

# **Car Sharing**

## **Project Research Document**

version 1.0

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*Prepared by: Martin Brehhov*

*Project Supervisor: Joseph Kehoe*

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## Abstract

This document aim is to show my project development progress. It should help me in different stages of my project as document includes a lot of informal thinking process with supported web links. A valuable way to develop something, when you don't really know where to start and where to end. All links are related with project with brief summary given.

Mostly Document follows topics:

- Android related programming research
- Cloud side Software
- Development Tools
- Cloud emulation locally
- informal comments

## Android programming

Simple way to start programming is to find any tutorial in internet. There are tons of them.

Good start is <http://developer.android.com/training/basics/firstapp/index.html?hl=p>

Writing 'Hello world' program on android. Just simply creating new android project in eclipse and run as 'android application' on emulator.

Just going through quickly important stages of android programming. Whichs is or was helpful for me.

Before diving into advantage stuff we need to learn simple things. Hello world is easy program and good way to start the project. So we can build thing on top of it.

Next to work with google maps. we have import google play sdk libraries use build Path to add external jars.

<http://www.androidhive.info/2013/08/android-working-with-google-maps-v2/>

Here is good tutorial how to get Android google map frame into phone. All configuration - like how to add key into manifest file and google account is described in detail.

ex. Fragment of my manifest file

```
<uses-feature
    android:glEsVersion="0x00020000"
    android:required="true" />
<permission
    android:name="eu.example.map.permission.MAPS_RECEIVE"
    android:protectionLevel="signature" />
<meta-data
    android:name="com.google.android.maps.v2.API_KEY"
    android:value="AlzaSyCXXXXXXXXXXXXXXXX9pOqA9p3zo-XXX" />
<meta-data
    android:name="com.google.android.gms.version"
    android:value="@integer/google_play_services_version" />
```

...

Another links to this area.

[www.vogella.com/tutorials/AndroidGoogleMaps/article.html](http://www.vogella.com/tutorials/AndroidGoogleMaps/article.html)

<https://developers.google.com/maps/documentation/android/>

Make sure you get your androidmanifest file correctly configured, otherwise you wont be able to use google map.

## User interface

For our small project we won't need to concentrate too much on UI, more how to get network functionality working. Still here are few good examples of Login Page look and feel type examples: here is couple of nice tips for creating login page

<http://beginandroiddev.blogspot.ie/2013/04/a-simple-login-application.html>

<http://examples.javacodegeeks.com/android/android-login-example/>

Project should be able respond on button clicks, open new intents, be able to navigate back to previous activity or forward to next activity.

Another important android programming parts are Layout files - those are xml files located res/layout, which are responsible how our phone App look like. They are simple xml files with View-elements in there.

Interesting that you can make manually folder "layout-land" and copy any portrait type of xml file into that folder and it will appear to be in landscape format.

When we work with android App, activities are constantly created ,closed, resumed...

### **onCreate,onResume**

very nice explanation of the 3 main components of the android phone.

<http://stackoverflow.com/questions/16058461/oncreate-vs-onresume-onrestart-behaviour-regarding-member-variables>

- onCreate: Activity launched for the first time. Here is where you may initialize your stuff.
- onResume: User returns to the activity after another activity comes into foreground. ( onPause)
- onRestart: User navigates to the activity after it's no longer visible ( onStop).

## Session

We need to use SESSIONS or Shared Preferences to traverse through different activities. If let's say Profile is going to be main activity - only registered users can reach it.

## HTTP requests

If we want create messaging capability between users we have to learn how to make web requests.

include into manifest file those permissions:

```
<uses-permission android:name="android.permission.INTERNET" />
```

```
<uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />
```

where INTERNET is permission to make request to web

ACCESS\_NETWORK\_STATE additional permission of is readint network status (is 3g or wifi connected or not).

As I'm going to need to learn how to make connections to database. Here is some valuable resources.

Good link example how to make call from app to web server:

<http://trinitytuts.com/load-data-webservice-android-application/>

<http://www.wikihow.com/Execute-HTTP-POST-Requests-in-Android>

<http://www.androidsnippets.com/get-the-content-from-a-httpresponse-or-any-inputstream-as-a-string>

<http://www.androidsnippets.com/executing-a-http-post-request-with-httpclient>

Usually network data is transfered in JSON format

## JSON

Data will be processed by 3rd cloud service (php scripts on server) and most probably sent over by using JSON format.

[https://docs.google.com/document/d/1OzKethIk7iEpL7MuBzWdvN85IzIReEFyz\\_d8oL9SSI0/edit](https://docs.google.com/document/d/1OzKethIk7iEpL7MuBzWdvN85IzIReEFyz_d8oL9SSI0/edit)

JSON is another acronym, standing for **JavaScript Object Notation**.

