

IOT BASED HEALTH MONITERING SYSTEM

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Abstract : Health is Wealth, based on this it is very clear that if health is good the wealth will come automatically. In Developing countries like India Though they got independence 70+ years back still there are people who are not having proper medical facilities in their locality. Government is taking so many initiatives to improvise the medical services the major problem they are facing is not able to carry the equipment to perform tests to some areas and in some areas Government keep on conducting medical camps or health camps the problems is they are not able to keep track of the patient past records. And another issue is if something happens to patient at night where doctors are not available whom to contact and how to contact. And the immediate question arises how the doctor come to know about the patient previous data to suggest him as a first aid before doctor reaches destination. As per statistics in India every day on an average 4 Crore members are looking for minimum health care in their locality. By considering all the above the proposed research is concentrating on serving the needs of people residing remote areas by developing an Handy Device using latest technology called IOT which will be used to perform minimal operations of ECG, Temperature etc..., In order to solve the problem of tracking the details of the patients who already got diagnosed the data will be stored in the cloud. And access will be given to Doctor's in order to keep track the information to make ease of diagnosis. The Proposed research will be solving the issues which are discussed above.

IndexTerms - IOT, ECG, Health, Technology, Government.

I. INTRODUCTION:

As per the latest statistics done by MHRD and MCI in association with World Health Organisation in India there are minimum 4Crore People per day looking for basic medical needs in remote areas. And this count will vary based on the season as winter and Rainy Seasons people will be easily affected by the virus the count will increase. And apart from this on an average of 1lakh kids are affecting with different kind of diseases because of lack of medical facilities in remote areas. The biggest question here is though the technology reached to a level where people can see what is happening throughout world in handy, why they are not in a position to get their minimum needs of Health.

As per the Quote Stated by Dr. Abdul Kalam the country growth purely depends on the Quality of Education and Health Services available in the Country.

As the country growing day by day in the form of technology and competing with the world market still India is lacking with medical facilities. The World Health Organisation did a survey to find out what are the issues where the minimum medical services are not reaching remote areas. And they found shocked after listening to the Doctors as well as people about the different problems they are facing.

As per the Discussion with the Doctor's for them to reach that places and provide services is not an issue but how to carry such a big equipment's in order to perform minimal test to people to know about their condition and another problem is these doctors are not permanent to same village they will be visiting different villages in and around it's very difficult to recollect the data so it could be great if the data stored in one place can be accessed anywhere when they need.

Basically the main intention of this research is to use latest technology like IOT in order to develop a Hardware Device with the help of different of sensors to make it handy to collect the initial data of patient and also do minimal tests in remote areas. Along with this one application is developed where people can store their information about their health issues which can be easily accessed by Doctor at the same time the doctor can suggest medicine and it will be stored again in the cloud which patient can also show the data to Pharmaceutical people to get the medicine or replacement of the medicine with different company.

Literature Survey:

According to the existing systems with respect to health monitoring systems, the main problem is all the sensors should be connected to a microcontroller and same should be replaced with new features. Though there are some systems in Health Care Industry which are in Smart in Nature but the problem is the storage capacity of sensors is very less. The entire system will be producing data continuously and there is no limit on this data. In order to store this data of patients and processing this data and sending this data to the doctors either in the form of SMS or Email is the limitation. The existing system is not a failure it is a limited version due to lack of technology. With the invention of new technologies and languages like IOT, Cloud Computing, Python and Open CV etc... The concept of Health Monitoring and Patient Monitoring System has been changed.

In this paper the proposed system will be a mixture of new technologies like IOT, Cloud, Python and Open CV etc.,

II. PROPOSED METHOD:

In the Proposed methodology main idea is to:

- To model a device for general checkup for patients to avoid travel and associated difficulties.
- To interface health management sensors and integrate to display output through visual/audio and process it to know the normality and abnormality of the obtained results.
- To integrate the obtained results with cloud for statistical analysis by specialists (Doctors).
- To use readymade neural network tool to draw inferences.

