

Smart Travel Alarm in android application

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Abstract— In this modern world Smartphones and Tablets are need for every group from Children, teens, Parents, Business executives, Professionals to old age people. With this techy gadgets, location based applications are widely used as it makes life very easier, faster and keeps track of our near and dear ones as well as our business associates. The SMART Travel Alarm is designed to provide high tech services to users based on the information of their current geographic locations. Some of these services include “Reached to destination alarm”, Email someone on reaching the destination etc. In this paper we illustrates the development of SMART Travel Alarm - a android application using Google Web Services to offer multiple services to the users on the move. The developed iOS app works perfectly fine on major smartphones and tablets running on popular operating systems like iOS, Android, Windows and Blackberry.

Index Terms— android application, Smartphones, Smart Travel Alarm, Tablets.

I. INTRODUCTION

The proliferation of mobile platforms and technologies, along with the evolution of smart devices, provide plenty of opportunities for compelling applications. The key expectations are multifold, and include cost effectiveness, a single code base to work across multi platforms, an outstanding UI and faster delivery cycles. The modern applications are taking full advantages of the device features (GPS, camera...), form factors (tablets) and appealing user interaction. The best fit to accommodate most of the key mobile capabilities (single code base form factors, great UI) is to adopt mobile web technologies. This can be augmented by using the hybrid approach to take full advantage of the device features in addition to the benefits listed above. SMART Travel Alarm is such an iOS application which is developed on Sencha 2.2 framework. Sencha Touch enables us to quickly and easily create HTML5-based apps that work on mobile devices, and produce a native-app-like experience inside a browser or in a hybrid shell. Sencha Touch supports Android, iOS, Windows Phone, Microsoft Surface Pro and RT, and Blackberry devices.

II. PROBLEM DEFINITION

There are many instances where we may want an alarm clock that doesn't ring at a set time, most notably, travel. Trains and planes get delayed, cars run into traffic, and it would be convenient if the alarm would ring when we arrived at our destination, not when we were supposed to arrive.

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If we implement it by designing a separate hardware it will add extra cost to the end user so we thought to implement on the commonly available device with everybody, Yes that's Smartphone and Tablet! which also have built in GPS. But if we use GPS continuously then the device will run out of juice quickly. Also everybody may not be using same Smartphone with same operating system and versions. So we have the following problems to address:-

- i. Design and develop the Smart Travel Alarm for Smartphones and Tablets.
- ii. The application design should be smart enough to be implemented on almost all the Smartphones and Tablets running on most of the operating systems and their various versions.
- iii. Propose and implement the logic to save the battery consumption from the GPS usage.
- iv. The application should send a SMS and an email to the relatives or other intended persons.

III. PROPOSED SOLUTION

Our solution was to develop an Alarm that could interpret GPS coordinates and had a program in it to ring and vibrate to wake the user up. It had to be completely portable, with a portable power source, and preferably fit into a pillow, while remaining comfortable. It also had to be easy to use and easy to replace batteries. Its design and advanced implementation allows us to save every volt of our smartphone.

It works with GPS but also with Network, selecting the best location on each moment. If we don't move it does not consume our battery checking our position. The application "SMART Travel Alarm" solves all these problems. It offers below services:-

- ① Retrieves the user's current geological coordinates.
- ① Allow user to enter new alarm for a particular location
- ① Along with alarm, user can optionally put the reminder text as well.
- ① Once user is near the location, the alarm will ring and also if there is any reminder text it will be displayed to user.
- ① User can edit/delete/update/enable/disable the alarms.
- ① User can see the locations on Map to find out how far he is from the expected location.

