

Synchronized Bus Movement and Information System with Futuristic Facilities

Mrs. Lavanya Santhosh¹
¹Assistant Professor,
Dept. of CSE, Dr. AIT,
Bangalore, Karnataka

V Saranya²
²Student,
Dept. of CSE, Dr. AIT,
Bangalore, Karnataka

Punitha N³
³Student,
Dept. of CSE, Dr. AIT,
Bangalore, Karnataka

Abstract— Transport infrastructure is the lifeline of a nation where buses are most important form of urban and rural passengers transport around the world. This paper demonstrates the availability of various information to the commuters regarding bus route number, source, destination, current location of bus and efficient time of arrival. The enhanced feature provided in this system is that commuters will get notification about real time bus location and its effective time of arrival by considering the traffic scenario through alerts in android application. This paper also proposes a futuristic easy ticketing system which will have the facilities such as display of seat availability, electronic pass, ticket-vending for cash and allowing only stipulated number of passengers to board the bus. The android platform provides an open source development with complete synchronization of world information and makes it universally accessible and useful. This system provides a comfortable journey and effective time management for the commuters.

Keywords- Notification, easy ticketing system, electronic pass, ticket-vending, synchronization

I. INTRODUCTION

In our routine life travelling in public transport has become an integral part of every day. Bus services are the most common type of public transport services which is used by large number of population. It is widely deployed in cities around world because they provide cost effective and economic public transportation. Due to the growing population, the main problem associated with public transport is the time management by commuters while commuting from one place to another. Usually buses are over-crowded and enough time is wasted daily by commuters due to unavailability of required bus information. Commuters waiting at a bus stop often face a dilemma of whether he should wait for a bus or travel through other modes of transport to reach his destination. He lacks the much required information about bus availability, seat availability, real time traffic in particular area, bus location and other details. We need a system so that commuters can make use of necessary information. This paper gives an effective and feasible solution to above problems.

In this paper, it is proposed to design an android mobile phone application that gives information about public transport buses and their position and estimated time to reach a specified location. It uses the real time information of bus

speed moving from one location to another in a traffic scenario and the bus indeterminate stoppage at any point. It will predict the traffic and will calculate the estimated time of bus arrival to a particular point based on latitude and longitude of the location. It shows the movement of bus on Google map. In this application, the users will be continuously getting alerts on bus location and estimated time of arrival for a particular desired selected bus stop (by user). The reason for android platform is those androids require an open source development which is probably the most feasible and present user friendly approach.

This paper also proposes an easy ticketing system which is fixed at the entry point of buses. In this concept, passengers are required to board the bus in a single entry system. The bus will have a separate exit point. This easy ticketing system provides two options for the boarding passengers. The passenger can either swipe the prepaid e-pass obtained through transport company to get the ticket or he can insert the money in vending machine which will issue ticket and returns the change. The automated door of bus will be synchronized by easy ticketing system which will allow only passengers with tickets to enter. The information stored in this easy ticketing system will be sent to the server (updated continuously) which will have all real time details such as number of seats available and number of passengers in bus. These details can be even made available to passenger application on request. The bus will have a digital signboard above the entrance which displays the number of seats available in the bus.

Presently everyone has a mobile phone for their personal use. Usually all transactions are carried through their personal mobile phones. By using this android synchronized bus movement and information application, commuters can plan their journey in advance and reach destination in time due to availability of seamless information provided by this system. Many people will stop using private vehicles and they will switch to public transport. This will help a long way in regulating traffic and pollution.

II. EXISTING SYSTEM

Many transport organization proposes an android mobile phone application that gives information about buses, bus number, routes both online and offline. It also deal with location based services which are used to track current location of bus as well as give static estimate remaining time for tracked bus to reach its destination using client server technology.

A. Pros:

The existing system provides following features of bus transport:-

1. Bus location on map
2. Static estimation of the bus location
3. Bus number information
4. Ticket system

B. Cons:

But none of these systems will provide the accurate and exact estimation of bus arrival to a particular point in real time based on traffic and other scenario. Users don't get any alerts and the ticketing system is very complex.

III. PROPOSED SYSTEM

The proposed system enhances the feature of existing system and uses the real time information of bus speed moving from one location to another and bus indeterminate stoppage at any point will predict the traffic and will calculate the estimated time of bus arrival to the particular point based on the parameters. This system also shows the movement of the bus on the Google map. The commuter can select a desired location for which he will be getting alerts in mobile about bus location and effective time of arrival till the bus arrives to that point.

This application will also have an added feature called simulation mode which can be used any time as guide to plan a journey in advanced based on prediction of current level of traffic in an area.

This paper also proposes a futuristic easy ticketing system which will have the facilities such as display of seat availability, electronic pass, ticket-vending for cash and allowing only stipulated number of passengers to board the bus. The availability of real time data at the server will help the transport company to increase the number of buses as per requirement.