In order to implement the above said system the concept of Raspberrypi3 is used along with sensors like temperature, heat and ...

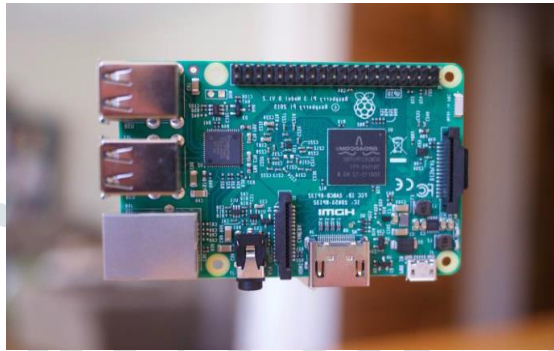


Figure 1: Raspberry PI 3

The proposed system works with Raspberry Pi 3 Model B that is a third generation Raspberry Pi. This powerful credit-card sized single board computer can be powered by a micro USB socket with 5 Volts, 2.5Amperes. It can be used for many applications and has replaced the original Raspberry Pi Model B+ and Raspberry Pi 2 Model B. Even though maintaining the popular board format, the Raspberry Pi 3 Model B brings a more powerful processor, 10x faster than the first generation Raspberry Pi. Additionally, it gives wireless LAN and Bluetooth connectivity making it the ideal solution for powerful connected designs. The processor that has been used in Raspberry Pi 3 Model B is Broadcom BCM2387 chipset, 1.2GHz Quad-Core ARM Cortex-A53. It can be boosted from Micro SD card, running a version of Linux operating system or Windows 10 IoT.

Along side of this Raspberry PI 3 to store the data the concept of cloud computing has been implemented. Before storing the data directly on to the cloud the SD card will be connected as flash memory in order to store the data when device is offline. Once the device comes online the entire data will be stored in the cloud. The main advantage of storing the cloud is , let us consider an example the data comparison can be done for the diseases like Diabetes, Blood Pressure etc., there will be upper limit and lower limit for this based on the report taken by the proposed device will be compared with default values if it is at the level where it supposed to be then no problem same message will be given to patient and if there is any disturbance immediately the data will be sent to Doctor , based on the data collected the doctor will take decision and same will be posted back to patients and they can take the help of local pharmacy people or medical officers to treat them on their own.

II.I.SENSORS USED:

- I. TEMPERATURE SENSOR
- II. CONTACT SENSORS
- III. NONCONTACT SENSORS
- IV. LM35 SENSOR
- V. EASY PULSE SENSOR
- VI. ECG OR ELECTROCARDIOGRAM SENSOR

The above mentioned are the few sensors which are used in this proposed work. And these sensors are not limited they will be changed based on the need and will be connected raspberrypi 3.

III. HOW IT WORKS?

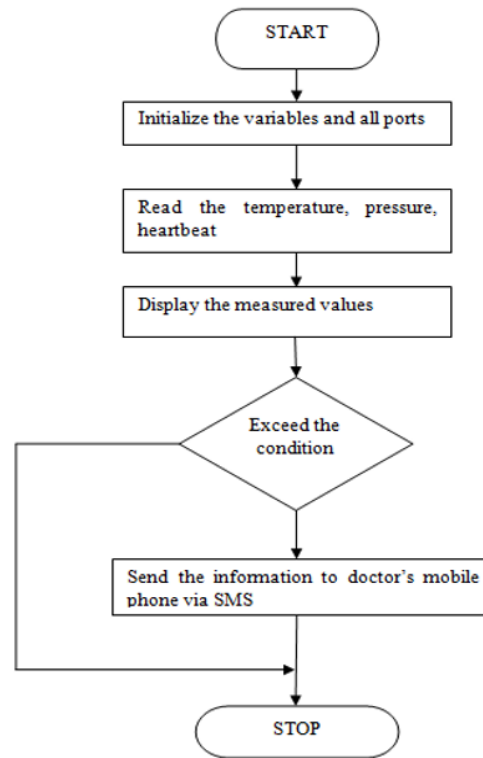


Fig.2. Flow Chart of Proposed System.

