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Smart Fleet Monitoring System

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Abstract - *Organizations use fleet monitoring systems for example vehicle tracking, driver behavior analysis, and efficient fleet management. Current systems are designed for commercial use and are of high cost. We present a model of a cheap sensible fleet monitoring system that might be used for non- commercial applications. The system is composed of a device and a Web application. The device reads data such as speed as well as fuel from the internal network of the connected vehicle and the location of the vehicle and sends them to a remote service. The remote service processes and stores the data. The users use a Web application to view the data about their vehicles in real-time.*

***Key Words*: Vehicle tracking, Driver behavior analysis, Web application, Remote service, Efficient fleet management.**

1. INTRODUCTION

In a developing country like India saving fuel plays an important role in development process. About 35% of the total population depends on public transport and usage of public transport helps in saving the most part of the fuel loss. Monitoring and maintaining of this is important. Since buses contribute 90% of the total public transport, thus monitoring the fuel usage in buses is highly necessary. As we can see digitalization is main reason in development of the country using modern technology like Internet of Things in reducing the non-renewable resource and human resource is much important. Keeping this in consideration we are developing an Internet of Things (IoT) based smart fleet monitoring system. The system monitors the vehicle with the help of fuel level sensor and a GPS sensor. The vehicle fuel tank will be installed with the fuel level sensor which provides the information of fuel level at a required instant. The GPS sensor generates a pulse at every meter covered by the vehicle. These information's are manipulated in the Raspberry pie which is connected with the fuel sensor and the GPS sensor. The information is sent t cloud database using GPS sensor. The cloud database holds all the information related to the status of the vehicle and the website will be developed for displaying these results. The Organization authorized person holds the login details and can access the website for monitoring the status of the vehicle and can provide control measures to the driver during the unmaintained condition of the vehicle.

2. LITERATURE SURVEY

The system shall transmit data from the vehicle to the server. The system shall transform the raw in-vehicle data to data that human can understand on the server. The system shall record vehicle data into a database. The system shall display a map with the locations of all the vehicles in the fleet. The system shall display live data, such as speed, engine temperature of a given vehicle. The system shall allow managers to register or remove the vehicles that belong to a particular fleet, The system shall allow managers to customise the information being exhibited to them. The main non-functional necessities are: enable solely man- agers to view fleet information on the web site, allow only man- agers to view fleet data on the website, allow only managers to view vehicles in their fleet.[1]

3. SYSTEM ARCHITECTURE

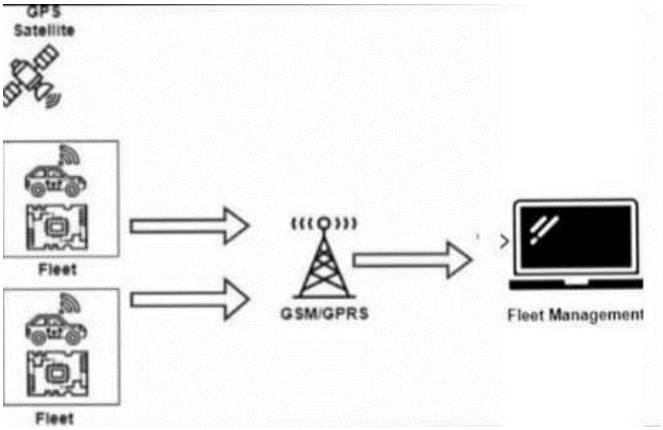

Fig -1: System Architecture

Basic components needed for Smart Fleet Monitoring System are as follows:-

3.1. Raspberry pi 3b+

The Raspberry Pi may be a low value, credit-card sized pc that plugs into a pc monitor or TV, and uses a typical keyboard and mouse. It's capable of doing everything you'd expect a personal computer to try and do, from browsing the net and taking part in high-definition video, to creating spreadsheets, word-processing, and taking part in games.

3.2. Jumper (Female to Female)

Jumper wires ar merely wires that have connective pins at each end, permitting them to be accustomed connect 2 points to each other while not fastening.

Fig -2: Jumper Wires

3.3. GPS module.

The NEO-6M GPS module may be a well-performing complete GPS receiver with a integral 25 x 25 x 4mm ceramic antenna, which provides a strong satellite search capability. With the power and signal indicators, you can monitor the status of the module

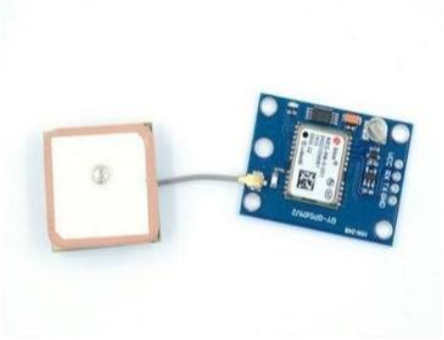

Fig -3: NEO-6M GPS Module

3.4. OBD-II Scanner

An On-Board Diagnostic (OBD) system might be a computer-based system for designation operational errors. associate degree OBD system might be a computer-based system that was developed by automobile manufacturers to observe the performance of various elements on academic degree automobile's engine, at the side of emission controls. OBD- II connect with DLC inside the vehicle. most the matter with the vehicle is also notice by OBD-II, like manifold, ABS brake perform, airbag (iSRS & SRS), engine performance thus on.Jumper wires area unit merely wires that have connection pins at each end, permitting them to be wont to connect 2 points to each other while not fasteni

Fig -4: OBD-II Scanner

3.5. Storage Device

A memory card or memory cartridge is an electronic data storage device used for storing digital information, typically using flash memory.

