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Vehicle Health Monitoring System Using ARDUINO and IOT

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Abstract: The paper portrays the execution of a model framework utilized for effective constant information securing, motor warming and blockage of fuel pipe. Legitimate vehicle observing and support can spare time, cash and enhance the possession encounter. Our framework takes a shot at Arduino and IoT stage used to separate different parameters like motor warming and blockage in fuel pipe and so forth for protected and cautious driving. The information is sent to IoT which can be checked both by vehicle producer through distributed computing and proprietor of the vehicle by the android application. The equipment unit comprises of Arduino, WI-FI module, android based portable and distinctive parameter checking sensors module.

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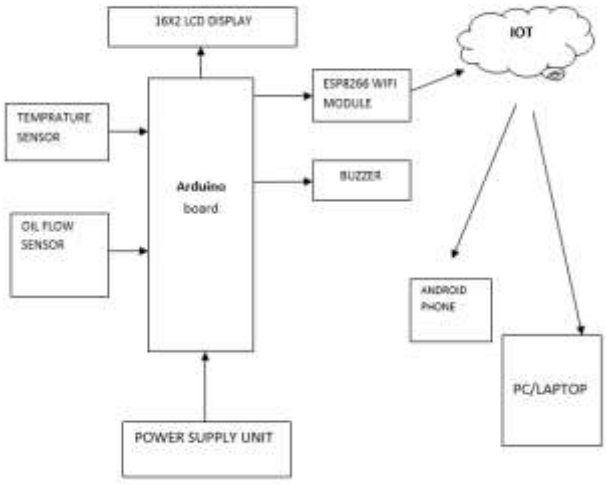
I. INTRODUCTION

This paper is about **IoT** and Telemetry based vehicle health monitoring system. Vehicles needs repair after a certain interval of time and if are not repaired at fixed intervals it can lead to loss of life of the person driving the vehicle or travelling on it. The objective of the project is to notify the owner about the excessive heating of the engine or the blockage in fuel pipe. A temperature sensor is employed in the engine that warns the owner about overheating of engine and a flow sensor is used that senses the proper flow of fuel in the pipe. This helps in proper monitoring of vehicle. If the vehicles are monitored the reliability of vehicles increases, service capacity and efficiency of maintenance and operations of vehicles improves, operating and maintenance cost reduces and reduces troubleshooting by almost half.

The information to the internet is sent through a network of **IoT**. The Internet of Things (**IoT**, sometimes Internet of Everything) is the network of physical objects or "things" embedded with electronics, software, sensors, and connectivity to enable objects to exchange data with the manufacturer or operator. Usage of **IoT** devices for monitoring and operating infrastructure is likely to improve incident management and emergency response coordination, and quality of service, up-times and reduce costs of operation in all infrastructure related areas.

BLOCK DIAGRAM



This project comprises of both the hardware part and the software part. Software part is a webpage that is used for notifying the user and manufacturer about the fault in the vehicle that needs repair. As per the hardware part is concerned, the Ardiuno is the most important component. It enables working of the entire circuit. Power is supplied by a DC power supply. A temperature sensor is employed in the engine that detects the temperature and continuously sends the readings to the **Arduino**. A flow sensor is employed in the fluid flow pipe that detects leakage or blockage in the pipe and sends the warning to the **Arduino**. The readings or the warnings are displayed on the LCD. Buzzer is employed so that it can produce a beep when the engine heats or blockage occurs. The information is continuously being

updated on the internet through a Wi-Fi module that is attached to the **Arduino**. The Wi-Fi module uses a network of **IoT** to send the data to the internet and also to access the data from the internet. A notification is also sent on the webpage by the **Arduino** whenever temperature rises or blockage is observed using Wi-Fi module and a network of **IoT**.

II. DESCRIPTION IN DETAIL

Arduino:

An **Arduino** is a small computer (SoC) on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals. Program memory in the form of Ferroelectric RAM, NOR flash or OTP ROM is also often included on chip, as well as a typically small amount of RAM. **Arduino** is designed for embedded applications, in contrast to the microprocessors used in personal computers or other general purpose applications consisting of various discrete chips.

Arduino is used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, toys and other embedded systems. By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input/output devices, microcontrollers make it economical to digitally control even more devices and processes. Mixed signal **Arduino** are common, integrating analog components needed to control non-digital electronic systems.

Some microcontrollers may use four-bit words and operate at frequencies as low as 4 kHz, for low power consumption (single-digit milliwatts or microwatts). They will generally have the ability to retain functionality while waiting for an event such as a button press or other interrupt; power consumption while sleeping (CPU clock and most peripherals off) may be just nanowatts, making many of them well suited for long lasting battery applications. Other microcontrollers may serve performance-critical roles, where they may need to act more like a digital signal processor (DSP), with higher clock speeds and power consumption.

Wi-Fi Module:

Here we used ESP8266 Wi-Fi module which is having TCP/IP protocol stack integrated on chip. So that it can provide any microcontroller to get connected with Wi-Fi network. ESP8266 is a pre-programmed SOC and any microcontroller has to communicate with it through UART interface. It works with a supply voltage of 3.3v. The module is configured with AT commands and the microcontroller should be programmed to send the AT commands in a required sequence to configure the module in client mode. The module can be used in both client and server modes.