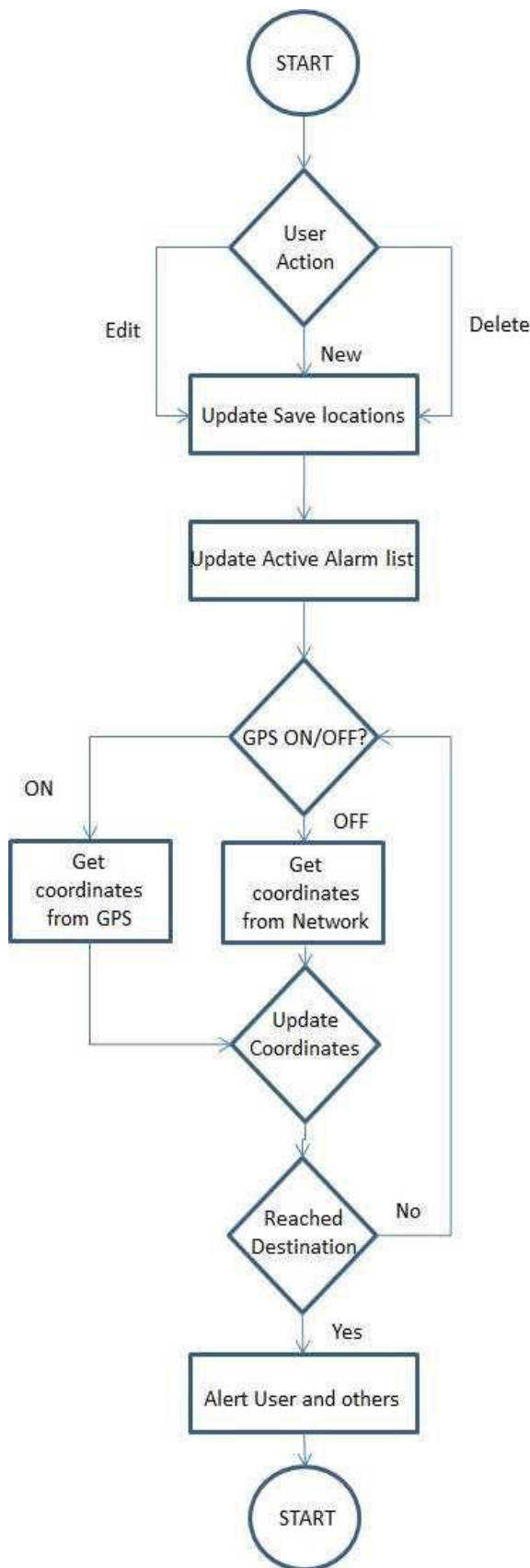


Figure 1: Logic of the Smart Travel iOS application

IV. SYSTEM ARCHITECTURE OF SMART TRAVEL ALARM

SMART Travel Alarm is a mobile application that has the capability to provide real time information based on the user's current location. GPS interaction module is the heart of SMART Travel Alarm, which has been developed, will act as collection centre, storing and supplying the geographical data for being manipulated by the application. Data which stored at the system will be used within making the decision process as per the logic explained below. Through this application, data will be collected to trace every unit location and every unit also can update any additional information. This module integrates hardware, software and data for capturing, managing, analysing and displaying all forms of geographically referenced information. The architecture of the SMART Travel Alarm consists of several segments that are needed to create a fully functional unit.

- ☒ Display module: In this module the, the Google map is displayed the locations using the GPS and GPRS/3G/Wifi networks available in the Smart phones. By using this module the user can set their destination and current location based on their needs of travel.
- ☒ GPS interaction module: In this module the GPS interaction (i.e. the location update is changed based on their users time limit. And check whether the GPS and the internet provider is enabled or disabled. Based on that the alert will shows to the android notification bar in android device.
- ☒ Place management module: In this module the location details are stored in SQLite data storage within the android device. i.e. The visited location details are getting from the location updates and stored in SQLite data storage for the user future reference.
- ☒ Ring tone module: This is the Settings module, the default five ringtones are stored within the application and also the ring tone chooser based on their user need from their Audio gallery. And also it has the volume control and vibrates mode control settings in this application module.
- ☒ Alarm module: This is main module of this project; in this the alarm service and location updates are done using the android Background services. The location updates is done by using the GPS and Internet providers. And the alarm is set using the android device alarm services.
- ☒ Feature Selection Module: From this module user can use the features available in the system.