3.6. Creating webapp.

Fleet Managers from anywhere can track his fleet devices. A web platform that enables users to detect and locate the position of his Fleet devices.

4. Algorithm

Algorithm 1: The driver's behavior algorithm.
//Determine whether speed in vehicle Vi's GPS message is 0, if not, then it indicates that the vehicle is in motion If Sv != 0
//Run accumulation of total driving time for the day CSv = CSv+Time
//Run accumulation of every 4 hours of driving
//Total driving time exceeds 10 hours If CSv > 10 Hour
// Issue warning
Warning
message End
//The driver has driven for more than 4 consecutive hours without taking a break
If RSv > 4 Hour
//Issue warning
Warning
message End
//If the vehicle speed is 0
Else if Sv = 0
//Vehicle speed is 0
If REv > 30minute
//The driver has rested for more than 30 minutes RSv = 0
End
End

5. IMPLEMENTATION

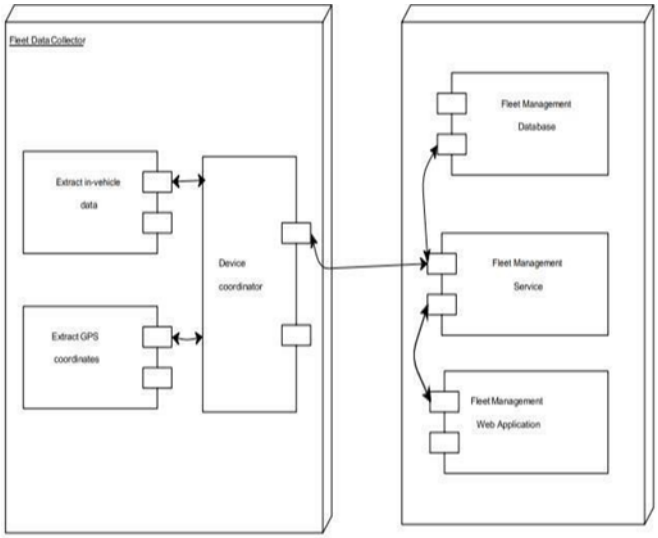

Fig -5: Block Diagram

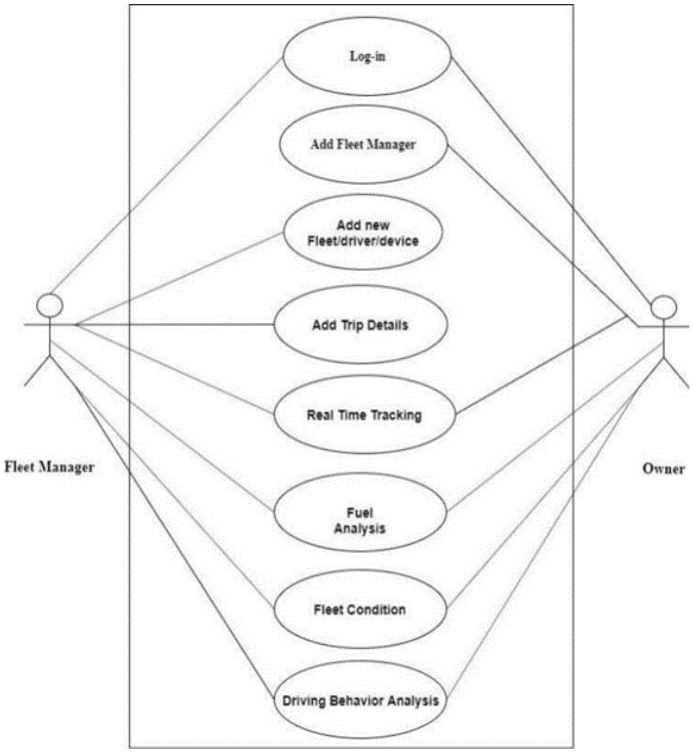

Fig -6: Use Case Diagram

6. CONCLUSIONS

In this paper, we have done the analysis of the problems available for the implementation of smart fleet monitoring system using IoTs. This system can bring revolutionary changes in the environment as well as in the day-to-day life of people. The proposed system ensures Management of vehicles fuel consumption based on daily, monthly, and annual reports provided for a particular vehicle or a group of vehicles. Efficient and exact management of the vehicle fleet and increase supervision capabilities. Receiving exact performance and operation information from the vehicles. Increase the customer satisfaction and staff transparency. Considerable reduction of driving violations during in-service periods.

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