



# **PREDICTING BUS LOCATION INFORMATION WITH MOBILE PHONE BASED PARTICIPATORY SENSING**

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*Abstract— The current location of the bus is primary information to most transport travellers. Excessively long waiting time at bus stops often discourages the travellers and makes them reluctant to take buses. With commodity mobile phones, the bus passengers surrounding environmental context is effectively collected and utilized to estimate the bus travelling routes and predict bus location. This helps in making better travelling decision by the passengers. From this system it can also be determined whether the bus is yet to come or has been missed out. Android based predicting bus location information system is required which tracks the real time location of the bus and this information is used effectively by the passengers to make better travelling decision. GPS is growing its popularity in day to day life application. In this era of 4<sup>th</sup> generation smart phone become a valuable part of human being. Android has made life easier and comfortable. In existing system GPS device is used for location tracking, since this device is expensive and consume more energy to operate .To resolve this problem in the proposed system instead of using GPS device there are two android applications one for driver and the other for passengers. With the driver's application locations are tracked and all the passengers' information is retrieved from the server. The passengers application displays the current location of the bus via Google map, all the bus and route details, driver details and also can make call to them, and SMS alert is sent to all passengers with the intimation of date,time,current location, latitude and longitude coordinates. Hence the passengers can get flexibility using the app to catch the bus and waiting time can also be reduced.*

*Keywords: GPS, GPRS, DDMS, APK, SDK*

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## I. INTRODUCTION

Various uncertain conditions in the daily operation of public transportation systems, affects the movement of vehicles as the day progresses. Uncertainty in passenger demand, traffic congestion, uneven vehicle dispatching times, unexpected delays and incidents are the major reasons for the passengers to reach office/school/college late. Many passengers are late to their respective errands because they are unable to choose whether to wait for the vehicle or take an alternative. Interfaces such as smart phone could make public conveyance system more user-friendly by disseminating location information of the bus and thus increases its effectiveness among various transportation modes. Most of the user wants the location of the bus. This motivates us to design a crowd-participated service to bridge those who want to know bus location (querying users) to those who are on the bus and able to share the instant bus route information (sharing users). To achieve such a goal, we let the bus passengers themselves cooperatively sense the bus route information using commodity mobile phones. In particular, the passengers may anonymously send their data collected on buses to a processing server, which intelligently processes the data and distributes useful information to those querying users.

Such a crowd-participated approach for bus location prediction possesses the following several advantages compared with conventional approaches. First, through directly bridging the sharing and querying users in the participatory framework, we build our system independent of the bus operating companies or other third-party service providers, allowing easy and inexpensive adoption of the proposed approach over other application instances. Second, based on the commodity mobile phones, our system obviates the need for special hardware or extra vehicle devices, which substantially reduces the deployment cost. Compared with conventional approaches, our approach is less demanding and much more energy friendly, encouraging a broader number of participating passengers. Third, through automatically detecting ambient environments and generating bus route related reports, our approach does not require the explicit human inputs from the participants, which facilitates the involvement of participatory parties.

During the on-line processing stage, we use the mobile phones of sharing passengers on the bus to record the cell tower sequences and transmit the data to the backend server. The current position of the vehicle is provided to the passenger by the application. In relation to the SMS alert sent to users and also bus details, driver details are provided so that the passengers can decide whether to wait for the vehicle or not. This helps in making better travelling decisions by the passengers. From this system it can also be determined whether the vehicle is yet to come or has been missed. To make life more efficient the system provides necessary basic information. For enhancing public transport, it has to be made more reliable for which various concepts have been proposed.

Quality of life of people in India is demeaning with the growing traffic congestion. Congestion leads to air pollution, decrease in accessibility and increased travel time. System and technology is growing even in microseconds. GPS is mounting its reputation in day to day life applications. With increasing use of smart phones and growing popularity of the GPS based applications. It has become feasible for the commuter to track the real time position of the vehicle and make better travelling decision.

## II. IMPLEMENTATION

### II.1 Android Application

This concept is implemented as an android application so that it targets a wide range of users where the user can access the system from anywhere and at any time through internet. Various classes and interfaces are used for building this application. The implementation is done in such a way that user can get full flexibility and can make best use of it. Apache tomcat server is used for running the application.

### II.2 Alerts and Databases

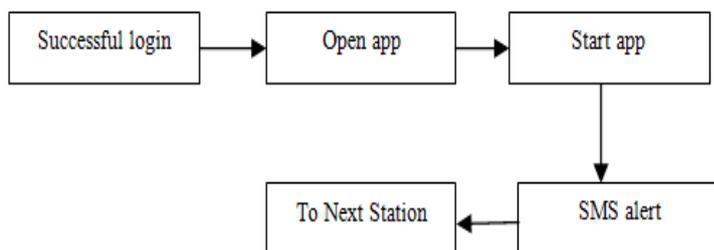
In the implementation part, the database used is MYSQL in which all the user details such as their personal information including mobile number, Boarding point, email id are stored. The driver details, Bus and Station details are also stored in the database. SMS alert is sent to the users with the intimation of date, time, current location of the bus, latitude and longitude coordinates. And also current location of the bus can be viewed through google map. Web application is used for admin to update the bus details as well as station details into the database.

