

Innovative Solutions for Women's Safety: The Role of Automatic GPS Location Trackers

S. Park^{*1}, J. Kim² & H. Lee³

¹Student, School of Computer Science, Seoul National University, Seoul, South Korea

²Assistant Professor, School of Computer Science, Seoul National University, Seoul, South Korea

³Assistant Professor, School of Computer Science, Seoul National University, Seoul, South Korea

ABSTRACT

The project “SAFETY MANAGEMENT FOR WOMEN THROUGH AUTOMATIC GPS LOCATION TRACKER” is designed using Standard Android 4.0.3 platform. The platform used to develop the application is Eclipse IDE (Mars) with Java 1.6 Standard Edition. It's an android app which will help people in their crucial time. For example if a person is in trouble and he needs a help so there should be an app through which he/she can contact with their one to help them by just clicking on one button, it will automatically send your 5 to 6 friends or family members about your status with your current location. The user adds the contact number and message using this app. In crucial time user message and location is automatically send to these contact numbers by clicking one button. In addition user tracks the location details by using GPS in mobile device. Therefore the user no needs to contact a person directly in a crucial time. When an application is on GPS mode is automatically enabled. This app contains self-defense techniques and emergency numbers. In addition it contains police siren sound when a user long press a volume button this sound will be enabled in an emergency situation. The mobile numbers that are already stored in this android app only can get notification in emergency situation. When the mobile is not identified, this app can easily track the mobile location through sending SMS to the Authorized user Mobile. This is more reliable and low cost

I. INTRODUCTION

Mobile tracking system installed in the missed mobile, to track the place. The place of the mobile identified using Global Positioning system GPS. These systems constantly watch a moving Mobile and report the status on demand. When the mobile is not identified, the android app in the mobile, automatically send SMS to the Authorized user Mobile. This is more reliable and low cost. The Mobile Register detail contains the Name of the contact person, mobile number of the person and address details to be given. Through these details SMS send to that number based on this process to avoid the unauthorized person to get the details about mobile information. The mechanism used in an organization to track the detection, reporting, and resolution of some type of problem. The project a goal is used to process the location activities in the Mobile based application. The application is processed in the end user application in well efficient manner. The project theme is executed in the about mentioned sequence flow for the reference. The application is more secured that the data is preventable from the unauthorized access.

II. LITERATURE SURVEY

P.Kalyanchakravarthy [1]-This paper describes about a Safety Triggering application being developed and its successful implementation with tested result The application has target users those sections of the people who surprisingly fall into a situation where instant communication of their whereabouts becomes indispensable to be informed to certain authorized persons at remote end. This application main purpose is for women's safety. When we feel that we are in emergency situation, for example travelling alone in the Auto/Cab at night time we can use this application so that on one click we can send our location to our family members and to any police stations continuously until we stop with password based button **Bramarambika Thota and Udaya Kanchana Kumar [2]**-The usage of smart phones equipped with GPS navigation unit have increased rapidly from 3% to more than 20% in the past five years. Hence, a smart phone can be used efficiently for personal safety or various other protection purposes especially for women. This paper presents Sauver, a personal safety application developed for smart phones of android platform. This app can be activated by a single click when the user feels she is in danger .This application communicates the user's location to the registered contacts for every few seconds in the form of message. Thus, it acts like a sentinel following behind the person till the user feels she is safe. The key features of this application are along with the user's location, one of the registered contacts gets a call. Also, the registered contacts and GPS location are saved from time to time in a database. **Mr.Magesh Kumar.S, Mr. Raj Kumar.M [3]**- This project presents an alert system for PROB detection using common commercially available electronic devices to both detect the PROB and alert authorities. Data from the

