

FUEL MANAGEMENT SYSTEM

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ABSTRACT

In today's world, actual record of fuel filled and fuel consumption in vehicles is not maintained. It results in a financial loss. To avoid this, we are implementing a microcontroller-based fuel monitoring and vehicle tracking system. We have used the reed switch which works according to the principle of Hall Effect for sensing the amount of fuel filled in the vehicle and amount of fuel consumed. Then this record is stored in the system memory. This system stores the record for several logs. We have used a microcontroller for our system. Also, we have used the GPS technology to track the vehicle. In this paper, the implementation of embedded control system based on the microcontroller is presented.

The embedded control system can achieve many tasks of the effective fleet management, such as fuel monitoring, vehicle tracking. Using GPS vehicle tracking technology and viewing interactive maps enable us to see where it was losing money, time and wasting fuel (such as on duplicated journeys). Fleet tracking is scalable by design and interfaces with the logistics industry's leading back-office systems. Rising fuel costs constantly challenge fleet operators to maintain movement of vehicles and monitor driver activity to avoid delaying traffic conditions by either, combining deliveries, reconfiguring routes or rescheduling time and distance.

Escalating oil prices are increasing costs for many businesses, particularly those with large vehicle fleets, adding a powerful financial impetus to the search for fuel efficiencies. Implementing real-time vehicle tracking as part of a commercial company's mobile resource management policy is essential for comprehensive operational control, remote driver security and fuel savings. Almost all of the public have their own vehicle. Now-a-days fuel theft is happening in the parking and vehicle security becomes a challenging thing.

Keywords: *Microcontroller, GPRS/GSM, GPS, Fuel indication, Accident switch.*

• INTRODUCTION

The challenges of successful monitoring involve efficient and specific design, and a commitment to implementation of the monitoring project, from data collection to reporting and using results. Fleet tracking is the use of GPS technology to identify, locate and maintain contact reports with one or more fleet vehicles. The location history of individual fleet vehicles allows precisely time managed, current and forward journey planning, responsive to changing traveling conditions. Applications of commercial vehicle tracking solutions in the fields of transport, logistics, haulage and multi-drop delivery environments can include optimized fleet utilization, operational enhancements and dynamically remote-managed fleets. Fleet tracking is scalable by design and interfaces with the logistics industry's leading back-office systems. Rising fuel costs constantly challenge fleet operators to maintain movement of vehicles and monitor driver behaviour to avoid delaying traffic conditions by either, combining deliveries, reconfiguring routes or rescheduling timetables. This aims to maximize the number of deliveries while minimizing time and distance. Escalating oil prices are increasing costs for many businesses, particularly those with large vehicle fleets, adding a powerful financial impetus to the search for fuel efficiencies. Implementing real-time vehicle tracking as part of a commercial company's mobile

resource management policy is essential for comprehensive operational control, remote driver security and fuel savings. Almost all of the public have their own vehicle. Now-a-days fuel theft is happening in the parking and vehicle security becomes a challenging thing. In practice by today no record of data is being maintained for fuel filled and its consumption value. To overcome this challenging problem a fuel monitoring system is being implemented. This task is being carried out by the use of embedded system based on Global System along with mobile communication technology. A system has been developed in which if fuel theft occurs, the system reports automatically via GSM module by sending SMS message to owner/driver of the vehicle.

• LITRATURE SURVEY

Jignesh B Jadav, Dr.K.H.Wandra, Mr.Rohit Dabhi, proposed system has the control and communication between the user and device are achieved through a short message services (SMS) protocol available in the mobile phone.

Safa Abd elmonem. Yosif, et.,al. developed a bus tracking and monitoring the fuel and speed system to provide a facility for the management requirements by the administrator. The developed-on Arduino, GSM/GPS and map suit ASP.MVC which provide the actuated arrival time in addition to graphically showing the bus location on Google map.

SeokJu Lee, Girma Tewolde, Jaerock Kwon, proposed system can get only the location of the conveyance, this project provides ignition switch and immobilizer relay which can immediately seize the engine ignition just by sending a message from android application. In addition, it also provides fuel security. pt to make fuel monitoring and vehicle tracking system by implementing a microcontroller. MSP430F149 microcontroller is employed for the system. Also, GPS technology is utilized to track the vehicle.

Yen-Jen Chen et.,al, developed a fuel consumption monitoring using FMS, which has front end Vehicle Tracking System (VTS) and the back-end Management Server (MS). VTS was established and installed into the vehicles, based on several well-known technologies, such as Mobile Telecommunications Technology of GPRS or 3G, Global Positioning System (GPS), and OnBoard Diagnostics II (OBD-II). In addition, VTS was also connected with the Vehicle Electronic Control Unit (VECU) through the OBD-II inter-face.

