Vehicle tracking system using GPS technology

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ABSTRACT

Vehicle tracking is one of the most important techniques mostly used in today's world. A vehicle tracking system works with the installation of a tracking device which is kept inside vehicles, so it allows the user or an owner to track the vehicle's location. Now a day's vehicle tracking systems are normally work on Global Positioning System (GPS) technology for tracing the vehicle, but other forms of vehicle tracing technology can also be used. In this paper, a survey is done on various vehicle tracking method using GPS. Vehicle information can be viewed and located on the maps via the Internet or specialized software. In this paper, study is done on a real-time vehicle tracking system that works using GPS and GSM technology, which would be the easiest and inexpensive source of vehicle tracing.

Keywords: *Tracking, Vehicle, GPS.*

1. INTRODUCTION

In today's world, vehicle tracking system is one of the most important systems which is mostly used by drivers and most of the vehicle owners. The maps given to the driver is the key weapon, which plays a most important role in this field. When large object or vehicles were a blowout over the ground, the owner corporations often found it problematic to keep track of what was happening[1]. The author suggested that Vehicle tracking has become so advanced and simple with various upcoming technologies. But the cost-effectiveness and its implementation have become high [2]. Nowadays, many organizations and individuals find a need for tracking for safety. It is a concern to have a vehicles tracking system as for the better implementation of a vehicle, as well as for safety. Mostly in all tracking systems, internet and external data servers are used as a primary requirement. Hence, this leads to an investing of a large amount of money into the system. So in this paper, a survey is done by aiming to reduce costs in tracking systems and making it feasible to implement on school buses which take a specific route on a daily basis for the better management of time and safety. Also to implement this system in public transport vehicles, various companies and many more. There is a requirement of some type of system to determine where each object was at any given time and for how long it traveled. GSM and GPS built tracking system will offer effective, real-time vehicle location, and report the location of the vehicle [1]. The author [1] states a GPS-GSM based tracking system will inform where the vehicle is and where it has been, how long it has been. From the Global Positioning Satellites, the system will fetch the geographic location and time information. The system takes advantage of wireless technology in providing the better way of vehicle tracking system. Vehicle tracking system is the technology used to determine the location of a vehicle. It is a system mostly used to keep an eye on the moving objects and using surveillance systems such as global positioning system are the best way to finding the position of the object. This survey found GPS system can observe the vehicle

activities all the time and allow owner or third party to view the position of the vehicle. In general, a study on GPS tracking finds that GPS vehicle tracking utilizes a space-based global navigation satellite system to track location information of vehicles. This information is then transmitted to a third party who access vehicle location. In order to implement a vehicle tracking system GPS device must be placed inside the vehicle. The vehicle position will be updated all time as the vehicle is moving. This system enables the owners who have cars to observe and track the vehicle and can be able to find out vehicle movement and its past activities. The tracking system work in a maximum of the major cities, highways, towns and works competently in zones with improved mobile connectivity.

2. LITERATURE SURVEY

2.1 GPS based vehicle tracking and monitoring system- A solution for public transportation-

The author of the paper provides a solution for tracking and monitoring the public transportation vehicles using devices such as Raspberry Pi and GPS Antenna. Raspberry Pi processing board can be used to receiving values and gives the result. This method can find a way to monitor the transportation vehicle from the location source to destination. In this paper, there is a use of GPS receiver module for receiving the latitude and longitude values of the present location of the vehicle continuously. A passenger of the vehicle will give different locations to the system between the source and destination locations. These values will be stored in the Raspberry Pi database and Raspberry Pi processor will compare the passenger specified values with the current vehicle location values and if the result is not the same then the passenger will be informed with warning message via display system that driver is driving in the wrong direction.[3]

2.2 Real-time GPS vehicle tracking system

In this paper implementation and designing of a real-time GPS tracker system via Arduino was applied. This method was applicable for salesman tracking, private driver and for vehicle safety. The author of the paper also tried to solve the problem of owners who have expensive cars to observe and track the vehicle and find out vehicle movement and its past activities of vehicle. The system has GPS/GSM modules controlled by Arduino MEGA placed inside the vehicle. The vehicle position will be updated every time as the vehicle moves. Then User will send SMS on registered number and they will receives the coordinate location. At the same time the data will get stored on SD card continuously. The location will be accessible to users by system via website over the internet. [4]

2.3 Android app based vehicle tracking using GPS and GSM

The author of this paper has explains an embedded system, used to know the location of the vehicle using technologies like GSM and GPS. System needs closely linked GPS and GSM module with a microcontroller. Initially, the GPS installed in the device will receive the vehicle location from satellite and store it in a microcontroller's buffer. In order to track location the registered mobile number has to send request, once authentication of number get completed, the location will be sent to mobile number in the form of SMS. Then GSM get deactivated and GPS get activated again. The SMS consist of latitude and longitude value of vehicle. This value received in the SMS can be viewed via android app and this coordinate will be plotted in the app automatically. [5]

