Survey on AI-Based Medical Chatbot Model for Infectious Disease Prediction

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ABSTRACT

This For an unwell individual, a hospital is the most accessible location to get a check-up, diagnosis, and subsequent recommendations. This is something which almost everyone in the world has done and it is one of the most trusted ways people use to evaluate an individual's health. This system seeks to develop an alternative to the traditional hospital visit, which includes making an appointment and receiving a diagnosis from a physician. This research intends to develop a chat bot interface utilizing machine learning and natural language processing techniques. Users can interact with the chat bot by asking a set of questions and the bot will recognize the user and respond as if it were a human.

KEYWORDS: KNN, medical chat bot, machine learning, illness prediction, and treatment.

I. INTRODUCTION

To stay happy, it's important to keep your health in check. A healthy body helps people do better and leads to a healthy mind. These days, folks don't think much about their health. They often forget to take the right steps to stay well while juggling busy lives. Many are less aware of their health needs. Recently, TOI pointed out [1] how people don't see health as a priority. Many think visiting hospitals for check-ups is just a waste of time. With a hectic lifestyle, there's often no room for good health. Most working people say their packed schedules don't let them see the doctor regularly. They can ignore pain until it becomes too much. The medical chatbot in this system is meant to be like a friendly helper. It chats with users about their health and gives suggestions based on the symptoms they share [2]. This chatbot can figure out symptoms through user interaction. It helps predict illnesses & treatments based on what users report. The K-nearest neighbour algorithm (KNN) is used in this scenario as a machine learning tool [3].This shows that a medical chatbot can help predict patient needs to some degree. It uses easy conversations & looks at simple symptoms,

thanks to natural language processing. Medical chatbots are changing the health culture in our state. They're less likely to make mistakes and are more reliable. Now a days, people rely on the internet a lot. Yet, many don't think about their health. They might ignore minor issues that could turn into bigger problems later. That's where this idea comes in. It aims to provide a free chatbot that's available all day, every day. The best part? The chatbot is free! You can use it from anywhere, even at work. This means people don't need to spend as much on expert advice. With this system, folks will be more aware of their health. They'll be encouraged to take steps to stay well. Long hospital visits often make people overlook their health. But with this new system, contacting the chatbot is easy! People can chat while doing other things. Their work won't be interrupted, & it's user-friendly. This is so important for healthcare because it gives people a way to learn about their health and what to do. Staying healthy leads to happiness. A healthy body helps people do better in life and keeps the mind sharp! Right now, many people forget to take care of themselves. They get busy & don't think much about their health. As TOI's latest news mentions, people are becoming less health-conscious. Many people just don't care about their health. They think visiting hospitals for check-ups is a big waste of time. Life is busy, right? So, in this hectic world, folks often say they don't have time for regular medical check-ups. Instead, they ignore those body aches until they become really bad. In this system, a health chatbot steps in. It's like an interactive helper that chats with the person about their health issues. It can suggest a possible disease based on the symptoms the person describes. By talking to users, the chatbot identifies symptoms pretty well. It can even predict illnesses & suggest treatments based on what it finds. The K-nearest neighbor algorithm (KNN) is the machine learning method that's being used here. This shows that a medical chatbot, using natural language processing, can help predict what might be wrong with patients. It does this through simple symptom checks and engaging techniques. Chatbots are changing the health culture in society a lot. They make fewer mistakes than humans and can be trusted more. These days, many people rely on the internet more than ever, but they don't seem worried about their health. They often hospitals for minor problems that might get worse later. Well, this idea helps solve that problem. The goal here is to make a chatbot that's easy to access any time – 24/7 – and it's free! Since it's free and can be used from anywhere, even at work. By using the new system, people will be more aware of their health. They will need to take the steps to stay Healthy. With this proposed system, fewer folks will ignore their health due to long hospital visits. Like everyone else, people can chat with the bot while doing other stuff. It's super user-friendly. Their work won't get interrupted. This helps in health care a lot because it gives people a way to learn about their health..

