Real-Time Fuel Monitoring and the Nearest Fuel Station Suggestion System

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Abstract: **"Real-Time Fuel Monitoring And The Nearest Fuel Station Suggestion System" by using this system, We can map all the retail outlets on Google Map and can have an application connected to fuel tank sensor which will generate an automated message and path may pop up regarding the nearest fuel station with details of fuel prices and the total fuel to be top-up for covering the remaining distance if the fuel level drops a particular level. We can design an application to recommend when to fuel the vehicle and what petrol pump to use. Provide facility to provide ratings to the fuel station and recommend fuel stations based on the ratings. This can be implemented using the following technology stack, With Languages Python, Android, R and JavaScript, with Sensors HC-SR04 and Ultrasonic Sensor, with Firebase as backend, using Raspberry-pie and Android as operating system, As well as well can access services of AdaFruit IO cloud and Google Map API's for real-time tracking and fuel station suggestion.**

I. INTRODUCTION

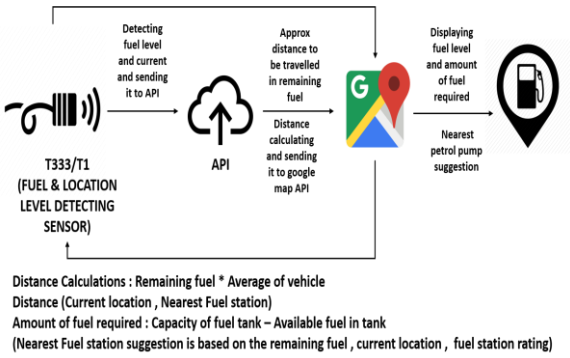
A. *Existing System*

Currently, vehicle displays real-time fuel level by using a fuel level meter. And the user gets the fuel station on the search basis by using Google-Map.

B. *Proposed* System

The proposed system is implemented on the base of single board computer R-pi which also acts as a gateway to fetch the real time data to the cloud platform. The main reason for choosing R-Pi 3 as base for entire system is because of its performance and variant features.

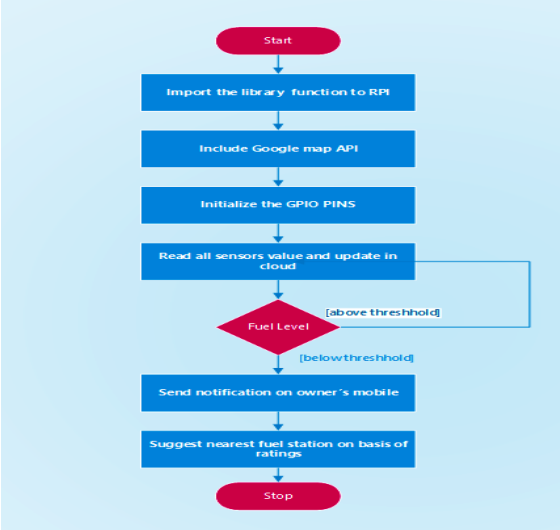
- "Real-time fuel monitoring and the nearest fuel station suggestion system" works on the Android Platform by using IoT Sensors, Google Map API as an interface to provide real-time location of the vehicle as well as providing a suggestion of the nearest petrol pump and rating.
- The fuel level detection sensor collects the data using Raspberry-Pi libraries and modules and transfers it to the cloud. On Cloud, Algorithm calculates the distance can be covered in remaining fuel and distance between a current location and nearest fuel stations. If the fuel level is less than the threshold level it sends a notification on user mobile that fuel is not sufficient to cover more distance. The system will send the current location as a parameter to Google Map API and then Google Map API will suggest the nearest fuel station based on Google Map Rating. User can choose a fuel station which user want from the suggested list.
- This process is continuous which will work in the background. Notification will be sent when the fuel level is below or equal to a threshold level or if the fuel is not sufficient for reaching the nearest fuel station.



II. OBJECTIVE

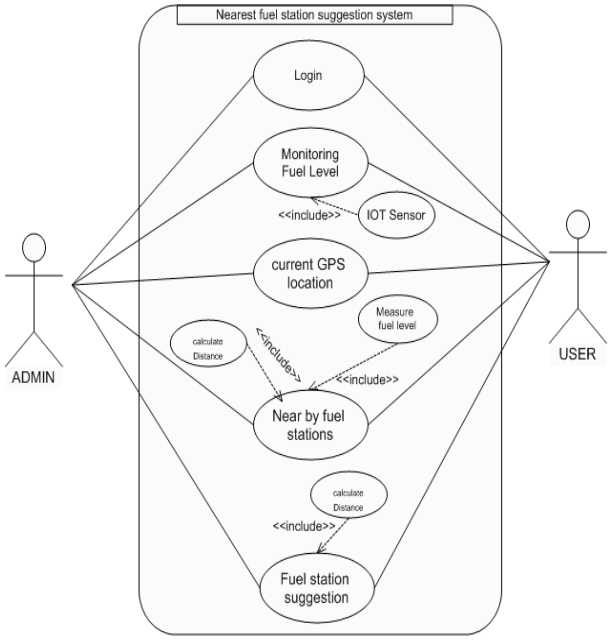
Real time fuel level detection system will provide intermediate of fuel level detection and Google Map in which we can map all the retail outlets on Google Map and can have this intermediate application which can get data from fuel tank sensor which will generate an automated message regarding the nearest fuel station with details of fuel prices and the total fuel to be top up for covering the remaining distance. This application will recommend when to fuel the vehicle and what petrol pump to use on the basis of ratings.

III. FLOW OF SYSTEM



The single-board computer R-Pi is directly interacting with sensor modules to collects vital information about Vehicles fuel level. The real-time tracking of the vehicle is achieved by Google Map API which receives coordinates from satellites and sends this information to R-Pi continuously. The fuel level of the vehicle is being identified by the fuel level sensor. All this information is gathered by the single-board computer on the vehicle and sends it to the cloud platform via the GPRS network using the GSM module GSM/Wi-Fi connectivity in real-time. Only the authorized vehicle owners can access these real-time data on the cloud environment anytime anywhere by using an Android application. By monitoring the vehicle location, the owner gets a better idea of arrival time to the destination as well as the status of their vehicle to manage accordingly.

USECASE



The system contains two users Admin and User. A given use case is a written description of how users will perform tasks on a system. It outlines, from a user point of view, a system behavior as it responds to a request. Each use case is represented as a sequence of simple steps, beginning with a user goal and ending when that goal is fulfilled.

CONCLUSION

We can map all the retail outlets on Google Map and can have an application connected to fuel tank sensor which will generate an automated message and path may pop up regarding the nearest fuel station with details of fuel prices and the total fuel to be top up for covering the remaining distance if the fuel level drops a particular level. We can design an application to recommend when to fuel the vehicle and what petrol pump to use. Provide facility to provide ratings to the fuel station and recommend fuel stations based on the ratings

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