# AI based Meddesk Chatbot for Healthcare

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**Abstract -**With increasing cases of covid-19 and seasonal diseases it is found that pre-booking bed at hospital is difficult. And this leads to improper treatment on time. This system will come up with a medical chatbot. Chatbots are computer programs that communicate with users using NLP technique. The chatbot stores the information into a database to identify and process the keywords from the sentences. This AI based medical chatbot can take decisions as per the request of the user by using its database. Through chatbot one can speak with a text interface and get answers through AI. In the system, there will be focus on building a chatbot which can easily recommend nearby hospitals and can also provide bed booking facility, nearby vaccination centers and doctor's appointments. The functioning of medical chat-bots depends on Natural language processing. Many experts and doctors across the globe believe that getting a COVID-19 vaccine helps us keep safe from getting serious illness even if you get affected by COVID positive patient. After getting vaccinated, it will protect other people around, and can save lives as well as reduce risk.

## 1. INTRODUCTION

Health care is treatment, prevention, and the curing of an illness and the preservation which includes mental and physical health by the services offered by the medical organization, nursing, and allied health professions. The system application uses the Q&A mechanism in the form of a chatbot to answer user related queries. If the match is found or discovered, then answer will be given or similar answers will be displayed. The input sentence of the chat pattern is stored in a RDBMS type of database. The chatbot coordinates with the input from the user question. Each query from the user is compared and processed within the knowledge database of the chatbot. The organized state of such services may lead to a health care system. Health is defined as a state of complete mental, physical, and social health. In the past years or decades, people have become more dependent on the internet for solving every query or doubts they have.

Another way is creating websites according to Aswini [9], a medical website plays an important role in today's digital world and a lot of panels are available for answering such queries provided by the user. Medical chatbot is stated as the need for an accurate and reliable diagnosis that has made the rise of a new generation of healthcare   technology.   AI is an umbrella term in the software field that consists of an algorithm that processes the user input information to provide output to the user.

## 2. LITERATURE SURVEY

Bao, Q., Ni, L., Liu, J. [1] gives information about a chatbot framework that works on a model which consists of a text similarity and a knowledge graph in it. Based on this, will have built a HHH, a Q&A Healthcare system which will help in answering complex medical queries. HHH keeps a knowledge graph used from medical data collected from the dataset provided over the internet.

HHH also applies a novel text representation and deep learning model, HBAM, to end the similar question from a big Q&A dataset. There is a comparison of HBAM with other models such as BERT and MaLSTM. Also have trained and tested the models with Quora duplicate questions dataset presented in the medical area. The experimental results show the model is able to attain a higher level of performance than the existing methods.

Dr. Mrs. Neeta A. Deshpande and Mrs. Rashmi Dharwadkar [2] explains that normally regarding the particular disease, the users are not conscious about the treatment or symptoms. For minute query or problems users need to go personally for check-up to the hospitals which leads to more time consuming. And also, the controlling and operating of the telephonic calls for the complaints of the users is hectic to us. This problem can be overcome by using medical chatbot for providing guidance to the user concerning their healthy living. The working of the medical chatbots depends on NLP technique that helps users to submit their issues regarding their health through the internet. The user can also question any queries and problems related to their health care through the chatbot without being physically present to the hospital.   The System's major task behind developing this web-based application is to solve the user's queries.

Dr. Paul Raj, Murali Krishna [3] suggests that taking care of health is very important to lead a good and healthy life. Immediate help should always be available in an emergency situation. The idea is to build a web-based application of a chatbot using ML that can recognize and cure the disease and provide likely diseases before going to a doctor. To decrease the cost of consulting the doctor each and every time and to improve the knowledge of the patient, the chatbot is developed. The symptoms of the patients are anticipated by the pattern matching technique.

With providing a map showing the nearby doctors and hospitals to get immediate help. The working is done with the help of API of the google maps. The doctors can also seek and update the profile of the patient by using the application so there is no need of carrying the prescription every time.

