Social Nature of a Human Being on Social Networking using Android

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Abstract –*This paper aims to present a system that illustrates the social nature of a human being–the need to be always in interact with friends and family–taking into account facilities available on Smartphone platform. In today's location has very much importance in everyone's life. As the trend is of smart phones, mobiles, iPhones, and all the gadget emerging today it's very important for the mobile user to have the location based services. Location based service can be detailed as the services. It is using to users geographical location which consist of two coordinates (latitude and longitudes), which is generated by GPS which acts as positioning device. The main goal of this application is to create an infrastructure in which the users are being alerted when their family member and friends are around. It will provide them the possibility to setup a meeting or to avoid one. The End users have the provision to check in few locations and allow their family member or friends to follow their activity. Taking into account the security of the users, we included in the services of the app an option which allows friends or family to check the user's location based on a key word text message. For this purpose, available Android location and messages services are used for finding an approximate location of a mobile phone running this program and then sharing it through Social Nature or via SMS. Information is being displayed using default components provided by Smartphone platform and also more complex elements including heterogeneous lists CWAC, Google Maps and augmented reality using Mixare Library.*

Keywords– Android, Location and SMS Services, Augmented reality, Social networks

I. INTRODUCTION

The social network is a theoretical construct useful in the social sciences to study relationships between individuals, families, friends, groups, organizations, or even entire societies. The social network term is used to illustrate a structure determined by such interactions. The ties through which any given social unit connects represent the meeting of the various social contacts of that unit. This kind of approach is, necessarily, relational. The Explanation of the social network is approach to understanding social interaction is that social phenomena should be mainly conceived and investigated through the properties of relations between and within units or societies, instead of the properties of these units themselves. Thus, one common criticism of social network theory is individual agency is often ignored. Although this may not be the case in practice. Accurately because many different types of relations, singular or in combination, form these network configurations, network analytics are useful to a broad range of research enterprises.

The need to use the smartphone not only for voice communication with someone or send and receive SMS has been perceived by Google since 2005, reason why it bought the original developer of mobile software Android Incorporation in August of the same year. Another significant progress had been accomplished in 2007 when Open Handset Alliance has been founded and joined by 48 companies' hardware, software and telecommunications, willing to help the development of open standards for mobile devices.

According to Wikipedia, Android architecture consists in a "Linux kernel with middleware, libraries and APIs written in C and application software running on a platform which includes Java-compatible libraries based on Apache", a free type software and open source license, aspect that makes it very attracted among developers. We will show in this paper how we used this architecture in order to build Social Nature application.

This application comes with two different new facilities in comparison with existing solutions. First one is Location based on facility. It can offered locations of every end user to others with users permissions. It will provide alert to users about who is close with them. The second one combines the first facility with augmented reality and

shows on phone camera the direction which must be followed in order to meet somebody and the corresponding distance.

The rest of the paper is structured as follows: Section 2 presents the state of the art in this domain and the most important mobile applications which allow users to stay connected to social networks at any moment; Section3 details the general architecture of our system and technologies used, while the last Section discusses the conclusions.

2. SYSTEM ARCHITECTURE

This application connects its users by sharing a current position user's with his friends, colleagues or other family members. A user has the option to be notified when a contact is near him and helps the others to find out his location even when the application is not open by sending a message containing a shared secret string.

Generally GPS location provide two values for X and Y Coordinates. User can view that location in google map with that coordinates(Latitude and Longitude), in order for his friends to be aware of places he frequented and the possible activities he conducted. As we stated, a notable feature provided by this program is the possibility to view a friend's locations using augmented reality.

The application presented in this paper consists of three modules corresponding to the three levels of the client-server architecture (3-tier architecture), where elements of interface and data processing are separated. The presentation layer consists of the Android client by which the information will be displayed in order for users to see and interact with, the data layer is represented by the databases to rage where the information are hold in and the logic layer, which connects these two levels

A. Logic layer– Technologies used

FacebookAPI

Facebook social network offers for Android platform a library through which mobile developers are able to develop an application which let users connect to their Facebook account and posts the desired information. Beside the regular registration made using the email address, the Social Nature users are able to connect also by using their Facebook account. To achieve this, the Social Nature application was registered in the Section Mobile Application from the Facebook App Dashboard.

