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Real Time Bus Location and Data Administration System

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Abstract: The massively populated states in the country needs an efficient and the effective transportation system for public use. Public bus transportation is one of important and widely used transportation system. The android application developed for this system with the use of other technology simplifies the transportation for travellers and management people as well. Tracking the real time location and updating the data in the timely manner on the application advances the use of application.
Keywords: Administration, Latitude, Longitude, Google map API, real-time data update

I. INTRODUCTION

There is no real time information available about the government buses at the bus depot. Not the exact location of the buses is known to the depot at particular time. Passengers need to wait for the bus without any knowledge. There is allot waste of time. The depot management also fails to confirm the bus location. The movement of Bus Transport is always affected by various conditions such as congestion, unexpected delays, and incident. The real time location tracking will help to the management and passengers as well. The application will contains dynamic and updating data about the bus schedules and their running paths, departure and arrival time. Use of advanced technology enhances the reliability of the database of the proposed system and can eliminate the drawbacks of existing system document is a template.

II. RELATED WORK

An Manish Chandwani, Bhoomika Batheja, Lokesh Jeswani, Praveen Devnani, Prof. Richard Joseph (Computer Engineering, VESIT, India) "Real Time Bus Tracking System", proposed a location tracking system using Google map API and system is an Android application that gives necessary information about all the buses travelling in Mumbai. The platform chosen for this kind of system is android, reason being Android Operating System has come up on a very large scale and is owned by almost every second person. As more and more applications of android operating system is developed day by day on large scale ever since it is advent. [1]
Manini Kumbhar, Meghana Survase, Pratibha Mastud, Avdhut Salunke Final Year Students of Department of Computer Engineering SBPCOE, Indapur .Asst. Professor Shrinivas Sirdeshpande,Asst. Professor of Department of Computer Engineering SBPCOE, Indapur, Pune(SPPU), Maharashtra, India "Real Time Web Based Bus Tracking System", the relevant information regarding all the bus numbers going from users source & destination along with the route details , real time location. Generally our system is operated by GPS which is attached with the bus. Firstly GPS receives the satellite signals and then the position co-ordinates with latitude and longitude are determined by it. The location is determined with the help of GPS and transmission mechanism. After receiving the data the tracking data can be transmitted using any wireless communications systems.[2]
Prof. Seema Vanjire, Unmesh Kanchan, Ganesh Shitole, Pradnyesh Patil "Location Based Services on Smart Phone through the Android Application", The idea of using the mobile handsets and phones is to deliver the valuable services. Location-based services or LBS refer to _a set of applications that exploit the knowledge of the geographical position of a mobile device in order to provide services based on that information.' Location based services (LBS) provide the mobile clients personalized services according to their current location. They also open a new area for developers, cellular service network operators, and service providers to develop and provide value-added services: advising clients of current traffic conditions, providing routing information, helping the users to find nearby shopping malls. [3]
Mihir Garude Department of Electronics Engineering, Nirmal Haldikar Datta Meghe College of Engineering, Airoli. "Real Time Position Tracking System Using Google Maps API V3", 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 real time speed of the bus. Secondly the prediction system, which calculates the average velocity of each segment from the data that captures the historical trends of traffic on the basis of different attributes like segment, day, time, volume of traffic and crossings in 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 the parts have been taken into account during development. Two client side applications are Bus Module and Passenger Module.[4]

P.Madhu Bala S.Sivaraman,Assistant Professor Paavai Engineering College ,Namakkal "GPS Based Bus Tracking System", the Vehicle Sensor Networks (VSN) are emerging as a new tool for effectively monitoring the physical world, especially in urban areas where a high concentration of vehicles equipped with on board sensors is expected.A vehicle tracking system combines the installation of an electronic device in a vehicle, or fleet of vehicles, with purpose-designed computer software at least at one operational base to enable the owner or a third party to track the vehicle's location, collecting data in the process from the field and deliver it to the base of operation.[5]

Md. Palash Uddin [1], Md. Zahidul Islam [2], Md. Nadim[3] "GPS-based Location Tracking System via Android Device" The purpose of system design is to create a technical solution that serves both the user and the admin. The system should be designed in such a way that is very flexible to use for both the administrator and the user. The preparation of the environment needed to build the system, the testing of the system and the migration and the preparation of the data that will ultimately be used by the system are equally important. In addition to designing the technical solution, system design is the time to initiate focused planning efforts for both the testing and data preparation activates. The Location Based Tracking System is a real life problem solving application. Both the admin section and the user section are designed in such a way that both parties enjoy the facilities of the application. [6]

III.EXISTING SYSTEM

Applications developed for location tracking of the buses are mostly for private bus providers or some school or institute buses and some travel agencies. This systems or apps are not for global use and do not used by public transportation system of any city of the country. Unreliable bus transportation is actually national problem, especially in areas where there is no option for public bus transport like local railways and such areas are main under consideration.