Flora Amato, Stefano Marrone [4], explains the valuable interaction of human-machine patterns for eHealth applications such as android applications or web based. In particular, to replace the human-machine interaction mechanisms with an approach that supports a chatbot, it is designed and trained in order to make an interaction with the patients like a human being. Moreover, it also validates the interaction pattern in real clinical circumstances, where the chatbot has interacted with a medical support system having the aim of providing useful tasks for several disease prevention ways. The chatbot realizes in helping patients by choosing the most proper prevention of the disease by asking different types of information and also supports in prevention and the final diagnosis.

Weiyu Wang, Keng [5] have suggested that health chatbot can conduct an intelligent conversation via input query for issues regarding healthcare. An estimate by market research is that by 2025, the chatbots will touch the $1.23 billion market value mark. There are n numbers of chatbots which are been provided to hospitals for their use. Chatbots can be downloaded for many sources for free through the app store or can be accessed through the internet by web-based application. Such health chatbots provide a vast variety of services. For example, there is a chatbot that helps the users to report their symptoms of their illnesses, checks and processes it through a dataset of such diseases, and then provides a significant output of the disease. If there is need then, the chatbots will provide a live video consultation between a real doctor and the users. The abilities of health chatbots are increasing year by year. With the rise in the population and rise in healthcare costs, the chatbots will become the primary care for the queries of the users. Health chatbots offers both options like making decisions and users rational options. Experts all over the world needs to trust health chatbots to hopefully us them as tools for the purpose of support. Also, the patients should trust these chatbots.

## 3.METHODOLOGY

The presentation gives an idea that it will help users to solve their queries. Request analysis and get return response are the two functionalities of chatbot. This system takes symptoms as an input and gives a number of recommendations of the hospitals to the user. The aim of our system is to build an interface which will help people regarding healthcare.

The system architecture consists of a bi-directional workflow between the user and the chatbot. The medical query from the user acts as an input for the system. The input query is none other than the symptom given by the user to the chatbot. With the use of algorithms such as Stopword removal, Tokenization, NLP for the ease for the working of chatbot. Tokenization is used for giving a token or number to the words in the query. Stopword removal algorithm plays an important role as some punctuation marks, articles and spaces do not mean anything and it's necessary to remove such words.

After taking the input query, the query is pre-processed and then the equivalent output from the system is displayed on the chatbot. It includes the nearest recommendation of the hospital on the basis of the user's latitude and longitude. This is achieved with the use of Google Map API that takes the current coordinates of the user. Book appointments and bed booking facilities are also available for the user in the recommended hospital. User just needs to add his/her name, time and date of the appointment and the Aadhar number for their identity. If a user needs to book a bed in the hospital \, then he/she needs to click on the book bed and then the confirmation will be sent to the user on the registered mail. This is achieved by using the GMail API.

As it is known that vaccination is a must for each and every citizen in the world, it is also necessary for the user to find the nearest vaccination center at the time of vaccination. This is achieved by using the Cowin API of finding the nearest center by LatLong. The user can book the slot for the vaccination of their choice center.
The system will also consist of a part which will have a vaccination for the kids also. Paediatric Specialized hospitals will have the doses for the kids. The data of the vaccination such as date, vaccine name with id will be saved and these details will be also sent to the user's registered mail.

Webster, Jonathan & Kit, Chunyu [6] suggests that in natural language processing technique, it's necessary to concentrate on pure analysis while taking the basic units like words, sentences. It is true that without segregating this basic units it is impossible to perform any analysis or generation. Basically, tokenization is the process of breaking the stream of textual data or unstructured data and natural language text into terms, symbols, sentences, word or other some meaningful and distinct elements called tokens. Many open-source tools are available for performing the process of tokenization.

Saini J. R. and Rakholia R. M. [7] gives us the idea that in order to gain accuracy, the redundant words with low or no semantic meaning must be extracted, such words are called as stopwords. Stopwords are frequently occurring words in a natural language which are considered as not important in certain NLP applications. there are many NLP applications such as Information Retrieval System, text summarization, question-answering system, stemming etc. Therefore, in order to improve the

performance of such a various NLP application, stop word removal is crucial pre-processing technique used in NLP applications. in order to reduce the influences on results, stopwords needs to be deleted from original text.

