TWO -WHEELER MONITORING SYSTEM USING IOT

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Abstract : The rapid growth of advanced technology and the accessbility of open source and hardware systems are establishing a new direction in system design. Using Advance technology IOT (internet of things) data processing and data analysis become easy. Hardware device can communicate and interact with each other via internet using IOT. As we know safety and security are prime concern in today's era. This project describe the effective system that monitor vehicle parameter in travelling such as Tire pressure, Engine Temperature , Fuel level, Engine Control and Location tracking etc, With the help of Micro controller(NodeMCU) and GPS module for data transfer.

***IndexTerms* - GPS, NODE MCU, INTERNET OF THINGS.**

I. INTRODUCTION

As safety become prime concern in this era , vehicle monitoring plays important role in that . Monitoring of vehicle is an essential activity for user to live secure lifestyle. It promotes technologies such as the IoT, ubicomp computing and the accessibility of affordable hardware systems, establishing a new direction/fashion in system design. Vehicle health monitoring[1] is an necessary functionality for user to avoid accidents and lead a safe lifestyle[7]. By using our system user get information about different vehicles parameter[6] and save the time.

Using Internet of Things i.e (IoT) technology make data processing, analysis and collection ease. IOT is system of interrelated computing device[2] , network connectivity, objects or people that provides distinct identifiers and capability to transfer data over internet. IoT sensed the object and controlled remotely across network[10] . "Things" refer to wide variety of devices in IOT. Things which collect info and send it and also receive info and act on it or do both.

The IoT helps in communication through the network, monitors and processes information through various transport systems. Various IOT applications in the transport sector, i.e. monitoring the vehicle[5], driver or user and data through the network[3]. The interaction between the components of a vehicle monitoring[4] system allows Inter and Intra communication between the vehicle, vehicle monitoring, location detection, theft control, fleet management and vehicle security. The network used for communication plays the main role in the IoT[11]. The technologies that support the IoT are direct WiFi, Bluetooth, GPS, GSM, Ethernet, ZigBee optical technologies such as Li-Fi. The IoT has a long way to go and it will certainly grow exponentially in the coming years. The use of an open source microcontroller such as (NodeMCU) and a GPS module make our system efficient, easy to use and economical.

II. Objective:

The system is designed to perform testing the various vehicle parameters useful to the user for the safety and understanding of vehicle conditions. Proto vehicles undergo various tests, such as internal and external tests. These tests are necessary to improve the design model. Developed system will be used to test vehicles. Table I provides information on tests performed on vehicles and the respective two-vehicle parameters are noticed by us.

| Outdoor test formed on system	Observed Parameter
Speedometer	Vehicle Speed ,vehicle location.
Temperature	Engine Temperature.
Tire Pressure	Tire Temperature, pressure in (PSI)
Fuel Consumption	Average fuel consumption level.
Engine control	Control vehicle engine ,vehicle location.

Fig(II.1):Outdoor test performed

1. **Workdone:**

Many of the researchers involved to Installation of Intelligent Event (ITS) for numerous solutions such as IOT based vehicle tracking systems[1], fleet management, intelligent vehicle with GSM alarm system[6], vehicle anti-theft system, vehicle tracking system based mainly on the line of transfer of latitude and longitude SMS from the knowledge of the GPS and the car to the finishing systems. Tons of analysis were performed together in the web-based vehicle tracking system, wherever lat and long are send towards server using hypertext transfer protocol. As an advanced technology, many researchers had explore the web of objects (IoT) for vehicle tracking, however the system includes a GPS to track position of this vehicle[6]. After discovering those systems we got the basic ideas of the system. Combine all the parameters in a single system and verify them, tracing them with the GPS for the user's safety and observing the vehicle. Security purpose we can use any of the algorithm such as SHA256 & SHA512 using cluster based sensor network[5].

2. **METHODOLOGY**

Our system has NodeMCU and GPS. The vehicle details and position coordinates of the GPS module have been delivered to Micro-controller. The controller send sensed data to the cloud using WIFI technology. We are using the Node MCU microcontroller which has an integrated WIFI feature, so we use WIFI for data transfer[4]. Vehicle parameters such as vehicle speed, vehicle position, engine temperature, tire pressure, fuel level, engine control, etc. These parameters are stored in the cloud[2] and accessible by the user via the Android application. At the same time, vehicle data is sync with google map for betterment of location tracking[7].
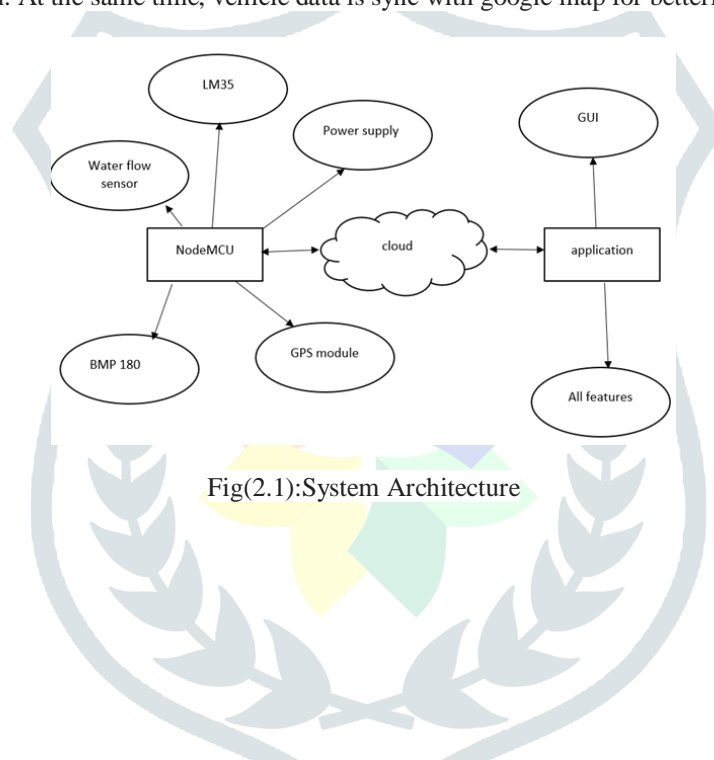
Fig(2.1):System Architecture

