FACULTY OF SCIENCE, ENGINEERING AND COMPUTING

School of *Computing and Information Systems*

BSc DEGREE
IN
Computer Science

PROJECT PROPOSAL

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Project Title: GPS Social Application for Android

Project Type: Build
Date: 26/09/2016

Supervisor: Dr. Dimitrios Makris

Did you discuss and agree the viability of your project idea with your supervisor? Yes

Did you submit a draft of your proposal to your supervisor? Yes

Did you receive feedback from your supervisor on any submitted draft? Yes

ABSTRACT

The project is to create a Social application for Android phones which will help different people meet each other while giving them power to configure their privacy. It will use GPS and make sure all the people in list have been close to or cross path with the user.

Currently there are similar application but most of them are focused on dating application. Not only this but many social applications are bombarded with fake, bot users. This can be very frustrating for user to use application.

This application will change how people meet. User can first see the person in live to confirm they are human and not just some bot, they then can talk to them. This won't be just some dating application but it would be a new social network where people can keep finding new people every day in safe and secure manner.

The perfect scenario for this application would be when a person might be going to his/her work by train and saw a person that they would like to talk to but he/she is busy at the moment so they don't have time to talk to the other person. In past they would likely never meet again, however with this application he/she can look at other person profile when he/she has time and message them If they want to.

Introduction and Background

Client for this application would any person who owns android phone. They can be a person going to work, school or a person who is busy, a person that travels by car, train or plane. But during that journey they might see or find someone who they would love to talk to but are busy or they are were in difficult place to talk. Usually this would be end, however with this application you will be able to see the person you crossed path with and see their profile and talk to them.

The stakeholders for this project will be Supervisor, Developer(Me) and Customers. The key decision during development process will be on developer. Supervisor will be there during whole project to provide me with feedback which could change application development process and some functionality. A group of Customers will be my friends. Customer need to be satisfied with the quality of the products, they could also help with testing application during iteration phase of development. Customer could also help in the beginning by providing some idea to create new requirements for the project. The application should deliver its objectives and aims successfully. Without customers the application won't be useful so keeping customers interested in the application is important.

The Motivation behind this project comes from due to huge gap in social network that is not just focused in dating using GPS in the market at the moment. There are many other applications similar to the one I am planning to build, for example happn, Nearby Live and tinder. All of these application is available in android and uses GPS to locate users. However, the problem with existing system is that they are focused solely on Dating. This won't be useful for many other customers who just wants a better social network or way to meet new people without the purpose of dating. This leaves many users unsatisfied with current application which is a good for us as the customer desires application similar to ours.

Stakeholders will be able to use system which is more boarder than system that only focus on dating. They will be able to use this new system to start their own new relationship with new people. They won't have to be scared weather a user is Real or bot/fake. This allow user to safely only think about thinks that matter instead of wasting time on thinking weather a user is real or fake.

Some of the similar previous system/application are happn, tinder and Nearby Live. All of these application use GPS technology to locate users who are close by. All 3 application uses Facebook data to login users. happn and tinder are focused in dating. happn has the interface where close by user profile will be shown at timeline and newer profile will be at top. User can also configure their profile, whether they want to see male or female profile in time line and make their location public or private.

Finally, most people use android as it is the most popular operating system. Which means many people will be able to use the application and it will be much easier to test the application during development process.

Aim

Project aim is to create an android application which will be able to show people who came close to them and have ability to message to them or look at their profile.

In long-term the project should be able to not only find people who came close to them but also be able to filter out what type of people should be in the list of the people that came to close to them. This would become a fully running social Network.

Objectives

The Objectives of application are given bellow:

- Provide an android application to people so they can see other user profile that came close to them
- One profile able to connect with other profiles
- User able to configure their settings so they can allow who can view their location and who cannot, also manage who can message them and other settings
- Connecting account from social network (Facebook) and reusing accounts
- User are able to message to right person 100% of time
- Updating profile list and add new people at top
- Ability to look at message history or delete them
- User able to block other specific Users from messaging or knowing their location
- User able to update and upload pictures
- User able to edit their profile
- User should be able to invite friends from another social network like Facebook
- To get 80% of user satisfied by using the application
- `To get 100% correct person that user is searching for if that person has the application as well

Technologies and Resources

GPS (Global Positioning System)

GPS is the core technology used in the application. The main functionality of the application is to locate user's geo location and GPS will be the technology used to locate user's geo location.

How GPS works? GPS uses geosynchronous orbiting satellites and GPS receiver. These GPS receivers are usually embedded within cell phones. GPS receiver uses a technique called Satellite ranging to calculate the position. First we know Satellites positions which are then transmitted via radio waves. GPS receiver position is unknown on earth; however, GPS receiver uses information received from satellite to compute its position. It uses simple (Speed = Distance / Time) formula. To find distance between GPS receiver and satellite. we rearrange the formula to D = S * T. (S = Speed of Light, Time = Time received – Time send) For this GPS receiver in client phone needs to know at what time message left satellite and was received by phone GPS receiver. Both GPS receiver and satellite generate same code exactly at same moment as they are synchronized. Then the receiver search back in its memory when the signal was received and search for time when same code was created by receiver.