Natural Language Processing and text analysis are becoming more and more popular in technical analysis. In order for the to maintain accuracy and efficiency, tasks such as indexing, topic modelling, and information retrieval should remove stop-words in the preprocessing step to increase the beep and noise ratio. A large amount of legal text is first converted to row set format using NLTK's sentence tokenization method and then normalized to lowercase to reduce the vocabulary caused by lowercase/ uppercase differences in the same word. The punctuation marks in the sentence are removed, but the " " and "/" are not. [8]
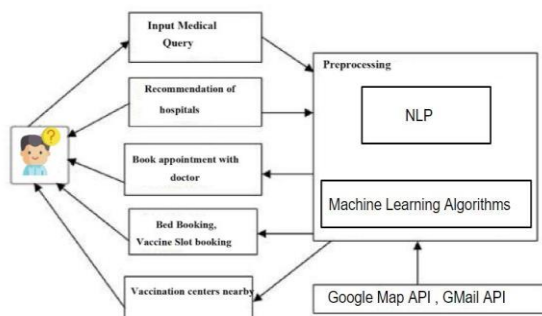


**Fig 1**: System architecture of working of Chatbot
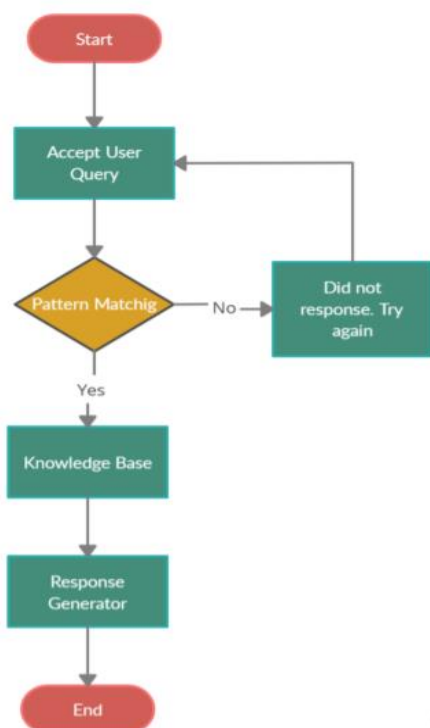


**Fig 2**: Planning/Flow of system

**Step 1: Accept User Query**

The query of the user is accepted from the chatbot and then it is further sent for pre-processing.

**Step 2: Pattern Matching**
In this step if the pattern has been matched with the query. If the query has been matched then it will go further in the Knowledge Base, if not then it will redirect to step 1.

**Step 3: Knowledge Base**
In this step the equivalent data will be assessed from the database and the query of the user will be answered.

**Step 4: Response Generator**
In this step, the response generated after pre-processing and matching will be displayed on the chatbot through the end device.

## 4.RESULT

The technique used in this system helps in achieving the goals of the system. After accepting the query, then preprocessing it and giving a relative output to the user is the goal of this system. The confirmation of appointment, bed book, slot booking will be provided to the user in their respective Gmail account. The user's queries will be solved.



**Fig 3**: Homepage of the Website

Above figure is the homepage of the chatbot. It consists of a signup button and a login button. http://127.0.0.1:5000 is the IP address of the localhost used for the system.
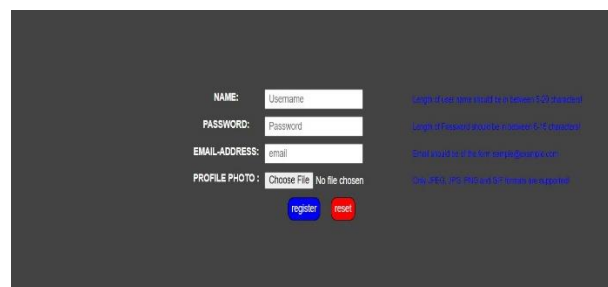


**Fig 4**: Signup Page

The above fig is the signup page of the chatbot. It consists of fields like name, password, email and profile photo for the registration.

