

# PUBLIC TRANSPORT TRACKING SYSTEM USING IOT

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**Abstract**— This paper describes a local transport tracking system, which utilizes mobile devices, GPS receivers and an online tracking application to provide real-time monitoring of public transportation vehicles. The system allows users to track the locations of buses, trains, and other modes of public transportation, as well as to view information on routes and arrival times. The system also provides a platform for communication between commuters and transit operators, allowing for improved customer service. The tracking system is designed to be affordable and easy to use, making it accessible for public transportation operators of any size. The system has been tested and proven to be reliable and effective providing significant improvements in the quality and efficiency of local transportation services.

**Keywords:** Bus Tracking, Mobile GPS, Google Maps, Android Studio, Node MCU, Firebase/AWS,

## I. INTRODUCTION

In today's world, time is essential to all people being a high-tech product; mobile phones are widely and increasingly used famous. The vehicle tracking system is widely used for vehicle tracking application. Due to traffic congestion and road work, most buses are delayed. People have to wait for their bus at the bus stop for a long time without knowing when the bus will arrive. Thus, the timing of the bus arrival cannot be guaranteed. GPS means it is handled to track real-time bus location and send information to the server which is why it was previously used by the app to support their travel locations and features. The main purpose of this app is to track the bus location and transfer it to users through the Android app on Google Maps. Therefore, this helps the user to prepare and save his/her time properly in the morning and catch the bus on time.

## II. PROPOSED METHOD

. The purpose of the proposed system is to make local transportation easier. There will be two modules, one is bus driver module and the other will be passenger. We are using GPS and IoT system for this project.

### A. Objectives

1. To get real time location of the bus.
2. To get approximate Time and Distance of the bus from user location.

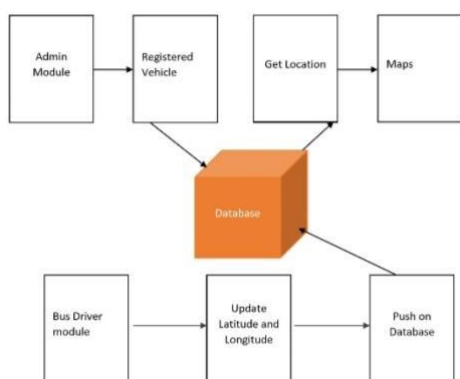
### B. Working

A user gives input in the form of source and destination stops on a particular route. The route will consist of multiple stops. GPS modules are installed on the bus. The GPS module tracks the location of the bus in real time and sends the data to the server through which it is displayed on the Google Map interface to the user. To send data to the server Node MCU esp8266 module is used as it has built-in support for Wi-Fi connectivity. This data is constantly updated to the server and real-time data is continuously provided to the user on the client device. This information is computed and the location is found out. The location details are shown to the user both in a tabular and graphical way. The most recent bus stop which the bus has passed is shown in the top of the tabular data. The information gets updated every 10 seconds. The graphical data shows a pointer on the current location of the bus

### C. Methodology

This tracking application provides the live location of the bus to the user. The commuters can fetch the bus location from the online database. The request made by the client for the bus information will be fetched from the database and delivered to client through server. The mounted device will send its coordinates continuously to our server where data will be stored. When the user selects that particular Bus number, its location will be retrieved from the server and shown on the map. Since the coordinates will be Changing, the point on the map will keep on moving; hence the user can actually see the live location of the selected bus. Also we will use google's distance matrix algorithm to show the user the approximate time taken by bus to reach the user. The application will be developed using android studio which has a very simple User Interface to use it. Google maps API is the core component that will be used in it, which is very easy to use and explore maps with simple gestures such as pinch to zoom tap to point etc. It will make tracking the bus very easy for the user.

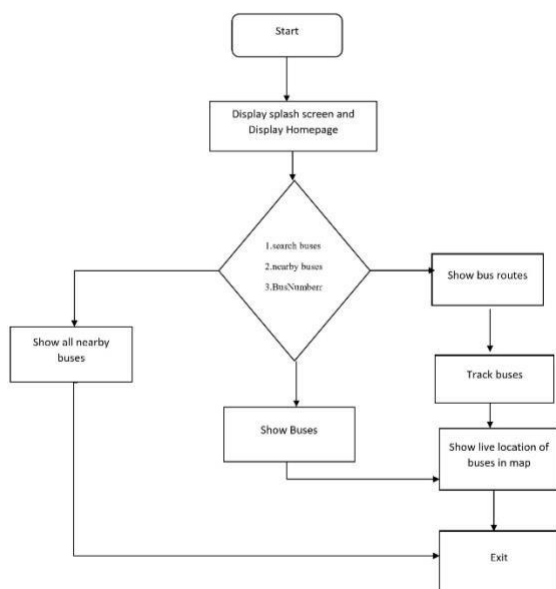
D. Block Diagram



Fig(1): Block Diagram

1. This block diagram explains the two main module used in this public transport tracking system.
2. The driver module will get the location using GPS (Global Positioning System) in the form of latitude and longitude and it will be stored in the database.

