Drive and Driver Monitoring System

Aniket Birle, Siddharth Ghadge, Girish Chavan, Anagha Mane,
Pratiksha Kotwal
Department of Electronics
Walchand College of Engineering, Sangli, India

Abstract— *Drive And Driver Monitoring system is a driving behavior and monitoring device which is designed and devloped to keep a track on Automobile, driver as well as his driving, thus to ensure the protection and safety on the road. The main and important intention of this project is to design and develop a system that we can install in any type of mobility vehicle so that we can keep a track , collect and store data. To construct safe vehicles, helping insurance companies and investigating agencies with their investigation related to vehicle crash and magnifying road status so the result would be decrease in death rate.*
Keywords *used —Speed Sensor, Temperature Sensor, Alcohol Sensor, Tilt Sensor, Arduino, Node MCU, GSM Module, DC Motor.*

I.   Introduction

Drive and Drivers Monitoring System is a Driving Behavior Monitoring Device, designed to keep an eye on rash driving, driver and car status thus ensuring more protection on the road. The flight data is recorded inside the aircraft itself, ' The black box' technology would now play a critical role in investigations. Of accientds.In accordance with the reports of World Health Organization, Geneva approximately 1.3 million people are victims each year only due to transportation related accidents. Aiming to minimise the death rate due to accidents, our system would draw the very first step to find a solution to this problem that crosses every nations boundary and endangers the safety , security and health of people around the world. This system was installed in some vehicles of the United States in 1999, and it proved itself.It was efficient. But in the latter event, the system was not introduced in the vehicle. Therefore, in addition to improve the treatment for accidental victims , enhance the road way ranking , reduces the death rate, making up of safer mobility maching, and helping insurance agencies with their inquiry, the main motive of this project is to develop a working model that can be introduced and installed in any mobility machine present worldwide. Conventional perceptions of every industry is radically drifting towards IOT development and usage of it. Automobile industry is one of the leading industry amongst them. Guessing the maintenance, Wi-Fi capabilities driven by 3G/4G/5G functionality, Car to Car connectivity,Accident monitoring,Vehicle Telematics,Rider Assistance and advanced fleet management are only a few examples of how IOT devloptments are changing the style of the modern automotive age. If you're eager to take a deep look at how IOT based solutions in automotive industry are reshaping the world then you will need lots of time and efforts.In this project we are trying to develop a Drive and Drivers Monitoring System using different mechnisms which are assembeled with a power efficient microcontroller. Sensors we have used are GSM module and Node MCU (ESP 8266 wifi module), which are connected with the microcontroller.

In the output zone, we will be using cloud computing services and create a data storage which will store the data collected from the various sensors. This will also provide a Dashboard for data visualization for the user. The working of system is in such a way that the sensors collect all the information and sends it to the microcontroller which stores it and we can get the data whenever required. The storage of data will ensure data usage whenever needed.

II.   Literature Survey

The approach is "Intelligent Drive and Drivers Monitoring System using IoT " The main intention of this paper is to provide vehicle safety,driver, passanger security and also provide a full time solution that automatically alerts the driver to be cautious.We would continuously monitor the performance of automobile using different sensors and the behavior of driver with use of IOT . The proposed working model is to be applied in the community which is very price conscious and also it occupies much lesser room. The controlled strategy coding for calculation of the dicharged gas limits has been done in PIC Micro-controller which examinies the data and sends the results which are then compared with the standard values. Driver and closeby

controlling units are regulated with feedback and alerts if the dadedlines are surpassed. The Gas sensor used is introduced to the provided control system by showing the conditions on Display provided. The motive of the project is to develop design and develop a working model of Monitoring System for identification of vehicle that can be planted into any vehicle worldwide. This working module can come into reality with least requirement of circuits and lesser lines of coding. This can lead to build safer automobiles, enhancing the treatment and care for accident victims, helping insurance companies with their supervisions related to accidents, and bringing up road safety so that the result would be decrease the death rate.

The main goal of this work is to design and develop a detection system with use of IOT. In the case of sudden accident which striked to the driver or the passenger inside the vehicle, a death may occur because of delay in clinical help. Sensor are been into communication with the micro controller used in circuit and it collects the different kind of driving factors in type of UBIDOTS (Open Source Cloud). This introduces the working model vehicle black box system. It contains the cluster of sensor and also orders the black box to send a warning message to SIM card number .

This prototype is fully devoted to two main proposals. Firstly how to identify and collect data from the mobility machine. Lastly,a reliable way to represent the recorded numbers to the client in simplest manner possible.

The working prototype aims to record accidental analysis by impartially tracking what exactly happens inside casbin as well as outside the vehicle. The working prototype also provides enormous boost of security by putting brakes to modification of the stored data.

The sensors are to be connected in and on the vehicle to keep an eye on activity of the driver and his vehicle, where the stored reading from sensors will be forwarded to the Email address stored in system and also by short message service(SMS). The website and readings from sensor stored can be traced in real-time. The accident and its approximate locality are reported for clinical help so that he could get immediate help. This system mainly puts light on improvising the assistance for injured persons of the accident, helping and easily detecting forgery with insurance companies.