accelerometer is evaluated with several threshold based algorithms and position data to determine a PROB. The threshold is adaptive based on user provided parameters such as: height, weight, and level of activity. The algorithm adapts to unique movements that a phone experiences as opposed to similar systems which require users to mount accelerometers to their chest or trunk. If a PROB is suspected a notification is raised requiring the user's response. If the user does not respond, the system alerts pre-specified social contacts with an informational message via SMS. If a contact responds the system commits an audible notification, automatically connects, and enables the speakerphone. **Bhijit Paradkar and Deepak Sharma**[4] According to the reports of WHO, NCRB-social-government organization 35% Women all over the world are facing a lot of unethical physical harassment in public places such as railway-bus stands, foot paths etc. In this paper the authors have reviewed of various existing systems on women security. The authors have felt a need of advanced women security system to provides the safety measure in public places as well as travelling alone through public transports (school buses, company vehicle etc.). This paper proposed a new model for the women security in public places which aims to provide the 100% safe environment. **Ravi Sekhar Yarrabothu and Bramarambika Thota** [5]in today's world, people using smart phones have increased rapidly and hence, a smart phone can be used efficiently for personal security or various other protection purposes. The heinous incident that outraged the entire nation has wakened us to go for the safety issues and so a host of new apps have been developed to provide security systems to women via their phones. This paper presents Abhaya, an Android Application for the Safety of Women and this app can be activated this app by a single click, whenever need arises. A single click on this app identifies the location of place through GPS and sends a message comprising this location URL to the registered contacts and also call on the first registered contact to help the one in dangerous situations. The unique feature of this application is to send the message to the registered contacts continuously for every five minutes until the "stop" button in the application is clicked. Continuous location tracking information via SMS helps to find the location of the victim quickly and can be rescued safely

III. SYSTEM ANALYSIS

1. Existing system

Mobile tracking facility is not available in the existing system which forces the user to specify the location details by him turns as the major drawback. In the existing system, the project contains options for tracking the current GPS location (Latitude, Longitude) of the mobile and displays it. So other required user cannot view/track the visited details of this mobile. Likewise, the details are not intimated to other given mobile no. as short message service. Owner cannot track the location of mobile. The person who is in difficult situation could not interact with known persons and convey their emergency situation. They are unable to enable the GPS services at the critical issues. This existing system is unable to track the person location and know their latitude, longitude and city details. Playing of Siren is not provided with existing system which diverts the nearby people and help them from issues.

Drawbacks

- **Service** does not have user interface and run in background
- The component **Broadcast Receivers** receives and reacts to broadcast announcements.
- Finding distance from one source location to more destination location is not possible.
User cannot track the given particular

2. Proposed system

In addition to existing system, the project contains options for tracking the GPS location (Latitude, Longitude) of the mobile At the given location details can be messaged to the given user mobile numbers also. The owner will receive a short message sent by GPS module and also main advantage of this application is to find out the mobile easily because of this owner mobile automatically enable the GPS Service for that given missed mobile. It is only applicable to the android mobiles. They can easily inform their known persons at their emergency situation by sending the SMS to their registered mobile number and save them at right time.

Advantages

- The user can simply use this app to locate and monitor the mobile location in real time.
- Short Message Service (SMS) is a good choice of communication.
- User friendly options.
- Improve information sharing.
- This app contains Emergency Number such as police, fire service etc.
- In addition police siren sound can be enabled in an emergency situation.

IV. FEASIBILITY STUDY

The main objective of the system analysis is to study the existing operation and to learn and accomplish the processing activities. The management of location status update information provision through android application needs to be analyzed well the details are processed through coding themselves. It will be controlled by the programs alone.

Economic feasibility

The organization has to buy a personal computer with a keyboard and a mouse, this is a direct cost. There are many direct benefits of covering the manual system to computerized system. The user can be given responses on asking questions, justification of any capital outlay is that it will reduce expenditure or improve the quality of service or goods, which in turn may be expected to provide the increased profits. The project is economical such that it consumes less memory in the mobile device and so consumes less power only.

Operational feasibility

The Proposed system accessing process to solves problems what occurred in existing system. The current day-to-day operations of the organization can be fit into this system. Mainly operational feasibility should include on analysis of how the proposed system will affects the organizational structures and procedures.

Technical feasibility

The cost and benefit analysis may be concluded that computerized system is favorable in today's fast moving world. The assessment of technical feasibility must be based on an outline design of the system requirements in terms of input, output, files, programs and procedure. The project aims to provide the latitude and longitude of current location information to all people having android mobiles through customized android application's activities. The current system aims to overcome the problems of the existing system. The current system is to reduce the technical skill requirements so that more number of users can access the application.

V. MODULE DESCRIPTION

- **Trace latitude and longitude**
- **Mobile settings**
- **Trace latitude and longitude**

This module provides details about latitude and longitude of the android mobile using Location Listener interface. It consist event as on location changed event and method as `location.getLatitude ()` and `location.getLongitude ()` is used to get the location details. These methods are mainly used to find the location of corresponding android mobile and the details are gathered and updated to normal mobile itself.

- **Mobile settings**

In this module user sets a message and mobile number. Using this module user knows the mobile location by sending the SMS to required android mobile.