V. IMPLEMENTATION & METHODOLOGY

The purpose and functionality of SMART Travel Alarm application is to provide the information available to their user when they arrive at certain location. GPS is becoming

popular with location positioning system, today there is huge demand of location based applications. In a SMART Travel alarm system we provide an alert when user reached the destination or any famous spot in city to provide knowledge and information of mobile user's current location. Google Places API is a service that provides service information about places, spatial locations, geographic locations, places of user's choice- using http requests. User can get places request/response specifies locations as latitude and longitude coordinates. We use these API for implementing our application.

There are some places API are available:

- ① Place Searches- It returns an array of places based on search string or locations defined by user.
- ① Place Details- this request returns detailed information about specific place including user reviews.
- ① Place Actions- user can schedule events, add or remove places.
- ① Place Photos- user can request for places related photos stored in Google's place database.
- ① Places Autocomplete- It provides autocomplete functionality to user for text based searching of geographic location by returning places a user type.

VI. ANATOMY OF THE IOS APP BASED ON SENCHA 2.2

An app is a collection of Models, Views, Controllers, Stores, and Profiles, plus additional metadata for app-related entities, such as application icons and launch screen images. Application indicates an instance of Ext.application, whereas application or app is the program we are coding.

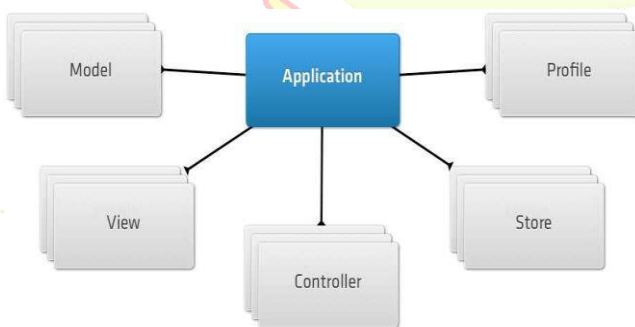


Figure 2: Anatomy of the application

- ① Models: represent a type of data object in Our app - for example an e-commerce app might have models for User, Product, and Order
- ① Views: are responsible for displaying data to Our users and for leveraging the built-in components in Sencha Touch
- ① Controllers: handle interaction with Our application, by listening for user interactions, such as taps and swipes, and taking action accordingly
- ① Stores: are responsible for loading data into Our app and for powering components such as Lists and Data Views

- ① Profiles: enable Us to easily customize Our app's UI for tablets and phones, while sharing as much code as possible.