Temperature Sensor

The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to the temperature (in °C). If the temperature is high then the fan will on and vice versa.., The Temperature Sensor is shown in Fig. The scale factor is .01V/°C.The LM35 does not require any external calibration or trimming and maintains an accuracy of +/- 0.4°C at room temperature and +/- 0.8°C over a range of 0°C to +100°C.

LCD display

This is a basic 16 character by 2 line display. Black text on Green background. Utilizes the extremely common HD44780 parallel interface chipset (datasheet). Interface code is freely available. You will need ~11 general I/O pins to interface to this LCD screen. Includes LED backlight.

Power Supply Section

This section is meant for supplying Power to all the sections mentioned above.It basically consists of a Transformer to step down the 230V ac to 9V ac followed by diodes. Here diodes are used to rectify the ac to dc. After rectification the obtained rippled dc is filtered using a capacitor Filter. A positive voltage regulator is used to regulate the obtained dc voltage.

Regulators

A voltage regulator is designed to automatically maintain a constant voltage level. A voltage regulator may be a simple "feed-forward" design or may include negative feedback control loops. It may use an electromechanical mechanism, or electronic components. Depending on the design, it may be used to regulate one or more AC or DC voltages.Electronic voltage regulators are found in devices such as computer power supplies where they stabilize the DC voltages used by the processor and other elements. In automobile alternators and central power station generator plants, voltage regulators control the output of the plant. In an electric power distribution system, voltage regulators may be installed at a substation or along distribution lines so that all customers receive steady voltage independent of how much power is drawn from the line.

Transformer (12-0-12 Volt 750mA Transformer)

It is a general purpose chassis mounting mains transformer. Transformer has 240 V primary windings and centre tapped secondary winding. The transformer has flying colored insulated connecting leads (Approx 100 mm long). The Transformer act as step down transformer reducing AC - 240V to AC - 12V.The Transformer gives two outputs of 12V, 12V and 0V. The Transformer's construction is written below with details of Solid Core and Winding.The transformer is a static electrical device that transfers energy by inductive coupling between its winding circuits. A

varying current in the primary winding creates a varying magnetic flux in the transformer's core and thus a varying magnetic flux through the secondary winding. This varying magnetic flux induces a varying electromotive force (EMF) or voltage in the secondary winding. The transformer has cores made of high permeability silicon steel. The steel has a permeability many times that of free space and the core thus serves to greatly reduce the magnetizing current and confine the flux to a path which closely couples the windings.

ADVANTAGES

- Low cost hardware unit and user friendly.
- Quality of assurance of the vehicle can be obtained easily before introducing in the market.
- Alert the owner on over heating of vehicle engine, grants the safety of owner.
- Low maintenance of vehicle is possible.

III. RESULTS:

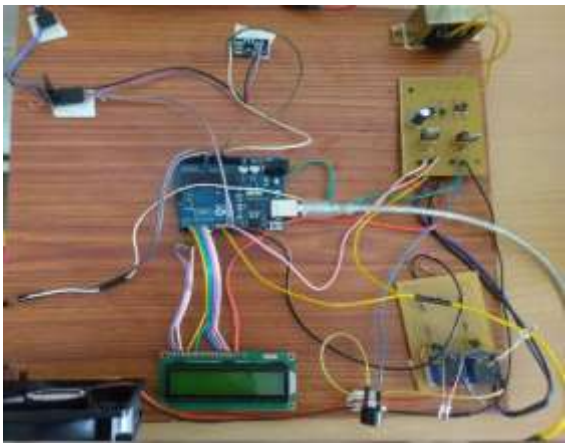


FIGURE 1.Hardware prototype with Various parameters

FIGURE 2:Manufacturer and driver display showing.

IV. CONCULSION

We have effectively executed a coordinated model framework comprising of minimal effort equipment unit and easy to use Android - based portable application programming used to make an on-board vehicle demonstrative framework for a vehicle information Acquisition, motor warming and blockage in fuel pipe and show System utilizing Arduino and IoT innovation. The perusing will be shown to maker through distributed computing and to proprietor utilizing android application.

REFERENCE

[1] Vehicle Health Monitoring Systems. M.Jyothi kiran, S.Ravi teja. International Journal of Engineering Research and Applications Vol. 2, Issue 5, September- October 2012, pp.1162-1167.

[2] Design of Vehicle positioning System Based on ARM, Zhang Wen Jiang Meng, Department of Physics & Electronic Information Engineering,Neijiang Teachers college,China.

[3] Real Time Vehicle Health Monitoring and Driver Information Display System based on CAN and Android.Esha Naryal,Prabha Kasilwal. International Journal of Advance Foundation and Research in computer Vol. 1, Issue 11, November 2014, ISSN 2348-4853.

[4] Android Based Vehicle Monitoring and Tracking System using ARM7 and CAN technology.T.Narendra kumar,S.Sivaji. International Journal of Engineering and Advance technology,IJSEAT,Vol. 3, Issue 4, April 2015,ISSN 2321-6905.