Join Us! Mobile Phone Software Management of Enthusiast ”Flash Mobs” Interested in Performing Social Tasks

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I. Introduction

Join Us! is a novel full-size application developed under the Android (Google Phone) SDK [1]. The core idea is to allow an easy management of enthusiast “flash mobs” from your own friendship circle or new acquaintances that are interested in perform some social task that involves a physical act or gathering of a crowd or interested group of people (mob). The physical act can be defined as to obtain some type of information as, for example, photos with annotations, notes, or some GPS-related info-gathering task that needs cooperation of many peers.

The application allows the freely creation of mini-campaigns. For example, suppose one greenpeace activist wants to check the conditions of a park in the middle of downtown. He sends out the invitation to his peer list (friends or communities) to help collecting as much pictures as possible from different angles of the park. The friends join as they wish, but also, as they reach physically close to the park itself.

Their GPS location triggers the campaign invitation as well. Once the campaign is active, the idea is to collect attachments, and store them such that the task of the greenpeace activist (collect as many photos of the park as possible) turns into an easy one. Flash mobs like these can be also created in other contexts: political, parties, ecological, crime-solving, searching, emergency alert and other spontaneous flash “mob” acts.

II. Joining a Mobile Social Network in Your Pocket

The software was built on top of the Google’s Android SDK. An open-Source platform for the creation of mobile smart-phone software. The real devices are not available yet, but the emulator enables a good set of look and feel of what the smart phone will look like whenever it is released later in 2008. One of the applications that one can execute is the Join Us! (once installed).

Fig. 1. Google Android Phone Emulator

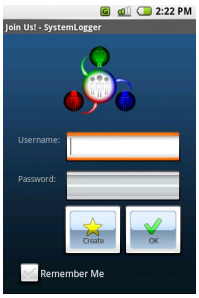


Fig. 2. Log in screen for Join Us! application

Join Us! philosophy was inspired by Orkut’s social network and divided people social interests in five categories: General, Personal, Professional, Social and Contact. These categories allow people to match profiles and add friends and acquaintances at will. The power of Join Us! is the combination of mobile phone, GPS-related smart-phone software and social networks, it allows an infinity of possibilities - for example, if a crime is going on in a certain region of the city, smart phones using Join Us! can be

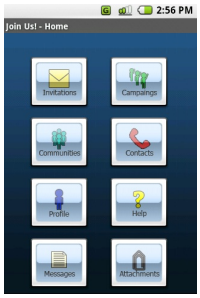


Fig. 3. Join Us! Home

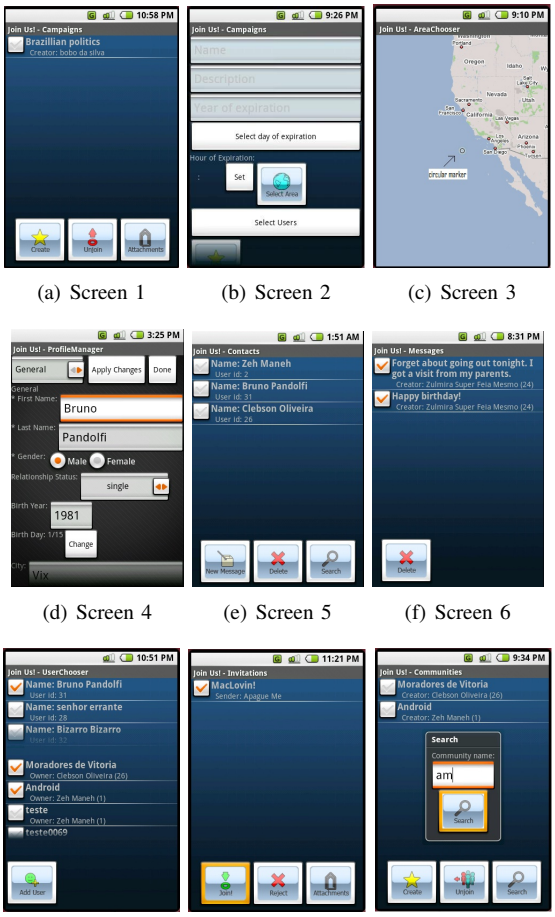
triggered to alert users of the danger and to provide crime scene proofs (photos, sounds, coordinates, video) if possible.

