

GPS Tracking of Public Transportation And Passenger Guide Using GSM

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ABSTRACT: Many people today face a difficulty, that they need to spend a notable amount of time waiting for their bus or train in the station and feel uncomfortable while going to new places in bus/train. Here is a solution that intimates us regarding which station /stop the train/bus has been approaching and crossed.

This is to track the position of the bus/train using GPS and guiding the passenger using GSM. Initially a kit comprising GPS, Microcontroller and a GSM modem will be installed in the bus/train. Then server will be set up at required places and a toll free number will be allotted to every bus/train. For all the bus/train their various stops and their route will be updated in the server. The GPS in the kit will generate co-ordinates and will send it to the microcontroller. Microcontroller will receive the data through the serial port and save the data in the registers. Then through GSM modem, the co-ordinates will be sent to the GSM modem connected to the server. After receiving the co-ordinates, the server will check for similar co-ordinates in the database. If it finds one then it sends the matched location to all the passengers who have requested the data. If not, it will continue the process. All the location related data, are predefined in the Database.

Two types of requests can be made by the passengers. One to track the bus from outside and other to guide the passengers at each bus stop. Initially the passengers have to send their location to the server. The subscriber number will be saved under the requested location. Then until reaching the location, the approaching stops name will be sent to the passengers via SMS. Then the location of the bus/train can also be tracked using sending requisition SMS to the server.

I. INTRODUCTION

1.1 Objective

Objective here is to create a better world and to help the people to customize their travel in bus/train by using a tracking system and passenger guide that informs about the station/stop name the particular vehicle is approaching and located through SMS.

This is to mainly help the people who rather go around new cities often, to guide them and provide them a comfortable tension free journey. This is also useful to people who travel regularly through bus/train to make their travel a better experience.

Many people who travel to new places are under pressure to reach their destination correctly instead of deviating from their path and making it more complex. Here a better solution that intimates the travelers about the station/stop that is approaching

One aspect which consumes time is in waiting for a bus or train in the station. Here, GSM is used to intimate the travelers regarding which station the train/bus has crossed. Primary aim is to design a system using GPS and GSM that acts as tracking and guiding system for the passengers in public transportation and to design a system that helps passenger to know the location of the bus/train they are regularly travelling.

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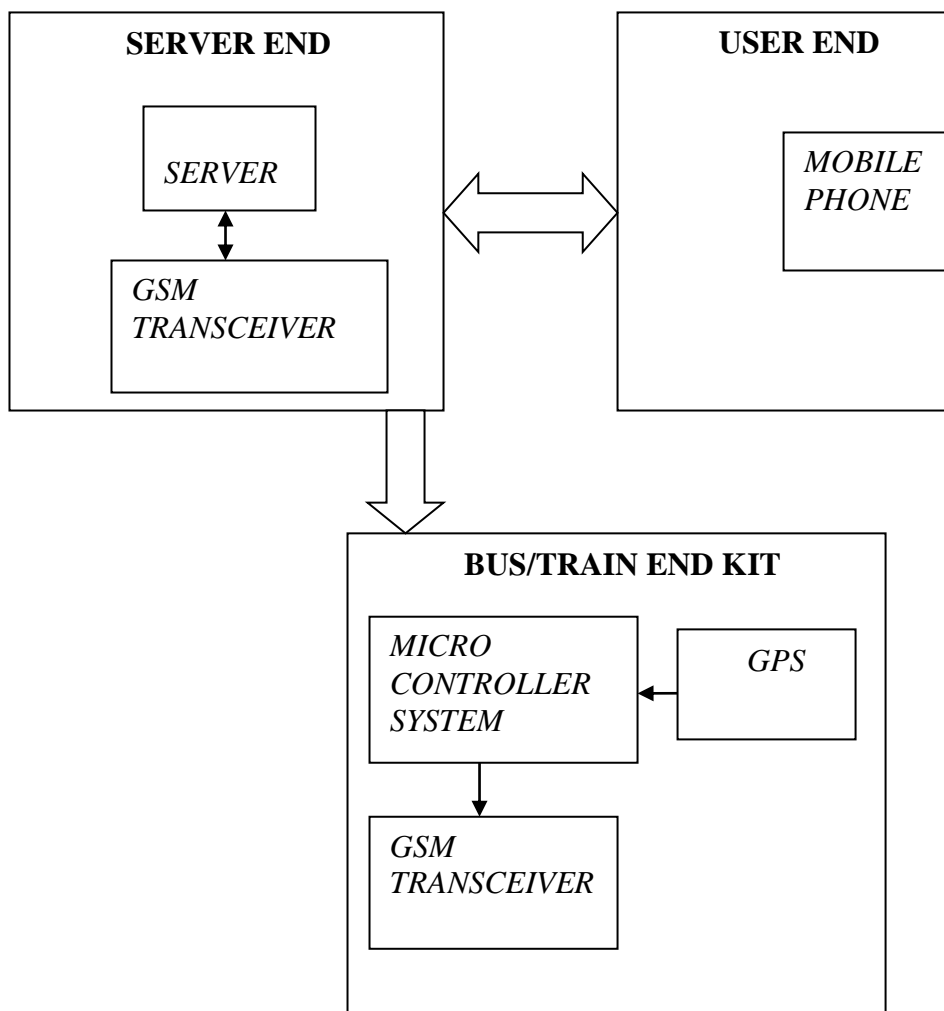
II. SYSTEM ANALYSIS