Automatic enabling of GPS

In this module, The Global Positioning System (GPS) is enabled on mobile device when the application is used and the message is reached from the corresponding android mobile. Based on this enable option GPS is automatically updated and give the latitude and longitude value of the current place. `Settings.Secure.Location_Providers_Allowedmethodused` to automatically enable a GPS

Creating security group of emergency number

This module used to adds emergency number such as police, fire service, ambulance etc., In an crucial time user press a number like 5 this app sends user location as SMS to the stored emergency numbers. It contains police siren sound when a user long press a volume button this sound will be enabled in an emergency situation when an app is on position. In addition every particular time limit user location is send as SMS to predefined mobile number.

VI. PROJECT DESCRIPTION

Problem definition

The project is mainly used to find the mobile location using GPS (Global Positioning System). The system provides essential information to military, civil and commercial users around the world and which is freely accessible to anyone with a GPS receiver. GPS works in any weather circumstances at anywhere in the world. In this system the owner mobile automatically enable the GPS option for the missed mobile. It is very useful to find out the mobile. To overcome the above difficulties, a system is required so that the problems may not be

happening. The computerized system now reduces the risk and time involved in the GPS Tracking process. The easy mobile application makes them for enable the location and sends the SMS to user mobile. Hence, if there is an application to tracking the losing mobile and send the SMS, then the problems can be solved. The software used to solve the problem and develop the android application is Eclipse Mars IDE with Android as programming language and SQLite 3. The modern computerized system is developed with the aim to overcome the drawbacks of existing system. The proposed system has got many advantages. People from different parts of the world can track the person very easily. The new system is more personalized. It is made in such a manner that all the new users can understand all the options in it very easily. It is made in a quick and easy referential manner.

VII. SYSTEM DESIGN AND DEVELOPMENT

1. Input design

Input design is the process of converting user-originated inputs to a computer understandable format. Input design is one of the most expensive phases of the operation of computerized system and is often the major problem of a system. A large number of problems with a system can usually be tracked back to fault input design and method. Every moment of input design should be analyzed and designed with utmost care. The system takes input from the users, processes it and produces an output. Input design is link that ties the information system into the world of its users. The system should be user-friendly to gain appropriate information to the user. The decisions made during the input design are To provide cost effective method of input.

- To achieve the highest possible level of accuracy.
- To ensure that the input is understood by the user.

System analysis decide the following input design details like, what data to input, what medium to use, how the data should be arranged or coded, data items and transactions needing validations to detect errors and at last the dialogue to guide user in providing input. Input data of a system may not be necessarily is raw data captured in the system from scratch. These can also be the output of another system or subsystem. The design of input covers all the phases of input from the creation of initial data to actual entering of the data to the system for processing. The design of inputs involves identifying the data needed, specifying the characteristics of each data item, capturing and preparing data for computer processing and ensuring correctness of data. Any Ambiguity in input leads to a total fault in output. The goal of designing the input data is to make data entry as easy and error free as possible. This project includes following input forms in the server system.

Mobile Registration

This form contains information as user mobile number and keyword such as 'location' or 'track'. These details are stored in 'MobileRegister' table

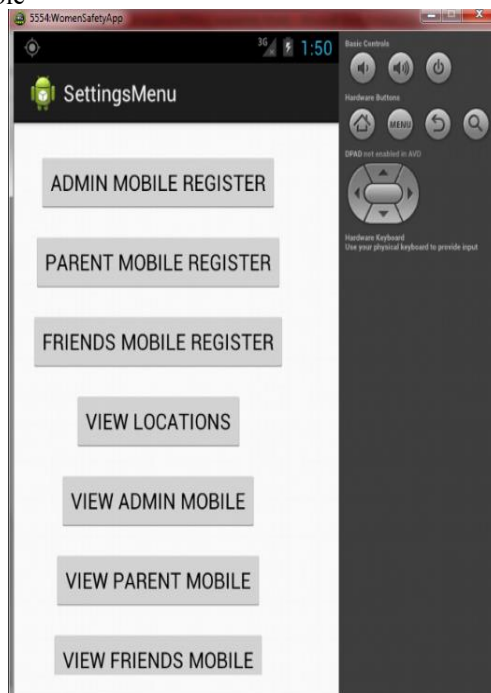


Fig (7.1.1): Mobile Registration

Add Contact Number

In this form contains the name of the contact user and mobile number also have address of the user. These details are stored in contact table.

