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A SURVEY ON SMS BASED ROUTE FINDER SYSTEM WITH SMARTPHONE

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ABSTRACT*—This paper present the location based services used in mobile for finding route. Location based Services offer many advantages to the mobile users to retrieve the information about their current location and process that data to get more useful information near to their location. Short Message Service (SMS) is one of the cheapest and best ways for sending and getting precise information with a limitation size.In this standalone programs are developed for both client and server side to communicate via SMS service provided by GSM services provider in the locality. The usage of SMS in GSM based mobile communication is successfully tested for getting GPS co-ordinates of the client location using a Android based Smartphone and dynamically plotting the co-ordinates, path etc. using Google Maps API in the server. Based on this, importance of SMS based application, GPS, Location based services and Android in detail.*

***Keywords*— Android operating system, LBS, GPS, Google Maps, SMS applications**

I. INTRODUCTION

TSmartphones are considered as the new generation mobile devices. Day after day Smartphones becomes more popular. Smartphones run with the fundamental parts of software system. This operating system which has been designed for these smart devices should have sufficient energy with fewer memory footprint and more development and optimizations. S. PH all and E Anderson .

By introducing the most common operating system in the market such as Blackberry, windows mobile, iPhone, Symbian and Android. So Smartphones depend on the mentioned operating systems and with the rapid and fast progress of Smartphones, international Smartphones shipments are expected to increase to reach 506 million units in 2014, from 246.9 million in 2010. And among these Smartphones, shipments of iPhone and Android have accelerated by launching HTC Hero and Nuxus and iPhone 3GS .

1. Android:

Android is the first development plat form and operating system for mobile phones that open, complete and free. Android was developed by the open Handset Alliance a group of over 30 companies led by Google when announcing Android, Google goal was to offer more flexible feature-rich platform in order to attract more community developers and use those advanced application to convince customer to buy Android handsets. Android is considered as an asset of software for mobile devices which contain an operating system, middleware and main mobile applications. Android covers

different features for instance: applications format framework, Dalvik Virtual machine, integrated browser, optimized graphics, SQL its for structured data storage, media support for common audio, video and image format, GSM technology, Bluetooth, EDG, 3G and Wi-Fi, Camera, GPS, compass and

accelerometer and rich development environment . The architecture of Android is like any other hierarchical system, it is divided into four main layers that consist of:[1]

1.1 Application:

Consist of asset of core application including email client, calendar, web browser, map application, SMS application, contact application, message application … etc.

1.2 Application framework:

This is the base of developing application in Android and it has been designed to facilitate the reuse of components and allow the components to be replaced by users.

1.3 Libraries:

They are set of C/C++ libraries used by diversity of components of Android system [1].

Android Runtime consist of core libraries and Dalvik virtual machine. Core libraries provide the functionalities which are available in Java programming language. Dalvik Virtual works as a translator between the application side and the operating system.Every Android application operates in its own process and with its own instance of the Dalvik virtual machine.

1.4 Linux Kernel:

Linux kernel performs as an abstraction layer between the hardware and Android software. Android uses Linux version 2.6 for core system services such as security, memory

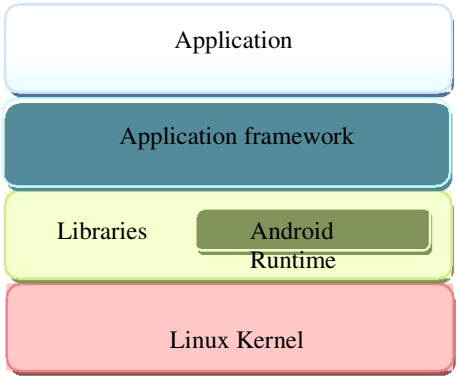

Fig 1: the architecture of Android

II LOCATION BASED SERVICES

Location-based services or LBS refer to _a set of applications that exploit the knowledge of the geographical position of a mobile device in order to provide services based on that information.' Location-based services (LBS) provide the mobile clients Personalized services according to their current location. They also open a new area for developers, cellular service network operators, and service providers to develop and provide value-added services: advising clients of current traffic conditions, providing routing information, helping the users to find nearby shopping malls. Location-based services offer many merits to the mobile clients. For the mobile user, the examples of location based services are:[2]

- **Profile changer based on place or area**
- **Person Location tracking by Family Member(SMS)**
- **Nearest Friends notification reminder**

Location based Services can be classified in 3 categories a) Public Safety / Emergency Services
The location of the client can be determined by the mobile carrier hence it finds great use during Emergency since it can be used during the emergency/health hazard to locate the mobile clients.
b) Consumer Services

Now days, smart phones like (Android, Blackberry and iPhone) provide a set of location based applications and services which helps the users to access the multiple services based on the user location.
Maps Navigation- The users can use the Google Maps to get to the particular location or to trace the route between any two locations.
Marketing /Advertising- Many corporate companies advertise their items based on the location of the clients.
For Example – Sale in Shopping Mall near to your location.
Location based Reminders- The phones can be used to set as the reminder based on the location.

