Health Monitoring for Paralysis Patients using IOT

Jadhav Rushikesh Bhaginath[#1], Harde Suvarna M.[#2], Alse Jyoti M[#3], Prof.Aher Sandip R#[4]
Department of E&TC,PREC College of Engineering Loni, Ahmednagar, India.

Abstract- Health is a very important aspect now a days as there are people having many health issues now a days in very young ages. There is also a problem in big hospitals in monitoring the patent as there are number of patients, so keeping record for all the patients is very hard and tedious job. Keeping the records in hard form can be very tedious task as the number of patients are high in a hospitals. Also there is a lack of live monitoring systems that can monitors data like heartbeat, temperature and ECG and show it a remote place. IoT can help solve this problem very efficiently. Creating a wireless network of sensors between the patients that will help collect the data on central sever on the internet can help make the data monitoring systems and data base maintaining process easier. IT can help reduce the risk of emergency situation by giving notifications automatically. It can also reduce human efforts and the stored data can also be used for later analysis.

Key Word: ***IOT***

I. INTRODUCTION

In this Paper, we are discussing the implementation of IoT based Patient Monitoring systems. First we must know about IoT, which has been a famous phenomenon now a days. Basically IoT stands for internet of things it means that when things will be connected in network and will communicate data between each other. In big hospitals there is problem of monitoring and maintaining database as there are large number of patients keeping hard records of the data is very hard and difficult. We will be using different sensors to monitor the parameter of the patient. Every module will have sensors like heartrate measurement, Temperature measurement and ECG measurement. Every module will be connected to the internet through a Wi-Fi module. All the data that will be collected by the controller from the sensors will be uploaded to the server. So that the doctor can monitoring the data from a remote place which will save some human effort.
All the collected data will be maintained on the cloud, There will also be a sensor that will detect heart attack and treat it as a emergency situation.

II. EXISTING SYSTEM

Modern health care system introduces new technologies like wearable devices or cloud of things. It provides flexibility in terms of recording patients monitored data and send it remotely via IOT. For this connection, there is need of secure data transmission .To transmit the data with privacy is the Moto of this paper. The proposed system introduces security of health care and cloud of things .System works in two major parts viz. storage stage and data retrieving stage. In storage stage, data is stored, updated for future use. In data retrieving stage, retrieve data from cloud. The cloud server can share with authenticated user as per request. A patient with wearable devices continually updates his record every 5 or 10 min. In emergency mode, it updates for every 1min.The wearied device will send results to phone using Bluetooth connection or NFC technology. This can able to give to cloud server using GSM and 3G. At cloud server, each patient is defines with unique address. So data at cloud can authenticate the right patient and provide the required request.[1]

Telemonitoring system via WBAN is evolving for the need for home based mobile health and personalized medicine. WBAN can able to collect the data acquired from sensor and record the output. This output results sent to controller wirelessly to health monitoring system. In this paper, Zigbee is used to in WBAN technology due to its guaranteed delay requirement for health telemonitoring system. Zigbee used in the communication.[2]

Afef Mdhaffar, Tarak Chaari, Kaouthar Larbi, Mohamed Jmaiel and Bernd Freisleben has explained low power WAN network to perform analysis of monitored data in health caring system. They have established WAN network for communication upto the range of 33m2 at around 12 m altitude. Also they have demonstrated that power consumed by LoRaWAN network is ten times less than the GPRS/3G/4G.The IOT architecture has been given for step wise working for understanding of IOT .The main purpose of LoRaWAN is the energy consumption. The power consumption in idle mode for LoRaWAN is 2.8mA while in GPRS is 20mA.Hardware cost in LoRaWAN is 10doller while in GPRS is 50 dollar. Maximum data rate in LoRaWAN is 50kbps (uplink), 50 kbps downlink while in GPRS is 86.5 kbps(uplink ,14kbps(downlink).These results gives the overall efficiency of LoRaWAN in the demonstration of IOT for health monitoring system. [5]

III. PROPOSED SYSTEM

The Block diagram consist of an Arduino Uno, a heartbeat sensor ECG sensor, Moisture sensor, LCD display, WiFi module and a power supply. The Arduino uno is a development board that consisit of ATmega328 controller which is the heart of the system all the sensor are connected to the microcontroller and the data is collected by the microcontroller the Arudino Uno is connected to the internet using the ESP8266 Wi-Fi module.

A. Arduino Uno: **Arduino Uno** is a microcontroller board which has a ATmega328. It has 14 Input output pins and analog pins and it works on 16 Mhz clock. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.. You can tinker with your UNO without worring too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

B. ESP8266: ESP8266 is a 3V WiFi module very popular for its Internet of Things applications. ESP 8266 maximum working Voltage is 3.6V and its very important to note. You must know how to power it, how to serial-connect it with Arduino safely, how to ping and many other things. You should use software like Circuito.io, Tinkercad, Fritzing to simulate and work with the board safely. You should also use Logic Level Controller to use with ESP8266 module.

