International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 10 Issue 6 ǁ 2022 ǁ PP. 1542-1550

An Android Application for Bus Tracking Using GPS and Digital Mapping

Dr.J.Stanly Jayaprakash 1st, Preethi.S 2nd, Priyadharshini.M 3rd, Salini.M 4th
1st Professor, 2nd, 3rd,4th UG Scholar (B.E), Department of Computer Science and Engineering, Mahendra Institute of Technology, Mahendhirapuri.

Abstract
The college bus tracking system helps users to know the bus location so that the users don't get delayed or don't arrive at the stop too early. In order to overcome increased waiting for time and uncertainty in arrival, we have come with this project. This mobile phone application gives information about buses, bus numbers as well as bus routes. Complete information namely the number of buses that go to the required destination, bus numbers, bus timings, the routes through which the bus would pass, maps that would guide the passenger with his/her route and most importantly, track the current location of the bus and give the correct time for the bus to reach its bus stop.
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. The main focus of the project is to save the waiting time of students and providethem the details of the bus.
keywords: Bus Tracking System, GPS and Digital Mapping.

Date of Submission: 08-06-2022 Date of acceptance: 24-06-2022

I. INTRODUCTION

College bus Tracking System (VTS) is the technology used to determine the location of a vehicle using different methods like GPS and other radio navigation systems operating through satellites and ground based stations. By following triangulation ortrilateration methods the tracking system enables to calculate easy and accurate location of the vehicle. Vehicle information like location details, speed, distance traveled etc. can be viewed on a digital mapping with the help of a software via Internet. Even data can be stored and downloaded to a computer from the GPS unit at a base station and that can later be used for analysis. This system is an important tool for tracking each vehicle at a given period of time and now it is becoming increasingly popular for people having expensive cars and hence as a theft prevention and retrieval device. A vehicle tracking system is one of the most common applications used for tracking vehicles which is also used to prevent vehicle from theft. Today Android Applications are very good source for tracking the vehicles. It provides real time data on the movement of vehicles. Android phones are widely used for this purpose because they have GPS device attached with it. It acts as both transmitter as well as receiver. A vehicle tracking system combines the use of automatic vehicle location in individual vehicles with software that collects these fleet data for a comprehensive picture of vehicle location

II. LITERATURE SURVEY

Authors "ManiniKumbhar, Meghana Survase, Pratibha MAvdhutSalunk" have implemented "Real Time Web Based Bus Tracking System" The proposed system reduces the waiting time of remote users for bus. A system is used to track the bus at any location at any time. All the current information is stored to the server and it is retrieved to remote users via web based application. This System is a web based system but nowadays people mostly tends to use Android apps since they are more portable and smart phones are used more widely in today's world. Also a web based system is inconvenient for a user to use on a regular basis while waiting for a bus at the bus stop.

Authors "M. A. Hannan, A. M.Mustapha,A.Hussain and H.Basri" have implemented the system "Intelligent Bus Monitoring and Management System" The proposed system uses Artificial intelligence with the help of RFID module which is used in-order to reduce the manual work carried out in the Bus-Management &

Monitoring System. In this a RFID is used to track a bus when it crosses the bus stop. Hence the exact location of the bus is not shown , only an approximate location is shown based on the bus stops. In today's world, accuracy is very important and hence this was the limitation of this project.

Authors "Süleyman Eken, Ahmet Sayar" have implemented" have implemented the system "A smart Bus Tracking System based on location- aware service and QR code." In this paper, Bus tracking system, any passenger with Smartphone can scan QR code placed at bus stop to view estimated bus arrival times, current location of the bus. The drawback in this project was that the user had to be physically press end at the bus stop to scan the QR code.

Authors "R.Maruthi, C.Jayakumari" implemented the system "SMS based Bus Tracking System using Open Source Technologies." A bus tracker application to track a bus using GPS transceiver has been proposed in this paper. The objective of this work is to develop a system that manages and controls the transport using a tracking device to know the scheduled vehicle and the current location of the vehicle via SMS using a GPS tracking device.

Author "Yusuf Abdullahi Badamasi" have implemented the system "RFID bus ticketing system" with the help of RFID card which discard the manual or traditional ticketing system(Conductor).

Author "Akshay Sonawane , Kushal Gogri" – "Real Time Bus Tracking System"

In the busy metropolitan cities like Mumbai, Delhi , people don't have time to invest in waiting for transport. Waiting time for transport in such crowded cities leads to less productivity on a whole. People face this problem in their daily life where they have no idea about the current status of their transport. So the proposed solution is an android based application that will help the user to check out the current location of the bus and also will help the user to know how much time the bus will take to reach the current location of the user. The system will use GPS as the basis for the application and basic android application will be interfacing with the updated database to provide the real-time data to the user, hence enhancing the user-experience

There are buses available for passengers travelling to different locations, but not many passengers have complete information about these buses. Complete information namely the number of buses that go to the required destination, bus numbers, bus timings, the routes through which the bus would pass, time taken for the vehicle to reach its destination location would assist the passengers with various routes, track the current location of the bus and give the correct time for the bus to reach its destination. The proposed system deals with overcoming the problems stated above. The system is an Android application that gives necessary information about all the buses travelling in Mumbai. The platform chosen for this kind of system is android, reason being Android Operating System has come up on a very large scale and is owned by almost every second person. As more and more applications of android operating system is developed day by day on large scale ever since it is arrival.

