MEDIoT

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Abstract **-** In today's active society people may not always be in a position to keep themself updated of their medication period. The course of the medication is often forgotten by patients, which affect their sickness and may even lead to conditions such as breathlessness, coma, or even death. An IoT healthcare system developed for patients, hospitals, and care centers that regularly monitor the health condition and checks whether the patient is stable or not or if he/she needs to be admitted to the hospital. The proposed work monitors the patient's body conditions such as pulse rate, and body temperature, etc, on a real-time basis. Such information will be used by the doctor to diagnose the patient remotely and guide the best prescription treatment. Further, the MedIoT system apart from collecting the data ensures that the patient has taken the medicine on time, it is a box-type small system equipped with the Internet of Things (IoT). For the proposed system we have used Wi-Fi Technology to send sensor data to a Smartphone and also to the Cloud Service Platform for archiving and study. The information available on the Cloud can be observed by the doctor by using a Mobile application or Web Portal. The mobile application also supports the scheduling of medicines as per the doctor's prescription. The overall system developed, to the best of the author's knowledge, is low cost, effective, and service-oriented as compared to the traditional healthcare practices and other e-Health solutions reviewed.

Keywords: Cloud Computing, Internet of Things(IoT), Sensor Technology, Smart Healthcare System, Artificial Intelligence(AI), Arduino, Raspberry Pi

Problem:

Amid this pandemic, the Crisis initially caused the health system to crumble down. This has led to a huge rise in no. of patients having a variety of symptoms, hence keeping a record of them with immediate effect. There is a lack of methods and devices for quick, cheap and efficient monitoring, treatment & recording of patients data

MedIoT:

MedIoT is a IoT based Real-Time Health Monitoring System connected to the cloud that let's the users keep real time check on some basic parameters Heart-Rate, Blood Pressure, Temperature, ECG Function, Glucose Level, Dissolved Oxygen Level using Bio-Sensors and than transmitted on cloud for storage over a website hosted using Raspberry pi. This will transmit the data to ThingSpeak/Firebase for

storage in the database and henceforth can be accessed by the authenticated person.

Solution:

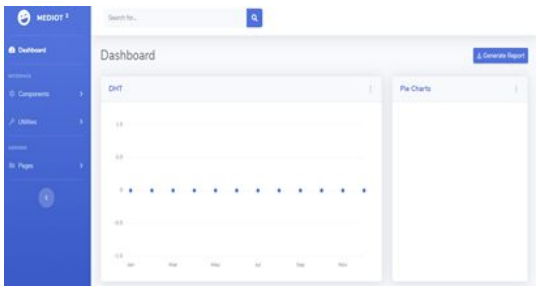
For this we have our sample website hosted on Raspberry Pi, the initial prototype is developed on Heroku Platform that allows free deployment.



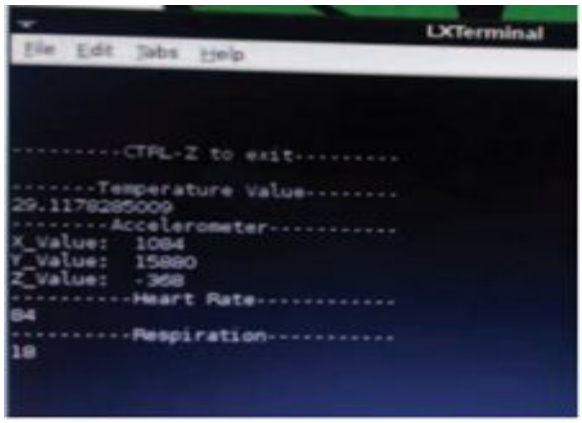
The data is fetched using the ThingSpeak APIs to fetch data and show it over our platform. The data is transmitted in real time and uploaded there itself.

Hardware for Data Fetching

Due to lockdown we didn't have much of the equipment available during this period hence we are using this prototype Drip System for the purpose of showing how the things will work and how the data recorded over cloud and how it will be displayed. It is one of the projects developed by me at National Institute of Technology Raipur. The figure on the extreme side shows the circuit connection used to retrieve data and the figure at the centre shows the CAD Model of the final Product. [**The Above Circuitry is used only to extract the data and send it to the cloud, it has no relation to the project built here.]

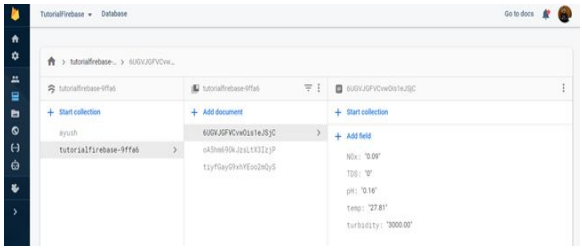


Heroku Personalized Dashboard and Raspberry Pi LXTeminal COM PORT Outputs:



Heroku Platform offers free deploying services for prototype apps developed for quick presentation. The Temperature level here is being shown on the Dashboard for instance. The Dashboard receives data from the ThingSpeak/Firebase database on being fetched using API. Though for now we have some issues like manual refreshing in order to know the updated data.

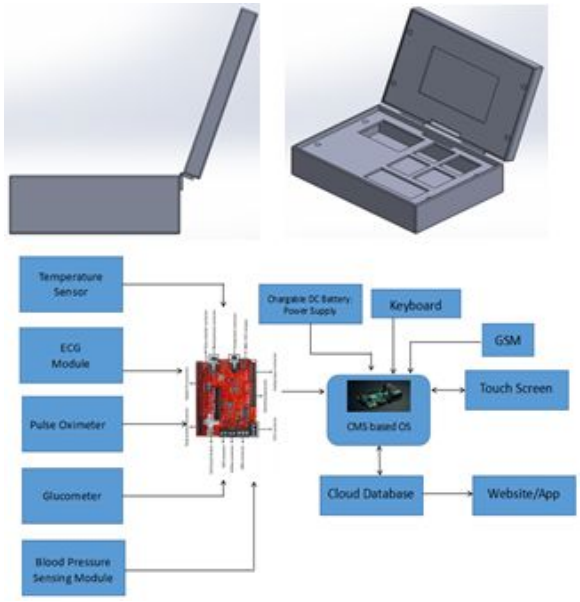
Firebase Database:



The Above database records the information about real-time NO_x , Temperature and other factors associated with the surroundings using Raspberry Pi. The data is collected as separate variables and then collected in a list(to produce a csv format) which can easily be manipulated and fetched.

Actual Connection for MedIoT:

The Circuit structure consists of a total 5 sensors which include an ECG Module, Pulse Oximeter, Temperature Sensor, Glucometer, Blood Pressure module connected to a Biometric Shield that manages all the sensors and is connected to Raspberry Pi on which the website is hosted. The Raspberry Pi is powered using a Common Laptop Battery System for operation and also connected to the input device for user user input. The Touch Screen is provided for interactive purposes. The user will only need to perform tests on the patients and the data will be recorded. We have a GSM Module to ensure 24*7 connectivity to the internet.



Charting the Data:

The data is sent to ThingSpeak for charting purposes and can be accessed directly using APIs.