

ANDROID BASED TRANSPORT TRACKING SYSTEM USING GPS AND GSM

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ABSTRACT

One of the greatest challenge in today's world is improving the efficiency of operations especially in the field of transportation services. All the services are available in android based smartphones and therefore in this paper we are making an android based transport tracking system which is being designed by the combination of GPS, GSM, Google Maps and Internet. This device will collect the GPS data from vehicle and transmit it to a server and from where that GPS data could be downloaded to android application using internet.

KEYWORDS: GPS, GSM, Android Application and Google Maps.

I. INTRODUCTION

Transportation is the only way which make the people connected from one another. It is Transportation only which helps the students to reach their schools, employs to their offices and workshops etc. but yet for transportation tracking we are using the complicated technique which are not easy for everyone to track their mode of transport. Today there is large percent of people are there in the world who are using the android based smart phones. Therefore, in this paper we are designing an easy and user friendly transport tracking which will be useful for persons of all sectors including Industries, Educational institutes, Bus Travel Agencies and Government offices to keep track on their vehicle.

In order to make tracking so efficient we are using the GPS and GSM in designing our hardware. The GPS will bring the accurate and real values of longitude and latitude and these values will be transmitted to the server with the help of GSM module and from server these values is being fetch by an android application installed in android based mobile phones and the location of vehicle is being viewed in google maps using internet.

II. RELATED WORK

In this Tracking system there will be two units one will be transmitting (installed in vehicle) and another one is for monitoring.

1. Description of Hardware Unit

1.1. GSM

GSM stands for global system for mobile communication here we are using the GSM module for transmitting the data from a moving vehicle to a server. There are various module are available for GSM modem but in this tracking system we are using the one of the most advance SIM900A module which is a quad band module and it has capability to work on most of the available frequency which are 850MHz, 900MHz and 1900MHz.

1.2. GPS

GPS stands for Global positioning system and has wide number of application today popularly in the field of navigation. The GPS module with active antenna will get the longitude and latitude coordinates from satellite of the actual location of hardware which will be there in the vehicle along with the other parameter such as time etc.

1.3. Microcontroller

MSP-EXP430G2553 by Texas Instrument will be used as the Microcontroller in the hardware because both GPS and GSM module are required to be interfaced together for receiving the GPS values and then to upload it on the server. MSP-EXP430G2553 is a 16-bit microcontroller which is having 8kB flash and 512B RAM.

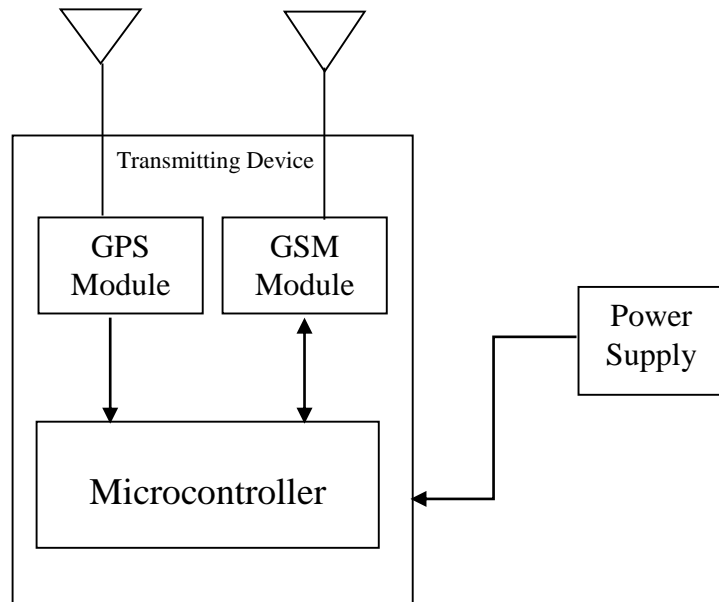


Figure. 1 Transmitting unit

The transmitting unit will transmit the data to server as per the diagram shown above (figure 1). The transmitting unit will be installed somewhere in the vehicle and every transmitting unit will be given a unique number which will be the registration number of the vehicle by entering that number in the android application the user will get the location of the vehicle.

1.4. Hardware Design

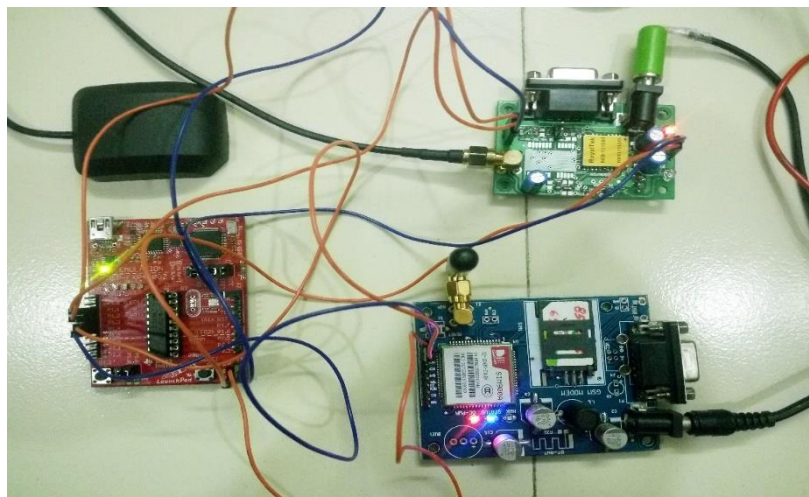


Figure. 2 Actual Hardware Design

The actual hardware is shown in the figure above (figure 2) and the connection between the GSM, GPS and microcontroller is also shown with power supply.

