Smart Bus Tracking System And Transportation Management In Rural Areas

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*Abstract:*The rapid growth of vehicles implies more fuel is required, resulting in the emission of harmfulgases into the environment, causing air pollution. An increase in the usage of private cars is notexactly a positive trend. Public transport has become a part of live most people reach from home toworkplace or school using public transportation. Waiting for public transport services is one of themost important factors & People spent more time in waiting for the vehicle. The services providedto passengers by transport systems are very important. People have the right to know where the busis now and how long time it takes has to reach bus stop. People need a service like route, scheduleinformation and current location of the public transport. This can be provided for the needy peopleto track the location of the buses and to manage the schedule of the buses in every branch location. The passengers can view the schedule of the buses and know whether the bus is On Travel, ArrivedDelayed, or Cancelled trip and they can view where the location of the buses.

Keywords–GPS Module, GSM Module, Real time bus tracking

INTRODUCTION

Among all public transportation services, bus service is the major transportation used by public. Especially in a busy town or city, bus is the most easy, convenient and cheaper transportation. Various reasons that people take bus instead of driving own vehicle such as traffic jam, heavy parking fee and lack of parking slot in destination.

However, bus transportation service has very poor transportation information system nowadays. Bus user do not know the exactly arrival time for a bus, but only know the scheduled arrival time. Compare to train or flight transportation system, bus transportation service does not have a proper system to track all buses position and the actual arrival time in every bus stops. These problems occur because current bus service system did not apply real time tracking technology to track on each buses on the road and also lack of a platform to update latest bus traffic information to bus users.

The movement of college buses is affected by various uncertainties such as daytime traffic jams, unexpected delays, and randomness in passenger demand, irregular vehicle sending times and many others incidents. Many students and staffs are often late for college because they have decided to wait for the bus instead of using alternative transportation. To reduce this confusion and inconvenience, a message will be displayed on the web providing real time information indicating the arrival time of the bus which will reduce the anxiety of the passengers waiting for the bus.

In order to solve these problems, Smart bus tracking system has to develop and implement. The main technology used to develop thissystem is Global Positioning System (GPS). It displays the exact location of the bus on a map and updates the user's knowledge at various intervals.

LITERATURE SURVEY

Bus transportation service is every way, but without a good bus management system, bus service may not fully utilize. In our country, majority bus service providers are not performing real time bus tracking. They only provide scheduled timetable which is not accurate in real time.

However, there is a University in Malaysia successfully implemented real time bus tracking system. In oversea countries, there are many university implemented real time tracking system for shuttle bus service. Thus, studies are performed on the bus tracking system implemented by Asia Pacific University (APU) in Malaysia, Northern Illinois University (NIU) located in USA and Rice University in Texas, USA.

Authors "M. A. Hannan, A. M. Mustapha,A.Hussain and H. Basri" have implemented the system "IntelligentBus Monitoring and Management System" The proposed system uses Artificial intelligence with the help ofRFID 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 exactlocationof the bus is not shown, only an approximate location is shown based on the bus stops. In today'sworld, 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 BusTracking System based on location- aware service and QR code." In this paper, Bus tracking system, anypassenger with Smartphone can scan QR code placed at bus stop to view estimated bus arrival times, currentlocation of the bus. The drawback in this project was that the user had to be physically present at the busstop to scan the QR code.

Authors "R. Maruthi, C. Jayakumar" implemented the system "SMS based Bus Tracking System using OpenSource.

Technologies." A bus tracker application to track a bus using GPS transceiver has been proposed in thispaper. 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).

METHODOLOGY

In development processes of bus tracking system, there are many uncertainly existed. In the bus tracking process, there would be many errors or unexpected results occur and this will affect the accuracy of estimated bus arrival time for users. In Users perspective, the accuracy of estimated arrival time will determine the success of the system. the process of developing a bus tracking system, there was a lot of uncertainty. In the bus tracking process, there will be many errors or unintended consequences and this will affect the accuracy of the bus arrival time for users. From the user point of view, the accuracy of the limited arrival time will determine the success of the system. Therefore, the prototyping method is appropriate for testing the end-to-end system acceptance from users. According to this method, when a user rejects a prototype, a new prototype is developed based on new requirements from user feedback and user testing again. If the prototype is accepted by the user, it will be the last system model. With higher user involvement in the prototyping process, the quality of the storage system will be increased.

