

GPS Supported Android Application for City Bus Scheduling and Tracking System

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Abstract: To effectuate the consequences of one second, ask the passenger who just missed a bus. GPS supported android application for city bus tracking and scheduling system is a system which is designed to display current location(s) of the city buses in Nasik city [14]. The person is not able to detect dynamic location, that is, current location, as it is being working on static data. So we want to develop an application through which the person will be able to get dynamic location using dynamic data [11]. The usage of android application for public transport system is developed in order to provide information to the user about the current location and timings of the buses using GPS. We are developing the web application, which is basically developed for the organization to handle the overall organizational activity [7]. The web application provides information about bus like location of bus, which is obtained by fetching the co-ordinates through android GPS [8]. The user, driver and bus database is stored and maintained.

Keywords: GPS, android phone, GSM.

I. INTRODUCTION

Now-a-days due to rapid increase in growth of population, public transport is often considered being easy and friendly [7]. A passenger using public transport system in Nasik often faces the problem to decide whether to wait for next arriving city bus or prefer using an auto rickshaw to reach their destination. Many students are late for their classes and even employees get late for their work as they decide to use buses for reaching their destination [4]. The increased waiting time and the uncertainty in the bus arrival make public transport system unattractive for passengers. If public gets an easy way to see which bus is near to their location in order to reach their destination then they will be able to take a decision whether they should wait for a bus or not. People will in this era of modern technologies, it is easy for people to stay in contact at all times with the use of smart phones and other internet capable mobile devices [2]. There are different technologies available in today's world for tracking the vehicle location. The passengers are not able to detect the current location of the bus, as it works on static data. In this project we are going to implement the modules using dynamic data. We are developing the web application, which is developed at the central control location. The control location will provide current bus location which is being obtained by fetching the co-ordinates through GPS. These fetched co-ordinates are sending to the server side web application, which plot them on Google map. Web application provides that fetched location to the android application user, who wants to know the location of particular bus. Organizational person can also see all the android application users. All information related to the bus is provided for the android users. The user, driver and bus database is stored and maintained. An android application is developed for the passengers [9]. So by using this application passengers can also see the bus location on Google map. Time table of buses from different stops are displayed and specification of one way and return way is given.

II. LITERATURE REVIEW

The paper presented by Daniel F. Urbanski [3] describes Development of GPS based transit tracking system gives a communication infrastructure that allows bus users to query and receive this information in real time. The system uses bus's positional data and route information to calculate estimated arrival times. The limitations of this system are it does not provide information about density of passenger. Omkar Sambare, Punam Gaikwad, Sayali Kapse, Aboli Gulame [1] describes GPS based bus tracking the android application system gives the facilities required for the admin to keep the watch over system and the user who wants to travel through the public transport. In this system admin maintain database information of buses and the system user. The system provides information of bus to the user which is transferred via internet to android application. Abid khan, Ravi Mishra [5] GPS - GSM based tracking system. The system can provide tele monitoring system for inter cities transportation vehicles. This system contains single-board embedded system that is equipped with GPS and GSM modems along with ARM processor that is installed in the vehicle. During object motion, its location can be reported by SMS message. Dr. Kamal Jain, Rahul Goel [8] GPS Based Low Cost Intelligent Vehicle Tracking System (IVTS). Intelligent Vehicle tracking systems (IVTS) are used for the purpose of tracking and navigation of vehicles. The paper describes the implementation of Global positioning systems (GPS) in IVTS systems. The system gives tracking and navigation of vehicles.

Pankaj Verma, J.S. Bhatia [9] Design and Development of GPS-GSM based tracking system with Google map based monitoring. Application is tracking your vehicle and keeps regular monitoring on them. It also includes the web application that provides you exact location of target. Main objective is to design a system that can be easily installed and to provide platform for further enhancement.

III. PROPOSED SYSTEM

A. Introduction

The GPS satellites transmit signals to a GPS receiver. These receivers statically receive signals. Each GPS satellite transmits data that indicates its location and the current time [10]. All GPS satellites synchronize operations so that these repeating signals are transmitted at the same time. The distance to the satellites can be determined by calculating the amount of time it takes for their signals to reach the receiver. A GPS receiver "knows" the location of the satellites because that information is included in the transmitted data. By calculating how far a satellite is, the receiver also "knows" it is located somewhere on the surface of an imaginary sphere centred at the satellite [1]. It then determines the sizes of various spheres for every satellite and therefore understands the receiver is located where these spheres intersect. A people counter is a device used to measure the number and direction of people traversing a certain passage or entrance per unit time [8]. The people counter finds the density of the bus and also provides the seat availability. If the density is high or if it is above a certain limit, the android application provides the user with the information regarding the capacity of the bus. This helps the passenger to opt for the next available bus service [4]. The carrier of information-bearing signals was acted by radio waves. The signals from the people counter are transmitted to the main server using radio waves. The server receives the data from the counter and stores it in the server. This data is provided to the user using android application when the user has to decide about the journey [5]. The capacity of the bus is intimated to the user.