Android Location Services

Location based information is becoming increasingly important in the world of mobile application development. Android offers this functionality, using network location providers, which determine the user location using GPS, cell tower and Wi-Fi signals. To get access to this information, an Android developer may use the classes from *android. Location* package, which includes members such as: *LocationManager*, *LocationProvider*, *Criteria* and *LocationListener*. Recentaly Google Client class is added in Android platform. Which is using we can get the current location of users. In android version Marshal mallow had high security to access location. The way that location classes communicate can be seen in Figure1.
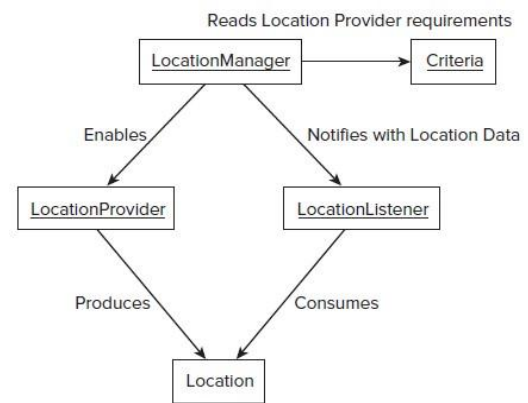

Fig. 1.Android location components

GoogleMaps

To display the items found by Location Manager tool, one can use the Google Maps external library. In this app has to be built as a Google APIs project, a standard Android version not being able to reference the required classes. In this project, this feature has been used to display user's friends and to show the shortest route to their location.

Google provide Google Maps API Service. Which is using to user can get route between two coordinates. It will provide distance, Traffic, multi path and etc... The API resulted. *Kml* file is then parsed and the extracted points are transformed into GeoPoint objects, which are displayed afterwards on the surface of the map.

Mixare API

Mixare is an open-source library for smartphones, which combines the image captured by the camera lens with

the device location. When the phone is being moved, the location is computed and sent to the webservices specified in the configuration file. Near by points of interest are serialized as a JSON object and returned back to application. Information is being displayed taking into consideration the camera's pointing direction, which is computed using the compass, the gyroscope and the motion sensors.

In this application, Mixare library is used to display friends' position on mobile screen. This was achieved by creating an Android Service which uses a RESTful web service in order to interrogate the database and retrieve user friends' location. Every 30 seconds are quest is made using the user identifier and the received result is parsed and mapped to the device screen.

Short Message Service

One of the useful features available to Android developers is the possibility of handling the receiving and the sending of text messages. As mentioned before, the application is focused also on user's security. When the application is closed and the user is not answering to his phone, close friends or family can still have access to his location by sending the shared keyword.

When a message is received, a background service is checking its content and if it is a match, the GPS is turned on and the location is computed and replayed. In this way, when a user is in danger or his parents are worried or people are waiting for their delayed friend, they can check his location to see if he is safe.

The Broadcast Message Intent includes information about the received text messages (the message content, the recipient's phone number, the time at which delivery took place), saved as an array of objects in PDU format. To extract the message information, it is necessary to transform the PDU byte array components into Sms Message objects, as illustrated in the following sequence of code:

Manifest file permission for receiving SMS:

```
<uses-
permissionandroid:name="android.permission.RECEIVE_
SMS"></uses-permission>
```

Broadcast Registration for Registration in Manifest:

```
<receiver android:name=".IncomingSms">
  <intent-filter>
    <action
android:name="android.provider.Telephony.SMS_RECEIV
ED" />
  </intent-filter>
</receiver>
```
Reciver coding:
```
Bundle bundle = intent.getExtras(); SmsMessage[] msgs =
null;
if (bundle != null) {

Object[] pdus = (Object[]) bundle.get("pdus");
msgs = new SmsMessage[pdus.length];
for (int i = 0; i <msgs.length; i++){
msgs[i]=SmsMessage.createFromPdu((byte[])pdus[i]);
}


}
```

This layer offers the main facilities of the Social Nature application. A user can use them via interface layer which his presented below.

B. Theinterfacelayer

The application interface is all that a user can see and can interact with. All user interface elements are built using View and ViewGroup objects from Android platform. A View is an element that draws something on the screen, while a ViewGroup is an object that holds other View objects in order to define the layout of the interface, as it can be seen in Figure

5. Android offers custom views such as layouts objects or input controls for defining the visual structure of a user interface.
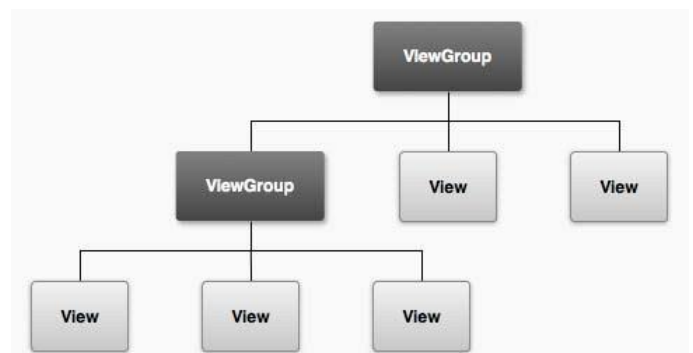

Fig. 1.View and ViewGroup Objects hierarchy

Heterogeneous Lists

The Recycler view, Card View are new Material Design for all android users. Recycler view items provided by Android are suited to expose data that have the same format. However, most of the time it is required a more complex structure in order to expose some information. In Social Nature program, these lists are used to group friends, merging in a CWAC list labels with contacts lists.

