Structural Health Monitoring System to Monitor and Diagnose Heart Attack using IoT

Dr. E. Punarselvam[1], N. Gokul[2], J. Jeyakumar[2], R. Lenin[2], S. Praveenkumar[2]
[1] Head of the Department, [2] Final Year Student
Department of Information Technology,
Muthayammal Engineering College, Tamilnadu,

***Abstract*:- Proposed law user's sensors as permit in accordance with discover mettle degree regarding checking the heartbeat of a person, men or women at the home. Sensor is interfaced to the microcontroller that permits checking morale degree readings and then transmitting the readings to them over internet. Proposing a far off sensing parameter regarding the ethnical body as consists concerning bough then room temperature to gets an accurate temperature of the patient. The parameters to that amount are old for sensing or monitoring intention send the facts through wireless sensors. And adding a net based totally looking at helps in accordance with maintain tune over the normal fitness fame about a patient**

Keywords: Internet of Things, RFID, GPS, WSN, LED, WSN, SHM.

I. INTRODUCTION

IoT is semantically related to two words "Internet" and "Things," where Internet is known as the global system that use TCP/IP protocol suite to interconnect different computer networks. Radio Frequency Identification (RFID) tags or barcodes have a unique identity, operate in a smart environmen Sensing devices are deployed in network to seamlessly collect and send in real-time raw data through the Internet to reach a data center . Wireless Sensors Network (WSN) is considered as one of key technologies of IoT and it is widely used in various areas such as healthcare systems, environmental monitoring systems, Structural Health Monitoring (SHM) systems, etc. Wireless Sensors Network (WSN) is considered as one of key technologies of IoT and it is widely used in various areas such as healthcare systems, environmental monitoring systems, Structural Health Monitoring (SHM) systems, etc.As novel idea, IoT has rapidly become an attractive topic for researchers and industries. Its integration into monitoring systems like SHM will be advantageous to Industries, businesses, consumers, environment, individuals, and society. The idea behind SHM is to collect data from multiple sensors installed on structures in order to process and extract useful information about current state of the structure for maintenance and safety purpose.

II. ARCHITECTURE DESIGN OF INTERNET OFTHINGS

The concept of integration of system is illustrated this is the concept of the project that shows the position of all the component which will be discussed in next section.If the ultrasonic sensor detects the output below 1 meter from the user, buzzer and LED will trigger and Vibrator Motor will decode the sound only if the obstacles detected exactly at 1 meter. The same process happens for distance 1.5 meters and 2 meters. The figure 1.1 shows Architectural Design of IOT.

