# HEALTHCARE CHATBOT SYSTEM FOR AGED AND PHYSICALLY CHALLENGED PEOPLE

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**Abstract -** Healthcare is a requisite factor for living a good life. Unfortunately, consulting a doctor for non-life-threatening problems can be difficult due to various health conditions of aged and physically challenged people. Chatbots are software programs built to innately engaging with received messages. In recent years, there has been enormous progress in the field of Artificial Intelligence (AI) with the development of deep neural networks, natural language processing, computer vision, and robotics. Chatbot acknowledges natural language and learns from interactions, increasing its knowledge; remembers commitments and medicines, connects remotely with doctors, family; controls transmission of physiological parameters; entertains the elder. And for the physically challenged, we believe we will see more advances in specific areas that will have a dramatic impact on people's lives, such as the process of translating text to the regional language. Thus, making it easy for anyone with any disadvantage be it age or disability to access health care without many troubles.

## 1. INTRODUCTION

A Chatbot is a software program that interacts with users using natural language. Distinct terms have been used for a Chatbot such as a machine conversation system, virtual agent, dialogue system, and Chatterbot. The purpose of a Chatbot system is to simulate a human conversation and the architecture combines a language model and computational algorithm to change the informal conversation between a user and computer. The massive amount of information that is available on the internet allows Chatbots to provide accurate and efficient information based on the user's requirements. The chatbot will contribute to health management by a better organization of patient pathways, medication management, help in emergencies or with first aid, offering a solution for simpler medical issues, and ease the burden on medical professionals.

The proposed Healthcare Chatbot can interact with the users, giving them a realistic experience of chatting with a Medical Professional. This can be utilized by any human being as in the case of an emergency where it can guide the user about the primary treatments which should be taken by the person under treatment. Along with that if a person is suffering from a certain disease, then by plainly answering a few of the questions asked by the chatbot, it can judge the kind of disease a person is suffering with. After this, if a person wants to know about the precautions and the remedies that he/she should take then the chatbot can also give the information regarding it. The chatbot will help by efficiently analyzing the problems of aged and physically challenged people dealing with stress and anxiety and various other issues by supporting them as a counselor or a companion. This healthcare chatbot will help to provide healthcare support online 24 x 7, it answers intense as well as general questions. The

Chatbot system also helps to generate leads and automatically delivers the information. By asking the questions in sequence it helps

## 2. LITERATURE SURVEY

In [1] the authors **Divya Madhu, C.J. Neeraj Jain, Elmy Sebastain, Shinoy Shaji, Anandhu Ajayakumar (2017)** proposed a paper in which the system provides a novel approach for medical assistance using trained chatbot. The proposed idea is to create a system with artificial intelligence that can meet the requirements. The AI can predict the diseases based on the symptoms and give the list of available treatments. The System can also give the composition of the medicines and their prescribed uses.

In [2] the authors **Mary Bates (2018)** proposed a paper on Health care chatbots are here to help. Chatbots are becoming the first contact point for primary care. People can now turn to chatbots to identify symptoms and recommend 3 further actions. For clinicians, chatbots can streamline the interaction with electronic health records and decrease documentation burden. These chatbots are not designed to offer diagnoses, but to guide people and help reveal if they are seriously ill and should see a doctor.

In [3] the authors **Grigorios Karageorgos, Ioannis Andreadis, Kanstantinos Psychas, George Mourkousis, Asimina Kiourti, Gianluca Lazzi, Konstantina S. Nikita (2019)** proposed a paper on the promise of Mobile Technology for the Healthcare System in the Developing World-A Systematic Review. The aim of the present paper is twofold: i) present an overview of the background and significance of mobile health. ii) summarize and discuss the existing evidence for the effectiveness of m-health in the developing world.

the patients by guiding what exactly he/she is looking for.

In [4] the authors **M.S Bennet Praba, Sagari Sen, Chailshi Chauhan, Divya Singh (2019)** proposed a paper on AI Healthcare Interactive Talking Agent Using NLP which talks about how good nutrition plays an important part in leading an active lifestyle. Combined with physical exercises, the diet can benefit people to maintain their weight, reduce the possibility of diseases and improve overall health. Chatbot fixes the problem of hindered communication regarding health and body weight. The architecture combines a language model and calculation algorithm to change informal conversation between a user and computer.

