Bus Tracking and Fuel Monitoring System

M.Ajoy Donison, P.Karthick Raja, S.Ajith Kumar, N.Anitha Devi

Abstract: The number of buses that are available in the public transport sector nowadays has been increased. It is not possible to track all available vehicle locations at a given period of time and to monitor the remaining fuel available in the vehicle. In this paper, we have developed a bus tracking and fuel monitoring system that will come in handy to maintain the services in which the bus owner offers. Our proposed system is based on the Arduino UNO, GSM module, GPS module, and fuel level sensor. It is an embedded application that will monitor the bus and transmit to the admin on demand.

Keywords : Arduino UNO, Global Positioning System, Tracking, Fuel Monitoring, Liquid Level Sensor and Fuel Tank.

I. INTRODUCTION

The bus tracking system is an efficient and cost-effective system. The main aim of our project is to provide the exact time forecast and the fuel monitoring system of the bus that provides a view of the bus to the passengers and also the exact arrival time of the bus along with the information to be sent to the Bus Owner as well. The data from the fuel sensor, GPS and sends it using GSM which can be done by using an Arduino board. The challenges of successful fuel monitoring involve the design which we are designed is more specific and efficient, and also it is made a commitment to implement the monitoring area, tracking with the help of GPS to locate, identify and to maintain the contact reports with one or more bus vehicles using these obtained results. Real-time vehicle tracking can be implemented which is a part of the commercial company's mobile resource management policy. This is essential to improve the security purpose and also to provide safeguard for the fuels which is really useful for the operations controlling driver. Increasing in cost of the fuel constantly challenges the bus operators to monitor the drivers behaviours inorder to avoid delaying in traffic situations and to maintain the movement of the vehicles either by combining certain features like rescheduling timetables, reconfiguring routes. Our ultimate aim is to improvize the number of deliveries while minimizing the time and the distance of the vehicle.

M.Ajoy Donison, Pursuing Engineering Graduate, Department of Computer Science and Engineering, National Engineering College, Tamil Nadu, India.
P.Karthick Raja, Pursuing Engineering Graduate, Department of Computer Science and Engineering, National Engineering College, Tamil Nadu, India.
S.Ajith Kumar, Pursuing Engineering Graduate, Department of Computer Science and Engineering, National Engineering College, Tamil Nadu, India.
Mrs.N.Anitha Devi, Assistant Professor, Department of Computer Science and Engineering at National Engineering College, Tamil Nadu, India

Fuel monitoring systems help the administrator to know the exact amount of fuel content of the bus, so fuel theft could be avoided, and the administrator could maintain the fuel more efficiently. The system principally monitors vehicle moving and tracking. To find a solution to problems like avoiding speed and accident, traffic jams vehicle monitoring is implemented along with handing over information for the vehicle owner. The system is capable of vehicle tracking, and monitoring. This type of vehicle monitoring will provide effective and vehicle location using GPS and GSM modules in real-time. The vehicle tracking based on GPS will notify the location of the vehicle and how long it has been there for. The geographical positions and time information that are used by the system are gathered from the Global Positioning Satellites. The system which resides in the vehicle to be tracked has a Base Station that monitors data from the various vehicles. This predictability has accurately detected the vehicle and monitors the speed for avoiding collisions.

II. EXISTING SYSTEM

We are using different types of mobile applications for tracking vehicles in different places of the world. Some examples are:

- ☐ An application has been implemented in Kolkata, named "Kolkata Bus guide." This application gives way to the destination correctly.
- ☐ Another application that was implemented in Mumbai, named "M-IndicatorMumbai."
- ☐ The application implemented in Delhi named "Delhi Bus Navigator."
- ☐ The application developed in Bengaluru named "Bangalore BMTC Info."

We are using different types of vehicle tracking applications all over the world.

III. METHODOLOGY

The proposed system's aim is to measure the fuel in the vehicle tank using a fuel level sensor. The ultrasonic sensor and IR sensor has better accuracy, and it is easy to calibrate and interface it with the Arduino controller, which is used. In this way, we can find the level of fuel in the tank. The system also uses GPS for tracking the location of vehicle; initially, information about vehicles' locations acquired from the GPS module should undergo a transformation into a form that will make it adequate for further usage in the system for analysis, and prediction.The device is designed to decrease the fuel usage and efficient utilization of fuel consumption by enabling fleet operators. When the system is mounted to the fuel tank, the amount of fuel level consumption is monitored by the sensor in the device which allows you to get consumption data any time with 98% accuracy.

The device can establish a connection with your computer or mobile phone, and you can get real-time reports in a printable format. Exact reports can be generated on the connected device regarding fuel consumption for the particular journey. This provides us the fuel consumption rate for the distance covered durting the particular journey.

