



# INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

A PATH FOR HORIZING YOUR INNOVATIVE WORK

## DESIGN & IMPLEMENTATION OF LOCATION AWARENESS & SHARING SYSTEM USING GPS & GPRS

PRANALI BAID<sup>1</sup>, MADHURA KADLAG<sup>1</sup>, AKSHAY SHARMA<sup>1</sup>, MOHIT HIRE<sup>1</sup>,  
AMOL POTGANTWAR<sup>2</sup>

1. B.E. Student, Department of Computer Engineering, SIEM, Nasik, India
2. Asst. Professor, Department of Computer Engineering, SIEM, Nasik, India

Accepted Date: 27/02/2014 ; Published Date: 01/05/2014

**Abstract:** Where am I? Where am I going? Where are you? What is the best way to get there? When will I get there? GPS technology can answer all these questions. GPS satellite can show you exact position on the earth any time, in any weather, no matter where you are! GPS technology has made an impact on navigation and positioning needs with the use of satellites and ground stations the ability to track aircrafts, cars, cell phones, boats and even individuals has become a reality. There are no subscription fees or setup charges to use GPS. So we are creating an innovative application introduced along with a mobile application to connect to various users and know their respective locations. It also allows users to set alert for some specific location. The user would then be notified with this alert, whenever he/she comes within that location proximity. It also provides special functionality of tracking the user's location history with the help of Google maps. Users can also share their location with friends and family. Further, users can take advantages of emergency features which send user's current location to emergency numbers.

**Keywords:** GPS, LBS, J2ME, Midmaps, Google maps, MySQL.

Corresponding Author: MS. PRANALI BAID



PAPER-QR CODE

Access Online On:

[www.ijpret.com](http://www.ijpret.com)

How to Cite This Article:

Pranali Baid, IJPRET, 2014; Volume 2 (9): 565-572

## INTRODUCTION

The advancement in mobile technology coupled with the advancement in wireless technology that provides continuous Internet connectivity have open up new opportunities for businesses to leverage on, such as location-based services. Location-based services use the location of mobile device users to bring location-specific and personalized services and information to them. These services allow users to receive up-to-date information about their surroundings, save time and money, and make better, informed real-time choices. It also enables businesses to build and maintain customer relationships, increasing their profit gain potential. Therein cell phones, global positioning system (GPS) tracking and sharing are some of the advancements. GPS systems can be used when outdoors for activities such as hiking or camping.

Within the last few years, mobile phones spread like wild fire. With more than 2 billion phones around the globe and more mobile than fixed line subscribers, mobile phone industry is the most growing industry in the world. Location Based Services attracts more and more users to take advantages of these services. A location-based service basically answers three questions: Where am I? What's around me? And how do I get there? They determine the location of the user by using one of several technologies for determining position (such as GPS), and then use the location and other information to provide personalized applications and services.

### I. Literature Survey

This section deals with some of the existing works related to the proposed mobile solution, mainly, using tracking systems through GPS or GSM cell. In paper [7], we will discuss the detailed design specifications of this system and in paper [8], we deal with the detailed implementation of this system.

In paper [22], the author proposes an application Locating Friends and Family Using Mobile Phones with Global Positioning System (GPS) based on client-server architecture that helps the users to locate their family members and receive alerts when their friends are nearby. The mobile application are implemented using J2ME where the most recent APIs and other older APIs are combined together in order to make the application reliable on all types of mobiles. The type of the Database used in the system was MySQL.

In paper [11], a technique is giving to send GPS coordinates of a mobile through a SMS to other mobile phones. Two algorithms, Kalman Filter and Velocity Renovation, which can be used in conjunction with GPS, are used as a basis for location tracking. The first coordinates are generated from a GPS assisted mobile on Google map, this location is then sent through SMS to another person. The latter can then see the exact location of the sender on his map with an accuracy of 0.57m.

In paper [10], two techniques were described to locate and track cellular phones using digital cellular mobile telephony networks. The first technique is based on time of arrival (TOA) methods with a minimum of three base stations required, while the later uses angle of arrival (AOA) methods that require only two base-stations, though greater accuracy is possible with three. Both TOA and AOA methods were examined for a multipath fading environment.

As it may be seen in the above-mentioned systems, most of them provide dedicate solutions using tracking methods to monitor a mobile device. Our proposal is designed for a regular mobile phone that incorporates a GPS. Unlike the systems mentioned above, the main feature of our application provides the user the ability to locate him, send his own location via SMS and share his location with friends through a web server.

## II. Proposed System architecture

The application architecture and its working principle are centered on the use of GPS. It is the most common technology for these kinds of applications. The centralized database server provides a coordinate's database to the users so they can get the location of friends and relatives and dates their own location on the server. The purpose of choosing centralized data sharing is to reduce the storage overhead on each phone. Otherwise, instead of using centralized database each mobile may have its own database stored on the phone and share these databases between different users. The internet is the medium that is used to transfer the user data and service request from the mobile to the server and then the requested information back to the user. Figure 3.1 shows the main 5 elements that construct the system which are the GPS system, the mobile clients, web server and the database.

