A LOCATION TRACER WITH SOCIAL NETWORKING SERVICES

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***Abstract*--In this paper, a real-time location tracing application has been discussed to cater the needs of the people who distinctly and constantly want to stay connected with their peers as well as it can be used in disaster management situations. It is developed on the BlackBerry platform provided by RIM(Research In Motion) which is a highly secure platform and is used to mitigate security risks. The application is integrated with Blackberry Messenger which has a large number of social networking users which is a value added feature of this application. The function of this project is to trace a number of people even in an environment buzzing with hoards of people. This application will also provide the user with features such as data-sharing, forming and managing groups, communities and other location based services.**

Keyword-BBM(BlackBerry Messenger), DFD(Data Flow Diagram), GPS(Global Positioning System),SNS (Social Networking Services), SDK (Software Development Kit), Plug-ins and Simulator.

I. INTRODUCTION

The need of this application is to provide people with facilities and get them huddled up into a group of peers who want to find and communicate with each other. The other needs of this application include keeping a track of new places as well as searching new places, a good navigation system, and business opportunities for entrepreneurs in advertisements. If a person is new to a place he can rely on this application to get directed to his desired destination. It can also serve the needs of students in huge campuses where getting from one department or to the library is not an easy task, new employees, fresh recruitments in companies can use this application to save time.

There is a constant need of increasing one's network or contacts, this need can be quenched by adding more contacts for example friends of friends, you can be connected with these people to form a web of connections that can give you leverage if you play your cards right. The notification features will inform the user of a friend entering his perimeter. The presence of such features enhance the need of this application. This application will also be able to keep up with the interests of the youth in an intensive social life, where spontaneity is very important. The services will be permission based. This means that only the subscribers who have voluntarily joined the service can be found by friends that they have selected and approved themselves.

II. PREVIOUS WORKS

The following Literature Survey depicts the inconsistencies in some similar available technologies which have triggered the development of this application.

Other technologies available to cater the same service:

-Real contact (BlackBerry): This application facilitates contact with all your BBM friends. You have to install this application in your blackberry handset and then send a request to your BBM friend after which you will be able to see each other's location except for eastern countries.

- NavXS (Navigation Exchange Service) (BlackBerry):

It is an app that lets people build a network of contacts like Skype, ICQ etc but instead of exchanging just text messages, NavXS lets you exchange location based information.

-XL friend finder (Blackberry): This application is supported only on the blackberry devices. Once you install this application you can contact your XL friend present in your phonebook except the ones in the eastern hemisphere, provided that that person has a blackberry and XL friend finder.

-Google latitude : Google Latitude is an innovative new opt-in feature of Google Maps for mobile and iGoogle (US only) that allows you to share your location with your friends and family. Since the location information is sensitive and should be well-protected, Google Latitude comes with strong privacy controls. Your location will only be shared with the people you choose.

Advantages, Disadvantages and limitations of available technologies:

Real contact (BlackBerry)

Advantages:

-Can set the privacy settings on the app to share your location, availability, battery level and signal level with each BBM Contact.

-You can manage your privacy by changing the settings.

Limitations:

-Requires BBM6 and blackberry maps.

-If a friend is mobile then it updates you after every 100 meters.

-No shortcuts.

-Can't set your manual location.

-Can't set your future information.

-NavXS (Navigation Exchange Service)(BlackBerry):

Advantages:

-You can add your friends who are already present on your Skype, ICQ or any other messenger account.

-No need to download other messengers, maps for this application.

-Works on many platforms.

Disadvantages:

-Its not user friendly.

-Doesn't work properly on the blackberry platform.

-Platform independency doesn't work.

-XL friend finder (Blackberry):

Advantages:

-No need of any data services.

-Works even if BBM is not activated.

-No need of GPS enabled devices.

Disadvantages:

-The only way to switch off this service is to switch off your mobile

-It doesn't give real time location on the map, it just gives the address.

Limitations: Works only in Indonesia.

