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Implementation: IOT Based Healthcare Monitoring System

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Abstract: The Internet of Things (IOT) is a new mega trend in the internet. This paper effort on implementation of a smart healthcare monitoring system that uses the sensors to collects the user health data and transmit the data to the server through Wi-Fi module. The data is stored in the database if any patients data is not in the normal range then the caretaker as well as the doctor are notified through the message service.

Keywords: Internet of Things (IOT), WiFi, LPU, healthcare system.

I. INTRODUCTION

Researches indicated that more than 80% of old people are suffering from deathly diseases like heart attack, diabetes and other chronic diseases. Due to the lack of the resources and doctors in critical time many people are dying. At present there is no continuous health monitoring system that can track patient's health daily in their places that leads to the death of many old people and people staying far from the hospitals. Now a day's new technology is developing a lot. Advances in the information and communications technology leads to the development of the IOT. IOT is nothing but a device such as sensors, hardware, software, physical devices that communicates with each other. IOT is an emerging technology that developed in 2003.it is a new trend in the internet. Our idea is concern with the development and implementation of a system that continuously monitors the patient's health and notifies the doctor and the patient's caretakers in case of any issues. Our system comprises of the sensors that are attached to the user body and information received from the user body is send to the server and in the critical situation the server will send a message to the doctor and caretaker about the patient's condition through an android app.

II. PROPOSED SYSTEM

Our system consists of three modules.

1. Data Collection Module

One end of the sensors is connected to the human body and the other end is connected to the microcontroller. The data collected from the sensor is sent to the server by WI_FI.

2. Alert Module

After the data is received from the system the server will compare the received data with the range provided if anything is wrong then the message will be sent by app.

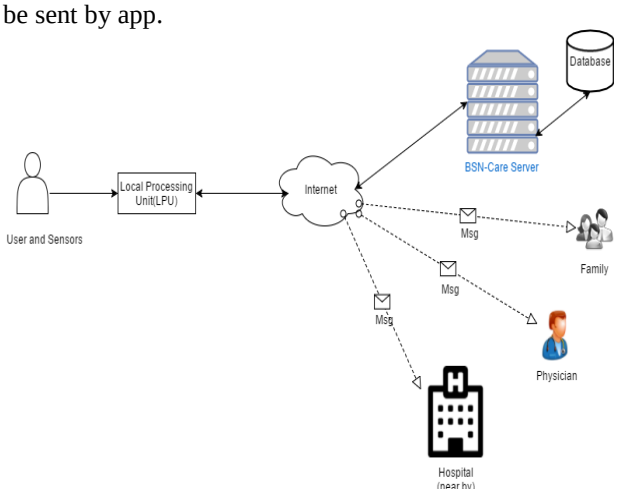

Fig 5.2 -System Architecture

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III. COMPONENTS USED

1. Arduino Nano

The arduino is a microcontroller board it is shaped based on the ATmega328. It contains 14 pins of input or output, 8 analog pin, 16 MHz ceramic resonator, USB, reset button. The microcontroller on the board can be encoded by means of the arduino programming language and the arduino development environment.

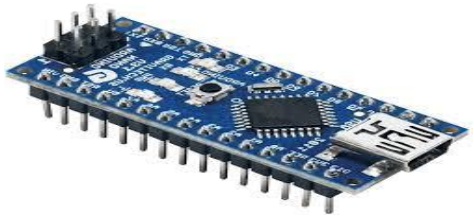

Fig -Arduino Nano

2. Heart Beat Sensor (pulse)

The heart beat rate depends upon the rate that blood pumps from the heart to the other body parts. It is basically calculated by the bpm. Normal heart beat for the human should be in the range of the 60 to 100 per minute. Pulse sensor which is used to measure the heart beat it will measure through the flow of the blood.

Fig- Heartbeat Sensor

3. Temperature Sensor (DHT11)

The DHT11 is the basic temperature sensor that collects the temperature deatails of the surrondings in the form of the ^{0}c. It measures the temperature bu using the thermistor.