VII. FUNCTIONAL ANALYSIS

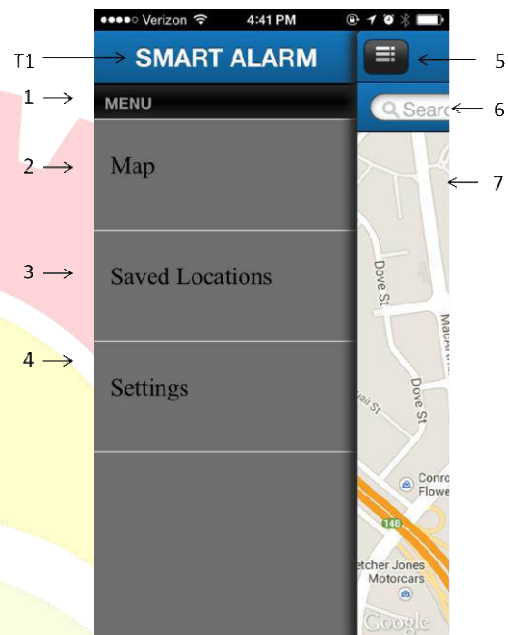


Figure 3: Home Screen

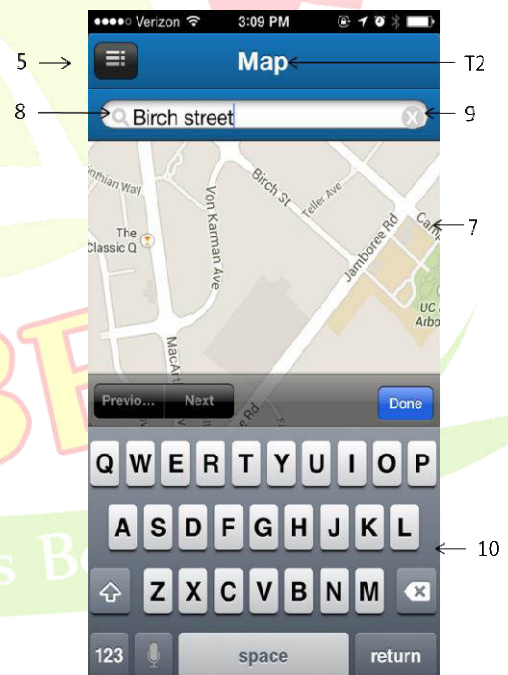


Figure 4: Map Menu

Figure 3 is the Home screen for SMART TRAVEL ALARM application which will be displayed once user launches the application. In Menu list user can see three options i.e. Map, Saved Locations and Settings. When user taps on component no. 2 it displays the map of Our current location if GPS is ON. User is able to search the location in component no. 6.

After editing the location in component no. 8 in Figure 4, user can tap on search button to get the search results. User

can go back to list of menu options available by tapping on component no. 5.

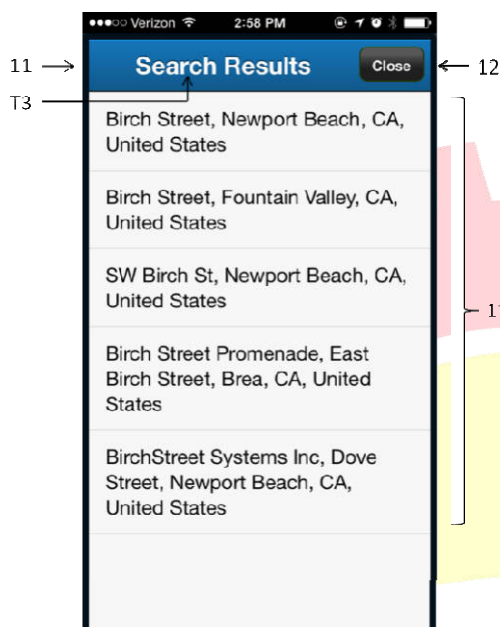
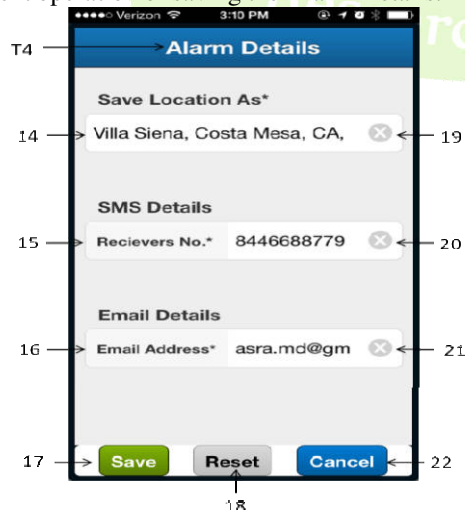