III. PROJECT INSPIRATION

The objective behind the development of this application is to become acquainted with the required superior technical skills and gaining expertise in the mobile computing domain. The concept of the Location tracer application has been inspired by the fictional novel Harry Potter by the author J.K.Rowling which includes the Marauder's Map. The Marauder's Map is a magical document that reveals all of Hogwarts School of Witchcraft and Wizardry. Not only does it show every classroom, every hallway, and every corner of the castle, but it also shows every inch of the grounds, as well as all the secret passages that are hidden within its walls and the location of every person in the grounds, portrayed by a dot. It is also capable of accurately identifying each person, and is not fooled by animagi, polyjuice potions, or invisibility cloaks; even the Hogwarts ghosts are not

exempted from this. It can also reveal secret passages the Marauders or in other words the inventors of the map found[1].

Similarly, like the marauder's map the user will be able to see the real-time movement of every person with this application. This application would provide the user with features such as data-sharing, managing groups, communities and other location based services. It appears that the mobile phone is actually a better platform for social networking than the PC and thus to cater to the above mentioned needs the application will be developed on the Blackberry Mobile Platform. The application will be deployed on the cloud to reduce overhead cost and maintenance.

IV. METHODOLOGY FOR SOLVING THE PROPOSED WORK

To develop the application proposed in this paper various components are needed to be implemented to meet the desired functionalities. This application can work on the BlackBerry Operating System version 5 onwards. Also, the use of this application requires the activation of the BBM services on one's device to access all the features of the application. This system uses GPS to acquire one's location. A location system can provide two kinds of information: physical and symbolic. GPS provides *physical* positions[5]. GPS tracking system is a common approach to get location information in real-time. The satellites periodically emit radio signal of short pulses to GPS receivers. A GPS receiver receives the signal from at least three satellites to calculate distance and uses a triangulation technique to compute its two-dimension (latitude and longitude) position or at least four satellites to compute its three-dimension (latitude, longitude, and altitude)position. Once a location is computed, it can calculate average speed and direction of traveling. Therefore, GPS is a key technology for giving device its position[6].

The functionalities include the use of:

A. BBM SDK to develop and simulate the application:

The tool used to develop this application is BBM SDK with Eclipse Plug-ins and an application server code is written to handle the user requests. The BlackBerry Java Plug-in for Eclipse includes the BlackBerry Java SDK. The BlackBerry smartphone is built from the ground up as a Java-based device, with all built-in apps and APIs written in Java. The communication between the modules is done through some application programming interface (API) [3]. API functions are the functions only which can be get called outside the module and non API functions are not called outside the module [4].

The SDK is provided with a simulator which lets you visualize the application to be run on the phone [2]. The BlackBerry Java SDK includes Java ME APIs and BlackBerry-specific APIs. The BlackBerry APIs provide access to advanced UI functionality, deep integration with existing applications, the ability to create databases with SQLite and use cryptographic functions to protect your content, the functionality to embed location-based features (for example, maps and geolocation functionality) and much more.

B. Use of cloud computing to host the application:

In order to plot a friend's location on the map his GPS device id will be used to obtain his location which will hence be depicted using a google map. For this, the application server interacts with the database and static maps services to locate the friends on the map and also tracks a friend. These also helps in providing functionalities like chatting, sharing of data etc. Thus to maintain the database and to provide the web services to the wide range of mobile users from anywhere through the web the application needs to be deployed on the cloud. Mobile cloud computing is defined as extension of cloud computing with a new ad-hoc infrastructure based on a mobile device. The goal is to utilize cloud computing techniques for storage and processing of data in mobile devices[7].

The application server is hosted on the Google App Engine. Google App Engine makes it easy to build an application that runs reliably, even under heavy load and with large amounts of data. It then interacts with Google Static map services to get the required map image of the locality where the user is considered to be at the centre of the map and locations are plotted accordingly. To support the real time feature the database is updated constantly which is handled by the application server to interact with BBM services and Google static map services. Using the BBM services the application server will gather information and update the database continuously according the users activities.