In order to make LBS services possible, some infrastructure elements are necessary, including mobile devices, applications, communication network, positioning component, and service servers Mobile devices are tools used by users to access LBS services, to send requests and retrieve results. Such devices can be portable navigation devices (PNDs), Personal Data Assistants (PDAs), laptops, mobile phones, and so on. Application is the interface for users to access the LBS service. It is usually software developed by an application provider, downloaded and installed on user's mobile device. A specific application is usually developed for a specific LBS service. Due to the restrictions of mobile devices (small screen size, limited processor power and memory, battery capacity), LBS applications need to be lightweight and battery saving. Communication network refers to the mobile network which transfers service request from user to service provider and requested information back to the user.
Service providers maintain service servers which offer different kinds of LBS services to users and are responsible for processing service requests and sending back request results. Servers calculate positions, search for a route, or search specific information based on user's position. Service providers usually do not store and maintain all the information requested by users. Instead, content providers are responsible for collecting and storing geographic data, location-based information, and other related data. These data will be requested and processed by service servers and then returned to users. Figure 1 shows the interactions among these components, and the process of a LBS service. First, user sends a service request using the application running on mobile device (Step 1). The service request, with user's current location information obtained from the positioning component (in this example, GPS data), is sent to service server via the mobile communication network (Step 2). The service server requests geographic database and other related database to get required information (Step 3, 4). At last, the requested information is sent back to user's mobile phone via mobile communication network paragraphs must be indented.

Every LBSs contain a number of components including maps and Geographic Information System (GIS) information, location collection services, and LBS application-specific subcomponents. The architecture of LBS can be generalized as shown in Figure 2.

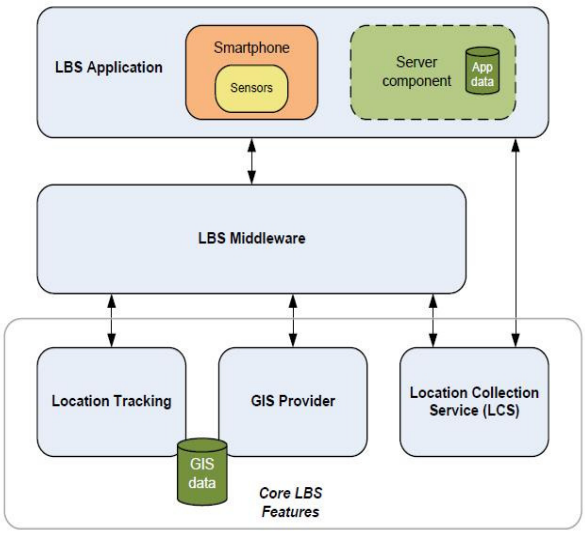

Figure 2 Components of LBS

Location Tracking
This component stores the location trace of individual users. This represents a fundamental component in next-generation LBS as it contains the data that allows a user's route to be determined and potentially predicted. In particular, this component would typically support the following functionality:
1. Keep records on user's current and past locations.
2. Notify other components when a specific user has moved, or when they move in or out of an area.
This supports location-based notifications being sent to

users.
3. Determine which users are within a defined location this supports geo-casting features.
4. Queries of location trace to generate user movement Models

GIS Provider

This component provides geospatial functionality for many LBSs including map information, map visualization and directory services. Google Maps with its API can be considered a GIS provider.

Location Collection Service

This component performs location collection to get a latitude and longitude for a specific user. Depending on the technology, this component may be accessed via the

LBS Middleware (e.g., mobile network triangulation via a service provider) or directly (e.g., via GPS receiver in the Smartphone). Android provides access to the above components to facilitate the implementation of LBS Services

through the help of following classes;
1. Location Manager

2. Location Provider
3. Geo-coding
4. Google-Map

III GLOBAL POSITIONING SYSTEM (GPS)

In order to track the location of the user's mobile device it checks the nearest base station available to the mobile network and GPS