In [5] the authors **Lin Ni, Chenhao Lu, Niu Liu, Jiamou Liu (2017)** proposed a paper on a proof-of- concept of Mandy, a primary care chatbot system created to assist healthcare staffs by automating the patient intake process. The chatbot interacts with a patient by carrying out an interview, understanding their chief complaints in natural language, and submitting reports to the doctors for further analysis. The diagnostic unit consists of three main modules: An analysis engine for understanding patient's symptom descriptions, a symptom-to- cause mapper for reasoning about potential causes, and a question generator for deriving further interview questions.

## 3. METHODOLOGY

To give the relevant response, the query must be converted from natural language to a given entry in the knowledge base. This process consists of breaking down the user input, i.e., a sentence, to identify key concepts of the conversation. The most remarkable concepts at play are entities and intents. An entity is a conceptual object which holds relevance to the user. It can be a conviction of both as a subject or an object in a conventional sentence. Both the subject and the object are entities in this sense and can be associated

with classes. Intents, on the other hand, are concept representations of the user's intentions. Since the user is asking a specific query, there must be a subject they want to do or know. However, in prevalent questions, the intent is not always present. Chatbots are one of the fundamental ways to deliver more personalized care for health. A chatbot can reside in any of the popular social messaging applications or as a standalone application. This ease of use means health care services can quickly reach aged and physically challenged people.

## 3.1 Build a simple and interactive real-time chat system.

These days mobile conversations are becoming the trend in communication. The specialty of such conversations is that they are a plain and time- saving mode of communication. So Chatbot can be successful if it follows all the simplicity of an instant messaging application. The system can mark out the medicine given the name and manufacturing company. It will give the chemical composition, the dosage for each age group, authorized uses, side effects, etc. The users can ask almost any query regarding the medicine. Then the users can verify the doctor's opinion and be confident of the treatment suggested.

## 3.2 Effective Symptom-based disease prediction.

Each disease has a signature. They start as minor problems and grow into something dangerous and life-threatening. The diseases start as symptoms like headache, fever, or back pain, which would seem normal. The most common diseases can be easily identified by analyzing the symptoms. By reading the symptoms like headache, itching, etc., and analyzing them, any possible health

problem can be predicted even before they start to cause any damage to the body.

## 3.3 Designed in such a way that it should work in cross-platform devices

The services of the system should be available to as much as possible people. So, it must be able to work beyond multiple platforms both in PCs as well as mobile platforms. The system should be designed in such a way that it is capable of working among any platform such as iOS, Windows, and Android. As the support increases so do the number of people we can help.

## 3.4 Can be easily integrated and upgradable

The system should be integrated. That is, it must be built of numerous modules. Each module is capable of performing a task. The modules must be able to be accessed and upgraded separately. As the system enhances, the capabilities of the system also increase. It will be able to prognosticate more and more diseases, as well as can describe more medicines. Thus, it can give a timely update on our health. Thus, giving us predictions on plausible diseases even before they start to grow.
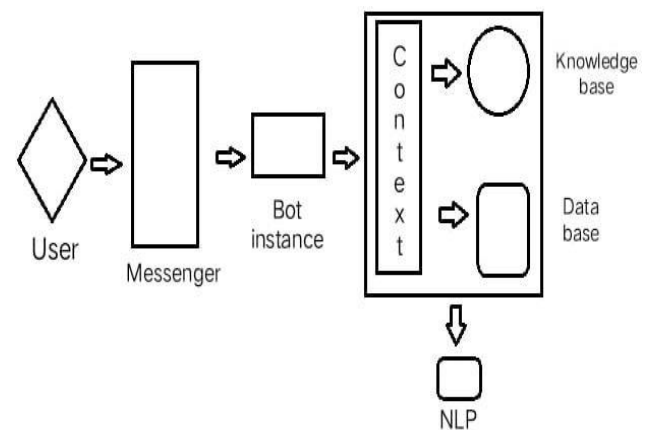
## 4. SYSTEM DESIGN