### 3.1 Mobile clients (Mobile):

The mobile requests its location from the global positioning system periodically and sends it through the communication network to the server. The user can request the location of a family member at any time from the server. Mobile client can also send its current location via SMS to any mobile number. Mobile client also has an internal database to store application settings. The mobile client application is named as GPS Locator.

#### 3.2.2 Server

The server receives users' location and updates the user about the location of family members.

#### 3.2.3 Database

The database contains all users subscribed in the service with their location. The database also stores the user's mobile number along with the other user's mobile number with whom user is

sharing his location. Database tuple mainly has six attributes namely who, whom, latitude, longitude, altitude and time which stores user's mobile number, mobile number of other user with whom user is sharing his location, latitude coordinate of user location, longitude coordinate of user's location, altitude coordinate of user's location and time at which user updates his location. Whenever, user updates his location the time is also updated.

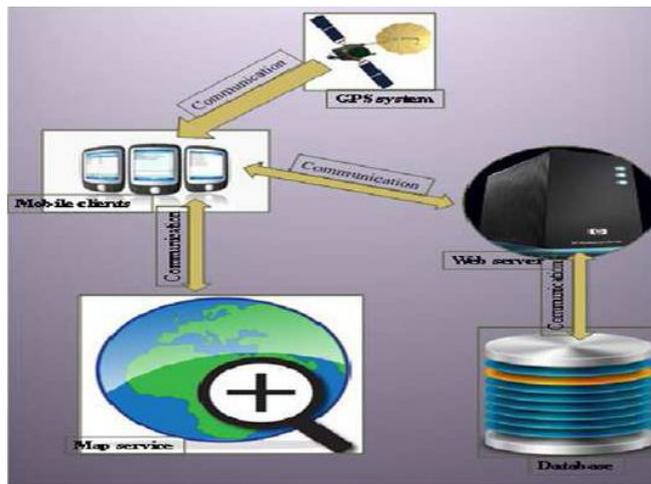


Fig 3.1 System Architecture

### 3.2.4 GPS

Every time the mobile phone updates the user location in the server, it requests the location of the user from the GPS receiver. The GPS receiver determines the longitude and the latitude with the help of satellite system. Map service provides the Google maps and several map handling functions as required by the user. However the map service is an indirect part of this system, and it will be supplied by an external source. Then latterly sends to the mobile phone. The major requirement of a GPS Locator shown in Figure 3.2 is the use of Location Based Services (LBs) such as GPS. The GPS Locator allows several operations such as user can get your own current location (latitude, longitude and altitude) and can view these co-ordinates on the Google maps using MidMaps API [14] for J2ME platform.

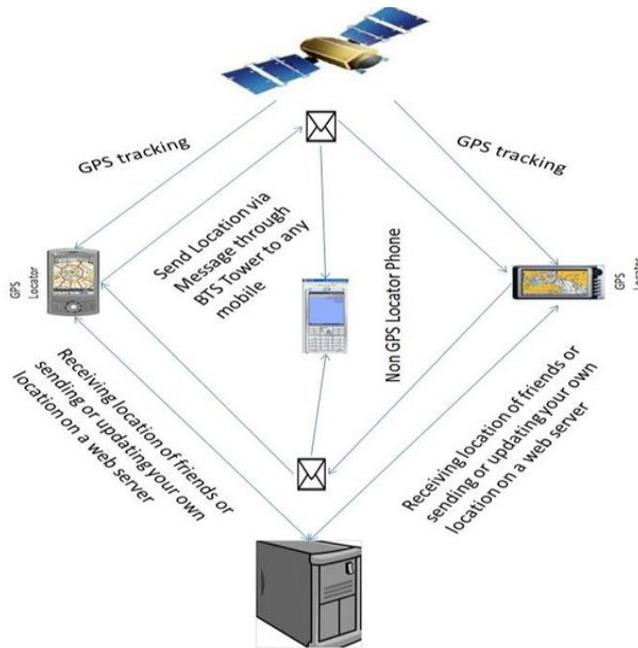


Fig 3.2: System Requirements

### III. METHODOLOGY FOR DEVELOPMENT

The mobile application will be implemented using J2ME while GWT is used for implementing server functions and MYSQL is used for the database. The implementation is easily understood by dividing this task into several steps. First we will see the implementation of mobile clients, then the web server and database further we will see how we are integrating external map service with our application.

#### 4.1 Mobile Client Side Implementation

A mobile client is a JAVA supported handheld with the GPS receiver providing several features to the user. The mobile client programming language and IDE is java and JAVA ME PLAT-FORM SDK 3.0. Java ME platform is a collection of technologies and specifications that can be combined to construct a complete Java runtime environment specifically to the requirements. The configuration targeting resource-constraint devices like mobile phones is called the Connected Limited Device Configuration (CLDC) [6]. Devices today are implemented with, a MIDlet is then created. A MIDlet is the application created by a Java ME software developer, such as a game, a business application or other mobile features. These MIDlets can be written once and run on every available device conforming to the specifications for Java ME technology. See Figure 4.1. Several functional implementation of mobile client is as follows.

