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On-Board Vehicle Diagnostics (OBD) and Reporting System

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ABSTRACT:

On-Board symptomatic prototypes play a critical part with in the current vehicle era and will play an vital part in the future. This paper proposes the advancement of the On-Board Demonstrative (OBD) prototype for vehicles with sensor networks. This OBD prototype comprises a Microcontroller circuit board with an ATMega32P Microcontroller acting as a preparing unit in which the program is written and sensors, LCD, and IoT acting as the client interface. The vehicle parameters such as oil level, motor oil quality, battery voltage, and break-fail status are recorded and are displayed on the LCD for visualization. To begin with, are the sensors introduced on distinctive areas of the vehicle to capture distinctive vehicle specifications. For remote information an IoT network is used.

Keywords: On-Board Vehicle Diagnostics, Internet of Things, Liquid Crystal Display.

I. INTRODUCTION:

The paper addresses the advantage of using the information which is useful for engineers, mechanics or any other vehicle user. The On-Board Diagnostic system plays a crucial role in the performance of an LMV/HMV. It is normally observed that the time required to diagnose a fault is more than the time required to resolve it. Hence, the adaptation of the proposed work will save a lot of time for the user. The Electronic Control Module (ECM) uses the parameters that are obtained and detected by the OBD which in turn controls the main operating methodology of the engine and ensures efficient and safe vehicular movement.

II. METHODOLOGY*:*

The replacement of the demonstrative instrument kit with Automotive IoT runs less time for updating ECM information. It is conceivable to utilize Wi-Fi for organizing other regions of the vehicle. The recommended strategy for diagnosing the vehicle is not at all like the existing OBD prototypes. This prototype does not require a check device, specialist, or benefit center as specified earlier. This works with server-client design as cloud is the server. The distinctive parts of the vehicle are associated with each other with different sensors and these sensors have sensors joined for monitoring. All sensors are associated with the vehicle collects the data of every individual part and justifies the normal and abnormal conditions. So, the user can know the status of the required parameter through the utilization of cellular phone.

So, the client knows the condition and working of the vehicle when driving. The prototype is pre-installed with high and low values of every parameter. The prototype shows an abnormal condition of vehicle in the display.

III. BLOCK DIAGRAM:

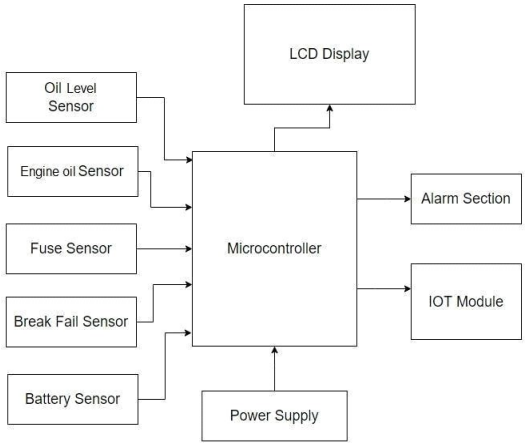
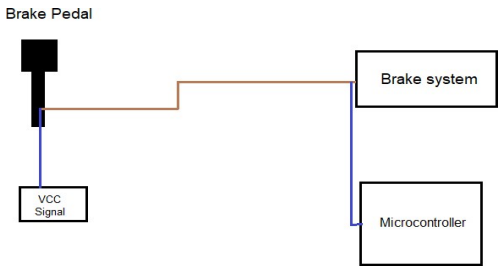


Figure.1Shows the Block diagram proposed method and Alternative strategy of vehicle Diagnostics. For this Diagnostics System does not require a filter device. It may be a Microcontroller-based prototype that includes a full-featured client interface with LCD and IoT. The prototype gathers data from several sensors which are attached for vehicle and keeps track of these properties.

The prototype will not look at the vehicle's parameters indefinitely, but also display real-time values for the client. As a result, the client can easily see what's going on when driving the chosen parts of automobile. Clients can select and view real-time parameter values using the interactive interface. A caution is generated whenever one of the Vehicle parameters becomes abnormal.

When the client observed the changes in the high and low values of the required parameter which are set as default but the client has a chance to modify the parameter values. It makes it the prototype is user structured.



IV. HARDWARE AND SOFTWARE SPECIFICATIONS

- ***Arduino UNO:***

Arduino Uno is a Microcontroller board designed by Arduino. cc and based on the Microchip ATmega328P Microcontroller. The board is equipped with a computerized and straightforward set of input/output (I/O) pins that may be connected to various circuit sheets andother circuits.

- ***Node MCU:***

The Node MCU is an open source platform based on ESP8266 which can connect objects and let data transfer using the Wi-Fi protocol.

- ***TCS3200 Color Sensor Module:***

The Colour sensor module is used to detect the color of engine oil which consists of four different types of filter-covered diodes in the sensor. 16 photodiodes have red filters, 16 have blue filters, 16 have green filters,and the remaining 16 photodiodes are clear without filters in the 8th x 8 arrays of photodiodes. S2 and S3 Selection inputs can be used to activate each kind. Because each photodiode has a distinct filter coating, they can all distinguish the same colors.

- ***Ultrasonic sensor HC-SR04:***

An Ultrasonic sensor is an instrument that detects obstacles and measures the distance utilizing Ultrasonic sound waves. The Ultrasonic transmitter transmitted an Ultrasonic wave in one course and began its timing when it was propelled.

