

# An AI Based Chat-Bot for Providing Health Services

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## Abstract:

India is a country with a population of more than 1.33 billion. Yet the lack of medication is a crisis here. To overcome and resolve these issues we set to create an Artificial intelligence (AI) based Chat bot. This chat bot will be having the potential to provide patients with access to immediate medicinal information based on their queries. We will be developing a website accessible to people all over India. These bots connect patients visiting the site, helping them to discover specialists, fixing their appointments and getting access to proper treatment. By asking questions in series it helps patients by guiding what exactly he/she is looking for and helps in fixing appointments for the user, suggest the specialist of a particular domain for example if the user is dealing issues with heart it suggest the specialized cardiologist around the user according to the timelines of the doctor and the user, incase if the user needs to find the laboratory for example like X-ray lab or microbiological lab for the medicinal tests etc the chat bot provide the information of the labs available in area and its opening and closing time which also fixes the appointments for user, the same chat bot also gives the availability of medicinal drugs available near them if and only if it is prescribed by the doctor through this chat bots portal. The design of this software is done through a combination of NLP (Natural Language Processing) and Machine Learning.

## Article History

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## I INTRODUCTION

The use of chatbots has spread from customer service to matters of life and death. Chatbots are entering the healthcare industry and can help solve many of its problems. Health chat bots is to communicate with users. It allows users to ask medical questions and receive answers from doctors. The medical chatbots helps the users to submit their problem about the health. The user can ask any personal query related to healthcare through the chatbots without physically available to the hospital. Query is sent to chatbots and gets related answers to the clients. A big disease can start from small problems such as headache which feels normal but it may be the beginning of big disease such as dengue and most of the disease can be identified by common symptoms so the disease can be predicted. Health Service Provider that provides consultations with doctors and healthcare

professionals via text and video messaging through web application. AI mostly drives the consultation provided through the web app on the basis of the patient's medical history and general information on various medical aspects. If necessary, the patients can have live chat with a real doctor as well.

In recent times, the discussion has moved to a point where AI doctors replacing General Physicians in the future is not startling any more. Even though the switch may not happen in the near future, AI in healthcare industry is definitely going to be assisting General Physicians to make an evolved diagnosis. There will soon be a time when the dependency on the human mind in the healthcare industry will decline from its current percentage. However; this technique is very costly and in developing countries maintenance is mandatory [7].

A chatbot is a type of web-robotic application powered by AI that helps in running automated commands on the internet. As the name suggests, these internet bots are primarily used as communication tools and facilitate automated conversation by way of audio or textual messaging. Instead of depending on conversing with an individual, Chatbot provide assistance in communicating between two sides with automated scripts.

A recent study identified that on an average, a patient spends 60 minutes in reaching to the right doctor after reaching a hospital. And it takes almost 30 minutes in finding out the right hospital or clinic. This is in regards to the treatment of basic healthcare. We're very close to the time where the bot would notify the user that it is time for their health check-up based on past medical records and schedule an appointment, or book a pathology lab visit to your home for your quarterly sugar test. The class with most elevated number of information point will be the classification of the new information point [13].

## II TECHNOLOGY STACK

A computer program of a chat-bot will understand a normal human chat or voice conversation then analyses it and project the potential results of the human need. to exhibit human like intelligence in any machine or software or a computer a technology called artificial intelligence is used .artificial intelligence enables a computer ,software or a system to learn things from past experiences, it can make corrections and adjustment to accommodate new data inputs, and effectively response for human like way. Chat-bots use AI as part of their intelligence. AI is artificial intelligence which is a branch of computer science whose main focus is to develop and study intelligent programs and machine which can be helpful to people in their daily work and make their life easy [2]. It is a technique which can be applied to multiple domains to get deep insights to

problems which are otherwise unsolvable. In many varieties of industries, it has a vast scope for practical application, it is a booming technology and now its transforming the way of how industries work and the industrial functionality. The part of artificial intelligence in the medical chat-bot is as the chat-bots users will give the symptoms of a particular disease, every person who has the same disease may give different form of the symptoms he/she experiences and the Artificial intelligence gathers and learns from all of this symptom dataset which it has collected and updates itself and asks the questions intensely and more accurate the results will be produced and with a good form of predefined flow it will solve the user's problem and queries.

