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# IOT Based Health Monitoring System

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**Abstract:-In present era, Technology is an important part for everyone's life. Similarly healthcare can also be regulated by the help of technology. In hospitals, a patient's health can be monitored using various sensory devices which can be connected to the internet which helps to get the regular information of the patient. Internet of thing serves as a catalyst for the healthcare and plays prominent role in wide range of healthcare applications.**

**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. Even in hospitals in between too many patients it become very difficult for the doctor to look over every single patients, here IOT can help doctors by giving the information related to health of the patients.**

**We proposed the remote sensing of parameter of the body mostly heart rate and temperature. The parameters are sensed and monitored wireless using wireless sensors. The whole information gets displayed on a screen which can be placed at a place where doctor and other staff can access them and take actions accordingly.**

**Keyword**:- Internet of Things, Healthcare, Hospitals, Remote Sensing, Heart Rate, Wireless Sensors.

## I. INTRODUCTION

Today internet has become one of the important parts of one's daily life. It changed the way how people live, play, work, etc. The next trend of the technology related to internet is Internet of Things (IOT).

Patients are not well versed with manual treatment which doctors normally use for tracking the count of heartbeat. There are various instruments available in market to keep track on internal body changes. But there are many limits in maintenance part due to their heavy cost, size of instruments and mobility of patients. The continuous or even occasional recording of biomedical signals is critical for the advancement of diagnosis as well as treatment of cardiovascular diseases by using wireless wearable sensors. We can measure the three degree parameters body temperature, Heart rate, Blood pressure. After measuring the parameter they can transmit towards the WEB server via wireless transmission. WEB servers can continuously recording the particular data and user can access on mobile, laptop or any other device which is connected to internet.

This way of notification would help to take an appropriate action at an instance of a time. This would save patients from the future health problem which would arise. This would also help patient's concern doctor to take an appropriate action at proper time.

## II. SIMILAR WORK

All similar works that have been done by other researchers that are similar to the current research problem are as follows:-

- A Health-IOT Platform Based on the Integration of Intelligent Packaging, Unobtrusive Bio-Sensor, and Intelligent Medicine Box.
- RFID Technology for IOT-Based Personal healthcare in Smart Spaces.

## III. PROBLEMS

Patient's who stays in home during post operational days, checkup for them become little difficult. Careless observation also cannot be accomplished by this system. Careless behavior at the receiver end also cannot be ignored; it is the major risk that can occur.

## IV. PROPOSED PROJECT

The major work of the project is to continuous monitoring of the patients in the hospital through internet. The model consist of Microcontroller, Temperature sensor, Pulse sensor, Liquid crystal display, GSM modem, Regulated power supply.

## V. HOW IT WORK?

- Sensor will sense the different body readings accordingly.
- Microcontroller placed in the arduino will collect the data from the patients by the help of sensors and sends this data through Wi-Fi module.
- Sent data is collected at the receiver end which is displayed on the liquid crystal display.
- Doctor or staff can access this data by the help of IP address provided to them.

