GPS Based Emergency Services

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Abstract -**In last decade tremendous technological advancement has being made every field including cellular devices, which have proven their usefulness in various aspects of life. This has given the tiny handheld devices the status of being the most demanding and desirable electronic device. Cellular devices have become a crucial part of our daily life nowadays. Everyone – from teenagers to senior citizens– have a personal cell phone. Our attempt is to use this same device for the improvement of society and its inhabitant's safety by using it to make emergency services (such as police, ambulance etc.) omnipresent. The project is developed as an Android application capable of registering and forwarding GPS coordinates of the message sender to appropriate authorities in case of an emergency.**

I.   INTRODUCTION.

In the busy world we live today people rarely report any undesirable statutory offense like murder, accident, child and women abuses etc. which they witnessed, to respected counter measuring authority, because they t find it tiring and wearying to visit that authority for submitting the report and to follow other procedures. This has led to decrease in quality of social bonding and vigilance as well as safety and security of individuals. In an attempt to integrate modern technology with today's safety system we came up with an ingenious idea of providing the means of communication with the concerned authorities right within hands reach of the civilians. The proposed Android application, which we envision to develop, would enable the smart phone users to lodge a complaint through the devices right on the crime scene. The coordinates of the device will be registered along with the complaint and necessary help can be dispatch immediately without breaking a sweat.

The motivation for every location based information system is: "To assist with the exact information, at right place in real time with personalized setup and location sensitiveness". The Global Positioning System (GPS), is a radio navigation system that allows land, sea and airborne users to determine their current exact location, velocity and time 24 hours a day, in all weather conditions and anywhere in the world, supporting a broad range of military, commercial and consumer applications[1].

II.   BASE IDEA.

Android platform is a new generation of smart mobile phone platform launched by Google. Android provides the support of mobile map and location service, which is probably concern of vast numbers of developers. So far, the development of mobile map and location applications is complex and difficult, and is often required to pay high copyright fees to map makers. Android is free and open, providing an easy-to-use development kit containing flexible map display and control functions. Our primary motive behind choosing an Android application is to integrate current emergency services with mobile technology to improve accessibility. Recentlly evolved Mobile phones are now viewed as complete package which provide knowledge, entertainment, social connectivity and many more things. They are also loaded with features like navigation, SOS alerts which are helpful in times of need.

As smart phones are taking over the population like a crazed wildfire we aim at equipping safety measures within those smart phones for optimum results. We all are familiar with the ever vigilant 911 service in the United States. In India, which in the past decade has turned into a criminal hotspot, we lack such social security measures. With an intention of bridging that gap for the sake of Indian Society an all-round security application is essential. We merely present the same multifunctional mobile phone as an emergency tool which would aid us in need or an emergency without much configuration changes.

III.   SYSTEM ARCHITECTURE.

The entire scenario can be conveniently express in form of a tabular diagram.
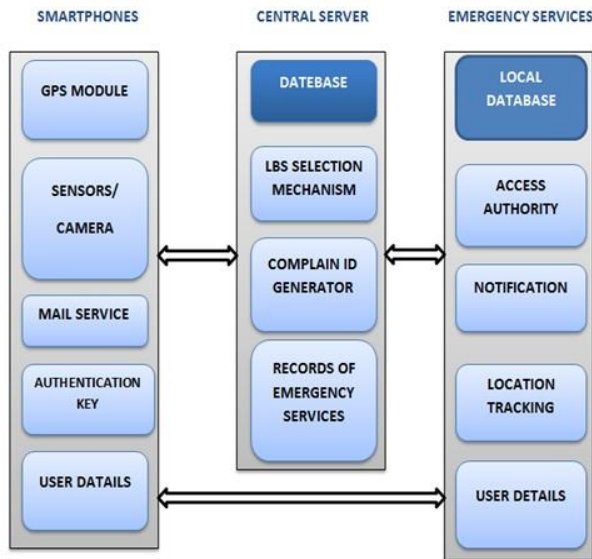
Fig 1. Components of application

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. Fig. 1 shows the main 4 elements that construct the system:which are the GPS system, the mobile clients, web server and the database

A. Mobile Clients (Mobile)

The mobile requests its location from the global positioning system periodically and sends it through the communication network to the server. Mobile client can also send its current location via SMS to any mobile number in the later upgraded versions..

B. Server

The server receives users' location and updates the corresponding authorities regarding the exact current location of the person in distress.

C. Database

The database contains all users subscribed with the service with their location. The database also stores the user's mobile number along with the other information. Whenever, user updates his location the time is also updated.

D. GPS

Every time the mobile phone updates the user location in the server, it requests the location of the user from the GPS. The GPS determines the longitude and the latitude and sends them to the mobile phone which is then forwarded to the server.