In order to start describing the overall software, we point out the main activities one can perform on Join Us! application by presenting the Home Screen. Such Home Screen appears right after a well-succeeded user login (Figure 2). It is important to mention that we use SSL to provide the highest level of security in the mobile phone to Internet communications.

Figure 3 shows the main functionalities. The functions performed by each button are:

1) *Invitations*: lists all campaign invitations you have received. It is possible to accept or reject one or many invitations at once.
2) *Campaigns*: shows all campaings whose invitations you have accepted. It is also used when you want to create a new campaign or unjoin any campaings you are participating.
3) *Communities*: lists all communities you are in. There is the possibility of creating a new community or unjoining an undesirable community.
4) *Contacts*: shows your contacts. It is also useful if you need to add someone in your contacts list or remove someone from it.
5) *Profile*: shows your profile information and allows you to update them.
6) *Help*: displays the online help for Join Us! application.
7) *Messages*: lists all messages Join Us! users have sent to you.
8) *File Manager*: The file manager is designed to coordinate the campaign attachments. These files can be texts, videos, photos and so on. At the current version, the file manager accepts only texts for uploading and downloading. This simplified version represents the general concept of sending and receiving attachments. Note that it will be extended in the next versions of the application.

In addition, we would like to show a few more screenshots of the system running (Figure 4).



(a) Screen 1 (b) Screen 2 (c) Screen 3

(d) Screen 4 (e) Screen 5 (f) Screen 6

(g) Screen 7 (h) Screen 8 (i) Screen 9

Fig. 4. Several Screenshots of Join Us! Application

Figures (a),(b) and (c) are related to creation and management of a mini-campaign. The user must specify a geographical area, set time limits, set goals and include users in the campaign. Figure (d) show the social network-like profile (i.e. Orkut). To keep in touch with friends, the software manages contacts and allow message passing among friends, Figures (e),(f),(g). Invitations of campaigns come in a single screen alert, Figure (h). Finally, in order to find other users that share common interests, communities can be created, searched and joined as the user wishes, Figure (i).

III. Actively Monitoring Participation in Mini-Campaigns

As part of the development effort, we developed a Location Manager which is an extra service deployed in Join Us! Application Server. It is designed to monitor the current state of the campaigns and users. Since the campaign concept includes a geographic acting area, then this service provides an interface from which the Join Us! Manager can view this geographic scenario in a map produced using Google Maps API.

Figure 5 presents a map in which campaigns' acting

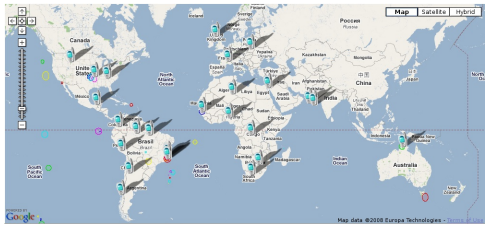


Fig. 5. Global scenario

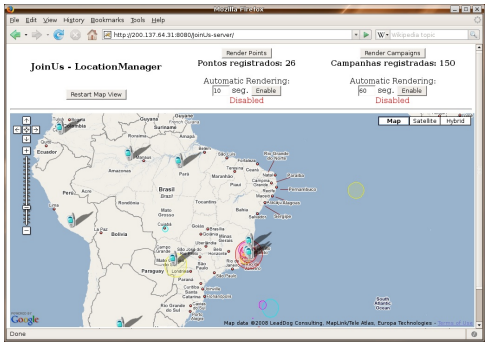


Fig. 6. Service interface

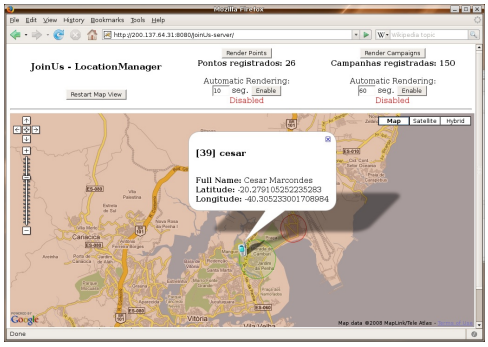


Fig. 7. Getting user information

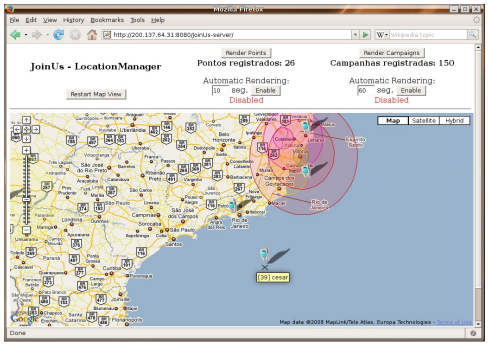


Fig. 8. Providing GPS Location

areas are shown as circles and active users as cellphones. This map depicts how campaigns and users are distributed around the world. In order to be useful to the Join Us! manager, the interface of Location Manager Service provides a set of features as can be seen in Figure 6. The main features are described below.