*SVM linear classifier*

$$f(x)=w^tx+b$$

For the proposed system with the three major technology one of them is natural language processing(NLP) , the major first objective of the chat-bot is to make the user's feel like they are talking to a actual human instead of feeling like they are having conversation with a bot this is the actual meaning of a working even a key point of a healthy conversation with chat-bot ,it must be friendly for that we are using the natural language processing (NLP) even the goal of the NLP is to make the interaction friendly . natural language processing consist of two major processes they are natural language understanding (NLU) and another is natural language generation (NLG) the work of natural language understanding (NLU) digest a text and then convert or translate it into computer language and produce an output result in a language that actual humans can understand . natural language generation (NLG) is an automated verbal presentation of data, NLG are made of three main components the data behind the text or conversation or the narrative, the conditional logic and software that makes sense of that data, and the result content that is generated.

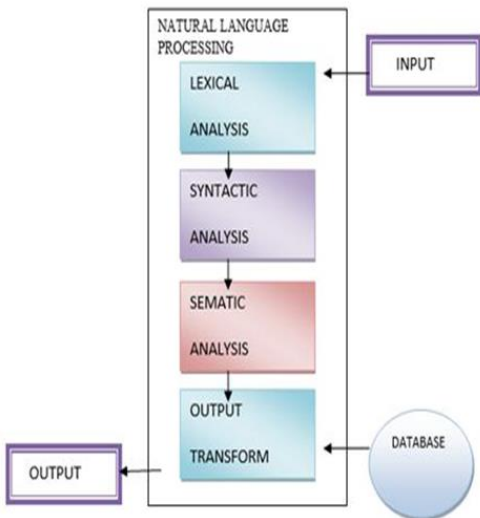


Figure 1 .Working with NLP

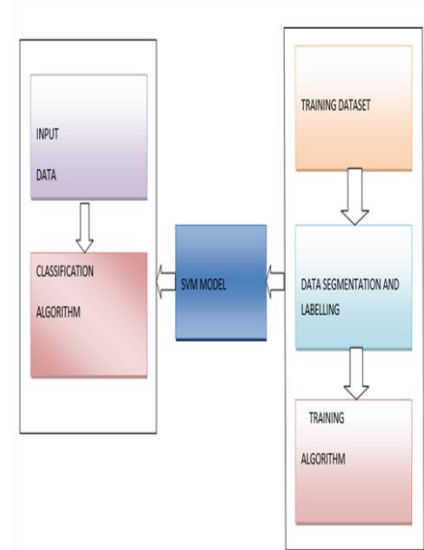


Figure 2. Working with NLP

Primal method:

$$\min w \in Rd ||w||^2 + C \sum_I^N \max(0, 1 - yif(xi))$$

The next technology that's used in this medical chat-bot is machine learning, to understand this technology let us present an example before you we are humans we could recognize, consume, make decisions etc... are the act of intelligence as we are humans we have intelligence now we have a actual robot which doesn't have intelligence unlike the humans so to resolve this the techno scientist have come up with the machine learning concept. Actually machine learning is a part of artificial intelligence where the most booming technology the deep learning is a subset of the machine learning. We will be able to build a neural conversational network with the help of machine learning. By using the machine learning algorithms, the efficient chat-bots are developed which could solve or make a betterment in human life.

