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Florence- A Health Care Chatbot

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***Abstract*—The most common means by which unwell people receive health related analysis, disease diagnosis, and medicine prescription are hospitals. This has almost become the norm of all individuals around the world. Hospitals are considered the primary and the most reliable means of diagnosis. The proposed idea of this is to make it easier for people to check on their health as compared to the conventional way of standing in a queue for hours before they could get their medication done. In order to build a chatbot, this research aims to apply the use of the RASA framework. As any person, the chatbot can connect with people and take on the user's symptoms. It will then identify the most likely disease and predict it along with the treatment recommended. This will help people get a quick answer to all their queries without any hassle. This type of system is less known among the people and hence it is not widely used. It will also be of great use to record the nutrients the user has consumed throughout the day.**

***Keywords*—Medical chatbot, RASA, Disease prediction, nutritional breakdown, health, Quick Analysis, RASA NLU, RASA CORE, Conversational Chatbot.**

I. INTRODUCTION

The famous proverb "Health is Wealth" has not long forgotten. As health is considered the most valuable and precious for every living being, it gives great meaning to our lives. Good health does not only mean the absence of illness in the body, but also focuses on an individual's total physical, mental, social and spiritual well-being. Maintaining health is crucial if a human wants a healthy and positive lifestyle. Only a person with a healthy body can have a healthy and positive mind and it impacts people's success positively. People nowadays are less aware of their wellbeing. Most often they forget to take appropriate measures in their lives to take care of themselves. In a recent article by TOI, we saw that people generally avoid going to hospitals mostly due to their busy lives and also because they do not care that much about their health. There is no place for health for a busy-scheduled life. People who are from the working society give reasons that they are not able to keep a track of their health because of their extremely busy schedule and hence they forget to go for medical checkups or sometimes even delay them as it requires time.

In this proposed system, we aim to design a health care chatbot which would resolve these problems of going to the hospitals and reduce the time of users by asking them their symptoms and giving the most relevant disease. The chatbot finds the most likely disease by analyzing the symptoms given by the user. The chatbot forecasts the disease using these extracted signs. The use of the RASA system has been achieved to incorporate this chatbot. This project aims to, with the help of RASA framework and natural language processing, a round the clock chatbot that can accurately diagnose patients with the analysis of the basic symptoms and a conversational approach. The chatbot designed will have a strong outcome on the health industry of the state. It will improve accuracy and is less vulnerable to manual errors. People spend a lot of time on the internet but won't search for their health. People avoid going to the hospitals as they think it is very time consuming and will take a lot of their efforts. They also do not go because they won't be able to take out time to stand in queues or wait for their turns during the time at the hospital. Due to this they neglect their health in lesser symptoms unless something big happens. To avoid this and to solve the problem we have come up with this chatbot which will help the users to predict their possible disease in an easy way by a simple conversation in which they will be asked about their symptoms and their mood and also their diets. It will make people aware about how serious the disease they are having and if they need to take action against it. This is the basic motive of our project.

II. LITERATURE SURVEY

In today's world, health is the major key in the development of each sector. Health also needs modern technology and their implementations in order to boost the development in this area. As we know that it is the most important field in each country, we need to provide sufficient technological development. A lot of researches have been done in this field in order to modernize the methods of health status. Old methods of diagnosing are still a major hindrance in the advancement of medical facilities. The best way to overcome this problem is using a medical chatbot with self-diagnosis using Artificial Intelligence [1]. This will basically ease the procedure of standing in queues to get diagnosed and provide

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an idea to the user before consulting the doctor. Chatbot for disease prediction and treatment recommendation using machine learning [2]. For a healthy lifestyle people need to interact and tell to the fullest what problems they are facing, then according to this paper the chatbot will apply natural language processing to create an application. A novel approach for medical assistance using trained chatbot is required [3]. The User can ask any personal query related to health care through the chat-Bot without being actually available in the hospital. By Using Google API for voice-text and textvoice conversion, the information is sent to chat bot and it fetches related answers and displays answers on android app [4]. AI enables the data of these symptoms to our chatbot. The data of these users can be obtained from the symptoms with the help of different types of machine learning algorithms. A text-to-text diagnosis with the machine connects users about their medical issues and gives a customized diagnosis to support their symptoms [5]. Medical chat bots are used to reduce medical cost and to save time and money and to improve medical access [6]. With the growth of artificial intelligence (AI) techniques, the chatbots have appeared as a promising direction in streamlining the communication between doctors and patients [7]. Many researches have been already done to determine the basic symptoms and cost effectiveness. Paper [8] suggests the use of artificial intelligence technology and other algorithms used in the determination of the symptoms to provide solutions to our daily problems. All the same, precise knowledge of symptoms and oral conversations can be improved in the long run to provide a realistic experience [9]. The proposal of a healthcare chatbot is turning the face of health industry and agriculture by not only providing solutions but also making it cost effective. Live data of the symptoms via a questionnaire will help the chatbot in realizing the possibility of the diseases. The diagnosis can also be done effectively [10]. In paper [11] we have seen the future trends and opportunities regarding the technological advancement in health care industry.

