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INTERNET INDEPENDENT MOBILE LOCATION TRACKING SYSTEM

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ABSTRACT

This paper represents Global Positioning System (GPS) based Internet Independent Location tracking application on mobile devices mainly on Smartphone. Now-a-days over billion people are using Smart phones which have inbuilt GPS facility. So it is very handy and useful if GPS based location tracking application is installed on Smartphone through which any person can be tracked whenever it is needed. This application is internet independent application. It is only required to have a phone to track a person. There is no need to have Smart phones in both ends. In this application this facility has been successfully achieved. Here a person's exact address can be achieved via SMS service through this application. Here all the security issues are also taken care .This application only send location to those mobile numbers which is already saved into database. If tracker uses smart phone then that received location information will be shown to Google Map.

Keywords: Location Tracker, GPS, Internet independent, Location Based Service(LBS), Android Application.

1.INTRODUCTION

Smart phones become the rapid growing technology in human life. A survey, by 2015, says that around two billion peoples are using smart devices. So, with its high usage peoples are expecting more and more user friendly technology. So, many applications are coming up very fast with its new features. Many of them are completely based on internet connection. But in many situations internet accessing is not possible. Then those applications become completely useless and sometimes those applications cannot able to give exact data even it is connected on Internet.

For this reason this Android based Location Tracking Application is proposed to solve those problems. Tracking or getting location of any person become very crucial in many situations like if that person is not picking up phone for a long time or if a person is returning home in late night. In this paper two things are highlighted. First, to develop such application which is internet independent as sometimes internet connection is unavailable and second, there is no need to have smart phones in both ends. On this paper not only Location Tracking facility is used on its highest accuracy but also it is scalable enough to get location of any person though internet is not available.

2.LITERATURE SURVEY

Mahesh Kadibagil [1] describes mobile based position detection and location based GPS tracking system where friends and family member can be tracked when they come around on the particular area which is predefined by user. This system includes a web client, map service, a repository, a mobile client and a server. But in this system Smart phone is needed at both the ends.

Monika Sharma [2] describes location tracking which is internet based system where location of any person/device can be achieved in form of latitude and longitude. But this system is completely dependent upon internet and hence location tracking is not possible where Internet is not accessible.

Nikita Mithapelli [3] describes Emergency mobile tracking system which is based on LBS and GPS system. This system includes client server based system which mainly used for tracking family members and receiving alert message about their location. For getting connection with the server it is important to have internet connection every time as described in this application.

Lash Kari A.H, Parhizkar B, Raman [4] describes Widgets based Location Tracking system where Location of friends and family members will be sent through a communication channel to share with others. This is a client server based system. Here only family members and friends can access the location and also both ends need to have smart phones.

Kumar N, [5] describes a location awareness system where position of the any smart devices or person can be achieved without informing the person. It can be used when mobile devices will be lost or snatched. This mobile based application will be implemented by GPS, GPRS, Google Maps. In this Location awareness system there is no authorized person only who can track. But it becomes very insecure as any person can achieve location of any person which is not secure.

Mr. Nilesh Manganakar, Mr. Nikhil Pawar, Mr. Prathamesh Pulaskar [7] describes real time a complete transport tracking system where any transport can be tracked rather waiting for a long time in bus stoppage. This application needs to access internet connection to get position of the transport. As it will increase annual cost of transport companies for spending some money on internet that may cause to increase the fare of that transport too.

B. P. S. Sahoo and Satyajit Rath [8] describes Location monitoring system using GPS where an object moving path is shown on Map on the monitor in case of car theft or tracking adolescent drivers . But this system requires constant internet connection.

Ruchika Gupta and BVR Reddy [9] describes human tracking system in a cost effective way .It is used IMEI number as tracking technology. As this system is stated this is a cost effective application but still it requires to access internet all the time for accessing location it also consumes some cost.