II. LITERATURE REVIEW:

In A Novel Approach for Medical Assistance Using Trained Chatbot,"[4] the idea is to create an AI model that helps people pick the right answer for their sickness. Some illnesses have many treatments, and it's hard to tell which one is best. The main job of AI in this model is to show a list of possible treatments based on symptoms. There's even a system that uses natural language processing. It can share what drugs are made of and why they are used. This helps users find the best choice, according to Rashmi Dharwadkar's piece [5]. This system helps users understand their health better. It gives them a basic view of their conditions. Health chatbots make it easier for people to talk about their health issues. With the Google API, users can ask questions about health without worrying about the machine. The chatbot gets the user's question and shows answers in an Android app. The main focus of this system is understanding how users feel about their health. [6] Divya plans to create a system, using artificial intelligence to help people avoid unnecessary doctor visits.

The goal is to find out what disease a user might have and give them the right information. It's made to be low-cost, so more people can access health data. This chatbot should be able to diagnose diseases and share important info. The proposed system acts like a conversational agent. It talks with users to learn about their problems and gives accurate diagnoses. Amiya Kumar Treaty's paper mentions the need for advanced technology that offers reliable healthcare management, so people can feel secure even without a doctor.

The requirement of advanced technology that provides individuals with an appropriate healthcare management system that they can trust in lieu of a physician is referred to in Amiya Kumar Tripathy's paper [7]. It points out the need for such a system to be accurate so that individuals can keep it with them. The presented system is developed with the help of a mobile heart rate sensor. Figure 1 illustrates an operational model of the proposed system monitoring, which measures heart rate and uses that data to make an accurate diagnosis in one click. The system also provides video conferencing such that in case of an emergency, a doctor can be accessed. Doc-Bot, which was specially created for this reason, is being worked upon as a mobile platform that will make the concept of giving a diagnosis based on symptoms possible. The concept of an intelligent voice recognition chatbot is presented in S.du Preez's work[8]. This indicates the technology utilized in the development of the system and its components. With this web service, clients can send and receive messages from the server from any location. The communication handling to and from the web service incorporates a black box approach. Access is facilitated through a transport XML processing interface. A web-based chatbot employs an artificial intelligence framework to answer user inquiries. In cases where user queries are unclear, additional processing will be undertaken with the assistance of an online intelligent research assistant, and the findings will be archived for future reference, allowing for more effective responses. [9] B. R. Ranoliya characterizes it as software that can leverage artificial intelligence to mimic human conversational patterns. It proposes the utilization of chatbots as virtual assistants or intelligent agents capable of executing tasks such as appropriately responding to user inquiries, controlling devices, providing navigation assistance while driving, and beyond. This document presents a chatbot designed to leverage a database of frequently asked questions to generate suitable answers for user-submitted queries. It employs latent semantic analysis and artificial intelligence mark-up language to fulfil this purpose. Both methodologies are tailored to address distinct categories of questions. For general or template-based inquiries, artificial intelligence mark-up language is utilized, while latent semantic analysis offers responses for various service-related inquiries. This approach is predominantly applied within educational settings to facilitate communication with students and to address their common questions.
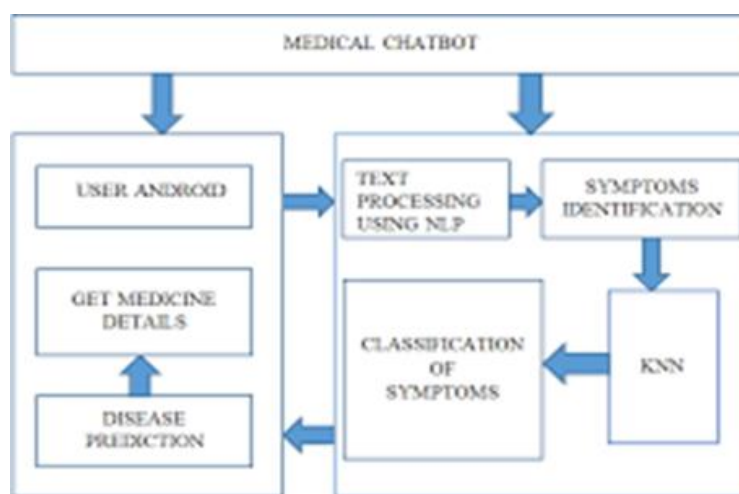