JSON is a plain text way to encode and decode objects: object can be encoded into JSON strings and JSON strings can be decoded into an object. It has low overheads (e.g. it is more efficient than using another plain text encoding such as XML).

Very Nice sample for generating elements on screen after button was pressed

<http://stackoverflow.com/questions/7348150/android-why-setvisibilityview-gone-or-setvisibilityview-invisible-do-not>

When working with JSON data in Android, you would use JSONArray. This is important. In our android app, when handling JSON array response from network, we have to break it down into Json objects.

JSON starts with the array brackets. Arrays in JSON are used to organize a collection of related items (Which could be JSON objects).

For example: [{"name": "item 1"}, {"name": "item2"}]

On the other hand, Of course, JSON arrays and objects may be nested inside one another. One common example of this is an API which returns a JSON object containing some metadata alongside an array of the items matching your query:

```
{"startIndex": 0, "data": [{"name": "item 1"}, {"name": "item2"}]}
```

## Cloud side Software

My back-end is working on PHP server side scripts.

Here is nice example how to encode mysql result and output it within php.

<http://stackoverflow.com/questions/383631/json-encode-mysql-results>

[http://www.w3schools.com/php/php\\_mysql\\_intro.asp](http://www.w3schools.com/php/php_mysql_intro.asp)

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Calculation between gps coordinates

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<http://developer.android.com/tools/publishing/app-signing.html#releasemode>  
For messaging I might use MQTT

## **MQTT**

<http://thejackalofjavascript.com/getting-started-mqtt/>

At the moment I have MQTT server working on my local laptop. Idea is notify android app when events occur.

Its also called a push service.

Google offer their own solution - but all connections and messages are sent over their servers . If MQTT won't work for me ,I need to use google GAE

From Eclipse Paho project we can use freely available MQTT service class file what runs in background and also some Push Callback that runs along with service class.

Back! MQTT is well designed solution from IBM. But there are lot in... so to pick up necessary parts.. we need to check several ready made solutions.

for local computer we can use this link to download and test tcp/ip server  
<http://mosquitto.org/download/>

Also a lot of usefully documentations are in the root domain - <http://mosquitto.org/>

I recomend to vисти this simple freely available project that has implemented MQTT code

[http://www.java2s.com/Open-Source/Android\\_Free\\_Code/Eclipse/Download\\_Free\\_code\\_android\\_mqtt\\_push.htm](http://www.java2s.com/Open-Source/Android_Free_Code/Eclipse/Download_Free_code_android_mqtt_push.htm)

and look the implementation of the Service itself.

It can be useful to understand how it works.

Next we need to include PAHO libraries. We only need on paho-mqtt-client-1.0.1.jar

That will allow program to contact any broker server and implement code necessary for publishing messages or listening incoming messages.

So thinking in terms of my project - Mqtt service should start when user logs in into the system.. then we can listen topics...

Topic is something like communication channel.



You register topic... in MQTT server and all people who register to this topic... can equally receive event notifications.

And if something happened... then this topic should be notify and we can act accordingly the action.

Example... if we want to get some messages. Then we can register topic as our system user name and if anybody want to send us a message... he can just send anything into the topic of the username he want to contact.. That way message is coming to the right user....

MVC? OBSERVER PATTERN?

Yes it's possible. But not in my first version. For MVC i need very clearly to understand what my core is and what is controlling what. What database object or what type of user interface to use where events occurred for controller. At the moment i'm just trying to get something working... And worry about performance later on.

At most i could considering some sort of publish-subscribe message pattern with MQTT..more on that later.

Is there a way to set MQTT working through PHP???

MQTT "SUBSCRIBERS"? Forget about responding to subscribers from PHP. I'm not mixing MQTT with PHP at the moment. With version one. But ideally yes in future. But it's going to be very complicated... There are PHP that supports MQTT, they are named PHP with SAM (Simple asynchronous messaging) support. But I don't know if there are freely available PHP hosting with SAM. So my project should have normal HTTP REQUEST TO WEB SERVER and android should pick some answers that PHP generates... And not through MQTT? At the moment yes...

## Development tools

### **LAMP** installation

Because I'm installing all backend in my local laptop at the moment.. here is few good instruction how to do that.

I'm using xubuntu so only linux guides are useful for me.

<http://www.unixmen.com/install-lamp-server-apache-mysql-mariadb-php-ubuntu-14-1014-0413-10/>

I'm interested to know How it's going to work locally and how hard it is to configure.

### **GIMP/Photoshop**

Good way to develop simple image buttons and UI elements.

### **Eclipse**

<http://embedded-computing.com/articles/the-commercial-eclipse-based-solutions/>

Most people who develop android Application are using Eclipse as developer tool.

### **Notepad**

PHP scripts were all written in simple notepad text editor and sent over through FTP to web server.