Fig 1. APSRTC and Red bus application

A. The existing applications like red bus, APSRTC, where's the bus, etc. asks the users for pick and choose their bus from multiple options by an operator that fits your schedule and payments 0r choose a bus based on fellow customer feedback and ratings for each operator.

B. The applications has to be operated by multiple operators and hence operators should be registered at application administrative system. These operators are limited and available in major population areas. So these existing applications are meant for business and marketing schemes.

C. These applications provide facilities like seat reservation, cancellation, emergency accident alert system. Entertainment resources, bus distance and timing schedules which can be not so much important aspects than real-time location tracking using Google map API provided my our proposed system.

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IV. SYSTEM ARCHITECTURE

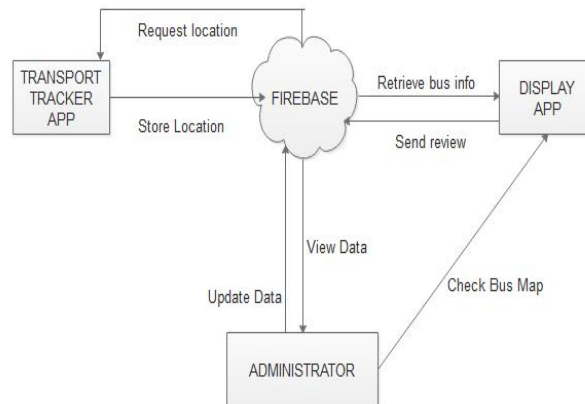

Fig 2. Architectural diagram of System

The Proposed System Has Three Modules

A. Transport Tracker Module
B. Firebase Unit For Administration System
C. The Display App
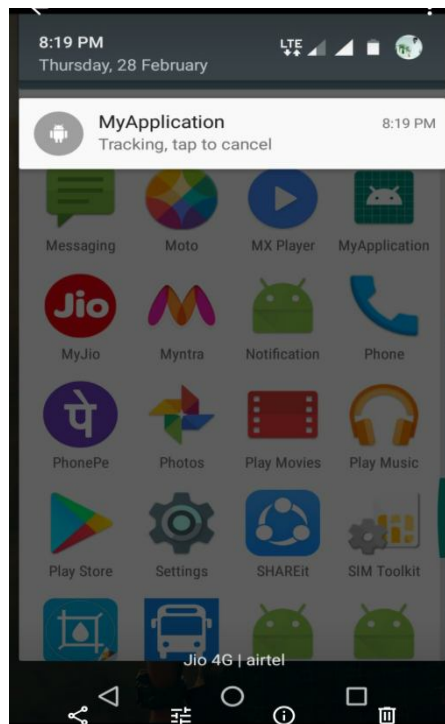
1) Transport Tracker Module

Fig. 3. Transport Tracker Module Running In Background

This is android application running in background on a mobile device which is to be governed by the Conductor and Driver of the travelling bus system who will start and stop the trip from one bus station to another bus station. It will help the firebase to store latitude, longitude, timestamp, accuracy, altitude of the bus unit and will keep updating for every 10 sec of time interval and storing the data in firebase. Only the driver and conductor of the bus unit will be provided access to this module and administrator at bus depot will check location updates in firebase console.

2) *Firebase Unit For Administration System:* It is a central control for the administrator which can trace out all kinds of bus activities, location details along with data analysis in the firebase as a database system

a) *Firebase:* Firebase is a backend platform for building Web, Android and IOS applications. It offers real time database, data storage, user authentication, static hosting, Performance, crash reporting, different APIs, multiple authentication types and hosting platform, Google Analytics, Cloud Storage and much more.

b) *Administrator:* An Administrator is provided with proper Login Id and password other than firebase Login Id and password which will display the map with marker for every bus location in the Display App. The firebase can also be accessed using Gmail login and password from Display App.

