



## Vehicle-Race-Tracking System

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**Abstract**—This paper presents a vehicle race tracking application system. GPS tracking system is a common approach to get location information in real-time for fleet planning. A system is required to monitor the location of multiple vehicles moving around the fixed course and to display all kinds of data in an easy to read format on the computer screen. It is basically a real time vehicle tracking system using Global positioning system (GPS) technology and a tracking device Teltonika FM1100. GPS module is used to receive the locations of the vehicles through the satellite and then GPRS will collect all the data and send it to the website. Vehicles can be monitored on the computer screen very effectively with Google-map.

**Keywords**— Real- time, GPS, GPRS, Tracking System, Google -map.

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### I. INTRODUCTION

The ability to track, trace and control anything by anyone from anywhere on the planet has been mankind's unfulfilled desire. The usefulness of GSM and GPS has made them popular in their own context. Integrating these technologies can prove to be a flamboyant solution for many unsolved problems. Vehicle race tracking system is the combination of these two technologies. The motivation for Vehicle-Race-Tracking System is the desire for advanced features in an inexpensive receiver. Currently there is no single system that integrates all tracking and tracing of any movable objects, there are applications but all of them are separate so to integrating all of them was the source of motivation.

GPS tracking systems are used to track anyone and anything these days. Technology has rapidly advanced in the past few years and it has become very easy for the average person to use a tracking system.

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather, anywhere on or near the Earth, Trying to figure out where you are is probably mans oldest pastime. You may think that you only need a GPS tracking device to get you from point A to point B if you are unsure of where you are driving.

A GPS receiver calculates its position by precisely timing the signals sent by GPS satellites high above the earth. The receiver uses the messages it receives to determine the transit time of each message and computes the distance to each satellite. These distances along with the satellites' locations are used with the possible aid of trilateration depending on which algorithm is used, to compute the position of the receiver. This position is then displayed, perhaps with a moving map display or latitude and longitude; elevation information may be included. Many GPS units show derived information such as direction and speed, calculated from position changes.

### II. LITERATURE SURVEY

GPS tracking System is a common approach used, to get the positions of vehicles in real time for fleet-planning. We are proposing a GPS tracking system called as Vehicle-Race-Tracking application. This system is composed of commodity hardware's, open-source software's and easy-to-manage user interface with the Google-map. It is a basic lap-counting method, for use in sports/motorsports which are held on fixed circuits or courses and can be used in events held at different coasts. There are different types of tracking devices available in market these days.

A system for fleet management is explained in [1] which comprises GPS, web-based management software and Global System for Mobile Communication (GSM). This software allows the user to monitor and perform some fleet management tasks. [3] Fleet management system is available in two forms:

- On-line System
- Off-line System

On-line system allows the user to monitor the location of a vehicle. The system sends the data by using cellular networks or by using base-stations. Off –line system provides full day tracking information of vehicles. The web based fleet management allows us to measure the difference between the trip track that is ascertained by the operator and the actual track which is recorded by the system to monitor performance of the driver. A real time system in [2] proposes the use of GPS to receive the positions of vehicles and then forward it to the microcontroller and connect to the internet by General Packet Radio Service (GPRS) technology to show real time on the website which is developed with the help of Google-map which permits the monitoring of the vehicles at all times.

### III. CURRENT EXISTENCE

There are number of systems which have addressed the issue of tracking of vehicles and receiving information of location contexts, in recent years . Existing systems are not real-time systems, when the racing event is held, a video recording is performed. Accordingly, the results are declared.

### IV. SYSTEM

The real-time system proposed of GPS vehicle tracking system on a Google-map based website in [2] is composed of five processes as given below :

- In the first process GPS module will connect to the satellites and then it will receive the positions i.e, longitude, latitude and altitude from the satellite.
- In the second process, the GPRS module will connect to the satellite.
- In the third process, it will send the positions of altitude, longitude and latitude to the database servers.
- For the next process, the proposed website based on Google-map will display the vehicle tracking using the data from the database servers which contains the GPS positions.
- In last process, people can access the website and monitor the vehicle objects.

Figure 1 shows the proposed system of GPS vehicle tracking On Google-map based website.

