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IOT BASED HEALTHCARE MONITORING SYSTEM TOWARDS IMPROVING QUALITY OF LIFE

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Abstract-We propose an innovative system that, automated this task with ease. Our system puts forward a smart patient health tracking system that uses Sensors to track patient health and uses internet to inform their loved ones in case of any issues. Our system uses temperature as well as heartbeat sensing to keep track of patient health. The sensors are connected to a microcontroller to track the statuswhich is in turn interfaced to an LCD display as well as wifi connection in order to transmit alerts. If system detects any abrupt changes in patient heartbeat or body temperature. Also system gives graphical representation of Patient's "ECG". The system automatically alerts the user about the patient's status over IOT and also shows details of heartbeat and temperature of patient live over the internet.

Keywords—IOT Wi-F, microcontroller, LCD, voltage booster.

I. INTRODUCTION

Health is always a major concern in every growththe human race is advancing in terms of technology.Like the recent corona virus attack that has ruined the economy of China to an extent is an example how health care has become of major importance. In such areas where the epidemic is spread, it is always a better idea to monitor these patients using remote health monitoring technology. So Internet of Things(IoT) based health monitoring system is the current solution for it.. The core objective of this project is the design and implementation of a smart patient health tracking system that uses Sensors to track patient health and uses internet to inform their lovedones in case of any issues.

While, in GSM based patient viewing, the flourishing parameters are sent utilizing GSM by strategies for SMS. In this manner IOT set up tolerant wellbeing following framework viably utilizes web to screen quiet wellbeing measurements and spare persists time. There is a significant capability between Fig. 1: Proposed System SMS based patient flourishing viewing and IOT based patient checking framework.

II. THEORY

A. WORKING PRINCIPLE OF ESP12E

We used the ESP12E as the microcontroller embedded with Wi-Fi, and the sensors are MAX30100 (pulse rate and SPo2 measurement sensor) and DS18b20 digital sensor (body temperature measurement sensor). And there are more components we are using, such as mobile application, serial display/plotter and LCD display. All the needed components for the health monitoring system are described in Figure 2 is the circuit diagram for the system. An ESP12E microcontroller, two sensors (MAX30100 and DS18b20), a 16 × 2 I2C LCD display make up the circuit whole system is powered by 3.3V & 5V. Microcontroller is connected to the computer using aUSB (Universal Serial Bus) that sends data to the device.

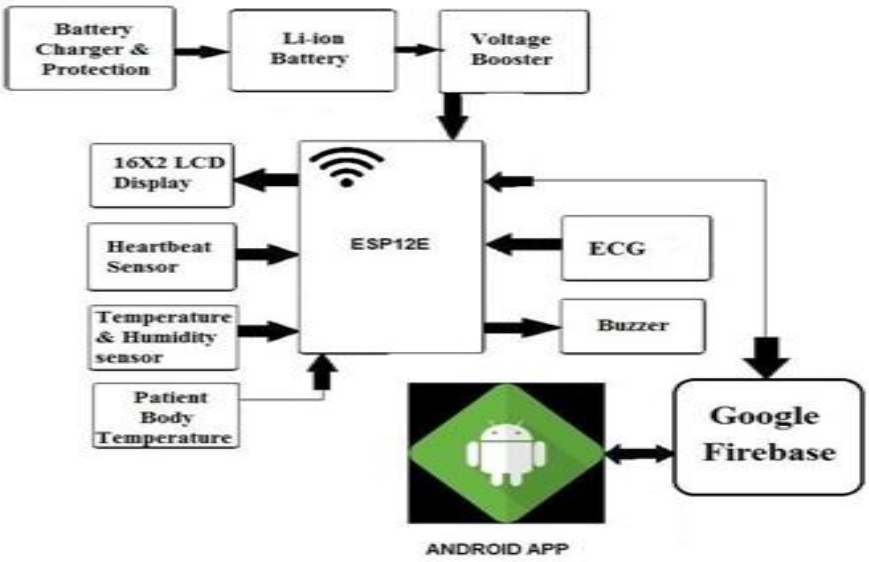

Figure No. 1: Working Principle of ESP12E

B.PROPOSED OF SYSTEM

The core objective of this paper is the design and implementation of a smart patient health tracking system. Fig.1 shows the overview of the proposed system. The sensors are embedded on the patient body to sense the temperature and heartbeat of the patient. Two more sensors are place at home tosense the humidity and the temperature of the room where the patient is staying. These sensors are connected to a control unit, which calculates thevalues of all the four sensors. These calculated values are then transmitted/ugh a IoT cloud to the base station. From the base station the values are then accessed by the doctor at any other location. Thus based on the temperature and heart beat valuesand the room sensor values, the doctor can decide the state of the patient and appropriate measures canbe taken. Sensors The temperature sensor connectedto the analog pin of the arduino controller is converted into digital value with the help of ADC.