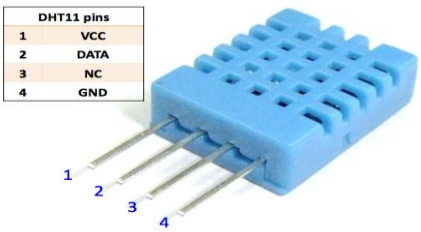

Fig- Heartbeat Sensor

4. Motion Sensor (Accelerometer Sensor- ADXL335)

The motion sensor is used to detect the motion of the user. It is sensor consists of X, Y and Z axis. If all the axis are in the same direction then the user is not in motion when the three axis are not in the same plane then the user is moving.

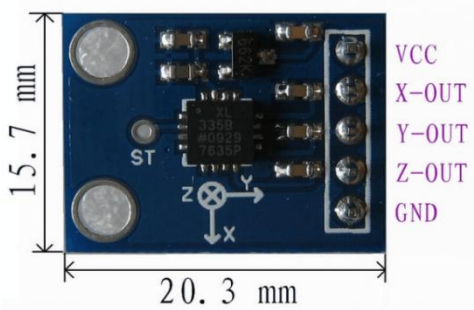

Fig- Motion Sensor

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5. Breathing Sensor (nozzle air flow sensor)

The breathing sensor which is used to detect whether the user is breathing or not . The sensor should be attached at the end of the nose. The output of the breathing sensor is 0's and 1's. if the person is breathing it will show 1. It will show 0 if he is not breathing.

Fig - Breathing Sensor

6. Node MCU

Node MCU is a low cost Wi-Fi technology that is used to transfer the data from the Arduino board to the server with the wireless connection. The node MCU uses the mobile hotspots and LAN connection.

Fig- Node MCU

IV. LANGUAGES USED FOR IMPLEMENTATION

1. The java programming language

Java is basically both programming language and a platform. Java is high level language and it is object oriented. Everything in java is object.in java all code must be written in plain text files ending with ".java" extension. Those sources are compiled into ".class" files by the compiler (javac).

2. MYSQL

MYSQL is the open source data base management system developed by the oracle. A database is mainly an application that stores the information each database has the dissimilar API's for making management and opening the data its holds.

3. Embedded C language

It is basically a high level programming language. It is used in our project for coding the hardware components and it is the extension of the c language.

4. JSP page

Java Server Page is a kind of technology that allows the coder to develop dynamic web pages by using the HTML or Xml etc. IT uses the java programming language. To run the jsp page a supported server need to be there like tomcat or jetty.

V. ALGORITHM USED

- Start
- Step 1: Patient should register.
- Step 2: Login.
- Step 3: The controller fetches the data from the sensors attached to the patient body.
- Step 4:Check if server connection working
  If yes go to step 5.
  Else show the error message.
- Step 5:Send the patient data to the server via WI-FI module . And save the data to database

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- Step 6:Check if the patient data is within the stranded range or not .
  If yes go to step 8
  Else go to Step 7.
- Step 7:Send the message to the doctor and the caretaker.
- Step 8:Repeat above steps for infinite loop.
- Stop.

VI. RESULT SCREENSHOT

The following snap describe the outcomes or outputs that we will get after step by step execution of all the modules of the system. After comparing the range of the data message will be send if there is any critical situation.

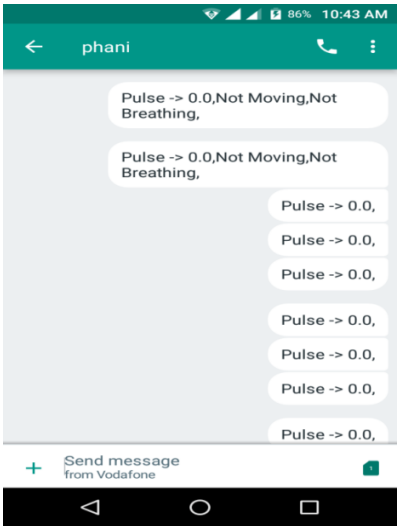

Fig - Message Received

VII. CONCLUSION

In this paper we discussed about the implementation of the health care monitoring system for the continuous monitoring of the patient health an the languages used for the implementation and we also discussed about the result of how the message will received when there is any abnormalities in the data .

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