HEALTHCARE CHATBOT

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Abstract: As the demand in Machine Learning and AI keeps growing, new technologies will keep coming in the market which will impact our day-to-day activities, and one such technology is Virtual Assistant Bots or
simply Chatbots. Chatbots have evolved from being Menu/Button based, to Keywords based and now Contextual based. The most advanced among all of the above is contextual based because it uses Machine Learning and Artificial Intelligence techniques to store and process the training models which help the chatbot to give better and appropriate response when user asks domain specific questions to the bot.
The idea is to create a medical chatbot that can diagnose the disease and provide basic details about the disease before consulting a doctor. This will help to reduce healthcare costs and improve accessibility to medical knowledge through medical chatbot. The chatbots are computer programs that use natural language to interact with users.
Our project focuses on providing the users immediate and accurate prediction of the diseases based on their symptoms. For the prediction of diseases, we have used Decision tree algorithm. Chatbots can play a major role in reshaping the healthcare industry by providing predictive diagnosis.

Index Terms - **Disease Prediction, Decision Tree Algorithm, Chatbot.**

I. INTRODUCTION

Since the past few decades, humans have been tirelessly working day in and day out that they fail to prioritize their health on a regular basis. In the longer run, this problem leads to jeopardizing the quality of life. Nevertheless, with the aid of Artificial Intelligence, we can now provide health care services to individuals at their convenience at reasonable prices. One of the biggest blessings we possess is a healthy body. A healthy body and enhanced quality of life is something each one of us looks up to. The primary focus of this paper is to provide these services to fulfill the above mentioned purpose. It is difficult to imagine our lives without high tech gadgets because they have become an essential part of our lives. Therefore the field of Artificial Intelligence is prospering due to the various applications of it in the research field. Disease prediction is one of the main goals of the researchers based on the facts of big data analysis which in turn improves the accuracy of risk classification based on the data of a large volume.

E-healthcare facilities in general, are a vital resource to developing countries but are often difficult to establish because of the lack of awareness and development of infrastructure. A number of internet users depend on the internet for clearing their healthcare based queries. We have designed a platform for providing online medical services to patients with a goal to provide assistance to healthcare professionals. The user can also seek medical guidance in an easier way and get exposure to various diseases and diagnosis available for it. In order to make communication more effective, we have implemented a chatbot for disease prediction. Chatbots are the human version of software that is based on AI and uses Natural language processing (NLP) to interpret and accordingly respond to the user. This study proposes the disease prediction chatbot using the concepts of NLP and machine learning algorithms. The prediction is carried out using the Decision tree algorithm.

II. LITERATURE SURVEY

[1]An application of counseling chatbot, which provides conversational service for mental health care based on emotions recognition methods and chat assistant platform. This application doesn't consider the user's psychiatric status through continuous user monitoring.
[2]In this text-based healthcare chatbots can be designed to effectively support patients and health professionals in therapeutic settings beyond on side consultations. It does not have face to face care and where THCB are likely to fail.
[3]This paper reports a primary care chatbot system created to assist healthcare staff by automating the patient's intake process. In this paper they did not include more disease and also a symptom synonym thesauri also should be produced.
[4]This provides a text-to-text conversational age that asks the user about their health issue. The user can chat as if chating with a human. The bot then asks the user a series of questions about their symptoms to diagnose and gives suggestions about the different symptoms to clarify the disease. Doesn't give detailed information No features such as duration, intensity of symptoms etc.

[5]The proposed method is a chatbot based mobile healthcare service that can immediately respond to the accidents that arise in everyday life and to the condition changes of chronic-disease patients. Also proposes a framework for the human-robot interaction that can endure an efficient implementation of the chatbot service. It is a text based bot irrespective of having all advanced features.

[6]Conversational agents have many technical, design and linguistic challenges. They introduced the nature of conversation user interface(CUI) for health and described UX design. Some technical limitations like voice message are not accurate, some corruptions are faced due to the network so the timing of bot remainders is corrupted.

[7]The Bot Transition program provides a framework and resources based on AAP, AFP and ACP recommendations to promote skill attainment in self-care. A scripted text messaging platform is feasible and appears to be well-received by patients and caregivers. It is designed only for people with special health needs transitioning into adolescents.

[8]The system uses a question and answer protocol in the form of a chatbot to answer users' queries. The complex questions and answers present in the database are viewed and answered by an expert. This chatbot is comparatively time consuming.

[9]This chatbot is an attempt to let users understand the symptoms they are facing and get a basic diagnosis about the disease they could be having. Complex interface, time consuming, high installation cost.