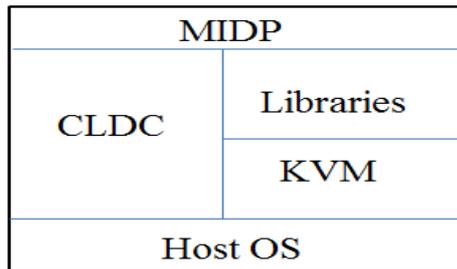


Fig 4.1: JAVA ME Technology Specifications

#### 4.2 Graphical User Interface (GUI)

MIDP applications are expected to run on many different mobile phones without modification. This is particularly difficult in the area of user interface; Mobile Information. Devices (MIDs) have got screens of all sizes, in grayscale and in color. Furthermore, for input, the MIDP is fairly open-ended. The input devices on MIDs vary widely in their abilities, from numeric keypads to alphabetic keyboards and soft keys to touch screens. The minimum screen size mandated by the MIDP is 96 x 54 pixels, with at least one bit of color depth. Below there are some important guidelines that we keep in mind while designing the application with MIDP graphical API functionality.

#### 4.3. Get Location

The location includes the latitude, longitude and altitude coordinates. These coordinates can be calculated using the JSR-19[8] location API available in J2ME. JSR-19 specifies a Java 2 Micro Edition (J2ME) optional package to enable location-aware applications for Mobile Information Device Profile (MIDP) based devices. Provider can use the gathered location data to create Location objects and distribute them to JSR-19 Java applications.

#### 4.4. Location Sharing

To share location with the other users, the mobile client needs to communicate with the web server using General Packet Radio Service (GPRS)[11][12] over TCP/IP protocol[13][14]. To allow the application to be portable across all mobile phones, HTTP connection is used to connect the client to the server. HTTP is a request response application protocol where the GET or PUT commands are used to supply data. In this system, GET method is used where the data of the request becomes a part of (encoded in) the URL. Since the client's requests do not contain large amount of data, there is no risk of overrunning the capability of environment variables.

#### 4.5. Web Server Side Implementation

In this feature there will background service running on mobile application that will send user data to the web services using HTTP protocol. Background service for sending location details of the user periodically to the web service and web service will store sent location details to the database. Mobile application will send data to the web service in JSON format. As data received at web service from the mobile application the received data will be persisted to the database server for future use.

The application needs centralized database for the purpose of location sharing. MYSQL is used for the database and GWT is used for implementing server functions to modify these data as user demands.

#### 4.6. Map Services

This part mainly provides such functions as parallel moving, zoom, geocoding and relocate center; Location service: exchanging data between client and server, displaying map information that centered by mobile terminal in real time. The MidMaps[14] is the map service which provides Google maps for our application. The Google maps server contains a vast earth image database. This method is only used for research purposes. It is not a licensed method to access the Google maps database. Google maps is latitude and longitude related [12].

#### CONCLUSION

Here we are designing java application which provides the users current location and sharing location with friends and family and views them on maps. Users can also take benefit of this application in emergency situations by using emergency feature of this application. To get the location coordinates, application is using GPS (Global Positioning System) as location provider.

Thus in this project we are implementing the location tracking system to keep track the location details of the registered user, we also can set the location based alerts for reminders settings. In this, there is also a facility of creating various of peoples for locating them. We can track the location according to the date and the time. The whole location schedule of a registered member can be seen through this application.

#### REFERENCES

1. G.Lawton, "Moving Java into Mobile Phones", Computer, vol. 35, no. 6, (802) June, pp. 11-8.
2. J. McNamara, \_GPS for Dummies\_, For Dummies, 1st edition, (998).
3. What is GPS, <http://www8.garmin.com>, (812) July.

4. <http://hyperphysics.phy-astr.gsu.edu/hbase/gps.html>, (812) July.
5. <http://www.gps.gov/>, (812) July.
6. Connected Limited Device Con\_guration (CLDC), <http://java.sun.com/products/cldc>, (812) July.
7. Mobile Information Device Pro\_le (MIDP), <http://java.sun.com/products/midp/whatsnew.html>, (812) July.
8. Java Community Process: Location API for J2ME Speci\_cation 1.0 Final Release, (803).
9. <http://developers.sun.com/mobility/midp/articles/wma2/>, (812) July.
10. <http://www.ibm.com/developerworks/wireless/library/wi-extendj2me/>, (812) July.
11. <http://www.rysavvy.com/Articles/GPRS/GPRS.htm>, (812) July.
12. <http://easyinfo.in/info/gprs.html>, (812) July.
13. <http://www.yale.edu/pclt/COMM/TCPIPHTM>, (812) July.
14. <http://www.protocols.com/pbook/tcpip1.htm>, (812) July.
15. MidMaps- Google MapsApi for J2ME, <http://www.jappit.com/blog/midmaps-google-maps-java-me-library/>, (812) July.