

Analysis of Bus Tracking System GPS on Smartphones

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Abstract— The Public transport networks (PTNs) are delicate to use when the stoner is strange with the area they're traveling to. This is true for both occasional druggies (including callers) and regular druggies who need to travel to areas with which they aren't acquainted. In these situations, acceptable on- trip navigation information can mainly ease the use of public transportation and be the driving factor in motivating trippers to prefer it over other modes of transportation. GPS device is enabled on the shadowing device and this information is transferred to centralized control unit or directly at the machine stops using RF receivers. This system is farther integrated with the literal average pets of each member. This is done to ameliorate the delicacy by including the factors like volume of business, crossings in each member, day and time of day. People can track information using LEDs at machine stops, SMS, web operation or Android operation. GPS equals of the machine when transferred to the centralized garçon where colorful appearance time estimation algorithms are applied using literal speed patterns. The provocation for every position grounded information system is "To help with the exact information, at right place in real time with substantiated setup and position acuteness". Position- Grounded services are decreasingly important for ultramodern mobile bias similar as the Smartphone.

Keywords: Android; GPS; GSM; Position Grounded Services; Clustering; Artificial Neural Network

I. INTRODUCTION

This paper proposes a bus tracking system based on that set up in Patiala, India. India. Travelling in Patiala is veritably delicate especially for the scholars. As scholars is the major population using public transport.

Public transportation systems play an decreasingly important part in the way people move around their communities. I consider some of the benefits of public transportation, the challenges facing its wide relinquishment, and the part conveyance rubberneck information systems can play in meeting those challenges. For individualities, public transportation provides mobility to those who can not or prefer not to drive, including access to jobs, education, and medical services. In general, transport mobility-the capability for people to move around their community-is a strong index for employment, with studies showing, for illustration, a direct connection between auto power and employment. By helping trippers move from single- residency vehicles to public transportation systems, communities can reduce business traffic as well as its environmental impact.

But still the machine service isn't dependable. To come over these day-to-day problems Bus Tracking System has been set up on the major route of the megacity. This system uses the Android platform with the erected in GPS receiver in the smart phone. This paper is organized as follows Section II comprises of the Need for the system. Section III gives the Review of the Being system and section

IV Describes the major factors of the Bus Tracking system. Section V describes the equations for Bus appearance time computations and Section VI shows the Results and Conclusion

II. LITERATURE SURVEY

The design of the navigation system was driven by a set of demesne that distinguish it from other navigation results.

- The service should be deployable on short term, and not in a far future.
- Deployment cost for the service provider should be effective.
- Operation cost should be low considering presently common communication costs.
- Service should be fluently adaptable and extendable to a fast-changing reality.

Coming to deployability under current conditions, another concern had a major influence in system design stoner benevolence. The system should bear as little commerce from the stoner as possible and little change of his habits. Likewise, all interfaces between stoner and navigation system should be precisely designed so that druggies strange with the system or with technology in general sense comfortable using it. Eventually, being userfriendly also implies using technologies that most druggies are formerly familiar with, so that they don't have to acquire any new device or learn to handle one.

A navigation system complying to these design conditions enhances the experience of druggies of a PTN in a cost-effective way. Callers and sporadic druggies are target stoner groups, as the system is especially helpful for people strange with the PTN. But also, normal druggies would benefit, being guided to destinations out of their current and given corridor of the transport network, for illustration visiting a place for the first time in an area they don't generally use. In this way, the navigation system enhances the civic mobility experience and makes using the PTN more seductive to people strange with it.

III. TECHNOLOGIES USED

A. GPS Technology

GPS (10), also known as a space-grounded radio navigation system, consists of 24 satellites ringing this earth under the operation of the US government. It was primarily developed for military purposes and latterly used to help general people with colorful operations, e.g., navigation, shadowing, timing, and positioning services (14) (15).