[10]A chatbot is an interactive software application to simulate natural user interactions based on AI modeling. We have proposed a dataset for the commonly occurring medical conditions together with a prototype model to provide quick assistance to the patients.It only gives solutions for the common medical conditions.

[11]Uses both KNN algorithm and decision tree classifier and from that more accurate one is taken and shows the output. As it uses both algorithms it is time consuming.

III. EXISTING SYSTEM

Many of the existing systems have chats through texts.Some limitations of such Chatbots are,there is no instant response given to the patient, they have to wait for experts acknowledgement for a long time. And also there are a limited number of diseases in the dataset.Technical issues like voice messages are not accurate in the existing system.

IV. PROPOSED SYSTEM

In our system the user can interact with the chatbot through text and chat bot will interact using voice and text manner. With respect to the users queries, the bot identifies the disease if user chatting with the chatbot. According to the diseases of the user, bot gives suggestions for the disease and also prescribe specialist doctors. This system can be used by multiple users at a time without any lagging.

4.1 Objectives
1. To extract symptoms from user chat.
2. To classify and predict the diseases using a decision tree classifier.
3. To develop a healthcare chatbot to predict diseases by symptoms taken as input.

4.2 Overall Algorithm
1. Insert user query in the chatbot window.
2. The details will be extracted from the user chat.
3. Decision Tree classifier algorithm is used to process the query.
4. The response is fetched from the chatbot like Disease Prediction and Disease Precaution and output to the user.
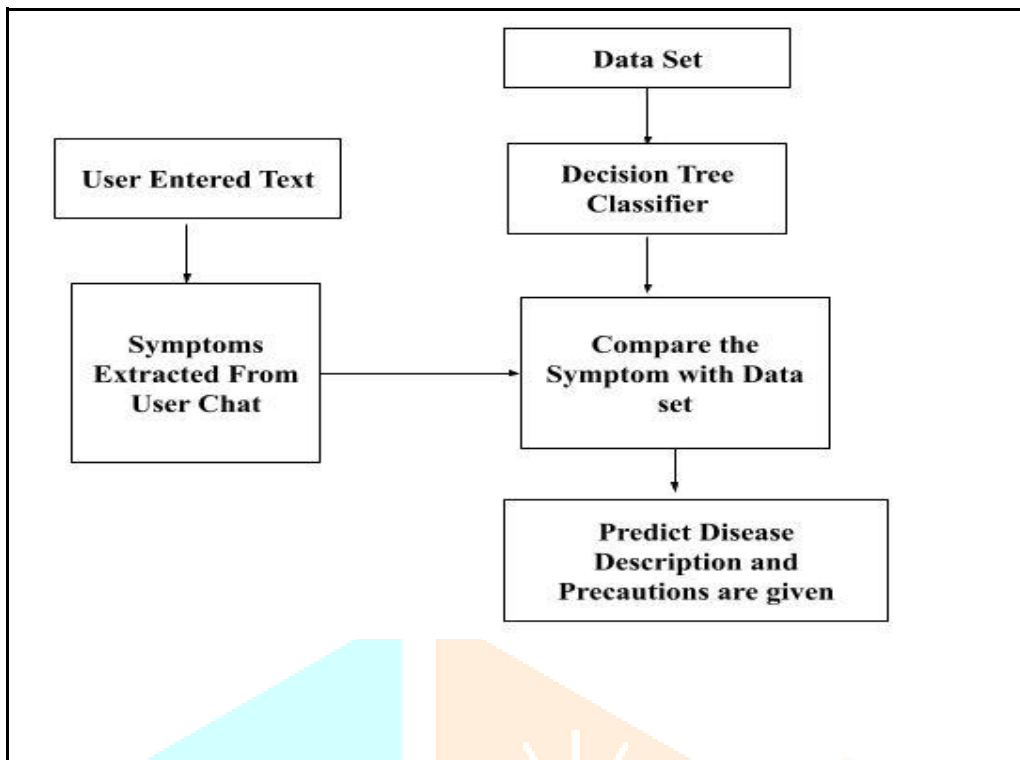5. Exit.

V . ARCHITECTURAL DESIGN

Figure 1:Architectural Design

Initially the chatbot ask to enter the name of the user, one major symptom that they are facing and period of facing that symptom. In the next step the chatbot ask the specific symptom the user is facing. for example, type 0 for heavy fever or type 1 for mild fever. Next the bot will ask some series of symptoms, and user have to answer in "yes" or "no" manner. Decision Tree is a Supervised learning technique that can be used for both classification and Regression problems, but mostly it is preferred for solving Classification problems. It is a tree-structured classifier where, internal nodes represent the features of a data set branches represent the decision rules and each leaf node represents the outcome. In a Decision tree, there are two nodes, which are the Decision Node and Leaf Node.