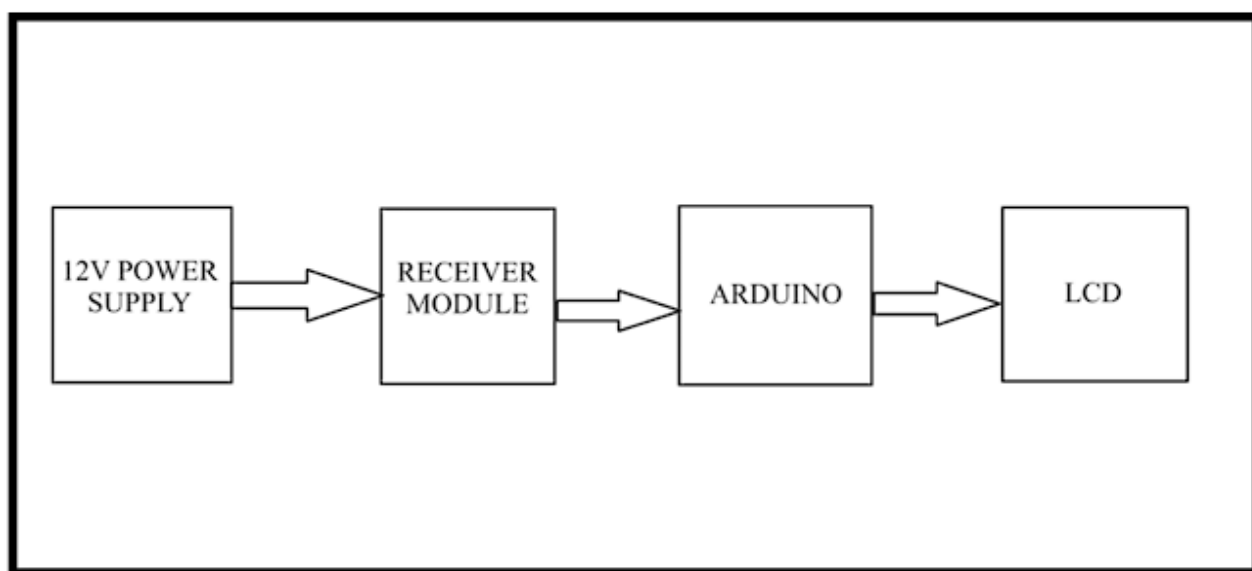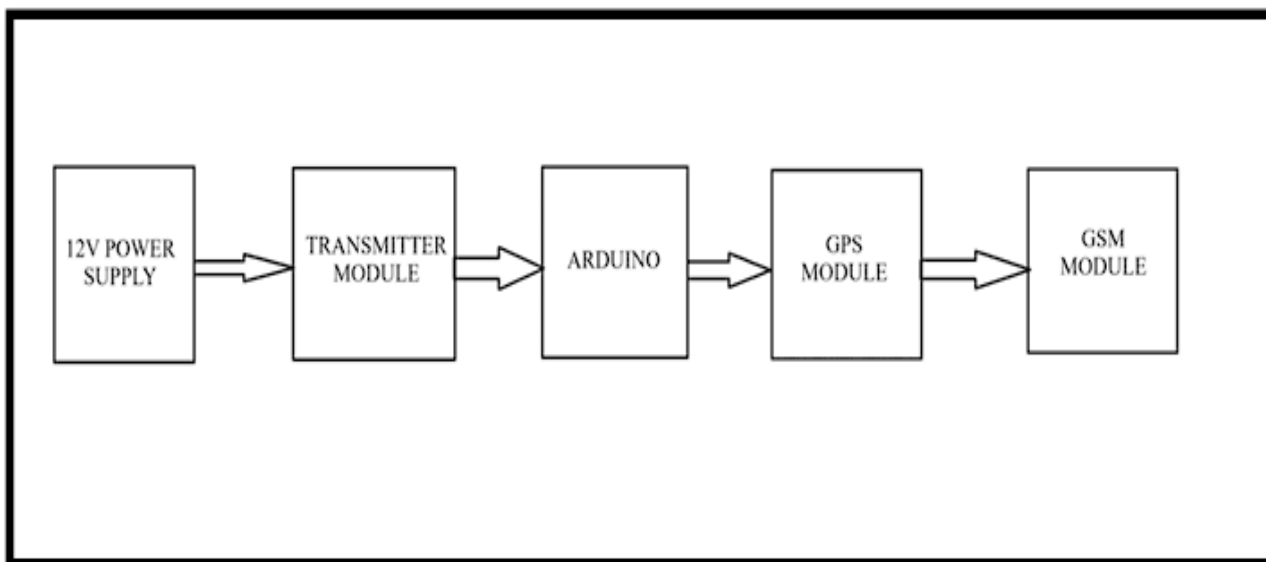## BLOCK DIAGRAM

