ANDROID APPLICATION FOR SMART BUS MONITORING AND TRACKING SYSTEM

R. Varalakshmi[1]
varalakshmi8.ramireddy@gmail.com

PG Research Scholar
Department of Computer Applications
Madanapalle Institute of Technology & Science, India

Dr.T.Manikumar[2]
tmanikumar.mku@gmail.com

Assistant Professor
Department of Computer Applications
Madanapalle Institute of Technology & Science, India

Abstract: Android has become very popular in the world since it is an open source and there are no extra fees for Java Virtual Machine (JVM). In today's world, the time is more important for students.Being a product of high technology, mobile phones are more widely used and are becoming more and more popular.A vehicle tracking system is a commonly used application for tracking vehicles. Due to traffic congestion and road works, most of the buses are delayed.People have to wait for their bus at the bus stops for a long time without even knowing when the bus will arrive Thus, the arrival time of the bus cannot be guaranteed.

1. INTRODUCTION

Nowadays, buses are used rapidly as a transportation system in the different organization, e.g., school, college, university, business firm, banks, etc. But, with the increase of population, vehicles are increasing day by day which is further leading to heavy traffic.[2] There are many reasons for heavy traffic in developing countries like india which results in more delay to reach at the destination ofthe respective buses. These reasons may be harsh weather, traffic conditions, etc.[4] On the other hand, at the bus station, most of the time people have to wait for the arrival of buses because of the delay of a particular bus at a particular stop. Therefore, an effective transportation system has effective movement of vehicles and people which leads to better quality of life and better economic growth of the society. Hence, the bus tracking system can be useful for passengers which will provide the location of the buses with routes using Google map at the current time.[6][7]

2.LITERATURE REVIEW:

The most important step in software development process.[4] Before developing the tool it is necessary to determine the time factor, economy and company strength.[2] Once these things are satisfied, ten next steps are to determine which operating system and language can be used for developing the tool.[4] Once the programmers start building the tool the programmers need lot of external support.[6] This support can be obtained from senior programmers, from book or from websites.[10] Before building the system the above consideration are taken into account for developing the proposed system.[3]

The Android Application for "A College Bus Tracking android application" enables the user to find out the bus location information so that the user does not get delayed. The main aim of this paper is to collect the data from GPS and delivering it to server from where itwill be fetched by android application and the bus real time location can be viewed on Google map, which is integrated onto the android application.[1][3][4]The users can log on to the application and can know about the scheduled routes of the college bus.[4] This application is user-friendly and flexible to use as it is a time saving application to the user.[8]

In this fast life, everyone is in hurry to reach their destinations. In this case waiting for the buses is not reliable.[4]People who rely on the public transport their major concern is to know the real time location of the bus for which they are waiting for and the time it will take to reach their bus stop.[8] This information helps people in making better travelling decisions.[5]This paper gives the major challenges in the public transport system and discuses various approaches to intelligently manage it.[6] Current position of the bus is acquired by integrating GPS device on the bus and coordinates of the bus are sent by either GPRS service provided by GSM networks or SMS or RFID. [8][9]GPS device is enabled on the tracking device and this information is sent to centralized control unit or directly at the bus stops using RF receivers.[5][6] This system is further integrated with the historical average speeds of each segment.[6] This is done to improve the accuracy by including the factors like volume of traffic, crossings in each segment, day and time of day. People can track information using LEDs at bus stops, SMS, web application or Android application.[2][3] GPS coordinates of the bus when sent to the centralized server where various arrival time estimation algorithms are applied using historical speed patterns.[1][2]

3.EXISTING SYSTEM:

Bus Locator via SMS using Android Application uploads the current location of the bus to the server.[9] The server then sends an SMS to all the registered students those are about to board at the bus stop.[3][4] Here the driver's mobile phone is used as a GPS receiver. It is a tiresome process where the details of all the students are to be kept and updated time to time.[5][6] The server is overloaded every now and then to get details of student at every stop.[6]

4.PROPOSED METHODOLOGY:

A Real-Time College Bus Tracking Application which runs on Android smart phones. This enables students to find out the location of the bus so that they won't get late or won't arrive at the stop too early.[5][6] The main purpose of this application is to provide exact location of the student's respective buses in Google Maps besides providing information like bus details, driver details, stops, contact number, routes, etc.[7][9] This application may be widely used by the college students since Android smart phones have become common and affordable for all. It is a real time system as the current location of the bus is updated every moment in the form of latitude and longitude which is received by the students through their application on Google maps.[6][7] The application also estimates the time required to reach a particular stop on its route.[9]

SYSTEM ARCHITECTURE:

Fig4.1System Architecture

5. RESULTS & DISCUSSION

The entire application has been divided into 2 modules:

1. Administrator module.
2. Parent module.

Administrator module:

The Administrator is the one who manages the school bus. He/she may be the driver or attendant of the school bus.[5]

The main objective of this module is:

Help the authority and parent to track the movement of their school bus and obtain the current location.[1][2]
Alert the parents through SMS to get to the pickup/drop location, when the bus reaches within predefined range of their house.[4]
Send an SMS to the parent when the child reaches the school.
An emergency message can be sent whenever there is an emergency condition like tire puncture, engine problem etc.[7]
In case of an accident of the bus, an alert is sent to the authorities and parent, also the emergency hospital number instantly.[6][8]

The entire workflow of the Administrator module is illustrated in the following steps:

Authorization:

The Administrator has to enter the correct credentials in order to Login successfully and access different features.[4][5]

Setting up the School Location:

The Administrator has to first set up the School Location by specifying the accurate Latitude and Longitude values.[7]

Adding a Student:

The Administrator can now add students who board a particular school bus.[10]A detailed description of students is taken which includes basic information about the student like name, register number, class and section.And it also contains important fields likeHouse location in latitude and longitude,Parent's mobile number,The distance before which the parent has to be notified about the bus arrival.[6]The Administrator can view the details of the students, which will offer a better management of the children in the bus.[8][9]There is also a provision to update and delete the details of the particular student's record.[10]

***Adding the Authority*:**

The Administrator can also add authorities. This helps the school management to keep track of the school bus and notify them about any emergencies like tire puncture, engine problem and also in case of accidents.[2][3]Authority information includes name and mobile number.[4]There is a provision to view, update and delete the details of a particular authority.[6][7]The Administrator starts the service of this module when the bus is about to pickup/drop the students.[8]

***Sending an Alert SMS to come to the pickup/drop location*:**

When the bus is about to reach the predefined range of the student's house, an alert SMS is sent indicating the parent to come to the pickup/drop location.[1][2][3]

The proposed method explains how to follow school buses and interact with them more efficiently and effectively, resulting in greater reliability and security.[4] We use a simple but clear user interface that is easy to navigate.[6] Because we are using an Android application, no additional hardware is necessary for implementation.[10] Because the majority of the functions run in the background, there is no need for specific alert message notification.[8] In the event of a tyre puncture, engine failure, or even an accident, the software also assists in keeping track of pupils, parent/authority contacts, and emergency notifications.[3][4]

Screenshots related to the output:

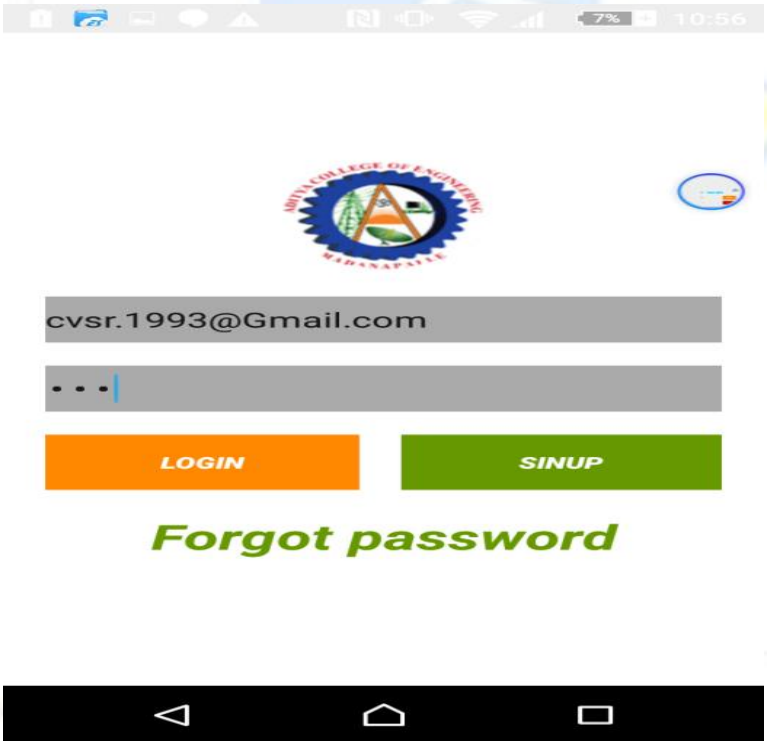

Figure:5.1 Front Screen

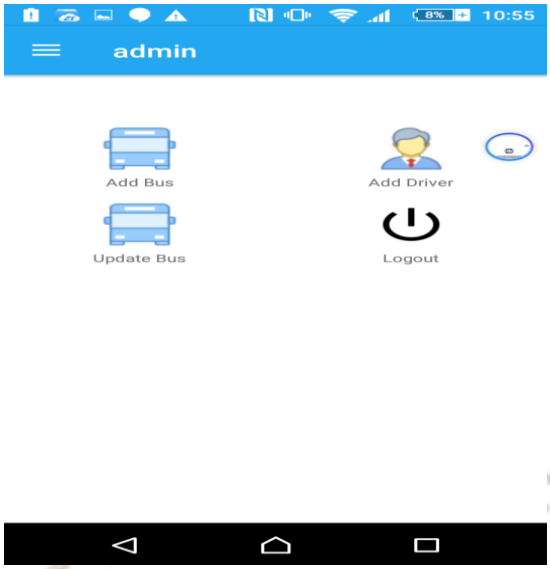

Figure:5.2 Admin Module

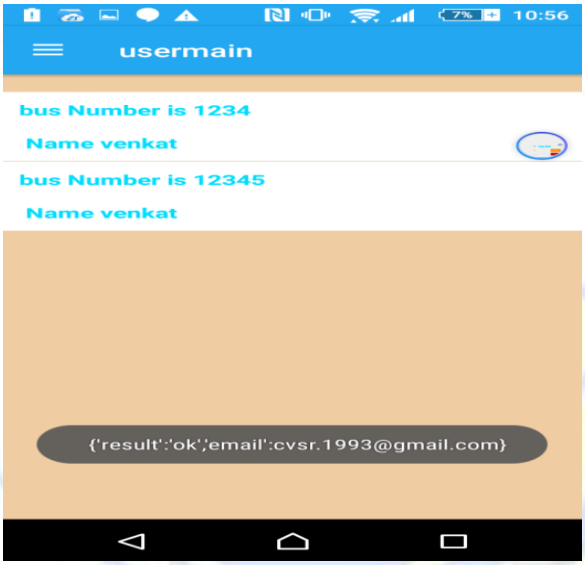

Figure:5.3 User Module

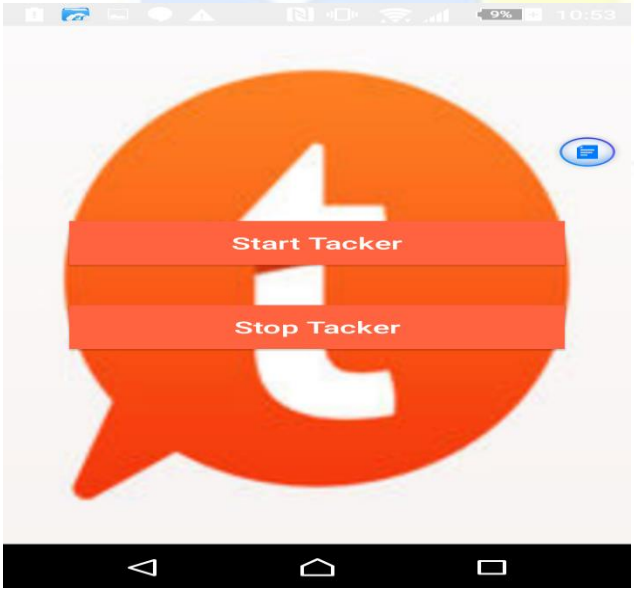

Figure:5.4 Tracking

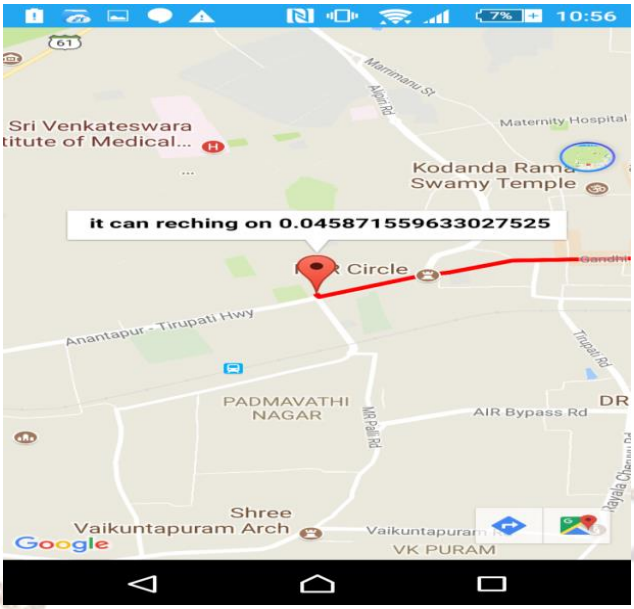

Figure:5.5 Final tracking

9.CONCLUSION:

The proposed system explains how to follow school buses and provide more efficient and effective interaction, resulting in increased reliability and security.[3] We employ a simple but clean user interface that makes it simple to use.[6] No additional hardware is required for implementation because we are using an Android application.[8][9] Because the majority of the functions execute in the background, no specific notification of alert messages is required.[6] The software also assists in keeping track of pupils, parent/authority contacts, and emergency notifications in the event of a tyre puncture, engine failure, or even an accident.[3][4]
The project may be improved by connecting it to the cloud, where we can track the movement of the bus in real time using Google Maps.[4][5]

10.REFERENCES:

1. S Om Prakash, R Karthikaeyan,"Vehicle Tracking System with Smartphone Integration", International Journal of Scientific & Engineering Research,