Decision nodes are used to make any decision and have multiple branches, whereas Leaf nodes are the output of those decisions and do not contain any further branches. The decisions or the test are performed on the basis of features of the given data set. Algorithm asks set of question to user and accordingly it arrives at a solution. It predicts the disease and gives necessary precautions based on it.

5.2 Modules

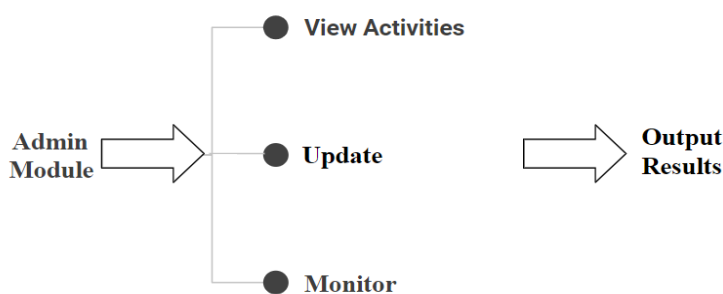These are the modules in our proposed system.

5.2.1 Admin Module

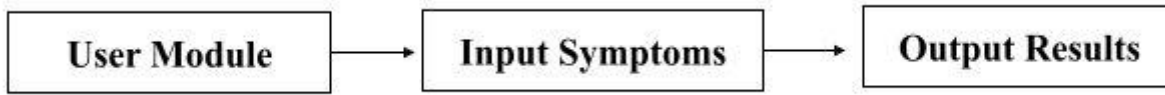**Figure 2 :Admin Module**

5.2.2 User Module

Figure 3: User Module

VI. DESIGN

We developed a website that uses HTML as a framework.HTML describes the structure of a web page semantically and originally included for the appearance of the document.
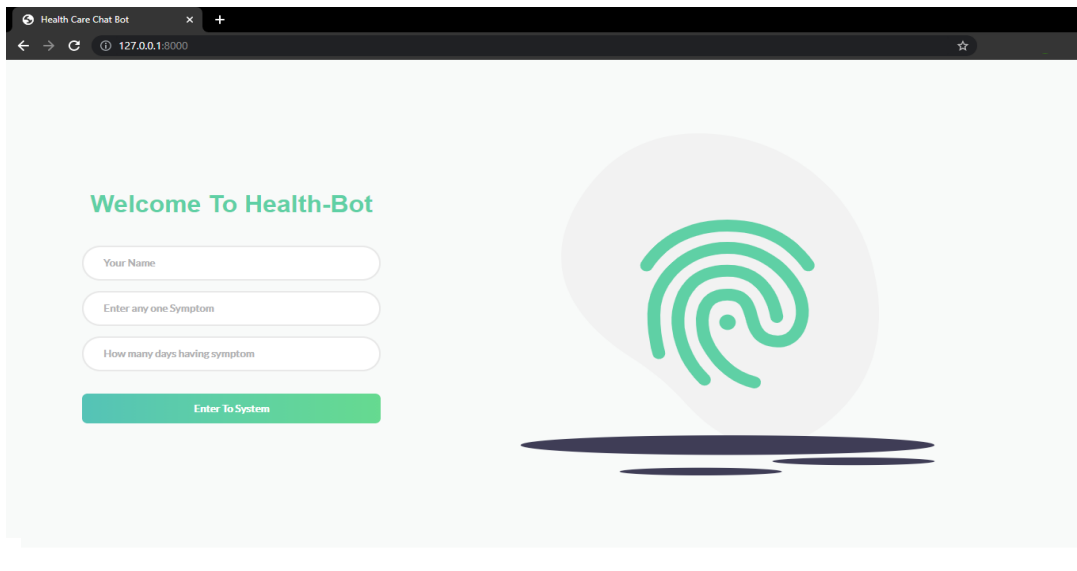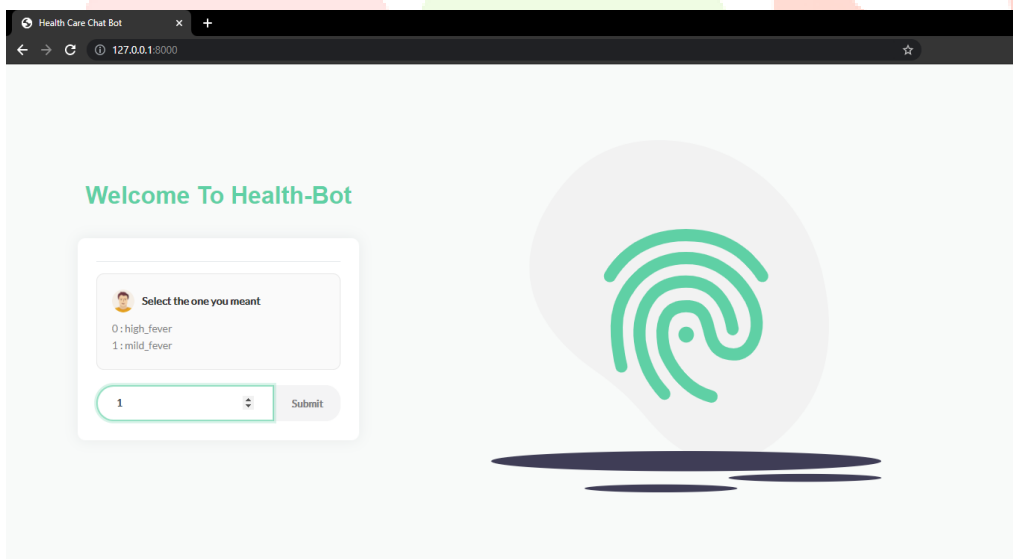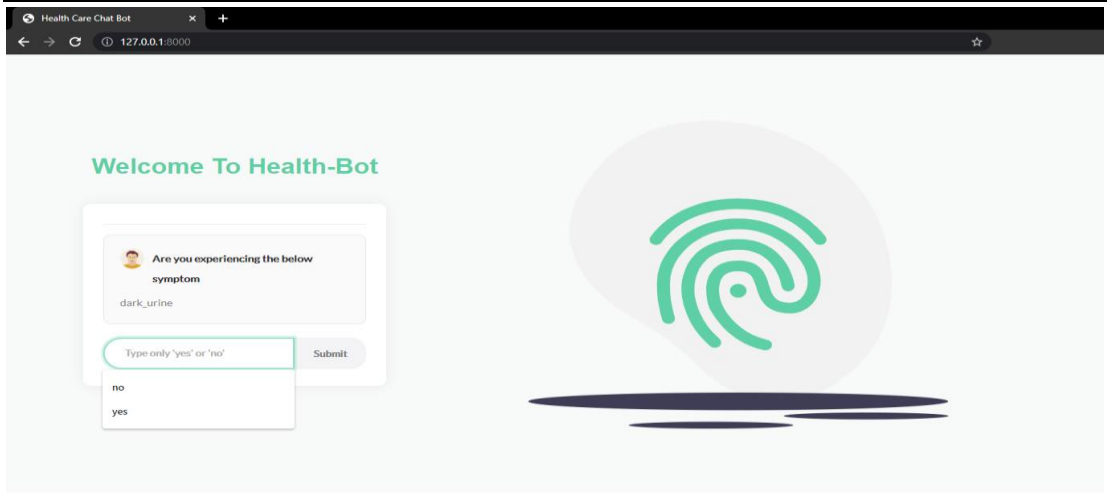

