IOT Based Patient Monitoring

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Abstract- *The propose system gives us the development of a Raspberry Pi based system for Wireless heartbeat, temperature monitoring, eye monitoring for coma patient, saline level Detector. That easily provide real time information available for many users and can send them alert in critical conditions over Internet. In India many patients are dying because of heart attacks and reason behind this factor is that they are not getting proper help during the period. To give them timely and proper help first want to continuous monitoring of patient health. The fixed monitoring system can be used only when the patient is lying on bed and these systems are huge and only available in the hospitals in ICU. The system is developed for home use by patients that are not in a critical condition but need to be timely monitored by doctor or family. In any critical condition the Mail is send to the doctor or any family member. So that easily save many lives by providing them quick service.*

Keywords- Raspberry Pi3, IR sensor, Temperature sensor, Motor, Heart beat sensor.

I. INTRODUCTION

Information and communications technologies are transforming our social interactions, over lifestyle and workplaces. One of the most promising applications of information technology is healthcare and wellness management. Health care is moving from reactive responses to acute conditions to a proactive approach characterized by early detection, prevention and long-term healthcare management. In this framework, health condition monitoring and wellness managements are seen as significant contributors to individual healthcare and wellbeing. This is particularly important in developed countries with a significant aging population, where information Technology can be employed to significantly improve the management of chronic conditions and, thereby, overall quality of life.

Continuous or even occasional recording of biomedical signals is particularly critical for the diagnosis and treatment of cardiovascular diseases. For example, continuous recording of a heartbeat, temperature and IR sensor by a wearable sensor provides a realistic view of a patient's heart condition by tracking such factors as stress, anxiety, and Depression, during normal daily routines. In the world, Health monitoring system is used in number of field like, car, Home care, Hospital etc. health monitoring is also for daily routine checkup that increase health of people, in this propose system to check the heartbeat, eye blinking, temperature and saline level. Heart bit 140-170bpm for 25 year old person and range between 115- 140 for 60 year old person. That propose system use sensor to sense the different think like temperature, humidity, IR to sense the coma patient eye Motion, if Patients are in comma condition the if thus recovery after doctor treatment or after some period they blink or open the eye then IR sensor sense.

I. SYSTEM DEVELPOMENT

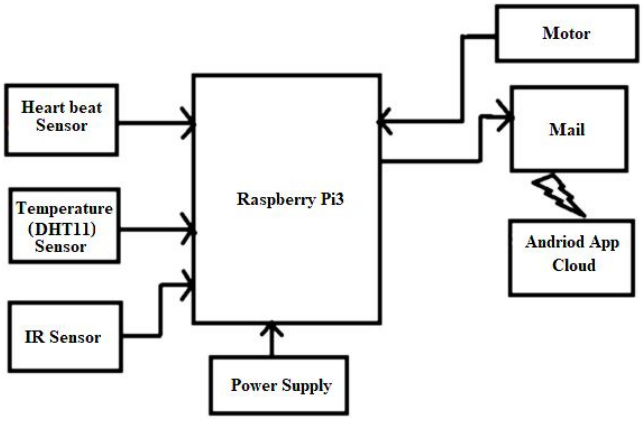

Fig 1. Block diagram of the system.

As shown in the propose system the sensors part that consists of different health sensors like as. Heartbeat sensor (INVNT 11), temperature sensor and humidity (DHT11), IR sensor. That sensors are placed at the patient's body. Sensors sense the patient body parameters like heartbeat, temperature, eye motion. The sensed data from the sensors send to the Raspberry Pi.

1. Temperature sensor measure temperature from patient body.
2. Heart beat sensor detector detect Heart beat from patient.
3. IR sensor to detect coma patient eye movement from patient body.
4. Motor that check saline level.

5. After the output of that sensor given to a Raspberry PI through wire. The Raspberry pi continuously reads input from these 3 sensor.
6. The Raspberry Pi is CPU. Then it sendsthis datato thecloud by sending this data to a particular URL/IP address or android app.
7. Computer then decrypted the information and store at data base. All the information brows by PHP and HTML and show on web page.
8. This proposed system is very useful since the doctor can monitor patient health parameters just by visiting website or URL.
9. And nowadays many IOT and android apps are also being developed. So now the doctor or family members can monitor or track the patient health through the Android apps.

A.Heart beat Sensor (NVNT 11)

The sensor gives the digital output of heart beat when a finger is placed on it. When the sensor starts, the LED ashes in union with beat.

Fig 2. Heart Beat Sensor.

The output generated is in Beats per Minute (BPM) rate. Heart rate data can be really useful whether you are designing an exercise routine, studying your activity or anxiety levels or just want your shirt to blink with your heart beat. The problem is that heart rate can be difficult to measure. The pulse sensor can solve that problem.

B. Raspberry Pi3

The Raspberry Pi is CPU .It quad-core 64bit CPU, Wi-Fi and Bluetooth. The Raspberry Pi 3 Model B is the third generation Raspberry Pi. Powerful credit-card sized single board computer can be used for many applications and supersedes the original Raspberry Pi model B+ and Raspberry Pi 2 Model B. The Raspberry Pi 3 model B brings you a more powerful processor, 10x faster than the first generation Raspberry Pi.

