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# Waypoint Based GPS Tracking

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**Abstract:** *This research article proposes an Android based application to monitor a user's day-to-day travel and send his/her location to preset contacts to let them know their whereabouts. This is beneficial for working parents who cannot be around their children all the time and thus helping them in knowing their child is safe through real-time monitoring or via SMS. Thus, this application really benefits working parents and makes their everyday busy schedule a little less demanding. This is very easy to use and affordable as it requires a working internet connection, and an Android smartphone to track movement and send updates. This technology also proposes a way to use the application offline for devices without an active internet connection. This project can be implemented across different platforms.*

**Keywords:** *Android, Child Tracking, Cross Platform, Geo-fence, Global Positioning System (GPS), Offline, Short messaging service (SMS).*

## I. INTRODUCTION

In India, a child disappears at regular intervals, as indicated by information from the National Crime Records Bureau in 2012. This measurement has expanded by around 84% between 2013-2015 for individuals of ages 15-30 years. Indeed, even in a created nation like the U.S. approximately 800,000 youngsters are accounted missing every year.

The framework proposed in this venture is targeted towards individuals 13 years or more. People underneath the age of 13 generally don't have cell phones and furthermore, having a mobile telephone expands the odds of them being focused by individuals with wrong intentions. Owning a cell phone is essential in the present computerized age. Individuals of any age, including children have a cell phone because of its simple accessibility and moderately reasonable expense. In the present advanced age, web network and accessibility are extremely normal and furthermore affordable. Because of persistent web association, it has become imperative to interact with individuals and even screen their developments and ensure they are protected. It is anything but difficult to utilize cell phone to monitor a man's whereabouts. Given a man's bustling work routine or different responsibilities, it isn't feasible for that individual to monitor their family member's whereabouts, particularly youngsters. Various frameworks have been outlined particularly for guardians to monitor their youngsters' whereabouts. Android being the most utilized portable Operating System will be utilized for this undertaking. Dissimilar to different platforms like iOS or less utilized ones like Windows or Blackberry OS, Android gives simple access to underlying frameworks without trading off on security and simple usage and additionally countless to benefit the application.

## II. EXISTING SYSTEM

The current advancements in mobile programming and innovation, it has turned out to be conceivable to use cell phones for well-being purposes among the different other existing administrations.

Quick adoption of the Internet and steady availability has made it simpler for individuals to be associated with each other. This has additionally reduced the cost of correspondence exponentially, which makes it less expensive and speedier for individuals to converse with each other regardless of whether they are isolated by extensive geographic separations.

Global Positioning System (GPS) has turned into a typical framework which is utilized by countless applications. Location based service (LBS) is the most recent service which has been fused by an expansive number of service providers.

Steady location tracking has made it possible to keep track of an individual's whereabouts at any given point of time with a decent level of accuracy. This can be utilized for sending guardians intermittent updates about the whereabouts of their kids without calling them up to ask the same. Utilizing the previously mentioned advancements, we can design a system which can empower steady following of an individual and send occasional updates of their whereabouts to their trusted contacts.

## III. PROPOSED SYSTEM

The system proposed in this paper is an Android based application. The client installs the application on their Android phone and sends location updates to their pre-set contacts.

The system requests for user permission for internet and GPS access on initialization. The client needs to set their trusted contacts which are ordinarily relatives or close friends. The client at that point sets their movement courses and the application stores that data. The application monitors client development and even saves an approximate time taken for each travel route.

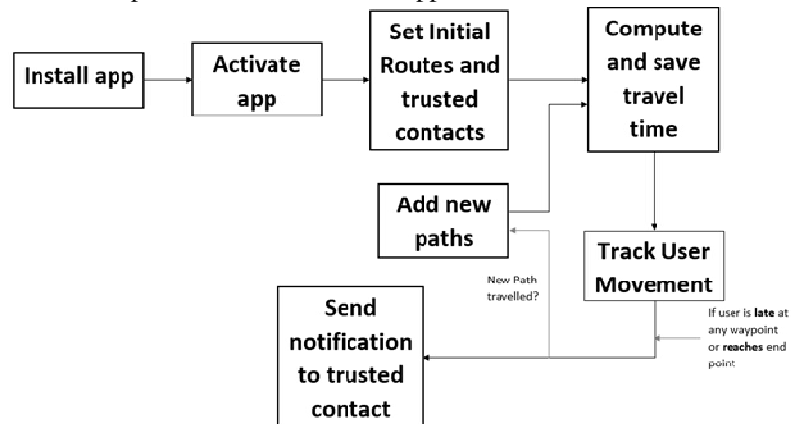


Fig. 1 Proposed System's Workflow

The application then sets waypoints with a geo-fence around each point on the course. The waypoints can be utilized to set triggers when a client enters or exits the geo-fence. If a client surpasses the time taken to reach a specific waypoint, the application sends a message to saved contacts. On the off chance that the client goes on another course, at that point the application includes it as an alternative course which can be utilized for future purposes. If there should arise an occurrence of no internet availability, a SMS is sent to saved contacts.

#### IV. SOFTWARE REQUIREMENTS

##### A. Real-time Database

A real-time database is utilized because of its fast execution and adaptability. Aside from this, the database will process huge amounts of information and perform calculations and synchronize the different clients (Android application and Web Console) of the application. The database will perform key operations such as client authorization and validation, session handling as well as data storage.

##### B. SMS Gateway

The SMS portal comes into picture when the user does not have a working internet connection. The SMS portal will exchange user location details to and from the server.

##### C. Web Browser

A web browser is used to access the interface to the web console of the application. The trusted contacts can view the user's current location through the web console.

#### V. HARDWARE REQUIREMENTS

The following hardware serves as the backbone for the functioning of the proposed system:

- A. Computer with minimum 4GB RAM and 20GB Disk space
- B. Android device with a 1GHz processor, 2GB RAM and working GPS and internet connection.

#### VI. WORKING

##### A. Android Application

The android application provides most of the functionality required for operation. The user must download and install the application in order to register for the service. After installation of the application, the user must create an account and login. The app allows the user to set trusted contacts to whom alerts will be sent. After setting the contacts, the user must set waypoints on the path. Every waypoint has a geo-fence attached to it with which the tracking is achieved. Apart from this, the application can be used to monitor another account that has listed it as a trusted contacted.

### B. Web Console

The web console is an extension to the mobile application. A guardian need not necessarily have the application to monitor progress. This can be done with the help of the Web console. The web console provides similar functions for monitoring like the application. The guardian needs to be listed contact in order to use the web console. Apart from this, the web console also allows modifying parameters of the application from the web. Parameters like contacts, waypoints, priority and other functions can be updated.

## VII. LIMITATIONS

The proposed framework offers an answer for a man's security, yet every innovation has a few restrictions. A portion of the constraints in our proposed framework are recorded beneath:

- 1) Cannot be utilized by children of lower age groups as possession of a cell phone may add up to an expanded danger to a youngster's well-being.
- 2) It is basic that the client is competent to work an android cell phone which makes the application unusable for a specific age groups, particularly kids.
- 3) Application does not work when the cell phone is turned off.
- 4) Can raise false alerts due to uncertainty.

## VIII. CONCLUSIONS

This research paper presents a solution for tracking at specific points between a journey by people who have to look after their loved ones and children. A key feature of the algorithm is the ability to detect when a device enters a certain geo-fence at some distance, allowing the application to know where the child is and send updates to the parent. Experimental results with a simulation demonstrate the feasibility of the system. The future scope for this project is to port this system to other mobile platforms, and to extend our system to encompass various other domains.

## IX. ACKNOWLEDGMENT

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