Figure 4: Home Window

Figure 5: Symptom Window

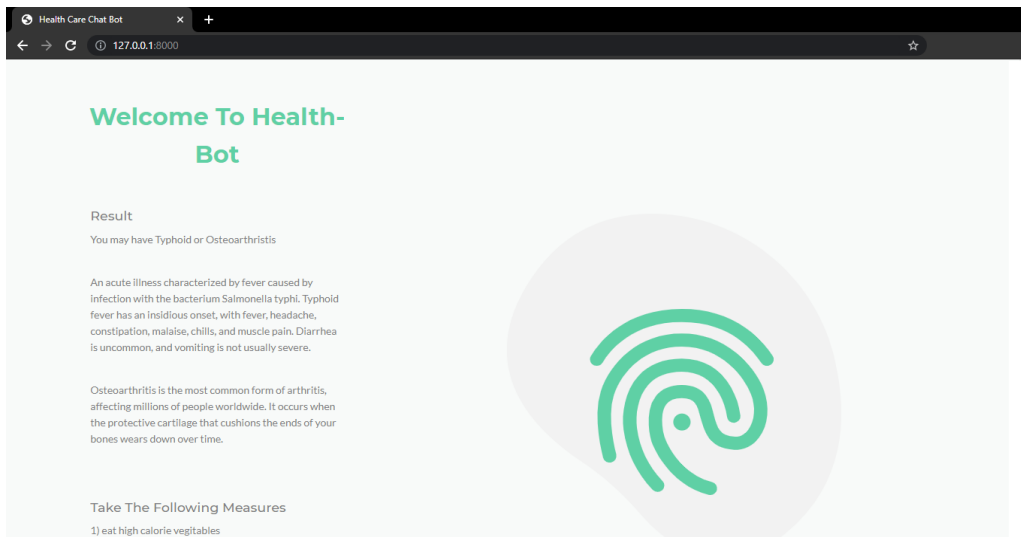**Figure 6: Symptom window with yes or no values**
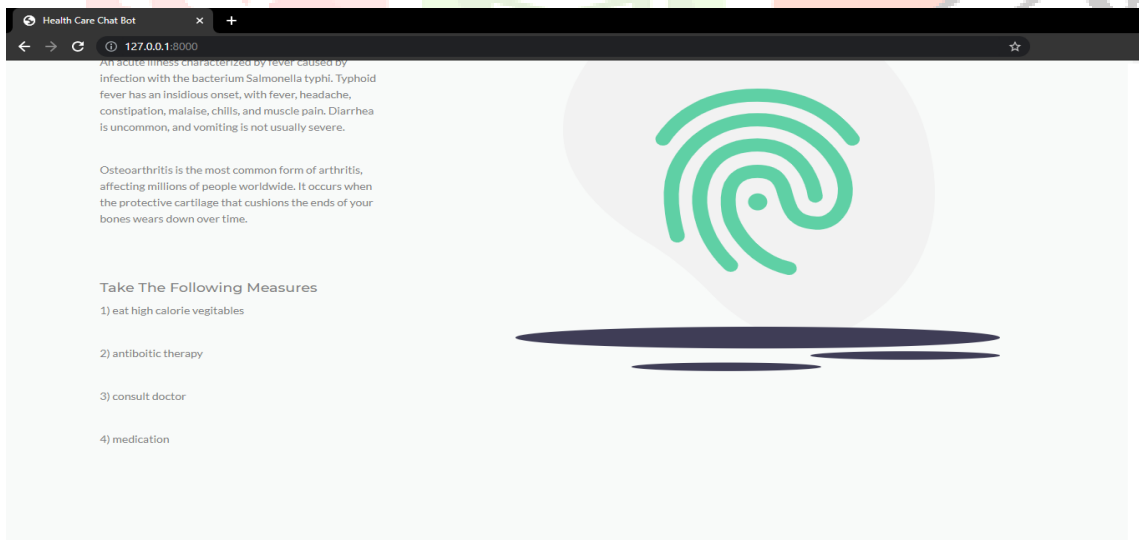

Figure 7: Output Result

Figure 8: Output Result with Precautions

VII. METHODOLOGY

Decision Tree algorithm belongs to the family of supervised learning algorithms. They can be used to solve both regression and classification problems. Decision trees use the tree representation to solve the problem in which each leaf node corresponds to a class label and attributes are represented on the internal node of the tree.If the value is less than threshold, then go to the left child node. If the value is more than threshold, then go to the right child node. Then as we have got the disease, now we need to append the details of the disease and necessary precautions need to be taken. If user is having that particular symptom for more than 13 days then, chatbot will respond as "You should take the consultation from doctor".If it is less than 13 days then chat bot will respond as, "It might not be that bad but you should take precautions". After predicting the disease, the bot will give necessary precautions that one must take. After predicting the disease,the bot will give a basic description about the disease, as the user will get an idea of what disease that user might be facing. Bot will respond to everything in voice,for that we have used pyttsx3. pyttsx3 is a text-to-speech conversion library in Python. Unlike alternative libraries, it works offline and is compatible with both Python 2 and 3.The proposed Chatbot system functions based on a Decision Tree algorithm. It generates responses for the user queries based on the following method:

VIII. RESULT AND DISCUSSION

The proposed system is an efficient, cheap, easy and a quick way to help patients to have a one to one conversation with the Chatbot that helps and assists them to take care of their health effectively. With the chat bot help of Chat bot users can post their symptoms and get the solutions from the bot. The system can be accessed from anywhere and at anytime conveniently. The chat bot is available 24/7. We manually calculated the accuracy and got 78.24 percentage.

IX. ACKNOWLEDGMENT

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