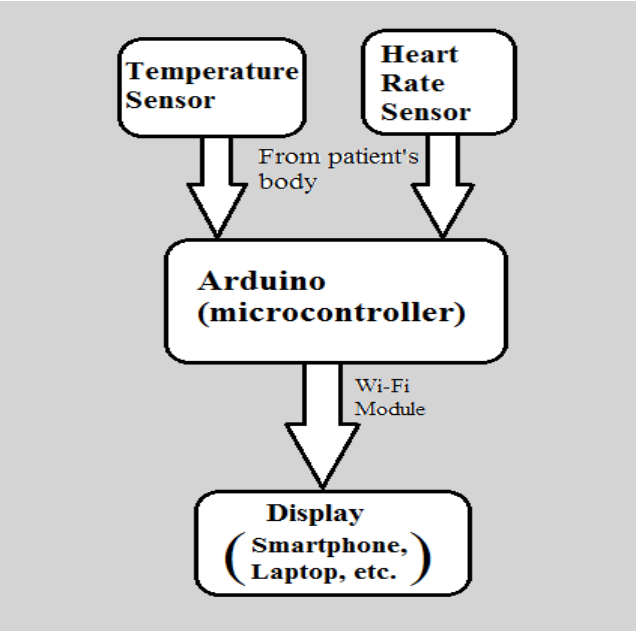


Fig. 1: Working Flow

## VI. ARCHITECTURE AND IMPLEMENTATION

### *A. Hardware Description*

*a). ATmega328*

The high-performance Microchip 8-bit AVR RISC-based microcontroller combines 32KB ISP flash memory with read-while-write capabilities, 1KB EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes.


Fig. 2: ATmega328

*b). Liquid Crystal Display (LCD)*

LCD is very important device in embedded system. Now days it is used everywhere. It is replacing cathode ray tube (CRT) screens frequently. Pixels are used for most flexible ones.

*c). Temperature Sensor*

LM35 series temperature sensors are used here. LM35 series are precision integrated circuit temperature sensor whose output voltage is proportional to that of Celsius temperature. It also possess low self heating and does not cause more than 0.1 ºC temperature rise in still air.

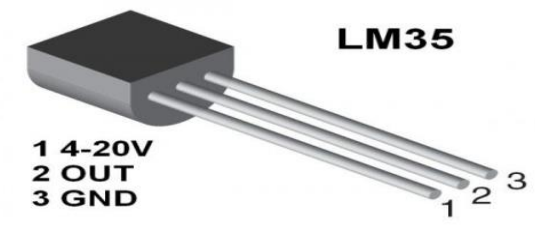


Fig. 3: Temperature Sensor

*d). Wi-Fi Module*

The ESP8266 Wi-Fi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. It has storage and processing capabilities hence can be easily connected to the sensors based on the application.

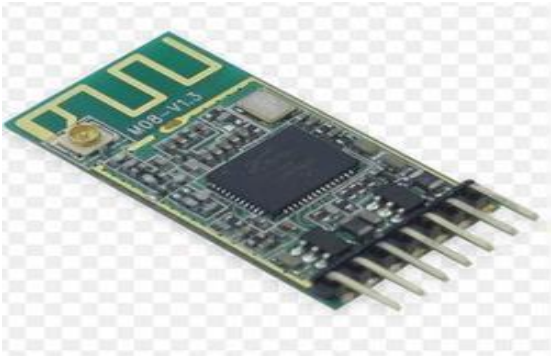

Fig. 4: Wi-Fi Module

*e). Heart Rate Sensor*

The heartbeat sensor is based on the principle of photo phlethy smography. 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).

Fig. 5: Heart Rate Sensor

*f). Arduino Board*

Arduino is the single microcontroller, planed to make building interactive objects or environments more accessible. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.


Fig. 6: Arduino Board

*B. Features*

- Atmega358 bit AVR microcontroller
- 16 MHZ crystal oscillator
- 10 bit ADC
- 2 VCC
- 2 GND
- 14 digital i/o pins
- 6 analog i/o pins
- On board FDDI IC

## VII. SOFTWARE DESCRIPTION

***Embedded C programming-*** The language extension of C programming is Embedded C, which was developed in order to address the common issues between C extensions for the different embedded systems. The programming gives the chances to change the software anytime whenever it requires changing anything in the programming of the whole system.

## VIII. CONCLUSION

As compared to the traditional existing systems it is more efficient method to monitor the health parameters of patient. This system is cheaper, takes less analysis time and consumes less power. This also gives accurate and effective measurement of health parameters of patients and also an efficient system in the field of medical. The future scope of this system, we can measure number of parameters like Blood Pressure, Respiratory Rate, and Pulse Oximetry etc with required interfacing system. We also enhance security parameter of system by using IPV6 communication technology to personalize and authenticate patient information.

As per consideration, each system has its own advantage. Every health monitoring system has different specification as per patient's requirement. This system provides more medical instrument facility on single system on-chip compare to conventional system. This system takes less than 1 minute to calculate result related to health condition.

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