Author "M. RISHABH SAI MADHUR1 , K. SREENIVASA PRIYATHAM2 , K.CHARAN RAJ3 ,K.BIPINNANDAN4,B.V. SATHISH KUMAR5"–"Smart Bus Tracking and Management System"

Internet of Things (IOT) joins the objects of this present reality to the virtual world, and empowers at whatever time, anyplace network for anything that has a turn ON and turn OFF switch. It constitutes to a world where physical things and humans and other living things, and virtual information and situations, collaborate with each other. Substantial measure of information is created as expansive number of gadgets is associated with the web. So this expansive measure of information must be controlled and changed over to helpful data keeping in mind the end goal to create productive frameworks. In the world of Internet of Things (IOT) when we have all the technologies to revolutionize our life, it's a great idea to develop a system which can be controlled and monitored from anywhere. In this paper, we concentrate on developing a Smart Bus Tracking and Management System using Arduino UNO, Wi-Fi Module, Router and GPS.

As the Wireless Sensor Networks have scientifically advanced more rapidly and more proficiently, they have become the key source for the advancement of IOT. They find use in almost all fields including smart grid, smart transportation systems, smart home, smart hospitals, and so on. The safety of private and public vehicles is a major concern nowadays so having GPS vehicle tracking system ensures their safety while travelling. Bus Tracking System becomes very important these days, especially for students who come late to

bus stop. In our College many students and staffs are not aware of exact timing and location of the college bus. So we have planned to implement a smart bus tracking system for easy transport facility using IoT. If you have GPS system installed in your bus, you can track your bus location using Google Maps. Arduino has been used as a platform to work. In this project, we will send the location coordinates to the Cloud or Server via Wi-Fi module using Arduino. In this bus tracking system, we have to use Google Maps, GPS Module for getting the Location Coordinates, Wi-Fi module to send data to computer or mobile over WiFi and Arduino is used to make GPS and Wi-Fi talk to each other. A. Motivation The inspiration for this project was to limit and curtail the difficulties and issues related with Bus transport framework in India. India is a developing country with tremendous population. Here, we confront numerous issues in our day by day life, for example, water, power, logistics, and economy.

The real-time bus positioninformation on Google maps and bus arrival and leaving time is additionally presented.Author "S.Sangeetha1 , S.Krishnapriya2 , Ms. S Janani3"-"SCHOOL BUS TRACKINGAND SECURITY SYSTEM'

In current point in time, due to more in number of kidnap and accident cases, parents always worry about their children, even their children using school bus for transportation. The proposed system recommends a SMS based application which consists parents to track their children location in real time. Initially the details of the students are collected and stored in the database. The details are converted into QR code and embedded with children's identity card. When the children enters the bus, the QR code is scanned by the mobile application and the timing, stop details will be sent to the parents as notification. Later on, when the bus gets started, the GPS in the mobile phone is turned on and send the location updates to the parents to easily track the bus location. Thus our proposed system is capable of notifying parents through SMS once the child enters/leaves the school, enabling parents to trace the bus, helping smooth and safer rides to the school

Children's security has always been a priority problem whose solution must constantly be improved. Children safety is importance to their parents even if they have most excellent precautions, children, due to their lack of skills to protect themselves. School bus play an essential role in carrying most of children everyday all over the world. While there are several problems that might disturb the parents with respect to the travel of school going kids. This system is especially focused on children's movements from home to school entrance, trying to solve a little part of the school-age children's security problem. QR code is a way of encoding more information than a traditional barcode. The bar code can be replaced by QR code so that one can easily insert or make a link to more information. A QR code contains of black squares arranged in a square grid on a white background, which can be read by an imaging device such as a camera, and processed using Reed– Solomon error correction until the image can be appropriately interpreted. QR codes are now used in the fields like commercial tracking applications and convenience-oriented applications aimed at mobile-phone users (termed mobile tagging). QR codes may be used to display text to the user, to add a vCard contact to the user's device, to open a Uniform