B. Android Platform

Android is a Linux grounded open-source operating system which was innovated by Andy Rubin, et al (16). The following are some ways in which Android is different from other operating systems (17). These are as follows

- Open Source • Easy to customize the Android platform

- Support the multiple heritage since it uses the conception of Java (18)
- Allow all graphic confines, i.e., 3D and 4D • Support the low-position interface for having a Linux operating system kernel
- . • Support standard libraries like OpenGL, Web Tackle and SQLite, etc.
- Appealing look-and-feel features including live Really Simple Syndication (RSS) feeds, rainfall information, etc. •
- Support numerous further connectivity and messaging services like Bluetooth, GSM, WIFI, MMS, SMS, CDM, etc.

C. Firebase Garçon

Firebase is a web and mobile operation developing a platform that provides tools and services to develop real-time apps. It was developed in 2011 by FirebaseInc. and in 2014 acquired by Google. Provides a real-time backend and database as a service. It's a pall-hosted database system (19) (20).

D. Google Map

Google chart is free software that renders 3D plates of the earth using satellite images around the world. It's an interpretation of Google Earth that shows the charts and can be bedded into web runners through Google maps API (21).

IV. WORKING OF PROPOSED SYSTEM

The system and technology are developing in nanoseconds. In this fourth-generation era, smartphones and palmtops have become a valuable part of people. We always listen to words on Android and Maps. These are its pick of success not only amongst the youth but the entire community. Since the rapid growth and huge advancements in Android, an Android application that meets the user's needs has become a key concept. Android devices have become powerful devices that offer much more than basic functionality. Android has given developers a platform to turn a simple phone into a smartphone. Android is based on the open Linux kernel., it uses a custom virtual machine designed to optimize hardware resources and memory in mobile environments.

System S=Android Application for Bus Module

System S1 = {S1', I, δ, O}

S1' = {GPS, GPRS}

I = {Bus Route, Bus number}

δ → {Function to determine current GPS location using Location based services}

O = {Latitude, Longitude, Speed}

System S2 = Server side

System S2' = {S2', I', δ', O'}

S2' = { Internet, Database server}

I' = { Longitude, Latitude, Speed, Route, Bus number}

δ' → Cal

Let, $F(M) = \sum_{i=1}^n \ln Cal$

Cal = {R, Dist, Va} [R = Routes, Dist = Distance, Va = Average velocity]

R = {R1, R2, R3,Rn}

R1 = {Source, L1, L2, L3,Ln}

where L1, L2, L3,Ln are intermediate Geographical points

Dist = {D1, D2, D3,Dn}

where D1, D2, D3Dn are distances between these points

Va= Average velocity from prediction system

Time= Dist./Speed

O' ∈ {Dist., Time, average velocity of the current segment}

System S3=Android Application for Passenger Module

System S3 = {S3', I'', δ'', O''}

S3' = {GPS, GPRS}

I'' = {Bus Route, Bus number}

δ'' → {Function to determine current GPS location using Location based services and sent to web service} O'' = {Distance, Arrival Time of bus}

The Application is User Friendly and free of cost.

The basic idea is to track the bus and get the arrival time of the bus on the basis of the speed with which the bus is moving and the average velocity from the historical trends under same day and time of day conditions. The proposed system is divided into 2 subsystems. Firstly, GPS based system that tracks the current location of the bus and the passenger to calculate the distance between the two. Also tracks the speed of the bus in real-time. Additionally, the prediction system calculates the average velocity of each segment by taking into account the historical traffic trends based on segment, day, time, the volume of traffic, and crossings on the segment The proposed system is based on the client-server technology, which consists of two types of client-side application and the server-side. The drawbacks of both parts have been taken into account during development. The two customer-side applications are the Bus Module and the Passenger Module.

V. GPS GROUNDED SYSTEM

GPS grounded system is further divided into 3modules which are as follows Module 1 gets the current GPS coordinates in terms of Latitude and Longitude of the machine. Also calculates the speed with which the machine is moving. Module 2 finds the current position of the passenger in terms of Latitude and Longitude. Module 3 takes the information from Module 1 and Module 2 to find machine and Passenger's exact position on the route and distance between the two.