Fig.1: Block Diagram of working of a Chatbot

The first step in the working process of the chatbot system is the user login, where the user enters his/her credentials. The Credentials are then verified if it is present in the database, if no, the user has to signup (i.e., to create an account). In the chat interface, the user states his queries/questions related to a particular disease, Chatbot APIs are implemented for an immediate response concerning the queries asked by the user. Medicine Enquiries are being given to the user if the Symptoms are matched with the Medicine API. On the other hand, which is the developer side, the developer's job is to add new features in the chatbot for the system to be more viable. Monitoring is being done mainly if the user doesn't meet the requirements from this chatbot system then the user is being told to consult a doctor with the specified hospital address. The designed bot can handle user requests and recognize message patterns with an artificial intelligence markup language. AIML is an XML- based markup dialect to generate natural language software agents and gives authentic human interactive experiences to the user. The functionality of the chatbot is designated in two ways: request analysis or return response. Initially, the chatbot evaluates the severity of the virus through estimation from a predetermined questionnaire. Simultaneously, if the user fails to acknowledge specific answers, the bot will fail to provide the correct response. In its response return, after the evaluation of a patient's condition, the chatbot provides a clear response in the form of either generic text or text retrieved from the knowledge base response. Eventually, we aim to make sure the user feels like they are having a conversation with a health specialist.

The figure 2 explains how a user interacts with simple. Chatbot receives the input from the user. The user input is then processed and compared with the strings present in the chatbot database. When the database is

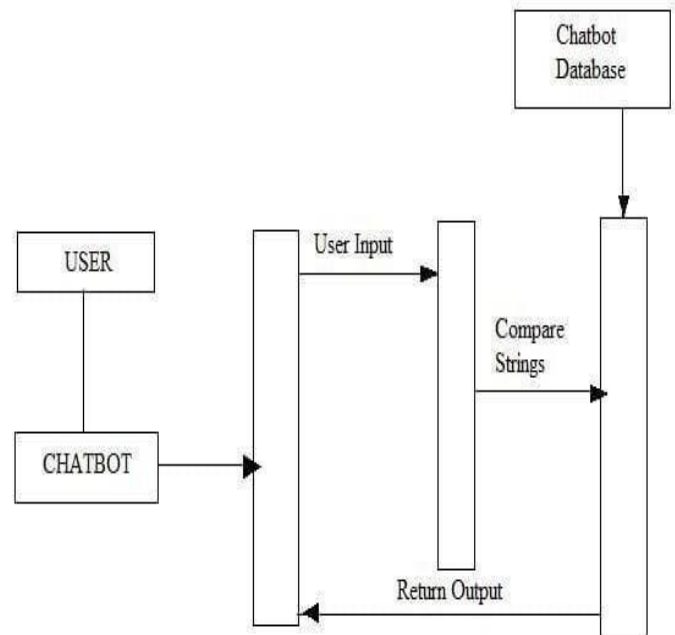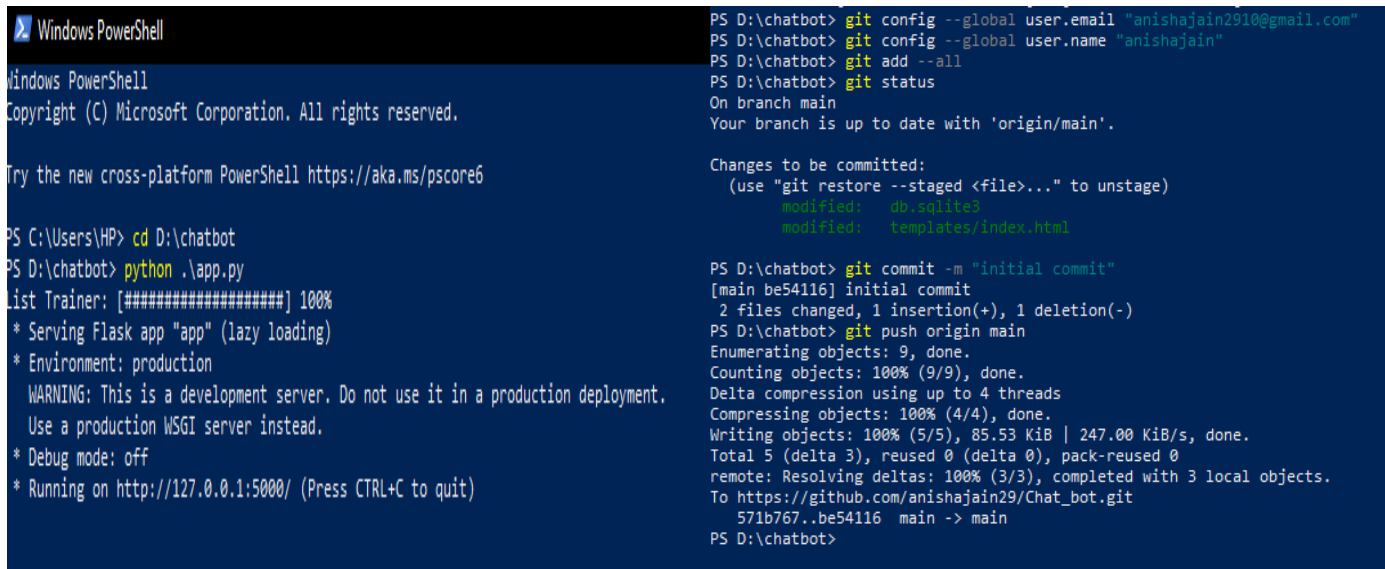matched with user input the output is returned.