Global Positioning System for tracking location.The GPS satellite is used for navigation purpose and it is combined with LBS is used to track the location of mobile device and actual work of the GPS is to calculate the position in the measure of coordinates like latitude and longitude values through the GPS receiver.In general this GPS work in open space areas only and used for radio navigation purpose through radio signals the GPS is a small device that can be embedded in any devices like mobiles.[4] In addition to the sensors mentioned before, mobile phones readily support GPS. GPS is used to obtain the current location and is used in outdoor navigation. The location of the device is estimated from signals sent from satellites. The Global Positioning System (GPS) is a well known means of obtaining locations in outdoor areas. However, this technique cannot be utilized in indoor environments as buildings and tunnels and congested metropolitan areas because of its reliance on satellite visibility There have been many efforts made to equip the GPS for indoor environments, efforts, for example, involving augmentation with an inertial navigation system (INS) or ["pseudo-satellite"] system . Also, many researchers have proposed alternate systems for indoor areas

A GPS satellite sends a beacon containing its position and the time at which the beacon was sent. From these beacons the GPS receiver calculates its own position. For this, it needs to receive beacons from at least four satellites. In addition to this the quality of the signal depends on the receiver having a clear view of the sky. As a result the quality of GPS signals is degraded with the amount of obstruction around the receiver, rendering the system inapt for indoor navigation. The time needed until the first x is calculated, can be shortened by using assisted GPS (AGPS).[3] An additional source is used to estimate a coarse location, for example on a Smartphone, through looking up the location of the current cell tower the phone is connected to. With this method the time needed for a first x can be shortened.

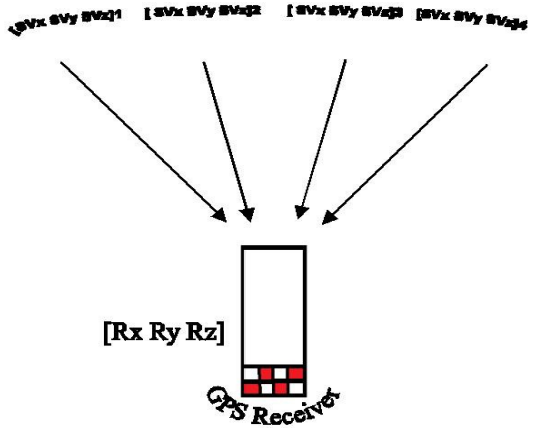

Fig 1: Line-of-sight pseudorange GPS measurements from at least four satellites

IV SMS

SMS is very common and **widely** used way of communication. Now-a-days we do most of the communication with SMSs. Today in the era of technology we want most of the things to be automated. Imagine that it would be great if we could perform various functions in our mobile phones even if it is far from us or it could respond a automatically like an intelligent device. So now this can be achieved by our SMS software application which is developed for android mobile platform. By using this application we can operate many functions via sending a SMS to the mobile phone which is far from us without interception of operator and in this way our android mobile phone will act as intelligent device. This application establish client-server relationship between mobile phones in which the mobile requesting operations by sending SMS will act as client and mobile serving those operations will act as server. Various operations that can be performed by this application are listed as storing and fetching contact numbers, fetching the device's location, sending SMS to other mobile phones through our remote mobile, auto responding to the incoming messages, finding and fetch the details about SIM and mobile like and we can also switch off our mobile via sending a SMS to it. This application makes the use of both traditional and advance technology like telephony and location based services (LBS [4]. These services are also used in various applications but we are presenting them in very different way from there conventional use. There are some issues that have gotten more attention like convenience to the user, security

which is very important and necessary aspect of this application and efficiency. . The communication between the client and server is done using Short Message Service (SMS). SMS offers the system unique features. It will allow the system to work without the need of internet connection thus allows the application to be implemented on smart phones that don't support GPRS, 2G or 3G internet connectivity. The system sends the location of child's smart phone to parent's smart phone when the parent wishes to check on the child.[5] SMS is text based messaging services available in cell phone or a mobile communication system, which used standard communication protocol that allow the exchange of limited size text message. This technology is widely used in day to day applications throughout the world .For example Text message services generated by users- include financial, news, sports, language and location based services, mobile commerce such as shopping, stocks and share prices, mobile banking facilities, remainders about programs and booking services.[3]

- **Google Places API**

On 10 May, 2011, at the Google I/O developer Conference in San Francisco, Google announced the opening up and general availability of the Google Places API. The Google Places API is a service that returns data about Places —

defined within this Web Service as, spatial locations, or preferred points of interest — using HTTP requests. Place

response specifies locations as latitude/longitude coordinates. The four types of requests are available with the Google Places API

There are 4 fundamental Place services available:

Place Searches - It returns an array of nearby Places

based on a location defined by the user.

Place Details - It returns more specific data about a user defined Place.

Place Check-ins - It allows the request that a person has checked in to a Place.

Place Reports - It allows the users to add new locations

to the Place service, and to delete Places that the application has added to the database.[6]

V CONCLUSION

This paper studies how android platform are effectively used in location based services through GPS which send latitude and longitude through SMS services. The client can dynamically interact with the server side for navigation incase he is lost and searching for the right address.

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