GPS has been used for Varity of application, it can be used while hiking to locate people position, used during emergency service in natural disaster situation. We will be using GPS in our application as well, to locate user location and compare it with another user.

Other Technologies:

Some of the other Technologies used to build the system are:

- Android SDK to build the android application. The reason behind building the application for android because android phone is most popular in market and loved by many.
- Google API are set of API from Google that allows communication with Google services like search, Gmail and Google Maps which I will be using during this project. This is the old way of using Google services. Now there is better method like using Google Play Services which not all devices have.
- To get users location, we could use Location API which has been part of Android framework since API level 1 or we could use Google Location Services API, which is a part of Google Play Services. Google play services is recommended, However, not all android devices have Google play Services. Google Play services are available from android 2.3.
- For the database I will be using MySQL as I have worked with it before for my project to build a Black Board System which made me familiar with MySQL. All the work in back-end will be done by JAVA.
- I will be using central server as back-end where user data will be stored in MySQL and calculation will be done to find who is close to users. Data for user will be used from existing system like Facebook by using Facebook SDK. To host the server, I could use Amazon web service, university hosting or any other hosting services.

Client-Server Communication

There many possible interface between client android app and server. The 3 common ways to communicate are: SOAP, Servlet and JSON.

- SOAP: Simple Object Access Protocol is a lightweight mechanism to exchange data in XML format.
- Servlet: HTTP(s) is the simplest way to exchange data with the help of Java Servlets. We don't have to serialize to/from XML which makes the process faster.
- JSON: JavaScript Object Notation is a light-weight data-interchange format. JSON has both use of a model and HTTP(s). This make it the best option out of 3 for our Server-Client implementation.

Data

We could use own login system where people can sign up with email and password but for this project I will be using Facebook for login system. This is where user signs up for application using Facebook login, an account will be created for them and authentication will be done by Facebook. This is because developers who implemented Facebook login in apps have had increases in number of people logging into their apps, possible due to easiness and smooth transaction.

How does it work? Facebook SDK for android enable user to sign in into application using Facebook Login. User need to allow permission to my application to retrieve information on Facebook on user behalf.

During basic login, my application will receive access to person public profile and friend list. However, to access additional profile information or to publish content to Facebook on someone behalf, I need to request necessary permission. If my app asks for more than public profile, user friends and email permission, Facebook must review it before I can release it. Facebook review login permissions on two main criteria:

1. Utility: The requested permission must clearly improve user experience
2. Visibility: Data gained from permission needs to be tied to a direct use

Facebook review my app to make sure it:

- Only requests the permissions it really needs
- Makes proper use of write permissions
- Works on variety of devices

Other functionality of Facebook SDK that might be useful is for my application to share or send message to Facebook. People could also send invites to friends from application. Link posts, stories and requests shared from my app back to my app. This could be useful for advertising and spreading news about application in customer filled social network like Facebook.

Finally, User can login to my app by using just phone number or email, without need of password. This can make user life easier and user are more likely to login.