The system will be made full proof so that no one can enter inside bus without a ticket. There will be a camera near the vending machine which will store photos in the server for any further use.

IV. METHODOLOGY

The proposed system consists of three components

1. Driver App (Bus app)
2. Users App (Passenger app)
3. Server

These three components interact among themselves in a very efficient manner for the effective working of the system.

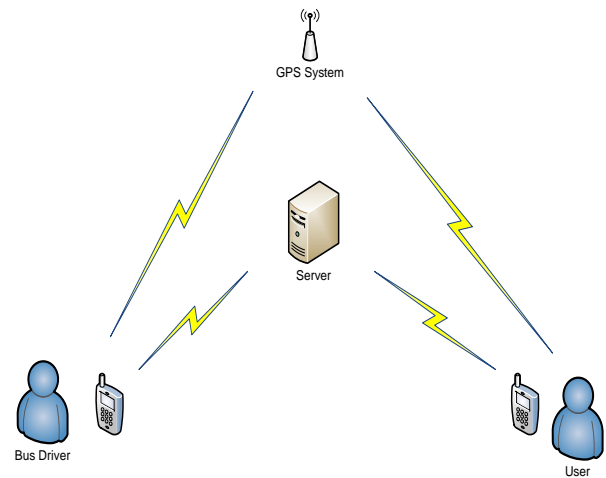


Figure 1: Interaction among the three components

1. Driver App :

It fetches the current location of the bus and periodically uploads the current location to the server.

2. Server App:

The server app stores the details of the bus such as registration number and bus route number on the server and also the bus stop coordinates in the database. The server application receives the current location of the bus and calculate the speed of the bus by determined to move from previous uploaded location and current location, calculates the distance travelled and time taken to determine the speed, the server calculates the ideal time the bus is in current location, and time taken to move from one location to another and determine the time to reach the bus stop. The server sends the real time estimated time and sends to the user to the user waiting for the bus. The server also sends the current location to the users so that they can give the location of the bus on map and shows the bus location on the Google map.

3. User app:

It shows the estimated time of bus to reach the current position by fetching real time data from servers. The application must detect the bus ideal time at particular position and identify the traffic scenario. The application must also identify the real time-travel time of the bus to Bus-stops.

The futuristic Easy ticketing system uses the following methodologies to avoid over-crowded buses and to prevent it from accidents.

- Electronic pass (E-pass):
E-pass is a prepaid card issued by Transport Company. The commuters can get the ticket by swiping it at the smart ticketing system fixed at the entrance of bus and should enter the destination code. Appropriate fare amount will be deducted from the balance of the card.

- Ticket-vending for cash:
A passenger should enter the destination code and insert the money in vending machine which will issue ticket and returns the change. The automated door of bus will be synchronized by easy ticketing system which will allow only passengers with ticket to enter in the bus.
- Digital signboard:
The information stored in the easy ticketing system will be sent to the server (updated continuously) which will have all real time details such as number of seats available and number of passengers in bus. So the digital signboard fixed above the entrance will show the real time number of seats available inside the bus.

V. CONCLUSION

This paper provides commuters to access various bus information such as route number, source, destination, estimated arrival time, to the desired bus stop based on current level of traffic and continuous alerts through android mobile application. Our system uses the real time information of bus speed moving from one location to another in the traffic scenario and guides the user to reach the destination in time. With the help of this application, one can always plan their journey in advance comfortably and save the time. The

Easy ticketing system will be made full proof so that no one can enter inside bus without a ticket. There will be a camera near the vending machine which will store photos in the server for any further use.

REFERENCES

- [1] Ajay Shingare, Ankita Pendole, Nikitha Choudhary "GPS supported city bus tracking and smart ticketing system "published in "Gree computing and internet of things", 2015 international conference.
- [2] Omkar Sambare , Punam Gaikwal , "GPS based bus tracking the android application" International journal of engineering and management research.
- [3] Real time bus monitoring system using GPS by Dr. Saylee Gharge, Manal Chhaya, Guarav Chheda, Jitesh Deshpande, Niket Gajra, June 2012
- [4] Bus navigation system with effective data transmission using GPS and wireless transmitter by P. Ramya , V. Lingavignesh, I. Mahalakshmi, C. Tharani, March 2014
- [5] Offline navigation system for mobile devices by Prithumit Deb, Nitin Singh, Saket Kumar, Nitish Rai, April 2010
- [6] Micro-navigation for urban bus passengers using internet of things to improve the public transport by Stefan Foell, Gerd Kortuem, Reza Rawassizadeh and Marcus Handte, UmerIqbal, Pedro Marron, October 2014
- [7] GPS supported android application for city bus scheduling and tracking by Daniel F. Urbanski, December 2014
- [8] GPS based vehicle navigation system using google maps by Ch. Chakradhara Rao, P. Pushpalatha, N. AdityaSundar, Nov 2013