International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.07, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

REAL TIME ANDROID BASED VEHICLE TRACKING SYSTEM USING GOOGLE MAPS

Mohan Chandan RK[1], MA Sharukh Khan[2], P Nafees Khan[3],Nayana DK[4],

School of Electronics & communication Engineering REVA University,Banaglore.

ABSTRACT

The number of vehicles aredrastically increasing, security flaws is a the major issue. Hence, transport authorities are an increasingly common user of vehicle tracking system particularly in large cities. In this work, real time Google map and Android application based vehicle tracking system is implemented with Global Positioning System (GPS) and Global system for mobile communication (GSM) technology. GPS module which is the space based navigation that provides location and time information in all weather conditions anywhere on Earth where there is line of sight to four or more GPS satellites.. At the same time, location is displayed on mobile application using Google map which is interfaced with the application. Thus, user will be able to continuously monitor a moving vehicle using the cell phone. In this paper the proposed model presents experimental result of the vehicle tracking system which proves the feasibility of the system and track the movement of a vehicle from any location at any time.

Keywords— *Android Application, GPS, GSM, Google Map, Smart Phone*.

I. INTRODUCTION

Modern days, the safety of private and public vehicles is a major concern. To ensure safety while travelling, GPS tracking system is installed in vehicle. Thus tracking system provided to public with the location information of a bus within a fixed route, but no map was used to get real location on earth [2]. Many researchers tried to develop an automated vehicle tracking system to track and display location of a vehicle in real time [3]. The cost of operation for most of these tracking systems is higher which prevents from widespread use. But there is no healthy literature about the low cost experimental set-up in real time monitoring. A cell phone will be good alternative to replace the existing system [4]. The main objective of this work is to reduce the cost of the tracking system using the latest technologies and making it available to the common people. In this paper, a real time Android application based vehicle tracking system with Smartphone shield is attached to the moving vehicle to enable the owner/user to track the location of that vehicle. The GPS receiver will continuously give the data indicating the position of the vehicle in terms of latitude and longitude in real time. The GSM module will send the position (Latitude and Longitude) of the vehicle to cell phone from a remote place [5]. The same data is also displayed on Smartphone display. Google map displays the location and name of the place on cell phone in real time which is internally embedded in the application. A transportation headquarter receives real time vehicle information like speed, location, estimated time of arrival from the vehicle system [6]. These data are stored and a software package is developed to read process and analyse the data. Various parameters like geographical coordinates, speed, distance, etc. can be obtained and then viewed on a digital map using software [7]. And a feature which private vehicle owners would relish and useSmartphone to communicate with the system, which uses GSM and GPS technologies to provide the desired services. The work also aimed to develop an interactive Graphical User Interface (GUI) for the Smartphone application [8].

International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.07, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

II.CONCEPTS OF ANDROID BASED TRACKING SYSTEM

The Prototype obeys client-server architecture. Android based vehicle tracking system has two parts - A client side and server side architecture. Software specification consists of an application with additional interface Google map, SOS, Camera to capture the inner view of vehicle, Speed sensor.

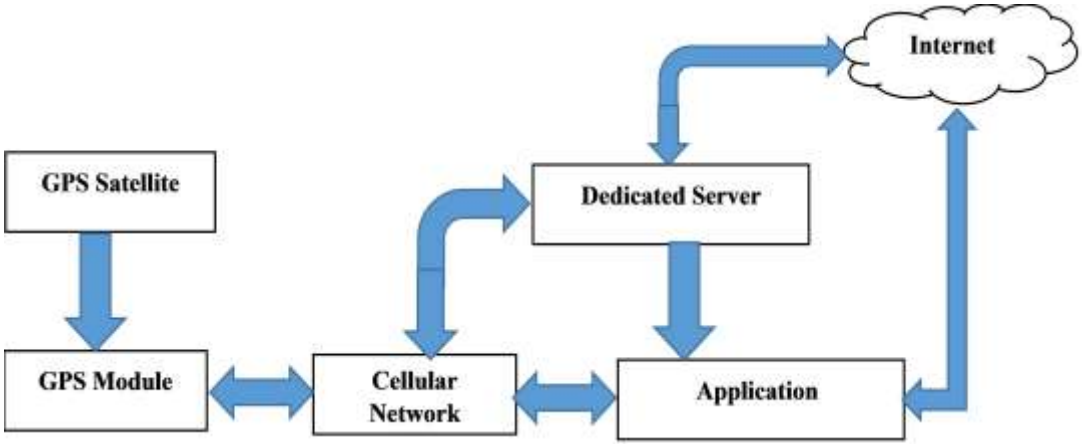


Fig 1. Block diagram of Android based vehicle tracking system.