Amol Dhumal, Manali Shilimkar ,Amol Naikoji, Yutika Patwa, Prof. M. K. Nighot [10] describes GPS based vehicle tracking System where an organization can track their each and every vehicle with GPS system and that can be monitored in Google Maps on monitoring devices. This application is required to have smart phones in both ends and also internet connection for accessing this. This would be more costly to achieve those requirements to use this application. Any vehicle company will must spend some money for this.

Duansheng Chen, Yongquan Du ; Yibao Zhang [12] describes Location tracking system for field police worker where position and event will be described to reach police quickly with detailed position in Google Map is proposed with the facility of sending and receiving SMS. This application will be useful only when both ends use smart device.

Ankur Chandra , Shashank Jain , Mohammed Abdul Qadeer [13] describes Location detection and sharing with friends and family using server side programming. This application needs to access sever as well as constant internet connection to access that server.

3.METHODS AND MODELS USED

In this GPS based location tracking system has mainly following objectives:

This application works as location tracker which can be used to track any person in any adverse situation as well as it helps to track any object also.

Tracker person must be saved some phone numbers who can track her whenever they need this. So, only selected person can track her.

This is Internet independent applications i.e. whenever internet is not available then also tracker can receive the data about location of the person.

Tracker does not need to have smart phones at all.

4.GPS (Global Positioning System)

GPS is a satellite-based navigation utility system .It is made up by 24 satellites which are placed into orbit by the U.S. Defense Department. GPS satellites circle our earth twice a day. It continuously transmits signal information to earth. GPS receivers take the information and calculate exact location. It makes it possible for people with ground receivers to pinpoint their geographic location. The location accuracy is 100 to 10 meters for most equipment. In this application GPS is used along with Google Map for fetching the location and showing the location in the Map.

The `Location Manager` is a predefined class provides Android location service. These services allow to access location providers, to register location update listeners and different types of alerts and more. Fig1 describes GPS working principles.

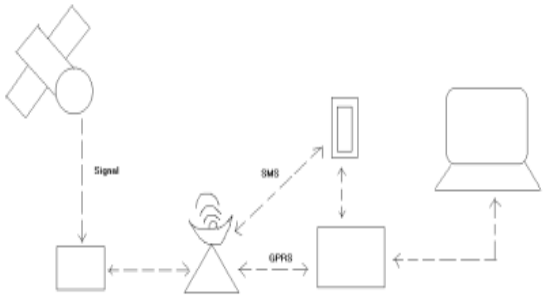

Fig1: How GPS works

Google Maps

Google Maps is a Web-based service that shows geographical regions and sites in detail around the world. In addition to conventional road maps, Google Maps offers satellite views of all places. In some cities, Google Maps also offers street views.

Android allows us to integrate Google maps. Any location and different routes can be viewed on the map etc. It is possible to customize the map according to user's choices.

5.PROPOSED METHODOLOGY

The proposed system architecture is shown in Figure 4 and consists of following modules.

- ❖ Tracker Person
- ❖ Tracking Person
- ❖ Google Maps
- ❖ Sqlite Database
- ❖ Global Positioning System(GPS)

In Fig2 total System Architecture is explained.

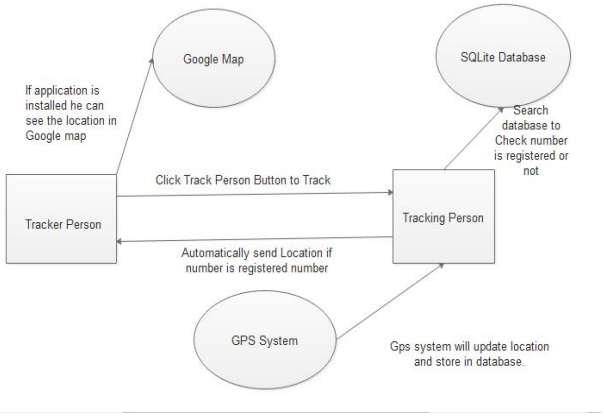

Fig2: System Architecture of proposed system

TRACKER PERSON

Tracker person of the system architecture is that person who can track the person whenever it is needed. If Tracker Person does not have smart device, still he/she can get the information of that tracking person. If tracker person has the smart phone with cellular data active then whenever he/she receive SMS regarding the location information of the tracking person ,it will open the application Google map part to show the current location of the tacking person with pin.