Dual method:

$$\max ai \geq 0X \sum_{k=0}^n \alpha_j a_k y_j y_k (x_j > x_k) \text{subject to } 0 \leq \alpha_i \leq C \text{ for } \forall i, \text{ and } \sum_i \alpha_i y_i = 0.$$

### III PROPOSED SYSTEM

The proposed system is subjected to have a major five services they are the disease prediction tool, doctor availability, medical lab availability, drug availability, insurance policies available the model shows the working of disease prediction tool. By using the website designed the user will register and login and he/she will interact with the chat-bot and the system proposed will produce a text to text conversation with the user and it will ask series of questions about the health issue it also suggest some symptoms to the user if he/she experiences and it will diagnose the disease.

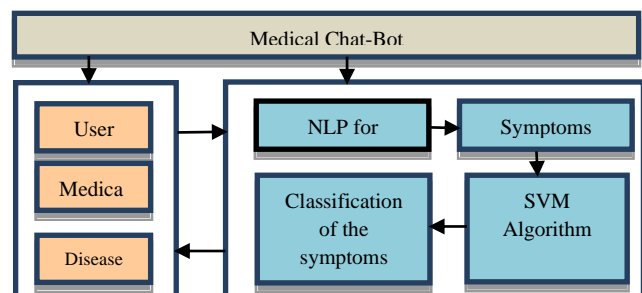


Figure 3. Working with Disease prediction tool

(a) Technology Heap

The summary of the conversation or the text is digested by NLP and then the text is translated into machine language , by the application of AI the

symptoms are identified by using the special type of machine learning algorithm, Machine learning can be categorized into four types (i) un-supervised learning; (ii) supervised learning; (iii) semi-supervised learning; and (iv) reinforcement learning[4] Machine Learning algorithms can be applied to the dataset and eventually choose the best algorithm for a specified problem[3] here we use Support vector machine(SVM)algorithm for the proposed system, The simply way to describe SVM is a binary classifier. SVM training algorithm built a model that predict whether the test image fall into this class or another [1]. It attempts to find a hyper plane that can separate two class of data by the largest margin Support vector machine are supervised learning models which is associated with learning algorithms that analyze data used for classification and regression analysis, It follows a technique called the kernel trick to transform the data and based on these transformations, it finds an optimal boundary between the possible outputs. So, the SVM is used.

(b) Service Provider

The services provided by this chat-bot are first is the disease prediction, then when a person is need to contact a doctor but only that person has a manual phone number of his/her family doctor so to overcome this issue we are providing the user with the doctors around the user by the application of GPS and will fix appointments on the basis of his personal wish, the chat-bot also provides you with the information of the laboratory availability as there are many types of labs Like for diagnosis , blood screening labs, microbiological labs, x-ray and scan labs etc... so the user could able to get a real time data of the labs available the opening and closing time of labs and also can fix appointments , the next is drug availability or medicine availability but here comes a question because it's a crime to buy and sell certain drugs without doctor prescription so the chat-bot cannot show the availability to resolve this after fixing and meeting the doctor the doctor will produce a digital

prescription and by that the particular user can avail the particular drug availability around his/her location.

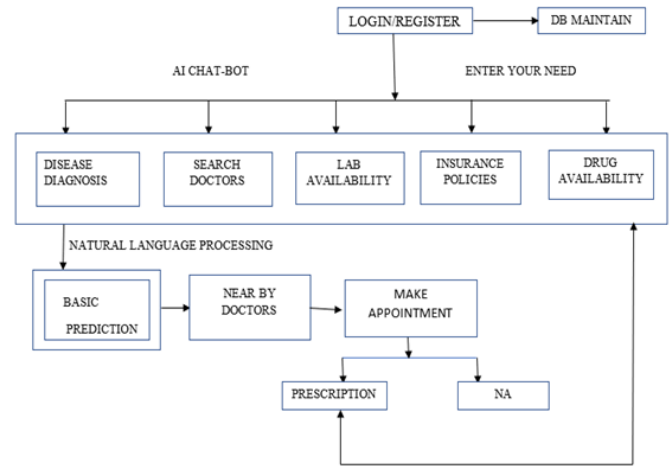
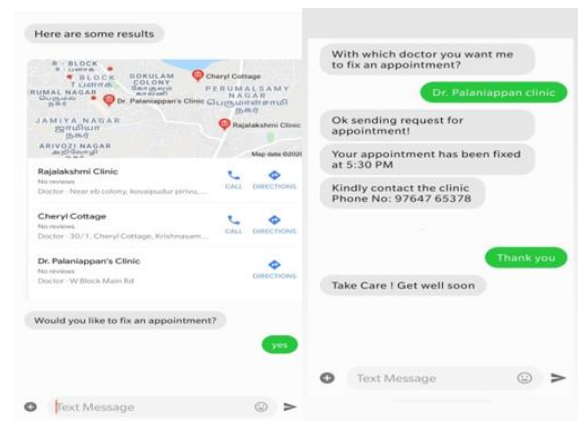