Nitesh.K.A [3] et.,al came out with the design and implementation of digital fuel gauge which measures the accurate level of fuel adding, by fixing the pressure sensor below the Fuel tank, at any point of time it will continuously measures the level of fuel with the help of processor and displays the value in the digital numeric form in the display unit. Hence, the measured values and location of fuel added is sent to the owner mobile through GPS and GSM and vehicle owner is aware of the fuel consumption through SMS services.

In 2014 Nitin Jade et.al., [5] developed “modified type intelligent digital fuel indicator system” and achieved an accuracy level of 95% -98% in measuring the fuel digitally.

Pavankumar Naik1, et.,al. focusses on a novel approach towards utilizing the controller area network (CAN) to achieve data acquisition, and logging for monitoring of critical vehicle parameters like vehicle speed, engine rpm, fuel economy, engine temperature, and distance travelled. An innovative approach towards monitoring the level of exhaust gas emissions and GPS based tracking is also discussed.

In January 2014 Vinay Divakar [6] developed “Fuel gauge sensing technologies for automotive applications” and achieved a smart fuel gauge system.

In April 2013 Jaimon chacko Varghese et.al., [7] developed “Low-cost intelligent real time fuel mileage indicator for motorbikes” and measured the probable distance that can be travelled by the vehicle corresponding to the amount of fuel in the fuel tank can also be estimated.

Areeg Abubakr Ibrahim Ahmed, et.,al. presents the implementation of monitoring system based on internet of things technology to protect the tower sites from theft and provide security to remote locations.

• PROBLEM STATEMENT

In present system all report work is done manually at the petrol pump. Admin user have to check each petrol pump in city to buy petrol, but in our proposed system user can check availability petrol from his monitor by clicking on some available button. This system also keeps records of user. Admin can also check which pump available how much petrol and what amount he submitted to accountant at the end of the day. Admin can also check how much oil availability in one day. This system also helps admin to generate the record of each pump on the basis of his position and working hour.

1. Current scenario is that people don't know the fuel availability status at the petrol pump due to which people suffers a lot. In case of males still it is okay if their petrol dries off. They can manage with that situation but in case of women if they suffer with same problem especially when the nearby petrol pumps don't have petrol in it, they can be in huge trouble.
2. Low fuel is not shown in some of the two-wheeler vehicles and what distance the vehicle will cover in the available petrol under the fuel tank.

• OBJECTIVE

- Fuel management system work efficiently even on slow internet.
- Fuel management system GPS to know your exact location.
- Quickly locates nearby petrol station and makes it easy for you without wasting your time.
- Fuel management system Works worldwide.
- Contact details, physical address, distance, website address and location of each place is available and overall user rating for their service.
- You can also write review for the particular petrol station.
- It helps to get estimated time and distance of the Petrol Pump.

• SCOPES

In this study, a survey on the real-time FM systems and the available tools has been conducted. The objective is to analyse the future requirements in order to improve the FM system functions and utilities in Thailand. FM Websites have been searched and investigated on examples of application and implementation of advanced technology around the world and also in Thailand.

From the scope of this study, the specific questions are:

1. What are the tools that have been used for real time fuel management from other countries?
2. What are the tools that have been used for real time fleet management in Thailand?

3. What are the future requirements for fuel management in Thailand?

A range of diverse advanced technologies and their associated devices are already available for real-time FM systems. By addressing questions 1 and 2 above, this study aims to investigate the available existing real time FM systems used in Thailand and other countries. Questions 1 and 2 also aim to present the status and utilities of real time FM systems in Thailand. This is linked to the analysis and prediction of the future requirements for FM systems.

Whatever may be the problem in the two-wheeler our system will detect the issue and highlight it on the dash board. The amount of air present in the tyres will also be known. We are also planning to take our project getting implemented on changing vehicles with changing stations. Not only in two-wheeler but also on other transport vehicles the project will be implemented.

