|| Volume 6 || Issue 6 || June 2021 || ISSN (Online) 2456-0774
INTERNATIONAL JOURNAL OF ADVANCE SCIENTIFIC RESEARCH
AND ENGINEERING TRENDS

PATIENT MONITORING SYSTEM BASED ON IOT

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Abstract: As we know that Health Care System is rapidly growing with new technologies, IoT is one of the most revolutionizing factor that has helped Medical care grow. Old age people find it difficult to move out in situations where can't move due to their heart issues, or in case not well. So, Here we are proposing an IoT based Patient Monitoring System which will monitor the heart rate and temperature with the use of Sensors. The sensors are connected to the Arduino-uno, this system basically helps in monitoring the heart rate and temperature on continuous basis at certain time intervals.

I INTRODUCTION

As we know that IoT has a revolutionary development in Health Care System, in this project we are IoT platform like Thingspeak. Thingspeak is an API which is used to store data and share through Local Network or Internet. In this Project we are also using ESP32, this device measures the heartbeats and the temperature with the sensors, it continuously monitors the pulse rate and surrounding temperature and updates them to an IoT platform.

1. SENSORS

1.1 HEART BEAT SENSOR

The heartbeat sensor is based on the of photoplethysmography, which measures the change in the volume of the blood through any organ. Heartbeats are measured as the blood pumped from the heart which also shows the pulse rate. Therefore the heartbeat sensor measures the heartbeat rates as the blood flow changes.

1.2 BODY TEMPERATURE SENSOR (LM35)

The LM35 sensor measures the body temperature, it is a series of precission integerated circuit which means that its ouput is linearly proportional to the Celsius (Centigrade) temperature. It analysis temperature between -55°C to 150°C. It is small and cheap IC which is used to measure temperature.

2. ESP32 PROCESSOR

ESP32 is one of the important tools of IoT. It has a full linux system on a small platform. It connects devices, sensors and actuators through GPIO pins. Both ESP32 & IoT hand-in-hand make a greater impact on health care system. ESP32 is basicallydesigned with integrated antenna switches, RF Balun, control amplification, lower nooise amplifier, filters and power management modules. It functions stand alone module or as a slave to host MCU,. It has a decreasing overhead interaction in the main application processor. ESP32 communicates with Wi-fi & Bluetooth devices through SPI/SDIO or I2C/VART interfaces.

II LITERATURE REVIEW

A Survey was done from one of the paper, International Conference on Information Security & Privacy, India Medicine Reminder & Monitoring System for Security Health Using IoT.

From this research, the concept of Telemedicine was discussed which was costly and also location autonomous monitoring system, in this data could be transferred from different devices with proper security & privacy issue. Emergency services need a proper network from domain like patients home, medical practices ambulances etc. IoT is a platform where health system is way ahead & technology can be used for the help of people. IoT, Thing Speak, ESP32 can make it easy to monitor patients by easy use of the system . In critical situations and pandemics such systems need to be designed. Transmission of data is done with utmost privacy & security. Low cost embedded platforms with the web based monitoring & controlling, these platforms consist of sensing and networking. Easy facilities can be available on one touch, with every use interface to user and remote web based access. IoT has developed much more platforms and technologies that has made the medical facility more reliable. The data is stored on reliable platforms so that it can be easily made available whenever required. This survey shows how IoT has impacted the health care system and how beneficial it has been proved.

III SYSTEM DESIGN

The main motive of this project is to monitor patient's condition by measuring their heartbeats reate and temperature. The project is basically architecture into 3 modules i.e. Sensor module, Data Processing module and Web User Interface. The sensors are connected, which collect the data from the patients body. This collected is processed through ESP32 module and is been sent to the gateway server. In this system ThingSpeak is basically used for graphical interpretion and displays the collected result. The current status is showed in this process.. Hence, the HTTP protocol provides an easier connectivity to correspond between a Wi-fi module and the Web server, In this the HTML user interface is updated after every 15s which allows the real-time track pf patients. The system architecture is shown in the fig. which shows that all sensors are connected to ESP32, which is the heart of this system.

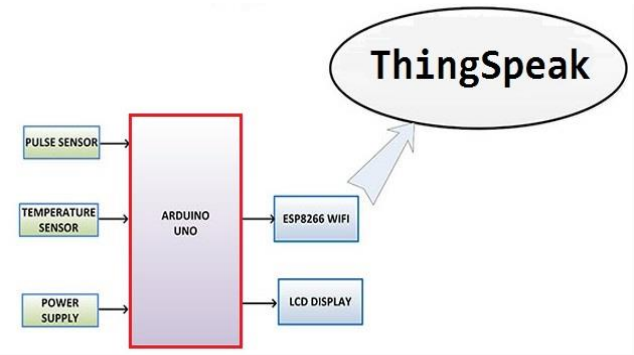

Fig 1: Circuit Design

ESP32 collects all data and sends it to IoT websites. The board has its own Wi-fi and processing unit, it is Xtensa dual core 32 bit 2 X 6 microprocessor. Output is linked with website of IoT.

IMPLEMENTATION DETAILS

The system is implemented by using the combination of hardware.Components of hardware are assembled together. The sensors are connected to the pins of ESP32, which is the processing device having its own Wi-fi module. The Vcc and GND pins of sensors are connected with the Vcc and GND pins of the ESP32. The signal pin of heart beat sensor is connected with D26 pin of ESP32 in case of any individual patient.

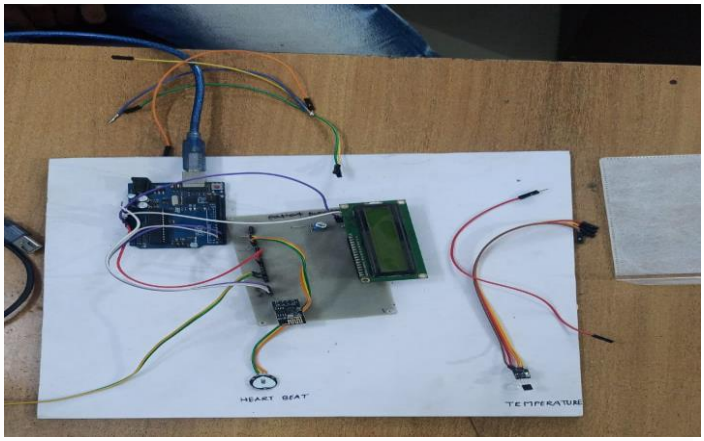

Fig 2: Implementation of hardware

III CONCLUSIONS

This proposed system of Patient Monitoring based on IoT platform shows the heart rate and the temperature which is the basic need for the treatment of an individual. Through this system we are just not providing fast treatment but also security for the doctors, nurses etc. When situations like COVID-19 occur it becomes risky even for the doctors and nurses to physically check these parameters, whereas, this system comes to an rescue and makes work easier.Therefore, we can conclude that Patient Monitoring system which is based on IoT platform is one of the smartest technology in the Healthcare System.

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