



## INTELLIGENT TAXICAB AD-HOC SYSTEM

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### ABSTRACT

Carpooling means to motivate public transportation and we are trying to developing an intelligence taxicab of bus to help Driver and passengers in their time. ARM processor is use auto GPS tracking system. The many systems integrate place tracking and wireless networking to allow for remote place tracking, few systems give the ability to check vehicle performance over the web. Design based on a standard for wireless communications GSM and GPS. The GPS technology is provide vehicle place; Apache's Tomcat extensions to provide Internet access via a vehicle tracking web site. The taxicab carpooling services is not new, but in real world it is normally negotiated privately by drivers and passengers in an ad hoc way. We lack a design to balance benefits of all the involved parties, e.g., passengers, drivers and taxicab operators.

Keywords- GPS, ARM processor, GSM/GPRS, wireless networking.

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### I. INTRODUCTION

In taxicab, we consider different real world constraints, e.g., passenger travel periods and taxicab capacities based on the taxicab route. Taxicab is encouraged both drivers and passengers to participate in carpooling system. In this taxicab, given a carpool benefit due to mileage reduction, passengers and driver will share this benefit by the supply and demand relationships in a taxicab network. The provide vehicle performance and position tracking system to users via the Internet.

The Global Positioning system technology used for designs and realizes one kind of embedded wireless system, intelligent vehicle control for critical remote location application using ARM 7 microcontroller from the hardware and software. The hardware design used ARM embedded system, GPS, GSM, obstacle testing module, different parameter monitoring sensor.

In this modern, fast moving and insecure world. It is become a necessity to be aware of safety. A system functions as a tracking and a security system. It is the intelligent vehicle control for critical remote location application. The system can deal with both pace and security. A GPS based vehicle tracking system that is used for security applications for vehicle monitoring and Security system. The project uses two main concepts first is GPS (Global Positioning System) and second is GSM (Global System for Mobile Communication). The main part of this system is tracking the vehicle to which the GPS is connected, giving the information about its position. The GPS satellite and the GPS module attached to the vehicle which needs to be tracked. This information got from the GPS antenna has to be sent to the base station where in it is decoded also we use GSM module which has an antenna. Thus we have at the Base station the complete data about the vehicle.

Real time monitoring an automatic system can be established in GSM module and vehicles automatically identify also upload critical data about the vehicle and operating conditions. The monitoring device can send modified control parameters and guidelines to the vehicle driver. The control parameters are temperature, alcohol detection, gas leakage detection, etc.

The problems identified in existing system not place to track or surveillance real-time position of vehicle on route, controlling process is time-consuming and non precise, unaware of number of pit stops taken by drivers, keeping records by paper work is unworthy of trust, Manual control through voice calls communication. Used in all public vehicle to motivate carpooling & to save fuel.

## II. SYSTEM ARCHITECTURE

### A. System Overview-

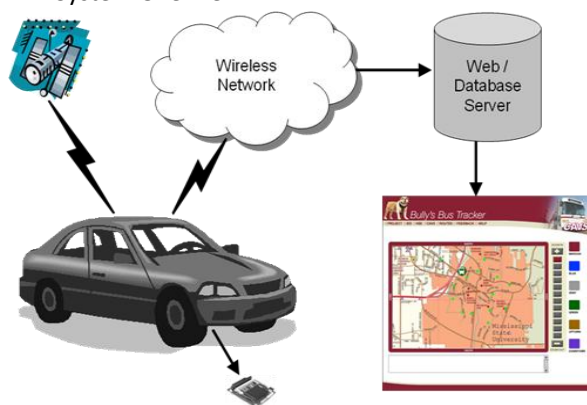


Figure1: Vehicle Performance Monitoring System.

In the existing taxicab networks of large cities, taxicabs are equipped with GPS and communication devices. The design is cost-effective, reliable and accurate tracking. GSM and GPS based tracking system will provide effective, vehicle location, and reporting also inform where your vehicle is and where it has been. The system uses geographic position from the Global Satellites.

B. Modules: Real time positioning- It gives the current place of required bus. To get the real-time place we have to just SMS or miss call the GPS device. If organization admin gives the miss call to GSM mobile SIM installed in the system, then system reply to admin with real-time position co-ordinates fetched from GPS satellite in text message on registered number. It also uses GPRS internet connection to

connect and record route travelled by vehicle, on MSO server and storing for replay.

