

Real Time Bus Tracking System

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Abstract-Bus tracking is an application that tracks a bus. Tracking System has the installation of an electronic device in a vehicle but electronic device is costly so we can use Android App for Bus tracking with an installed Android App on any SMART phone .User get the vehicle's location. There are two applications one for server and the other for the client. Bus driver start application on there Android phone to track their positions. By this positions to server are periodically updated Customer application shows delineate demonstrates the situation of transport. It indicates where transports are on a guide and give clients the refreshed data at various time interim. The server will screen area and will store its information in the database. It is a continuous framework as this naturally sends the data on the GPS framework to a PC or framework/SMART telephone.

Keywords-Bus Tracking,Bus Monitoring,Gps based Tracking,Approximate times

I.INTRODUCTION

Transport systems are one of the basic and daily needs of common man. People spend a most of time in travelling and availing the facilities of these systems. But a most of time is being wasted in waiting for the means of transport. Many times, the waiting time is more than the travelling time. Everyone would have experienced that whenever we wait for a bus to come and are actually in a dilemma that weather to wait for a bus or to opt for other means of transport? This question needs a proper answer. A proper solution to this problem faced which is being faced daily. Waiting time must be minimized if not eliminated. This is where the application comes into picture. "TRACKIT" is an android application which provides real time position of the vehicles on Google maps. It consist of two modules first is user module and second is driver module which is placed in vehicle.

Real Time tracking of all vehicles of travel agency using Global Positioning System as the name suggests, it uses GPS to track any vehicles.

This project working on tracking travel buses, and can be further implemented on government transport system as well. It will help both the passengers and the agency to track the vehicles, to get real time position of the vehicles, changed routes (If any), it can also act as an antitheft application by finding the exact position of the bus. At that point the client will enter the source and the goal of their area. In the wake of entering all the important data, the client will tap on the Search catch. After tapping the Search catch, the client will get all the definite data about the area of the transport.

There are transports which is accessible for explorers voyaging separations, however very few explorers have finish data about these transports. Finish data specifically the

quantity of transports that go to the required goal, transport numbers, transport timings, the courses through which the transport would pass, time taken for the transport to achieve, maps that would control the traveler with his/her course and above all, track the present area of the transport and give the right time for the transport to achieve its transport stop.

The GSM based Real Time Bus Arrival Information System is a discrete framework that shows the area of the transport and the time it takes to achieve the station. This framework is outline such that, when the transport driver can enter utilize name and secret key at that point press login catch as he achieves a station, the data with respect to the ebb and flow area of the transport and the time will be transmitted by a transmitter mounted on the bus. This data is gotten by a traveler and showed all buses of city on LCD screen. This framework there by lightens the traveler's uncertainty to sit tight for the transport or to take a substitute methods for transportation[1].

The GSM based Real Time Bus Arrival Information System would not exclusively be some assistance to the general population of India, yet additionally would be an extraordinary change to the Transportation benefits in India[1].GPS and Google Maps are used for displaying current locations of buses on the maps, together with the related route information. If users are registered to the system.

II. LITERATURE SURVEY

Continuous transport following framework has been a field of enthusiasm for some examination and a ton of examination work has been improved the situation following

framework. As of late the different hostile to burglary modules like directing wheel bolted hardware, arrange following framework and conventional electronic caution are created alongside customer distinguishing proof and continuous execution observing.

Paper 1: “real time tracking system ”El-Medany, W.; Al-Omary, International Journal Of Innovations In Engineering Research And Technology [Ijert] volume 1-2017

This paper provides accurate localizations of the tracked vehicle with low cost. GM862 cellular quad band module is used for implementation. A monitoring server and a graphical user interface on a website is also developed using Microsoft SQL Server 2003 and ASP.net to view the proper location of a vehicle on a specific map.

Paper 2:"A Cost Effective Real-Time Tracking System Prototype Using Integrated GPS/GPRS Module" Hu Jian-ming; Li Jie;International conference on wireless and Mobile communication[Ijert] volume 3-sep 2010.

The paper also provides information regarding the vehicle status such as speed, mileage. Li Guang-Hui describes an automobile anti-theft system using GSM and GPS module. The system is developed using high speed mixed type single-chip C8051F120 and stolen automobile is detected by the use of vibration sensor. The system remains in contact with automobile owner through the GSM module, for the safety and reliability of automobile.

Paper 3:Swati Chandurkar, SnehaMugade, Sanjana Sinha, MegharaniMisal and PoojaBorekar, Implementation of Real Time Bus Monitoring and Passenger Information System, International Journal of Scientific and Research Publications, Volume 3, Issue 5, May 2013.