III. EXISTING SYSTEM

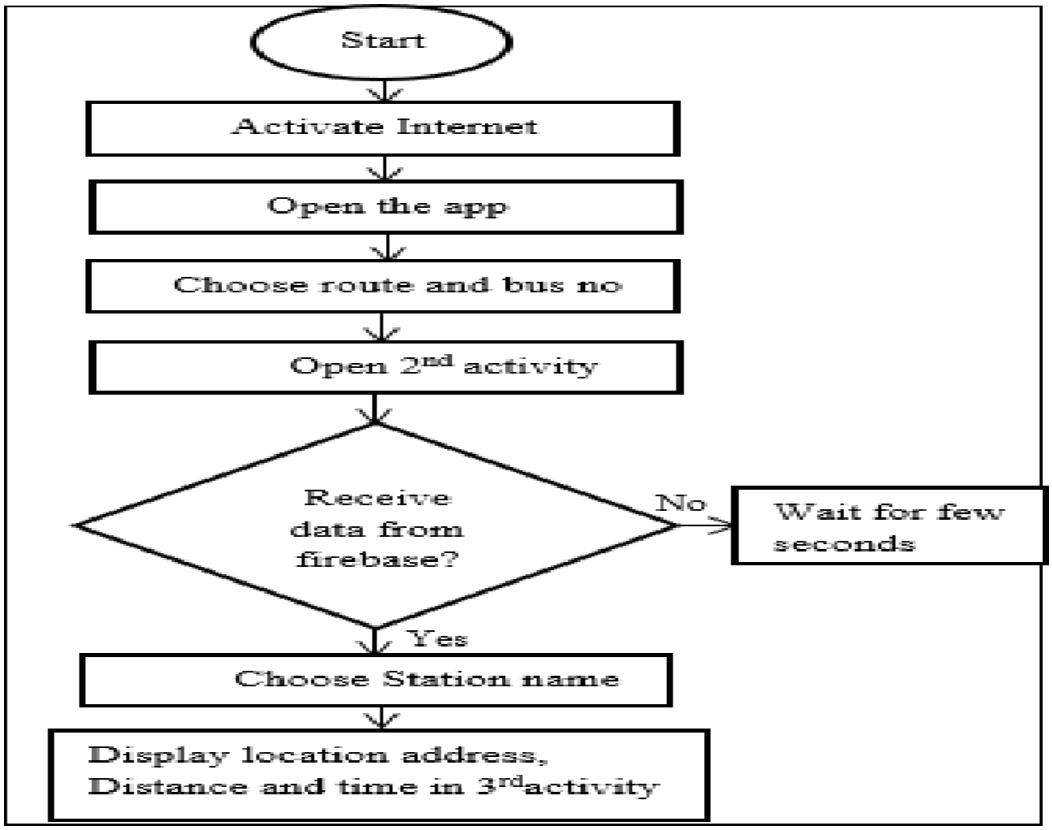
Continuous Campus University Bus Tracking Mobile Application is a versatile application to help grounds individuals distinguish the present area of the transport progressively. Constant Campus University Bus Tracking Mobile Application is a mixture portable application. In any case, for this advancement, it is created for Android client as it were. It can indicate refreshed estimation time entry and the number of people inside the transport. This undertaking utilizing two gadget's implanted inside the transport, which is GPS Tracker gadget and IOT individuals counter gadget. All gadgets will transmit the information into a cloud database which is Firebase. Constant Campus University Bus Tracking Mobile Application is created as a stage for the client to get the information transmitted from the database. Other than that, Student will know the time entry of the transport and the present amount of individuals inside the transport to lead them to stay away from dawdled realizing that they hang tight for the transport that pack of traveler. The understudy additionally to make grumbling and input by means of the stage.

IV. PROPOSED SYSTEM

Continuous Campus University Bus Tracking Mobile Application is a versatile application to help grounds individuals distinguish the present area of the transport progressively. Constant Campus University Bus Tracking Mobile Application is a mixture portable application. In any case, for this advancement, it is created for Android client as it were. It can indicate refreshed estimation time entry and the number of people inside the transport. This undertaking utilizing two gadget's implanted inside the transport, which is GPS Tracker gadget and IOT individuals counter gadget. All gadgets will transmit the information into a cloud database which is Firebase. Constant Campus University Bus Tracking Mobile Application is created as a stage for the client to get the

information transmitted from the database. Other than that, Student will know the time entry of the transport and the present amount of individuals inside the transport to lead them to stay away from dawdled realizing that they hang tight for the transport that pack of traveler. The understudy additionally to make grumbling and input by means of the stage..

4.1 BLOCK DIAGRAM



MODULE DESCRIPTION

1 Admin Login

In this module the admin should upload the details of the bus driver and user.In that the admin should able to modify the details and it should be maintained in the database.The admin will able to login using their name and password.

2 User registeration and Login

The user will register to the application using their details .These details will be maintained in database by the admin.The user will be able to login using their details and then they will able to track the bus track and know the exact position of the bus.

3 Driver Login

The driver will login to the application using their details.These details will maintained by the admin in the database.When the bus has to start the bus the driver should login to the app then only the user can track the location.