• **SYSTEM OVERVIEW**

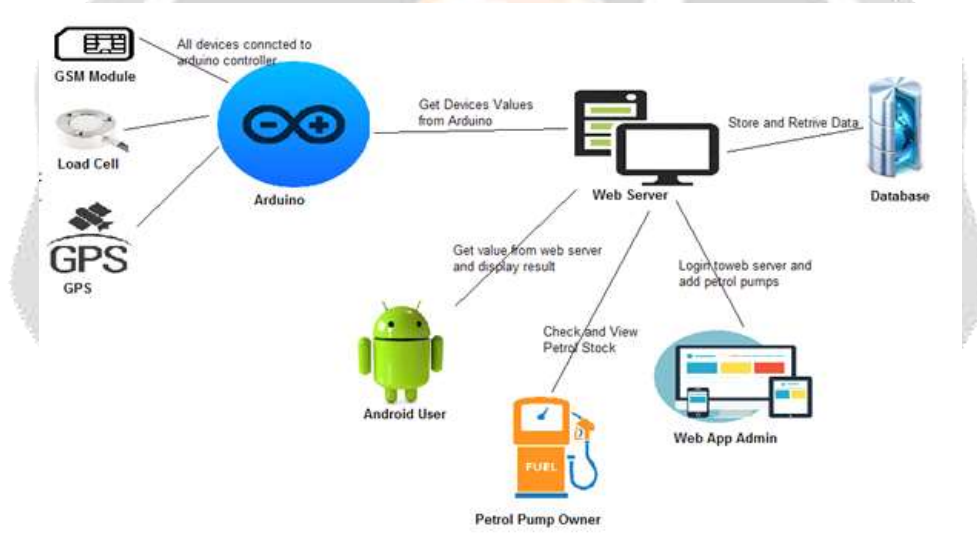


Fig 1: Petrol Management System

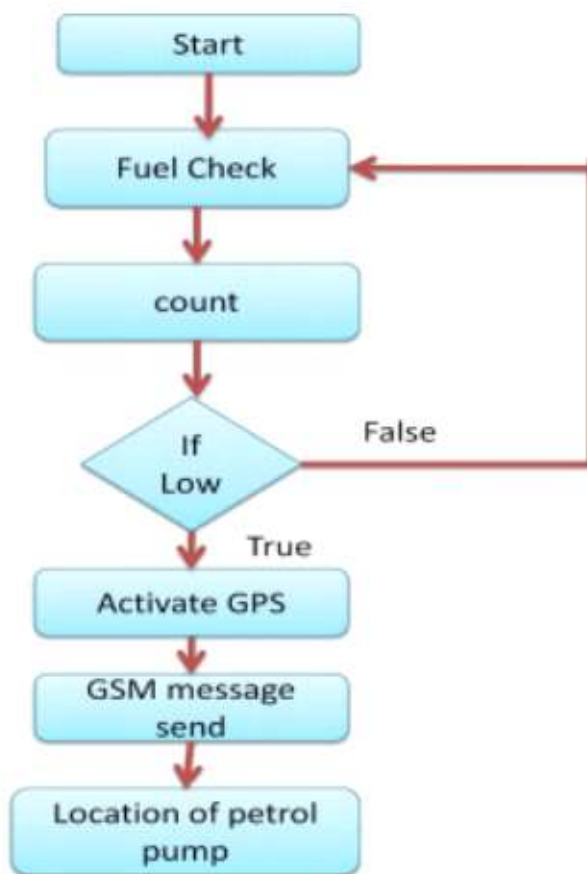


Fig 2: working flow mode

- The application has been development which will show fuel availability status in fuel station vehicle has been improved with hardware which will show exact fuel present in fuel tank and up to where the vehicle will travel in the amount of fuel present in fuel tank.
- Low fuel indication: The programming done in embedded C for interfacing the load cell with the controller called as Arduino uno kit will detect the fuel count of petrol available in the fuel tank of two-wheeler vehicle. If the fuel count is sufficient or above average then flow will go on in continuous way but if fuel count is detected low then GPS will get activated.

• CONCLUSION

In the nation like India there is progressively developing number of individuals with the utilization of bike vehicle but without fuel. It is difficult to drive the vehicle. In this development world petroleum pumps are followed through google map because of which siphons are followed yet the fuel accessibility status isn't show which prompts exercise in futility and individuals faces inconvenience.

The fuel management system will allow you to maintain, monitor, and control access to fuel. Without fuel, it is not possible to operate equipment in transportation, construction, and other fleet companies. When the process

of recording must be carried out manually, it is not an easy thing and usually results in errors. The right fuel management system will eliminate all the hassles related to fuel management in any industry. Continue reading to know some of the benefits that are offered by the software.

The automated fuel control system is designed accordingly to manage all the works related to the fuel automatically. When a transaction is done, it captures all the data and stores for later purposes and analysis. This data can include the driver, vehicle, product type, and any other business information that may be needed.

Here the application has been created which will show fuel accessibility status in fuel station. Vehicle has been improved with equipment which will show precise fuel present in fuel tank and up to where the vehicle will go in the measure of fuel present in fuel tank.

In this paper we have created one android application which has certain focuses in it, that are petroleum pumps, administrator and client. The undertaking is done which will have the android application that is created with the administrator of specific petrol pumps. He will oversee everything with a single click of android application.

Undertaking additionally closes the 75% business related to equipment that is the interfacing of GSM and GPS with Arduino-Uno kit.

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