Figure 4. Service model of chat-bot

While coming for the last service there stands the insurance policies when a user wants to know which hospital provides which insurance claims and what are the acceptable schemes are availed in a particular hospital on the basis of users need. The Demand Sides are Doctors, Surgeons, Medical Consultants, Nurses, Healthcare IT Solution Providers, Healthcare IT Service Providers, Hospitals and Physician Offices, Diagnostic Laboratories, Government Institutes, Market Research and among others. so this chat-bots will be highly beneficial and has a great market requirement.

IV RESULTS & DISCUSSIONS

Work flow of chat-bot



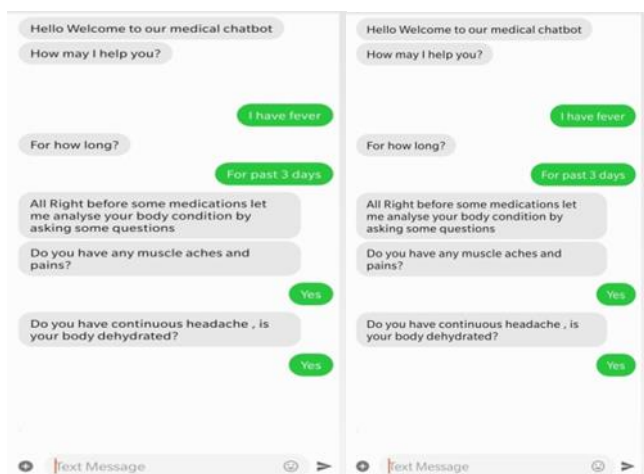


Figure 5. Screen shots of Chat bot

This is the demo of the medical chat-bot where the user conveys his/her symptoms or queries to the chat-bot for which the chat-bot by using AI it provides an appropriate reply on the basis of user's requirements and it This healthcare Chat-bot system will help hospitals to providehealthcaresupport online 24 x 7 as it answers deep as well as general questions

#### V CONCLUSION AND FUTURESCOPE

The AI implementation in healthcare shows us how the chatbots are improving the state of healthcare in India and will be going very far with its use in more number of tasks. It will increase reliability and cost effectiveness to the current scenario of health which proves chatbots to be a boon to mankind.Our study of uses shows that healthcare chatbots have not yet reached maturity yet. They are only in the early stages. However, it seems certain that their use will be generalized soon. Chatbots are being increasingly integrated into homes, especially via connected speakers that become a daily companion and begin to address healthcare uses. Tomorrow, parents may turn to a vocal chatbot for advice when their child shows minor clinical signs. Patients will carry out a pre-consultation via a questionnaire on a chatbot at the time they make their appointment.

Chatbots could also help adapt the habitat for home-based healthcare through oral communication:

- By promoting access to home automation
- By enriching current remote assistance offers with an alert system based on user responses.
- By providing a socializing activity.

However, all new technologies, including chatbots, could be integrated into uses only on the condition that health ethics are respected. For example, confidentiality is important, as is data security. While many simple or repetitive tasks are and will increasingly be handled by chatbots, robots will never replace humans until technologies are able to understand emotions and unexpressed, implicit information. This is even truer in the health field.

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