Final Project: Let's Hangout

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ABSTRACT

In this paper, we present our Android application, *Let's Hangout*. This app solves an issue society faces today: finding a group of people to do a fun activity with you. The application works by users posting activities they want to do, such as playing basketball, and posts a pin on the map with the description of the activity. Users can click on the activity in order to see more about the activity, such as the start time, members attending, description, and other relevant information. In the sections below, we talk more in detail about our application, related work, how this app was implemented, results, discussion future work, and conclusions.

1. INTRODUCTION

The authors of the paper, Adam Chaulk and Zhongyuan Fu, are Computer Science graduate students at Worcester Polytechnic Institute. We decided to work on this project because we have been in situations in the past in which we wished we could have found more people for a fun activity. For example, if we had a group of four people ready to play basketball, but wanted to find a few more in order to play 3v3 or 4v4. With our app, we could post an event, and say we are looking for a few more members to play a game of basketball.

Our application combats a handful of problems. First, this app can simply be used to find a few more members to do an activity with. It can be used to spontaneously search for that final member for a game, or plan an event later in the afternoon. Next, Let's Hangout could be used for finding friends in a new city. Through using this app, users can try out different activities in a new place, forming friendships in no time. Finally, with future work, our application can also be used to plan recurring groups, such as weekly soccer games. The weekly event can still show up on the map in the same way as spontaneous events, but it has the capability to grow into a sizeable event with more and more members joining each week.

2. RELATED WORK

Currently, the Android marketplace contains a number of meet-up applications. The main differences, however, are that these apps are generally for creating recurring groups that meet on a schedule, such as a book club that meets twice a month. Our application stands out because it is aimed at spur-of-the-moment activities, or at the least activities planned for the same day they are posted. Below we will go into detail about the similar apps that exist on the marketplace.

The first application, *Meetup* [1], is an Android application that helps users find a group of people with similar interests. An example usage of this app is a person moves to a new neighborhood and is looking for people with similar interests, such as reading and hiking. This person could then find a book club and an outing group that goes hiking every other weekend. This app does an excellent job at handling large meet-up groups and includes features such as posting announcements to the whole group and chat between individual members.

Another similar application on the Google Play store is *Find a Player* [2]. This app is specifically aimed at finding additional members for sports, although they say it can also be used for games, classes, and events. This application is similar to ours in that it has pins in the map for the various events in your area, including icons such as a tennis racket for organizing tennis matches. When creating events, users can list the skill rating of the players, fitness level of the activity, reliability of the group, and how many times the event has occurred.

A third related application is *Smacktive*, an app for finding friends for fitness-related activities. This social networking application uses hashtags in order to people interesting in doing certain activities, such as "#gym" for finding people to go to the gym with. This app allows users to post their availability for the day, such as 10AM to 3PM, letting you share what activities you are willing to do such as "#running #tennis". You can also browse all nearby ongoing activities as well as people nearby.

Overall, the related applications we found each have their use cases such as using *Find a Player* for sports. We want to create an application that can be used for all activity types, including sports, video games, or even going to the movies or shopping. In doing so, our application can be extend for spontaneous activities, activities planned hours before, and even weekly group meetings.

3. METHODOLOGY

As described above, we intend to build a meet-up application for users to post events that are happening currently or activities planned for later in the day. For example, a user is looking for three more players for a game of monopoly. They should be able to post when the event is happening, the location, and members should be able to join the activity and converse with the other members.

Below are the minimum goals for our project:

- Create a map with individual 'pins' for events
- Users can click on an event to see the description, members, time, etc.
- Users can join/leave an event

Additionally, below are a few stretch goals or potential future work for this app:

- Login screen
- User Profile screen, including activity preferences (sports, board games, shopping, etc.)
- In-Group messaging
- Create permanent groups and setup meeting intervals (weekly, bi-weekly, monthly, etc.)
- Map filters based on activity type or time of the event
- Schedule future events
- Recommender System for recommending potential interested events for each user

We have five main activities for this prototype. SignUpActivity handles the user registration process. SignInActivity handles the user sign in process. MapActivity allows users to 'pin' their activities on the map. When the user clicks on a pin on the map, a popup should appear and the user can join the activity. EventListActivity displays a list view of activities. Users can click the "join" button on an item in the event list to join. He/she can click the button again to leave the event. PostActivity handles creating new events. These encompass the main functionality of our application.

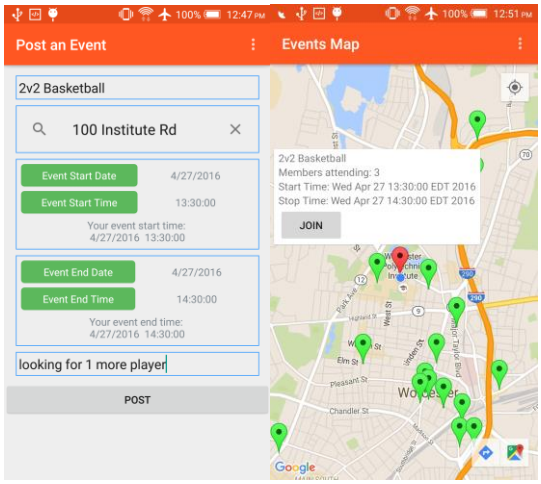

Figure 1: *Let's Hangout* Post an Event and Map Views

4. IMPLEMENTATION

The following sections describe the APIs and tools used in order to implement *Let's Hangout*.