A. BUS MODULE

Bus Module is the Customer side of the Android operation. This operation is installed on the Android platform smart phone which is placed on the machine whose position is to be tracked. The Demand for this operation is GPS and GPRS. In the morning of the route, machine motorist initializes the operation with the Route number, Direction and the machine number. Once this initialization is done it initializes the garçon side with this route number and machine number. This operation uses Position grounded services (LBS) to get the current GPS position of the Bus. Position services automatically maintain the stoner's current position, so operation has to recoup it as demanded. Delicacy of the position depends on the position warrants that have been requested and the position detectors that are presently active for the device. Once the shadowing has been initiated Machine module submits its equals constantly, every 6

seconds to the garçon. These frequent sessions are used to track current position of the machine on the route.

B. PASSENGER MODULE

This module is another type of the customer operation. This android operation is installed by the passenger who wants to track the position of the machine and get its appearance time. The introductory demand of this operation is the GPS and GPRS. This operation uses Position grounded services to get the passenger's current GPS equals. These equals are transferred to the garçon side where it's coordinated with the nearest machine stop because the machine will stop only at machine stops. The appearance time is prognosticated with respect to the distance between the machine's current position and the passenger's nearest machine stop. The passenger selects the Bus number from the drop down and request is transferred to the garçon. After recycling garçon sends the appearance time also passenger can detect the machine's current position on the chart.

C. SERVER MODULE

This module is the garçon side of the android operation where utmost of the processing is done. Web service is used that facilitates the submission and request of information to the database garçon. MySQL garçon5.6.23 is used where tables for all the routes are present. Each table comprises the Coordinating point, Latitude, Longitude and Distance. Points are set up along the route at the distance of 100 measures or at the machine stops, whichever is closest. These coordinating points are essential for easy computation of the distance between the machine and passenger and results in increase in delicacy. Google charts were used to compass the position of the machine, but eventually conniving the real time GPS generated equals were inconsistent with the Google chart road structure. To overcome this problem Coordinating points were fitted along the route. Bus's current real time equals are transferred to the garçon where it's matched with the nearest coordinating point laid on the Google chart. This increases the delicacy in the definition of the real time position of the machine on the chart at passenger side operation. Also computation of the distance has come more effective. When database is set, along with each coordinating point number and separate equals, its distance from the coming coordinating point is depicted. If distance between coordinating point 1 and 5 is to be calculated also using database query Distance from the coordinating point 1 to 4 is added. With the use of coordinating points it can also fluently be plant if the machine has been missed or still to come (13). Also by using the Direction of the machine as major element, the size of the database is reduced to half. Rather of creating different tables for routes from coordinating point 1Æ 35 and 35 Æ1, only one table could be used for both

VI. SYSTEM ARCHITECTURE

Our proposed and developed android grounded system provides the scholars to find out the exact position of the motorcars from anywhere. The machine routes are shown on the stoner interface displaying the position of the motorcars using google chart. Consequently, stoner can plan and start. The advantages of the advanced system are to

- Give the exact position on Google chart
- Show the details of the motorcars

from anywhere

- Give details like machine number, motorists' contact number, machine route, stops, etc.

Figure 1 shows the armature of the advanced system. The system consists of a customer and a garçon interface. The developed android operation is used on both motorist and stoner module. The stoner can track the position of motorcars controlled by a motorist on Google chart from the garçon using GPS. Admin maintains and updates all applicable information like machine routes, motorist number, number of motorcars. on the garçon.

