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Vehicle Tracking System using "GPS and Android"

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Abstract: ***The Global Positioning System or GPS is a navigational system using satellites signals to fix the location of a radio receiver on or above the earth's surface or we can say that it is a space-based satellite navigation system that provides location information. In today's world Vehicle Tracking is one of the most important techniques used. This location based application helps in ensuring safety and improving the services for any organization. With this thought in mind we propose a GPS based vehicle tracking system which would give the admin real-time information about the vehicle. This could be used for a call taxi application as the admin could get information about the location of a vehicle and accordingly allocate a vehicle to the customer. This system would track the ground position of a vehicle and send the details to the admin. Using this system the admin would be able to know the location of the vehicle as well as the location of the driver that is driving the vehicle , which would in turn guarantee a level of security and also help the admin avoid any discrepancy in the records.***

Keywords: GPS, Satellite, radio receiver.

I. INTRODUCTION

Smart phones become an inherent part of human life. They are combined with numerous and different features that allow us to communicate with the world, organize our lives in an easy away and document events properly. One of the most important features is location-based services(LBS). A location-based service (LBS) is a general term denoting software services which utilize geographic data and information to provide services or information to user's phones use different features to get the location of the phone and many other purposes also. One of these features is the GPS. The GPS uses satellites to get the accurate location of the phone in terms of geography terms which are longitude and latitude.

GPS abased vehicle location and tracking system will provide effective, real time vehicle locations mapping and reporting this information back to Admin device and improving the level of service provided. The smart phone utilizes this coordination and uses them to show the phone's location in a map application A GPS based vehicle tracking system will inform where your vehicle is and all the previous records of travelling.

Vehicle tracking system is the advance technology used to determine the real time location of a vehicles. It is a system mostly used to keep an eye on the moving vehicle and using surveillance systems such as global positioning system are the best way to finding the position of the vehicle. Special mobile applications have been developed with various abilities of navigating. Tracking vehicles has always been a problem for school, colleges, transport companies. A GPS tracking device is complicated, expensive and the technologies used in it are monopolized by their owner. A technology with location-based services and API(Application Program Interface) is needed to develop a tracking system.

A. GPS (Global Positioning System)

The Global Positioning System, conjointly referred to as NASTAR(Navigation signal timing and ranging), that we tend to use was designed by the United States military and has been absolutely operational since 1995. Several trendy GPS receivers use a mix of each GPS and therefore, the Russian GLONASS (Global Navigation Satellites System) satellites for improved coverage and accuracy. GPS Satellite The GPS system presently has thirty-one active satellites in orbit inclined fifty-five degrees to the equator. The satellites orbit concerning 20,000 km from the Earth's surface and create 2 orbits in a day. The orbits are designed in order for their area unit perpetually "vi" satellite insight, from most places on the earth. GPS uses plenty of advanced technology, however, the idea is straightforward. The GPS receiver gets a sign from every GPS satellite present in the orbit. The satellites transmit the precise time the signals are sent. By subtracting the time, the signal was transmitted from the time it was received, the GPS will tell however so much it's from every satellite. The GPS receiver conjointly is aware of the precise position within the sky of the satellites, at the instant they sent their signals. Thus given the period of the GPS signals from 3 satellites and their precise position within the sky, the GPS receiver will verify your position in 3d(dimension)— east, north, and altitude.

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There is a complication. To calculate the time, the GPS signals took to arrive, the GPS receiver must recognize the time terribly accurately. The GPS satellites have atomic clocks that keep terribly precise time, however it isn't possible to equip a GPS receiver with an associate timekeeper. However, if the GPS receiver uses the signal from a fourth satellite it will solve the associate equation that lets it verifies the precise time, without having an associate timekeeper.

If the GPS receiver is simply able to get signals from three satellites, you'll still get your position, however, it'll be less correct. As we tend to note on top of, the GPS receiver wants four satellites to figure out your position in 3-dimensions. If solely three satellites area unit on the market, the GPS receiver will get the associate approximate position by creating the belief that you just area unit at mean water level. If you actually area unit at the mean water level, the position is going to be moderately correct. But if you're within the mountains, the 2-D fix may well be many meters off.

A modern GPS receiver can usually track all the on the market satellites at the same time. However solely a variety of them is going to be accustomed to calculate your position.

B. Android

The word, “ANDROID” is an acronym for “Automated Numeration of Data Realized by Optimized Image Detection.” The first commercial version, Android 1.0, was released on September 23, 2008. Developer of android was Google and open hand set alliance. Android is an operating system related to the Linux kernel initially design for smart phones. Android Smart phones are the best-selling smart phone in the world. Android is completely based on Java programming language. The source code for the android is freely available without any cost under open source software license. Features of android it has beautiful user interface (UI), connectivity with many sources such as Bluetooth, CDMA, IDEN, Wi-Fi, LTE etc, SQLite, a relational database management system (RDBMS), is used for data storage, it is also supporting single direction and bi-directional test, it is dynamic in nature by which it will become multi-tasking, User can switch from one task to another and same time many applications can run simultaneously so many features are available.

