Abstract - Smart phones formulate the world smarter. The person travelling in the college bus possibly will wait for the arrival of the exacting college bus at the bus stop. Occasionally the student may appear late to the bus stop and they don’t recognize whether the bus have crossed their boarding spot. And if some bus number changes, the student doesn’t recognize which bus comes to their boarding spot. To trounce these problems a new android application is created for the students. By using this application, the bus position can be tracked very effortlessly. This application desires student’s information for verifying the authorized students. This Android application gets the details about the buses like bus numbers, bus routes for the students. The web server utilize the knowledge of Location Based Services, which helps to track the current position of the bus and it approximation time to track the bus location until it reach its destination using the Client-Server technology. Each bus sends its current position to the web server. This detail is stored on the server database. The students who have installed the college bus tracking application can follow the bus routes, bus number, and the bus position. The bus position is tracked by using Global Positioning System and the location information is send to the students and viewed in the Google map which reduces their waiting time.

Index Terms -Android Application, Global Positioning System, Google map, bus position, Real-Time Bus Tracking.

I. INTRODUCTION

Transportation is one of the important infrastructures of any kingdom. The main problem about the transportation is the ambiguity of waiting time due to traffic jams and any other issue live anomalous conditioning. The safety of private and public vehicles is a major anxiety so GPS vehicle tracking system ensures their protection while travelling. In the existing system, different tracking methods are used such as combination with Google maps, Automatic transit directions or real time tracking and arrival time prediction.

In this modern life, everyone is in scurry to reach their destination. In this situation waiting for the buses is not consistent. People who rely on the public transportation their most important concern is to know the real time place of the bus for which they are waiting for and the time it will take to reach their bus boarding point. This detail helps people in making better travelling decisions. This paper gives the major confronts in the public transportation system and discusses various loom to shrewdly manage it. Current position of the bus is attained by incorporating GPS device on the bus and harmonizes of the bus are sent by either GPRS service provided by GSM networks or SMS or RFID. GPS device is facilitated on the tracking device and this detail is sent to essential control unit or directly at the bus destination stops using RF receivers. This system is further incorporated with the historical average speeds of each fragment. This is done to recover the accuracy by including the features like level of traffic, crossings in each fragment, day and time of day. People can track location details using LEDs at bus stops, SMS, web application or Android application. GPS organize of the bus when sent to the centralized server where various arrival time estimation algorithms are applied using historical speed patterns.

A. GPS

The Global Positioning System (GPS) is a liberty based satellite direction-finding system that provides locality and time information in all weather conditions, everyplace on or near the Earth where there is an unhindered line of sight to four or supplementary GPS satellites. It is upholder by the United States government and is freely reachable to anyone with a GPS receiver [7]. A GPS receiver estimates its position by precisely timing the indications sent by GPS satellites high above the Earth. Each satellite frequently transmits information that includes the time and message was transmitted Satellite point at time of information transmission. The receiver uses the information it receives to establish the transition time of each message and computes the expance to each satellite using the speed of light. Each of these expanse and satellites' locations defines a sphere. The receiver is on the surface of each of these spheres when the expance and the satellites' locations are correct. These d expanse and satellites' positions are used to compute the position of the receiver using the direction-finding equations. This position is then displayed, perchance with a moving map display or latitude and longitude; elevation or altitude information may be built-in, based on altitude above the
geoids. GPS dimensions yield only a position. However, most GPS units can routinely derive velocity and direction of movement from two or more position measurements. A GPS tracking unit is a device that uses the Global Positioning System to decide the precise location of a vehicle, person, or other positive feature to which it is attached and to record the position of the asset at regular intermissions. The recorded localization data can be stored within the following unit, or it may be transmitted to a central location data base, or internet-connected computer, using a cellular (GPRS), radio, or satellite modem embedded in the unit. This permits the asset's position to be displayed against a map milieu either in real-time or when analysing the track later, using personalized software.

B. Location-Based Services

Location-based services (LBS) applications that give data to users in light of their location are developing transportation systems. From interpersonal interaction to route to managing routes, users are being offered a scope of new LBS.

LBS are used more commonly by the mobile users. A LBS is a locality provider that is used to follow the location of any mobile node through the mobile network that incorporate vehicular tracking system called fleet net. In versatile correspondence the tracking of location assumes a noteworthy part utilizing this LBS services. In order to track the position of the user's mobile appliance it checks the nearest base location available to the mobile network and GPS for tracking location. The GPS satellite is utilized for navigation intention and it is combined with LBS is used to track the location of mobile device and the authentic work of GPS is to calculate the position in the evaluation of coordinates like latitude and longitude values through the GPS receiver.

