Design for Scientific RENAISSANCE

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Android App for Muslim Daily Activities

Adnan Shaout[1] and Ibrahim Ahmed Alafeef[2]
[1]The ECE Department, University of Michigan, Dearborn, MI USA
[2]Computer Science Department, Princess Sumaya University for Technology, Amman, Jordan
[1]shaout@umich.edu,[2]Iaalafeef09@cit.just.edu.jo

ABSTRACT

There are many Android applications that serve Muslims all over the world, and the most important applications are those that provide information to help Muslims in their daily Islamic activities. In this paper, we will present an Android application that includes many features that could serve Muslims in their daily life, such as providing a Muslim with a map of all mosques around him, give the ability for an Islamic cleric to post his lecture schedules, providing live streaming from Makkah etc.

Keywords: Prayer Times, Mosque Location, Android App, Muslims Activities, Qiblah, Zakat, Live Streaming

1. INTRODUCTION

Muslims in their daily life are required to perform many types of activities such as perform their five daily prayers, perform Wudu, pay Zakah, etc.

Technology is advancing and affordable these days, enabling Muslims to maximize the efficiency in utilizing their time. Many efforts and contributions can be found that serve Muslims and make their life easier through the use of mobile applications. Everyone nowadays carry a smart phone and Muslims can use smartphones in a useful way to make their life easy.

Many mobile applications have been written to serve Muslims. Applications such as providing information about daily prayer times, Qiblah direction, how to perform prayers, etc are some examples. Those kinds of applications are very useful to Muslims, especially since they always carry their smart phone with them most of the time. Smartphones can help provide Muslims worldwide with the exact information about their daily religious activities.

In this paper, a new Android application is proposed that could serve Muslims by providing many useful features. The following are some of the functions that the Android App will provide:

- Prayer times,
- To go to nearby mosques,
- Qiblah direction,
- Zakat calculator,

- Live streaming from Makkah,
- Learning the right way to pray and to perform Wudu,
- A Login and registration system to make share notes about Islamic lectures with others.

The remainder of the paper is organized as follows: Section 2 describes the proposed application details and its functions. Section 3 presents a literature review of the existing Muslim Apps. Section 4 describes the differences between the proposed application and other existing applications. Section 5 describes execution warnings of the application. Section 6 describes the testing environment. Section 7 presents the conclusion. Section 8 describes the discussion and future work.

2. MUSLIMS DAILY ACTIVITIES APPLICATION

The new proposed Android App has many useful functions that could help Muslims in their daily activities. The following are the functions that the App will provide:

A. Nearby Mosques

It is a good idea to make the user check nearby mosques to know where these mosques are and how to navigate to anyone of them.

Using GOOGLE maps API service, and the current location of the user, a search will be performed on mosques that are near the user location. The result is executed in JSON code, in the class "ActivityMaps.java". The JSON code will be executed and the mosque coordinates and their names will be entered using GOOGLE maps, then coordinates will be marked on the map so that the user will be able to view each mosque and their routes. Figure 1 shows a screenshot of this feature.

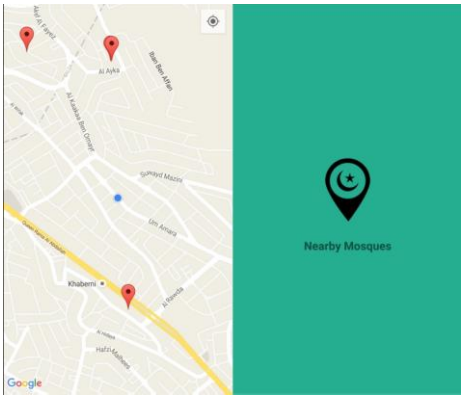

Figure 1. Nearby Mosques indicator.

1- Kaaba Compass (Qiblah)

This feature will be useful for Muslims, especially when Muslims are not in their homes and when they need to know the exact Qiblah direction to perform their prayers on time.

This feature provides the exact Kaaba location which is the Qiblah of all Muslims to perform their prayers on time.

Using the user's current location and Kaaba coordinates, the north sensor of the smart phone which marks the north, will be changed to the Kaaba coordinates which indicates the correct direction for the Qiblah. Figure 2 shows a screenshot of this feature.