II. CLIENT APPLICATION

This feature consists of a client android application that represents the client of the system. It aims to recognize the location of the user and then send that location information to the server. This android application can be installed on any smart phone and then run using any version of the Android OS. When the application is installed then an icon appears on the screen that acts as an anchor to the application. After the user clicks or taps on the icon a splash screen or a start-up screen opens and then after a few seconds a login screen appears. The key feature in this application is GPS is used to track the present location of the user. This Global Positioning System is enabled in the phone which then in turn locates the current position of the user and saves this information in the application. The service of the application begins automatically when the user is logged into the system. But this is true only when the GPS is enabled otherwise a message-” GPS is disabled” pops up on the screen. As soon as the location of the phone changes, the new location is tracked by the GPS and the current location is updated in the application. The next step followed by the service is sending the location of the phone to the server. SMS messages are used to perform this action. The knowledge of the location is acquired by the application and sent to the server automatically in the form of a message created by the message service. Thereafter the sending service sends messages at regular time intervals as mentioned in the settings. After a several messages are sent, the user is notified with the number of messages sent. The service is initialized by selecting the aforementioned “start sending” button in the tracking activity. A notification appears in the notification bar as soon as the service begins and it is seen throughout the time duration when the application is running.

III. LITERATURE SURVEY

To determine the précised location of the object "Abid khan And Ravi Mishra" have a proposed tracking unit which it's and using GSM modem this information are often transmit to remote which is control by the user. this technique contains GPS and GSM modems together with an ARM processor that's set up within the vehicle. Through SMS the situation of the car is often reported. GSM and GPS technologies help to trace the vehicle's exact information. Real-time control is provided by an SMS system. you'll monitor the situation from anywhere using this technique. [1] Rodrigo R. Oliveira, Felipe C. Noguez, Cristiano A. Costa, Jorge L. Barbosa, and Mario P. Prado has proposed a model to induce the precise position of the car. The device used for tracking the situation of the car is known as SWTRACK. The distributor companies use this model to induce the situation of their respective vehicles. It also provides the mechanism to watch the detours coming within the planned route and sends an alarm message through the device [2]. The vehicle tracking monitoring system was designed by "Zechun Huang, Dingfa Huang, Zhu Xu and Zhigen Xu" using CORS and Mobile GIS. The accuracy and exactness are provided by the CORS service network and Mobile which has also

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verified the feasibility to integrate CORS and Mobile GIS for mobile location services. GPS helps to induce accuracy and high speed for performing in a faster way to spot the object. it's best fitted to taxi monitoring, school buses and navigation, vehicle anti-theft, and other fields [3].

IV. SOFTWARE USED

1) *Visual Studio:* Visual Studio is an associate Integrated Development Environment(IDE) developed by Microsoft to develop GUI(Graphical User Interface), console, net applications, web apps, mobile apps, cloud, and net services, etc. With the assistance of this IDE, you'll be able to produce managed code additionally as a native code. It uses the assorted platforms of Microsoft software system development software system like Windows store, Microsoft Silverlight, and Windows API, etc. it's not a language-specific IDE as you'll be able to use this to write down code in C#, C++, VB(Visual Basic), Python, JavaScript, and plenty of a lot of languages. It provides support for thirty six totally different programming languages. it's on the market for Windows additionally as for machOS.
2) *Android SDK:* Android software development is the process by which new applications are created for devices running the Android operating system. Google states that[3]"Android apps can be written using Kotlin, Java, and C++ languages" using the Android software development kit (SDK), while using other languages is also possible. All non-JVM languages, such as Go, JavaScript, C, C++ or assembly, need the help of JVM language code, that may be supplied by tools, likely with restricted API support. Some programming languages and tools allow cross-platform app support (i.e. for both Android and iOS). Third party tools, development environments, and language support have also continued to evolve and expand since the initial SDK was released in 2008. In addition, with major business entities like Walmart, Amazon, and Bank of America eyeing to engage and sell through mobiles, mobile application development is witnessing a transformation.[4] The official Android app distribution mechanism to end users is Google Play; it also allows staged gradual app release, as well as distribution of pre-release app versions to testers [4].
3) *Microsoft SQL Server:* Microsoft SQL Server is a relational database management system (RDBMS) that supports a wide variety of transaction processing, business intelligence and analytics applications in corporate IT environments. Microsoft SQL Server is one of the three market-leading database technologies, along with Oracle Database and IBM's DB2. Like other RDBMS software, Microsoft SQL Server is built on top of SQL, a standardized programming language that database administrators (DBAs) and other IT professionals use to manage databases and query the data they contain. SQL Server is tied to Transact-SQL (T-SQL), an implementation of SQL from Microsoft that adds a set of proprietary programming extensions to the standard language [5].