B. Architecture

Architecture of GPS supported android application for city bus scheduling and tracking system includes

1. Client side
2. Server side

As shown in figure 1:

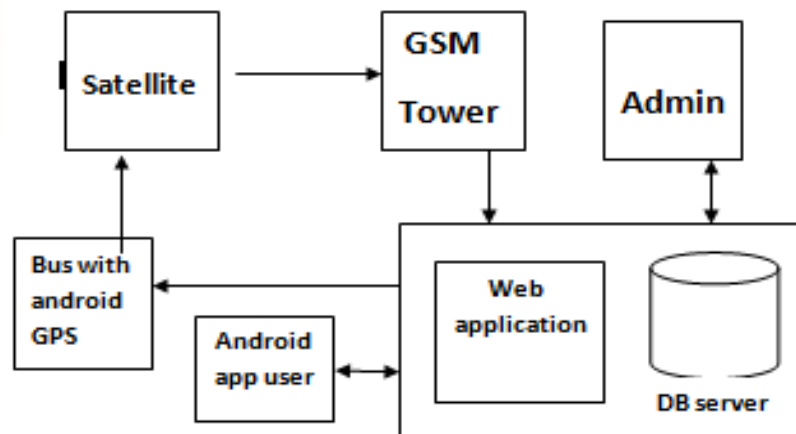


Figure 1: System Architecture

Client side includes an android application developed for the use of local public using public transport. Hence, by using this android application the passengers who are travelling in city buses will be able to get the real time location of the bus and it can also be seen on Google map. In this application, we also get the information about the present density in the bus. Client side also provides the facility of auto announcement, which will announce the next halt [2]. The people who are not familiar or do not use android phones will be able to get the bus info through SMS system. As soon as the application is been installed by the user, simultaneously he has to register for that application. The user selects the source location from which he/she wants to arrive. Hence by selecting the specific source and destination the appropriate bus schedule is been displayed.

Server is used to contain all the data regarding the functioning of the public transport system [2]. The server is provided with a receiver that receives all the information regarding the location of bus and the capacity in the bus.

The server contains all the information regarding the position of the bus continuously when the bus is in motion. It gives the complete location information of the bus constantly. The details from the people counter sensor regarding the density of the bus are updated continuously. The user using the android application will be able to get all the information regarding the bus using the data from the server [8]. The server determines the position of the bus by marking each and every stop. For accessing the database the city bus controller (MSRTC) is provided with separate server. If the schedule of the bus has certain changes, the server will apply the changes. As soon as the changes have been applied the passenger who uses the application automatically updates the software. As application will be connected to internet it's not necessary for user to update it [7]. The Estimated Time of Arrival (ETA) for all the buses at next halt will be calculated.

C. Algorithm

User:

1. Start
2. User should provide authentication using ID and password.
3. Enter source and destination user wants to travel.
4. Requested bus timetable will be displayed on the screen.
5. Search bus arriving on that bus route.
6. Route details will be displayed on the screen.
7. Dynamic location of bus will be shown.
8. Next halt of bus is also announced.

Admin:

1. Log in into system with ID and password.
2. View and edit details in application.
3. Permit user to install application for the further use.
4. Mapping of bus route will be done at server.
5. Tracking current location of bus will be done at sever.
6. Technique for changing bus timing.
7. Technique for changing bus route.
8. Strategy for sending SMS to user will be at client side.

D. Advantages

The advantages of GPS tracking include improved communication between conductors and drivers and the acquainted for passengers to access bus schedule that are instantly advanced. Added benefits include the ability to preserve equipment which means immediate Return On Investment on fuel and system functioning. Today's technology allows conductors to view a computer screen to supervise bus location and traffic like accidents and construction to share with the driver who is on the road. Effective scheduling is another benefit; if a bus is running on or behind schedule, the conductor can direct the driver toward a better path or simply control the driver to safely adjust their speed. This type of quick connection increases fuel and supervise efficiency while increasing customer fulfillment. With GPS tracking, bus driver can access electronic schedules with near dynamic updates. By being able to act with bus scheduling systems, traveler may be more likely to transport and depend on the bus. That means repeat customers for the transit system, whether traveling along their usual path or travelling to a variety of different locations. Managing fuel costs, length, supervise and reducing unproductive time have both short and long-term benefits. The amount of money saved per year can be amazing. With GPS tracking it is likely for more people to drive the bus. When more people travel through the bus, fuel savings increase because fuel spends is less. This results in more efficient operations and big yearly savings. Comet Fleet can help improve the ability of any fleet operation.

E. Disadvantages

A lot of users who use GPS in vehicles are prone to accidents if they focus more on GPS rather on road. The GPS can often land you in trouble over blocked roads or under construction roads. No longer do you need to carry a map around with you when examine a town by car or hiking in a field that you are unusual with. Rather, there are Global Positional Systems, known as GPS, that can help you find your location and the field you are tackle to travel. These GPS devices can be mounted in cars, boats or can even be mobile devices. GPS devices are limited by having clear access to the satellites that provide the tracking. In locations with tall buildings or inadequate coverage, reception can be poor. Maps on GPS devices are not updated in real time for all models.

IV. CONCLUSION

Bus tracking system is very useful and important mainly in cities and it is much secured than other systems. This system has many advantage like wide area range, easy to implement in vehicles, more effective, huge capability etc. This system was made up of a tracking module containing GPS- GSM model to excess dynamic vehicle location and send it to the server. The control unit i.e. server receives the information, processes it and displays vehicle location on android application. This project grants us to get furnished with work custom, person and ecosystem. This project serves the need of user as well as administration of transport system. Reflecting on the beneficial on an application as scheduling of a bus and secure distance, we believe that our application will perform important role.

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