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IOT Based Fuel Monitoring for Vehicles

N. Loganathan, J. Prasanth, R. Shankara Saravanan, V. Jayasuriya

Abstract*: Today, the actual record of fuel crammed and fuel consumption in vehicles isn't maintained. It ends up in a loss. To avoid this loss, watching Associate in Nursing chase system is enforced by an IOT based mostly Fuel watching in the vehicle. The fuel watching system is constructed on the ESP8266 Wi-Fi chip. This technique uses Hall result sensing element to calculate the data regarding the tank's current stockpile and conjointly the number of presently inserted fuel. It delivers information to the ESP8266 Wi-Fi chip. ESP8266 chip may be hardware that connect flow sensing element and server, then the server sends that information on user's robot app. On the inaccessibility of the device, it stores information into memory. This technique is predicated on IOT technology that provides security to user identity to attest access and determine impersonated devices or pretend devices within the network. The aim of the IOT is to create potential things to attach at any time, in any place, with something and anyone ideally victimization Network and repair.

Index Terms*: ESP8266 Wi-Fi chip, Flow sensing element, IOT.

I. INTRODUCTION

As fuel costs square measure rising, there square measure some problems individuals face regarding fuel felony at fuel pumps. To avoid this, we tend to square measure implementing such system that monitors current Fuel mensuration by victimization Flow sensing element. Internet of Things (IOT) may be an idea that considers pervasive presence within the setting of things and distinctive addressing theme to act with one another. Cloud computing is Associate in Nursing rising computing technology that uses the central remote server to take care of information and application. Internet of Things (IOT) may be an idea and a paradigm that considers pervasive presence within the setting of a spread of things that through wireless and wired connections and distinctive addressing schemes square measure ready to act with alternative one another and get together with other things to form new applications/services and reach common goal. A world wherever the important, digital and therefore the virtual square measure connection create to form sensible environments that make energy, transport, cities and plenty of different areas a lot of intelligent. The aim of the web of Things is to alter things to be connected anytime, everywhere, with something and anyone ideally victimization any path/network and any service.

RFID technology to the way the location of supervise members and their particular laptops or devices of any huge organization methodically. RFID schemes use produced radio waves from the bookworm to communicate tag data wirelessly to a swarm computer. The tag information of the tags in the wireless range of reader gets warehoused in the server database. This inside tracking scheme is created on the finding of an inactive tag involved to a strength. In high-frequency inactive tags, the reserve active to which a tag can be sensed is up to 12 meters [1]. Developed a bus tracing and monitoring the fuel and speed system toward offering an ability for the administration necessities by the manager. The projected scheme founded on Arduino, GSM/GPS and map suit ASP.MVC which deliver the activated coming time in adding to realistically viewing the bus location on Google map [2]. Fuel sensors input has been nursed into the regulator and its production response is investigated. This procedure is complete by consuming Proteus design suite 8 professional software. Thus, the output is experiential that, when the confrontation rate is different in the stem shift of the fuel level revealing sensor which is reserved inside the fuel tank of the vehicle, its applicable voltage stays specified done calibration; accordingly, output differs in the TeCU [3] The problematic of monitoring a Hybrid Energy Storage System (HESS) for an electric vehicle. The storing scheme contains a Fuel Cell (FC), portion as the main power source, and a Super Capacitor (SC), portion as a supplementary control source. It similarly covers a power hunk for energy renovation containing a boost converter associated with the chief source and a boost-buck converter associated with the auxiliary source. The converters part the similar dc bus which is associated with the traction motor concluded an inverter [4]. A stand-alone FC scheme combined into an automotive power train is not continuously sufficient to deliver the consignment demands of a vehicle [5]. Use of IOT technology and Raspberry PI computer and sensors but it can't show how much fuel is currently deposited in the vehicle. To get information about balanced fuel use of GSM/GPS for bus tracking. Some defects are coming in the scenario because the use of GPS, Sometimes the GPS signals are not accurate due to some obstacles to the signals. GSM provides limited data rate capability. Technologies use telematics for wireless

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***** Correspondence Author (s)
N.Loganathan*, Assistant Professor, Department of EEE, Sri Krishna College of Engineering and Technology, Coimbatore, India.
J.Prasanth, Student, Department of EEE, Sri Krishna College of Engineering and Technology, Coimbatore, India.
R.Shankara Saravanan, Student, Department of EEE, Sri Krishna College of Engineering and Technology, Coimbatore, India.
Jayasuriya, Student, Department of EEE, Sri Krishna College of Engineering and Technology, Coimbatore, India.

communication and informatics as well as fuel level sensor (ultrasonic sensor), Useful only for large fuel tanks not for vehicle fuel tanks. Provide solution for a hybrid energy storage system (HESS) for the electric vehicle but Smartphone app does not support also Hardware is more Costly. So here we find a solution as ESP8266 Wi-Fi chip and flow sensors which estimate currently fuel filled in the vehicle and this hardware are less expensive as compared to previously used Raspberry.