3. **Hardware used:**

3.1 NodeMCU

   NodeMCU is a Wi-Fi SOC(System on a chip) produce by Espressif System. It is based on ESP8266-12 Wi-Fi module. It is highly integrated chip, Which is designed for the purpose to provide internet connectivity in small package. It's an open source platform for the IOT similar to Arduino. NodeMCU uses simple programming language like Lua or Arduino IDE.

3.2 LM35

   LM35 is Temperature sensor with 3 pin. It measure temperature ranges from -55 0C to 150 0C. Three Terminal device which denote the analogue voltage proportional to temperature. In THIS Output pin given to A0, one pin for +5v and 3rd one is for the GND(ground).
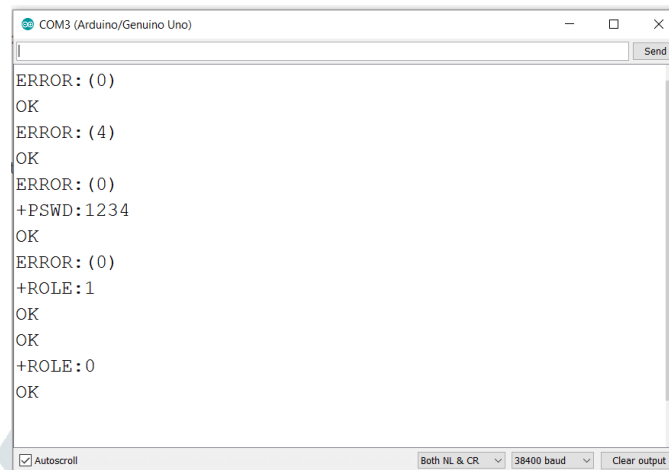
3.3 BMP180

   The BMP180 is that the operate compatible successor of the BMP085, a replacement generation of high exactness digital pressure sensors for shopper applications. The ultra-low power, low voltage physical science of the BMP180 is optimized to be used in mobile phones, PDAs, GPS navigation devices and outside instrumentation. The I2C interface permits for simple system integration with a microcontroller. The BMP180 chip solely accepts one.8V to 3.6V input voltage.

4   RESULT AND VALIDATION

Using WIFI configuration interfaced done with Node MCU to get GPS parameters such as vehicle speed ,pressure and temperature. NodeMCU is programmed to process data of vehicle parameters and send it to a cloud. Bluetooth module are configure using AT commands which are performed via Arduino code. These Command are used to make communication between Bluetooth model as master and slave response are checked on Arduino's serial monitor.
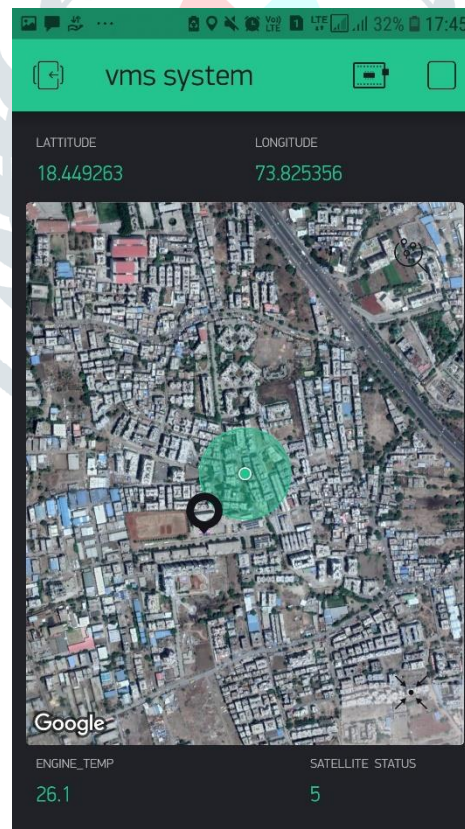
Serial port of Arduino:

Fig(4.1): Bluetooth Configuration using AT command

An Android Application is developed to display various parameters sent by NodeMCU and GPS module on the cloud[8].To display the real time vehicle location on the map , sensed data or parameter are linked with Google map.

Fig(4.1): Location of vehicle and user display on map

5.   Advantage
- Our System shows all parameter details on phone.
- Real-time wireless transmission of data.
- The system save user time.

6. Conclusion

AVMS system will used for Monitoring different parameter and also u can track the location of vehicle from any location with the help of application. Open source and IOT(Internet of thing)platform make our project effective ,coherence and profitable.

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