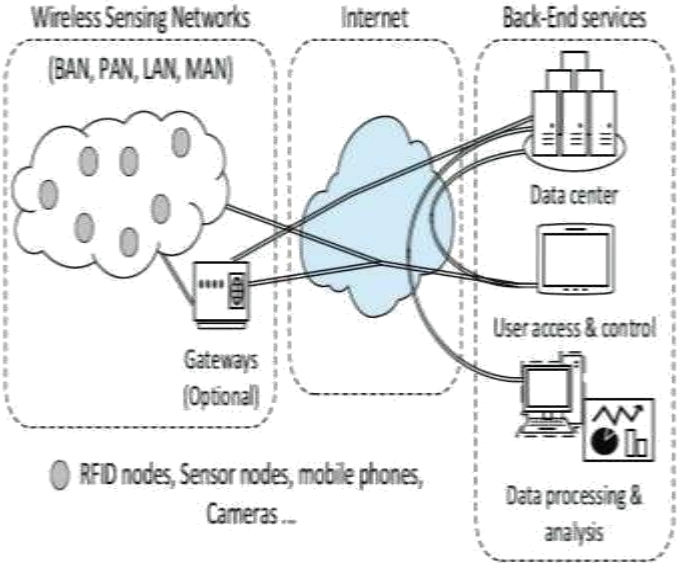

Figure 1. Architectural Design of IOT

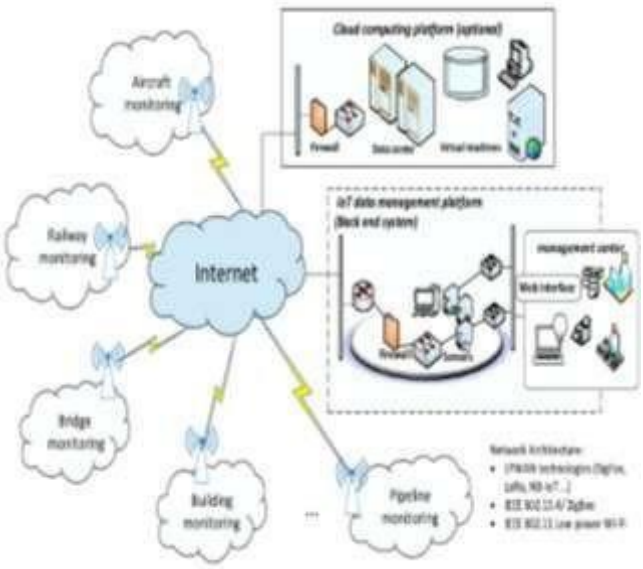

Figure 2. SHM framework overview based on IoT

II. PROPOSED WORKFLOW METHOD

In the proposed system, an efficient surveillance system is designed, that can monitor the patient on time and without the presence of the nurse in any place by using IOT technologies. In-house human behavior detection and Classification are involving in this system, even the patients can be monitored in any scenarios without any restrictions. Because of its compatibility and cost anyone can use this device so easily and its operation is too user-friendly. This system provides Global Communication with small size of devices with less power consumption.