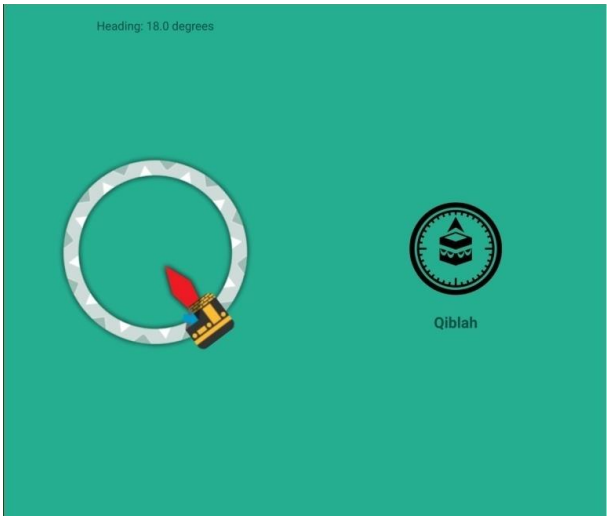

Figure 2. Qiblah direction feature.

2- Live Streaming

Streaming the "Al-Haram" in Makkah is a useful feature which will allow the user to watch Al-Haram live at any time.

Using the GOOGLE API YOUTUBE service and the ID of the live stream YOUTUBE video for Al-Haram and Al-Madinah, this feature will allow live streaming for both Al-Haram as well as for the Prophet's Mosque in Al-Madinah. Figure 3 shows a screenshot of this feature.

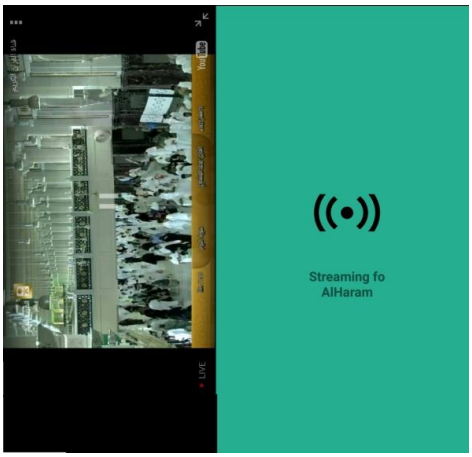

Figure 3. Live Streaming service.

3- How to Perform Salah

Muslim children that are learning Islam and want to know how to perform their prayers correctly can benefit from this feature.

The feature uses pictures for each step whilst performing Salah in Arabic, English and French languages. The user will be able to learn the correct way to perform the prayer. Additionally, children or new Muslims can use this App to learn how to perform Salah as well. Figure 4 shows a screenshot for this feature.

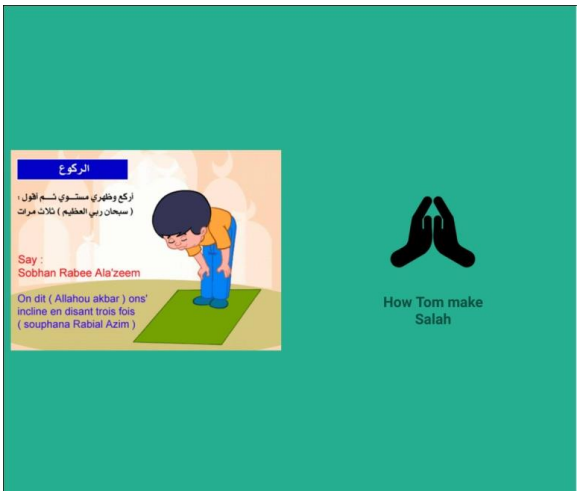

Figure 4. How to perform Salah.

4- How to Make Wudu

This feature that is similar to the previous feature. It relates to how to perform wudu the correct way (Wudu) so that you are ready to perform prayers. This feature includes pictures using the same three languages to describe each step during Wudu. Figure 5 shows a screenshot of the feature.

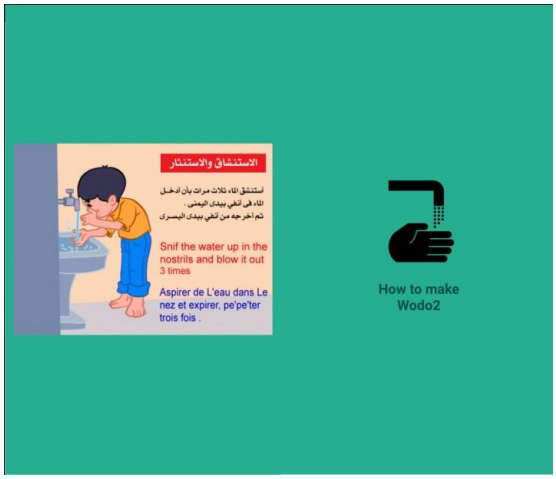

Figure 5. Wodo2 illustration feature

5- Zakat Calculator

Many Muslims face some difficulty calculating their due Zakat. This Zakat calculator feature provided will calculate the Zakat for money and Gold.