2.1 Existing System

A classical vehicle tracking system combines the installation of an electronic device in a vehicle, or fleet of vehicles, with purpose -designed computer software at least at one operational base to enable the owner or a third party to track the vehicle's location, collecting data in the process from the field and deliver it to the base of operation. Modern vehicle tracking system commonly use GPS or GLONASS technology for locating the vehicle, but other types of automatic vehicle location technology can also be used. Vehicle information can be viewed on electronic maps via the internet or specialized software. Urban public transit authorities are an increasingly common user of vehicle tracking systems, particularly in large cities. Vetrac, is a wireless enabled vehicle tracking system, implemented by Net Research Labs for Indian urban city scenario.

The announcement of the approaching stops had been implemented in city buses. They employ either display or voice based system. When the bus reaches every stop, either name of the bus will be displayed in the front or the stop name will be pronounced by already recorded voice.

2.2 Proposed System



Block diagram of the proposed system

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III. SYSTEM SPECIFICATIONS

3.1 Hardware Requirements

- GPS
- GSM Module
- ATMEGA Microcontroller
- Power Supply
- I/O Peripherals (LCD Display, Keypad)
- PCB

IV. PROJECT DESCRIPTION

4.1 Definition of Problem

Modern vehicle tracking systems commonly use GPS or GLONASS technology for locating the vehicle, but other types of automatic vehicle location technology can also be used. Vehicle information can be viewed on electronic maps via the Internet or specialized software. Urban public transit authorities are an increasingly common user of vehicle tracking systems, particularly in large cities.

The announcement of the approaching stops had been implemented in city buses. They employ either display or voice based system. When the bus reaches every stop, either name of the bus will be displayed in the front or the stop name will be pronounced by already recorded voice.

The common GPS based vehicle tracking system demands the user to use high end mobile gadgets and it also demands the internet connectivity. These requirements stands out to be a great hurdle for uneducated people and the people in rural areas to use this system.

The voice based and display announcement systems are not suited for the people new to the place and persons under abnormal conditions. Sometimes they are annoying and it affects the privacy of the public.

4.2 Project Overview

Many people today faces a difficulty, that they need to spend a notable amount of time waiting for their bus or train in the station and feel uncomfortable while going to new places in bus/train. They also feel tensed while going to a new place they had not visited and even hesitate to ask others.

Here is a solution that intimates us regarding which station /stop the train/bus has been approaching and crossed . This makes us feel comfortable, so that we need not stand in the stations for long time and can accordingly plan our precious time. This also make the passengers to remain calm and relaxed throughout their journey.

4.3 Description of Modules

This project uses a GSM technology to send request from user end (i.e.,) mobile to server end. In server side the whole database of the bus /train route and their corresponding status of the bus/train have to be maintained.

When the user sends the request about the detail of a particular bus / train the server retrieves the location of the vehicle and then it sends the location of the bus/train to the user end.

When the user sends the request to know the approaching stops/stations, the server receives the subscriber number and save it under the requested location. Then the server sends the approaching stops to all the subscribers and delete the subscriber number once they reached their location.

