An Intelligent Medical Assistantship in Trains Using IOT

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Abstract*:* Railways is one of the old and developing mode of transportation. Railway transportation offers reduced time travel, energy conservation etc., This mode of transportation plays a major role not only in transportation but also safety of humans traveling in it. In this modern era of technology, we develop many technologies to protect human life but we haven't seen one installed in train. Our paper is mainly based on providing a emergency medical module in trains, so that it can help people in emergency situation in train. We propose a controller-based technique to give first aid support to the emergency patient and the details will be transferred to the loco pilot by implementing this technique to save the life of emergency patient in travel. We use Arduino Mega as controller and heartbeat and temperature sensor to sense the patient's heartrate and temperature and IOT to transfer the information.

Keywords: Arduino Mega, IOT, Heartbeat Sensor, Temperature Sensor, Emergency medical module

I. INTRODUCTION

Railway transport are being used by wide range of people nowadays. Many people prefer Railways over travelling in roads because of the accident and traffics in roadways. Railways are also inexpensive and the travelling time is also less when compared to other modes of transportation. Indian Railways is the biggest railways system in Asia and the second biggest railway system of the world and also provides employment for 17 lakh people through railways. Throughout these years we have seen several types and upgradation of train, from stream engine trains to full air-conditioned train, express trains and with all fancy facilities. We never witnessed a better medical system in train for emergency medical situation. On the other hand, we have started to develop medical assistants which doesn't need any doctor supervision, can take care people's health and their health problems. These two different things no medical facility in train and advanced and developing medical facility in hospital gave us a way to work on emergency medical assistant in trains. The main objective of this paper is to design a module that helps the people in train during emergency health conditions and to provide basic first aid for patient

II. LITERATURE SURVEY

An IoT based Patient Health Monitoring System: This is for specially monitoring the old age patients and informing doctors and loved ones. So we are proposing a innovative project to dodge such sudden death rates by using Patient Health Monitoring that uses sensor technology and uses internet to communicate to the loved ones in case of problems. This system uses Temperature and heartbeat sensor for tracking patient's health. Both the sensors are connected to the Arduino-uno. To track the patient health micro-controller is in turn interfaced to a LCD display and wi-fi connection to send the data to the web-server (wireless sensing node). In case of any abrupt changes in patient heart-rate or body temperature alert is sent about the patient using IoT. This system also shows patients temperature and heartbeat tracked live data with timestamps over the Internetwork. [1]

Smart health monitoring system of patient through IoT: The patient health condition or status i.e., Pulse rate, Respiratory rate, Body Temperature, Position of the body, Blood glucose, ECG and so on can be measured by utilizing the Non-invasive sensors. These sensors are associated with the Arduino Uno board, it gathers the information i.e., Biomedical data from the sensors and the detected biomedical information can be transmitted to the server. The "Thingspeak" named new cloud is utilized here to place the detected information into the server. From this server the information can be envisioned to the specialists and other paramedical staff by Thingspeak android app.[2]

III.PROPOSED SYSTEM

The System proposed here is built by using embedded system and IOT. Firstly we use Arduino MEGA for this system which is the main part of our project. We have temperature and heartbeat sensor to monitor the the human body temperature and heartbeat in emergency situation. There will be an emergency switch in each compartment which acts as input and APR module provides audio as emergency alert. The LCD will be placed in loco pilot room and all the data are uploaded in cloud using ESP8266 IOT module with an alert message

IV. BLOCK DIAGRAM
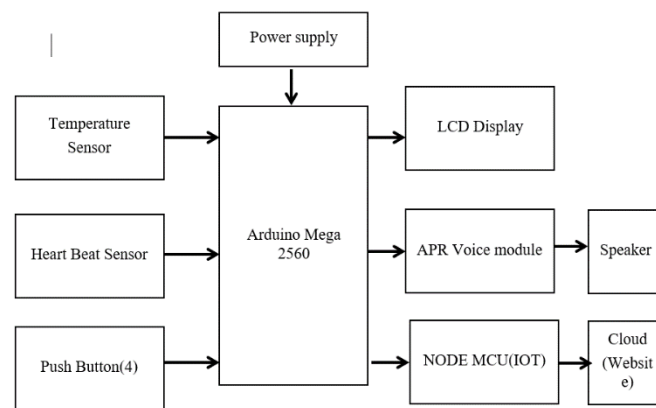
Fig 1. Block Diagram

A. The Arduino Mega 2560 ia a microcontroller with 54 digital input/ output pins, 16 nalog inputs, 4 hardware ports , a 16 MHz crystal oscillator and there is also USB connection port, a power jack and a reset button