Fig.1 shows the block diagram of Android based vehicle tracking system. The Global Positioning System (GPS) is the Global Navigation System (GNSS) that receives signal from at least three satellites to compute its two dimensional (latitude and longitude) position. Therefore, GPS is a key technology for getting position. The GPS in vehicle tracking systems is employed to provide users the coordinates of the location anywhere on earth. The fleet data is stored in the dedicated server of the vehicle authority and fetched data is sent back to the user. The GSM/GPRS module is responsible for

establishing connections between a tracking system and a remote user for transmitting the information of vehicle's location, using TCP/IP connection through the GSM/GPRS network. The Software specification is as follows:

2.1 Android Smart Phone mobile

It is advanced version of phones developed in several mobiles. It provides several applications depending upon specific task. It plays a prominent role in several mobiles. In our project the smart phone is used for getting alertness to a specific person without using GSM. Android Smartphone consists of GPS system, with use of which the current position of the transit vehicle and the commuter can be easily tracked. GPS system in the Smartphone can be easily used with appropriate security permissions. Android is developed by Google and is an open source operating system for mobile devices. One of the key feature provided by android is the set of android applications (apps) provided through android market that enables the user to extend the functionality.

The android SDK (software development kit) is a tool and API (application program interface) facilities the development of android application. The android SDK manager provides an excellent feature to install API components according to the different versions of the android OS with ease. Another key feature of SDK is that it provides the developers with android emulator which ensures the developers to delay their code and test its working on different virtual phones with different specifications. Android software stack or android architecture is roughly divided into following categories. The fig.2 shows the Android Architecture.

International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.07, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

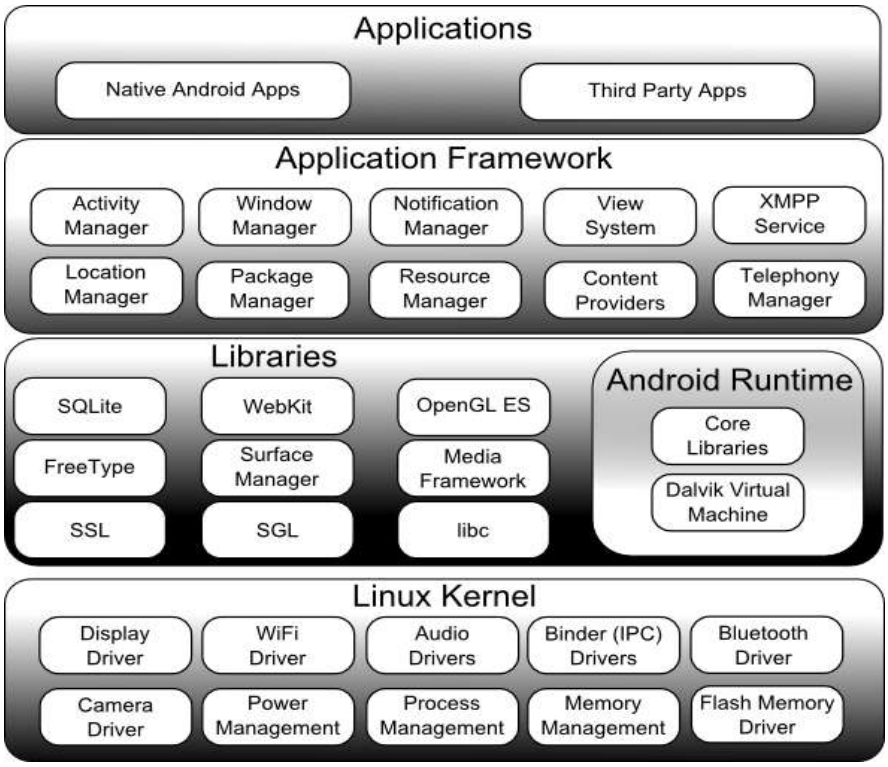


Fig 2. Android Architecture

2.2 Linux kernel

It exists at the root of the android architecture and is the heart of android architecture. Linux kernel is responsible for memory management, device management, power management, and resource access and device drivers.

