

## **Real Time Vehicle Monitoring By IOT Application**

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**Abstract**—Vehicle is continuously for many hours. It is necessary to early detect the any symptoms of any vehicle trouble. Raspberry Pi 3 using Sensors are used to detection of condition without relying. This sensors are cautiously monitoring the different parameters like Engine temperature, vibration, Brake Temperature, Brake links, Oil level in Engine, Fuel level in tank. These sensors will collect the data from different parameters of vehicle and Raspberry pi 3 gather this data. From the Raspberry Pi 3 the data will sent to the main server. Through that server, the user can get completed information of that vehicle condition. By using this IOT application user can able to proper monitoring and maintained of vehicle condition.

**Keywords**— Vehicle, Raspberry pi 3, Temperature Sensors, Vibration Sensor, Float Flow Sensor, IR Sensor, Website

### **INTRODUCTION**

The vehicles has been around more than 100 years. Since the development of automobile invention have been made to improve their safety. Vehicles are operated for many hours for long distance. It is necessary to early detect any symptoms of vehicle trouble. They get some problems due to low maintained. Now a days there is a tremendously growing in traffic special in cities. If there is any unfit vehicles or any problem vehicle leads to an accident which will be affected by the major loss. By this project we can decrease the accident and mainly less pollutions and have maintained a good environment. It will also increase the life cycle of the product.

### **INTERNET OF THINGS(IOT)**

The Internet of Things generally refers to scenarios where network connectivity and computing capability extends to objects, sensors and everyday items, allowing these devices to generate, exchange and consume data with minimal human intervention. The Internet of things was first in the year 1999 by British Technology pioneer Kevin Ashton. The internet of things led to a wave of connectivity between the vehicle and intelligent transportation. The IOT is very simply to interconnected devices that generate and exchange data from observations, facts, and other data, making it available to anyone. IOT solutions are designed to make our knowledge of the world around us more accurately. IOT get data about anything from anywhere at any time. IOT is a system of interrelated computing devices, mechanical and digital machine.

#### **Objectives:**

- Engine Temperature
- Fuel Level
- Oil Level
- Brake Temperature
- Brake Links
- Vibrations

### **HARDWARE COMPONENTS**

Hardware Components like Sensor and Signal Board are used in this experiment they are listed below

Raspberry pi 3:

Raspberry Pi 3 is the single-board computer (SBC) and development board. This board is heavily used for the prototyping of internet of things based products. The Raspberry Pi 3 use the Broadcom BCM2837 SoC with a 1.2 GHz 64-bit quad-core ARM Cortex-A53 processor, with 512 KB shared L2 cache. Display connect by HDMI port and audio is connected by 3.5mm jack. It has four USB 2.0 ports. Storage SD card. Networking wireless Frequency band 2.4GHz, 5GHz and Ethernet port .It has GPIO (General Purpose input and output) header.

LM35 Temperature Sensors:

LM means Linear Monolithic. Linear means Anglo, Continuously and Monolithic means One piece. It ranges for -50 to 150<sup>0</sup> C. It is low cost and small in size. LM35 takes very less amount 60 $\mu$ A from its supply. it has very less self-heating.

Float Sensor:

Level measurement sensor are used to check the liquid or fluid height. The Float sensor works on the principle of buoyancy. This sensor have mechanical arm or sliding pole and activities a switch when the level moves in upward or downward directions.

Infrared (IR) Proximity sensor:

Infrared Sensor is non contacting sensor. It is fast obstacle detection using infrared. Infrared uses the special sensor to modulate IR signal that is emitted from the 2 IR transmitter and detects modulated IR signal reflected back from a nearby object.

Vibration Sensor:

Vibration are sensors that are operated according to the mechanical vibrations. The piezoelectric sensors are works on the basis of seismic principle and the piezoelectric effect. Here quartz crystal and piezo ceramic replace the spring used in a Seismometer. The piezo material is fixed to the vibrating object on the one side and to the seismic mass on the other.