Daily route tracking and Recording the path- From the recorded logs of the buses we can track the bus according to their travelled path and decide the vehicles is travel correct path or not. If the path was change due to any reason then ask to driver about it. Administrator can play or resume the all path or laps recorded in to storage. Acknowledges to admin several missed pickup points, number of pit stops, distance travelled, time stamps, engine-status at end of the day, speed variations, and number of stops.

Surveillance of on route- To monitoring the running buses on the route surveillance is necessary to know the vehicles are on the right route if not then we can alert the user or administrator about that and can take necessary actions on it. Administrator after login successfully done, system can check one or more vehicles. System provides real-time positioning of vehicle under surveillance.

Alerting engine cut off and Fuel monitoring- Real time surveillance alerts to admin if engine on/off status, speed and fuel gauge. From the recorded logs of previous day we can calculate engine fuel efficiency. Alert empty gauge of fuel tank and engine real-time revolutions per minute (r.p.m.'s). Alert vehicle engine ignition time to time. Admin can remotely cutoff the engine when required.

Report generation- At the end of workday, System will generates detailed organization vehicle tracking report containing routes, time, date, day, missed pickup point, fuel status (if any). Notify admin statistics about the particular vehicle engine when required. Store the report to server and display the report to admin.

## III. IMPLEMENTATION TECHNIQUE

### Intelligent Transportation Systems-

A relies heavily on vehicle communication systems including peer-to-peer and peer-to-base station communications; Incorporates seamless integration of in vehicle networking with existing wireless telephony. Uses networks of collaborative vehicles to optimize traffic flow and offer dynamic routing ability (intelligent network).

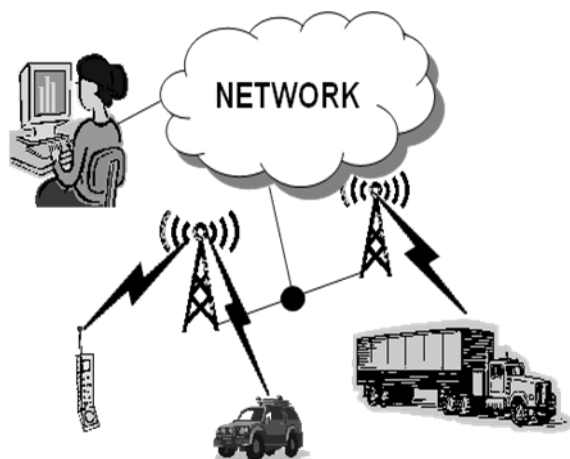


Figure 2: Overview of Intelligent Taxicab Systems

C. Global Positioning System: The GPS means Global Positioning System. GPS provides highly correct place information anywhere in the world and 24 geostationary satellites orbiting at an elevation of 11,000 miles. The Global Positioning System (GPS) is a satellite-based navigation system. The Global Positioning System (GPS) was design to show your exact place on the Earth anytime, in any weather, anywhere. It is the most advanced system of navigation. They track and check the GPS satellites. A receiver detects, decodes, and processes GPS satellite signals.

D. GSM/GPRS Wireless Network: Global System for Mobile Communication (GSM) is the fastest growing mobile communication standard. GSM (global system for mobile communication) is a cellular network that mobile phones used to acquire connectivity in their immediate vicinity. These networks run in different frequency ranges, mainly between 900 MHz and 1800 MHz. It uses a narrowband variation of Time Division Multiple Access (TDMA). SMS (Short Message Service) is a protocol for sending and receiving text messages over GSM networks. The text can comprise of words, numbers or an alphanumeric combination. A message can go up to 160 characters of text in length using GSM coding. It is the GSM service that provides the networking and messaging, also internet connectivity to the device using GSM SIM card module in-built in the same device .The place which is real-time tracking of the vehicle shared or via internet or sms to MSO server or the user mobile number automatic or manual access via application on mobile. GPS (Global Positioning