c) *Backend:* The backend is built with JavaScript, JSON, Node.js which tracks and stores Latitude and longitude of each bus location in the Firebase console which is real-time Database and keeps updating the marker for every 10 seconds for every single bus.
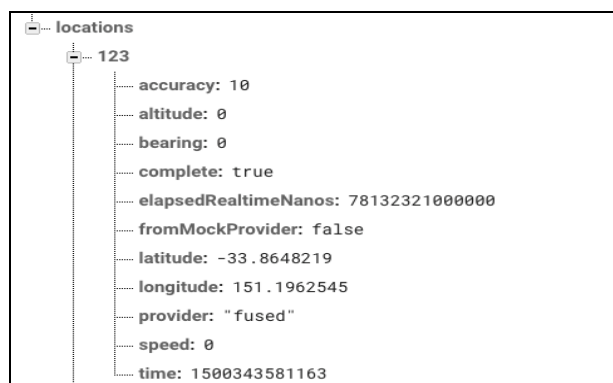

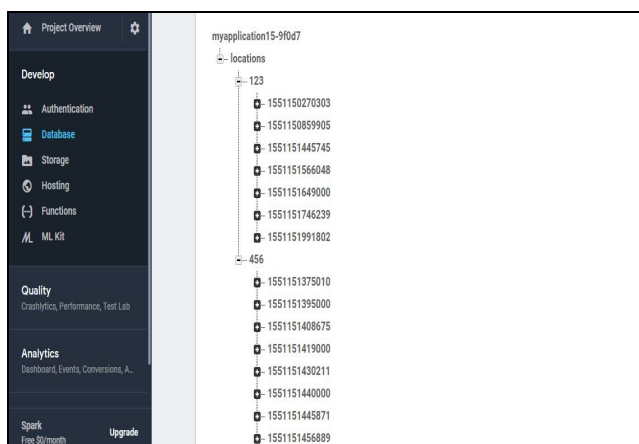Fig. 4. Storing Longitude and latitude For a Single Bus Unit

Fig. 5. Auto-Updating Of Location for Each Bus

Fig. 6. Storing Different Locations for Multiple Bus Units

3) *Display App:* A Remote user module i.e. end user with real-time bus location, bus arrival and departure time and all the bus information. It will also be provided with login and password for Administrative department of bus depot which will be able to get known the bus location for every single bus with Google map. The "Track-O-Bus" android application uses various techniques for location tracking of bus using Google map API's without using any physical IOT models like sensor, arduino etc.

4) *Components of Display App:* A Display is app that displays and stores the vehicle information, snapped to the map API which provides real-time data synchronization to the backend i.e. Firebase database and also static information and Graphical User Interface for end users who can access the application for Bus informative. The application consists of different card views which consists of different information about basic GUI, bus time-table, distance from one station to another station. It also consists of district-wise more than 20 district bus time tables, bus availability for every 24 hour time interval.
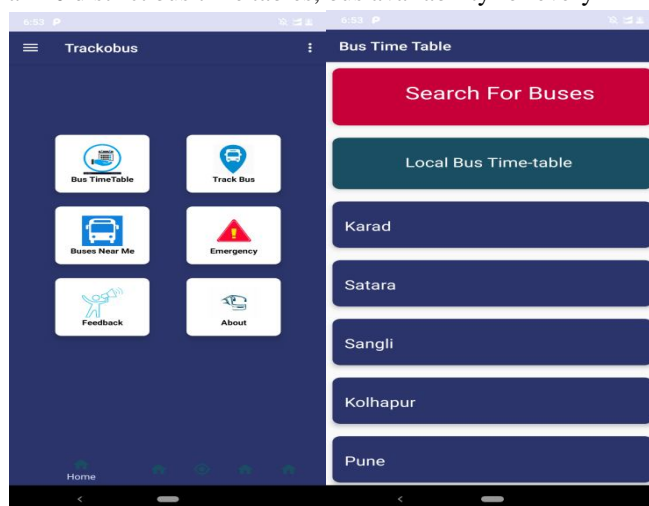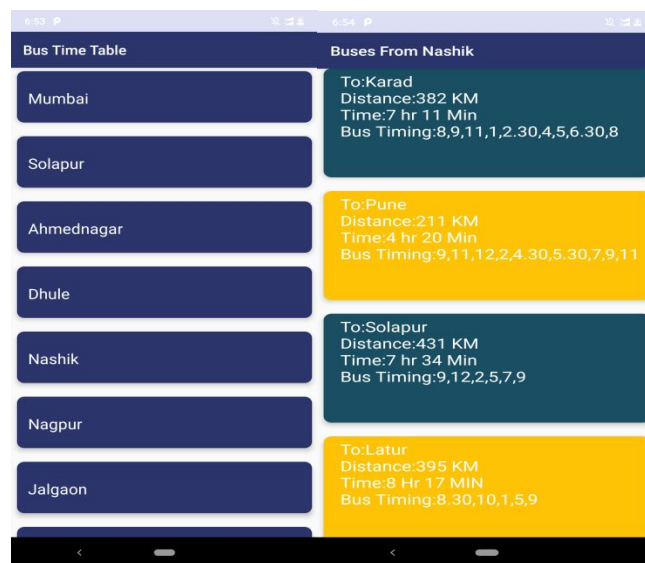