Hence, allowing the fleet operator to detect fuel threat effectively. There is no way a driver can fake a bill and fill up the tank with less fuel, as the fuel level can be ascertained at any given point.If the fuel reserves are low, a message is intimated to the admin through a gsm module accompanied by the help of the Arduino module. The message contains GPS location information of the vehicle where it was having low fuel.
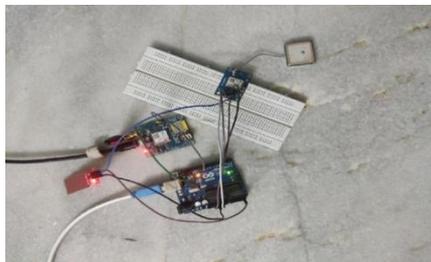
3.1 ARCHITECTURE DIAGRAM
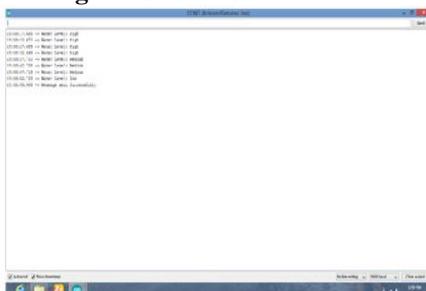

Fig.3.1 ARCHITECTURE DIAGRAM

3.2 BLOCK DIAGRAM
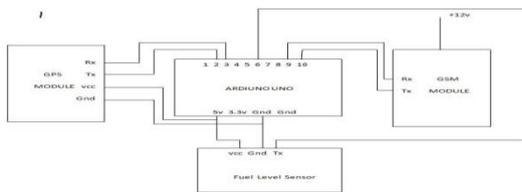
Fig 3.2 CIRCUIT DIAGRAM

IV. RESULT AND DISCUISSION

Fig 4.1 Circuit Connection

Fig 4.2 Arduino IDE

Fig 4.3 Received Message

V. CONCLUSION

This paper offers a ingenious design to track and monitor the vehicle location along with the fuel level, which helps the bus agencies to provide a high-quality service. This system reduces the time required by the remote users that they spend on waiting for buses and provides bus tracking at any location which makes management smudge free, With the help of fuel monitoring, we can further reduce the potential threat of fuel theft. We can also maintain a database of these values to monitor the activities of the bus drivers.

REFERENCES

1. M.Kotadia, "RFID based tracking system," International Research Journal of Engineering and Technology, Volume: 02 Issue: 06 | Sept 2015.
2. T. A. Ranney, E. Mazza, R. Garrot, and M.J. Goodman, "NHTSA driver distraction research: Past, present, and future," Nat. Highway Traffic Safety Admin., East Liberty, OH, USA, Tech. Rep., 2000.
3. Y. Liang, M. L. Reyes, and J. D. Lee, "Real-time detection of driver cognitive distraction using support vector machines," IEEE Trans. Transp.Syst., vol. 8, no. 2, pp. 340–350, Jun.2007.
4. Karan Punjabi, PoojaBolaj, Pratibha Mantur, SnehaWali, "Bus Locator via SMS Using Android Application "International Journal of Computer Science and Information Technologies, ISSN: 0975-9646, Volume 5, Issue: 02 | 2014.
5. M. Manikya Kumar, K. Rajesekhar, K. Pavani, "Design of punctually enhanced bus transportation system using GSM on " International Journal of Research in Computer and Communication Technology, Volume: 02, Issue: 12 | December 2013.
6. Mohammad A. Al-Khedher, "Hybrid GPS-GSM Localization of Automobile Tracking
7. System" International Journal of Computer Science & Information Technology (IJCSIT) Volume: 03, Issue: 6 | December 2011.
8. Yen-Jen Chen, Chai-Hung Chien."FUEL CONSUMPTION SYSTEM", Journal of Computer and Communication, page no: 153-158.
9. Mr.Aher S.S, Prof. KotakeR.D. "MONITORING FUEL AND VEHICLE TRACKING," (IJEIT) journal, Volume 1, Issue3.

AUTHORS PROFILE

M.Ajoy Donison is a present final year Engineering Graduate in the Department of Computer Science and Engineering at National Engineering College, Tamil Nadu, India. He did his Higher Secondary from Star Matriculation Higher Secondary School, Thoothukudi, Tamil Nadu, India in the year 2013.

P.Karthick Raja is a present final year Engineering Graduate in the Department of Computer Science and Engineering at National Engineering College, Tamil Nadu, India. He did his Higher Secondary from Christhuraja Higher Secondary School, Palayamkottai, Tirunelveli, Tamil Nadu, India in the year 2016.

S.Ajith Kumar   is a present final year Engineering Graduate in the Department of Computer Science and Engineering at National Engineering College, Tamil Nadu, India. He did his Higher Secondary from KVS Higher Secondary School,Virudhunagar, Tamil Nadu, India in the year 2016.

Mrs.N.Anitha Devi received her M.E degree from Mepco Schlenk Engineering College, Anna University in 2014.She   is currently working as an Assistant Professor in the Department of Computer Science and Engineering at National Engineering College, Tamil Nadu, India.Her research interests are in the area of Big data Analytics and IoT.