E. Flow Chart



III. LITERATURE SURVEY

A vehicle tracking system is very useful for tracking the movement of a vehicle from any location at any time. These are some of the technical literatures in engineering and technology where people have tried to implement similar

kind of Systems which are mentioned below with their shortcomings with respect to our application.

[1]: M. B. M. Kamel, "Real-time GPS/GPRS based vehicle tracking system," International Journal Of Engineering And Computer Science, Aug. 2015. The Real Time Bus Monitoring and Passenger Information bus tracking device will serve as a viable notification system that will effectively assist pedestrians in making the decision of whether to wait for the bus or walk. This device is a standalone system designed to display the real-time location(s) of the buses in Mumbai city. The system will consist of a transmitter module installed on the buses, receiver boards installed on the bus stops, LED embedded map of the BEST bus transportation routes at the centralized controller. It will also have passenger information system software installed at the bus stops, which will provide a user the relevant information regarding all the bus numbers going for his source to destination along with the route details and the cost. Assembly of these modules will enable the tracking device to obtain GPS data from the bus locations, which will then transfer it to the centralized control unit and depict it by activating LEDs in the approximate geographic positions of the buses on the route map. It will also transmit its bus numbers and route names continuously as soon as the bus comes within the range of the receiver at the bus stop. In addition, the device will be portable and sustainable; it will not require an external power source, which will eliminate long-term energy costs.

[2] Sridevi, K., Jeevitha, A., Kavitha, K., Sathya, K. and Narmada, K., 2017. Smart bus tracking and management system using IoT. Asian Journal of Applied Science and Technology (AJAST) Volume, In this paper the Bus tracking application is used that tracks a bus and gathers the distance to each station along its route. Based on IoT this project is implemented as Android application. It uses RTC to show where buses are on a map and provide students and staffs the updated information at different time interval. Simple mode of communication is the key feature of the proposed system.

[3] Raj, J.T. and Sankar, J., 2017, December. IoT based smart school bus monitoring and notification system. In 2017 IEEE Region 10 Humanitarian Technology Conference (R10-HTC) (pp. 89-92). IEEE. In the proposed system RFID and GPS technologies are connected to a remote server over WIFI using an ESP8266 microcontroller to give the real time information about various parameters of the vehicle like the location, the route, the speed, the list of passengers, the commitments of drivers to the schedule. An Ublox 6M GPS module is used to find the geographic coordinates also the MFRC522 RFID reader identifies each student as they board. This system uses ESP8266 microcontroller to upload the information, which can be accessed by the parents through a mobile application and this helps them track their wards effectively.

[4]: "Real Time Availability System" International Journal of Advanced Research in Computer Engineering Technology (IJARCET) Volume 4 Issue 3, March 2015, This Paper is a survey to implement a method that makes transport much convenient for individuals who commute daily using the public bus transport of the city, for effective time management and making it trouble-free, not just for the commuters but the Transport Department to create an efficient public transport system.

There are applications available in the market today which specifies the route and the timings, predict arrival times of different buses. But the survey presented here aims to build an application that takes it to the next step by making information about the vacant seats and the current location of any bus in Real-Time, accessible to the daily commuters with a novel and economical wireless system. These methodologies offer incremental improvements in bus system to meet the capacity requirements of different size cities and present a review of strategies which can be employed to satisfy public transport demands of different city sizes. Their aim is to build a flexible, comfortable, easily available and reliable bus service which may encourage shift from private vehicles to public transport..

## V. CONCLUSION

This project has described the design and architecture of our Public transport tracking system. Our system is composed of smart phones and a server. The system is able to demonstrate its performance to track the local bus from any area. And for students, workers are very helpful application to access their activity Furthermore, our system is Low-cost and compact. The project, a complete track can be kept of the buses.. The display at the user's end acts as a time saver. Due to this, we establish an ideal system of Public transport. By implementing our system, a student or an worker can plan their journey more efficiently before time as the waiting time at the bus stops is reduced. Thus in this system, we have shown that transit information collected in real time can be shown on the server for tracking and monitoring. Internet-enabled mobile phones can receive real-time transit information and will help the passenger to monitor their time more effectively..

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