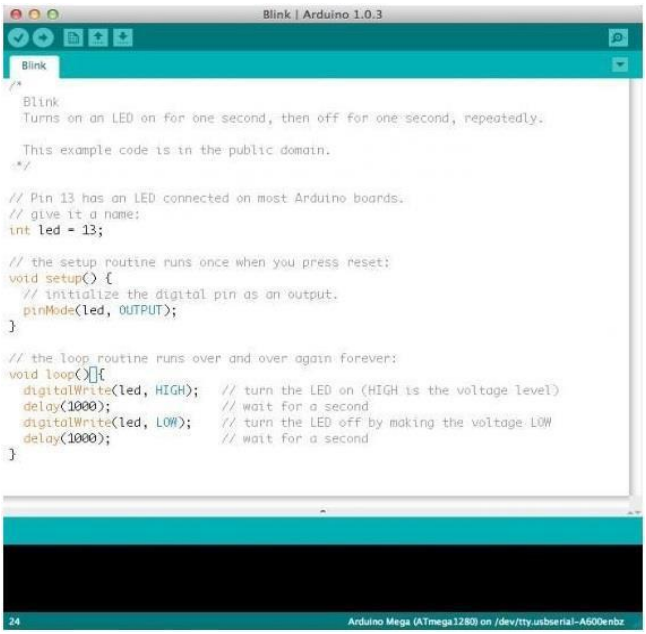

Figure 3.Arduino IDE Environment

Dataflow Diagram

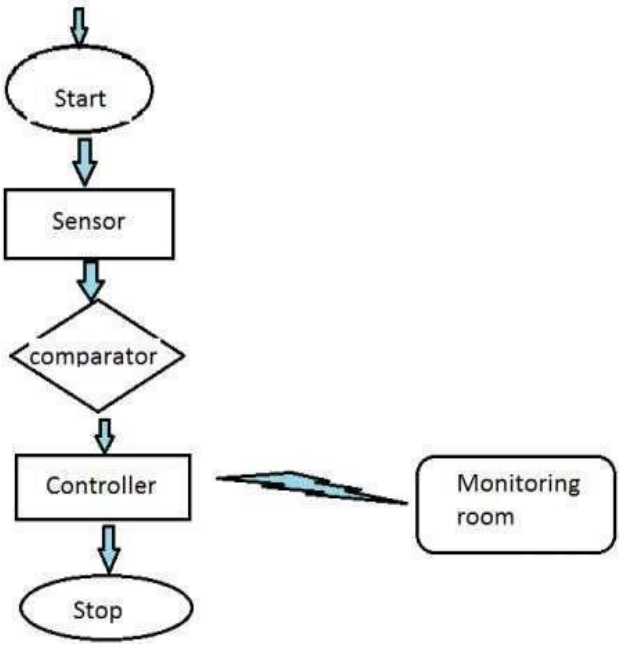

Figure 4. Workflow sequence

IV. HEART RATE MONITORING SYSTEM SEQUENCE DIAGRAM

1. Sequence Diagram

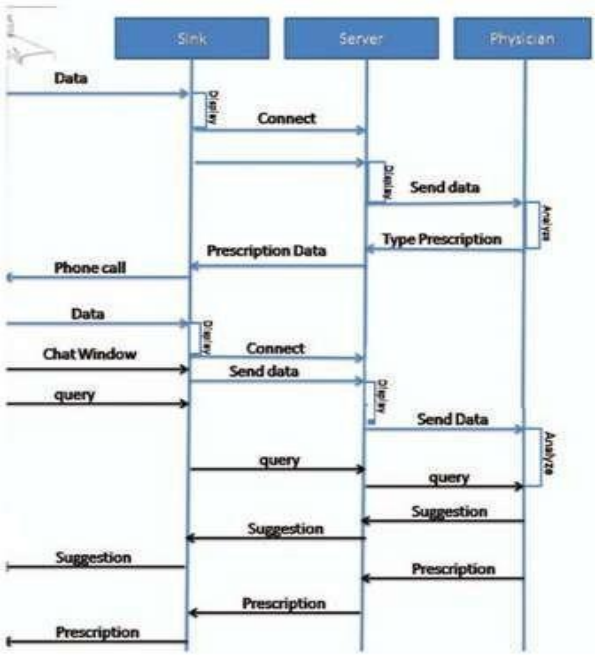

Figure 5(a)Sequence Diagramheart rate monitoring system sequence diagram

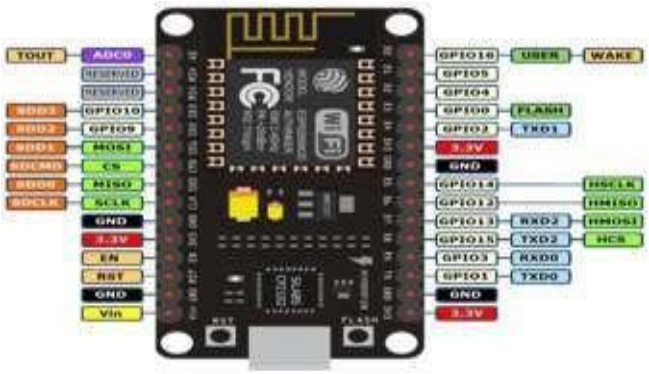

Figure 5(b)NodeMCU ESP8266 WiFi Module

2. THE BUTTON

The Button is a Wi-Fi connected push button designed by Peter R Jennings. The Button is design for single-purpose, internet-enabled functions. When the button is pressed, a connection is made to a web server which will perform the desired task. Applications include a doorbell or panic button.

3. NODEUSB

NodeUSB is an open IoT platform about the size of a standard USB stick. It was designed to

leverage NodeMCU (Lua) for easy programming and has the extra feature of USB capability. It is ideal for Plug- n-Play solutions, allowing easy prototyping for developers.

4. HIGH LEVEL OF INTEGRATION

ESP8266EX is among the most integrated Wi-Fi chips in the industry. Measuring just 5mm x 5mm, ESP8266EX requires minimal external circuitry and integrates a 32-bit Tensilica MCU, standard digital peripheral interfaces, antenna switches, RF balun, power amplifier, low noise receive amplifier, filters and power management modules - all in one small package.

5. USB-TO-TTL RS232 SERIAL COMMUNICATION CABLE

The USB TTL Serial cables are a range of USB to serial converter cables which provide connectivity between USB and serial UART interfaces. A range of cables are available offering connectivity at 5V, 3.3V or user specified signal levels with various connector interfaces. All cables feature an FTDI FT232R device integrated within the cable USB type _A' connector, which provide access to UART Transmit (Tx), Receive (Rx), RTS#, CTS#, VCC (5V) and GND connections. All cables are fully RoHS compliant and are FCC/CE approved. The cable is easiest way ever to connect to your microcontroller/Raspberry Pi/WiFi router serial console port. Inside the big USB plug is a USB<-

>Serial conversion chip and at the end of the 36" cable are four wire - red power, black ground, white RX into USB port, and green TX out of the USB port. The power pin provides the 5V @ 500mA direct from the USB port and the RX/TX pins are 3.3V level for interfacing with the most common 3.3V logic level chipsets. Because of the separated pin plugs, this cable is ideal for powering and connecting up to the debug/login console on the Raspberry Pi or Beagle Bone Black.

