Smart System for Preventing Passenger Destination Missing in Bus

Dr M Saravanan¹, S Soundarya²,

¹Department of Electronics and communication engineering, IFET College of engineering, Villupuram.
²Department of Electronics and communication engineering, IFET College of engineering, Villupuram.

msaravanan@ifet.ac.in

Abstract. Passengers need not to worry any more about the arrival of their destination missing in Bus. Bus passengers will be able to recognize their destination during the journey by using this proposed setup. This project is very useful to the people who are illiterates and new to cities. It also announces important places such as hospitals, police station etc. along with the passenger’s destination. It is one of the parts of Intelligent Transport System which will reduce the workload of Bus drivers and Conductors with the help of automatic station display setup. This project also ensures the safety of bus drivers. In this project we are proposing the design of an embedded device by using the GPS module, which keeps tracking on the bus route and when the destination of the passenger arrives, it is intimated to the passenger with the help of loudspeaker and LCD display. It is one of the most cost effective methods which can be easily implemented by public bus transportation. All kind of people gets benefit by this project

Keywords- Microcontroller, GPS module, Loudspeaker, LCD Display

1. Introduction

Road transport is the widest transportation system in the world. It transports more than ten millions of passengers daily. Most of the passengers usually prefer bus transport for long distance travel. By this project human disturbance is avoided. It is ensured to be accurate and reliable. This project reduces the workload of bus drivers and conductors. In many countries ITS have great attention among which GPS module is an essential one. It could improve Quality of Service and attracts many people to prefer public transport instead of using private vehicles. By this way we will reduce much traffic and could produce benefit to Government also. This project will greatly reduce the burden of the bus driver and will improve the efficiency of ticket sellers. This setup involves the usage of GPS module information to perform tracking bus location and hence it is compared with the previously stored stop location in the Microcontroller at the same time. All this process can be achieved automatically without the use of much manpower operation. Hence GPS is identified as the best solution for this automatic announcement system. The GPS receiver has the capacity to identify the current location in the form of latitudes and longitudes. The obtained information is very useful and it can be processed in order to alert the boat drivers. Hence the GPS gives the data which is received from the satellites. Here GPS module keeps continuous monitoring of the bus and when the passenger’s destination is reached it is intimated with the help of loud speaker and destination displayed through LCD. It not only display passengers destination but it also includes the display of important places such as Hospitals, Police station. Through this intimation of such places it will be more beneficial to the people who are new comers to the city. It is also very helpful to the blind people which enable them to know where they are travelling without the guidance of another person. This project gives them moral support to live independently without depending on others. It motivates them to overcome the thought of being blind and makes them to live happily like others.
2. Existed method

In Bus transport it usually consists of drivers, conductors who used to alert the passengers about their destination. Conductors alert the passengers by making a whistle sound and announce the current stopping and upcoming stopping names to the passengers. This method causes a lot of inconvenience to the passenger when they fall asleep or else when they failed to notice the whistle sound. Sometimes even conductor and driver failed to stop the bus in the perspective locations. In order to overcome these consequences, automatic announcement system was developed. However it was implemented successfully in metro trains in urban areas [1]. Metro trains play a vital role in smart city transportation. Nowadays thousands of people are travelling through metros because it is cost effective and its high tech facility and high speed transportation. However this system covers only some portions of the urban cities. It is not efficient for the people who are in the rural areas.

3. Technical Overview

In order to overcome this drawback, this automatic passenger destination announcement system is carried out in public bus transportation [2]. This system is very effective and could be easily accessed by every kind of people in this world. This project is the most cost effective one and it could be affordable by every kind of people. One of the most important technologies involved in this project is GPS tracking module. This device plays an important role in this automatic passenger destination announcement system. GPS is an area which is fit for getting data about followed area from satellites for finding the specific area of a vehicle and it is the most significant innovation utilized in this task is GPS. GPS tracking system works on the principle of satellite communication. It recognizes gadget’s topographical area regardless of any climate conditions anyplace on the earth. This sort of innovation can be utilized in different territories like military, commercial utilization and common administrations everywhere throughout the world. They are used in order to map the location of forests, to help farmers by providing required information about when to harvest their fields and to navigate airplanes on the ground or in the air. GPS can be utilized for flawless timing, positioning of satellites and mistake correction as shown in figure 1. It is also used for automated vehicle, Geo fencing measurements of faults during earth quakes, military robots in real time applications.

![Figure 1: GPS Tracking](image)

4. Proposed Approach

In this method the proposed system divided into two sections namely Figure 2 transmitter and Figure 3 receiver section. This transmitter part act as ticket billing section through this section passenger...
destination is stored in the ticket billing machine. It is comprised of four parts namely keypad, power supply, microcontroller and a RF Transmitter. It is carried out by conductor’s every day in the form of ticket billing machine. In this section passenger’s destination is stored in the controller via keypad. Then the 12V power supply is given to the transmitting section which is taken from the bus. The receiver section consist of seven parts namely RF receiver, GPS module, power supply, Microcontroller, Voice chip, amplifier and a loud speaker. The collected data gets transmitted to the receiver section through RF Transmitter. Here again the power supply is given to the receiver section which is taken from the bus. The RF receiver which lies in the receiving section fetches the data which is transmitted from the RF Transmitter and gets passed to another microcontroller. The GPS module in this section keeps tracking of the passenger’s destination. Simultaneously the area got by GPS is sent to the microcontroller. The area is shared to the microcontroller as scope esteems and longitude values. These values are compared with the data which is already stored in the microcontroller. While comparing with the data, finally passenger destination is announced with the help of loudspeaker. A LCD which is also connected to the controller display the destination of the passenger.