### III. WORKFLOW

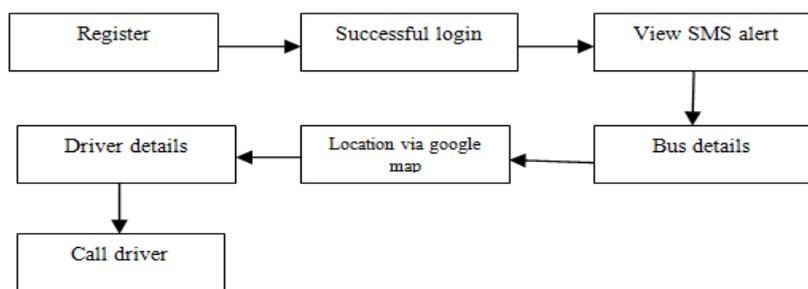
#### III.1 Workflow Diagram

The flow of the project begins with user registration. The user needs to register them into the application by providing their personal information such as name, mobile number, email id and boarding point details. All these details get stored in the database. After registration user will be logged into the application by providing their mobile number and can view bus details, station details, driver number, can make a call to driver using call button, current location via goggle map. With the driver application, driver will be logged into the application by providing their id and password. After logging before the driver start the bus he need click the start button, and at each and every stop SMS alert is sent automatically to the user with the intimation of date, time, current location, latitude and longitude coordinates. The admin will be updating the boarding point details through web application.

The general workflow for user is as follows:



The general workflow for driver is as follows:

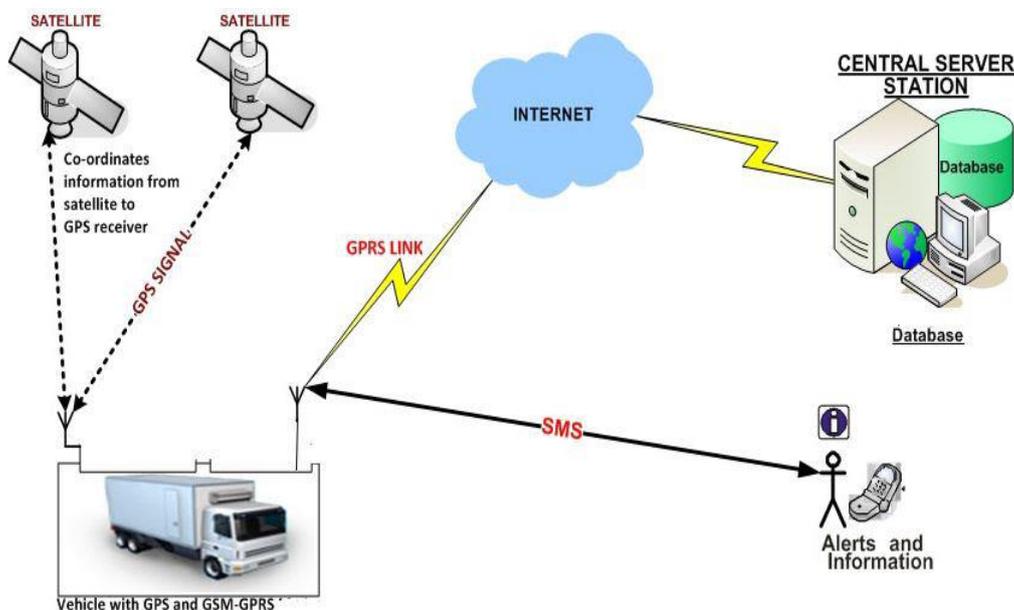


#### III.2 Important features

- The application will consume less energy and internet
- SMS alert is sent to users with the intimation of date, time, current location of the bus, latitude and longitude coordinates.
- Viewing bus details, Station details, driver details, can make call to driver
- Viewing current location via google map
- The user can efficiently use their time instead of wasting their time for bus.

#### IV. ARCHITECTURE

The idea of the proposed system is to track the current location of the bus.  
The architecture diagram is as follows



#### V. Conclusion

The system aims at reliable transportation by providing passengers with the real time location of the vehicle. The system also gives the details of bus details, station details, driver information, an option to make call to the driver, SMS alert with the intimation of date, time, current location of the bus, latitude, longitude, can view location via google map. Hence the passengers can decide whether to wait for the vehicle or not. This helps in making better travelling decisions by the passengers. The basic idea behind the proposed system is to track the bus and to reduce the waiting time of the passengers for the bus.

#### VI. Acknowledgements

We have taken efforts in this application. However, it would not have been possible without the kind support and help of our institution which provided data for this project. We are highly indebted to Mr. **K.Padmanaban** for his guidance and constant supervisions as well as for providing necessary information regarding the application and also his support in completing the project. The authors are thankful and gratefully acknowledge all reviewers for their valuable suggestions for enriching the quality of the paper.

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