When the user enters the gold weight and the gold price per gram in addition to his money saving over the past lunar year, this feature will then calculate the Zakat provided that the total amount of money is more than the price of 85 grams of gold. The Zakat is 2.5% of the total amount of money. Figure 6 shows a screenshot of this feature.

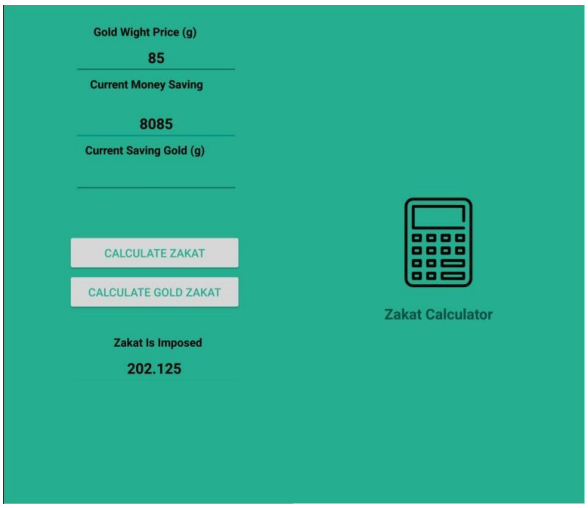

Figure 6. Zakat Calculator feature.

6- Posting Lectures by Muslim Clerics

Muslims who are interested in attending lectures of a specific cleric can do so by receiving a message directly from the cleric. The cleric can post the lecture title, the time and the location for each lecture. Many Muslim clerics would benefit from this feature so that clerics can make their lecture information available for everyone to know the time and the location.

The cleric requires to open an account and add his lecture title, location, and time for all his lectures. Users can open their accounts too and see all the clerics and their lecture information.

Using a server and PHP code connected to java code, all account information will be sent to the server and retrieved from it when needed. Figure 7 shows a screenshot for the login and register interfaces.

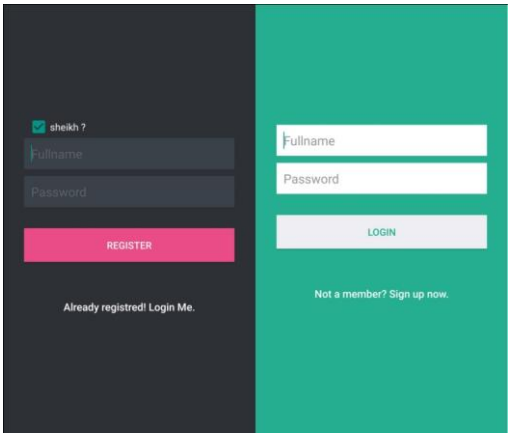

Figure 7.: Registration System interface.

7- Prayer Times

It is a useful feature which enables users to check prayer times using their smart phones.

Prayer times are based on the user's location by passing the longitude and the latitude of a user's location to the prayer time's class to calculate the prayer times for the user based on his location.

Figure 8 shows prayer times, users coordinates, the country, the city and the street name.

Figure 8. Prayer Times identifier feature.

3. RELATED APPLICATIONS

In this section we will describes the features for the most rated Muslim applications that are available in the GOOGLE play store.

1- Salatuk (prayer times)

(Salatuk, 2016) includes prayer times, mosques location, the ability to change the alarm for each prayer time and the Qiblah direction.

2- Muslim Pro (prayer times Quran)

(Muslim Pro, 2016) includes prayer times, Qiblah direction, calendar, nearby mosques, nearby HALAL restaurants, Duas, and Quran.

3- Muslim's prayer times

The (Muslim prayer times application, 2016) includes prayer times, an alarm for each prayer time, a Qiblah direction and Hijri calendar.

4- Prayer Times

The (Prayer Times application, 2016) includes prayer times, Qiblah direction, an alarm for each prayer time and previous months events.

5- Prayer Times: Qiblah & Azan

The Prayer Times: (Qiblah & Azan application, 2016) includes prayer times and a Qiblah direction.

6- Prayer Times: Azan prayer times

The Prayer Times: (Azan prayer times application, 2016) includes prayer times, Qiblah direction, holy Quran audio, Azkar Muslims, how to make wudu, how to perform Salah, Quran and Azkar.

7- Adhan Time/ Holy Quran pro

(Adhan Time/Holy Quran Pro, 2016) includes prayer times, Qiblah direction, Quran, nearby mosques and a library for Quran Tafseer (Quran explanation).