E. Map Service

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..

F. Camera

Image captured can be used as an evidence. This will ensure the authenticity of the complaint and can assist any further action that could be taken.

G. Mail Service

User will receive any response via mail.

H. User Details

Will contain information regarding user (e.g. contact no, mail id etc.) Used for future reference.

I. Database

It will hold all the data posted by users and service authorities. This technique provides better accessibility than the traditional file management system making the registration and retrieval of records much easier.

J. LSB Selection Mechanism

Depending upon coordinates provided by GPS, nearest local authority will get selected automatically to ensure timely arrival of help.

K. Complain ID Generator

It will generate unique reference key for each complain posted and it will send it to user as an acknowledgement.

IV. GUI MODEL

Fig.2 GUI model

V. IMPLEMENTATION.

The User Interface near at the client or user side is kept as simple as possible of the sake of understanding in the initial stages of use. The major part of the GUI is developed using ECLIPSE and Android SDK. 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.

A. Client Side

A mobile client is an Android supported handheld device with the GPS receiver providing several features to the user. The mobile client programming language and IDE is XML and JAVA ME PLATFORM SDK 3.0. Android SDK platform is a collection of technologies and specifications that can be combined to construct a complete runtime environment specifically to fit the requirements. Android platform has been divided into two base configurations, one to fit small mobile devices and one to be targeted towards more capable mobile devices like smart-phones and set top boxes. The configuration targeting resource-constraint devices like mobile phones is called the Connected Limited Device Configuration (CLDC). It is specifically designed to meet the needs for an Android platform to run on devices with limited memory, processing power and graphical capabilities.

B. Server side

The application needs centralized database for the purpose of location sharing. MYSQL was used for the database and PHP was used for implementing server functions to modify these data as user demands. First we fulfill this need by using local server on Personal computer (PC) .For this purpose we used software named WAMPSERVER which include PHP, MYSQL and apache web server in one package [2]. In this application, once a client sends its request over the network to the server, it is then up to the server to interpret the request and generate an appropriate response. The application's receiving end on the server is a PHP page which is a regular HTML page with two elements added: First, the file's name ends with the ".php" extension, so that the web server knows that it should be interpreted specifically. Second, the file includes some server-side code instructions, such as getting the current date that the server should perform before sending the page to the client side. In the application's main menu shown to the user, lists of available layer names are displayed for the user to select. Once the user makes his selection, the client connects to the server and transmits the user's request parameters using GET/ PUT method, which fires the PHP code execution on the server. The PHP code is used to reach the database and form a dynamic HTML page with the data pulled out from the database. In the application, PHP code mostly contains SQL statements to make the queries in the database. The resulting data is then sent back to the client. The communication with web server takes place over the TCP/IP protocol.

C. LBS Components

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. Global System for Mobile communications (GSM) is currently the most common standard for mobile network and is used by majority of mobile phones globally. Mobile networks are usually controlled and maintained by operators who provide connectivity for mobile users and charge them for data and voice transmission. A positioning component is usually needed in a LBS application to determine the location of user's mobile device. Most of the current LBS services do not require users to input location manually, like giving zip code or street name. Instead user's location can be obtained by using some positioning technologies, such as satellite positioning, cellular network positioning, WLAN stations or radio beacons . 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.
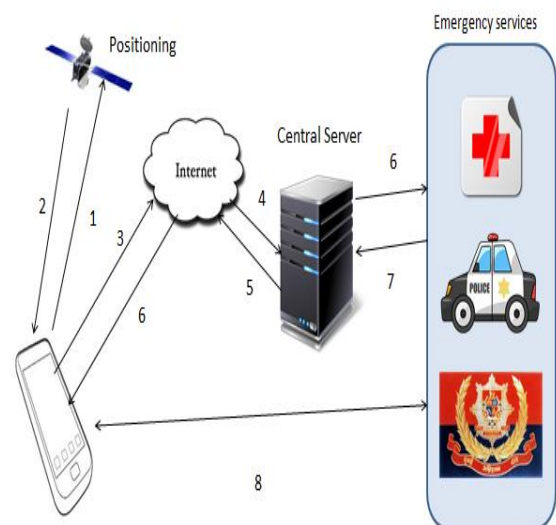

Fig.3: Implementation flow

VI. CONCLUSION

Depending upon current location of user, the application will successfully forward his complain to local authorities. The application is also implemented as a client server system that

helps users to share his location and other information with server. The location average accuracy using this system is believed to be within a couple of meters. The application works better in the open space areas only as it relies on GPS.

In spite of the limitations if this system is enforced, the public can achieve great success and ensure safety of the public. Also the government bodies will be able to help the public in a better functional manner.

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