V. AIM AND OBJECTIVE

The objective of the project is given below:
The features of Android vehicle system are the following:

A. Get the location of the device in longitude and latitude format.
B. History of fuel usage and maintenance records of all the vehicle.
C. Show Multiple locations of multiple vehicles on a single map.
D. Running information of vehicles along with real-time.
E. Location history of vehicles.
F. Display Traffic update in the area.
G. Display Weather update in the area.
H. Regular transit tracking.
I. Distance Calculator

VI. MODULES

1) *Admin Login:* Admin has is own unique id and password. Admin is the one who can access user login.
2) *User Login:* Driver is the user. Driver also have unique id and password.
3) *Monitor Vehicle and Driver Location:* Admin monitories the activity off the driver, and also the location details.
4) *Registration:* Registration of vehicle and driver in this module.
5) *Records:* Fuel, repair, engine efficiency & maintenance entry.
6) *Weather Update:* Gives weather real time update, which is shown in this module.
7) *Distance Calculator:* Distance calculator help in measuring the distance travelled.

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VII. APPLICATION

A. This system is can be used in school, colleges and transport companies
B. Also help full for home delivery companies.
C. Also help for Govt. Transport agency.

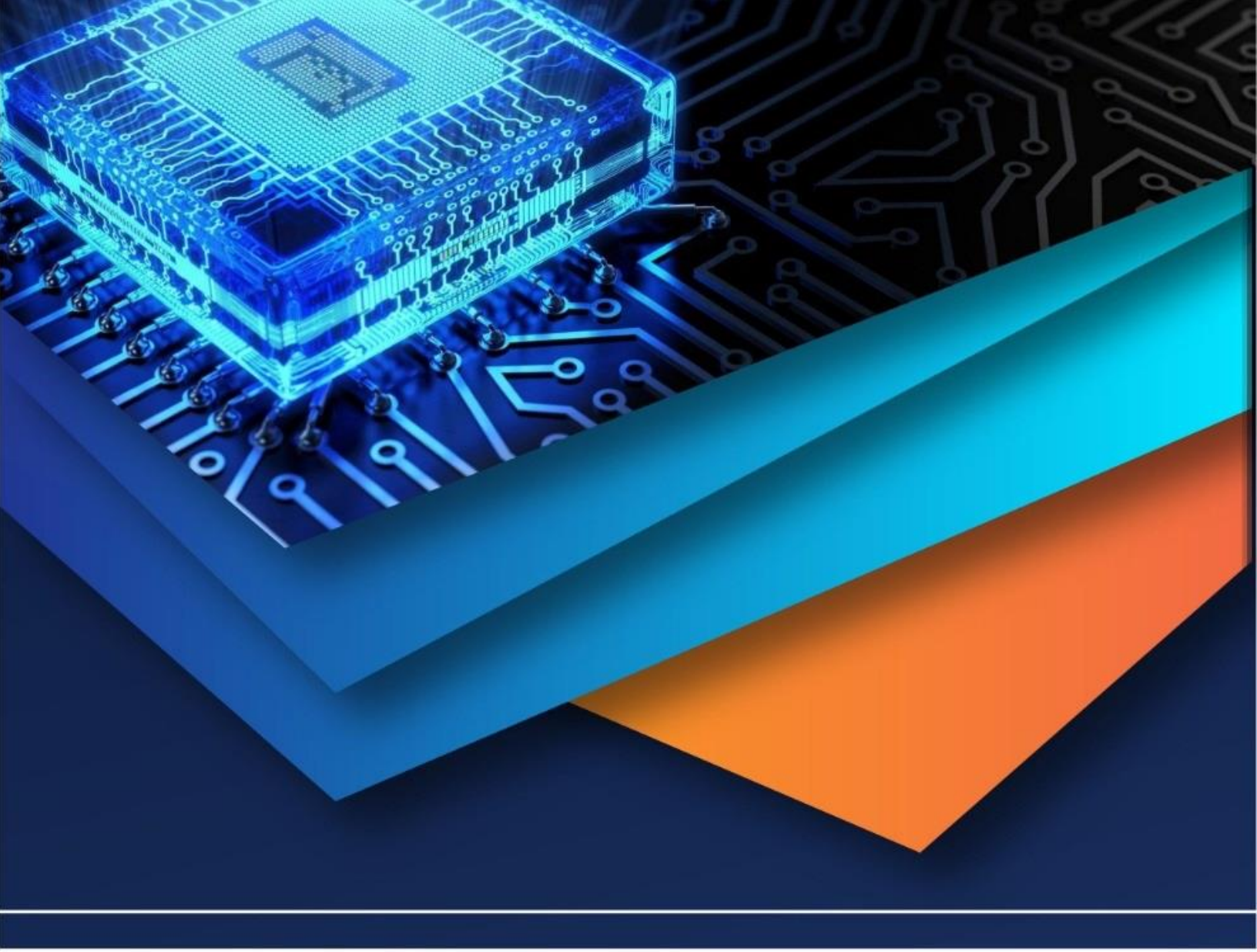
VIII. CONCLUSION

The application helps to the many small and big organization to look after their transport department with a minimum no of manpower in administration. And also look at their expenditure on vehicle maintenance and fuel consumption. The application allows real-time monitoring of vehicles and also the previous location of the vehicle all these things are possible because of GPS. GPS plays a very vital role in the tracking of any object. GPS is connected with the satellites in the orbit and get the coordinates of a particular object. By which we can locate any object. This Application gives transparency in the organization and security also.

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