International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.07, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

2.3 Application Framework

On the top of android runtime and libraries, there is android framework. It includes android API's such telephony, UI, resources, package managers, content providers, location. For android application development, application framework provides a lot of interfaces and classes.

2.4 Native Libraries

On the top of Linux kernel, there are libraries such as SQLite, FreeType, WebKit, Media, OpenGL, C runtime library etc. The Slate is responsible for database, Webkit for browser support, Media for playing and recording audio and video formats, Free Type for font support.

2.5Android Runtime

In android runtime there is DVM(Dalvik Virtual Machine) whose responsibility is to run android application and core libraries. The Dalvik VM makes usage of Linux core features like memory management and multi-thread which is inherent in the Java language. The Dalvik VM permits all android applications to run its own process with its own performance, with its own instance of the Dalvik virtual machine.

IV. RESULTS AND ANALYSIS :

International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.07, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

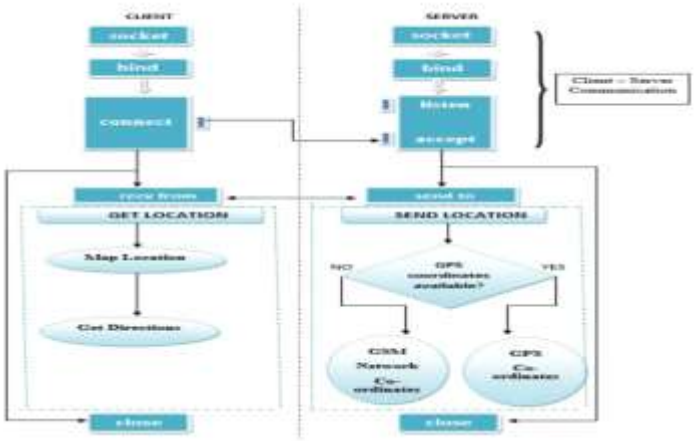
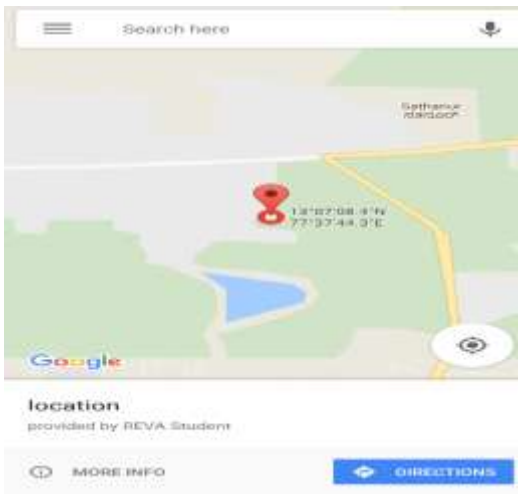
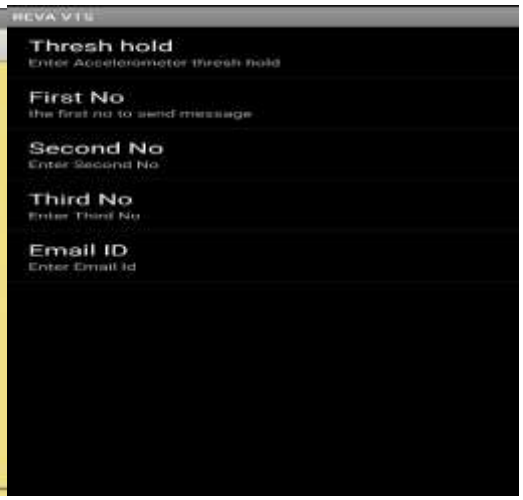


Fig3. Flowchart of proposed model.