Connect the pins as shown to power the Pi or BBB and establish the RX/TX link.

- If you are running Windows 7/8/10 etc, check this tutorial page with links to drivers for both PL2303 and CP2102
- If you are running Mac OS X, check this tutorial page with links to drivers for both PL2303 and CP2012
- If you are run

  in the kernel, no need to install anything! Also handy for hacking WiFi routers to install alternate OS's, or nearly any other 3.3V logic serial port. This is easier to use than an FTDI cable in many cases because the wiresare separated. Note that we call this a "TTLcable"(sincethat's what they're called) but technically it's CMOS logic.

Figure 6. Heartbeat Sensor Module

6. Heartbeat Module

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. Luckily, the Pulse Sensor Amped can solve that problem.

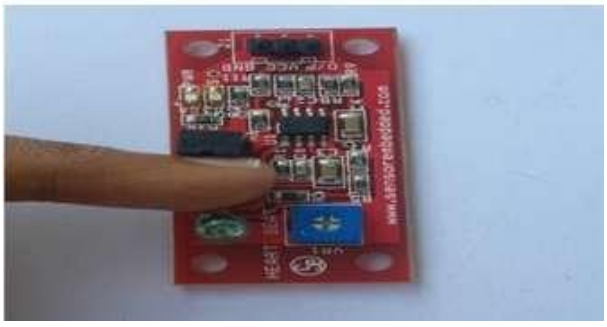

Figure 7.Heartbeat Sensor Module

The Pulse Sensor Amped is a plug-and-play heart-rate sensor for microcontrollers. It can be used by students, artists, athletes, makers, and game and mobile developers who want to easily incorporate live heart-rate data into their projects. It essentially combines a simple optical heart rate sensor with amplification and noise cancellation circuitry making it fast and easy to get reliable pulse readings. Also, it sips power with just 4mA current draw at 5V so it's great for mobile applications. Simply clip the Pulse Sensor to your earlobe or finger tip and plug it into your 3 or 5 Volt Arduino and you're ready to read heart rate! The 24" cable on the Pulse Sensor is terminated with standard male headers so there's no soldering required. Of course Arduino example code is available as well as a Processing sketch for visualize heart rate data.

V. RESULT AND DISCUSSION

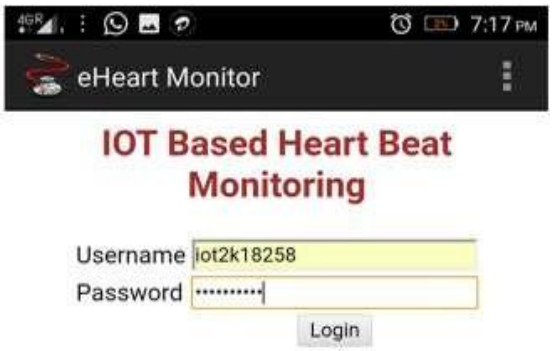

Figure 8. User name and password verification for IOT based heart beat monitoring system

A. HOME PAGE

Figure 9.Heartbeat Sensor

B. MOBILE NUMBER

Figure 10.Report displayed on Mobile Number

C. HEART BEAT NORMAL STAGE

Figure 11.Report for Heartbeat Sensor

D. ABNORMAL STAGE

Figure 12.Report for abnormal stage

E. MESSAGE NOTIFICATION

VI . CONCLUSION AND FUTURE ENHANCEMENTS

1. CONCLUSION

In order to provide a framework for IOT Based Heartbeat Monitoring and Alert System implementation, this is intended to give a survey of current technologies on IoT paradigm. It can be seen that the choice of wireless technologies, which address Structural Health Monitoring system deployment based on IoT, is extremely large. As IoT is a technology that is in trend, a myriad of technologies is being developed to meet all the requirements from IoT community. A number of solutions for IoT communications of Structural Health Monitoring have been proposed in recent years to connect net device, which is able to sense and collect useful information.

2. FUTURE ENHANCEMENTS

After checking all the pin connections and adding the library to the Arduino IDE and uploading the source code, run the code.

LCD display will be turned on to display the Human-Human Heart rate reading obtained by the Pulse Sensor. Place your index finger on the front side of the pulse sensor, you should see LED1 (red) glow in time with your Human-Heartbeat when you place your finger on the sensor.

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