Analog to Digital Conversion:

ADC Provides a link between the analog world of transducers and the digital world of signal processing and data handling.

### I. Software Description

Python:

Python is a high-level, interpreted, interactive and object-oriented, scripting language. Python is designed to be highly readable which uses English keywords frequently where as other languages use punctuation and it has fewer syntactical constructions than other languages. Scripting language is a form of programming language that is usually interpreted rather than compiled. Conventional programs like c,c++ are converted permanently into executable files before they are run. In contrast, programs in scripting language are interpreted one command at a time.

Apache Tomcat:

Apache Tomcat often referred to as Tomcat Server, is an open-source Java Servlet Container developed by the Apache Software Foundation (ASF). Tomcat implements several Java EE specifications including Java Servlet, Java Server Pages (JSP), Java EL, and Web Socket, and provides a pure Java HTTP web server environment in which Java code can run.

Twilio:

Cloud communications platform for building SMS, Voice & Messaging applications on an API built for global scale.

### V. Block Diagram:

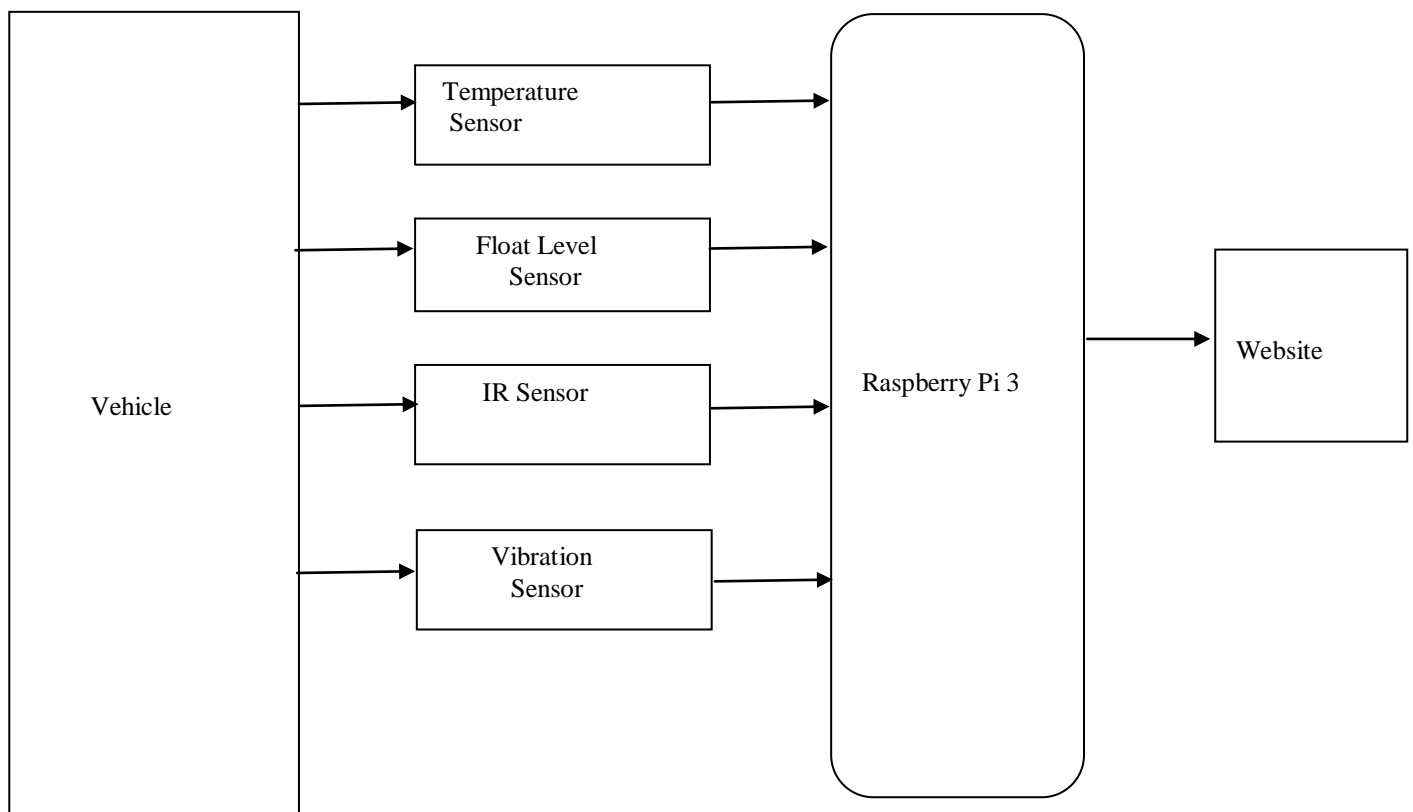


Fig 1: Block Diagram of Real Time Vehicle Monitoring by IOT Application

## **VI. Experimental Arrangements**

Different types of sensor are fixed at different position of vehicle as shown in figure 2.



Float level Sensor Raspberry pi 3 IR Sensor Vibration Sensor Temperature Sensor

The project Producer:

- i. Connect the Sensor at the respective parts of the bike.
- ii. Connection should be in this Temperature sensor of engine and brake connected, Fuel level sensor and oil level, , and vibration sensor to the ADC .
- iii. From this ADC board this data covert into the Digital form and sent to the Raspberry pi 3.
- iv. Raspberry pi 3 is should be connected with the good network signal.
- v. This Raspberry pi 3 is continuously sent data to the server without any replying and we check the data through that server.
- vi.

Precaution:

- i. Should not short circuit.
- ii. Avoid from dirt and water.
- iii. Don't allow overvoltage into the circuit.
- iv. Check the Sensor before using it.
- v. Connection should be done in correct manner.
- vi.

## **VII. Results**

The results of the Real Time vehicle Monitoring by Using IOT Application Can check through the website by following steps.

- i. Open Google and type localhost:2020
- ii. Click on the admin and enter the login id and password.
- iii. Click on the view vehicle info.