III. PROPOSED FLOWCHART

The proposed flowchart is given below.

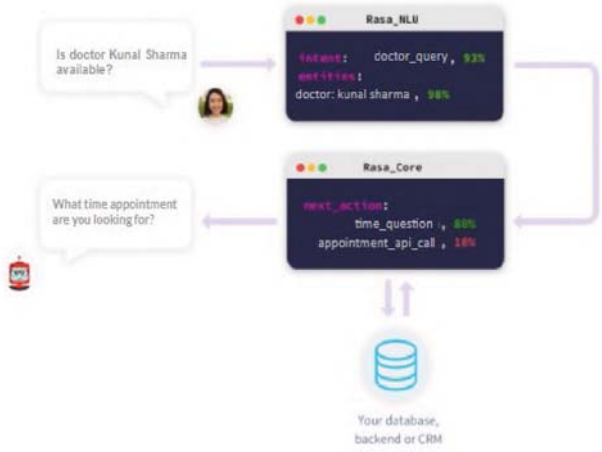

Fig.1 Our Proposed Flowchart

IV. FEATURES

A. CREATE A REAL TIME CHAT SYSTEM THAT IS SIMPLE AND INTERACTIVE.

In today's fast paced world, people generally do not like waiting for long hours to get work done. Mobile conversations are becoming the most reliable source of communication as it transfers the information within seconds. So, people will opt for a chatbot that can help them predict the possible disease according to the symptoms instead of going to a hospital or a clinic and having to wait for hours for your turn. Typically, a chatbot is a simple application that deals with text, images and unified widgets, making it simple to manage for the user. It's as easy as it can possibly be, and that's exactly why the entire world loves it from the kids to the adults. Just think about every regular messenger app you're using. The gui is really user-friendly, and for people who are not that used to technology, it is simpler. Material is king, so with features that are fancy but redundant, don't distract the customer.

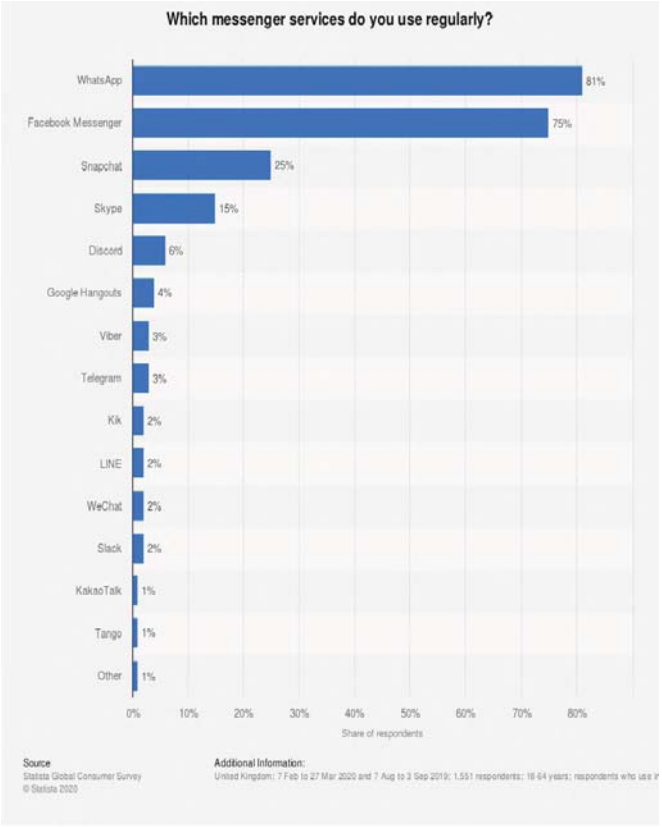

Fig.2 User density of various messenger applications

Unfortunately, if you think that all chatbots are fairly built, you are wrong. Today, chatbots come in all shapes and sizes and have diverse characteristics. Although generic chatbots for most scenarios may be satisfactory, some scenarios demand more advanced chatbots. For somebody who wishes to get the hang of anything concerning health, bots are handy. Users can connect with the chatbot
and they can be dependent on getting a prompt diagnosis. This structure allows the people to analyze their physical

