Health Assistance using AI Chatbot

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Abstract— Normally Common people are not aware about all the treatments or symptoms regarding the particular disease. For small problems they have to go personally to the hospital for the check-up which is more time-consuming. And Health professionals also have limited resources and are not able to personally monitor and support patients in their everyday life. Such a problem can be solved by using healthcare chatbot by giving proper guidance regarding health. The Healthcare Chatbots functioning depends on Natural Language processing that helps user to submit their problems or symptoms in the form of query. Then, this query is sent to Chatbot and the related answer is replied and displayed on chatbot in the form of conversation between user and bot. A patient could tell the bot what symptoms they are feeling & on the basis of seriousness of symptoms this bot identifies the disease and either suggest medicines or ask to fix an appointment with doctor. This healthcare chatbot system will help to provide healthcare support 24 x 7 to patients.

Keywords: Medical Chatbot, Text Based Healthcare Chatbot, NLP, Health Information system, Machine learning Chatbot

I. INTRODUCTION

Modern medicine is technological medicine. Health institutions are moving from analog to digital, mastering computer analysis and forecasting systems. Technologies in healthcare are not only the latest medical equipment but also industry-specific software that automates work processes.

One of the promising areas is the chatbot application in healthcare. It is projected that healthcare chatbots market will reach $314.3 million by 2023 from $122 million in 2018. Juniper Research shows that chatbots enable healthcare to cut costs by $8 billion per annum by 2022.

Research says 60% of visits to a doctors are for simple small-scale diseases, 80% of which can be cured at home using simple home remedies. These diseases mostly include common cold and cough, headache, abdominal pains, etc. They may be caused due to the changes in the weather, intake of improper diet, fatigue, etc. and can be cured with the help of chatbots without the intervention of a doctor.

The high cost of our healthcare system can often be attributed to the lack of patient engagement after they leave clinics or hospitals. Various surveys in this area have proved that that chatbot can provide healthcare in low costs and improved treatment if the doctors and the patient keep in touch after their consultation. To answer the questions of the user chatbot is used. There is very less number of chatbots in medical field. The proposed system provides a text-to text conversational agent that asks the user about their health issue. Think of medical chatbots as virtual assistants for your clinic, hospital or medical centre in your pocket. A chatbot is a system that can interact humans with natural language. The proposed Medical Chatbot can interact with the humans, giving then a realistic experience of chatting with medical professional. The main purpose of the chatbot is to bridge the gap between the user and health providers by giving immediate replies to the questions asked by the user. Today's people are more likely addicted to internet, but they are not concern about their personal health. They avoid to go in hospital for the small problem that may become a major disease in the future. The goal is to provide health related information to users and predict the disease based on symptoms and give suggestions of medicines and precautions and also provide the facility of appointment with doctor.

In other words, This Chatbot are designed to handle follow-up medical care that can help the hospital in delivering better patient care & decrease the re-admission rate.

II. LITERATURE SURVEY

The paper gives the information regarding our project which is a healthcare chatbot which provides a solution to the healthcare sector in the form of a chat interface that can improves the method by which patients interact with doctors or any Healthcare organization. Many medical Chatbot designs have been proposed in the past few years which aim to provide the user with medicine recommendation after extracting the illness information from the user messages. KrishnenduRarhi et al. [1] proposed a clear design a medical Chabot which provides diagnosis and remedies based on the symptoms provided to the system. They describe how the medical chatbot have impact on life of its users and how it providing an advantage of caring virtual doctor in their pocket.

Divya S et al. [2] proposed a simple idea of creating a chatbot that reduce the healthcare cost and accessibility to medical knowledge. They give clarification about the necessary information about chatbot.

De Gasperis et al. [3] proposed that how Artificial Intelligence and Markup Language can add up the quality to the chatbot. They also clarify about how Artificial Intelligence Markup Language which is the well-known XML derived language used to build chatter bot knowledge bases in context of case-based reasoning and textual pattern matching algorithms.