The mobile that is entrenched with GPS receiver compute the exact longitude, latitude and altitude values and those values can be used by LBS for verdict the location. GPS also provides information like time for manipulating sender and receiver locations depends on the information gathered from the satellites. Using GPS receiver in the mobile appliance set the navigation lane from source to reach a meticulous destination. Three satellites may be enough for calculate the position of mobile devices.

II. LITERATURE SURVEY

A. Energy-Efficient Rate-Adaptive GPS-Based Positioning

In this paper, Jeongyeup Paek investigates RAPS, rate-adaptive positioning system for smart phone applications. It is based on the observation that GPS is commonly less precisely in urban areas, so it be adequate to turn on GPS only as often as necessary to accomplish this accurateness. This system [6] uses a collection of techniques to ingeniously determine when to turn on GPS. It uses the location-time narration of the user to estimate user velocity and adaptively turn on GPS only if the estimated ambiguity in position exceeds the accuracy threshold. It also professionally estimates user movement using a duty-cycled accelerometer, and utilizes Bluetooth communication to reduce position hesitation among neighbouring devices. Finally, it utilizes cell tower-RSS blacklisting to detect GPS unavailability and avoid turning on GPS in these cases. Jeongyeup Paek evaluate RAPS through real-world experimentation using a prototype accomplishment on a modern smart phone and show that it can enhance phone lifetimes by more than a factor of 3.8 over an approach where GPS is always on. The advantage of this method is uses Bluetooth communication. It condenses GPS activations. The disadvantage of this method is the GPS does not work appropriately in urban areas and by using Bluetooth facility the long distance cannot be tracked. It was identify location in very small distance.

B. Android Mobile Based Bus Tracking System

Generally, every person waits for the bus arrival to their boarding point. Due to heavy traffic, the people feel uncomfortable to make contact with their neighbours. The calls and message services over phone necessitates more cost. Mobile based bus tracking system was proposed in [14] which help to retrieve the bus location without calling or disturbing the person travelling in the bus. Here the people boarding the bus and the controller of the bus should have an Android mobile phone with internet connection. The GPS which supports GSM will report the transport information to the server. The information from the server is conveyed to the user to track the bus location. The advantage of this method is that it has high flexible. The disadvantage is that the passenger does not get the exact location of the bus. System can be useful for short distances. Long distance tracking will not provide precise location of the bus.

C. Real Time Bus Monitoring System

In the daily process of a bus system, the progress of vehicles is affected by hesitant conditions as the day progresses, such as traffic jamming, astonishing delays, and randomness in passenger demand, jagged vehicle dispatching times, and incidents. Real time bus monitoring and passenger information system was proposed in [9] focuses on the implementation of a Real Time Passenger Information (RTPI) system, by installing GPS devices on city buses. It facilitate the tracking devices to obtain GPS data of the bus locations, which it will then transfer it to federal control unit and represent it by activating symbolic demonstration of buses in the estimated geographic positions on the route map.
Unambiguous software’s will be used to interface the data received to the map. The advantage is passenger can use smart phones for view bus arrival time and current location of the bus. The disadvantage is this method is not suitable in real time because it needs modem.

**D. Tracking Of Complete Transport System Using GPS**

Due to the high cost of time several schemes are proposed to reduce the consumption of time on the bus station or waiting for the bus for more time is not preferred. This method was proposed in [10] require one tracking system to track the Complete transportation System. Every GPS tracking system is a frequent approach to get vehicle position information in real-time. In this proposed procedure a GPS following framework called tRackIt that is aloof of ware equipment i.e. GPS empowered Android Mobile as GPS Device, open source programming (GCM Architecture) and a simple to-oversee UI through a web server with Google Map programming. The system includes a GPS/GPRS module for location acquirement and message transmission. GCM to transfer of location information, and third party App Server to momentary store location. The advantage is cost effective. The disadvantage of this method is Passengers cannot get the exact location of the bus when the bus crosses the trees or flyovers.

**E. Bus Monitoring System Using Polyline Algorithm**

The bus monitoring system is requiring of smart system which provides real time information to passenger of bus. In this paper [15] system will manage the data about current location of bus, and by using this data the real time tracking of bus will be found out and provided to traveller for bus current status. The system is developed using technologies like GPS, Google maps and GPRS (General Packet Radio Service). The system includes mobile application, which services user by tracking the real time location of bus on Google Maps, time table for specified bus and locating the nearest bus stop. The system consist GPS enabled device like mobile phone embedded in bus, which find out its current coordinates periodically after some interval and send it to database for being processed and analysed. The advantage is finding nearest stop in very fast. The disadvantage is needs two coordinates our place and nearest place. It cannot specify current location only specify the nearest location.

