

TRACKING OF DTC BUS USING GPS AND ANDROID

Md Shoeb¹, Jawed Ahmed²

¹Student, Department of computer science, Hamdard University, New Delhi, India

²Assistant Professor, Department of computer science, Hamdard University, New Delhi, India

Abstract - Public transport mainly city buses are shared passenger transport service which is available for use by the general public and are generally based on a regular operation of transit buses along a route calling at agreed bus stops according to a published public transport timetable. Due to unavailability of prior information about the buses arrival time, passengers have to wait for buses on bus stops specially in morning when they have to reach to their work in time as traffic disturbances and jams do not allow buses to reach on time. This project proposes a solution for improving a public transportation management service based on GPS and GSM, parameters like nearest bus stop, location of the bus is shown to the passengers in their smart phone.

Key Words: Bus Tracking, GSP/GPS, bus location, location tracking

1. INTRODUCTION

Nowadays, It's very easy to track the vehicles running on roads with the help of GPS and android phones. Private transport systems have switched to this new and easy to use technology, which attracts the people to use private transport for traveling even though they charge much higher than public transport. As the demand increases for private transportation day by day, pollution and traffic also increase simultaneously. To decrease the demand for private transportation, passengers should attract towards the public transportation. To make it possible, time efficiency management needs to be handled and for this purpose, these tracking system technologies can be applied to public transport like DTC buses which are currently not using these tracking systems and makes the DTC bus more competitive and passenger friendly.

In Delhi, a very good percentage of people use DTC buses in their daily routine but due to heavy traffic, roadwork,

technical problems, and many more other problems, buses are not able to reach at a bus terminal on the time, because of this people often late for offices, schools, hospitals etc. Most of them agreed on that they have been late because they decide to wait for the bus instead of walking or hire some cab/rickshaw. Even one can know the arrival timing of bus at a particular destination but buses never arrive on time due to many reasons and passenger have to wait for a long time. We are proposing the solution whose main focus is to provide a system to the passengers which help them in getting all the details of bus regarding the arrival and departure of a bus and real-time location of the bus. This will reduce the waiting time for bus and passenger can spend their precious time in some other works instead of wasting time on bus stops in waiting for a bus. So, we need the best tracking system for that and to get the best results about the bus location and timing, some components like google maps, GPS, android application are required. The tracking system consists of mainly four modules, In-Bus Module, Bus Stop Module, Central Controller Module and User Application. In-Bus, Module sends the information containing the current location of the bus and arrival time to the Central Controller for a particular destination using GPS Modem. GPS installed on bus sends the full information of the bus to central controller at bus terminals, after uploading the details of a bus in the server this information can be access at any point by the web-based application using the internet either be at home or in the workplace on the user's smartphone. Google maps display all the detail on maps and automatically refresh the location of the bus at every 30 seconds interval and give the updated current location of the bus to the end user so that user departs from the home or office to the bus terminal accordingly. Bus Stop module gives the nearest bus stop information to the passengers on their phones.

Our main goal is to create a friendly relationship between public transportation and passengers and make it more passenger-friendly which attracts the traveler to use buses as well as reduce the traffic and environmental impact. When people start to use public buses for a journey, traffic from the road automatically reduced and hence reduced the traveling time for all and the most important thing is that the

pollution will decrease. Also by knowing the real-time location of the bus and approximate time, it will take to reach the terminal, a user can make a right decision whether he should wait for the bus or should hire some cab/rickshaw.

2. PROBLEM STATEMENT

The existing system of DTC buses having the time table and schedule for the buses for their arrivals and departures from every source to every destination for all the routes. Although buses follow this time table and dispatched the source on scheduled time but due to the problems faced on the routes like traffic jams, accidents, technical problem or many more, they are not able to reach the destination on time because of this passengers have to wait for a long time sometimes to board the bus.

Passengers can get the time table of buses for every route on the website owned by DTC over the internet. By this information, passenger can know the time of bus arrival to the bus stop but very rarely buses reach on time to bus stops. Hence, passengers leave on time for the bus stops because they don't know the exact time of bus or exact location of the bus which makes them wait for a bus on bus stops for longer times. This implies that one can't depend on the bus in an emergency like if he has to attend some meeting or any other important work.

At the end, the problem is cause passengers only as they getting late for their offices, schools etc. People suffers a lot in a measurement of time. In urgency, passengers take a cab for journey, and in that situation, they suffer a lot in a measurement of money as well. Excess use of private transportation increase the traffic on road and hence pollution too. Which will again cost to the people only.

To solve this problem there should be a real time tracking system for the DTC buses which minimize the problem of passengers. Passengers can then manage their time schedule accordingly. This technique will save a lot of time and money and also make a buses more attractive to passengers. Mobile is the best medium of communication to replace the existing system, because in today's world everyone is having a smart phone and knows how to use internet, GPS, navigation, map etc.