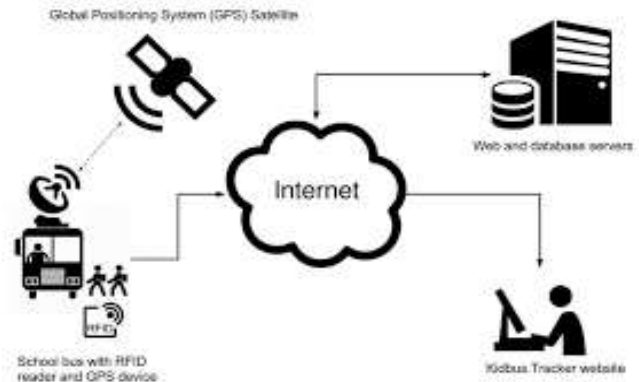


Fig. 1: System Architecture

VII. SYSTEM FLOW

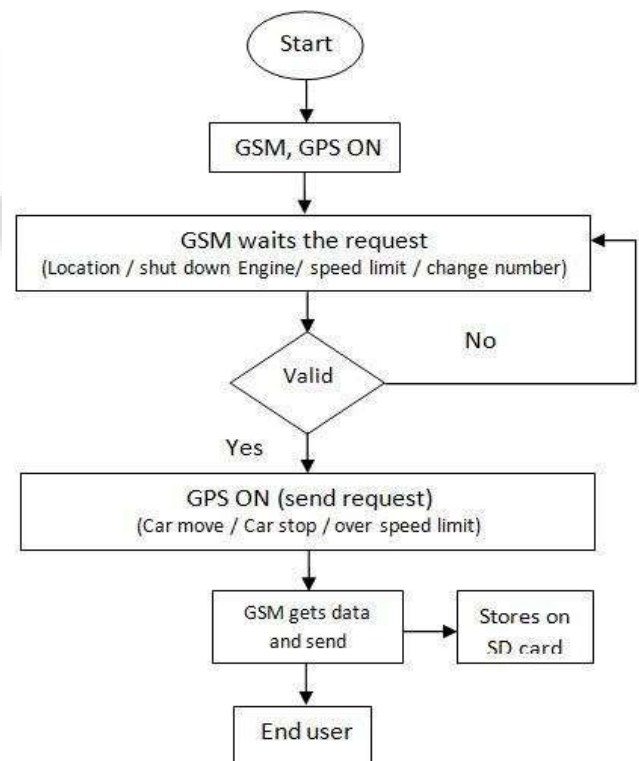


Fig. 2: flowchart

VIII. ADVANTAGES

- Scheduling and Routing Bus Passages. Every pupil's transportation involves careful, routing and scheduling of passages.
- Real-Time Tracking.
- Report Generation.
- Emergency Buttons.

- Dispatches and Announcements.
- Budgets.

IX. DISADVANTAGES

- Delicate to use in mixed business.
- Primary difficulties in understanding.
- ITS outfit expensive.
- The control system software could be addressed by hackers.

X. OPERATION

- City mapper
- Transport
- Conveyance
- Move it
- Google maps

XI. FUTURE SCOPE

The vehicle monitoring market consists of revenues generated from the sale of complete solutions, including hardware, software and other subscription costs related to data monitoring and reporting technologies. The solution integrates many aspects into the loop, including GPS, GSM / GPRS, digital maps and dedicated software.

Monitoring and managing these vehicles in real time allows companies to use their resources efficiently. Utrack's Vehicle Tracking System ensures the safety of your vehicle. In the event of an emergency, Utrack will help locate vehicles and show the exact location from which the alarm signal was received.

Smartphones play an important role in everyday life. The technological revolution is helping manufacturers to introduce a variety of smartphones at lower prices. Thanks to advances in technology and various software, smartphone users can access GPS signals for vehicle tracking and more.

XII. RESULTS

GPS bus tracking system is client task on android platform. It has no operating cost and can be easily installed on your device. The subtlety of the system depends on the GPS coordinates generated using the satellites, while the reliability of the system depends on the GPRS installation. This system works wherever you have internet access. Including the notion of direction halves the size of the database, so that the server and the database don't get bored of similar datasets in other tables. The average rainfall of the machine is also included in the proposed system with clustering and rear promotional system. It enhances the system's dishes because it also keeps in mind the terms and conditions of this day and day.

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