The working model provides the solution to keep an eye the gases from the vehicle to increase the life expectancy of the automobile and to reduce sharply environmental pollution. This system will also detect Alcohol and closely monitor the driver's conditions. The Tilt Sensor will continuously monitor the slope on which the vehicle is driving and we can set the tilt height at which vehicle can sustain. This will alert the driver weather if he is driving against the vehicle capabilities.
The proposed system is pocket friendly and easy to maintain.

This working model proposes Drive and Drivers Monitoring System for early discovery and forecast of accidents and also to avoide vehicle robbing. It depends upon IOT technology to keep an eye on the conditions of Driver and his Drive continuously and also to get in touch with the data from any corner of the world. The device installed in mobility machine is developed with help of Micro controller that comes with sensors to discover and forecast accidents as soon as possible. This will allow the user to continuously keep track of vehicles location. This data would be very useful for finding the automobiles locality in case of crash or robbing. The end outcomes of proposed system were quiet satisfactory and efficient.The model detected the crash, found the status of occupants and also detected the speed of vehicle.

The Monitoring of vehicle is collected through planted and connected sensors, microcontroller chips, GSM and Internet. We can reach to the Monitored data at any place in world through Internet by Front End Coding. Long Distance Communication is achieved by using Wireless Communication. The proposed prototype provides us enhanced automobile care and vehicle repairy. The working model is devloped to do task correctly and efficiently in areas with high noise levels and in wild and deadly circumstances.

III.   Proposed System
A.   Node MCU
Node MCU is an open source platform which is specifically designed for IOT projects. It is cost effective. NODE MCU has a little board which is based on ESP8266 WiFi module which is specifically used for working with or without micro controllers.This chip can work with Lua scripting language which supports for the ESP32 32-bit MCU.
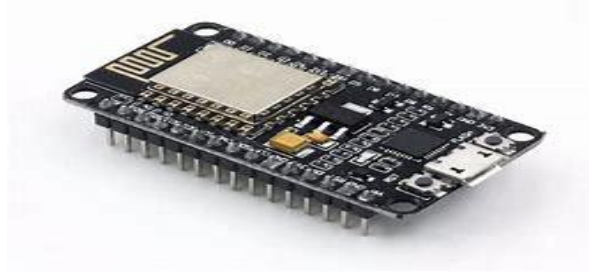
B.   Alcohol Sensor
MQ-3 is a gas sensor which is used for alcohol detection. It is a Metal Oxide Semiconductor (MOS) type of sensor. It is a economical semiconductor Gas sensor Module which would provide us analog and digital output as per our needs. It requires no any extra external components.We need to just plug in VCC & ground pins to use this sensor.

C.   Speed Sensor
A potentiometer is used for measuring the speed of the automobile. The potentiometer has 3 pins in total. First two terminals (the blue and green colored) are connected to an element having high resistance and the remaining terminal (the black colored) is attatched to an adjustable wiper.
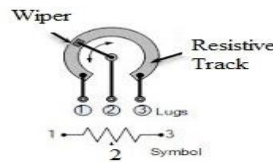
D.   GSM Module
GSM Module is a semiconductor wafer that can establish a connection to the GSM Network by using a SIM (Subscriber Identity Module) .Its can operate on frequencies: 850MHz, 900MHz, 1800MHz and 1900MHz


E.   Temperature Sensor:
We are using LM35 temperature sensor. In this, the temperature sensor continuously reads the temperature and sends to the microcontroller and temperature value is converted into electrical signals.LM35 has temperature sensing range from -55 to +150°C.
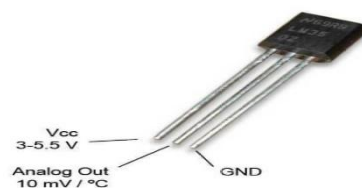
F.   Tilt Sensor