Figure 5: Search Result Screen

In Figure 5 user can select the desired location from the component no. 13. After selecting the desired location and tap on component no. 11, Alarm will set to that location. If user wishes to exit from current activity, he/she can tap on component no. 12. After tapping on component no. 11 user will be navigated to the Figure 6. Component no. 14 shows the selected location for Alarm. Tap on component no. 19 will clear the content written in Save Location As* field. User can edit cell phone number of the person willing to get the information of traveller about his confirmation of reaching to the destination via SMS in component no. 15. Component no. 20 clears the content of SMS Details field. In component no. 16 user can enter his email id or person willing to get the information of traveller about his confirmation of reaching to the destination via email. Component no. 21 clears the content of Email Details field. User can save all the data edited in component no. 14, 15 and 16 by tapping on component no. 17 on screen 4. Component no. 18 will reset all the data edited in component no. 14, 15 and 16. Component no. 22 will cancel the current operation of saving the Alarm Details.



In Figure 7, user can see all the locations which have been saved by him before. If user taps and hold on component no. 23 then pop up with component no. 24, 25 and 27 will be displayed. This will allow user through component no. 24 to edit the previous location address. With component no. 25 user can delete the selected option and on tapping component no. 27 current process will get cancelled. After tapping on component no. 24 in Figure 7, user will get navigate to Figure 4.4 and allowed to modify already edited fields.

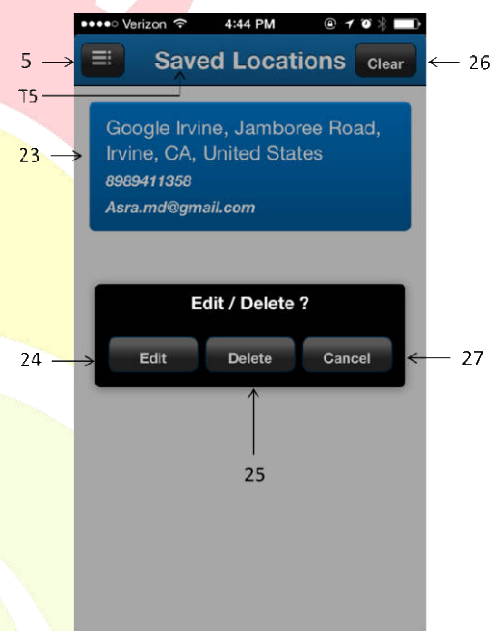


Figure 7: Saved Locations Screen

In Figure 8 tap on component no. 28 will update all the data enter by user in all fields.

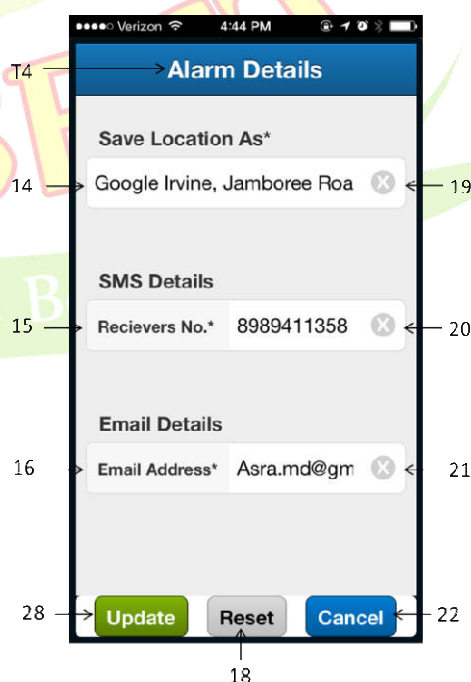


Figure 8: Update Alarm Details Screen

Figure 6: Alarm Details Screen

In Figure 9, tap on component no. 26 will display a pop up with "Delete All?" message. Tap on component no. 29 will cancel the delete operation. And tap on the component no. 30



will delete all the saved address locations in one go with user confirmation.