III.WORKING PRINCIPLE OF SYSTEM

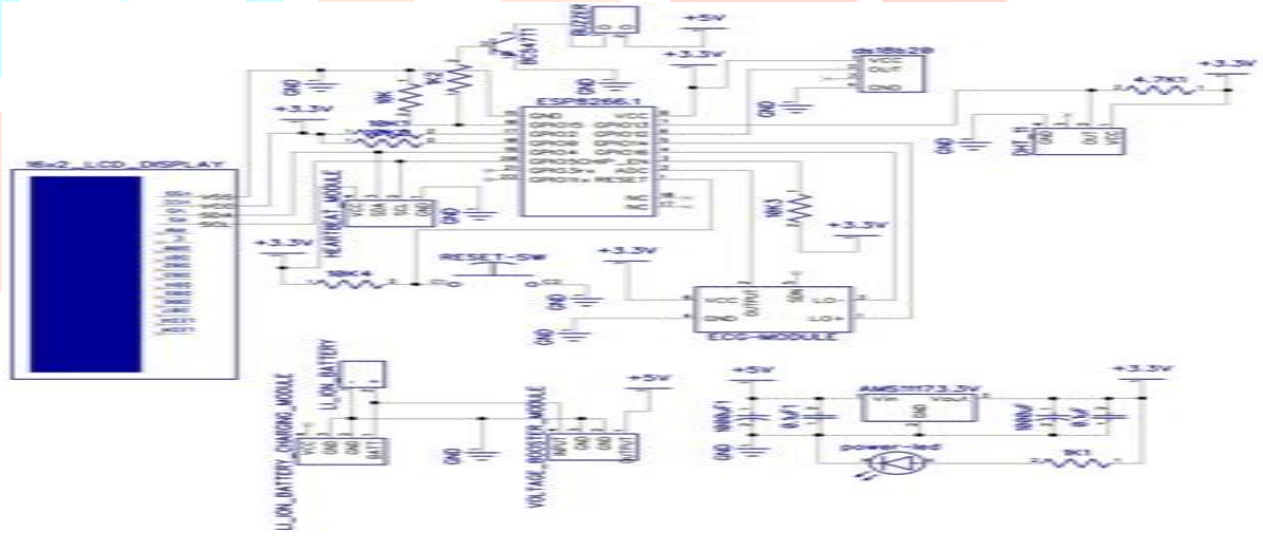

Figure No. 2: Circuit Diagram

The body temperature, humidity and pulse rate sensors are monitored and initially displayed on LCD. The values from the sensors especially the body temperature sensor and the pulse rate sensor isstored in the database.

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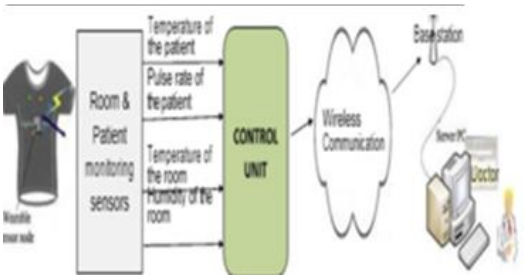
A.SOFTWARE MATERIALS

Mobile application was developed by the MIT inventor App. After developing the application, we simply load it onto the mobile device, and a link will be provided to download the application. After connecting to internet the application through scanning with the mobile, a connected message willbe viewed. after performing the required process, we can show our collected results on the screen.

B.PROPOSED SYSTEM



Pulse rate	Body Temperature		
	Low	Normal	High
Low	Health Checkup	Unwell	Health Checkup
Normal	Hypothermia	Healthy	Fever
High	Health Checkup	Unwell	Health Checkup

Figure No. 3: Observation

Using this digital data, the controller converts it into the actual temperature value in degree Celsius using the equation: temperature (°C) = [raw ADC value*5/4095- (400/1000)]*(19.5/1000) These calculated values are then transmitted through a IoT cloud to the base station. From the base station the values are then accessed by the doctor at any other location. Thus based on the temperature and heart beat values and the room sensor values, the doctor can decide the state of the patient and appropriate measures can be taken. Sensors The temperature sensor connected to the analog pin of the arduino controller is converted into digital value with the help of ADC Using this digital data, the controller converts it into the actual temperature value in degree Celsius using the equation: temperature (°C) = [raw ADC value*5/4095- (400/1000)]*(19.5/1000) The heartbeat sensor is based on the principle of photo phlethysmography. It measures the change in volume of blood through any organ of the body which causes a change in the light intensity through that organ (a vascular region) . At the point when the information is exchanged to the therapeutic server, it checks whether the patient has any past medicinal record then the server adds the new information to that record and exchanges to the specialist. In the event that patient does not have any past therapeutic record then the server makes new ID and stores the information in its database . This information is exchanged to the specialist for diagnosis.