III. INTERFACING SOFTWARE

Interfacing of GPS and GSM module with the controller is done using the energia software. In this software the code is written in sketch code. We have to extract the GPS data starting with '\$' sign since we requires the longitude, latitude and UST time which we have to mention in the programming also a web link is to be provided in the programming which is the address of server where data of longitude and latitude is being stored.

IV. SERVER

This tracking system will require a server where the data from transmitting device is being stored and whenever the user want the location of the vehicle the android application will fetch the data of that particular vehicle and by using that longitude and latitude values it will show the location of tracked vehicle in google maps. Here WAMP server is being used and it will run only when internet is in use. On WAMP server a table is created using MySQL and data is being stored.

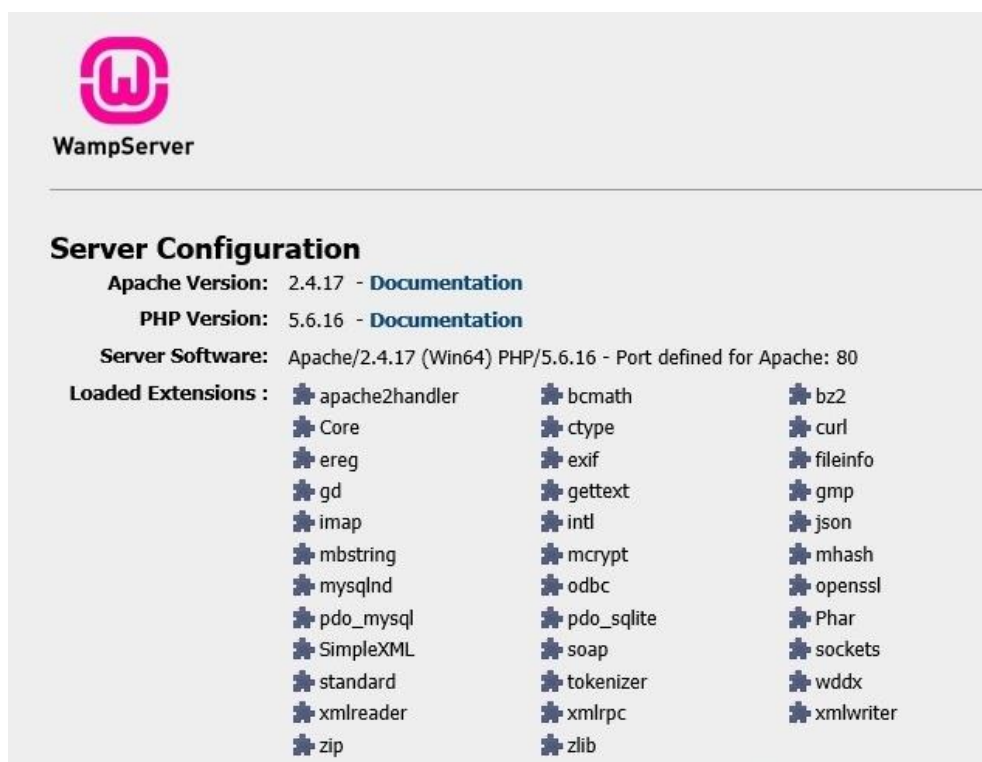


Figure. 3 WAMP server home page

V. MONITORING SOFTWARE

A Monitoring unit is developed and it will work as shown in the figure (figure 5) below .This Monitoring Unit will be an android application and will be used for tracking of the module installed in vehicle with the help of goggle maps. As the user will open this application in their mobile this application will ask for the bus number (figure 6) which the user want to track after entering the bus number if the bus number exist (figure 7) on the server it will bring the longitude and latitude values of that particular bus to the android application and shows the real time location of the tracked vehicle with the help of Internet.

Advantages of Android Application

1. Can be install in android based mobile only.
2. Within an organisation everyone can be given the application to track their transport. No separate device is required for everyone.
3. Easy to track, use and carry as everyone is familiar with android.

- 4. Gives location exactly with the help of google maps.