![BLOCK DIAGRAM](image)

**Figure 2:** Transmitter Section

This is the working model of the transmitter section which acts as a ticket billing machine.

![BLOCK DIAGRAM](image)

**Figure 3:** Receiver Section

This is the working model of the receiver section. This section act as the automated bus destination announcement system. This system intimates the passenger about their arrival of the destination. In
this section GPS technology plays a vital role in it. It continuously keeps tracking of the location of the bus and sends to the receiver in the form of latitudes and longitudes signal form.

5. System Description

5.1 Keypad

Keypad is generally used to store the destination of the passengers. It contains a set of pair of buttons which is arranged in the form of block which usually consists of digits, symbols and alphabetical letters. Here we are using 4X3 keypad as shown in figure 4. Each button is set with different codes and responsible for storing different destination location of the passengers.

![Keypad Image](image.png)

Figure 4: Keypad

Keypad is used as input in this system. The destination of the passenger is entered via different buttons provided in the keypad. This part act as a ticket billing machine which is given to the conductor. It is one of the most important part used in the transmitter section.

5.2 Power Supply

Power gracefully is an equipment gadget which supplies capacity to an electrical gadget. It converts AC supply into DC supply as per the requirement of components. Here we are using 12W power supply which can be directly fetched from the bus. The power supply is given to the both transmitter and receiver section.

5.3 Microcontroller

Microcontroller is a small sized integrated chip used to perform a specific operation in an embedded system. In Project we are using at mega 48A Arduino Microcontroller as shown in figure 5. It is used to collect and stores the passenger destination in the bus.

![Microcontroller Image](image.png)

Figure 5: Microcontroller

5.4 RF Transmitter and Receiver

RF module is a little estimated electronic gadget which is utilized to transmit and get the radio signals between two parts and systems. Now it is used for the wireless communication between two devices.
Here we are using 433 MHz RF transmitter with Receiver kit as shown in figure 6. It covers a distance of 20-200 meters. It is used to transmit and receive the passenger’s destination from the microcontroller.

5.5 GPS Module

GPS can be expanded as Global Positioning System. By this system everyone can know their position information from everywhere in this world. Here we are using Neo-6 GPS module in this setup as shown in figure 7. It is used to track the location of the passenger in the form of latitudes and longitudes.

This component is used in the receiver section which is connected to the Microcontroller. Hence the fetched latitudes and longitudes are compared with the data’s stored in the microcontroller and the respective location of the passenger is intimated with the help of loud speaker and LCD display.

5.6 Voice Chip

Voice chip is an integrated circuit which is specially designed in order to produce sound in the form of digital signal, analog signal or mixed-mode electronic signal. Here we are using DFP layer Mini Module which is used to produce MP3 as shown in figure 8.
5.7 Amplifier

Audio power intensifier is a gadget which is utilized to enhance low power electronic sound signals to make it enough for driving amplifiers. It is the last electronic stage in a run of the mil sound playback chain before the sign is sent to the loudspeakers. In this project 4.6W Dual Audio Power Amplifier which is used in the intimation process.

5.8 Loudspeaker

A Loudspeaker is a device which is used to convert an electrical audio signal to its respective audio sound. An 8 ohm loud speaker is used in this setup as shown in figure 9. It is used to announce the destination of the passenger. Blind people and Illiterate people will get benefit through this announcement.

![Figure 9: Loudspeaker](image)

5.9 LCD Display

A LCD display can be expanded as Liquid Crystal Display. It is one of the sorts of level board show which uses fluid precious stone in its significant type of operation. In this setup 16x2 LCD type is used as shown in figure 10. Destination of the passenger is displayed with the help of this LCD Display.

![Figure 10: LCD Display](image)
This LCD Display is placed at the receiver side which is involved in the intimation process about the destination of the passenger.

6. Result and Implementation

Initially the destination of the passenger is entered via 4x3 keypad and the power supply is given to it. Hence the destination is stored in the At mega microcontroller and after that it is passed through the RF Transmitter. This part act as a transmitter section which is kept by the conductor in the form of ticket billing machine.

![Prototype Model](image)

In the Receiver Section the receiver receives the destination of the passenger and transmits it to another At mega microcontroller. A GPS module which is connected to the microcontroller fetches the current location of the bus and transmits it to the microcontroller and a power supply is given to it. While comparing the latitude and longitude of the GPS the passenger’s destination is announced to the passenger with the help of LCD display and a Loudspeaker which is connected through it as shown in figure 11 prototype model. This is the working methodology of Smart system for preventing passenger destination missing in bus. Hence the project is verified and experimented successfully.

7. Conclusion

In this automatic bus destination announcement paper, we successfully explained a proposed system for the intimation of passenger destination this paper shows an idea of designing embedded device which is used to intimate the passengers about the arrival of the passenger destination. This automated passenger destination announcement system highly depends on GPS tracking technology. This system is greatly beneficial for the upcoming projects of smart transportation system. This system also helps blind people to travel in bus as the other normal people. It is also beneficial to the illiterates and newcomers to the city. This GPS technology brings a great change in the society as well as it gives
great accuracy to the people. This framework is incredibly financially valuable and it could be for all intents and purposes actualized for enormous scope way effortlessly. This project encourages more people to prefer public transport most widely. It improves the revenue of the Public Bus Transportation system... It brings a good name and fame about smart system transportation among various people in the world. Every kind of people gets benefitted by this automatic announcement system. This project can be further modified for its future work. This project is highly going to perform a smart role in the smart city transportation process.

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