3. PROPOSED SOLUTION

The solution is to avoid the wastage of time waiting for a bus on the bus stops. This can be achieved by providing the real-time tracking system to the buses, which gives the detailed information about the bus location and expected time to the passenger so that they can leave their homes or workplaces accordingly. This technique is based on the Global Positioning System (GPS) and Global System for Mobile Communication (GSM). The system will provide the detail of bus number with the real time location of the bus on the route and the expected time of the bus. The GPS attached with the bus determine the position co-ordinates with longitude and latitude by receiving the satellite signals. After receiving the detail this information is transmitted to the central controller server using wireless network. From servers users get the information on their smart phone through web based android application.

The main goal is to provide the real time bus location and the nearest bus stop to the end user and make his journey more comfortable. Provide the user with the expected time of the bus to reach the bus stop so he/she can manage their time and leave their places accordingly.

4. Architecture of the Proposed System

The proposed system consists of four modules

1. In-Bus Module
2. Central Controller Module
3. Bus Stop Module
4. User Application

A. In-Bus Module

This is an important part of the tracking system which will be installed in the bus. It is a GPS device which works continuously in any weather without failure. It captures the detailed information about the bus such as speed of the bus, the current location of the bus, ultrasonic sensors for measuring the distance etc. It works by receiving the signals from at least three satellites depending upon the application it is used. A GPS receiver receives the signals from at least three satellites to calculate distance and uses a triangulation technique to compute its two dimensions i.e. latitude and longitude position or at least four satellites to compute its three dimensions i.e. latitude, longitude and altitude position. Therefore GPS is a key technology for giving the device its real-time position. It is responsible for transferring the information to the central controller at a bus terminal.

Here all transmission from In-Bus Module to central controller is done through a wireless network.

B. Central Controller Module

For real-time tracking of the vehicle, reliable data transmission to the remote server is very important. When the information is extracted, it transmitted to a central controller at bus terminal which saves this information on the server which acts as a database and further display the information to the end users on their smartphone with the help of web based application by using the internet. At a regular interval of every 30 seconds, data will be updated on the servers.

C. Bus Stop Module

This module provides the information of the nearest bus stop to the passengers on their mobile. This will be a GPS based module helps in determining the nearest bus stops to the passengers.

D. User Application

This act as a module for user as this is an android application needs to be installed on every passengers smart-phone looking to use the public transport for their journey. The information updated on servers on controller side will display to the passengers through this android application.

services and applications for the traveling public, the project has been developed, which apply rapidly emerging information technologies in buses and transportation infrastructures. This helps the passenger to take a right decision on right time and minimize the waiting time to the minimum possible time. This will attract public to use public transport (buses) over the private transportation and saves time, money and the most important it reduces the pollution by encouraging the public to use buses and minimize the use of private transportation.

The practical model of this paper can be proved to be very efficient, attractive, cheaper, and reliable system for this. For vehicle tracking in real-time, in-vehicle module and a tracking central server are used. The information is transmitted to Tracking central server acts as a database using a wireless network.

6. FUTERE SCOPE

The project is having a wide scope in the future. Mobile application can be further modified and gives the information of inside the bus like the number of passengers traveling in the bus, number of available seats and available space. Display screens can be installed on the bus stops which display the expected time of the bus to reach there.

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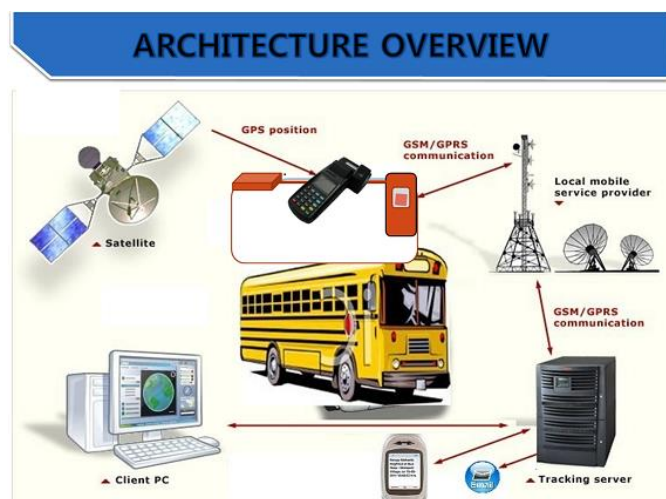
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5. CONCLUSIONS

Insufficient technologies currently used in the public transportation systems like buses have caused significant loss of time, loss of money, waste of energy, and loss of productivity. To improve the profit and efficiency of the public transportation systems and enable new mobile

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