II. SYSTEM ARCHITECTURE.

IOT based fuel monitoring and tracking system have implemented to overcome Fraud at petrol-pumps. At an instant, when an agent starts filling fuel in vehicle tank the flow sensor gets activated and provide a series of pulses proportional to instantaneous flow rate. It converts pulses into liters and sends it to the ESP8266. It works on the Hall-Effect sensor model. ESP8266 is hardware which stores data send it to server throw Wi-Fi setup. It is cheaper than other hardware. The ESP8266 sends the data to the cloud server The communication between ESP8266 and cloud servers occurs by HTTP protocol. A different algorithm is used in this communication to increase security like SHA (secure hashing algorithm) and AES (Advanced Encryption Standard). The cloud server stores data and further sends it to the user application. Since users get information about currently inserted fuel. The user application is based on ECLIPSE, MYSQL, and HIDESQL. User application also locates the user throw GPS. Due to localization, there is an advantage for the reorganization of petrol prices.

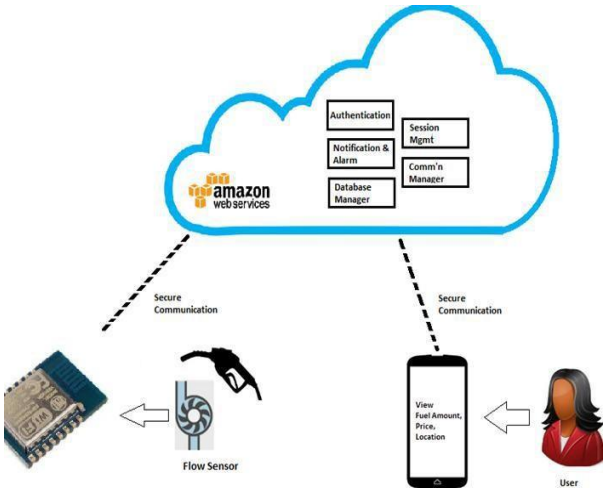

Fig. 1 Proposed System Architecture

III. SYSTEM SPECIFICATION

1) ESP8266

ESP8266 is a Wi-Fi chip having complete TCP-IP stack and micro control unit. In this small system, there are microcontrollers which can be connected to the Wi-Fi network and TCP-IP connection occurs. This chip is very light and very cheap than external another component.

Fig. 2 ESP8266 Wi-Fi Chip

2) Flow Sensor (YFS201)

Flow sensor works on Hall Effect method. It acts like a simple frequency counter. It produces a series of pulses which are proportional to instantaneous flow rate. The equation of the flow rate of fuel can be shown as follows: Q=V*A

Q is the flow rate/total flow of fuel through the pipe.

V is the average velocity of the flow of fuel.

A is the cross-sectional area of the pipe of fuel flow.

Pulse frequency (Hz) = 7.5Q, Q is the flow rate in Liters/mints.

Flow Rate (Liters/hr's) = (Pulse frequency x 60 min) /7.5Q

Fig. 3 Flow Sensor

IV. RESULT

Initial altogether the devices in the buses guide a setting to the head office every 25 seconds through GPRS network using the GSM module. In the head office when the developed program is implemented, chief form in the desktop application is showed to perform the following: Location the baud rate and the com of the GSM that attach with the main system to expose the assembly with the bus. Once the connection establishes the GSM receive the data from the buses and send it to the desktop application to store it in the database. This process occurs in the background.

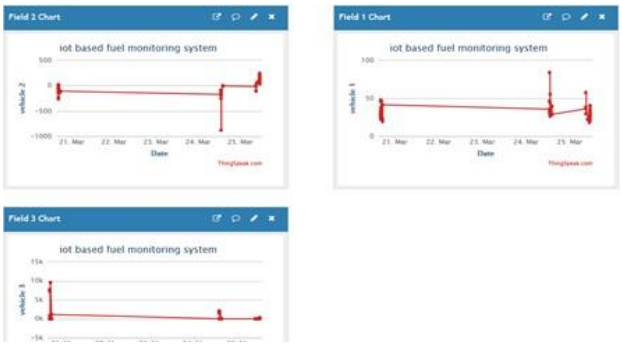

Fig. 4 Fuel Level

V. CONCLUSION

This proposed system shows that it calculates the current fuel filled in vehicle tank. The application is based on IoT technology, flow sensor, and ESP8266. At that instant, the information of fuel transaction can be stored in the database of the system. This system overcomes the disadvantage of the existing system by calculating current filled fuel. The system application is developed on an Android smartphone; it can also give information about the current location. As the price of fuel varies at a different location. In the existing system, there is the use of Raspberry-pi which is Costlier than ESP8266. There is also a limitation in this system. Due to slow internet speed, there may be a delay in information transformation and representation of web-application. In the future further, there will be an enhancement of this application. Enhancing system security from unauthorized access is also an open issue to develop.

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