Fig. 7.GUI for "Track-0-Bus"

Fig. 8.Bus Time-Table with Bus Details

5) *Displaying .Map:* It is a web interface that displays vehicle locations and schedule information. The android application uses the Maps JavaScript API to display a styled map showing the bus locations and routes. It displays every single bus with proper marker to each bus location and keeps changing for each 10 seconds for each bus location. The map for each bus location is accessible only to the administrator of bus depot who will be provided with proper login and password other than firebase login Id and password provided by the depot.

a) The whole map activity with marker for each bus location is provided in the Display App with a particular authentication for administrator. The administrator can also login for Firebase using this Display app.

V. FUTURE SCOPE

The application can be further developed to web application and cloud can be used for data storage. To increase level of security in the transportation system camera can be used. . It will help to monitor the crimes that happen now a days which is witnessed by common people every day. This would prove a major breakthrough in reducing the crime rates. Also, with use of motion sensors the speed of the bus can be calculated. Reservations of the seats in the buses and also payment options will be future development part of the application. For analysing the data collected on the server data analysis can be used with machine intelligence concepts.

VI. CONCLUSION

The system improves the effectiveness and overall performance of existing transportation without any extra hardware deployment. It is having low cost maintenance and wide future scope. With the implementation of the project, a complete track can be kept of the buses. This system also throws a light on the frequency of the buses on the same route. The features of this systems are the efficient usage of time, real time and updating information on the availability of buses, route congestion acknowledgment, and commuter satisfaction. Real-time location tracking of the bus, continuously updating data of the bus time table and estimation of departure and arrival time of the buses are main expected outcomes of this application.

VII. ACKNOWLEDGMENT

REFERENCES

[1]   Manish Chandwani, Bhoomika Batheja, Lokesh Jeswani, Praveen Devnani, Prof. Richard Joseph(Computer Engineering, VESIT, India) "Real Time Bus Tracking System" IOSR Journal of Engineering (IOSRJEN) Volume 14, PP 24-28.

[2]   Manini Kumbhar, Meghana Survase, Pratibha Mastud, Avdhut Salunke Final Year Students of Department of Computer Engineering SBPCOE, Indapur .Asst. Professor Shrinivas Sirdeshpande,Asst. Professor of Department of Computer Engineering SBPCOE, Indapur, Pune(SPPU), Maharashtra, India "Real Time Web Based Bus Tracking System" International Research Journal of Engineering and Technology (IRJET) Volume: 03 Issue: 02 Feb-2016.

[3]   Prof. Seema Vanjire, Unmesh Kanchan, Ganesh Shitole, Pradnyesh Patil "Location Based Services on Smart Phone through the Android Application" International Journal of Advanced Research in Computer and Communication Engineering Vol. 3, Issue 1, January 2014.

[4]   Mihir Garude Department of Electronics Engineering, Nirmal Haldikar Datta Meghe College of Engineering, Airoli. "Real Time Position Tracking System Using Google Maps API V3" International Journal of Scientific and Research Publications, Volume 4, Issue 9, September 2014.

[5]   P.Madhu Bala S.Sivaraman,Assistant Professor Paavai Engineering College ,Namakkal "GPS Based Bus Tracking System"

[6]   Md. Palash Uddin[1], Md. Zahidul Islam[2] , Md. Nadim[3] "GPS-based Location Tracking System via Android Device" International Journal of Research in Computer Engineering and Electronics.

[7]   https://developers.google.com/maps/solutions/transporttracker/

[8]   https://codelabs.developers.google.com/codelabs/realti me-asset tracking/index.html?index=..%2F..%2Findex

[9]   https://firebase.google.com/

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