Fig.2: Sequence Diagram for a simple chatbot

Based on patient requirements we need to alter different elements, but the basic communication flow remains the same. If the message is unrecognizable by the chatbot it hits the human fallback. If the message is recognizable, it continues the interaction between the bot and its user. The user input will be in the form of text and the text will be in the form of human-understandable language, the text will be converted using NLP algorithm to machine understandable language.

## 5. RESULTS

Chatbot applications streamline interactions between people and services, enhancing a more human like conversations. When these chatbots are applied in the field of healthcare, it not only saves time, but also provide efficient solutions. The underprivileged don't have to wait a long appointment line for every little medical reasons. Instead, they would find proper medical facility suggestions with one click away using healthcare chatbots.

Fig.3: Training of data and hosting on the local server

Figure 3 shows the processes of training of data (list trainer) for the chatbot and, then hosting the same on a local server.
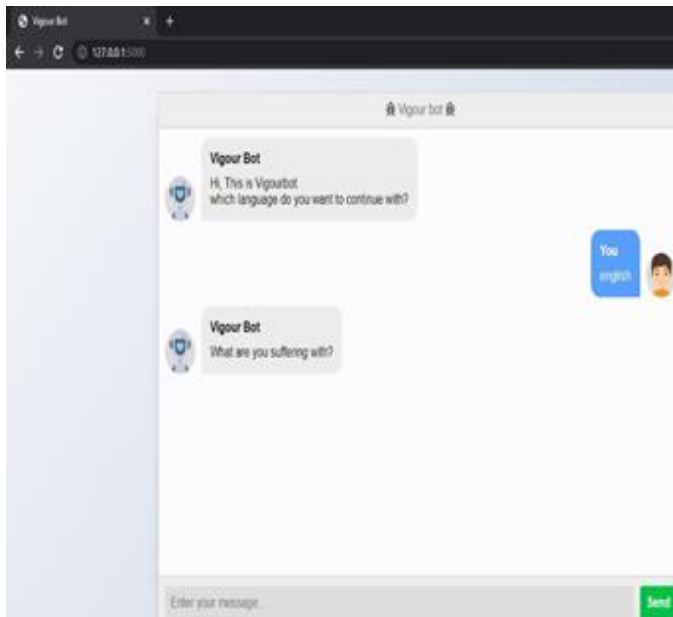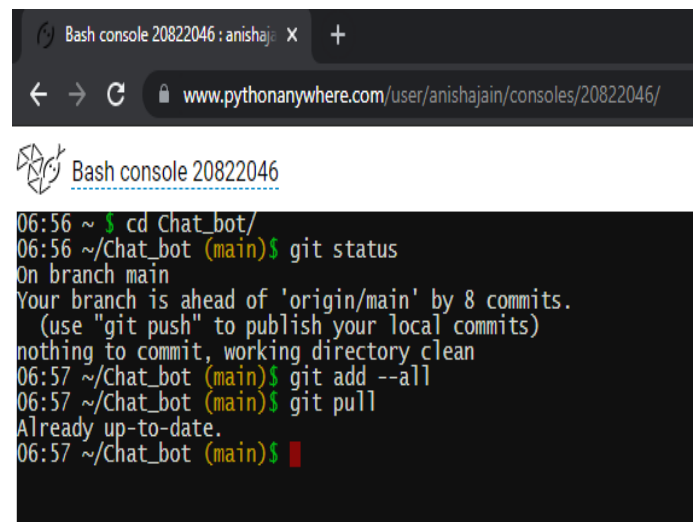


Fig.4: Interface of the chatbot

Figure 4 represents the interface of the chatbot. The bot is named as 'Vigour Bot'. The interface is designed using Flask.



Fig.5: Web hosting of the chatbot

Figure 5 shows the web hosting of the chatbot by uploading it to GitHub. It saves a copy of the project files in the git repository.