health and wellbeing. The chatbot's true well-being is to promote the general public by offering sufficient advice in terms of a great and balanced life.

To start the diagnosis, the users will have to register themselves. The users will have to enter some details which will be kept in the database for future reference. The user will then enter his symptoms or the food for which he wants to know the nutritional value and RASA NLU is put to work to analyze.

B. *Nutrition Based Health Analysis*

In the body, nutrition can be identified as food at work. It can also be described as the cycle by which nutrients are ingested, digested, consumed, transported and used by the organism and their end products are disposed of. Nutrition is an essential part of the life of each person. It is important to ensure that each of us receives a healthy nutritious diet with all the components needed in our stage of life.

The famous saying, "You are what you eat" still holds true in most of our lives. Today's generation spends most of their time in front of screens. They don't even keep track of how much they eat and how much their body actually needs. Since the mind is focussed on doing the work, the mind keeps reminding them that they are hungry and need food which in turn forces them to have junk.

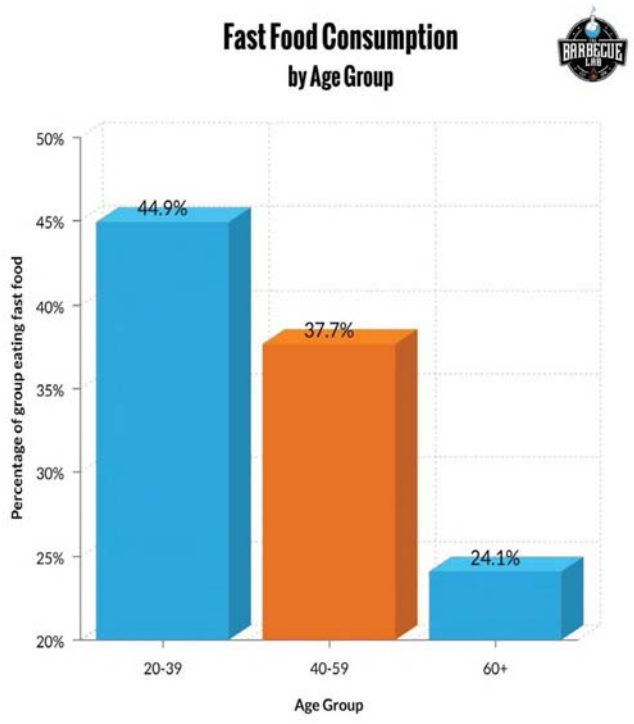

Fig.3 Fast Food Statistics March 2020(source- The Barbeque Lab)

Every year, the fast-food industry expands by 2.2 percent. Considering that most of the youth eats fast food and the rising alarm of the healthy habits going in drain. The fast-food industry is flourishing as it appoints millions of people and has millions of fast-food restaurants and establishments around the world, so it is very obvious that the fast food is not going anywhere soon.

Hence, knowing what to eat and what to avoid is crucial for all of us. Our plate needs to be safe and balanced and the right ingredients have to be used to give us the right nutrition one needs. A healthy human being needs carbohydrates, proteins, fats and vitamins and minerals along with water and roughage in the correct proportion.

The chatbot aims at calculating and showing the user the total nutrient intake of the user per day by asking them to input what all they have eaten throughout the day.

C. *Dedicated System which is able to detect disease according to the symptoms*

There seems to be a signature style to every disease. They appear as small issues in the beginning and might evolve into something life-threatening and deadly. The diseases begin as symptoms such as a headache or a pain in the back, which might seem less odd at first. But it could be the beginning of anything like cancer or a tumor. So, each disease is unique and has a fixed way of growing.

Mostly the most common illness can be identified by just diagnosing the initial signs as they are not that big. Small symptoms like headache, itching and cold can be the sign of fever. So, by reading and analyzing the symptoms we can predict the health condition. If the body of a person is regularly analyzed, it is predicted that even before they can foresee any potential issue, they can start to do some harm to the body.