Apart from this Microcontroller and Sensors in order to store the data and process the data there is a need of some database or Cloud. In this proposed method the concept of:

Thing Speak is an open-source Internet of Things (IoT) application and API to store and retrieve data from things using the HTTP protocol over the Internet or via a Local Area Network. Thing Speak enables the creation of sensor logging applications, location tracking applications, and a social network of things with status updates.

Thing Speak has integrated support from the numerical computing software MATLAB from Math Works, allowing Thing Speak users to analyze and visualize uploaded data using Mat lab without requiring the purchase of a Matlab license from Math works.

By combining the above said Software and Hardware, the product is going to solve the problems. In the Proposed method this has taken as a main weapon in order to implement the proposed methodology.

III.I.Architecture of IHMS:

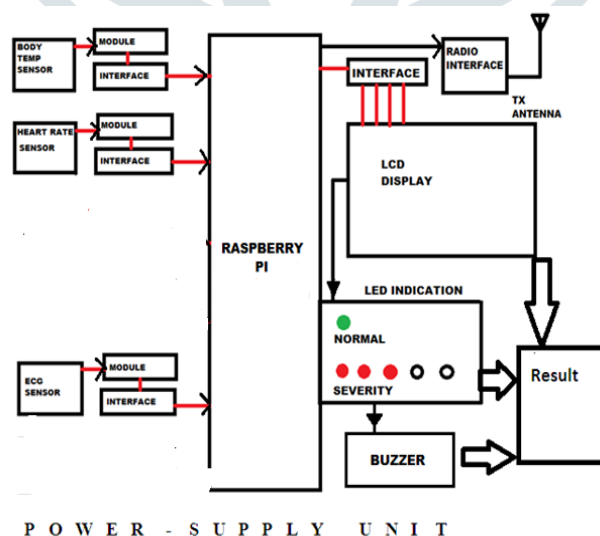


Fig 3: Proposed Health Monitoring System.

The Fig.3. Represents the proposed Health Monitoring System. The first and four most method is to perform basic tests like Temperature, ECG etc... And the data will be stored in SD card initially once the process starts same data will be stored in cloud and doctors now can see and take the decision.

IV.METHODOLOGY

- 1 Identifying the pain areas where people are facing problems.
- 2 To find a solution for the existing problem and to carry out the literature survey on the pain areas which are presently being faced by the people?
- 3 To come up with the solution that eliminates the above mentioned problem.
- 4 To check the availability of required components in the market.
- 5 Interfacing of the leads and the sensors to the corresponding modules.
- 6 To check the outputs of the sensors for calibration if needed.
- 7 Programming of controller or SOC and interfacing sensor module's digital output to it.
- 8 To check the results on the LCD or TFT screen and also at LED to verify the code.
- 9 Set up the Wi-Fi or the GPRS Hardware for uploading of the obtained results.
- 10 Store the results on flash memory or SD card and upload it to cloud.
- 11 To perform the cloud computation to analyze the results graphically.
- 12 To observe the graphically analyzed results that is obtained after the computation.
- 13 To predict the probabilities of occurrences of some diseases by using readymade neural network tool. This may help in prevention and care taking henceforth

V.CONCLUSION

Healthcare monitoring and management system using IOT implemented. This system offers the doctors to take advantage of the massive amount of healthcare data and provide right intervention to the right patient at the right time. Hence personalized care could be given to the patient. Raspberry Pi has acted as IOT agent in this paper and is used to deploy the health information of patients into the Thin speak Cloud. This remote monitoring system allows the doctor to monitor the health status of the patient remotely. This is efficient system which alerts about the patient health condition to his or her family members in the form of SMS and E-mail. Since the response time of the proposed system is less, it is suitable for real time alerting.

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