Fig: Block diagram of Bus Module

Fig: Block diagram of Bus Station

COMPONENTS REQURIED

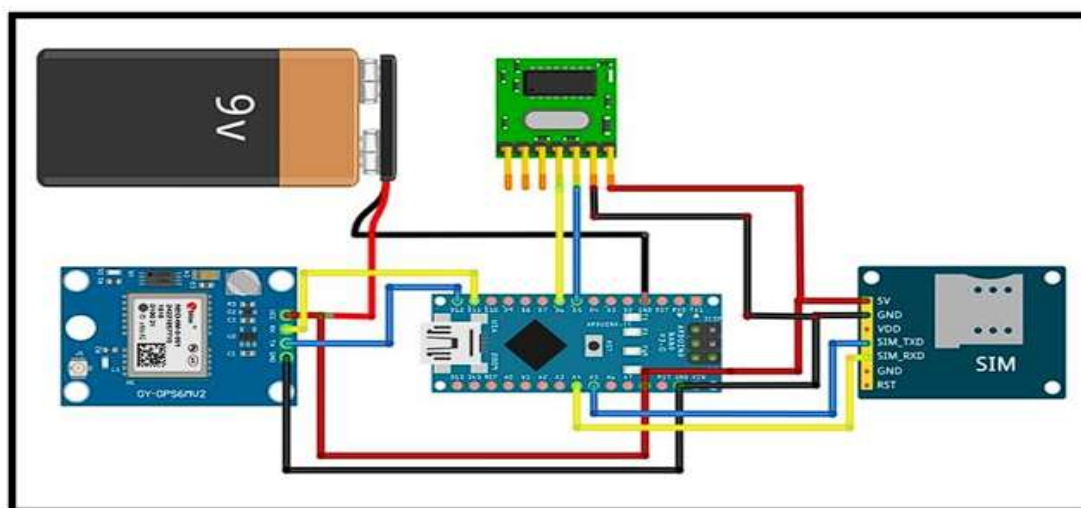| SL. NO	COMPONENTS
1	Receiver
2	Transmitter
3	GPS Module
4	Arduino
5	LCD Display
6	GSM Module

CIRCUIT DIAGRAM
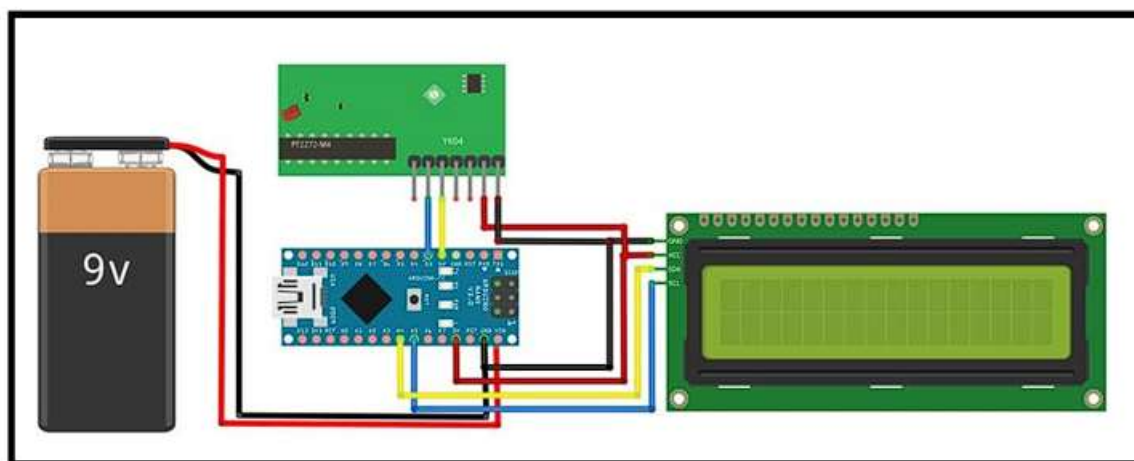

Fig: Circuit diagram of Bus Module

Fig: Circuit diagram of Bus Station

WORKING PRINCIPLE

At first, we are going to connect the Transmitter in the bus and Receiver in the bus station, when the bus enters into the station it transmits the signal to the receiver and the receiver receives the signal and it uploads the arrival of bus and it shows in the LCD display. GPS updates the live location of the bus and

through GSM we are getting the message of bus location. We can access the live location of the bus by using the mobile phones through the internet.

By implementing this we are able to save the precious times of many working people by providing the live locations of the buses. and it is very helpful for the unfamiliar passengers, they can easily find their buses.

ADVANTAGES

• A bus tracking system using GPS offers a more convenient and comfortable experience for passengers.

• With accurate information on bus locations and arrival times, passengers can plan their journey better.

• Passengers can track buses using mobile apps or websites, reducing waiting times and improving travelplanning.

• A smart bus tracking system improves safety and passenger satisfaction.

• By using bus routing and traffic analysis more efficient routes can be found and it will save lots of money.

APPLICATIONS

• The system has much application at railway station, bus station, airport etc.

• The passenger will get real time alert.

• It is easy to implement and save time and money.

CONCLUSION

While waiting for a bus, people may felt impatient and anxious if he or she does not know when the bus will arrive. For the bus management side, it is very difficult to provide an accurate schedule for bus user due to some uncertainties may happen on the road such as traffic jam or bus breakdown. When a bus is delayed, bus management side should inform bus user immediately. However, they do not have a platform to inform bus user in real time about the latest bus traffic status.

In order to enhance bus system and increase the performance of bus service provider, the bus tracking system is needed. Bus tracking system provided a real time platform for bus user to check on bus traffic status in anytime and anywhere. It also provided a platform for bus service provider to monitor bus status and update latest information to user.

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