

Bus Tracking and Management System

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Abstract— Bus tracking is an application that tracks a bus and gathers the distance to each station along its route. Tracking System involves the installation of an electronic device in a bus, with an web based Application on any SMART phone to enable the Administrator/User to track the bus location. Based on IoT this project is implemented as android application. There are two applications one for server and the other for the client. Buses carry GPS devices to track their positions. By this positions to server are periodically updated. Client application displays map showing the position of bus. It shows where buses are on a map and provide students and staffs the updated information at different time interval using RTC. The server will monitor location and will store its data in the database. It is a real-time system as this method automatically sends the information on the GPS system to a system/SMART phone. The students/staffs can get flexibility of planning travel using the app, to decide when to catch the bus. The waiting time of the user can be reduced. Simple mode of communication is the key feature of the Bus Tracking system. This application can be easily extended for central tracking system to keep track of all the buses. The different queries and efficient route management can be easily done through central server system.

Keywords—GPS device, Low cost, Internet.

I. Introduction

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. The location of the bus is tracked using GPS and sends the collected data to a remotely located server using GSM module. Using application, students or staffs can locate the bus at any time when they need. The collected data is retrieved and processed by the server using an application that we installed. College bus transport system having many buses and that provides students and staffs for convenient travel from the long distances. But some students/staffs are not aware of timing and directions of the buses. In this case we have planned to do a project for easy transport system. In our project we develop an application on smart phones to monitor a location and timing of the college bus using IoT. It works using GPS and GSM technology designed to continuously monitor a moving buses for doing so a microcontroller is interfaced serially to a GSM Modem and GPS receiver used to send the position (Latitude and Longitude) of the buses from a remote place. IOT places the major role that provides the all details of the buses through the application on the smart phones to the students/staffs for easy transport system. This android application will be helpful to students and staffs for convenient transport system, which solves the drawback of current public transportation system. So our system handle all the data like current location of bus, management of buses and its schedule. The real time tracking of bus can be done by our proposed system and this information is then given to remote user who want to know the real time bus information. Some technologies like GPS (Global Positioning System), Google maps and GPRS (General Packet Radio Service) are used for development purpose. Our system provides web based application, which gives real time location of bus on Google maps to remote user.

The system consists of modern hardware and software components enabling one to track their vehicle online or offline. Any vehicle tracking system consists of mainly three parts mobile vehicle unit, fixed based station and, database and software system.

i. Vehicle Unit: It is the hardware component attached to the vehicle having either a GPS/GSM modem. The unit is configured around a primary modem that functions with the tracking software by receiving signals from GPS satellites or radio station points with the help of antenna. The controller modem converts the data and sends the vehicle location data to the server.

ii. Fixed Based Station: Consists of a wireless network to receive and forward the data to the data centre. Base stations are equipped with tracking software and geographic map useful for determining the vehicle location. Maps of every city and landmarks are available in the based station that has an in-built Web Server.

iii. Database and Software: The position information or the coordinates of each visiting points are stored in a database, which later can be viewed in a display screen using digital maps. However, the users have to connect themselves to the web server with



Fig.1. Block diagram of existing system

II. Existing System

Due to rapid increase in population, there is need for efficient public transportation system. There is increased burden on public transportation like bus just because of population. Therefore remote user needs a smart system which provides real time information of bus. So we proposed a new system.

III. Proposed System

Our system provides the relevant information regarding all the bus numbers going from user's source & destination along with the route details, real time location. Generally our system is operated by GPS which is attached with the bus. Firstly GPS receives the satellite signals and then the position co-ordinates with latitude and longitude are determined by it. The location is determined with the help of GPS and transmission mechanism. After receiving the data the tracking data can be transmitted using any wireless communications systems. A real time clock (RTC) is a computer clock that keeps track of the current time. In this project Arduino UNO is a microcontroller to program with RTC. Based on IoT the students/staffs can access this information of a bus based on users source and destination through the android application. Our proposed system gives the real time location of bus. Smart bus tracking technology is advantageous for tracking and monitoring a college bus.

IV. Description

4.1 GPS :-(GLOBAL POSITIONING SYSTEM)

The GPS is a system for calculating position from signals sent by a network of satellites. To accurately determine the position and it is able to determine the strong signals. GPS tracking system is easy to use, mobile friendly, as intuitive user interface and is designed to communicate with a wide variety of GPS devices. The GPS receivers were much simpler than today, they provided only the latitude and longitude position, the rest was on account of the user who needed to calculate the map.

4.2 RTC:- (REAL TIME CLOCK)

A **REAL TIME CLOCK** is a computer clock that keeps track of the current time. RTC are present in almost any electronic device which needs to keep accurate time. The term real time clock is used to avoid confusion with ordinary hardware clocks which are only signals that govern digital electronics. The DS3231 is available in commercial and industrial temperature ranges, and is offered in a 16-pin, 300-mil SO package. The RTC maintains seconds, minutes, hours, day, date, month, and year information. The clock operates in either the 24 hour or 12-hour format with an AM/PM indicator.

4.3 Live Chat Support

Chat is currently available 24 hours a day, a week for customers. At times when all operators are busy or unavailable, you'll be able to get through to private email support. It might be best to work through your questions in real time. Help with third party applications. Our system sends your message straight to our email so that we can help you out as soon as possible.

4.4 PJ News Ticker

PJ News Ticker uses messages for important notice that shows your most recent posts in a marquee style.

V. Result

The android application gives the information about the college bus for students and staffs. The proposed system is more user friendly than existing system. And it also gives greater performance.

VI. Conclusion

In this paper we have reviewed various existing techniques of college bus tracking. By implementing this idea, we can improve the transportation safety and the quality of services to the college buses. The system will have latest technology and optimized algorithms with moderate cost. The system may focus on accurate arrival time and position of the bus.

VII. Future Scope

To implement a real time application for all other college buses for easy transportation in a smart college bus tracking system.

VIII. Application

It contains all the data structure of student and staff. In future it is helpful for management of all the records of student and staff, also for student to easily track the bus.

Reference

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