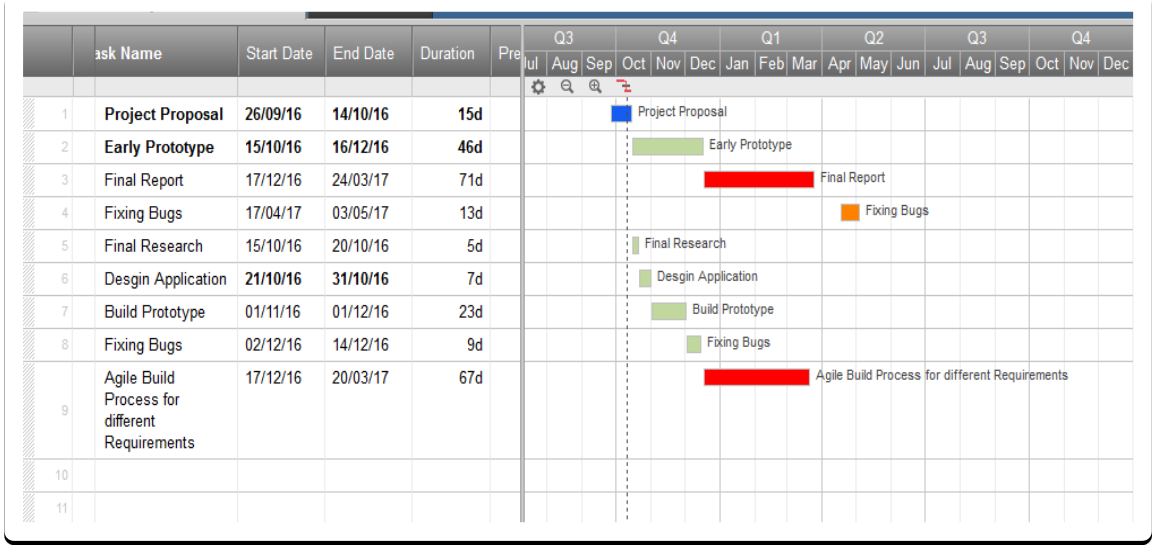
Method and Work plan

There are many methodologies for managing project development process. Some of the most used ones are Waterfall Model, Spiral Model and Agile Approach. I will be using Agile approach with DSDM model for the project as it is flexible and easy to adapt to change in requirement. Not only this but due to iteration build process. There will be many deliverables with different functionality. In short DSDM Atern project lifecycle is divided into 7 phases which are given bellow and explained in brief:

1. Pre-project – Project proposal (Current)
2. Feasibility – Check weather project is viable or not
3. Foundations – Project is properly understood and high level requirements are known
4. Exploration – Early solution to requirements (functional)
5. Engineering – refinement of solution
6. Deployment – Implement and test System
7. Post-Project – assess weather functionality is achieved or not

I will be using Android Studio to create client android application. The application will have Facebook SDK as well to use Facebook functions. For the Server Java and MySQL will be used to handle user data.

Work plan using Gantt Chart



	ask Name	Start Date	End Date	Duration	Pre
1	**Project Proposal**	**26/09/16**	**14/10/16**	**15d**	
2	**Early Prototype**	**15/10/16**	**16/12/16**	**46d**	
3	Final Report	17/12/16	24/03/17	71d	
4	Fixing Bugs	17/04/17	03/05/17	13d	
5	Final Research	15/10/16	20/10/16	5d	
6	Desgin Application	**21/10/16**	**31/10/16**	7d	
7	Build Prototype	01/11/16	01/12/16	23d	
8	Fixing Bugs	02/12/16	14/12/16	9d	
9	Agile Build Process for different Requirements	17/12/16	20/03/17	67d	
10					
11					

Deliverables and milestones

Some of the deliverables for the project is making first prototype with some functions. The second deliverables will be to have complete build application and finally last deliverable will be to make sure application is bug free.

Prototype with certain functions:

- GPS info (Geo Location of Client)
- User Data / Profile in Server
- Add people GPS location to server
- Check user distance and inform user
- Integration with social network (Facebook)
- Configure settings
- Ability to message from one user to another

Risk and Contingencies

Some of the Major risk and contingencies for it are given in table below:

Risk	Likelihood	Impact	Priority	Effect on Project	Mitigation Plan	Contingency Plan
Failing Facebook review for extra permission	10%	Low	Low	Certain feature has to be thrown	Follow the guidelines from Facebook	Use other social network for those features
Difficulty while making connection between client app and server	20%	High	High	Slow developme nt and quality	Make sure both client and server connection is feasible	User different method to connect client app and server
Failure of integration with Facebook	20%	High	High	Have to remove some function	Different way to sign up and login	More than one way to sign up and login
Difficulty of using GPS by android SDK	10%	High	High	The Quality would be affected	Check if phone GPS and android version	Use Wi-Fi-based location locater or look for solution
Heavy Load on Server while calculating distance between user	60%	High	High	The quality and speed of the System will be slowed.	Implement and test different method to calculate user distance	Create a better efficient algorithm to calculate the distance
Loss of important data	20%	High	High	The quality and time would be effected	backup all important data	restore data from back up
Unavailability of Software that may be required during course of project	20%	High	High	The time taken to finish project will increase	Obtain most software needed as soon as possible	Carry out project with older or alternative software.

Discussion regarding legal, ethical, societal and security issues relating to the project

Ethics, data protection and safety relating to the project is very important in this project as we are invading human privacy. Only user who are registered and has correct login information will be able to use the application. For privacy user can configure to

I must think about the confidentiality of users which is why only authorized people will have access to the people Data like their current geo location.

The application is Social Network which uses people geo location, profile, information, picture and Facebook data. Due to all information being in public if configured in settings and minimum age limit for creating Facebook account being 13 years, this application is meant for 13 year or older. All the information about user like geo location, profile, messages and images will be kept safe and secure and made public only if the users allows to share it. The system will not store information that is not required for it to function. For example, the application/server will not store any passwords from Facebook but instead asks for tokens which will be store in server and encrypted.

Also, "Continued use of GPS running in the background can dramatically decrease battery life." When using this application, data is stored in server. This information will be used to make sure application function properly and improve service. Data can include but not limited to: geo location based on GPS, Latitude and longitude, Facebook session access tokens and Application Settings/preferences.

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