The workflow for proposed system is illustrated in fig 3. It is based on the client-server application in which the commuter acts as the client and the vehicle in which GPS mounted acts as the server. Two applications are developed in which one acts as client side application and other acts as server side application.The commuter uses the client side application on his smart phone whereas the server side application is used by the vehicle in which GPS system is installed.

International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.07, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354





The main objectives of the proposed Android application based vehicle tracking system are:

i. Acquisition of a geographic coordinates of vehicle in real time using the GPS receiver.

ii. Transmission of information about the location of vehicle using the GSM module.

iii. Display position and name of the place on Google map in real time using cell phone.

The above objectives have successfully met.

V.CONCLUSION

The system aims at reliable transportation in the city by providing passengers with the real time location of the vehicle. The system also gives the details of the estimated arrival time and distance of the vehicle to the passengers. In relation to the estimated arrival time the passengers can decide whether to wait for the vehicle or not. This basic idea behind the proposed system is to track the vehicle and get the arrival time and distance of the vehicle from the commuter. After successful connection establishment between commuter and the server the server sends its location coordinates to the client. Once the GPS coordinates are available they are sent to client by server otherwise the nearest GSM network location coordinates are sent. For the location coordinates to be available the gaps of the smart phone must be turned. On receiving the location coordinates by the server the client can map it on Google map which is embedded in the application to get the estimated time and distance of the vehicle to reach the commuter and client can also get the direction i.e. the shortest path between the vehicle and commuter.

The proposed system provides better service and cost effective solution for users. A vehicle's geographic coordinates obtained from an in-vehicle device. A cell phone has been used to display location of vehicle on Google map. The system was able to experimentally demonstrate its effective performance to track a vehicle's location anytime from anywhere. This is easy to make and inexpensive compared to others. The proposed system will ensure safety and security of vehicle, driver, and passengers and enhanced using camera to get the real time view of the vehicle, which would be more convenient for the user to track the vehicle. The system can be made compatible through SMS in future. Buzzer can also be added to alert the theft of vehicle. Travelling distance can be calculated and recorded using database.

REFERENCES

[1]Telegraph, UK, 2015. http://www.telegraph.co.uk/finance/newsbysector/transport/11558743/Number-of-cars-stolen-in-the-UK-falls-to-48-year-low.html Accessed on:September 29, 2016.

[2] Eddie Chi-Wah Lau, ''Simple Bus Tracking System'', Journal of Advanced Computer Science and Technology Research, vol.3, no.1,2013.

[3] Montaser N. Ramadan, Mohammad A. Al-Khedher, and Sharaf A. AlKheder,"Intelligent Anti-Theft and Tracking Sytem for Automobiles",International Journal of Machine Learning and Computing, vol. 2, no.1, February 2012.

[4] Junaid Ali, Shaib Nasim, Taha Ali, Naveed Ahmed and syed Riaz unNabi, "Implementation of GSM based Commercial Automobile Tracker

Using PIC 18F452 and Development of Google Earth EmbeddedMonitoring Software" Proceedings of 2009 IEEE student conference onResearch and development (SCOReD 2009), Nov. 2009, Malaysia

[5] Khondker Shajadul Hasan, Mashiur Rahman, Abul L. Haque, M AbdurRahman, Tanzil Rahman, and M Mahbubur Rasheed, "Cost Effective

GPS-GPRS Based Object Tracking System," Proceedings of theInternational MultiConference of Engineers and Computer Scientists2009 (IMECS 2009), March 2009, Hong Kong, vol. 1.

[6] R.Ramani, S.Valarmathy, N.SuthanthiraVanitha, S.Selvaraju,M.Thiruppathi, R.Thangam, "Vehicle Tracking and Locking System

Based on GSM and GPS," Int. Journal Intelligent Systems andApplications, vol. 9, pp. 86-93, 2013.

[7] SeokJu Lee, Girma Tewolde, Jaerock Kwon, "Design andimplementation of vehicle tracking system using GPS/GSM/GPRStechnology and smartphone application," 2014 IEEE World Forum onInternet of Things (WF-IoT), 2014.

[8] MZ Parvez, KZ Ahmed, QR Mahfuz, MS Rahman," A theoretical model of GSM network based vehicle tracking system," 2010 InternationalConference on Electrical and Computer Engineering (ICECE), Dec.2010, pp. 594-597.