The ADXL335 (Tilt Sensor) is an accelerometer which works in all 3 axis along with signal conditioned voltage outputs.It is tiny,slim and pocket friendly. This sensor is able to measure acceleration with a minimum full scale range of ±3 *g*. This sensor also measures static acceleration of gravity in tilt-sensing applications, as well as dynamic acceleration which is a result of motion, shock, or vibration.
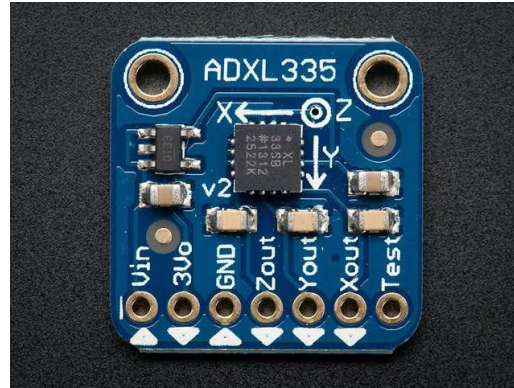
IV.   System Block Diagram
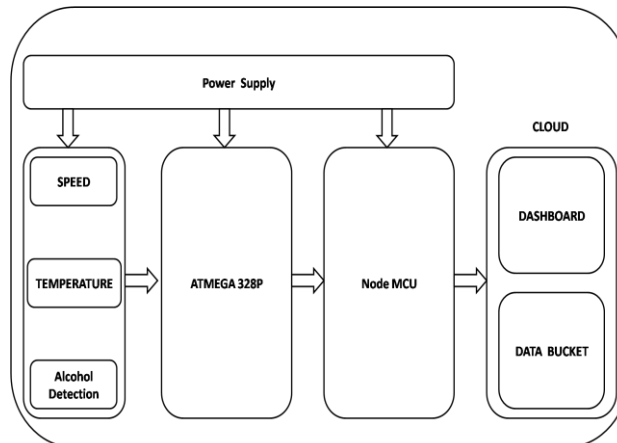
Fig(1). Block diagram for IOT based Black Box System

V.   Methodology

Firstly, turn on the power supply to the circuit. After turning on the power supply, the sensors are activated and the data from the various sensors (values) are stored in the EEPROM of the microcontroller. This includes values of all the sensors such as Temperature sensor, Alcohol sensor, potentiometer, etc. Along with the data stored in the microcontroller, the same data is also send to the cloud creating a dashboard of the data. Continuous monitoring of the sensor values is done in the cloud. Now, we have to determine the threshold value of the sensors. It is done when all the sensors are integrated like if the temperature goes beyond a certain limit, so when these sensors exceed limit, immediately send the alert signal is sent to the car dashboard.
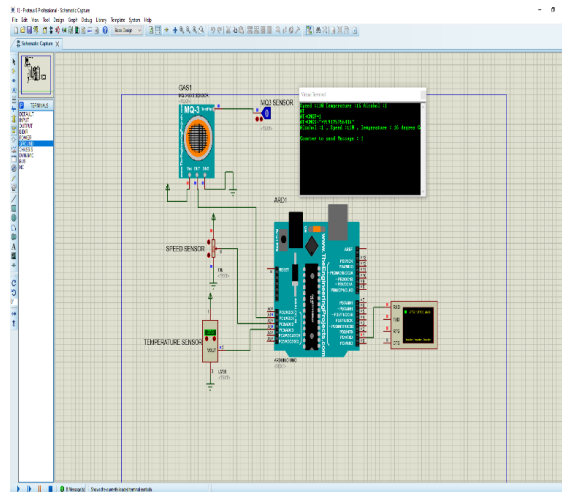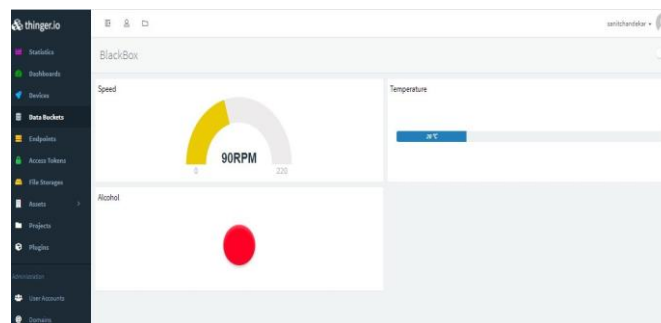
VI. Results

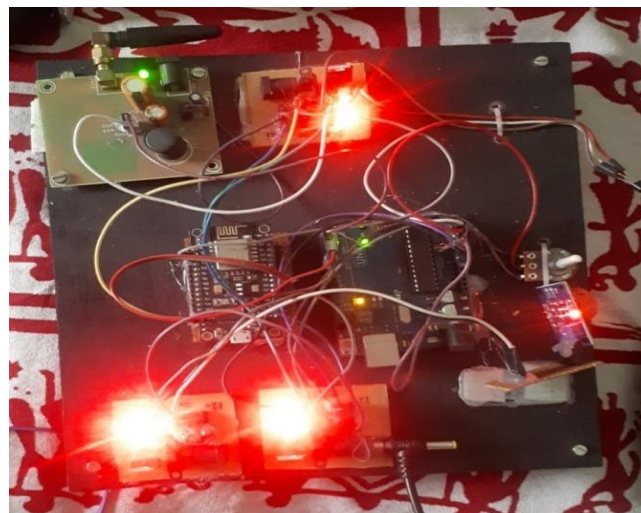Fig.(2) proteus output

Fig.(3) cloud output

Fig (4) hardware output

VII. Conclusion

The prototype of DRIVE AND DRIVERS MONITORING SYSTREM for analyzing and forecasting accidents that can be connected to any mobility machine is designed with least number of components. This working model can contribute to build more safer automobiles, enhancing the medical assistance for needed, helping insurance agencies and investigation agencies with their investigations, and increasing transportation safety so that we can cut down the death rate drastically.

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