Military Institute of Science & Technology

User and System Requirements

Project Title: Health AI: A Personal Healthcare Companion

Course Name: IDP/Capstone Project

Course Code: CSE-360

Program: CSE-20

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Group No: B3

Requirements discovery

Literature Review:

We have recited a good number of articles, journals, conference and research papers and observed some important viewpoints. Based on health there is a lot of research, projects, documents & applications. But there is only a few such documents or applications which can act like a personal doctor or a healthcare assistant. But the existing applications have a lot of limitations. One of them based on AI analysis of patient's symptoms and suggest doctor but this app cannot suggest any physical activities to the patient. Another app is for online doctor appointment booking app and a medicine shop giving telemedicine & ambulance services. We also noticed that there is no app on the market which can talk with the patient to analyze the symptoms and give predictions on patient's health problems along with giving valuable suggestions as well as any system which takes real time diagnostic values for analysis purpose. So, we have found that user needs a full functioned medical apply which they can do all the jobs easily at one application.

Interview:

We conducted two interviews regarding healthcare availability. From conducting these interviews, we found out that healthcare is still not easily accessible for people. It's hard to find out relevant doctor's contact info for a particular illness.

Moreover, it is even harder to figure out which disease a person is suffering from without going for a formal checkup. Many people don't want to go for formal checkup as they see it as a waste of energy. Instead, they ask their friends/family for suggestions which is quite risky.

Survey:

For collecting the user requirements, we have used Google form to interact directly with the users to know their requirements. Then we have conferred with our team members for detect and discover requirements. The questions can be found in the following link:

https://docs.google.com/forms/d/e/1FAIpQLSfb2fqjlt2i5ZfWzUiXpPurKCLoSCL4BQd_8p9Jau5jOf7l5A/viewform

All the way through these questions, we assembled our necessary requirements to demonstrate the elicitation procedure. From the summary of the result of the survey we have noticed some important behavior, activities and problem of the participants which can be assisted or solved by our system. These important points are given bellow

- About half of the participants think healthcare services are not always available to them and about 25% think that healthcare services are never available to them any time they want. So, we think, an AI based healthcare and consultancy app is required for our participants.

- About seventy 5% of the participants searches on the internet for finding the solution of their medical problems. Sixty percent people thinks the results from the internet are somehow (50%) acceptable. So, our system can be a solution for them to find their queries.
- Only 1% of the participants check their blood pressure, heart rate, or oxygen level always whereas above 90% participants people agrees that it is important to track these records continuously. As a result, our system will be enough appropriate or handy for keeping track of these record easily at anywhere.
- In case of emergency about 40% people cannot remain calm enough and do not have any doctors or ambulances contact number. So, we think these is a unavoidable requirement for our users which can be fulfilled by our systems SOS option.
- About 40% of our participants are familiar with fitness or medical apps which do not have all the function of our system. So, it will not be hard for getting used to with our system for the user as well as our system will be much more efficient and will be with much more functionalities.

User Requirements

1. The system shall understand human language and various health metrics.
2. The system shall detect illness/disease.
3. The system shall suggest relevant general instructions for the cure.
4. The system shall suggest relevant doctors.
5. The system shall have an emergency ambulance/contact system.

System Requirements

1. Understanding human language and health metrics
1.1. The system shall take human voice/text as input via mobile phone to interpret the meaning and understand the symptoms.
1.2. The system shall use blood pressure machine to measure blood pressure and interpret the significance of the received value.
1.3. The system shall use finger oximeter heart rate module to measure oxygen level, heart rate and interpret the significance of the received value.
1.4. The system shall use contactless temperature sensor module for Arduino to measure temperature and interpret the significance of the received value.

2. Detecting sickness/illness
2.1. The system shall process all the provided information using machine learning and database.
2.2. The system shall give prediction about the illness/disease type with 99% accuracy.
2.3. The system shall give prediction via text as well as voice output.

3. **Suggesting Cure**
3.1.   The system shall suggest various general instructions for the cure on the basis of the predicted disease/illness by processing database and machine learning model.
3.2.   Instructions shall be given via text as well as voice output.

4. **Suggesting Doctors**
4.1.   The system shall have a database of available doctors' contact information.
4.2.   Based on predicted disease and doctors' expertise, the system shall suggest various doctors with the contact information.

5. **Emergency Contact**
5.1.   The system shall have an emergency button.
5.2.   If the button is pressed then an emergency message will be sent to the nearest hospital for ambulance service.

5.3.   Also, an emergency help message will be sent to predetermined close contacts.

System Requirements	Functional	Non-Functional
Voice/text input	✓	✗
Real time data collection	✓	✗
Interpreting the significance of received data	✗	✓
Processing data using ML	✓	✗
Prediction Accuracy	✗	✓
Text and Voice Output	✓	✗
Suggesting Cure	✓	✗
Suggesting Doctors	✓	✗
Emergency message	✓	✗
Emergency ambulance service	✓	✗