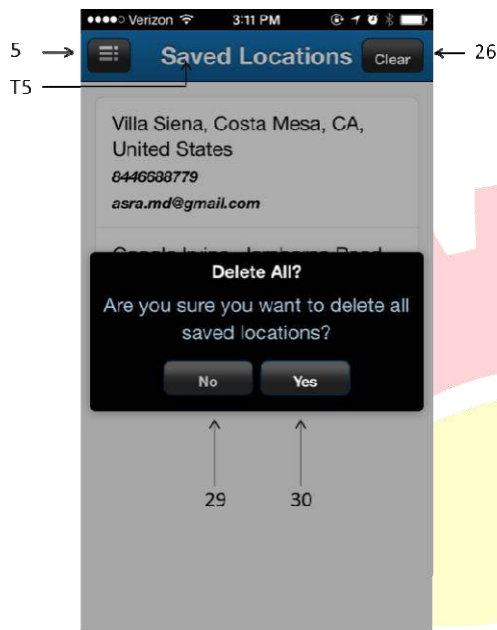


Figure 9: Updated Saved Locations Screen

When user has reached the destination, “Destination Reached!!!” pop up message gets displayed as shown in Figure 10 and this will also send the email and SMS to the person as mentioned while setting up the alarm. On tapping component 31 pop up will get closed.

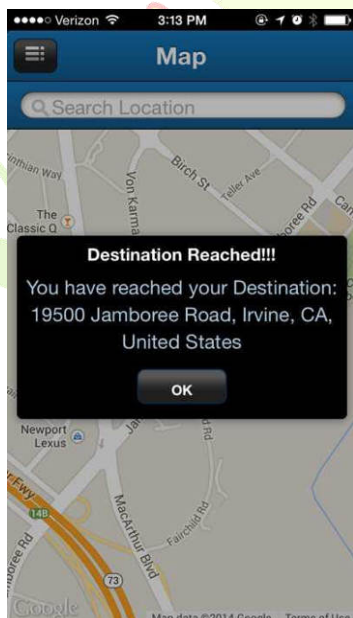


Figure 10: Destination Reached Confirmation Screen

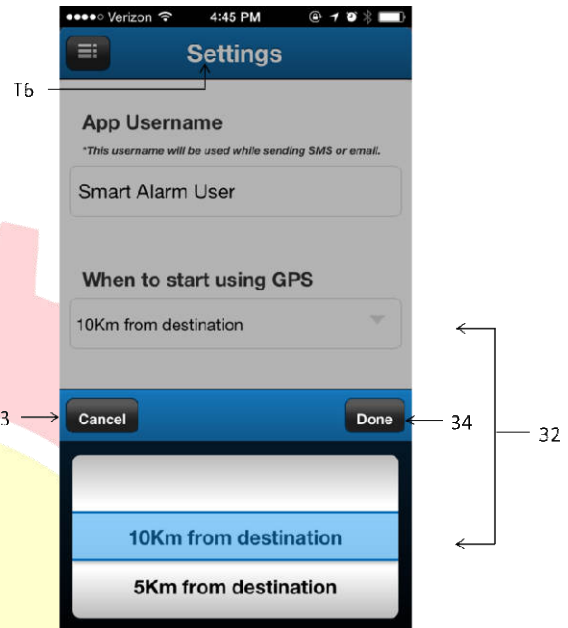


Figure 11: Settings Screen

In Figure 11 user is allowed to make changes in settings as desired. On tapping component no. 32 user can change one of the settings i.e. ‘When to start using GPS’ from the dropdown options available. On tapping component no. 34 changes will be done which is selected by user from dropdown menu and tapping on component no. 33 cancel the settings for ‘When to start using GPS’, if user wants to continue to the default settings. The benefit from this setting is “to reduce the battery consumption of the user’s cell phone this option is made”.

