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IOT BASED FUEL MONITORING FOR FUTURE VEHICLES.

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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 an IOT fuel monitoring and tracking system. We can use the reed switch which works according to the principle of Hall Effect for sensing the amount of fuel filled in the vehicle. So as soon as agent starts filling petrol in your bike/car, the flow sensor is activated. This flow sensor will be active till flow ends. Once flow ends it will calculate the amount of fuel filled and directly notify on your mobile phone. If the phone is not available then it will store this data on cloud.*

Keywords: Reed Switch, Flow Sensor ,IoT ,Flow rate, Tail pipe emission.

I. INTRODUCTION

Flow sensor is typically output of pulses proportional to the instantaneous flow rate which means that to interpret them it is necessary to implement simple frequency counter. Since this project uses a fuel flow sensor containing a Hall Effect sensor that output a pulse rate proportional to flow rate, so not only it is a useful project in its own right but it also demonstrates a very useful technique that you can use in a wide range of projects that need to measure the rate at which something happens (an electronic wind instrument, for example). Flow rate can be determined by different techniques like change in velocity or kinetic energy. Here we have determined flow rate by change in velocity of fuel. Velocity depends on the pressure that forces the through pipelines. As the pipes cross-sectional area is known and remains constant, the average velocity is an indication of the flow rate. The basis relationship for determining the liquid flow rate in such cases is Q=V x A, where Q is flow rate/total flow of fuel through the pipe, V is average velocity of the flow and A is the cross-sectional area of the pipe (viscosity, density and the friction of the liquid in contact with the pipe also influence the flow rate of fuel).

- Pulse frequency (Hz) = 7.5Q, Q is flow rate in Litres/minute
- Flow Rate (Litres/hour) = (Pulse frequency x 60 min) / 7.5Q

In other words:

- Sensor Frequency (Hz) = 7.5 * Q (Litres/min)
- litres = Q * time elapsed (seconds) / 60 (seconds/minute)
- litres = (Frequency (Pulses/second) / 7.5) * time elapsed(seconds)/60
- litres = Pulses / (7.5 * 60) Once the flow started, application will start

reading pulses and convert it into litres and then send to cloud server. Mobile application will also track location where fuel has been deposited.

Fig 3.1.1.1

Fig 1. Flow Sensor

II. RELATED WORK

[1] Optimal Energy and Catalyst Temperature Management of Plug-in Hybrid Electric Vehicles for Minimum Fuel Consumption and Tail-Pipe Emissions. In this paper, they develop a method to synthesize a supervisory power-train controller (SPC) that achieves near-optimal fuel economy and tail pipe emissions under known travel distances. We first find the globally optimal solution using the dynamic programming (DP) technique, which provides an optimal control policy and state trajectories. Based on the analysis of the

optimal state trajectories, a new variable energy-to-distance ratio (EDR), is introduced to quantify the level of battery, state-of charge (SOC) relative to the remaining distance. This variable plays an important role in adjusting both energy and catalyst thermal management strategies for PHEVs. A novel extraction method is developed to extract adjustable engine on/off ,gear-shift, and power-split strategies from the DP control policy over the entire state space. Based on the extracted results, an adaptive SPC that optimally adjusts the engine on/off , gear-shift, and power-split strategies under various EDR and catalyst temperature conditions was developed to achieve near-optimal fuel economy and emission performance.

[2] Wireless sensor network based smart home: Sensor selection, deployment and monitoring. This paper details the installation and configuration of sensors in an elderly person's house a smart home in the making in a small city in New Zealand. The overall system is envisaged to use machine learning to analyze the data generated by the sensor nodes. The novelty of this project is that instead of setting up an artificial test bed of sensors within the University premises, the sensors have been installed in a subject's home so that data can be collected in a real not artificial environment.

III. PROPOSED SYSYTEM

The location history of individual fleet vehicles allows precisely time managed, current and forward journey planning, responsive to changing travelling conditions. To avoid this we are implementing an IOT fuel monitoring and tracking system. So as soon as some agent starts filling petrol in your bike/car the flow sensor activated. This flow sensor will be active till flow ends. Once flow ends it will calculate the amount of fuel filled and directly notify on yours mobile phone.