Lin and Zeng proposed a set of bus arrival time prediction algorithms for a transit traveler information system implemented in Blacksburg, Virginia. Four algorithms were introduced with different assumptions on input data and were shown to outperform several algorithms from the literature

Paper 4:"Automobile Anti-theft System Based on GSM and GPS Module" Fleischer, P.B.;Nelson et al, IJSTE-International Journal of Science Technology Engineering, Volume 1, Issue 2010.

It describes development and deployment of GPS (Global Positioning System)/GSM (Global System for Mobile Communications) based Vehicle Tracking and Alert System. This system allows inter-city transport companies to track their vehicles in real-time and provides security from armed robbery and accident occurrences.

Paper 5: "Design and development of GPS/GSM based vehicle tracking and alert system for commercial inter-city buses" Le-Tien, T.; Vu Phung , IJSTE-International Journal of Science Technology Engineering, Volume 1, Issue 2014

It describes a system based on the Global Positioning System (GPS) and Global System for Mobile Communication (GSM). It describes the practical model for routing and tracking with mobile vehicle in a large area outdoor environment .

Paper 6:"Real Time Bus Position and Time Monitoring System” IJSTE-International Journal of Science Technology Engineering, Volume 1, Issue 10, April 2015.

These technologies can be applied to conveyance systems particularly buses, which are not ready to adhere to predefined timetables owing to reasons like traffic jams, breakdowns etc. The increased waiting time and the uncertainty in bus arrival build conveyance system unattractive for passengers. The real-time bus position and time observance system uses GPS technology alongside totally different application to fetch knowledge and with code that displays the information online on with different buses on a special route to the user. When this information is conferred to the traveler by wired or wireless media or online internet media, they can use their time with efficiency and reach the stop simply before the bus arrives, or take alternate means of transport if the bus is delayed.

III.EXISTING SYSTEM

The GPS receiver at the buses computes the longitude and latitude of the vehicle coordinates. This information is sent to the central server over the GSM networks using SMS and this information is stored in the database. Users can retrieve the information by sending the route number and the bus number[3].

Bus tracking system using Android application uses the inbuilt GPS service provided by the Smartphone. Smartphone is mounted on each bus and gets its GPS coordinates.[2]

Users can retrieve information through android application where users select the route number, bus number and receive the arrival time of the bus with respect to the user’s current location instead of the bus stop. Maps are also used to graphically plot the bus and the user on the Google- maps.

Second part of the system is the prediction system which finds the average velocity of each segment. This average velocity is integrated with the real time velocity of the bus which is calculated using GPS information.[2]

IV. COMPARATIVE STUDY

Table no:1 Comparative study

System	Platform Technology	Methodology	Comment
Bus Transportation System Using Wireless Sensor Network	PC Based System. WSN Are Used To Monitor The System	Location Analysis, Sending Information To Server	The System Is Complex.

Children Tracking System	GPS, Mobile Ad-Hoc Network, PC Based System	Children Tracking And Data Analysis	The System Is Easily Upgrade.
Public Transport Management Services	Microcontroller And PC Based System.	GPS Tracking, Sending Alert Message	Complex
GNSS Based Bus Monitoring & Sending SMS To Passenger	PC Based System.	RFID Monitoring, Location Tracking And Alerting	The System Is Easy To Upgrade.

V. PROBLEM STATEMENT

Management of buses of public transportation system is the main problem now a day. Based on to the current system there is no such system which provides information about the bus, its expected arrival time, the expected waiting time and what is the current location of the bus.

1) In the daily operation of bus transport systems, mainly that of buses, the movement of vehicles is affected by different uncertain conditions as the day progresses, such as:

- traffic congestion
- unexpected delays
- Irregular vehicle-dispatching times
- sother incidents

2) Many students are late for classes because they decide to wait for the bus instead of just simply using a alternate transportation.

VI. PROPOSED SYSTEM

The system aims to eliminate the waiting time of the commuter and provide them with actual positioning of the vehicles. Keeping this in mind we have developed a system taking into consideration various parameters that would reduce this time if not eliminate it completely. Passengers with smart phones or mobile devices get list of buses. Passengers choose one or more of them to view interested and estimated bus arrival time current location of the selected bus. Passengers can view routes of buses on maps. Users can utilize Google map's mapping tools such as zooming in/out, panning, dragging and dropping to get better view for the selected route and buses. If users are registered to the system, they can be informed of the routes and the busses they are interested in, through e-mails and SMSs.