This layer allows the user to perform the main actions in the system and to use the facilities defined in the logical layer. There sults of the interaction between user and this layer are saved in the storage layer.

C. Storagelayer

Basically Android contains two type databases. One is SQLLite DB and another one is Shared Preferences. In our project we used Shared Preferences for storing last login time. Social Nature application user information is stored in a MySQL database on the server. Almost all interactions with interface layer have as result a communication with storage layer, where information is saved. The Android Client is displaying the data by interrogating the database using RESTful Php services. The communication between the web services and the Android Client is performed using JSON Object format messages.

D. Social Nature operations

A Social Nature user can perform the following main actions in the system:

a) **Register**–allows somebody to create a Social Nature account in order to use this application. The registration can be performed in two different ways: first, via the *Get a new Social NatureID!* Option or second, via Facebook login. Using the first one, a user must fill in a form with is personal details while the other one will extract the necessary information from his Facebook account (using the Facebook API).After performing this step, the account will be created and the user will have access to the Social Nature server, where all his information (locations, friends, groups, preferences, etc.) will be managed. The registered details are all stored in server Mysql DB.

b) **Login/logout** –when the user is logged in the application, he can use the Social Nature application, otherwise he cannot be informed about his friend's position and vice versa his friends cannot be notified

about his current location, except they use the shared keyword.

c) **Locations Management**(Create/modify/delete) – defines the main operations for managing locations. In order for a user to set his current position, he must first create it (if the location has not been used so far) using the GPS facilities of his phone, when he is located in a point of interest, or by manually inserting the desired location's coordinates.

d) **Friends Management** (Create/modify/delete) – defines the main operations for managing friends. All users must possess an Android phone that has the Social Nature application installed. When new friend requests are received, a background service changes the view and notifies the user about those requests. If the requests are accepted, the users will start sharing their location.

e) **Groups Management** (Create/modify/delete) – defines the main operations for managing groups. At group level, users can add/delete friends and they can customize group parameters (like distances under which a user will be/will not be notified about the presence of a current group member). For example, a user can set: Max Distance For Family = 500 m, Max Distance For Friends = 200m, Max Distance For Colleagues = 50m. Similar, users can specify an area for *home* (where will not be notified when someone from Family is close to them) or can define an are a for *office* (where will not be notified when someone from Colleagues is close to them).

f) **Settings**– manages the shared keyword which will be used by friends to have access to the current user location, when he is not online. The keyword can be changed only by user using his chosen password.

g) **Search** – the basic search is looking for users in friends' friends while the user is typing the name. The advanced search is looking for a match of the typed name in the entire database.

h) **View**– is composed from a principal view which changes dynamically, a menu bar and a sliding menu. The menu bar contains 4 buttons: one for menu, one for friends' requests, one for friends' locations feeds and one for locations management. When the menu button is pressed, the menu windows slides to right and after choosing an option, the menu windows slides to left (becoming invisible) and the principal view changes accordingly to the selection. In the upperside of the menu

window, the user can find the search box, which will open by touching it the search window.

i) **Check-in** – a user may want to add some information to his current location, like the activities he is conducted or the friends he is with. For this to happen, he can check in to a defined location and add a short message which will appear to his profile and also on his friends' feeds window.

E. Technical details

In present the application was tested using a server with following architecture : Pentium(R) Dual Core Processor, 3GB Ram, 320 GB Hdd, with Windows 7 SP1, and MySql5. For client component we used a phone with following architecture: Samsung I 9001 Galaxy SP l us model, 1.4GHz Scorpion processor,512 MBRAM, 8GB storage, Android OS, v2.3 (Gingerbread) with a service that allowed data transfer.

We tested application with10 users and we didn't remark notable problems until now. In the future we intend to test our application with more than 100 active users in Social Nature application in order to see if the server can handle all the necessary traffic.

3. CONCLUSIONS

Social Nature application consists of three modules corresponding to the three levels of the client-server architecture (3-tier architecture), where elements of interface and data processing are separated. The presentation layer consists of the Android client by which the information are displayed in order for users to see and interact with, the data layer is represented by the database storage where the information are hold in and the logic layer, which connects these two levels (performed using Android services and Php services).

The role of this system is to create a social network that allows sharing user location-based information and activities they carry out. For this purpose, available Android location services like GPS technology, wireless and mobile towers are used to find an approximate location of a mobile phone running this program. Information display has been achieved by using both default components provided by Android platform and more complex elements including heterogeneous lists CWAC, Google Maps and augmented reality using Mixare Library.

The novelty of our approach is related to the fact that a user can be alerted, accordingly to his group preferences, when his friends are in his vicinity. On one hand, it combines features found in other applications like "checkin" from Foursquare or Google Latitude, request location via SMS from Tehula, and on the other hand, it adds new options like viewing all friends' location using augmented reality and drawing the shortest road to the selected friend using Google Maps service.

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