4.3.1 Modules

- Vehicle end module
- Server end module
- User end GSM module

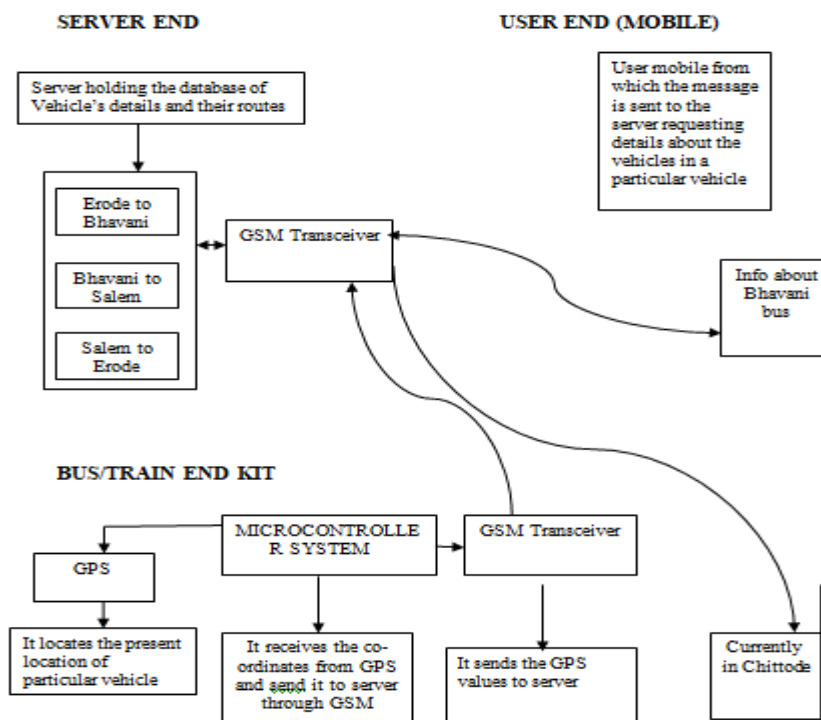
are the three main modules that are needed to realize the project in real time.

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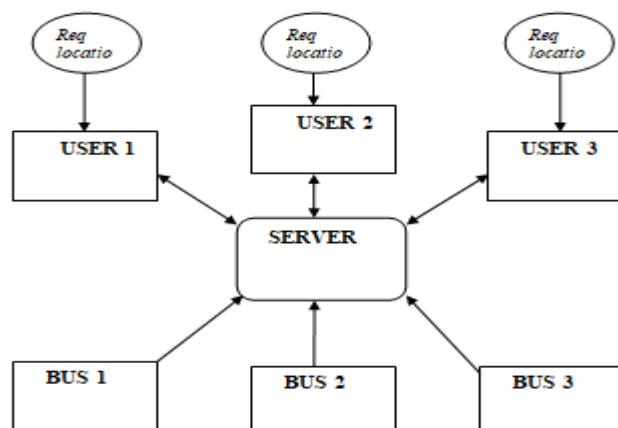
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4.4 Data Flow Diagram Block Diagram



4.5 E-R Diagram



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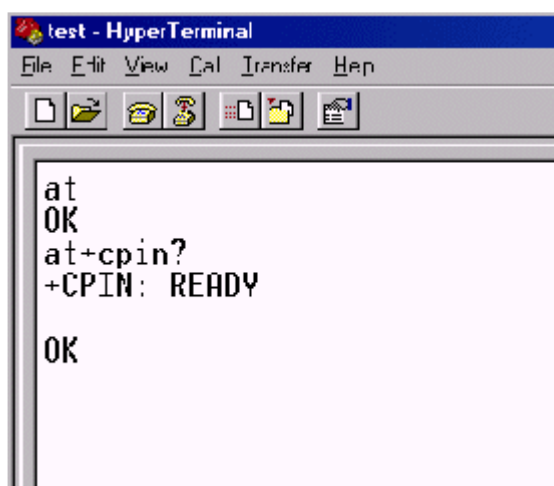
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V. SYSTEM TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product. It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner.

There are various types of test. Each test type addresses a specific testing requirement. GSM device, phone or GSM modem can work with Visual GSM. The entire GSM module can be configured using the window's hyper terminal. A screenshot of the window's hyper terminal is shown below.