1) *Rendering*: in the service control panel, the manager can find the render controls. The buttons Render Points and Render Campaigns perform instantly a rendering of users and campaigns respectively. Also, the service provides two additional features for Automatic Rendering. Enabling this feature, the manager can see the users' movement on the fly.
2) *Zooming and moving map*: these capabilities are inherited from traditional Google Maps application. With this, the Join Us! manager can focus his attention to a specific area of the world, for instance, a specific city or state.
3) *Getting information*: the manager can click on users and campaigns to get more information about them, like in Figure 7.
4) *Providing GPS Locations*: Additionally, the Location Manager has been used as a location provider to the android in order to emulate the GPS coordinates (latitude, longitude). Thus, the manager can drag-and-drop users to wherever he wants, in order to test the Join Us! capabilities (Figure 8).

IV. Network Architecture

The basic idea of the Join Us! architecture relies on the asynchronous distributed principle. It allows android mobile users to interact with the system in an independent way and under their own desire. Basically, Join Us! is a client-server application. We present two using scenarios of that. In both we can see its components acting to produce the desired result. The first scenario is presented in Figure 9, where the user creates a new campaign. This new campaign is composed by a description (name, list of invited members, geographic acting area and etc) and a set of attached files. This package of data is sent to Join Us! server which stores it. The second scenario is presented in Figure 10, where the user is receiving a campaign. These two scenarios show how the information flows throughout the system components.

A. Join Us! Clients

Implemented on Android platform, the Join Us! client application gathers a great set of functionalities. The only requirement is to have a mobile phone Internet connection. The client application is implemented using Android Activities and Services. Each of them is described below.

Android Activities : Home (main application interface); System Logger (provides users authentication); Profile Manager (manages users profile information); Area Chooser (allows users to point out the campaign geographic acting area); User Chooser (allows campaign creator to use his contact list to invite users).

Android Services : Polling Daemon (provides data synchronization with Join Us! application server). For instance, getting campaign invitations.

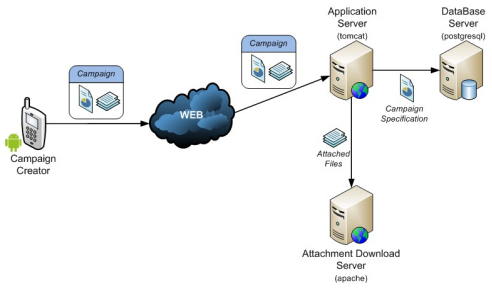


Fig. 9. Creating Campaigns

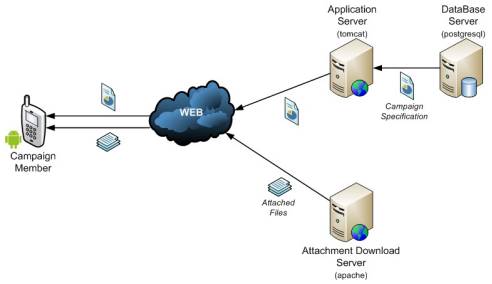


Fig. 10. Getting Campaigns

B. Join Us! Servers

In order to coordinate all the information and events, Join Us! have a group of servers. Each of them is described below.

Application server: designed using Apache *tomcat*. The main roles of this server are:

1) users authentication
2) to support security communication, which is based on the standard protocol SSL
3) to manage all the system information and its interaction process with the users. For instance, information related to campaigns, communities, contact lists, messages, invitations, etc.

DataBase Server : designed using PostgreSql to store all the system data.

Download Server : designed using ApacheWeb server aiming at providing download feature of the campaigns file attachments. This server allows to distribute the system load improving system scalability.

V. Conclusion

The project can be further improved to have access to open API to social networks like *Orkut* and other *Web 2.0* mash-ups. It would be also possible to trigger a series of smart-phone sensors to sense the urban scenario (like temperature, air pollution, noise, etc).

References

[1] Android SDK Website - http://code.google.com/android/.