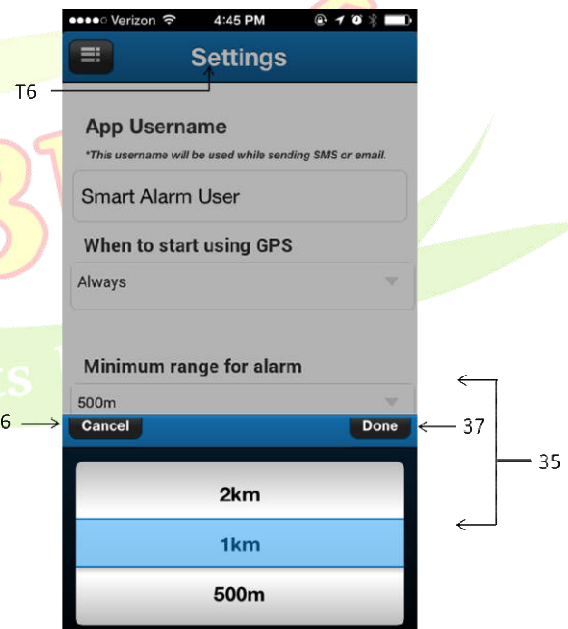


Figure 12: Settings Screen

In Figure 12, tapping component no. 35 user can change one of the settings i.e. ‘Minimum range for alarm’ from the dropdown options available. On tapping component no. 37 changes will be done which is selected by user from dropdown menu and tapping on component no. 36 cancel the

settings for 'Minimum range for alarm', if user wants to continue to the default settings.

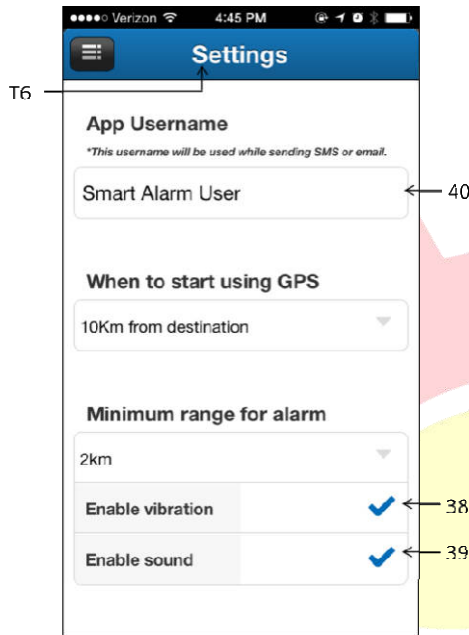


Figure 13: Setting Screen

In Figure 13, tap on component no. 38 will check or uncheck the 'Enable Vibration' setting of the T6 screen, enabling this will trigger alarm with vibration. In same figure, tap on component no. 39 will check or uncheck the 'Enable Sound' setting of the screen 11, enabling this will trigger alarm with Sound. On tapping component no. 40 user can edit the name which will appear in the SMS and email sent to user or intended person.

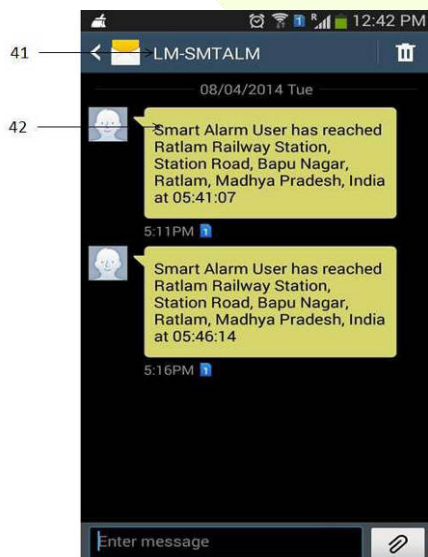


Figure 14: Received SMS details on cell phone

In Figure 14, Component no. 41 shows the sender of the message. And Component no. 42 shows the content of the SMS which will send to the person whose no. is set in Alarm setting. This SMS give the time details of the user when he/she has reached the destination.

