



VEHICLE MONITORING & LOCATING IN REALTIME USING GPS AND GIS

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Abstract

In recent years, the advancement of the present day urban areas is quickly expanding and they are experienced by a few issues, such as heavy traffic in transportation services and so on. This outcomes to a major transport issue for colleges, offices, schools, etc. So using this system, students of colleges as well as offices can be aware of the arrival time and also they must be informed about bus details and also know where it is located. GIS is one of the main frameworks which is used in this project. It is used to store, capture, manage, manipulate and consists all types of geographical data. GPS is also used in this project, which is used to get the insights about the area of transport. Every school and collage bus is having a transmitter which transmits the latitude and longitude persistently and the transport mode area is gotten by the client in portable. The area of the transport is discovered, which is imparted to the Coordinated Node through RFID handset. The client will send the solicitation to the Coordinator Node through SMS. The Coordinator Node will store the Vehicle Location and also it gets the

User Query through GPS and reacts back to the user with respect to the current location of composition transport.

Key Words:transport; vehicle; GIS; GPS; location; tracking; RFID; coordinate.

1 INTRODUCTION

The Global Positioning System (GPS) is a space-based course structure that gives zone and time information in each atmosphere condition, wherever on or near the Earth where there is an unrestricted perceptible pathway to four or more GPS satellites. The structure gives essential abilities to military, normal, and business customers around the world. The United States government made the structure, cares for it, and makes it wholeheartedly open to anyone with a GPS gatherer.

A geographic information system or topographical information structure (GIS) which is planned to catch, store, control, analyze, manage, and demonstrate an extensive variety of spatial or land data. GIS is used for geographic information science that studies land information systems which is an immense domain. GIS application tools will allow clients to make intuitive questions, dissect spatial information, modify data in maps, and present the results of each one of these operations. The Global System for Mobile communication (GSM) is an immense, quickly extending and successful innovation. Under five years prior, there were a little number of organizations dealing with GSM. Each of these organizations had a couple GSM specialists who brought information once again from the European Telecommunications Standards Institute councils outlining the GSM determination. Presently, there are many organizations working on GSM and a huge number of GSM specialists. The GSM system can be isolated into three wide parts. The Mobile Station is conveyed by the endorser; the Base Station Subsystem controls the radio connection with the Mobile Station. The Network Subsystem, the primary piece of which is the Mobile administrations Switching Center, performs the exchanging of calls between the versatile and other altered or portable system

clients, and in addition administration of portable administrations, for example, confirmation. Not demonstrated is the Operations and Maintenance focus, which manages the best possible operation and setup of the system. The Mobile Station and the Base Station Sub-system convey over the Um interface, also called as the air interface or radio connection.

Tracking of a location is one of the rapidly expanding technologies. Generally a tracking system is used for the observing of persons or objects on the move and supplying a timely ordered sequence of respective location data to a model e.g. capable to serve for depicting the motion on a display capability.

2 REVIEW OF RELATED WORK

The present day technologies used in tracking vehicles only give the location of the vehicle and not any more information. Let us take the famous cab service providers like ola and uber, they use the Global Positioning System (GPS) in order to find the co-ordinates of the vehicle and track its changes from time to time. We dont get any information as to how many members are in the vehicle, at what speed the vehicle is moving and since when the vehicle is in locomotion.

This is possible with the technology known as Geographical Information System (GIS). In previous research work [1], we have analyzed the density dynamics of using GIS. And by the database information collected by GIS we can predict weather condition of a particular route [2]. Therefore alternative route can be suggested by this system. As said by Xiong, H. in Encyclopedia of GIS [3] a moving object can be tracked in real time with spatial recognition. We can track the vehicle using mobile based GIS as referenced from [5]. We can use GIS in delivery vehicles by finding the most suitable route to avoid loss of time [6]. The data collected can be stored and processed from the spatial database systems and predictions can be made by evaluating data [7]. In case of disaster at any point of time , GIS can be used to track lost vehicles due to earthquake or floods

and other calamities [8].

3 FEATURES OF GIS/GPS INTEGRATED VEHICLE MONITORING.

There are a lot of features we can achieve by integrating GIS and GPS in monitoring vehicles. Let us consider a Police Vehicle Monitoring System using GIS and GPS [4]. The following advantages can be achieved:

- Recording of route and movement of police car - having in mind that police officers do have their own route to pass, in some cases it is necessary to monitor road the car paths since any emergency case can be better managed having accurate and precise vehicle position under monitoring,

- Velocity of movement - depicts the way police officers behave under certain route conditions,

- Fuel expenses - measurements of fuel expensed may lead to managing of main expense that police car make. This function of GPS helps police officers having knowledge about the car's engine conditions by providing evidence in circumstances of increased fuel expenses due to the engine problems, for instance. - Number of people (passengers) sitting in car - GPS sensors are installed in order to identify number of people or passengers on car.

- Filling fuel - sensors identify amount or gallons poured into fuel tank, time and place is also recorded. By having this data police officers will have information about the particular car how much fuel remained just by looking into the records provided by GPS at the time they decide to take a car for a drive, - Starting and stopping time of vehicle - 5 seconds after the car is turned on, signal is sent showing car is ready for use and assist on fuel expenses management. Information supplied shows time car has set and "idle" time meaning car stand on place with turned engine on but it was not driven.

- Parking of vehicle - place and time vehicle was parked. Trying to avoid shirking of police officers, monitoring will proof for reliability and time spent while on duty.

