A Survey Paper on Bus Tracking System using GSM & GPS

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Abstract— The present generation requires information from time to time. Every day the use of technology has been increasing. We are planning for the present technology with the requirement of information transmission. Bus tracking is an application that tracks a bus and accident detection. There are two applications one for the client and another for the server. The server will monitor the 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 to a system/SMART phone. The waiting time of the user can be reduced. A simple model of communication is the key feature of the Bus Tracking System. This application can be easily extended for the central tracking system to keep track of all the buses. To overcome the drawbacks of the previous method of paper-based and we introduce a project to track a bus using GPS and GSM. This Bus Tracking System can also be used for Accident Detection Alert System, accident detection, by just making few changes in hardware and software and widely in tracking Cabs/Taxis, vehicles, school/college buses, etc.

Keywords: GPS, GSM, Tracking System

I. INTRODUCTION

A bus tracking system is the technology used to determine the location of a vehicle using different methods like GPS and GSM. By following trilateration methods the tracking system enables us to calculate the easy and accurate location of the bus. The smart system is necessary which provides real-time information on the bus to a remote user. So we proposed a new system which overcomes the drawback of the public transportation system. So our system handles all the data about the current location of bus and by using this data the real-time tracking of bus can be done and this information is then given to user who wants to know the bus information. Bus information like location detail, passenger count, accident detection, etc. can be viewed on a mobile with the help of software via the Internet. The vehicle unit is the hardware component attached to the vehicle having either a GPS/GSM modem. The controller modem converts the data and sends the bus location data to the server. Fixed based station consists of a wireless network to receive and forward the data to the server. Base stations are equipped are useful for determining the bus location. Maps of every landmarks and city are available in the base station that has an already in-built Web server. The position information or the location of the bus is 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 satellite with the respective bus ID stored in the database and only then he/she can view the location of the bus. The microprocessor-based system is built for controlling a function is not designed to be programmed by the end-user in the same way a PC is defined as an embedded system. An embedded system is a combination of both hardware and software, each embedded system is unique and the hardware is highly specialized in the application domain. Hardware consists of processors, microcontrollers, IR sensors, etc. The main advantage of this project is that it reduces the overall pollution, reduces the traffic on the road, time management, etc.

A. Existing System

Due to an increase in population, there is a need for a public transportation system. So the user needs a smart system that provides the information of the bus. So we planned a new system which solves the drawback of this system. So our system handles all the data like the current location of the bus, passengers count, etc. The bus tracking can be done by our proposed system and this information is then given to the user who wants to know bus information. Some technologies like GPS (Global Positioning System), GSM (Global System for Mobile) are used for development purposes. Our system provides a web-based application, which gives real-time location of bus on the mobile user.

B. Proposed System

Firstly GPS receives the satellite signals and then the position co-ordinates with latitude and longitude are determined. The system is operated by GPS and GSM which is connected to the bus. With the help of GPS and GSM, the location is determined. The data may be received by Satellite from the bus to the receiver. After receiving the location the tracking bus information can be transmitted using any wireless communication systems. The information is received by the satellite is from the bus to a receiver. After receiving the bus location, the information can be transmitted. This system uses GSM to transmit the information. Generally, a user can access the information on a bus based on the user's supply and destination. This system provides the precise location of the bus.
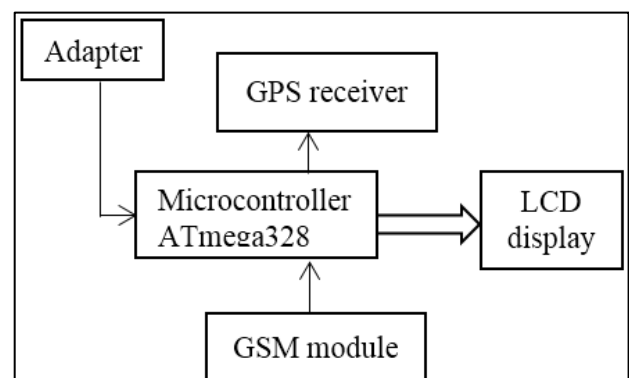
II. SYSTEM BLOCK DIAGRAM

Fig. 1: System Block Diagram

III. MODULES

− Microcontroller
− Crystal oscillator
− LCD

- GSM module
- GPS receiver

A. Module Description

1) Microcontroller

The microcontroller is used to manipulate operation based on the program preset in the output. The Atmega328 core combines a rich instruction set with 32 general purpose working registers. These 32 registers are connected to the Arithmetic Logic Unit (ALU).

B. Crystal Oscillator

The crystal oscillator is used to produce oscillated pulses which is given to the microcontroller.

C. LCD

LCDs are available to display arbitrary images that can be displayed or hidden, such as preset words, digits and 7 segment displays as in a digital clock. LCD can display messages in two lines with 16 characters.

D. GSM Modem

The Global system for mobile (GSM) communication is a globally accepted standard for digital cellular communication. A GSM modem is a specialized type of modem which accepts a SIM card and operates on a mobile phone.

E. GPS Receiver

GPS (Global Positioning System) is a device that is capable of receiving information from the GNSS (Global Navigation Satellite System) satellite. Though the GPS satellite data is free as well as works anywhere in the world. The satellite can access location in all weather conditions.

IV. CONCLUSION

The project titled "Bus tracking system using GSM and GPS" is a model for bus tracking unit with the help of GPS receivers and GSM modem. This system gives the information about the bus for public. The proposed system is more useful than the existing system. We have completed the project as per the requirements of our project. Also, it gives better performance. So in the coming year, it is going to play a major role in our day to day life. Finally, the aim of the project i.e. to trace the bus and count the passengers on that bus is successfully achieved.

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Paper

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