IV.HARDWARE WORKING

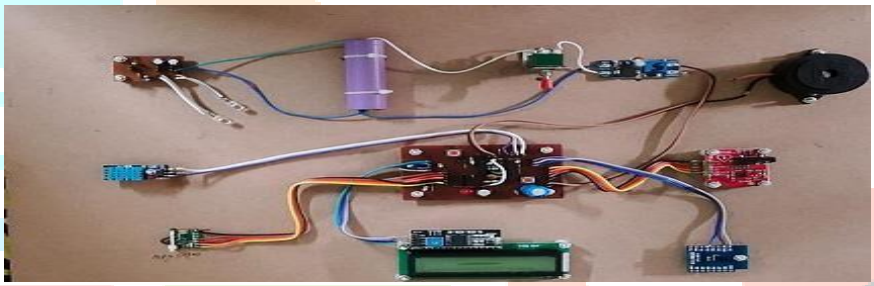


Figure No. 4: Module

We used the ESP12E as the microcontroller embedded with Wi-Fi, and the sensors are MAX30100 (pulse rate and SPo2 measurement sensor) and DS18b20 digital sensor (body temperature measurement sensor). And there are more components we are using, such as mobile application, serial display/plotter and LCD display. An ESP12E microcontroller, two sensors (MAX30100 and DS18b20), a 16 × 2 I2C LCD display make up the circuit whole system is powered by 3.3V & 5V. Microcontroller is connected to the computer using a USB (Universal Serial Bus) that sends data to the device.

V.DATA BASE STRUCTURE

This information is exchanged to the specialist for diagnosis. The complete Data transmission using IoT is given in Database Structure. At whatever point the patient goes to the healing center premises, sensors sense the physiological signs and these signs are changed over to electrical signs. It is more favored for gadgets which are littler in measure and expend less vitality. From nearby server the information is exchanged to the therapeutic server through WLAN. Medicinal server comprises of substantialdatabase as given in Table .

VI .FLOW CHART

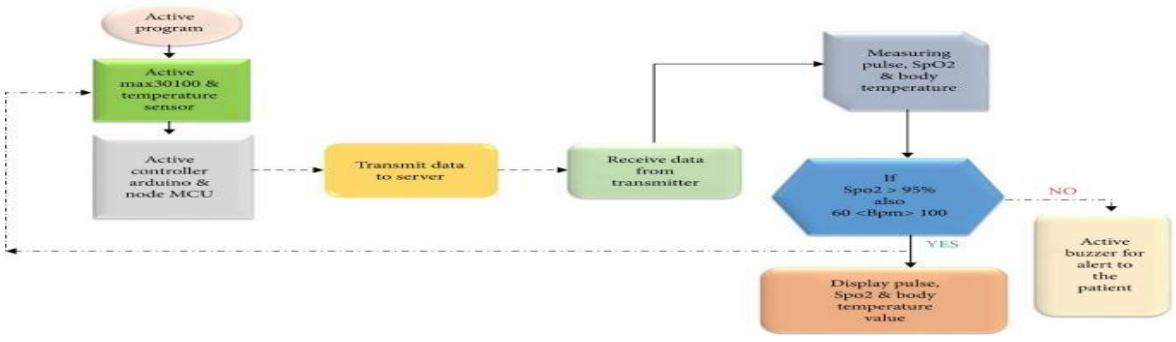


Figure No. 5: Flow Chart

The system of block diagram shows that when the power of system is switched on ,the sensor starts taking values . here the system has two types of sensor measuring Spo2,pulse rate and temperature. The sensor measures the physiological data from a human body and then pass the analog values to the aurduino,which converts them into and mathematical methods in medicine.

VII.CONCLUSION

Design and implementation of a health monitoring system using IoT are presented in this paper. IoT- based device allows users to determine their health parameters, which could help regulate their health over time. Eventually, the patients could seek medical assistance if the need arises. could easily share their health parameter data instantly withinone application with the doctor. As we know, the IoT is now considered one of the most desirable solutions in health monitoring system. It makes sure that theparameter data is secured inside the cloud, and the most important thing is that any doctor can monitor the health of any patient at any distance.

VIII.FUTURE SCOPE

The development of an IoT system requires the integration of various biomedical sensors with semiconductor-rich devices. Further, more research must be devoted to making sensors using biodegradable materials. With the rapid growth in mobile technology, new healthcare apps are added with passing days.

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