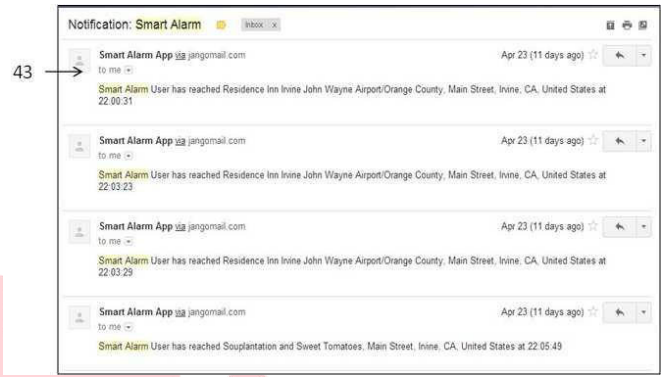


Figure 15: Email Details in mailbox

In Figure 15, Component no. 43 shows the email which will send to the person whose email id is set in Alarm setting. This SMS give the time details of the user when he/she has reached the destination.

If any of the data like cell phone no. or email id is not valid then data will not be saved and cause for the same will be displayed on the same screen.

VIII.SMART TRAVEL ALARM FEATURES

An affordable and smart technology keeps huge features like:-

- i. Mobile user gets alert at a particular location when he travels around or out of the city
- ii. User would be able to search address, search location or a particular place from his current location
- iii. An email can be send automatically to traveller relatives or intended persons, give information if user reach the specified destination.
- iv. The application user would be able to find the exact way to reach any particular place.
- v. Any user can find his/her friend at any location or receiving the location of the stolen phone.
- vi. An SMS can be send automatically to traveller relatives or intended persons, give information if user reach the specified destination.
- vii. The application user would be able to store locations on which alarm was previously set so that he/she can use it later.
- viii. The application user would be able to set the vibration control option which will vibrate when user reaches the destination. This feature will help the dumb and deaf travellers a lot as they can't speak and hear but they can feel the vibration sense.
- ix. The application user can set the ringtone as per his/her choice from the ringtone control option available on the settings screen.
- x. The application travel has implemented with logic to save the power consumption by the GPS of the phone. It initially gets the location coordinate from the service provider network and will turn on GPS only when destination is near (example 5km) so as to give more precise location.
- xi. The application is loaded with a feature to provides minimum distance on which user want to trigger alarm (example before 2 km)

- xii. The application allows users to edit details of the already set locations.
- xiii. The application allows users to delete option for stored locations individually or all of them in one go.
- xiv. The application can be configured to enter the username of the traveller so that they can be tracked uniquely from the SMS and Email confirmation.

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IX. CONCLUSIONS

Thus we conclude the implementation of SMART Travel Alarm through Google Web Services and Google APIs on Smartphones and Tablets offers multiple services to the users based on their location. We have overcome the problem statement as defined earlier. With Sencha 2.2 its easy to develop the iOS app which runs on all the major operating systems like iOS, Android, Windows and Blackberry and on various devices of different screen size and resolution.

All the leading smartphones and tablets have very powerful HTML rendering engines, which already support most of the upcoming HTML5 and CSS3 standards. JavaScript toolkits like Sencha Touch are fully compatible with the iOS app development model, making it easier to achieve a look and feel that is often indistinguishable from native. As a result, iOS apps running on mobile devices with reasonably modern hardware can achieve highly interactive and impressive user interfaces using just HTML5, CSS3 and JavaScript.

For those cases where your app does require special graphics or system-level interaction that cannot be achieved with HTML, iOS apps can combine web pages with native ones. Other organizations are developing iOS apps, while planning to turn them into HTML5 web apps in the future without having to rewrite them from scratch.

From a strategic point of view, development organizations should seriously consider adopting HTML for mobile app development sooner rather than later. The iOS app model, although not suitable for all app development needs, provides a cost-effective solution for a very wide range of downloadable app types and allows gradual entry into the new world of HTML5 while future-proofing your investment.

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