**F. Real-Time Bus Tracking Android Application**

Public transport is used by majority of the population in cities. Waiting for buses it would be beneficial for the passengers to know the tentative timing of the buses. This method was proposed in [13] an android application is proposed, which will track the location of both the user and the bus and then will calculate the approximate time required by the bus to reach the stop including the traffic analysis. The approximate time will be calculated by tracking the current location of the bus and the user. GPS is installed in buses, and the tracking algorithm will help in locating the bus. The approximate time required by the bus will also be calculated so that the commuters will be aware about the waiting time for their respective buses. The advantage is GPS/GPRS based system sends alert to the student when the bus location is changed. The disadvantage is system needs external database server. Long distance cannot provide precise location of the bus.

**III. METHODOLOGY**

**A. Proposed System**

The objective is to decrease the difficulties of the commuters and overcome the downsides of previous systems to generate precise results in less time. An Android application is established to provide all required information about bus location to the Android application that gives essential information about all the buses travelling in that route. The bus locality is displayed on Google map also. The information about buses will be kept in the database and can be retrieved whenever desired.

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![System Architecture](image-url)
be update time to time, so all adjustments in the transport timings and the locations are recorded. The tracker will track the location of the commuter as well as the bus so that estimated time required by the bus to reach the stop will be premeditated.

The Bus administration can include accessible Bus Routes and Bus Numbers from source to destination to this Application. Those transports added to this application can be followed by the users. GPS System is placed in Bus which can send the GPS location continuously to the web server. The user can introduce this Application. Those students added the college bus tracking application can track the Bus routes, Bus number from source to destination, Bus which is close to the nearest location and the current location through the application. Additionally, it shows current position of the bus it the required map with the assistance of GPS.

a. Admin Module

This module is utilized to include the student subtle elements, for example, student name, enlist number, date of birth, course source point, destination point and so on. This student details can be included, refreshed or erased. This module manages bus location details, for example, place of bus. At the point when the admin chooses the bus number from the dropdown list, the locality will be show in Google map. This module can use the innovation of Location Based Services, which is utilized to track the present location of the bus. This data is put away in server database. The student subtle elements are put away in the database and administrator can see all bus location. This bus location details can also be seen on Google map. Location-based applications are one of the most important new fragments of the mobile industry. These new applications are empowered by GPS-equipped phones. These applications will couple LBS with alerting users, consequently gives approximation time to reach particular location.

b. Student Module

This module manages bus location subtle elements, for example, location of bus. The student chooses the transport number from the dropdown list; the area of the transport will be shown in the Google map. The client can easily to track the transport area and also the inexact transport entry time.

c. Bus Module

The transport ought to have introduced the College Bus application. Utilizing the Latitude and longitude the present area of the transport can be discovered and the present area is refreshed to the server. The bus movement the change in

IV. IMPLEMENTATION AND RESULT

A. Admin Module

In this module administrator enters the student details in database and monitor the bus location in Google map. In case the bus number gets changed, Admin send notification to corresponding bus students.

B. Kalman-Filter Prediction Algorithm

Kalman-Filter Prediction Algorithms is a straight recursive prescient refresh calculation used to appraise the parameters of a procedure show. Beginning with introductory appraisals, the Kalman filter allows the parameters of the model to be predicted and balanced with each of new estimation. Its capacity to consolidate the impacts of both the procedure and estimations, notwithstanding its simple computational calculations, has made it exceptionally prevalent in many research fields and applications, especially in the area of autonomous and assisted navigation. The Kalman filter algorithm works abstractly as follows. The historical passenger arrival time is obtained from the data as in this fashion: The amount of on-passengers at a bus stop is divided by the most recent headway. Assuming that bus n is currently at stop i

Assuming that bus n is currently at stop i

\[ AT_{n(i+1)} = DT_{n(i)} - RT_{n(i+1)} \]

Where: is the predicted arrival time of bus n at stop i+1 is the predicted running time between i and i+1 from Kalman Filter prediction algorithm is the actual departure time of bus n from stop i.
C. **Bus Module**

In bus module to begin with installed the college bus application. This application is used to update the bus location changes in server.

D. **Student Module**

The student can login to the application using his/her registration number and date of birth to view the bus locality.
V. CONCLUSION

The college buses may reach the boarding point little earlier or bit late due to any traffic situation. So that the students may wait for a long time in their stop or there is a chance to miss their bus to reach the destination point. In this proposed system, an Android application is developed to maintain the student details and to track the bus location. By using this application the student can get the current locality of the bus and if any changes occur in the bus number instantly the notification is send to the student to alert that the bus number was changed. When the student login to this application they can see the existing notification and the bus location in the Google Map. By using this application, the waiting time for the bus can condensed.

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