Fig.6: Hosting of chatbot using PythonAnywhere

Figure 6 shows the process of hosting of the project after uploading it to GitHub. The website PythonAnywhere allows us to host the project so that the user can access the project from any device.
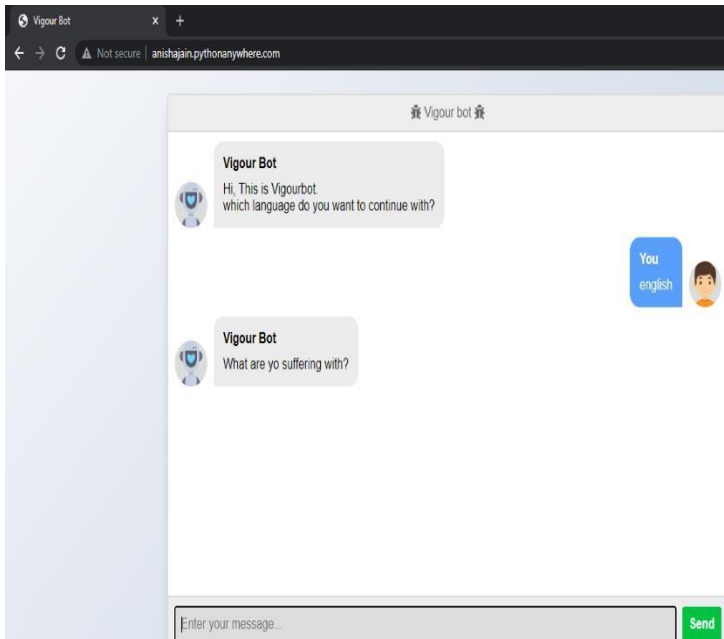
Fig.7: Interface of chatbot in hosted
site

Figure 7 shows the interface of the chatbot in the hosted site. The chatbot also has a various language options available.
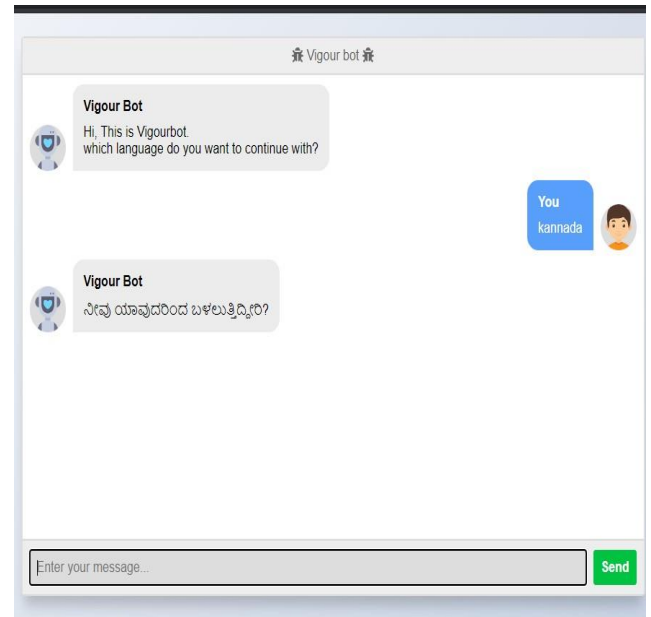


Fig.8: Setting language to Hindi

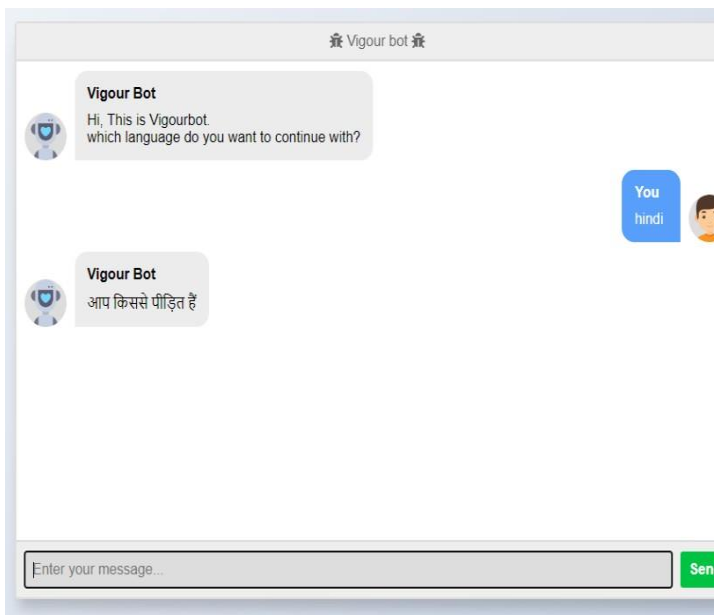Figure 8 shows the language setting of the chatbot to Hindi.