ALGORITHM

```

step 1: Start
step 2: login driver ID
step 3: get continous Latitude and longitude
    if(location != null){
latitude = location.getLatitude();
    }
return latitude;
    }
if(location != null){
longitude =location.getLongitude();
    }
return longitude;
step 4: update to server
step 5: every 30 sec run step 3 and step 4

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step 6: user get list of bus
step 7: select bus Number
    if(json.getString("success").equals("0"))
    { key = false;
    stringArray.add("No bus found that
    match source & destination ");
    } else {
    key = true;
    jsonArray = newJSON
    Array(json.getString("bus")
    for (int i = 0; i < jsonArray.length(); i++)
    {
    stringArray.add(getResources().getString
    (R.string.struu) + jsonArray.optString(i));
    }
    }
step 8: get MAP user to bus
step 9: get Approximate time from location
step 10: exit

```

VII. MATHEMATICAL MODEL

Framework and innovation is becoming even in nanoseconds. In this time of Smartphone have turned into a valuable piece of the people. We regularly listen words Android and Maps. These are its pick of progress among the adolescent as well as whole group. Android Application that addresses the client's issue has turned into a primary thought with the quick development and immense advances in Android. Android gadget has turned into an effective gadget which gives much more than essential offices. Android has designers which makes a basic telephone to an advanced cell. Likewise it uses a custom virtual machine that is utilized to streamline equipment assets and memory in portable condition. System S=Android Application for Bus

Module System $S1 = \{S1', I, \delta, O\}$
 $S1' = \{GPS, GPRS\}$
 $I = \{Bus\ Route, Bus\ number\}$
 $\delta \rightarrow \{Function\ to\ determine\ current\ GPS\ location\ using\ Location\ based\ services\}$
 $O = \{Latitude, Longitude, Speed\}$
System $S2 = Server\ side$
System $S2' = \{S2', I', \delta', O'\}$
 $S2' = \{Internet, Database\ server\}$
 $\delta' \rightarrow Cal\ Let, F(M) = \sum_{i=1}^n Cal\ Cal = \{R, Dist, Va\}$ [$R = Routes, Dist = Distance, Va = Average\ velocity$]
 $R = \{R1, R2, R3, \dots, Rn\}$
 $R1 = \{Source, L1, L2, L3, \dots, Ln\}$
where $L1, L2, L3, \dots, Ln$ are intermediate Geographical points
 $Dist = \{D1, D2, D3, \dots, Dn\}$

where D1, D2, D3.....Dn 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}

VIII.SYSTEM ARCHITECTURE

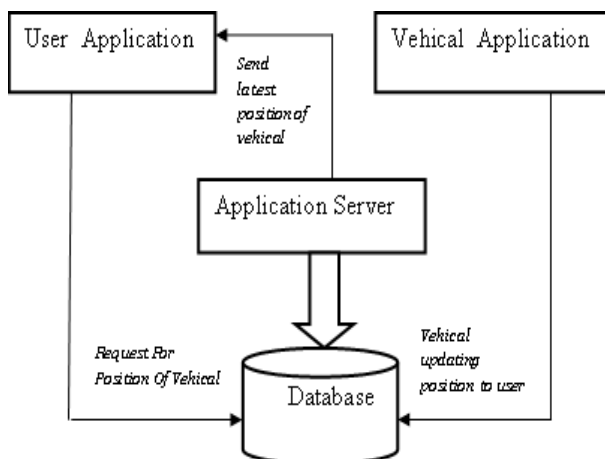


Fig No:1 System Architecture

Overview of Modules

The Track It system consists of three major units as shown in the diagram. These are the User Unit ,vehicle Unit, application server unit.

User Unit:

The system comprises of three user interface:

- 1)**Home Page:** This interface consists of two buttons, one for viewing the available vehicles and second for closing the application.
- 2)**Bus list:** This interface displays all the available number of buses.
- 3)**Map:** This interface will show the position of the selected bus by the user on the G-map.

Vehicle Unit:

The vehicle unit is implemented on the driver side of the system and is responsible for sending position to the application server.

The driver enters the bus number he is driving and presses the start button before commencing the journey. Once pressing the start button, the application starts taking its self position and sends it to the application server after every specified time interval.

A toast showing the bus details along with the position details confirms that the data is being successfully sent to the application server. The vehicle unit is implemented on the

driver side of the system and is responsible for sending position to the application server.

