automatized medical chatbots are conversationally built with technology in mind with having the potential to reduce efforts to healthcare costs and improve access to medical services and knowledge. They built a diagnosis bot that engages patients in the conversation for their medical query and problems to provides an individualized diagnosis based on their diagnosed manifestation and profile. Their chatbot system is qualified to identify symptoms from user inputs with a standard precision of 65%. Using these extracted diagnosed symptoms correct symptoms were identified with a recall of 65% and a precision of 71%. Finally, the chatbot returned the expected diagnosis for further more operations. This determines that a medical chatbot can provide a somewhat accurate diagnosis to patients with simple

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symptom analysis and a conversational approach, this suggests that an effective spoken language medical bot could be viable.

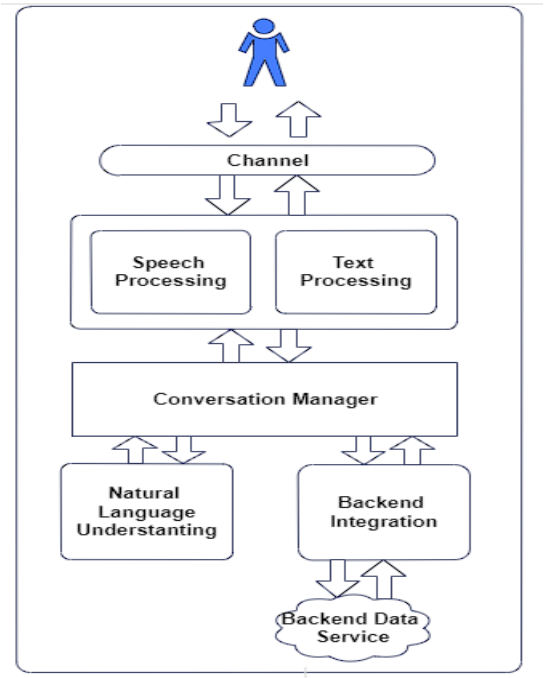
In another paper, The Potential of Chatbots: Analysis of Chatbot Conversations, published in the year 2019, the authors, Mubashra Akhtar, Julia Neidhardt, Hannes Werthner, used chat conversations between customers and the chatbot of a telecommunication company are analysed to find out if these interactions can be used to determine a) users' topics of interests and b) user satisfaction. To reach this goal, chat conversations are interpreted as sequences of events and user inputs are analysed with the help of text mining techniques. The study shows that based on users' written conversational contributions, valuable insights on users' interests and satisfaction can be gained.

In the third paper, Chatbot for Healthcare System Using Artificial Intelligence by Lekha Athota, Vinod Kumar Shukla, Nitin Pandey published in 2020. They developed system that can learn themselves and restore their knowledge using human assistance or using web resources.This application is incredibly fundamental since knowledge is stored in advance. The system application uses the question-and-answer protocol in the form of a chatbot to answer user queries. This system is developed to reduce the healthcare cost and time of the users, as it is not possible for the users to visit the doctors or experts when immediately needed.

III. EXISTING METHOD

The scheme's main purpose is to facilitate communications among users and healthcare practitioners by responding quickly to inquiries submitted by users. People today are more inclined to be online, yet they are unconcerned about their own health. They quit seeking medical attention for small ailments that could develop into major illnesses. Rather than browsing the internet for a list of possibly significant documents, developing question-and-answer platforms is now an easy approach to find answers. Many current implementations have problems, such as patients not receiving rapid responses and having to wait a long period for specialists to recognize their concerns. Any technique that allows patients to contact with doctors online via live chat or phone might charge a fee. There is now no system in place to provide answers to patient requests, nor is there any software that can provide the best response to common questions. During the subject discussion, we went through a lot of publications but couldn't locate any that were helpful to the strategy.

IV. SYSTEM ARCHITECTURE DIAGRAM



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V. PROPOSED SYSTEM

Module:

Module 1:Login/Registration
Module 2:Choose medium as voice/text input.
Module 3: We need to ask/write question or query to system.
Module 4: System will recognize the speech/text.
Module 5: Recognize the query using Speech Recognition Module and convert to text using text Conversion.
Module 6: Translate the query using translator(Use NLP).
Module 7: Match the query in database.
Module 8: Convert the resultset into proper message.
Module 9:Respond to user with text/voice.

Natural Language Processing(NLP):

A. Automatic Speech Recognition: when user speaks to the software using audio feed, firstly it gets converted into wave file, then the wave file is cleaned by removing background and normalizing volume. the filtered wave form is then broken and converted into phonemes. Phonemes are the basic building block sounds of language and words. English has 44 of them, consisting of sound blocks such as “wh”, “th”, “ka” and “t”.Each phoneme is like a chain link and by analyzing them in sequence. the ASR software uses statistical probability analysis to deduce whole words and then from there, complete sentences

B. Natural Language Understanding: What do the user say? their intent? Meaning?

a. Lexical Ambiguity: If user said "How are you?" lexical Ambiguity performs tokenization on sentence. the given sentence gets tokenized and get converted into individual word ("How", "are", "you", "?"). also, lexical ambiguity finds the actual meaning of words.

b. Syntactic Ambiguity: Performs structuring of sentences. In NLP Syntactic Ambiguity is unexpected vague and does not ‘follow the rules’. Improper pauses, rambling sentences and incomplete sentences.

c. Semantic Ambiguity: Semantic ambiguity occurs when the meaning of the words themselves can be misinterpreted. Also, semantic ambiguity happens when a sentence contains an ambitious word or a phrase in a sentence.

d. Pragmetic Ambiguity: this type of ambiguity arises when the actual meaning of words of a sentence is not same. There are various sentences in which the proper sense is not understood due to the grammar formation of the sentence this multi interpretation of the sentence gives rise to ambiguity.

C. Natural Language Generation: What should we reply to user?

a. it should be intelligent and conversational.
b. it Deals with structured data.
c. Text / Sentence Planning.

It is subfield of NLP, a software process that automatically transforms the data into plain text. this technology actually tells story just like a human being.

VI. FUTURE SCOPE

By taking the advantage of the extensibility of the system in future it will be used as voice and face recognition to mimic a counsellor, also interacting with the patient at deeper levels. If the future demands advanced chatbots that do more than use scripted, single-turn exchanges, then their method of interface will also have to advance. A voice interface can assist users with disabilities or those who are sceptical of technology.

In the future, the bot’s symptom recognition and diagnosis performance could be much improved by adding support for more medical features, for instance location, duration, and intensity of symptoms, and more detailed symptom description. the future era is the era of messaging app because people going to spend more time in messaging app than any other apps. Therefore, medical chatbot has huge and large future scope. No matter how far they are, people can have this medical conversation. The only requirement they would need is a simple desktop or smartphone with internet connection.

Also, if possible, we will definitely try to extend this project with a machine-like Alexa, Siri.

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VII. CONCLUSION

We built the platform to make it easier to user. Just at moment, we're aiming to make the portal as user-friendly as possible. There is really no compelling incentive to press the catch to select the option, just like there is no persuasive point waiting for the answer. In this application, we employ the Voice Recognition software, Sound to Information Transformation, and Language Interpreter modules.

We have developed web based application that is Medical Chatbot which helps user to provides the healthcare system / health related queries. In this system, by using NLP(Natural Language Processing) and Machine Learning algorithms we've provided user friendly healthcare medical chatbot which will solve the queries of user's related to health with higher accuracy. Also we've provided native language support i.e. (Hindi, Marathi, English).

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