8- My prayer

(My Prayer, 2016) includes prayer times and a Qiblah direction.

These are the most rated android application for Muslims. Each one of them has some features that are different from others and each of them has its way and its theme in serving Muslims.

4. PROPOSED ANDROID APPLICATION

Our proposed Android application includes some features that have been introduced before and some other features that are new.

The features that have been introduced before are as follows:

1- Nearby mosques
2- Prayer times
3- Qiblah direction
4- How to perform Salah
5- How to perform wodo2

The new features:

1- Streaming live TV from Makkah.
2- Streaming live TV from Al-Madinah.
3- Teaches how to perform Salah in English and French.
4- Teaches how to perform wudu in English and French.
5- A Zakat calculator.
6- A cleric lecture announcing system (Register and Login).

Figure 9 shows the block diagram for the new proposed Android application.

The source code for this Android application is available for all readers so that enhancements to the features or the GUI can be made or new features can be added that can better serve Muslims.

5. EXECUTION WARNINGS

Prior to executing the code, there are some warnings that should be considered in order for the code to work correctly:

1- Google API service

The Google API service is an application interface for Android. Every service should be used by a key code and every user should have one key, and every key can be used only by one person. We used our key in this source code and the key would not work with any other programmer. You must change the key for every service by logging in to the GOOGLE API website and generating a new key for free.