System) is a satellite based navigation system made up of network 24 satellites placed in to the orbit. These satellites transmit code information which allows us to find locations of earth precisely by measuring distance from satellites. The vehicle Tracking System (VTS) also uses GPS to take the location, speed, direction, and time data via satellite from the Global positioning system to the GPS pulse GSM. Device in a vehicle and also transmits it to a central server connected to a private network or internet. It is an electronic device installed in a vehicle to enable the third-party to track the vehicles locations. Most of these systems combined with mobile phones through SMS to communicate with vehicle place to a remote user. The market for GPS vehicle tracking system is consider as one of the fastest growing market for GPS applications. There are many levels of sophistication, but what all systems have in common is GPS receiver and software to put the tracking results on a map. The vehicle tracking system has several applications such as stolen vehicle recovery, fleet management, asset tracking, field service management, field sales and trailer tracking. MSO server is general positioning and map service provides uses the coordinate/GPS data received by device and shared to MSO server which detects the place on the map (real-time) preciously and accurate in which region track of the vehicle routes and log them and store to usable form. A log contain route traveled kilometer travelled speed lock and speed of travelling, stops and starts and intermediate pickup points gets recorded in the log. It also informs fuel cutoff, remote engine monitoring and controlling status accidental protection and reports, speed violations, missing pickup points.

In this application we need to make communication between the server and device so to do this we need a SIM with good range capacity. There are many factors which effects on the range. These are as follows;

- The connecting technology.
- Landscape features.
- The size of the network.
- The design capacity of the network.

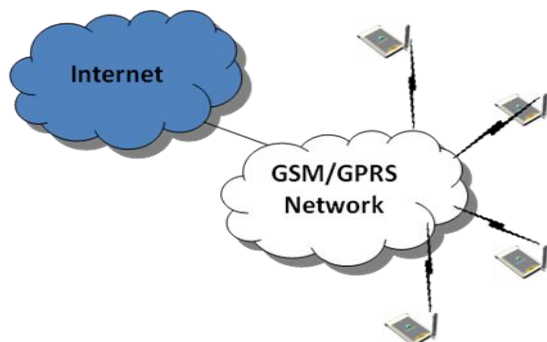


Figure 3: GSM/GPRS Network.

E. ARM Processor: A RISC-based computer design approach means ARM processors. This approach reduces costs, heat and power use. ARM architecture forms the basis for every ARM processor. The ARM architecture supports implementations across a wide range of performance points, establishing it as the leading architecture. The ARM architecture supports a very broad range of performance points leading to very small implementations of ARM processors, and very efficient implementations of advanced designs using state of the art micro-architecture techniques. Implementation size, performance, and low power consumption are key attributes of the ARM architecture.

F. Data Collection Software: A combines OBD-II data and GPS coordinates into a single data stream. OBD-II data is retrieved by continuously polling the system. OBD-II data is find by generic parameter identifications or PIDs specified in SAE J1979 standard; Speed, Engine RPM, Calculated Throttle Position Sensor (TPS), Engine Load, Engine Coolant Temperature, and Air Intake Pressure.

G. Web and Database Server: A database is an organized collection of data. It is the collection of schemes, tables, queries, reports, views and other objects. Database server may refer to both hardware and software used to run a database, according to the context. The used Apache web server and Tomcat extensions. Core development of the Apache Web server is performed by a group of about 20 volunteer programmers and Apache is a freely available Web server that is distributed under an "open source" license. Five http servers to keep up data flow from the vehicle to the database to the user interface. Separate database for real-time and stored data are support.

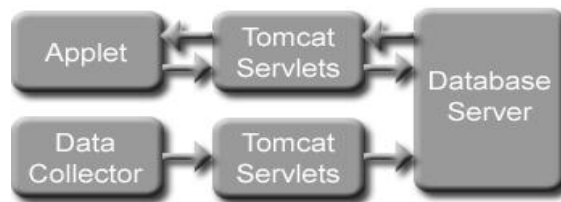


Figure 4: Block diagram Web and Database Server.

#### IV. Summary and Future Work:-

Prototype is real-time vehicle performance monitoring system which exploits existing wireless networking technology. The last design incorporates a single board including chipsets for various wireless technologies and in-vehicle networking protocols. A modular architecture supports a variety of sensors and high-speed data communications.

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