Based on the symptoms our chatbot can predict the diseases and give the list of available treatments or provide contact details of the best physician to consult. It can perform many functions on patient's behalf, thus making interaction smoother. The user can achieve real benefit of chatbot when it can diagnose all kind of disease and solve necessary health related queries. The system uses pattern matching algorithms and machine learning to process all the information it receives from the users, and provides a

correct and quick responses. The system takes a plain text as input and answering all type of questions output by qualified user is the output. The purpose is to provide a generic solution to this problem. this paper helps in recognizing the reality in texts and giving the past content for developing a conversation.

III. RESEARCH METHODOLOGY & PROCESS

The front end of the system is Chat interface which is implemented in HTML, CSS, JavaScript and flask through which user can interact with bot. It is responsible for collecting the user queries which are the input to the system from the user and it is also responsible for displaying the system generated results as a response to the user. Therefore, it can be said the face of the system is the chat interface through which the entire communication takes place. It works as the mediator of conversation between the backend and the user. The query which fires by user on the chat interface is passed on to the chatting backend which acts as a message passing system between the Chat interface and the Machine Learning Layer. This interface can be accessed either as a smart phone app or as a website.
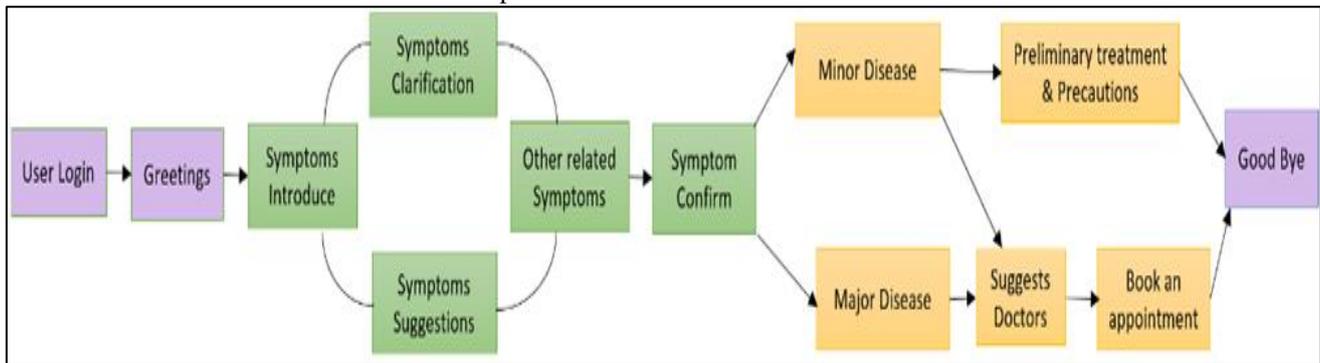

Fig. 1: Process Flow of Proposed System

Here majorly we have decomposed our whole chatbot into three parts:

The Dataset, Backend and Frontend. Dataset is a collection of Information required to train the Chatbot we have used the conversational dataset of YML files to train bot using supervised learning. And Backend consists of model of Chatbot with some important python libraries and Database to store the last conversations and other details of user. The proposed system has the following modules:

A. Web Application:

1) The web module provides a front end user interface, where the user will get an interface to communicate with the Chatbot.
2) The system is a standalone application where the user can register himself by logging into the application with his username and password. After sign in, the users can chat with the chatbot and can provide their personal information such as their symptoms, age and other specifications etc. which will be stored in the user database.
3) The Login module will receive username and password from the user, it will then check the database if it is already present and record the user information in its database.
4) The User can perform two tasks, they can chat with Chabot and book a doctor's appointment. The user can chat with the chatbot by asking a query, the keywords related to the query are fetched and matched with the keywords in the database, which helps to retrieve and process the information and display the results to the user.
5) The chatbot suggests the doctor's based on the symptoms the user gives and allows the user to book an appointment with the doctor.

B. Chatbot Module:

The chatbot module is an AI ENGINE that detects the users' queries, extracts the requested data from the Knowledge Base, Triggers the Actions and responds to the users. The proposed Chatbot system design integrates computational algorithms and language model to stimulate a natural language chat communication between a human user and a computer. In addition to that the system incorporates some medical details like enquiry about a medicine, its dosage or symptoms of a particular disease etc. so that Chatbot delivers it to the user whenever the user needs it. When the query is asked by the user, keywords are fetched and matched with that of the database with the help of keyword matching algorithm.