V. STRUCTURE OF APPLICATION

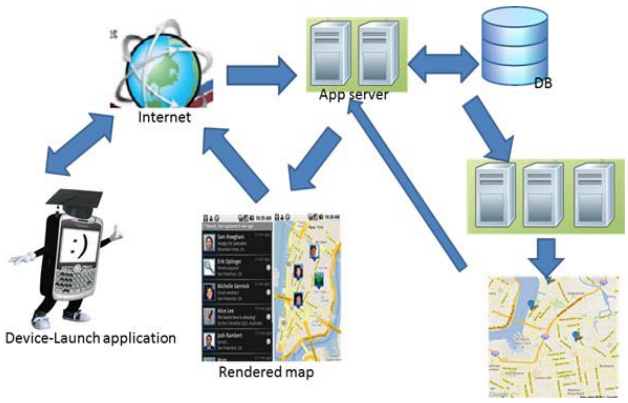

Fig. 1 Flow of tracking functionality

The above figure represents the flow of the application during the tracing procedure where once will be able to trace his peers in real-time where the application server will constantly and continuously update the database with the location co-ordinates which will be represented on a static map. The user will also be able to leverage the social networking services provided by the application. Figure 3 represents the Data Flow Diagram of the system.

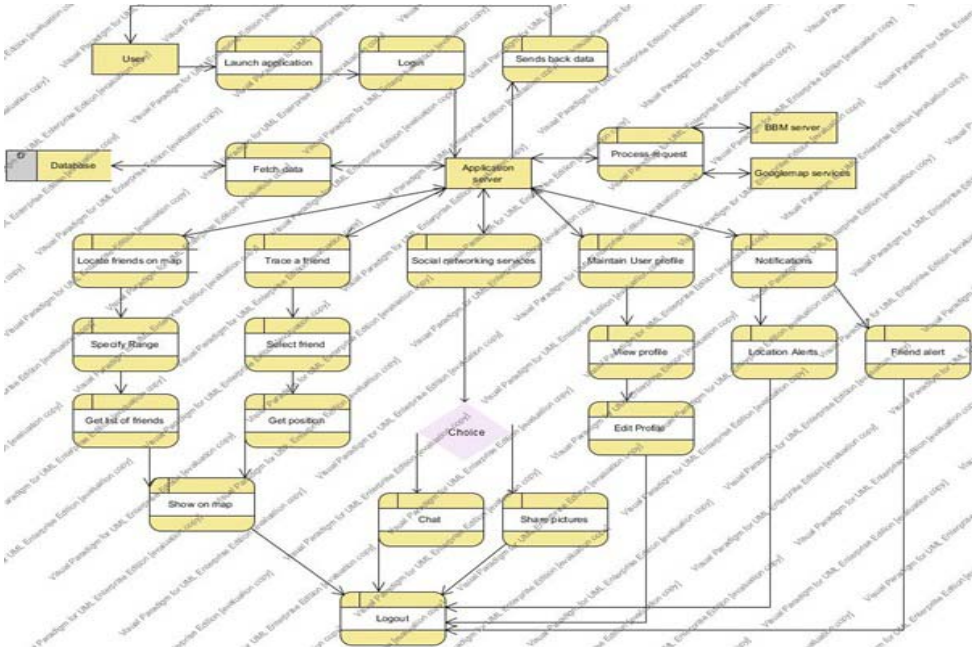

Fig. 3 DFD of the System

VI. APPLICATION SCOPE

A system like this will be useful in a number of applications, such as detection techniques using surveillance, artificial intelligent networks, the interaction between the humans and computers as well as robots with mobility that work among people. The concept of this application can be used along with suitable location-based services to keep a track of elderly and disabled People. The concept of this application can also be used in nuclear labs where it is quite essential to maintain a track of all the employees due to safety hazards. It can also be used in

navigation systems. This concept will prove to be quite useful in military operations where each member can be aware of the whereabouts of his comrades.

VII. CONCLUSIONS

In this paper, the application for tracing people is proposed but the idea can be used to trace people in different environments such as disaster prone or struck areas or even finding items. In the future, it can be improvised and made generic by achieving platform independency.

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