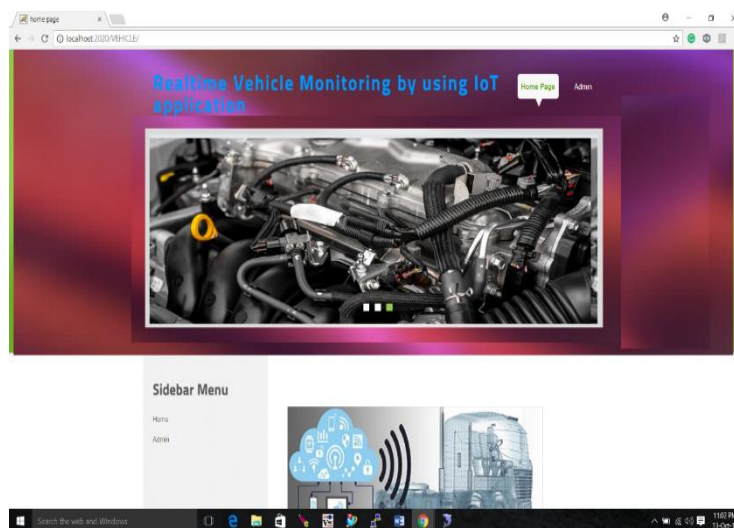


Fig 3: Homepage of website

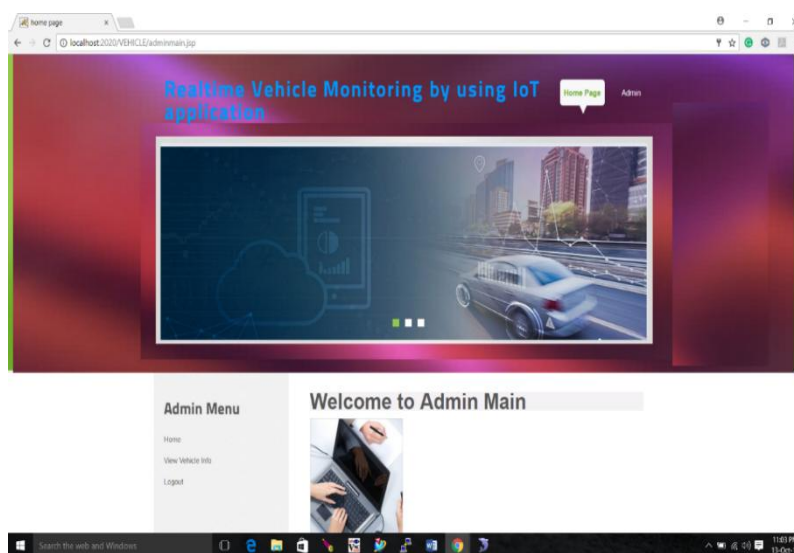


Fig 4: Login in Website ID and Password

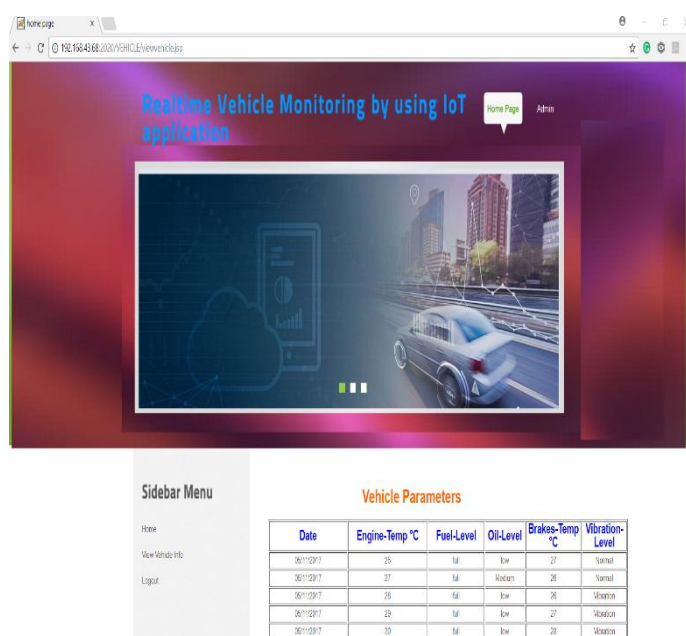


Fig 5: viewing of vehicle Information

This website can be capable for mobile.

Brake Failure Notification to the Mobile

This result can be automatically when brake linkages are damaged. This alert of can be message form as Brake Failed.

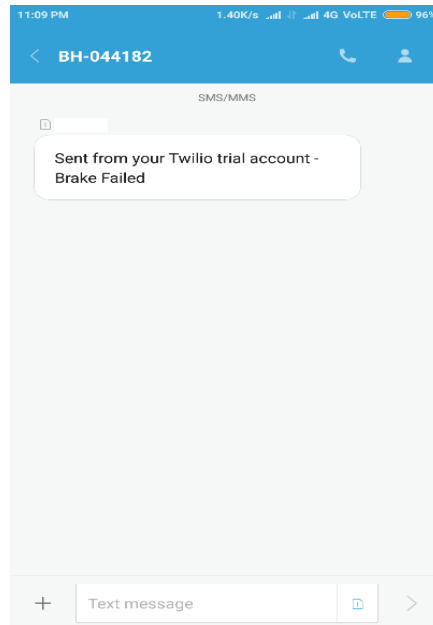


Fig 6: Brake Failed message Alert

## VII. Conclusions

This Experiment is conducted on the bike by using the IOT application. Temperature and Vibration sensors are contact with Engine. Float Level Sensors are placed in Fuel Tank and Oil Sump. Infrared (IR) Proximity sensor placed near the brake links and temperature sensor placed at the outer surface of the Drum Brake.

- The following are the conclusion can be drawn from the Experiment.
  - Engine Overheating can be avoided.
  - Brakes are maintained in good condition.
  - Fuel and oil level can be checked continuously.
  - We can maintain the Engine in good condition.

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