Fig.9: Setting language to
Kannada

Figure 8 shows the language setting of the chatbot to Kannada.
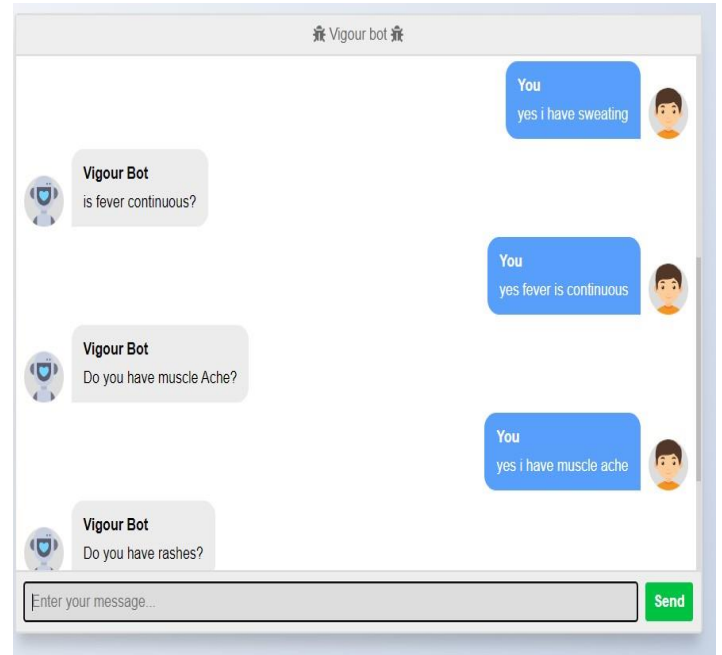


Fig.10: Interaction with the
user

The chatbot interacts with the user by asking various questions and analyzes the symptoms faced by the user to find the most appropriate disease that the user might be suffering.
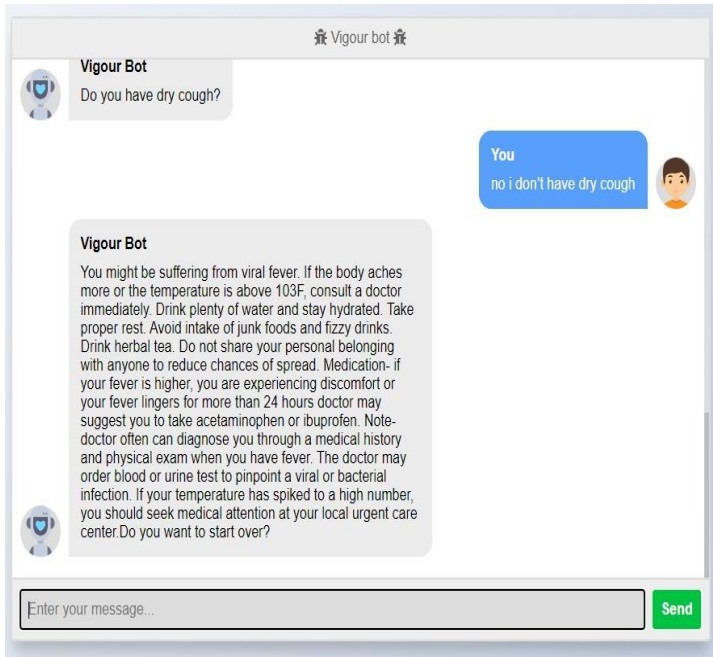
Fig.11: Disease prediction by the chatbot

After analyzing all the symptoms, the chatbot predicts a disease and suggests the user with various treatments available, food control etc.

## 6. CONCLUSION

Chatbots or smart assistants with artificial intelligence are dramatically changing businesses. There is a wide range of chatbot building platforms that are available for various enterprises, such as e- commerce, retail, banking, leisure, travel, healthcare, and so on. Chatbots can reach out to a large audience on messaging apps and be more effective than humans. They may develop into a capable information-gathering tool in the near future. Chatbots are capable of analyzing your patients' questions and providing instant and accurate resolutions, leading to a high ticket-deflection volume.

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