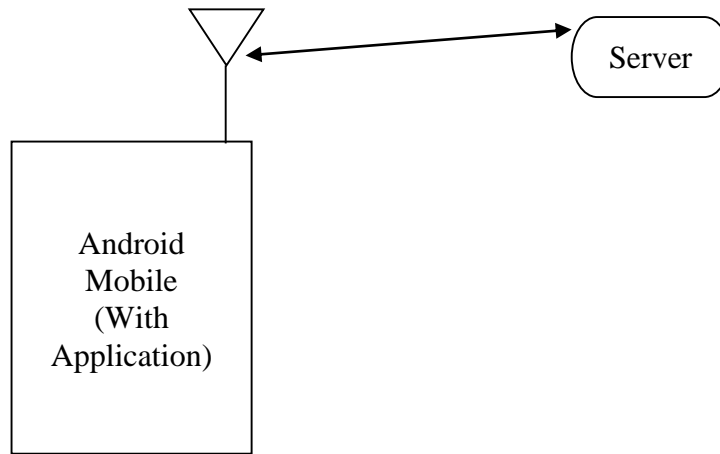


Figure. 5 Working of monitoring unit

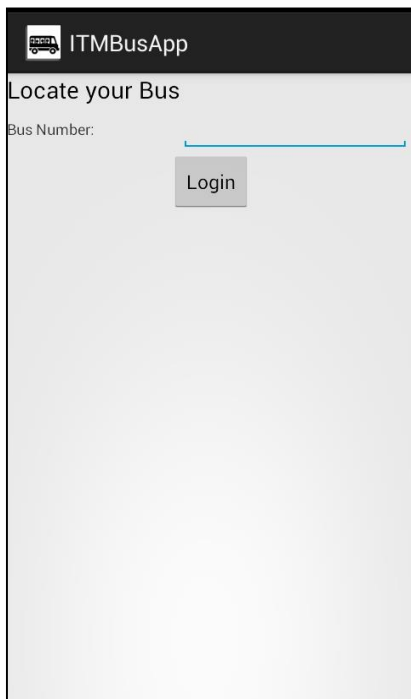


Figure 6 Login Screen

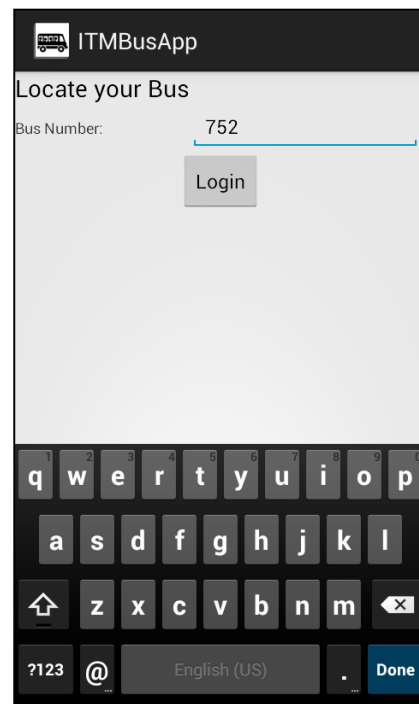


Figure 7 User Enter a Bus Number to Track

VI. EXPERIMENTAL RESULTS

After completing the above mention two steps the page will open in google maps showing the position of the tracked vehicle (figure 8).After getting the position of vehicle in map we can see the current movement of the vehicle also. The results

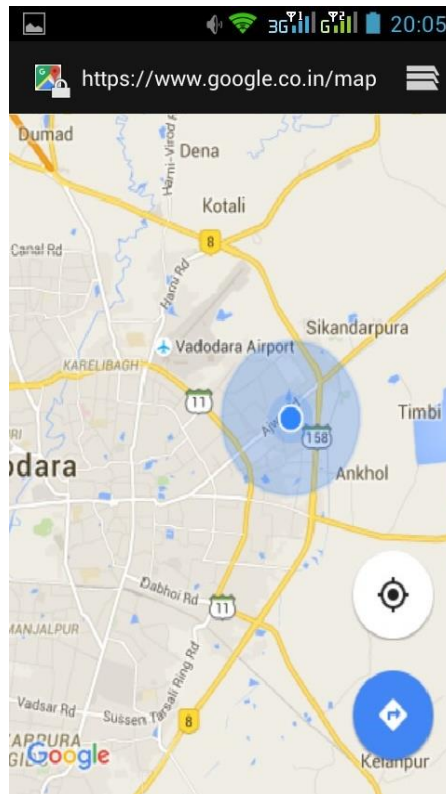


Figure. 8 Getting the location of tracked bus

VII. CONCLUSION

We have developed an android based smart transport tracking system with the help of GPS, GSM and Google Maps and it will help to locate the location of the vehicle.

This developed system could be beneficial to:

1. Educational institutes and parents for their students and children.
2. Car rental and food delivering companies.
3. Can be used for the tracking of state run buses.
4. Container shipment companies for proper location of their container.
5. Private bus travelers.
6. Tracking of Government vehicle police and various government agencies.

VIII. FUTURE EXPANSION

1. Many cities in India are installing Wi-Fi hotspots throughout the cities and installing Wi-Max services throughout the cities which can provide with better connectivity with greater speeds than GSM.
2. Can be installed in the number plate of vehicle and may be helpful for recovering of vehicle when they are stolen.
3. Can be used to track all the available vehicles passing from any starting and ending point specified by the user.

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