2. Manini Kumbhar, Meghana Survase, Pratibha Mastud, Avdhut Salunke "Real Time Web Based Bus Tracking System", International Research Journal of Engineering and Technology.

3. R.Maruthi, C.Jayakumari, "SMS based Bus Tracking System using Open Source Technologies", International Journal of Computer Applications.

4. Wei-Meng Lee, "Beginning Android 4 Application Development", Wrox, Wiley India Edition.

5. Reto Meier, "Professional Android 4 Application Development", Wrox, Wiley India Edition.

6. Google API Tutorials, W3school.

7. Eddie Chi-Wah Lau, ''Simple Bus Tracking System'', Journal of Advanced Computer Science and Technology Research, vol.3, no.1, 2013

8. Khondker Shajadul Hasan, Mashiur Rahman, Abul L. Haque, M Abdur
GPS-GPRS Based Object Tracking System," Proceedings of the International MultiConference of Engineers and Computer Scientists 2009 (IMECS 2009), March 2009, Hong Kong, vol. 1.

9. MZ Parvez, KZ Ahmed, QR Mahfuz, MS Rahman," A theoretical model of GSM network based vehicle tracking system," 2010 International Conference on Electrical and Computer Engineering (ICECE), Dec. 2010, pp. 594-597.

10. https://en.wikipedia.org/wiki/Arduino
https://www.dfrobot.com/wiki/index.php/GPS/GPRS/GSM_Module_ V3.0_(SKU:TEL0051) .