A screenshot of a HyperTerminal window titled "test - HyperTerminal". The window has a menu bar with "File", "Edit", "View", "Cal", "Transfer", and "Help". Below the menu bar is a toolbar with icons for file operations and terminal functions. The main text area contains the following text:

```
at
OK
at+cpin?
+CPIN: READY
OK
```

VI. SYSTEM IMPLEMENTATION

Implementation is the stage in the project where the theoretical design is turned into a working system and is giving confidence on the new system for the users, whether it will work efficiently and effectively. It involves careful planning, investigation of the current System and its constraints on implementation, design of methods to achieve the change over, an evaluation, of change over methods. Apart from planning major task of preparing the implementation are education and training of users. The more complex system being implemented, the more involved will be the system analysis and the design effort required just for implementation.

An implementation co-ordination committee based on policies of individual organization has been appointed. The implementation process begins with preparing a plan for the implementation of the system. According to this plan, the activities are to be carried out, discussions made regarding the equipment and resources and the additional equipment has to be acquired to implement the new system.

Implementation is the final and important phase, the most critical stage in achieving a successful new system and in giving the users confidence. That the new system will work is effective. The system can be implemented only after thorough testing is done and if it found to working according to the specification. This method also offers the greatest security since the old system can take over if the errors are found or inability to handle certain type of transactions while using the new system.

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User Training

After the system is implemented successfully, training of the user is one of the most important subtasks of the developer. For this purpose user manuals are prepared and handed over to the user to operate the developed system. Thus the users are trained to operate the developed systems successfully in future .In order to put new application system into use, the following activities were taken care of:

- Preparation of user and system documentation
- Conducting user training with demo and hands on
- Test run for some period to ensure smooth switching over the system

The users are trained to use the newly developed functions. User manuals describing the procedures for using the functions listed on menu and circulated to all the users .it is confirmed that the system is implemented up to user need and expectations.

Security

- Application level security using user id and private key
- Secured Socket Layer
- All Messages are kept encrypted in a file
- Failure of controller's does not affect the group's operations

VII. SCOPE, FUTURE ENHANCEMENT AND CONCLUSION

7.1 SCOPE

The Passenger guide and Tracking system helps people to know the location of the bus/train they are travelling regularly. It also helps them to know the approaching stops/stations through SMS and make them aware of their destination stop and exit the vehicle they are travelling.

7.2 FUTURE ENHANCEMENT

In future, with the stops/stations approaching the distance and time taken to the stop/station can also be sent through SMS based on the request made by the subscriber. The approaching stops/stations can be also accompanied with the next stops/ stations in the SMS sent to the subscribers.

7.3 CONCLUSION

This project optimizes the way the people travel through the public transport system and save their precious time. This system provides a great solution for the people who want to make their daily routine travel tension free.

This project helps the people who have been travelling in and around to new places often in bus/train. This project helps them to travel with confidence and not with a fear of losing in midst of crowds.

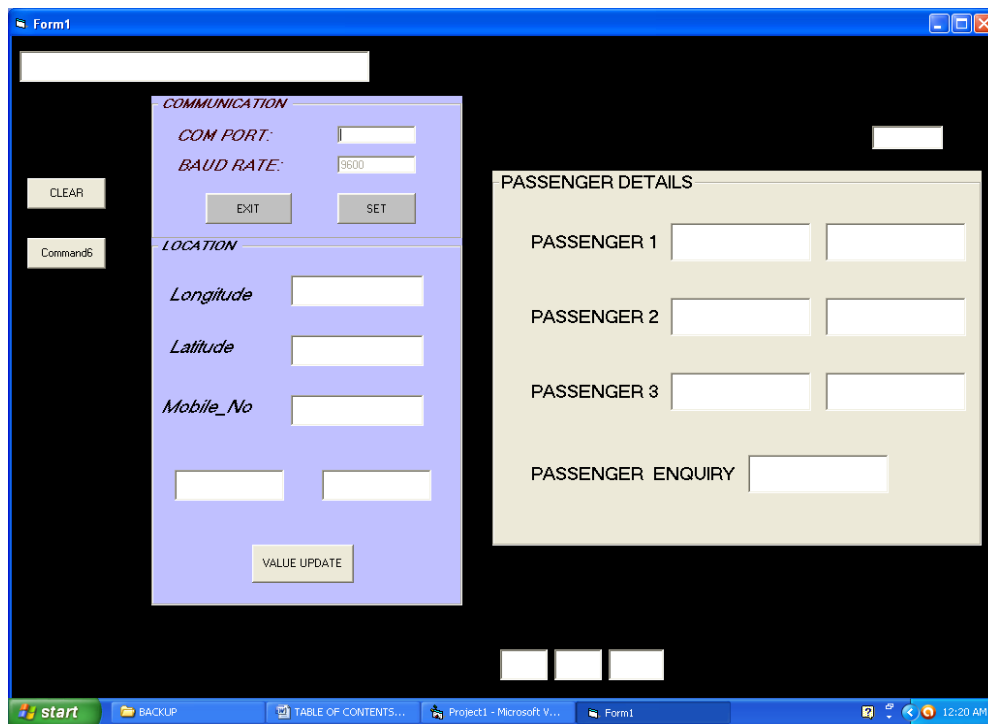
The proposed system based on Atmega microcontroller is found to be more compact, user friendly and less complex, which can readily be used in order to perform. Though it is designed keeping in mind about the need for industry, it can be extended for other purposes such as commercial & research applications. This system is fully software controlled with less hardware circuit. The feature makes this system the base for future systems.