C. ECG sensor Module: his sensor is a cost-effective board used to measure the electrical activity of the heart. This electrical activity can be charted as an ECG or Electrocardiogram and output as an analog reading. ECGs can be extremely noisy, the AD8232 Single Lead Heart Rate Monitor acts as an op amp to help obtain a clear signal from the PR and QT Intervals easily. The AD8232 is an integrated signal conditioning block for ECG and other bio potential measurement applications. It is designed to extract, amplify, and filter small bio potential signals in the presence of noisy conditions, such as those created by motion or remote electrode placement.

D. Temperature sensor: The temperature sensor will be used to measure the Body temperature which will be conditioned by the Micocontroller.

E. Cloud: According to its developers, "**ThingSpeak** 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. ThingSpeak enables the creation of sensor logging applications, location tracking applications, and a social network of things with status updates. ThingSpeak was originally launched by ioBridge in 2010 as a service in support of IoT applications. ThingSpeak has integrated support from the numerical computing software MATLAB from MathWorks, allowing ThingSpeak users to analyze and visualize uploaded data using Matlab without requiring the purchase of a Matlab license from Mathworks.

F. Heart Rate Sensor: The Heart Rate sensor is used to count the heart rate of the patient which has a photo diode and a light emitting diode which is used to measure the heart rate.

G. Fall Detection: Accelerometer sensor is used to measure the Fall detection. It gives the value in the form of 3 axis x,yand z using which we can determine the Fall of the Patient.

IV. System Architecture

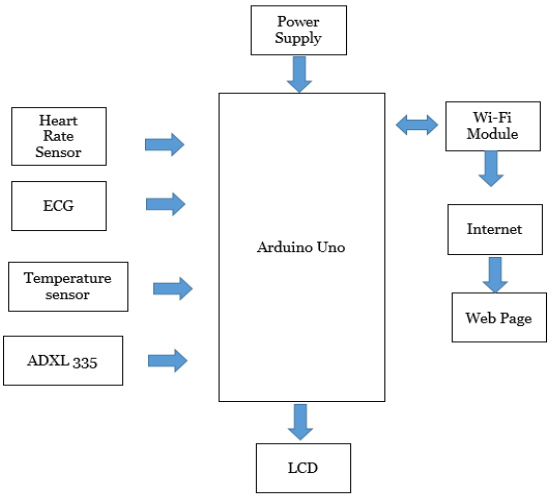

FIGURE 1.1 SYSTEM ARCHITECTURE

V. RESULTS

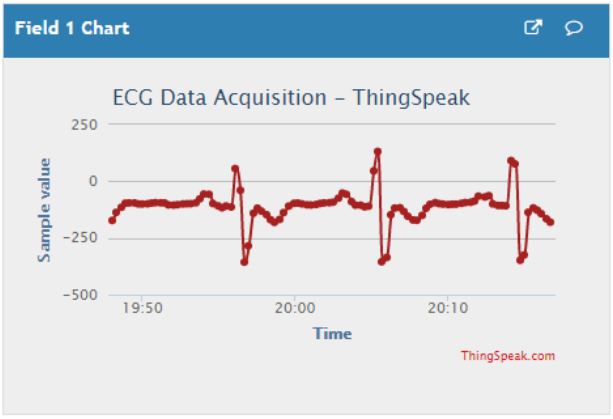

Fig 2: ECG Data

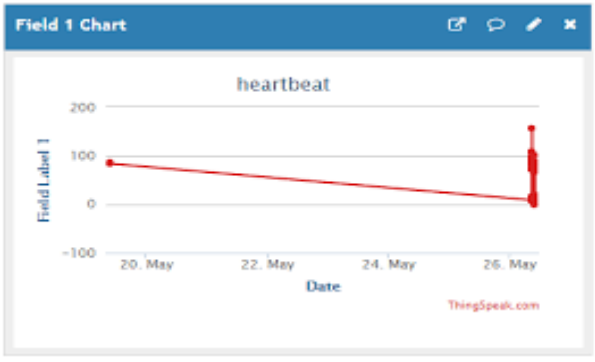

Fig 3: Heart Rate

VI. CONCLUSION

Hence we conclude that we have all the hardware and the software requirement for our project we have also seen all the sensors required for the particular task. We have also discussed the technology and hardware and software design. We have also implemented ECG, Heart Rate and temperature monitoring using IOT, the data has been saved and plotted on a graph using the Thingspeak API.

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