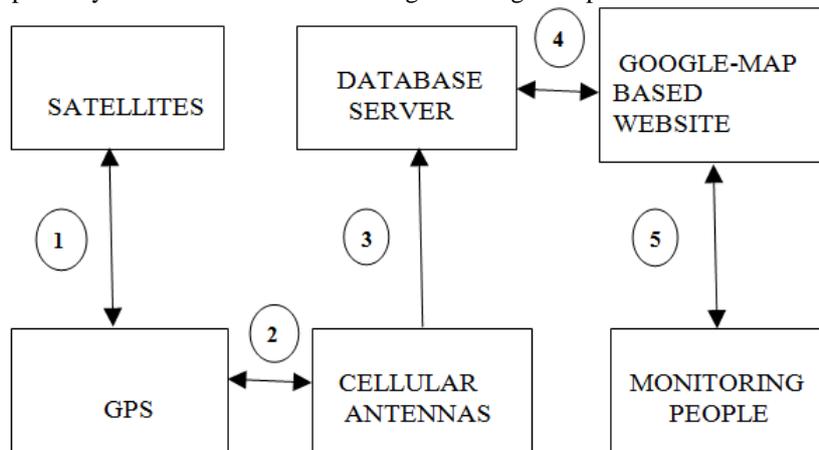


Fig.1 Vehicle-Tracking-System displayed on Google-map based website

The In-vehicle embedded system described in [3] is given below:

- 1) The Firmware :The software used for the system composed of firmware which comprises two parts .The first part communicates with RFID,OBD and GPS receiver to hex the data ,then compress it and store it in the memory. Second part is responsible for communicating with the Access Point(AP), collecting the data from memory and then send it to the web server through AP.
- 2) The Hardware : The embedded system integrates with the Wi-Fi, OBD, GPS and RFID in one device.
  - Wi-Fi Module : Wireless networking is the future of computer and internet connectivity. Lately Wi-Fi is widely used at work places, home and small business network. The system uses the Wi-Fi infrastructure that is already installed to connect the vehicle to internet. Here, the only thing that is needed to connect vehicles to the internet is the embedded system.
  - GPS Module : GPS has many advantages that make it useful in many life applications. The spread of satellites all over the world gives free services related to GPS data. GPS modules are available with cheap prices.
  - OBD Interface : OBD devices are incorporated into vehicles as early as 1994. OBD system turns on the Malfunction Indicator Lamp (MIL) in the car when there is any malfunction in the engine. The malfunction code stored by the engine control is to be accessed through the OBD connection by the OBD scan tool.
  - RFID Reader :The main task of RFID in the system is to know the driver of the vehicle. RFID card has a unique identification code. This code is sent by the card when it is placed close to the RFID readers. Later, it is sent to the microcontroller to be stored, so it can further be sent through Wi-Fi to the web server.

Web based Information System : The main goal of the web based software is to store and analyse collected data from vehicles. It also enables users to access the system from anywhere through Internet which allows users to monitor and manage vehicles from work, home or even while they are on their way. Web based information system that can be accessed by normal browsers. It does not need any software's to be installed in the user's computer. System is able to deal with huge number of vehicles with less overhead. The automated web based fleet management system offers new possibilities for workflow planning and organization by:

- Running a well structured database.
- Guaranteeing fast and easy information access.
- Guaranteeing data protection.
- Improving dispatch.
- Presenting good interactivity and flexibility.

The proposed web based fleet management system is an intelligent software that can take many decisions that are related to vehicles and drivers. This system enables the organizations that have many branches to optimize vehicles and drivers distribution. It also reports the mileage, fuel consumption, driver's performance, driver's assignment, vehicle's maintenance problem, and driver's status. This system is designed to be used by organizations that have big fleet. This software is able to do statistical analysis for fleet management optimization

#### **V. RELATED RESEARCH**

The paper in [1] represents a vehicular data acquisition and analysis system for fleet management automation. It exploits On-Board Diagnostic (OBD), GPS, RFID, and Wi-Fi technologies. It proposes an effective fleet management system that exploits the Global Positioning System(GPS), On-board diagnostic system(OBD), Wi-Fi, Radio Frequency Identification (RFID), and a web-based fleet management software. An embedded system is installed in a vehicle. Data acquisition system is integrated with IEEE 802.11 communication system. . A microcontroller based system is used to sample and store the GPS system, driver Id, and OBD diagnostic code. Wi-Fi technology is used for wireless connectivity, where each vehicle of the fleet communicates the data to a centralized server using the IEEE 802.11 wireless connection. The data is uploaded as a file to the web server. This file has the sample of GPS data (Latitude, Longitude, Time), OBD codes if there is any malfunction, and the driver ID.

#### **VI. CONCLUSION**

In this paper, we have tried to explain the real-time vehicle tracking system through the use of the global positioning system (GPS) technology to receive the location of the vehicle, the process includes the location information being forwarded onto the microcontroller and the connection to the internet by a general packet radio service (GPRS) technology. It helps in displaying the real-time location information on the website map developed by Google-map which allows inspection of vehicles throughout the race.

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