The driver enters the bus number he is driving and presses the start button before commencing the journey. Once pressing the start button, the application starts taking its self position and sends it to the application server after every specified time interval. A toast showing the bus details along with the position details confirms that the data is being successfully sent to the application server. The application keeps on sending the position to the server until the drivers presses the stop button.

Application Server Unit:

This unit is responsible for storing, sending and receiving location data from the vehicle and from the users as well. Application server stores the position of the bus and sends the updated value to the user on their request. The data in the application server is updated after every specific interval of time and sends data to the users on demand.

Back End:

1)PHP:

For this application, we are using Php to handle database related operations.

2)MYSQL:

The database used to store all the details of users as well as vehicles is MYSQL.

3)JSON:

JSON is used to converts the data generated from the mobile to be compatible to store on the server and vice versa.

IX.ADVANTAGES

- It Is Important To Run Our System Properly
- Its Helpful For Working And Our Work Can Not Hold In Between While We Developing System.
- Analysis Is Always Better To Development Flawless System.
- SMS Service Provides Real-Time
- Bus Arrival Information For Convenience Of Passengers. Bus Passengers Can Schedule Their Journey Accordingly.
- Increase the Use of Mass Transport will going to save the fuel And Increase in the Operational Revenue.

IX.DESIGN DETAILS



Fig No:2 Home Page

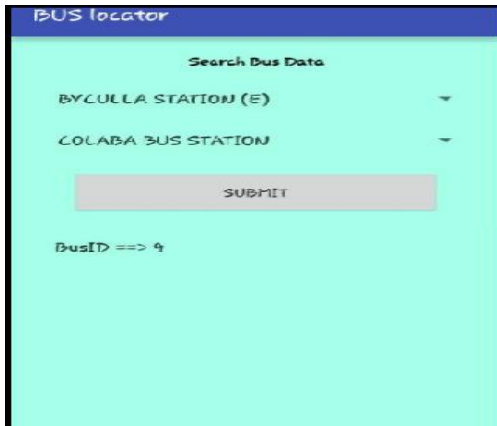


Fig no:3 search bus data

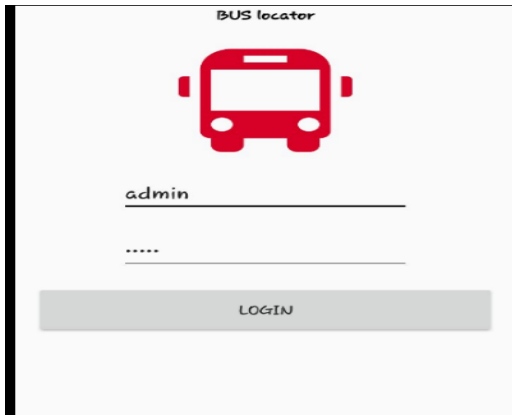


Fig No:4 Login Page



Fig No:5 Bus Track System

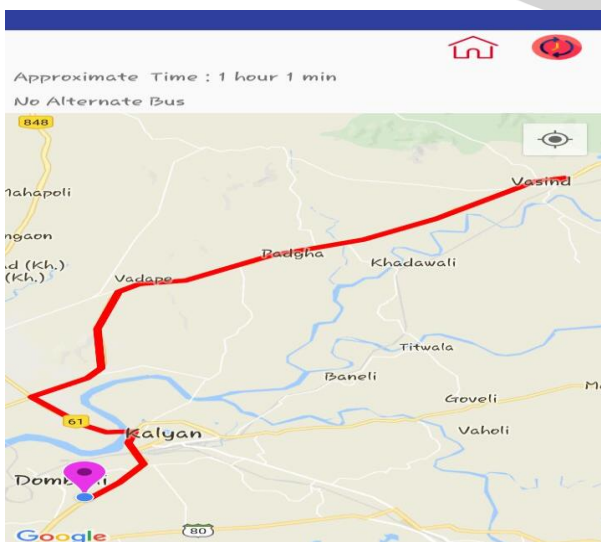


Fig no:6 google map

X.CONCLUSION

we have try to implement a Süleyman Eken, Ahmet Sayar smart bus tracking system” IEEE 2014 and the conclusion is as follows, It is based on GPS and Google’s map technologies. The proposed system will tracks the busses and estimates their arrival times at specific bus stops , informs the users through prevents traveller unwanted to wait at bus stops and enables them to use their time more efficiently. In the future, we plan to enhance the system with some other estimation tools and statistical analysis. This might used by public users and decision makers in the local municipalities. Moreover, since the system is developed with open standards and open sources.

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