IV.SYSTEM ARCHITECTURE:

. The following figure gives a brief idea about the system architecture

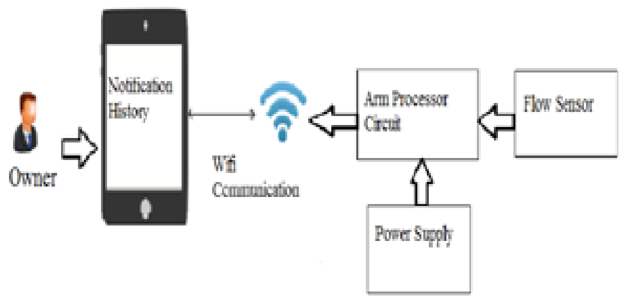

Fig 2. System architecture

The location history of individual fleet vehicles allows precisely time managed current and forword journey planning ,responsive to changing travelling conditions. To avoid this we are implementing an IOT based fuel monitoring for future vehicles. When agent start filling petrol in your vehicle flow sensor will get activated. This sensor will active till the flow ends. Once the flow ends it will calculate how much amount of fuel is inserted and this information will directly notify on your mobile. Also location can track via GPS so we know from where we have deposited the fuel.

V.PERFORMANCE REQUIREMENT

[1] JVM should be tuned on mobile to provide extra address space to application.
[2] Raspberry-pi 3 will be used.
[3] Hardware should have 1 GB RAM and good processor.

VI. FLOW SEQUENCE

[1] Initially power get on and flow sensor get started.
[2] Flow sensor will wait till flow of fuel get started.
[3] Flow sensor will calculate how much amount of fuel is filled.
[4] Then this calculated information of fuel is send to the cloud.
[5] At the same time location is fetch by the users mobile.

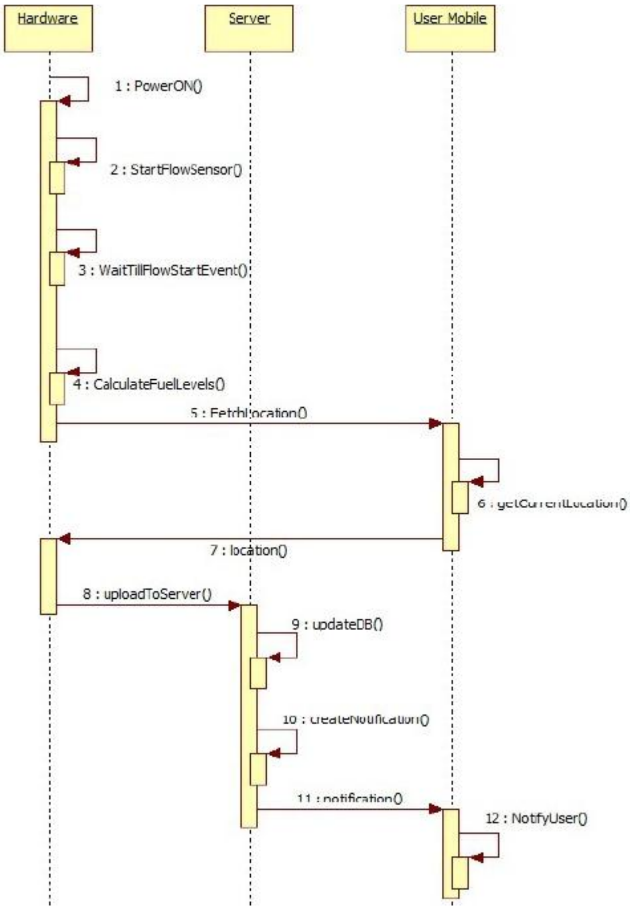

Fig 3. Sequence Diagram

VII. ADVANTAGES

There are a number of advantages like:

[1] We can cross check how much fuel is deposited.

[2] We can also check where we have deposited fuel.

[3] Instant Notification.

. VIII. CONCLUSIONS

The proposed system will make sure that how much amount of fuel is exactly deposited to avoid loss of amount of money. System implementation will be done by using flow sensor and mobile .We can get good mileage.

IX. REFERENCES

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