V. KEY RESULTS

5.1.HOMEPAGE

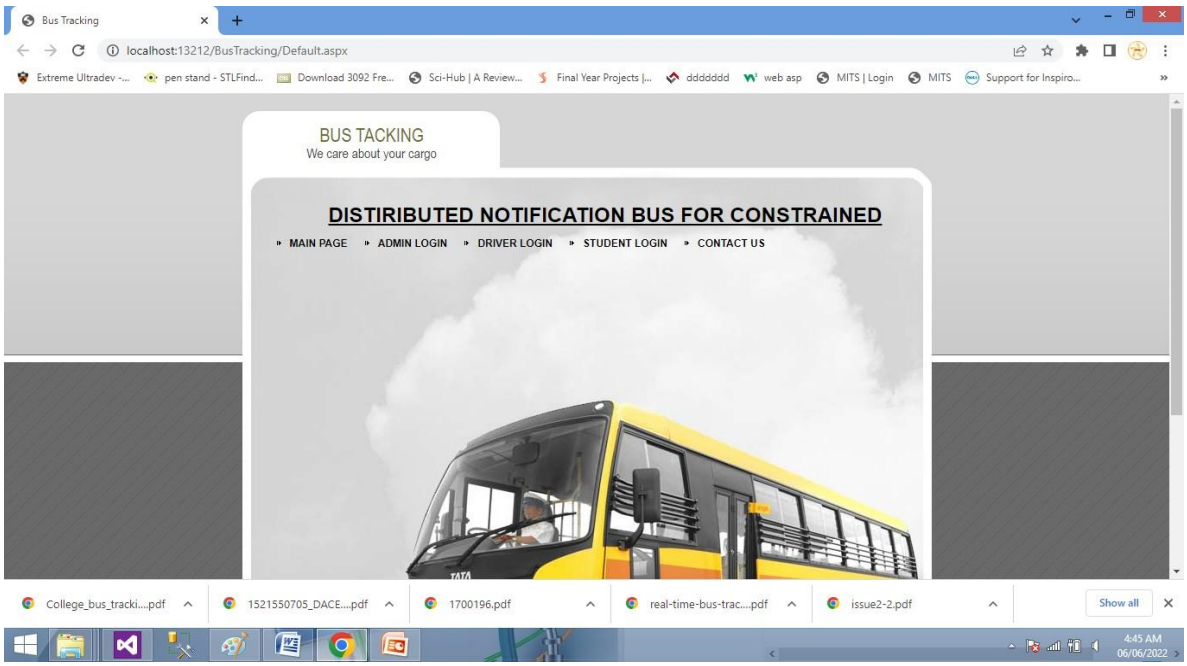


Fig. 5.1 Home Page

5.2.ADMIN LOGIN

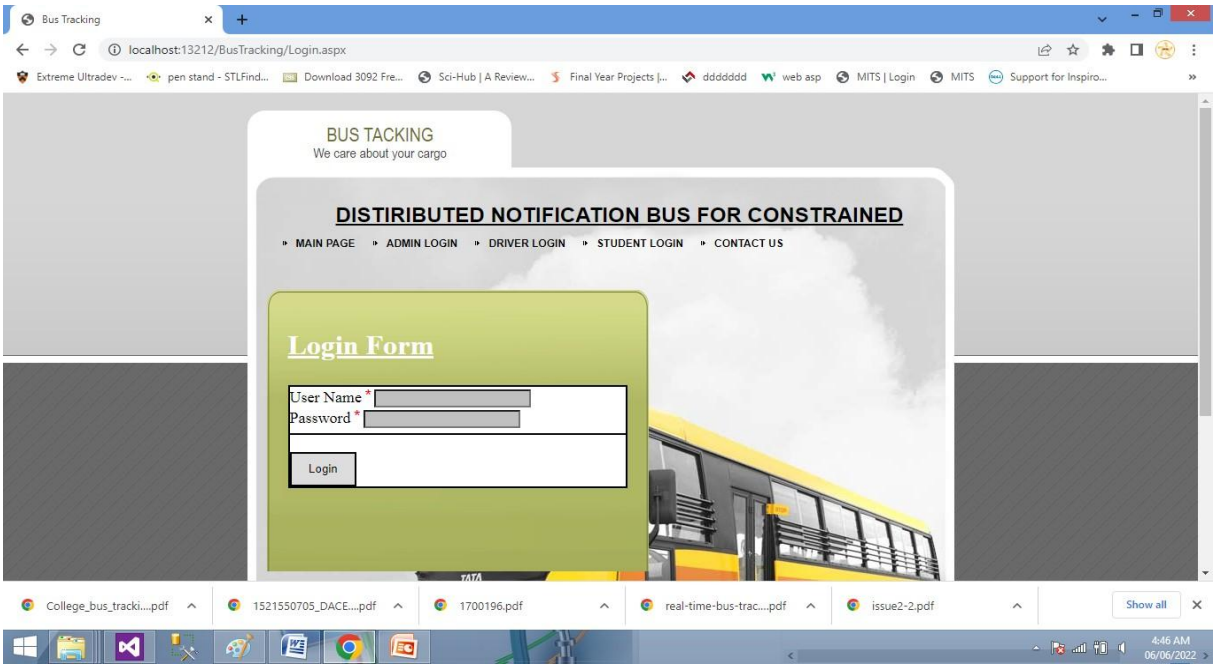


Fig. 5.2 Admin Login

5.3 ADMIN PANEL

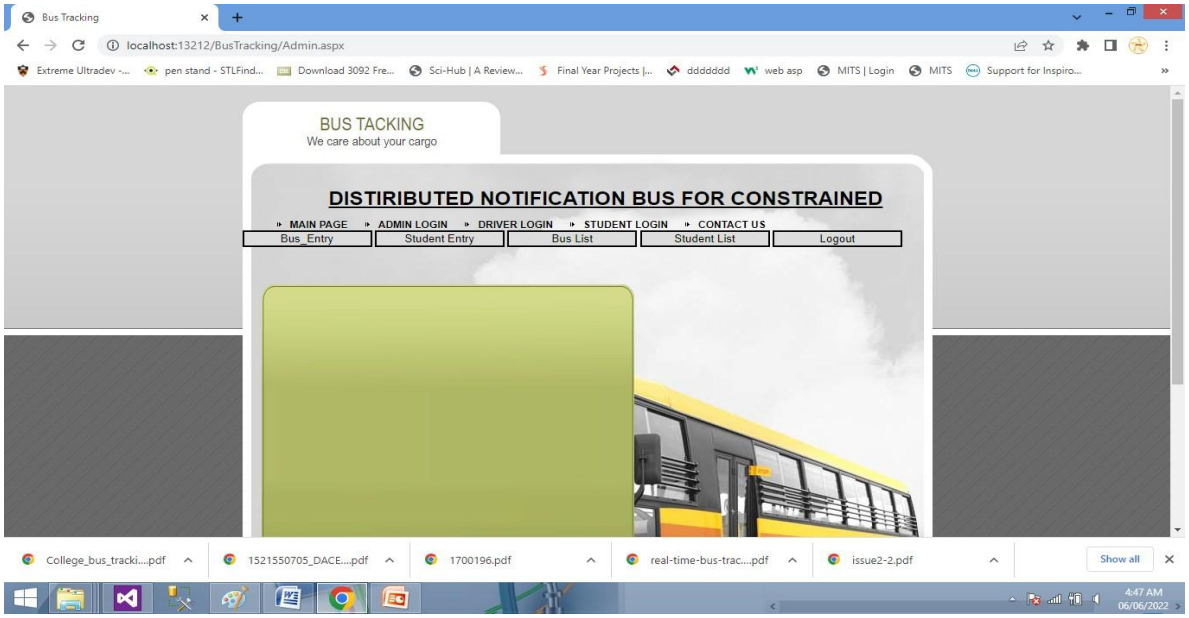


Fig.5.3 Admin Panel

5.4 BUS DETAILS ENTRY

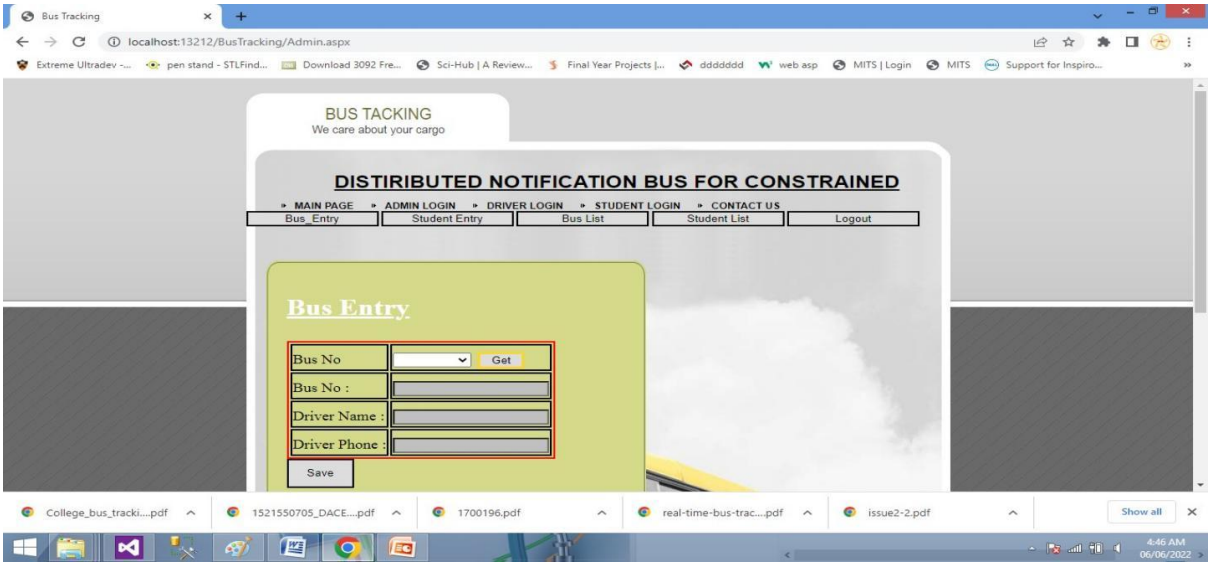


Fig.5.4 Bus Details Entry

5.5 STUDENT DETAIL ENTRY

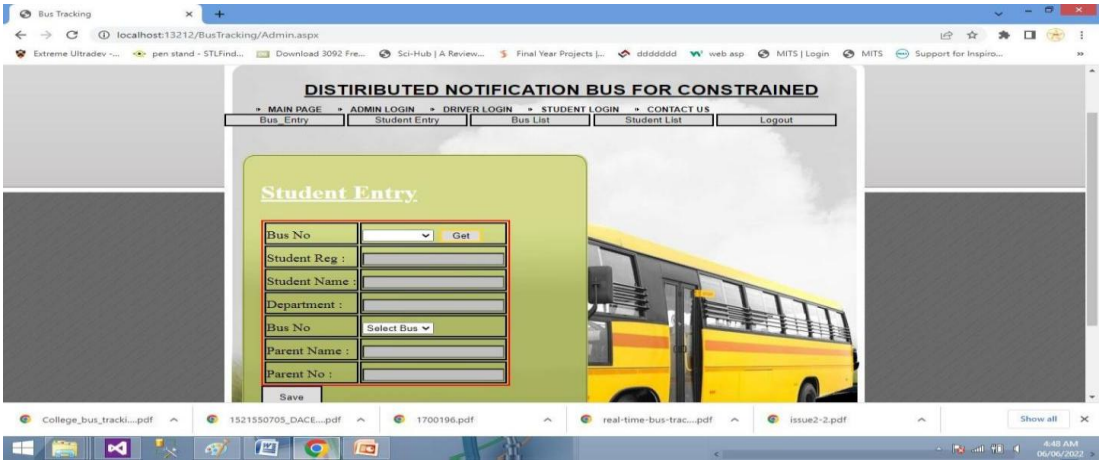


Fig.5.5 Student Detail Entry

5.6 BUS LIST

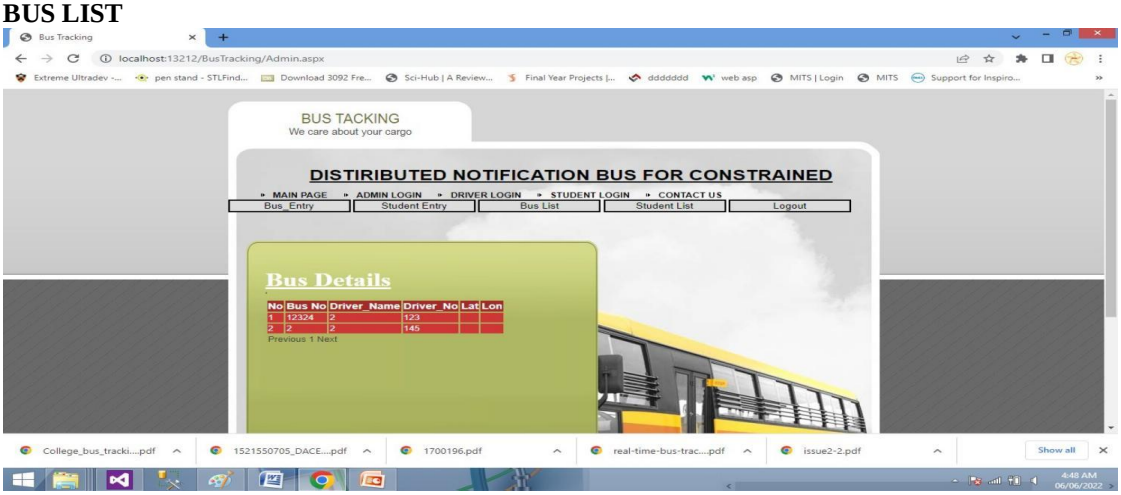


Fig. 5.6 Bus List

5.7 STUDENT LIST

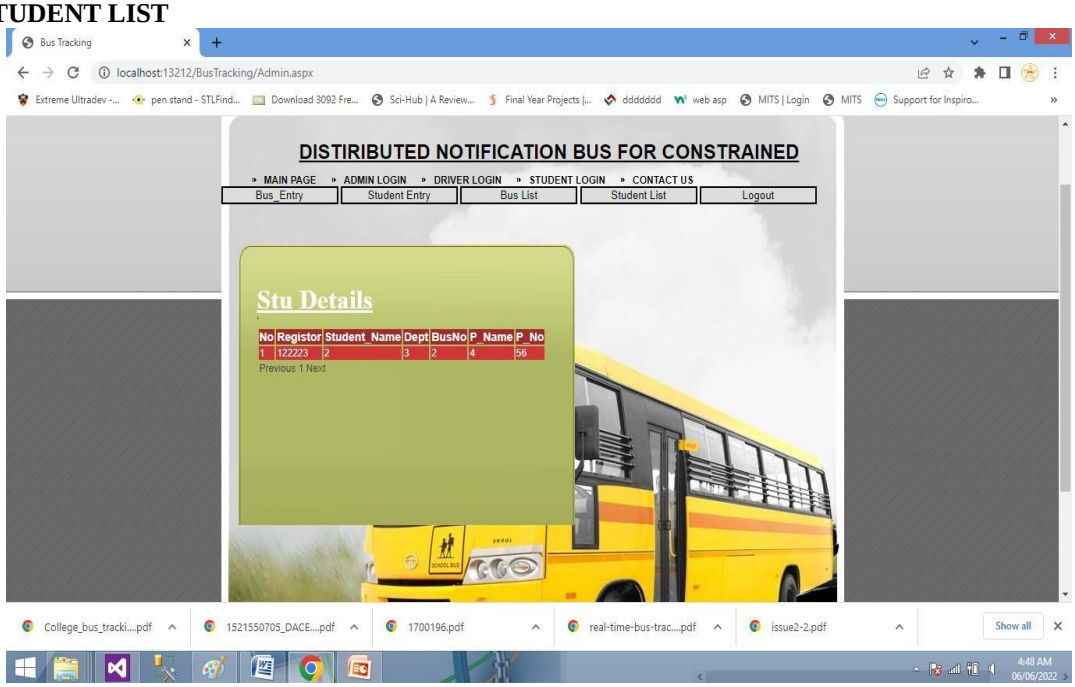


Fig.5.7 Student List

5.8 BUS TRACKING

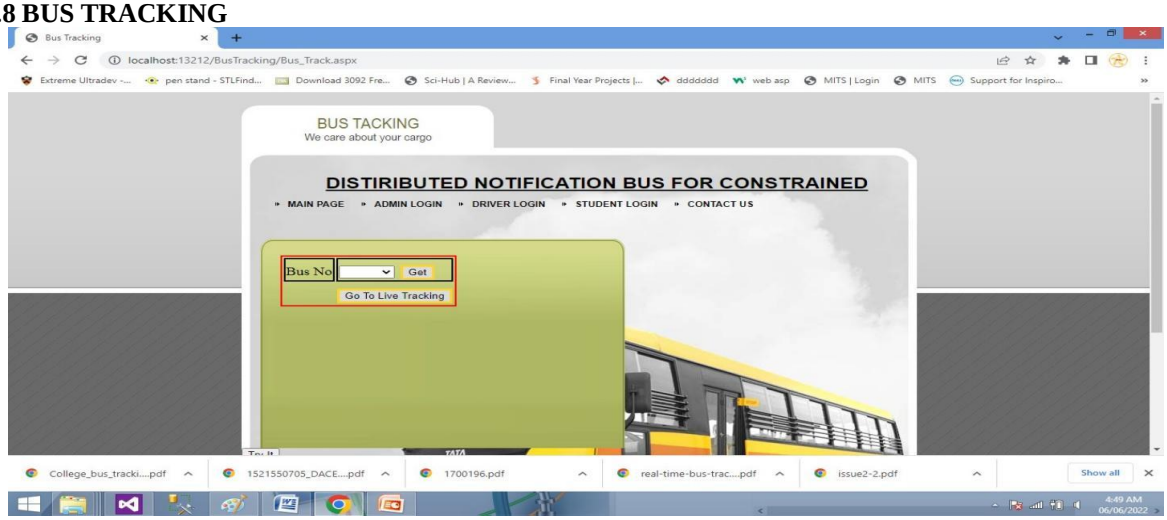


Fig 5.8 Bus Tracking

5.9 GET BUS TRACKING