Fig 1: Working model of the proposed system

III. METHODOLOGY:

The user interacts with the chatbot application in the same manner as he or she would interact with another human being. Upon registration, the user accesses the system via this Android application. With the help of conversations, the chatbot can diagnose the user's symptoms. The chatbot is able to reply adequately to the users or patients in the order they have been formulated. In order for everything to run smoothly, the chatbot will be equipped in advance with some of the potential queries and answers that the user might ask. Upon receipt of messages, processing of text will take place. Processing of any form of text is done using natural language processing (NLP). We have discussed earlier that a text can be in the form of speech and with the help of NLP, people can smoothly communicate with machines [10]. The term NLP describes the process of receiving input in the form of a speech or text, processing it, translating as it's needed, and producing the output in the required form. When there is a query, the chatbot attempts to map it to one of the k nearest neighbours already available in the dataset it has trained itself on. KNN is used in this case. We can mention that Python has within its power many libraries that respond to the needs of NLP constituents dealing with the Third International Conference on Trends in Electronics and Informatics (ICOEI 2019). Natural Language Tool Kit (NLTK) implements various approaches to offer functionality needed for NLP as they are a collection of libraries. One of the primary activities performed by every NLP implementation is Tokenization, which, for NLP, involves segmenting a corpus into smaller pieces called tokens. The most significant tokenization operation is to convert the text inputted by the user into tokens. Tokenization would lead to various words being converted into different tokens [11]. Afterwards, tokens serve as the input for subsequent parsing and analysis. The generated tokens will undergo stemming and lemmatization. Stemming and lemmatization are two operations that ease text processing. These are the primary operations on natural language. Stemming is rule governed and it looks at and strips prefixes and suffixes from the tokens results leaving only the stemmed outcome [12]. A word bag is formed after the words are transformed to their root level. In the same manner, a dataset consisting of illness and symptoms is treated and converted to a word bag. Each of the 0s and 1s in the vector will receive an answer ID. This framework needs an algorithm through which it can assist in identifying the disease from the symptoms have been provided by the user K Nearest Neighbour (KNN) is simple yet very potent. Its best application is in pattern recognition. Widely acclaimed as one of the most efficient classification algorithms, it categorize neighbours majority class label. The classes are stored, and from that point onward, the data sample gets classified. Essentially, with every new sample of data, classification is done using a similarity measure to previous data sample, for example, past samples of data which include a tumour or a normal fever can assist in separating headache symptoms. Predictors can be of any number and class features can be limitless. For instance, consider the four most common types of mapping diseases – KNN can successfully tag the right diseases to their symptoms. First step will be building the model using the sclera library in python. Whenever a user posts a query, the input goes through multiple text operations before it can be transformed into a vector or "bag of words." After receiving the vector, the model can provide the answer index which identifies the disease.

IV. CONCLUSION:

This article discusses a medical chatbot that replaces the traditional methods of diagnosing illnesses and proposing treatment options. A chatbot can act as a doctor. The chatbot is an application designed for users. Application users can give the chatbot their symptoms, and the chatbot will then suggest appropriate

measures to be taken. Because the dataset contains general information about symptoms and illnesses, the chatbot instance can provide the user with relevant and useful information concerning illnesses, as well as possible treatments. Ultimately, after observing the symptoms of a number of users, it gives them a link to info about the treatment they can receive. Patients stand to gain from an intelligent medical chatbot which understands symptoms and gives relevant diagnosis together with possible treatment to be offered afterwards. Owing to the nature of people's daily activities, it becomes next to impossible to visit hospitals regularly for routine checkups. In this chatbots are extremely useful since they are capable of diagnosing problems at the click of a button. One of the major advantages provided by chatbots is the offer of appropriate health care steps without the need to book an appointment with a medical professional. As a result, users are extremely attracted to chatbots due to their low-cost features. Furthermore, what helps retain users is the affordability of chatbots. Since interaction is personalized, users tend to be more frank concerning their health problems which enables chatbots to precisely diagnose illnesses.

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