4.1.1 Google Maps Android API

With the Google Maps Android API [4], we can add maps to our app that are based on Google Maps location data. The API automatically handles access to Google Maps servers, data downloading, map display, and touch gestures on the map. We can also use API calls to add markers, polygons and overlays, and to change the user's view of a particular map area. Every time a user posts an activity, all nearby users within the predefined radius will see the activity and decide whether or not to join the activity.

4.1.2 Location Services

Android gives our applications access to the location services [5] supported by the device through classes in the *android.location* package. The central component of the location framework is the LocationManager system service, which provides APIs to determine location and bearing of the underlying device (if available). Our application requires the *ACCESS_FINE_LOCATION* and *INTERNET* permissions.

4.1.3 Server and Database

Parse Server [6] is an open source version of the Parse backend that can be deployed to any infrastructure that can run Node.js. In order to run our application, you must run the Parse server locally on your computer in order to run application. Parse provides a software development kit for the Android platform, using MongoDB to store data. The main tables in database are User, Events, and EventMembership. The User table is a parse provided table that stores the user login information. The Events table stores the information for an event, including the title, description, location, owner, start time, and end time. The EventMembership table handles the relation between a User and an Event for joining an event.

4.1.4 Eventful API

The Eventful API served as a critical part of the application This API pulls event information from *eventful.com*. Although there is an existing Java API, it does not work with Android due to XML binding issues. Hence, we found a public implementation on Github that uses *Simple XML* for XML serialization that works on the Android platform [7].

With this API, we are able to pull events and filter by location, date, and category. In our implementation, we leveraged event location and event date primarily.

4. Is Hangout an app you would consider using?

#	Answer		Response	%
1	Yes		1	25%
2	Maybe		2	50%
3	No		1	25%
	Total		4	100%

Figure 2: Survey Results

5. EVALUATION & RESULTS

In order to evaluate our application, we allowed four users to test our application and complete a survey afterwards. We asked them five main questions: if they use an android phone, have they used a similar application, were the events relevant to them, would they consider using this app, and if they have any suggestions.

The results to the survey show that many of the events were not relevant. We feel that if we had more WPI related events, we would have seen more success. On the other hand, the survey was a success in that we received a large number of suggestions in order to improve our application. Out of four users, none of them have used a similar application that aggregates nearby events, showing that our idea is unique.

6. DISCUSSION

One of the main challenges of creating this application was the API chosen to pull events from. WPI uses a system named OrgSync, an online community for schools to manage organizations. Most of the groups on campus create OrgSync events for all of the activities they host. Since OrgSync is so popular, we wanted to leverage the OrgSync API to pull WPI related events into our application. However, the system administrators decided our application could not leverage their API due to the sensitivity of the information provided by the platform. In turn, we decided to use the Eventful Java API. The main flaw of using this API with Android is the API is implemented with Java Architecture for XML Binding (JAXB) [8]. Through a number of searches, we found that JAXB does not work well with android. Luckily, we found an Android implementation of the API that uses Simple XML [7].

Another challenge related to the Eventful API was the presence of recurring events. For example, in Worcester there is a yoga studio

that created a recurring event for a yoga class every Saturday from June 2015 to June 2016. However, if we run a query for all events on 4/26/2016, the API includes the yoga event in its result set since the event length includes our search date. Future work could address the issue of displaying recurring events in a different manner.

7. FUTURE WORK

Future work for *Let's Hangout* would involve adding additional activities, including a separate activity for viewing the event description, members, and chat between users. For the filtering features, we would modify the MapActivity to include a filter for the 'pins' on the map as well as filtering by the time of the event. In order to create permanent groups, we would modify the post activity to include a flag for making it a recurring event, as well as having an GroupManagerActivity for managing permanent groups. For recording the usage statistics and letting users choose their event preferences, we would add another ProfileActvity for showing the events that the user joined previously, the events the user may be interested in, and the events that the user plans to attend.

In the future we would utilize the Google and Facebook Sign In APIs to allow users to login and register the *Let's Hangout* accounts with their Google or Facebook accounts. This feature is common among mobile applications and would help improve the overall user experience. Additionally, Google and Facebook could help popularize our app if users shared a link on Facebook.

Currently, the loading times for the MapActivity and EventListActivity are quite slow. This is because it takes a significant amount of time to read all of the events from the Eventful API, and then read the events from our database. We would optimize our database queries in order to improve user experience.

Right now, we deploy the Parse server on our own laptops in order to run the application. This is ideal for testing, but not an effective solution for production. We plan to migrate our current Parse server onto AWS, which would help alleviate some of the difficulty. Additionally, we would develop a custom Parse server that ran Eventful API queries every few minutes or so, and pull those events into our database. With those changes, the application would be significantly more responsive and effective.

Based on the feedback from our survey, we realized that the Eventful API may not be able to provide enough relevant events for users. We would explore other APIs that we could leverage in order to have a larger event selection.

8. CONCLUSION

Let's Hangout provides a new way for users to meet up with others who have similar interests. We feel that our application is an app that can be used for a variety of events, including sports, video games, and board games. Future work for this application could make it an effective application for managing large groups, such as a monthly book club or a weekly soccer game. Our evaluation shows that users would be interested in an app such as *Let's Hangout*, as they have not used an application or website similar to it. Overall, we feel that our application is unique application for finding a group of people to do a fun activity with.

Our Github repository for the project, including instructions on how to run the app, is located at: https://github.com/zyfu0408/Hangout

9. REFERENCES

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