There can be a lot of diseases predicted for the same symptoms but our chatbot will give the closest one. For instance, if we take the four closest types of diseases involving headache and dizziness, relative to other symptoms, they are categorized as a proper disease. RASA will categorize the symptoms correctly and map them to their related diseases.

D. *Crafted in such a way to work on all devices*

A project or an idea is successful only when the common man is able to use it. Our main motive is to make our chatbot accessible to each and every person in the world. So, to make this possible, it must work across multiple platforms and multiple devices such as PCs, laptops, tablets and mobile phones and also on various operating systems such as Windows, iOS, Linux and Android. The wider the support, the more reach to the people.

E. *Can be easily incorporated and updated*

The project should be interconnected, which means that different modules for different tasks should be usable. The modules must be able to be independently accessed and updated. There are several programs provided by the system. Most of them are very intricate. So, each module can be

optimized as time passes. Therefore, the system must be configured such that each module can be upgraded independently. The device must be capable of enhancing module performance. The framework can thus be easily strengthened. As the system progresses, the system's capabilities increase as well. As well as explaining more nutritional values, it would be able to predict more and more diseases.

V. EXPERIMENTS AND RESULTS

Experiments

The chatbot developed by us was tested among some people. The ones with health issues entered their symptoms to check for analysis. In a person who may have a cold fever, symptoms such as dryness, cough, dizziness, fatigue, nausea and pain in the body were seen. These symptoms were analyzed on the basis of the database that we created, and Florence correctly predicted the user to have cold fever based on his symptoms.

Results

On giving the following symptoms, these results were obtained-

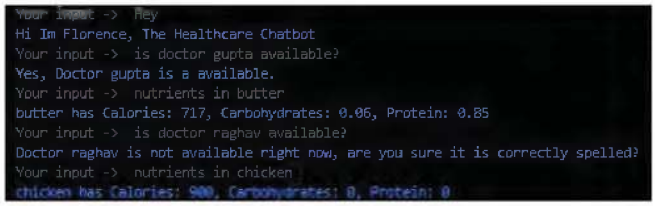

Fig.4 Checking the availability of a doctor and finding nutritional value of the food consumed by the user

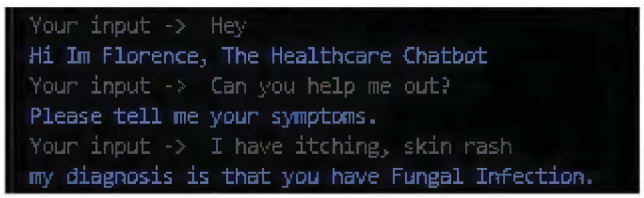

Fig.5. Florence checking for symptoms and predicting disease

In a person who may have a cold fever, symptoms such as dryness, cough, dizziness, fatigue, nausea and pain in the body were seen. These symptoms were analyzed on the basis of the database that we created, and Florence correctly predicted the user to have cold fever based on his symptoms. The correct disease for the patient's introduced symptoms has been predicted and is therefore reliable and accurate and can be used in the hospitals. In people's hectic-scheduled lives, a safe mechanism is needed. With the near perfect results, people can look forward to this chatbot.

VI. CONCLUSION

This main purpose of this research paper is to make lives easier and healthier for the people who do not have time to look after themselves. Chatbot is able to function as a virtual doctor. As a server, the chatbot runs. The chatbot will specify their symptoms to the user of this application, and in response, the chatbot will specify the nearest possible illness and the health care steps to be taken.

The dataset includes general information about symptoms and illnesses, so the chatbot example will provide the user with information about illness and care. After observing the symptoms of the various users, the user is eventually able to predict the disease and provide a parameter where the specific needs are met. A chatbot will be helpful to people as it will ask for their symptoms and provide the most suitable disease to them along with the nutritional breakdown of the food that they have consumed. It is highly difficult for working people to go to hospitals for their checkups. In such cases, Chatbot is of great importance because it offers diagnostic support with a simple push of a button. Chatbot does not need the support of any doctor to provide users with effective health steps, and this is one of chatbot's key advantages. In addition, the cost-effectiveness of chatbot use is a big attraction for users. The conversational AI is completely reliable on the people for their symptoms and it only helps the chatbot to analyze the disease completely.

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