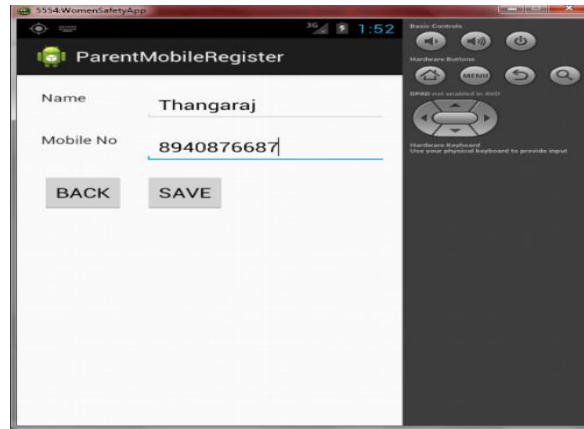


Fig (7.1.2): Add Contact Number

Add Emergency Number

This contains used to store the emergency numbers. It includes emergency number and name. These details are stored in 'Emergency Number' table.

Message Setting

This form contains information as user mobile number, key and message. These details are stored in 'Message Setting' table.

View Location

This form contain location information. these details are stored in "View Location" table.

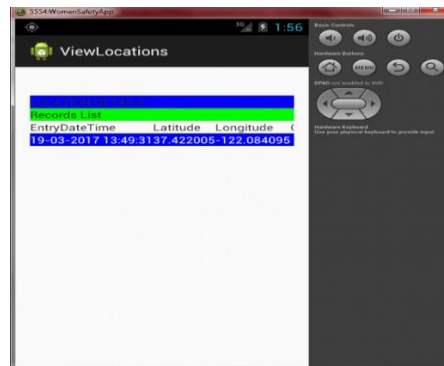


Fig (7.1.5): View Location

VIII. SYSTEM IMPLEMENTATION

In the System development life cycle, the system implementation and maintenance will be occurring after the completion of analysis and system design. The term implementation is ranging from the conversion of a basic application to a complete replacement of a computer system. In other term, implementation is used to process of converting a new or a revised system design into an operational one. Implementation is the process of converting a new system design into operation. It is the phase that focuses on user training, site preparation and file conversion for installing a candidate system. The important factor that should be considered here is that the conversion should not disrupt the functioning of the organization. The implementation process begins with preparing a plan for the implementation of the system. According to this plan, the activities are to be carried out in these plans; discussion has been made regarding the equipment, resources and how to test activities. Thus a clear plan was prepared for the activities.

The implementation phase is less creative than system design. It is primarily concerned with,

1. User Training
2. Site preparation

1. User training

An analyst of user training focus on two factors, user capabilities and the nature of the system being installed. Users range from the naïve to the highly sophisticated. Development research provides interesting insights into how naïve computer users think about their first exposure to a new system.

2. Site preparation

The review team prepares a formal review plan around the objectives of review, the type of evaluation to be carried out and the time schedule required.

3. Types of implementation

There are three types of implementation,

- Implementation of a computer system to replace a manual system
- Implementation of a new computer system to replace an existing one
- Implementation of a modified application to replace an existing one, using the same computer

During the final testing, user acceptance is tested followed by user training. Depending on the nature of the system, extensive user training may be required. Conversion usually takes place about the same time the user is being trained or later.

The implementation of the project is done through the following steps,

- Install NET framework.
- Create the folder with project name and bin, object folders are copied into that project folder
- Implementation of a computer system to replace a manual system
- Implementation of a new computer system to replace an existing one
- Implementation of a modified application to replace an existing one, using the same computer

During the final testing, user acceptance is tested followed by user training. Depending on the nature of the system, extensive user training may be required. Conversion usually takes place about the same time the user is being trained or later.

IX. CONCLUSION AND FUTURE ENHANCEMENTS

Conclusion

The application eliminates the manual communication difficulties currently faced by the user. It is developed in a user-friendly manner since the application is developed using Android. The application is very fast and any transaction can be process across the network. Error messages are given at each level of input of individual stages. Concurrently the application can be executed since the database is SQLite and capable of processing more client connections. The database is required to be installed in server space only. Only client drivers are required in client nodes before accessing the application.

Future enhancements

The project provides a best assistance in the network based regime. It allows adding up the following facilities in future

- Automatic pre-recording call to owner.
- Take photo from camera and send it to owner.
- Implement website with integration of app.
- Integrate with loud speaker to alert theft message to people

X. REFERENCES

- [1] Professional Android 4 Application Development 3rd Edition, Reto Meier, Wiley/Wrox.
- [2] Android Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides) 1st Edition, Bill Phillips, Kindle Store.
- [3] Android Programming: Pushing the Limits, 1st Edition, Erik Hellman, Wiley