- Seeking for vehicle - in case of any accident or any "force majeure" disaster (earthquake or flood), GPS makes possible monitoring cars in such occasions by shortening time for rescuing police officers from disaster or accident.

- Speed limit - in many circumstances police officers are ought to speed up while driving aiming to catch wrongdoers. In rare cases monitoring can be used showing if any of officers "intentionally" disobeys rules,

- Number Plates - GPS automatically shows plates of car strolling. This information helps identifying which car is taking particular route.

- Car identification - name of driver and his/her colleagues is identified. In case of any emergency or any duty call, car identification depicts if officers are on proper route, driving meticulously, their location, any plenty additional information according certain vehicle.

4 EXISTING SYSTEM

In the currently available framework just the zone or that particular area is covered. It is utilized to consequently recognize and track the area of objects or people in real time, usually inside of a building or other contained range. DRAWBACKS OF EXISTING SYSTEM:

The main drawback of the existing system is that dislocation cant be traced exactly and time complexity is high.

5 PROPOSED SYSTEM

In the proposed system the location of the vehicle is tracked by the GPS and also the following methodologies will be implemented.

- Attendance Management with SMS alerts to parents
- Live Vehicle Tracking Dashboard
- View Bus, Driver and Students details
- RFID readers and badges that record the boarding/disembarking to ensure complete data
- Alerts on bus deviation from the fixed / regular route
- History available up to six months.
- Fuel level, acceleration level, travelling duration, stop point time, waiting time database.

6 ARCHITECTURE DIAGRAM

Major Parts:

- Geo Information system
- Global Positioning System
- RFID data tracking

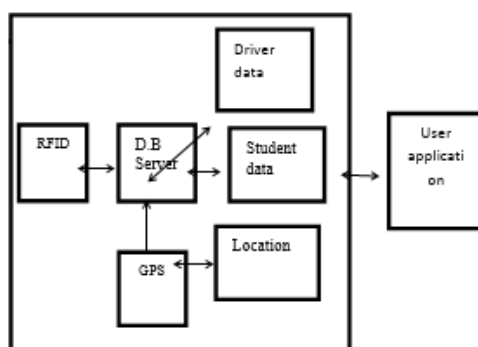


Fig.1. architecture of GIS based vehicle monitoring.

7 USER APPLICATION

The client uses the application and track the location based on the module implementation and it will show the number of students and driver information and travel route. The travel route identification is done based on the GPS using the Latitude and longitude. Now it will display the database of the students and driver through RFID (Radio Frequency Identification) for past six months.

8 SERVER

It is utilized to store the information and sends the data to the client through message. It assumes a part, which is utilized to store the data to the server and communicates through the RFID (Radio Frequency Identification)

9 HARDWARE CONSTRUCTOR

RFID, which is a wireless protocol, is used as hardware in this project. It is defined as a Radio Frequency Identification used to transmit the signals from server to client. Here the data of the students and the driver will be transmitted through RFID. Hence the data will be displayed.

10 GLOBAL POSITIONING SYSTEM

The Global Positioning System (GPS) is a space-based route framework that gives the area and time data in every climate condition, anyplace on or close to the Earth where there is an unhampered viewable pathway to four or more GPS satellites. The framework gives basic capacities to military, common, and business clients around the globe. The United States government made the framework, looks after it, and makes it unreservedly open to anybody with a GPS collector.

11 GEO INFORMATION SYSTEM

A geographic data framework or geological data framework (GIS) which is intended to catch, store, control, examine, oversee, and show a wide range of spatial or geographical information. GIS is utilized for geographic data science that studies, geographical data frameworks which is a vast domain. GIS applications are tools that permit users to make interactive queries, analyze spatial data, alter information in maps, and present the consequences of every one of these operations.

12 CONCLUSION

In the proposed framework the location of the transport as well as the students and driver data will be implemented. By this client can know whether the student had gone to the collage or office, etc. Furthermore the driver data, for example, who is driving the transport and the location will be shown. The whole process is implemented in an android application. This turns out easy to know about the student, driver and the location details.

References

- [1] Dhamodaran, S. & Kunapareddy, S. Density dynamics using GIS. *Int J ApplEng Res.* 2015; 10(5):1222936.
- [2] Dhamodaran S & Raja A. Prediction of weather condition using probability function. *Int J ApplEng Res.* 2015; 10(4):1066570.
- [3] Shekhar, S. & Xiong, H. (2008). *Encyclopedia of GIS.* SpringerScience+Business Media, LLC. Ney York 10013, USA.
- [4] Brick House Security. "How police use GPS for personal and vehicle tracking." Retrieved March, 2015 From:<http://www.brickhousesecurity.com/category/gps+tracking/gps+tracking+and+law+enforcement.do>

- [5] Dong, X. H. & Weihong, W. Mobile GIS Based Vehicle Navigation and Monitoring System." College of Software, Zhejiang University of Technology, Hangzhou, P.R.China, 310032
- [6] Balaa, A. "Geographic Information Systems in the Vehicle Tracking and Dispatch Industry: An Applied Experience" GeoVision SAL. Lebanon, Beirut.
- [7] Yeung, A.K.W. & Hall, G.B. (2007). "Spatial Database Systems- Design, Implementation and Project Management." Springer, P.O. Box 17 3300 AA Dordrecht, The Netherlands.
- [8] J.Refonaa and Dr. M. Lakshmi Analysis and Prediction Of Natural Disaster Using Spatial Data Mining Technique,IEEE Conference Publications, Pages:1-6,DOI: 10.1109/ICCPCT.2015.7159379.