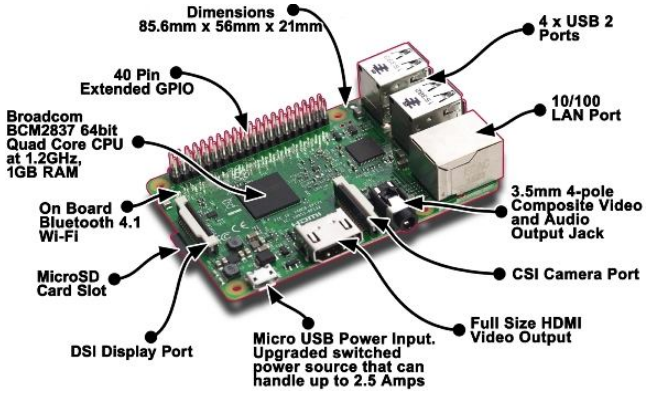

Fig 3. Raspberry Pi3 module.

Additionally it adds wireless LAN and Bluetooth connectivity making it the ideal solution for powerful connected designs. The digital signals from the sensor are received at the Raspberry pi. Raspberry pi cannot process analog signal. Raspberry pi does not have in built ADC so that the sensors are used in our project they directly give converted digital signal. Then the output of sensor sent to the Raspberry pi. Raspberry pi send the received signals data to mobile devices or cloud through Email or through app or cloud. It is a small, powerful, cheap, hack able and education-oriented computer board introduced in 2012. The credit card-sized computer with many performances.

C. Temperature Sensor (DTH 11)

It is a sensor used to measure temperature and humidity. The DHT11 series are precision integrated circuit temperature and humidity sensors, whose output voltage linearly proportional to the Celsius (Centigrade) temperature.

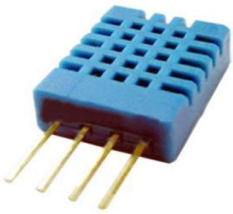

Fig 4. Temperature Sensor.

It measures temperature more accurately than thermistor. It is sealed and does not undergo oxidation. It does not require output voltage to be amplified.

D. IR Sensor

The IR Sensor-Single is a general purpose proximity sensor. It use for collision detection.The module consist of A IR emitter and IR receiver pair. The high precision IR receiver alwaysdetects IR signal. The module consists of 358

comparator IC. The output of sensor is highwhenever it IR frequency and low otherwise. The on-board LED indicator helps user to checkstatus of the sensor without using any additional hardware. The power consumption of thismodule is low. It gives a digital output.

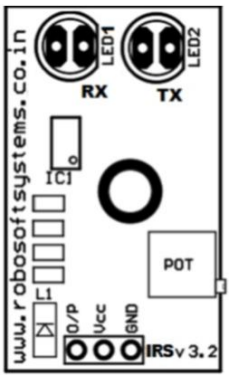

Fig 5. IR Sensor.

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. The types of sensors measures only infrared radiation, rather than emitting it is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. That types of radiations are invisible to our eyes that can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photo diode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photo diode the resistances and these output voltages, change in proportion to the magnitude of the IR light received.

III. ADVANTAGES, APPLICATIONS& FUTURE SCOPE

A. Advantages.

1) IOT monitoring very helpful when need to monitor, maintain record and keep track of changes in the health parameters of the patient over the period of time. So with the IOT health monitoring, the health parameters database changes. Doctors can take the reference of these changes or the history of the patient while suggesting the treatment or the medicines to the patient.
2) Hospital stays are minimized due to remote patient monitoring.
3) Hospital visits for normal routine checkups are minimized.
4) Patient health parameter data is stored over the cloud. So it is more beneficial than maintaining the records on printed papers kept in the _les or even the digital records which are kept in a particular computer, laptop or memory device like pen drive. Because there are chances that these devices can get corrupt and data might be lost. Whereas, in case of IOT, the cloud storage is more reliable and does have minimal chances of data loss.

B. Applications

1) This system are more useful in Hospital ICU and in ambulance.
2) IOT healthcare is the most demanding Field in the medical area. For the senior citizen living alone or living with 1 or 2 members. The proposed system really helpful when family member need to go out for some emergency work.
3) Disable patients can use this project. Disable patients who find it really difficult to go to doctors on daily basis or for those patients who need continuous monitoring from the doctor.

C. Future Scope

1) For Coma patient add more sensor to check the coma patient health status. Sensors like motion sensor.
2) IN future Using Wireless sensor to minimize connection.
3) UDO board replace raspberry pi. Because has more features.
4) Using different type of sensor, it is possible to check the patient status.
5) Use for Handicap and old age patient.

IV. CONCLUSION.

The proposed system uses sensor technology as an emerging element for healthcare services. The proposed system a computer and mobile monitoring system is presented, which is able to continuously monitor the patient's heart beat, temperature and humidity, coma patient eye motion and other critical parameters of patients. The system is able to carry out a long- term monitoring of patients condition and equipped with an emergency rescue mechanism. This system is also beneficial for physically handicapped and Disable patients who find it really difficult to go to the Hospital on daily basis and patients who need continuous monitoring from the doctor. In the highly developing area, where directly or indirectly, everything is dependent on computation and information technology, Raspberry Pi to be a smart, economic and efficient

platform for implementing the health monitoring system. The Raspberry pi is a single computer board with credit card size that can be used for many tasks that your computer does. Comparison with other board Raspberry pi is more advanced in terms of cost, speed, complexity etc.The proposed system, switch to wireless technology to have a better estimation of health monitoring system.

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