**Fig 5**: Nearby Vaccine center using API

The above figure is the fetched vaccination centers near by the user. This is fetched by the Cowin API with the help of LatLong of the user.
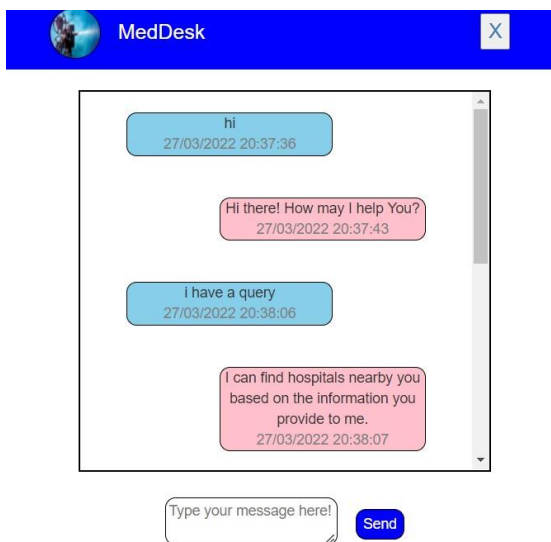


**Fig 6**: Interaction with Chatbot.

The above figure demonstrates the conversation of the chatbot with the user. Response will be sent to the user as per the user's input.
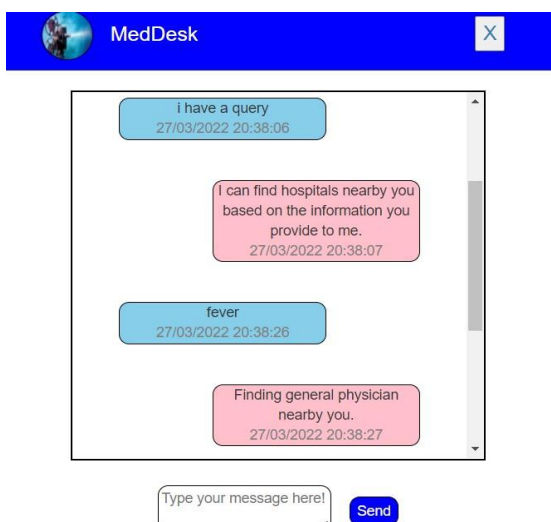


**Fig 7**: Interaction with chatbot

In this figure user gives fever as a symptom and then the chatbot in response finds an appropriate specialized hospitals for the user.
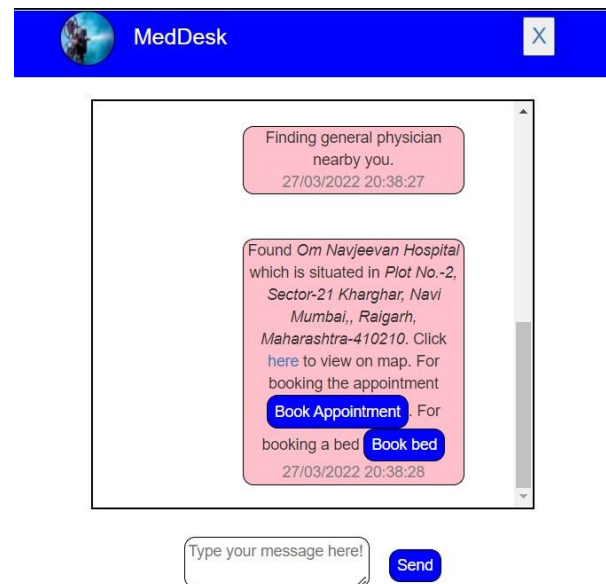


**Fig 8:** Booking of bed/appointment.

The above figure demonstrates that the nearest hospital has been recommended according to the entered symptom of the user. The User can book an appointment or can book a bed according to their choice.

## 5.CONCLUSION

From reducing the time to solving the queries of the users this chatbot fulfils all the requirements. This is a system which takes input query, preprocesses the problem and gives an accurate output to the user. Various Machine Learning Algorithms are used. Algorithms such as Stopword Removal, Tokenization, and various python libraries are used.

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