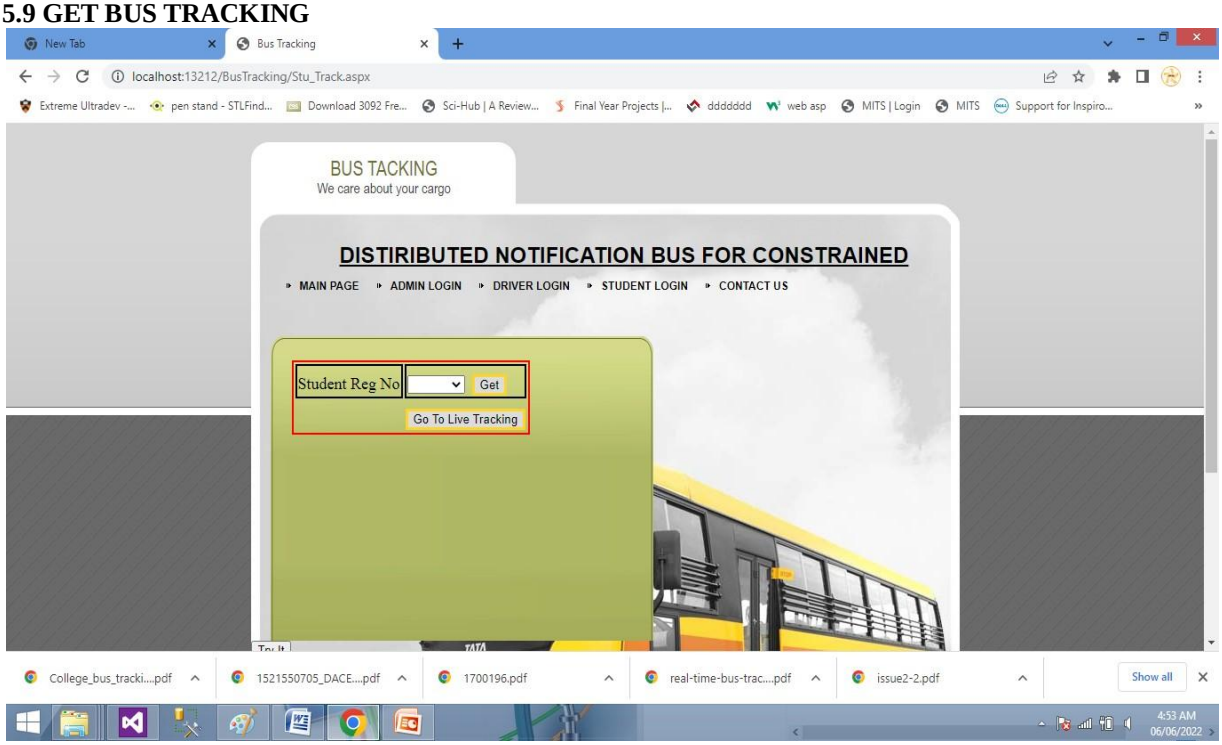


Fig .5.9 GET BUS TRACKING

VI. CONCLUSION AND FUTURE ENHANCEMENT

The main goal of the proposed work is to improve the Bus Tracking system by adding the necessary features to our project, like projecting accurate bus timings, presenting correct bus numbers and by adding a GPS tracker into it for accurate locations. For future enhancement, we can develop a vehicle monitoring system using GPS & GSM module with high speed processor. The system can be installed in buses, cars and trucks, hence. this project is having a wide scope .

Along with this we can create a bus ticketing system where the user can actually buy a digital ticket just like the UTS app in the mumbai railways. in which app take the