TRACKING PERSON

Tracking person of the system architecture is that person whom tracker can track. Tracking person must have smart device. When tracking person receives SMS "hi" from a tracker then this application will search database if that number is registered number or not. If it is a registered number then automatically the location information will be sent. If on that moment cellular data is no active then it will send last updated location to the tracker.

GOOGLE MAPS

Google map is an inbuilt feature of smart devices. When tracker person will receive SMS regarding location information then if cellular data is active then application will open with Google Maps to show the location of the tracking person to Google Maps with pin.

GLOBAL POSITIONING SYSTEM

Global Positioning System (GPS) is also an inbuilt feature of the smart devices. In this application GPS will keep update of the location whenever it will be opened. If any tracker person wants to track the person then that location information will send to him/her which has been updated with GPS.

SQLite DATABASE

Sqlite Database is database system which is implemented in this application. Whenever this application will be installed to any device then that person can save some number who can track him/her. Here mobile number can be added or deleted.

6.IMPLEMENTATION

This system is based on Android Operating System. The Database is used is Sqlite Database. The front end is based on XML (Extensible Markup Language) and backend is based on JAVA. The total system can be expressed through this following algorithm.

The overall algorithm is described below

STEP 1: Start
STEP 2: If any message is received then the application go to Active mode from the Ideal mode.
STEP 3: Message will be read by the application to check if it contains "hi"
STEP 4: If text of SMS contains only "hi" then
If the sender number is authorized then
If GPS is on then check then
If mobile data is on then
If application is open
Location will be fetched from the welcome page of the application and go to STEP 5.
Else it will check the database for last update of location when GPS was activated and go to NEXT STEP.
STEP 5: SMS process will be initiated and SMS is sent automatically about his location to the tracker.
Else do nothing.
STEP 6: After receiving SMS to the tracker, check if the application is installed to his mobile then
STEP 7: If mobile data is on then
STEP 8: The location will be shown to his Google Maps
STEP 9: END

USE CASE DIAGRAM

In Fig3 use case diagram of this application is described. In this diagram it is shown how Tracker person and Tracking person interact with total system.

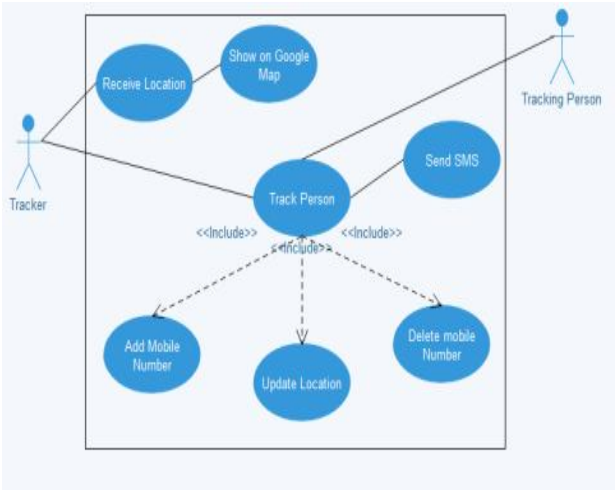

Fig3: Use Case Diagram of proposed system

ACTIVITY DIAGRAM: In Fig4 Activity Diagram of this proposed system is shown. In this diagram the activities are described like how they interact with each other and what conditions control the activity flow etc.