C. Knowledge Base:

The knowledge base is the repository that stores the history of all the user queries and the system retrieves the data from the knowledge base by processing the query based on keyword matching patterns. The database used for developing the system is 'SQLite', it works great as the database engine for most low to medium traffic website.it can also handle large amounts of web traffic. Raw data is collected and extracted from Yml files, then that data is processed to generate summary reports. SQLite has many advantages such as being reliable, simple, fast and easy to maintain and configure.
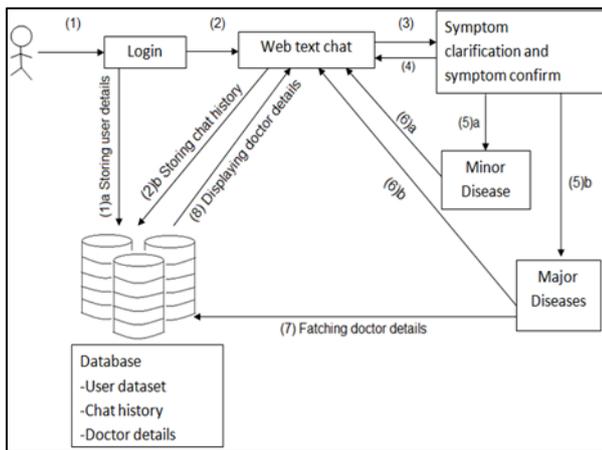
Fig. 2: Architectural Design

The above figure of Architectural design proceeds with the user's login where the users' details will be stored in the database. Then the user can start their conversation with the chatbot and it will be stored in the database for future reference. The chatbot will clarify the user's symptoms with serious of questions and the symptom conformation will be done. The disease will be categorized as minor and major disease. Chatbot will reply whether it's a major or minor disease. If it's a major one user will be suggested with the doctor details for treatment.

IV. RESULTS

By following the proper working design flow we are able to get chatbot which is user friendly and able to predict the disease by your symptoms with good accuracy.

Figure 3 shows the mobile view of the healthcare chat-bot which is also simple to use. In first page it contains login page which is used for login activity or to create profile for new user to use this chatbot. After login it goes to conversation platform where we can fire a query and can get information related to healthcare. It can Identify disease, give suggestions based on symptoms and also scheduling appointment with doctor. It saves cost, time and provide improved health services. We can say that it provides improved health service.

V. CONCLUSION

Our Healthcare Chatbot will have a great impact on the life of its users. It would provide the advantage of carrying a virtual doctor in their pockets. It would also give them the freedom to consult a doctor 24/7 and also can get preliminary treatment.

This can be a most popular tool for people with busy schedule as they won't have to hamper their schedule to consult a doctor for minor health queries. This will also beneficial for elderly and physically disabled people as this can help them get solutions to all their health related issue at their fingertips.

To lead a good life healthcare is very important. But it is very time consuming to consult a doctor for common or small health issues. The user can achieve the benefit of a chatbot only when it can diagnose all kind of disease and provide necessary information. No doubt, the healthcare industry can benefit from these chatbots cost savings related to customer care, but extra attention should be given to the functionalities that are automated. A small mistake in this area can be life threatening. Therefore, it is best to keep these chatbots for simple tasks to save precious time of the doctors. So that people will get an idea about their health and have the right protection.

VI. FUTURE SCOPE

The Future era is the era of messaging app or chatbots because people going to spend more time in messaging app than any other apps.

Thus medical chatbot has wide and vast future scope. Thus medical chatbot has wide and vast future scope. The efficiency of the chatbot can be improved by adding more information in database so that it could handle all type of diseases. we can include voice based queries in addition to text based inputs. The users will have to give voice input and the system can generate either a text output or even a voice based output which make it more easy to use.

We can also add virtual reality or augmented reality technology with this chatbot application to connect doctor and patients virtually from remote locations allowing doctors to continuously monitor patients with real time data to determine how to best treat patients.

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