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Automated Location Based Services

Vedang Moholkar, Prathamesh Hule, Mandar Khule, Sumit Sourabh
Comp Dept., PVPIT, Pune,
India

Abstract: *Over the next few years there is likely to be a dramatic increase in services for the general public which are based on knowing their location. Location-based system positions a person's mobile phone to provide some context-based services. Some of these services – called 'location tracking' and 'push LBS' etc. applications need frequent updates of the current position to decide whether a service should be initiated at the current moment or not. Automated location based services will facilitate users with scheduling their jobs and provide services in relationship to a personal context of an identified user in terms of time and place. Thus, auto switching mobile phone profiles and setting reminders for particular location.*

Keywords: *GPS, Google maps, Haversine Formula, Android.*

I. INTRODUCTION

Most of the applications in today's world are using android operating system. Android is one of the versatile operating system which is capable of satisfying the user. In this system we are going to develop android applications which are location based. We will use GPS concept to implement our "Automated Location Based Services". The whole concept is that, when we reach any desire place then our mobile should indicate us to complete some of the task as we have already come here. The purpose of this system is to make changes in profile as per location, give reminders as per location and meeting request. This application allows user to input locations by typing in the addresses or by selecting location from Google maps and providing actions at that location. The output to this system are profile change as per location, text reminders and text sms in meeting request. The system continuously keeps on updating the location and takes actions as specified in database at that location. This application allows to provide services at public places automatically as well as the locations of users choice.

II. LITERATURE SURVEY

In last few years usage of smart phones in general public has been increased. Previously cell id's and cell towers were used to find the location of the phone. Now a days concept of cell id's are replaced by GPS (Global positioning system). GPS calculates the latitude and longitude and according to that exact location of the phone determined. GPS receivers are now embedded into mobile phones and applications using the location of the user in real-time are widely available.

The main purpose of location-based services is to provide services to customers based on the knowledge of their locations. Certain attempts were made to implement location based services. In previous applications profile change and reminders were implemented but in those applications user needed to choose the profile manually after reaching to the selected location. In proposed application profile gets changed automatically according to the location. Previously features like public place based profile switching and meeting request were not provided but in proposed application such services are provided.

III. PROPOSED SYSTEM

A Introduction

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. With the help of A-GPS in phones and through Web Services using GPRS, Location based Services can be implemented on Android based smart phones to provide these value-added services: handset profiling, scheduling alarms.

Location-based services are a general class of computer program-level services used to include specific controls for location and time data as control features in computer programs. As such (LBS) is an information and has a number of uses in Social Networking today as an entertainment service, which is accessible with mobile devices through the mobile network and which uses information on the geographical position of the mobile device. This has become more and more important with the expansion of the Smartphone and tablet markets as well.

We would like to use location services to help user to provide location based services as alarms, profiling.. Profile of mobile handsets is like configuration parameters for so many things. Some of the examples of profiles are office, silent, outdoor etc.... Now people use these profiles as per their schedule but they need to update it after their action is over. It means that profiles cannot be updated by itself. So we propose applications which will automatically switch profiles as per user location. Sometimes we have some work at a particular location and we forget it to do even

when we reach at that location. In such case this application reminds us about our work when we reach at that location and this application includes one more important module and that is meeting request. In this module user is suppose to add the contact number of the person whom he/she is going to meet and also the location where they are going to meet, when user reach the nearby location automatically a text message is sent to the other person whom he/she is going to meet. This saves the waiting time.

B System Architecture

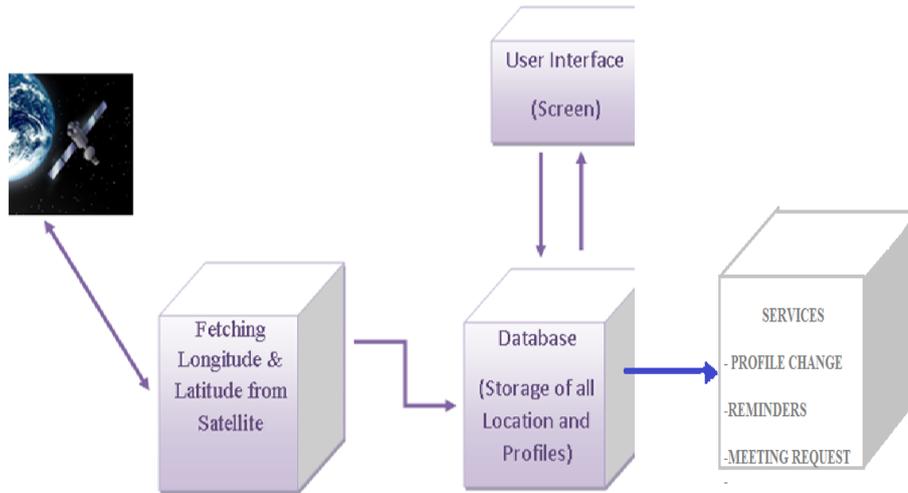


Fig- System Architecture

System mainly consists of following components:

1. **Database:** It stores information about location where various services are to be performed.
2. **Service handler:** It handles various services like profile change , reminders and meeting request.
3. **User Interface:** It allows user to select particular location dynamically and allot action to be taken at that location and also allows to add contact numbers for meeting request.
4. **GPS system:** It continuously fetches the location co-ordinates and compares it with database and if any match found it calls the service handler.

IV. IMPLEMENTATION DETAILS

The whole functionality of the product is to find the exact location of the user when he starts using the application. For this we are using GPS and Google Map to find the users exact location. Using the extracted location information, application will search for any services registered by user for this location. Means if any alarms are requested then application will generate alarm. If any profile has been selected then application will change user's handsets profile. Also application will track whether user is nearby any Hospital or Petrol pump to put users handset on offline mode/silent mode. The client to whom you are going to meet doesn't have to wait as he receives message automatically when you reach nearby location. In this application location shown by the GPS is going to be optimized so that user will know the exact location.

A. Mathematical model -

In this application, to implement all the modules its very necessary to calculate the shortest distance between two points. It is calculated by formula

$$dist = \arccos(\sin(lat_1) \cdot \sin(lat_2) + \cos(lat_1) \cdot \cos(lat_2) \cdot \cos(lon_1 - lon_2)) \cdot R \quad (1)$$

Where 'R' is the radius of the Earth.

We can also use alternate formula for this called as 'Haversine' formula

$$\begin{aligned} \text{Haversine formula:} \quad & a = \sin^2(\Delta\phi/2) + \cos(\phi_1) \cdot \cos(\phi_2) \cdot \sin^2(\Delta\lambda/2) \\ & c = 2 \cdot \text{atan2}(\sqrt{a}, \sqrt{1-a}) \\ & d = R \cdot c \end{aligned}$$

Where ϕ is latitude, λ is longitude, R is earth's radius (mean radius = 6,371km)

V. FEATURES

On start up application runs automatically in background. It means user don't have to separately start this application when he/she turn on his/her phone. This application uses dynamic Google map 2.0 version. This application is purely a client side application so there are no problems related to server.

VI. FUTURE SCOPE

This is a pure client side application .Application can be extended by connecting it with servers. It can include environment based services(e.g.: weather conditions, traffic conditions alerts) or restaurant based services(e.g.: time of closing, menus, prices etc). GPS accuracy can be improved in future.

VII. CONCLUSION

In today's fast moving world people tends to reduce their work effort and also save their time. This application intelligently provides the services as per locations, thus reducing human efforts. An elegant GUI improve user experience

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