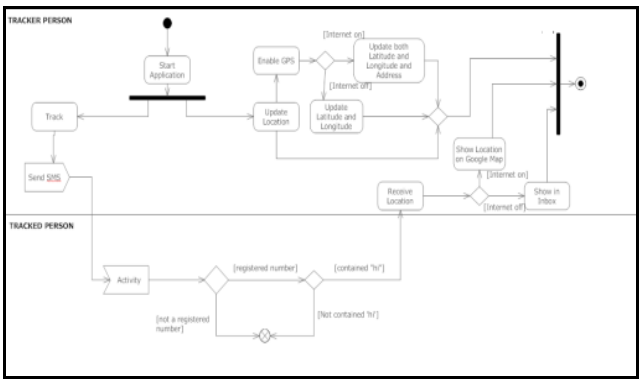

Fig4: Activity Diagram of proposed system

7.EXPERIMENTS and RESULTS

The experiments are done on Windows Operating System. The application is executed on Emulator and Android devices with GPS system and Google Map facilities. Some results are shown below with the screen shots.

- ❖ In Fig5 splash screen is shown which will be appeared first after application opening.
- ❖ In Fig6 update location and Track Person Button will come up.

Fig5: Splash Screen

Fig6: First Page

- ❖ If 'Click here for Update your Location' button is clicked then this following activity will open, shown in Fig7.
- ❖ After updating location Fig8 will open.

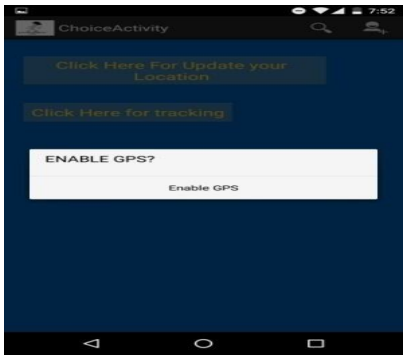

Fig7: Enable GPS

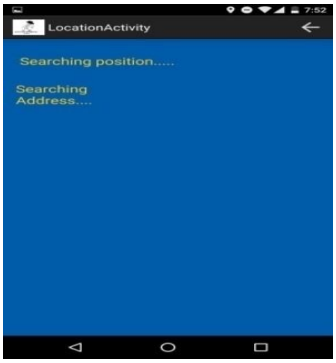

Fig8: Searching Position

- ❖ After receiving message about location of the tracking person. Fig9 is showing message received with address and Latitude and Longitude of the tracking person.
- ❖ This Activity shows location on the map if cellular data is activated of the tracker. In fig10 the received location is showing on Google Map.

Fig9: Location SMS

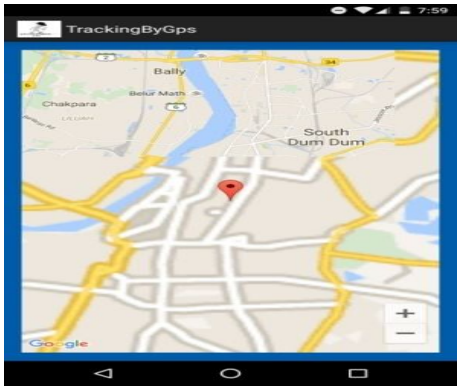

Fig10: Show Location in Map

8.DISCUSSION AND CONCLUSION

When a plain GPS system gets costly, a simple mobile application can do the same thing very effectively and that is free of cost. It will not only send the latitude longitude but also the application can fetch the exact address of the person though the application is not installed to the both ends. If it is installed to the both ends the location will be shown to the Google Maps to tracker ends. It is internet independent application where it is possible to get exact location of any person though smart phone is not connected with cellular data. Keeping on mind the security this application is also facilitate enough for not sending location to any mobile number. There is a registered number option where particular mobile number can be saved by which only that registered mobile number can get the location of the person. Some advantages and disadvantages are described in the following

ADVANTAGES:

- End user can track his/her position.
- End user gets exact address of the person along with latitude and longitude.
- If end user has smart phones then location of the tracked person will show on the Google Map.
- If internet is not available then also tracker can receive the SMS about the last position of the tracking person.

DISADVANTAGES:

- Tracking person who is tracked must has smart phone.
- If internet is not available to the tracking person then only Latitude and Longitude will be updated.

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