2.4 Survey paper on vehicle tracking system using GPS and android

This paper propose a GPS based vehicle tracking system to help organization for finding addresses of their vehicles and locate their positions on mobile devices. The author states system will give the exact location of vehicle along with distance between user and vehicle. The system will have single android mobile, GPS and GSM modems along with processor that is installed in vehicle. When vehicle get activated and starts moving, the location of the vehicle will be updated continuously to a server using GPRS service. Monitoring unit will access the database from server to check the vehicle location. The location information present on database will be plotted using Google maps on monitoring device. Monitoring unit can be a Web application or Android application or a through which user will get to know the actual position of the proposed vehicle. [6]

2.5 Review of Accident Alert and Vehicle Tracking System

In this paper, the author has described the system that can track the vehicle and detect an accident. There will be automatic detection of traffic accidents using vibration sensors or a piezoelectric sensor. This sensor will first sense the occurrence of an accident and give its output to the microcontroller. As soon as vehicle meets accident the GPS module will detect the latitude and longitudinal position of a vehicle. Then the GSM module sends latitude and longitude position of the vehicle to the ambulance which is near to that location. This message sending operation will be automatically done and an alert message may send to the central emergency dispatch server. This system is familiar with vibration sensor, Raspberry Pi, GPS and GSM modules to detect traffic accidents. [7]

Table 1.1 Literature Survey

Author/ Title/ Publication	Technology used	Research Gap
1) Akshatha S.A, "GPS based vehicle tracking and monitoring system", Volume: 04 Issue: 04 | Apr - 2017.	1) GPS technology. 2) Raspberry Pi technology.	1) Only the comparison result can be displayed by the display unit, no map was shown. 2) Need more input for comparison.
2) Hazza Alshamisi, Veton Këpuska, "Real Time GPS Vehicle Tracking System", Volume 6, Issue 3, March 2017.	1) GPS technology. 2) GSM technology. 3) Web technology.	1) Fully web-based. 2) Unable to see location in case of internet failure. 3) Difficult in hardware implementation.
Author/ Title/ Publication	**Technology used**	**Research Gap**
3) Jessica Saini, Mayank Agarwal, Akriti Gupta, Dr. Manjula R, "Android app based Vehicle tracking using GPS and GSM", volume 6, issue 09, September 2017.	1) GPS technology. 2) GSM technology. 3)Microcon-troller.	1) Due to a certain limitation in hardware, app location on the app has an error of approximate-ly 10 meters. 2) Hardware requirement costly.
4) Amol Dhumal, Amol Naikoji, "Survey Paper on Vehicle Tracking System using", Volume 3 Issue 11, November 2014.	1) GPS technology. 2) GPRS technology.	1) The tracking device is not internally built on the vehicle.

5) Prashant Kokane, Prof. Yogesh Thorat "Review on Accident Alert and Vehicle Tracking System", Vol. 3, Issue October - December 2015.	1) GPS technology. 3) GSM technology. 4) Vibration sensor.	1) The absence of initial tracking, the system will only track vehicle after meeting an accident. 2) Chance of damaging hardware while meeting accident and unable to track.

3. COMPARATIVE STUDY

From the above-mentioned vehicle tracking system it has been found that each technique is appropriate for its work. Whereas in some system there is a need for continuous net access and this system will not work in case of net failure. In the second system the GPS tracks the vehicle location and send it to the microcontroller and monitoring unit will access the location via Google map on the display unit, this system is useless without a net because the location of the vehicle can only be viewed by the Google maps. In the other system vibration sensor is used to detect all the accident which work only when vehicle meets an accident. By considering all these factors the upcoming implementation needs to overcome all the disadvantages and should be able to perform many more facilities which will make the system user-friendly and efficient.

4. APPLICATIONS

After doing this survey it was found that vehicle tracking system very uses full in today's era and can be used in a number of fields-

- This system can be used by transportation companies.
- Schools or colleges can also use vehicle tracking system could also use in school vans to keep a constant check on the route of the vans.
- It could be used in Bus stands by the managers to predict and display the timing of the arriving buses for the waiting passengers. [5]

5. FUTURE SCOPE

While doing this survey, it was found that vehicle tracking is a huge field. There are a number of technique that can be used to track vehicle. The technique should be cheaper and also efficient. Due to the increasing ratio of a vehicle in today's world, the vehicle tracking system will have a great scope in future. A various type of database can be created to record the route of the vehicle. The hardware can be replaced by installing the device with sensors like fire sensors and proximity sensors. Proximity sensors will be exceedingly supportive in case whenever vehicle will meet with an accident. It is possible to make the device wearable by reducing the size of the hardware so that not only for finding the location of the vehicle but the device could also be used to find the shortest path to reach the destination.

6. CONCLUSION

The aim of the paper is to give an overview of vehicle tracking system. This system used to track the vehicle by using GPS which is one of the biggest technological advancements to track the activities of the vehicle. This system can be used in both cases of personal as well as business purpose to improve safety and security. This technology can also help to advance the system of transportation and can be used in many organizations for security purpose and tracking purpose. This system allows organizations to track their vehicles and to get the exact location of the vehicle.

7. ACKNOWLEDGMENT

8. REFERENCE

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