current location of the user ask for the destination and calculate the fare we will also provide pay option from various third party app such as Paytm , PayPal etc. We can generalize the project to common man where he can implement the hardware part to the personal vehicles which will help them to track their location after it has been stolen it will also police.

REFERENCES

[1]. P.Verma, J.S.Bhatia, "Design and Develop Tracking System with Google Map based Monitoring", International Journal of Computer Science, Engineering and Applications (IJCSEA), vol. 3, no. 3, pp. 33- 40, 2013.

[2]. J. Gong, M.Liu, S.Zhang, "Hybrid dynamic prediction model of bus arrival time based on weighted of historical and real 2013 25th Chinese Control and Decision Conference (CCDC),pp. 972 976, 2013.

[3]. X. Guo, E. Huang, B. Hung, L. Juras, Design a Smart Bus System, Dept. Electrical and Computer Engineering, Uni 2012.

[4]. W. El-Medany, A.Al-Omary, R. Al "A Cost Effective Real-Time Tracking System Prototype Using Integrated GPS/GPRS Module", Sixth International Conference on Wireless and Mobile Communication Valencia, 2010.

[5]. http://www.flightradar24.com/ (accessed 19 January 2014).

[6]. http://traintimes.org.uk/map/tube/

[7]. http://www.marinetraffic.com/ais/hom

[8]. S. Pooja, "Vehicle Tracking System Using GPS", International Journal of Science and Research (IJSR), vol. 2, no. 9, pp. 128 ONCLUSION DISCUSSIONS -mails and SMSs. The system prevents might be EFERENCES Development of GPS-GSM based rrival real-time GPS Data", 972- University of Victoria, Canada, Al-Hakim, S. Al-Irhayim, M.Nusaif, Communications, pp. 521-525, 20-25 September, (accessed 19 January 2014). (accessed 20 January 2014). 128-130, 2013.

[9]. T. Le-Tien, V. Phung-The, "Routing and Tracking System for Mobile Vehicles in Large Area", Fifth IEEE International Symposium on Electronic Design, Test & Applications, pp. 297-300, 2010.

[10]. F.M. Franczyk, J.D. Vanstone, "Vehicle warning system", Patent number: 7362239, Issue date: 22 April 2008.

[11]. Lin Yu-Hsun, Chang Yu-Pei, Wu Ja-Ling, "Appearance- Based QR Code Beautifier," IEEE Transactions on Multimedia, vol. 15, no. 8, pp. 2198-2207, 2013