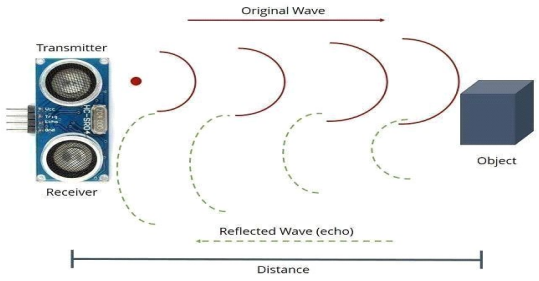


Fig . 2. Working of an Ultrasonic Sensor

Figure. 2 Shows the working of Ultrasonic waves spread across the discussion and returned swiftly when they encountered deterrents along the route. When the ultrasonic collector received the reflected wave, it would finally stop time. Because the Ultrasonic spread speed in the air is 340m/s, the separation (s) between the deterrent and transmitter may be calculated using the clock record t: s = 340*t/ 2, which is the so-called time contrast remove estimate rule.

- ***Brake fails system Detection Sensor:***

Vehicles were the primary mode of transportation for most of us and we depend on them for our daily commute. Unfortunately, many mistakes can happen in Driving, and such as brake failure is one. In this system, the brake pedal is connected to the brake system with metal

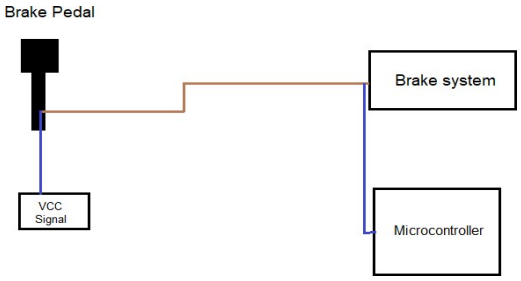


Fig . 3. Working of Brake sensor

Figure. 3 Shows the working of Brake sensor can see in this diagram we will connect the VCC signal wire at the starting end of the metal wire or metal road. Now same VCC signal expecting on the other end of the metal wire or metal road using the Microcontroller Input pin. If we VCC signal is not detected by Microcontroller, then the brake failed due to a wire cut and if the Microcontroller can detect the VCC signal, then the brake is OK.

- ***Voltage Sensor:***

A push sensor is a sensor that is used to calculate the AC and DC voltage levels that can be determined with voltage sensors. This sensor's input can be voltage, while the output can be switches, analog voltage flags, current flags, and audible one flags, among other things.

- ***LCD Display 16X2:***

A fluid gem show (LCD) may be a lean, level show Gadget comprising of any number of monochromes Pixels set before a light source or reflector. It is Commonly utilized in battery-fueled electronic gadgets since it employments exceptionally small control.

- ***Buzzer:***

The buzzer is a device that produces a sound of a certain frequency when it found any fault parameter in the OBD system

- ***Blynk App:***

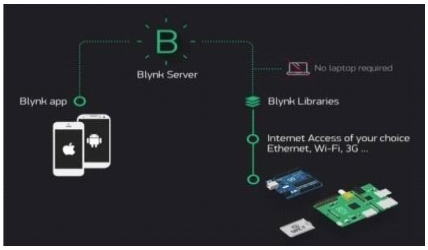


Fig. 4. Blynk App

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Figure. 4 Shows the Blynk, which was founded in 2014 and known for its top-notch mobile app editor that pioneered the no-code approach to developing IoT apps. Blynk provides a full suite of tools for prototyping, provisioning, and managing linked electrical devices.

By mixing several widgets, the Blynk app provides you to build fantastic interface for prototypes. For all common hardware platforms, Blynk Libraries facilitates connectivity with the server and handles all incoming and outgoing commands. With Blink, you can design cellular phone apps that let you interface with Microcontrollers or even entire computers like the Raspberry Pi.

- ***Arduino IDE:***

The Arduino IDE is an open-source computer tool that is used to compose and compile code for Arduino Models. It might be an official Arduino software that makes code compilation so simple that even someone without specialized knowledge .

V. APPLICATIONS:

- On-Board diagnosis system for Petrol or diesel vehicle
- On-Board diagnosis for EV vehicle.
- Use full for Agriculture machine
- Testing of the vehicle during manufacturing

VI. ADVANTAGES:

- If we are facing any problem in a vehicle this system will help to find the fault.
- Increases efficiency of the vehicle
- Live monitoring of the fault
- Easy to use
- Cost effective
- Can interface with existing vehicles and upcoming vehicle
- EV vehicle interface is also possible.

VII. RESULTS*:*

The observation of On-Board vehicle demonstrative prototypes are remotely able to carry out from any place. That The prototype gets information from various sensors mounted on the automobile and keeps up these parameters. The prototype will not only examine the parameters of the automobile persistently, but moreover, displays the client's real-time values. Observations can be made remotely and reported directly over the Internet.

VIII. CONCLUSION:

The On-Board vehicle Concludes that it is Easily operated, As it is designed as per Client's requirement. It can be used by any Automobile owner, Mechanic. To detect the faulty parameter in the existing vehicles.This project reduces the cost and time of user by providing faulty parameter in Advance.

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