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SCREEN SHOTS



Form1

COMMUNICATION

COM PORT:

BAUD RATE:

CLEAR

Command6

LOCATION

Longitude

Latitude

Mobile_No

PASSENGER DETAILS

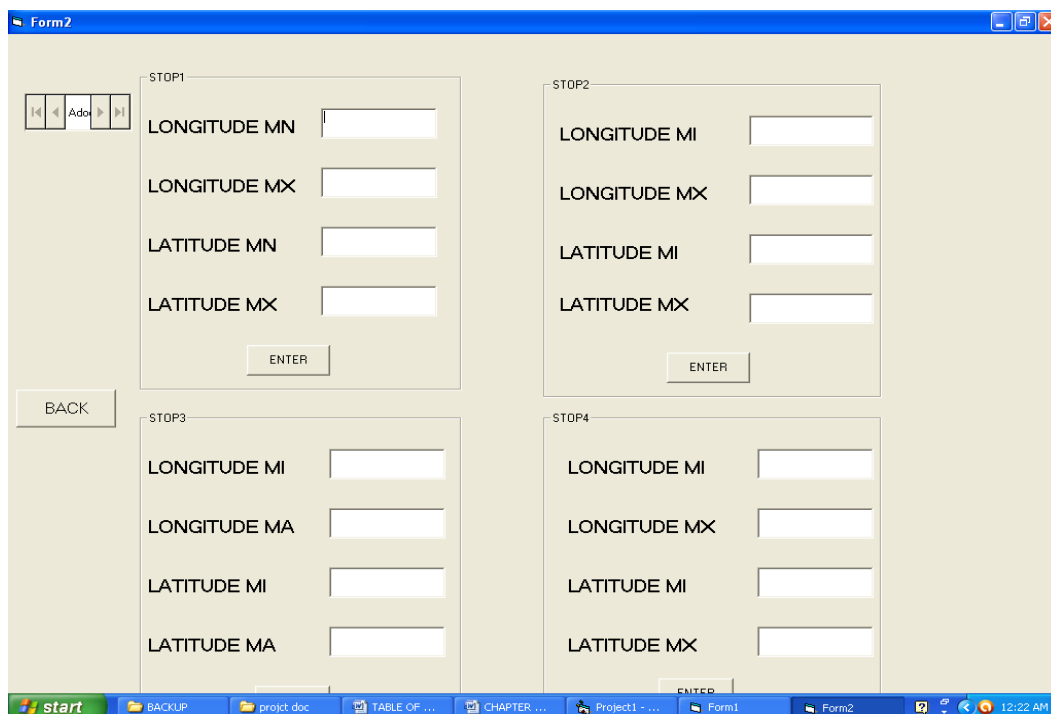
PASSENGER 1

PASSENGER 2

PASSENGER 3

PASSENGER ENQUIRY

start BACKUP TABLE OF CONTENTS... Project1 - Microsoft V... Form1 12:20 AM



Form2

STOP1

LONGITUDE MN

LONGITUDE MX

LATITUDE MN

LATITUDE MX

STOP2

LONGITUDE MI

LONGITUDE MX

LATITUDE MI

LATITUDE MX

BACK

STOP3

LONGITUDE MI

LONGITUDE MA

LATITUDE MI

LATITUDE MA

STOP4

LONGITUDE MI

LONGITUDE MX

LATITUDE MI

LATITUDE MX

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