Fig 2. Arduino MEGA board

B. The Liquid crystal display is an electronic display module which we used to display the output

C. Temperature Sensor is a sensor which can be used to measure temperature with an electrical output proportional to the temperature in celcius
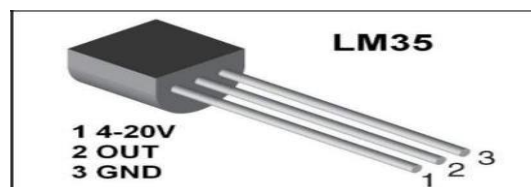

Fig 3. Temperature Sensor

D. HeartBeat Sensor which is used to measure the heart rate with a bright IR LED and a phototransistor to detect the pulse in the finger
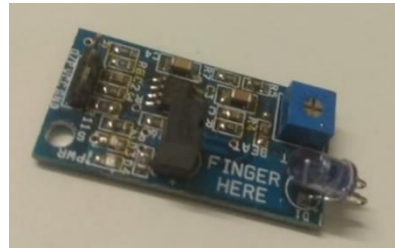
Fig 4. Heart Beat Sensor

E. APR9600 voice IC is a low-cost high performance sound record/replay IC which is used to store pre-recorded voices incorporating falsh analogue storage technique

F. Node MCU(ESP 8266) , the iot module used here, offers a bridge between the contoller and the Wi-Fi and it is also capabe of running self-contained applications
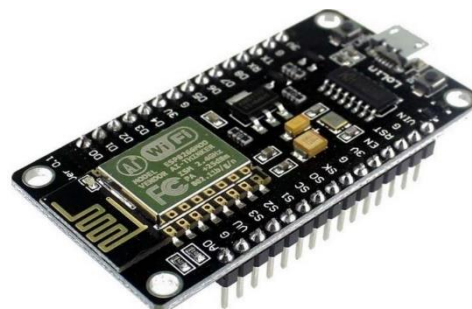

Fig 5. Node MCU

V. FLOWCHART AND WORKING OF THE SYSTEM

The Arduino Mega 2560 microcontroller is the main part of our system. Since this is a basic emergency module we planned to measure heart beat and temperature of the patient using heart beat and temperature sensor and the measurements will be displayed in LCD. Simultaneously an alert voice message will be delivered to each compartment using APR Voice module, searching for any doctors aboard. All the data fetched with the help of sensors are updated to cloud therefore all the operations are controlled and monitored by IOT.
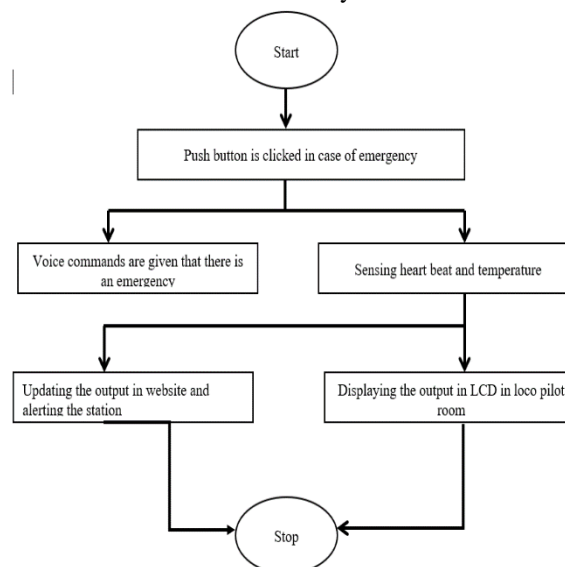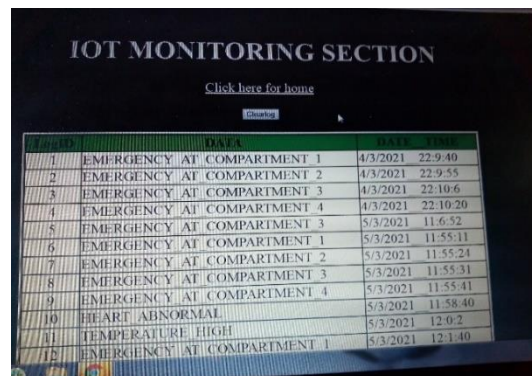

Fig 6. Flow chart

VI. HARDWARE CONNECTION AND RESULT

The digital pins of Arduino Mega are connected to Liquid Crystal Display, Push button, Heart Beat Sensor and to the receiver of Node MCU. The analog pins of Arduino Mega are connected to the Temperature Sensor and APR Voice Module. Further APR voice module is connected to a speaker

Fig 7. Temperature and Heartbeat rate data

Fig. 8 Emergency message at cloud

VII. CONCLUSION

In conclusion, the idea or module proposed here is to provide an emergency medical assistantship to the passengers in train. Compared to related systems, our proposed system which is cost-effective will be robust enough to facilitate much safety. This module is designed in order to provide medical care to every people in spite of the place or qualification. Human life are costless, so protecting it is the main influence of this project.

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