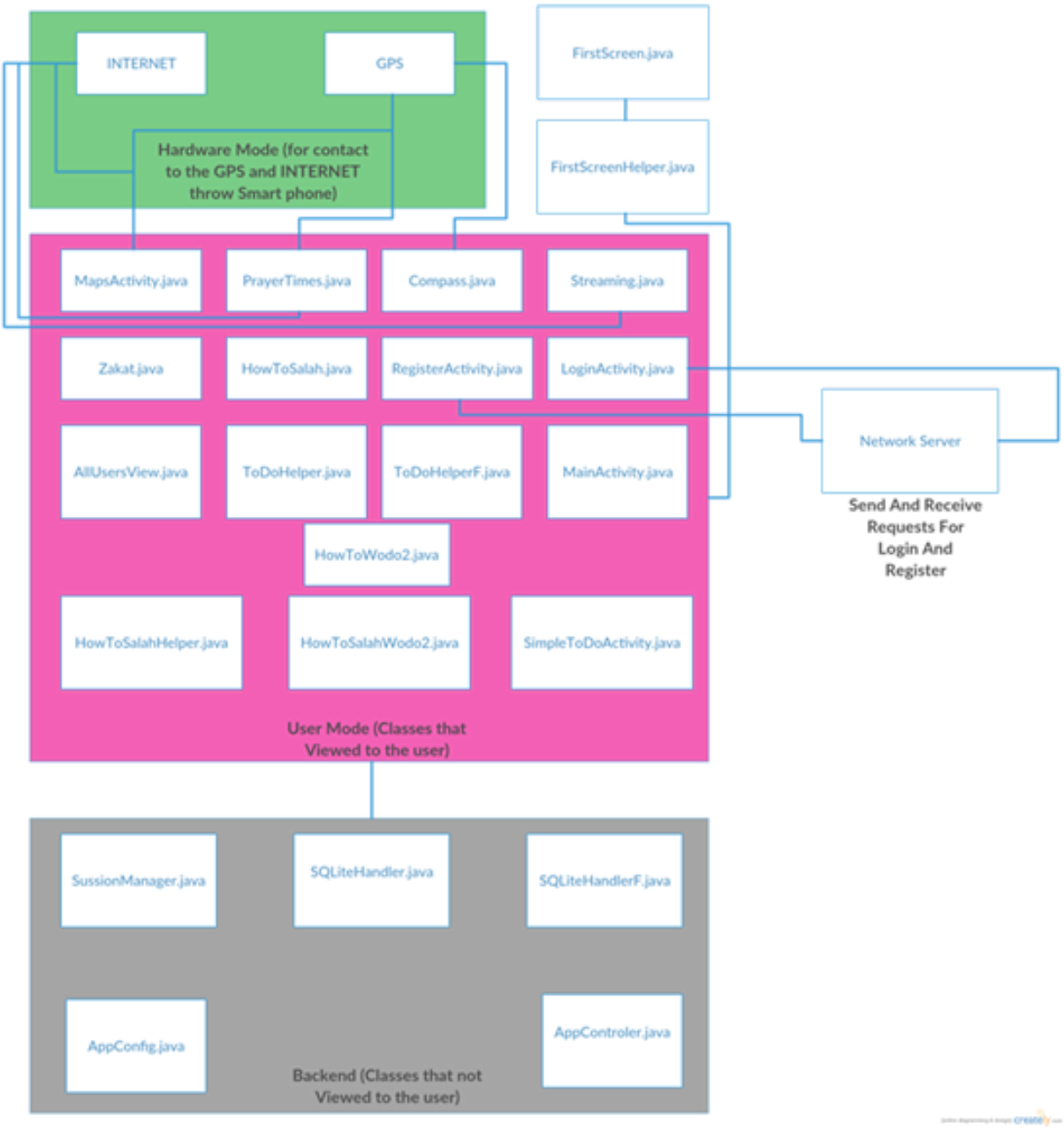

Figure 9. Block diagram for the proposed Android application

For example, to obtain the current location, the key needed is the regular GOOGLE API key (Android key). The old key is located in the MANIFEST file as shown in Figure 10.

```
<application
    android:name="info.androidhive.loginandregistration.app.AppController"
    android:allowBackup="true"
    android:icon="@drawable/ic_launcher"
    android:label="@string/app_name"
    android:theme="@style/AppTheme" >
    <meta-data android:name="com.google.android.maps.v2.API_KEY"
        android:value="AIzaSyDbZIQhTG9o110afKYXBQCH2PKQzh1_5rU"/>
    <activity
        android:name=".muslimActivities.FirstScreen"
        android:label="Muslims Daily Activities"
        android:launchMode="singleTop"
        android:windowSoftInputMode="adjustPan" >
        <intent-filter>
            <action android:name="android.intent.action.MAIN" />

            <category android:name="android.intent.category.LAUNCHER" />
        </intent-filter>
```

Figure 10: Android key found in the manifest file.

Additionally, to obtain the YOUTUBE streaming service, the regular GOOGLE API key is needed (Android key) and the keys being located in Streaming.java class as shown in Figure 11.

```
// String url = "https://maps.googleapis.com/maps/api/place/nearbysearch/json

String url = "https://maps.googleapis.com/maps/api/place/nearbysearch/json?l
// String v = "n";
try {
    json = new ProcessJSON().execute(url).get();
   // TextView txtl2 = (TextView) findViewById(R.id.textView2);
  //  txtl2.setText(v);
} catch (InterruptedException e) {
    e.printStackTrace();
} catch (ExecutionException e) {
    e.printStackTrace();
}
```

Figure 11. Android key in Streaming.java class.

o retrieve the GOOGLE maps service, the Server Key is the key needed, with the keys being located in the MapsActivity.java file as shown in Figure 12.

```
.ng extends YouTubeBaseActivity implements YouTubePlayer.OnInitializedListener {
inal String API_KEY = "AIzaSyDbZIQhTG9o110afKYXBQCH2PKQzh1_5rU";

= FirstScreenHelper.makkah;
ie/<VIDEO_ID>
inal String VIDEO_ID = "VopbGPJVkzM";
inal String VIDEO_ID2 = "4OoKpZWJASY";

nCreate(Bundle savedInstanceState) {
ite(savedInstanceState);
g layout xml **/
ew(R.layout.streaming);

zing YouTube player view **/
erView youTubePlayerView = (YouTubePlayerView) findViewById(R.id.youtube_player);
erView.initialize(API_KEY, this);
```

Figure 12. Server key located in the MapsActivity.java class.

Thereafter, it is necessary to enable the YOUTUBE API service, GOOGLE MAPS ANDROID API, and GOOGLE PLACES API, including the "YOUTUBE ANDROID PLAYER API" library.

2- Login and Register PHP code

The PHP code should be uploaded onto a server. Two tables should be built (similar to the tables in Figures 13 and 14) to connect the PHP code to the server and to be able to retrieve or send to and from this server to the Dataset.

3- Login and Register JAVA Code

To connect the JAVA code to the PHP code, one must type the IP Address of the server, which includes the PHP files. The IP address that is in the code must be changed to work with your server IP Address. The IP Addresses are in 4 classes; ToDoHelperF.java, ToDoHelper.java, AllUsersView.java, and AppConfig.java. Figure 10 shows an example of the IP address code that must be changed.

6. TESTING ENVIRONMENT

The testing environment was done for the following:

1- PHP My Admin.

2- Android studio 2.0.

3- PHP code files.

1- PHP My Admin:

This is the server that is used to test the environment. The programmer can create tables, decide the user names and the password for the server, and link this server to the PHP code files. There are two tables that are created in it:

A. "users", which includes all users' information.

B. "note", which includes all lectures' information for all users. Figures 13 and 14 shows the structure of the two tables.

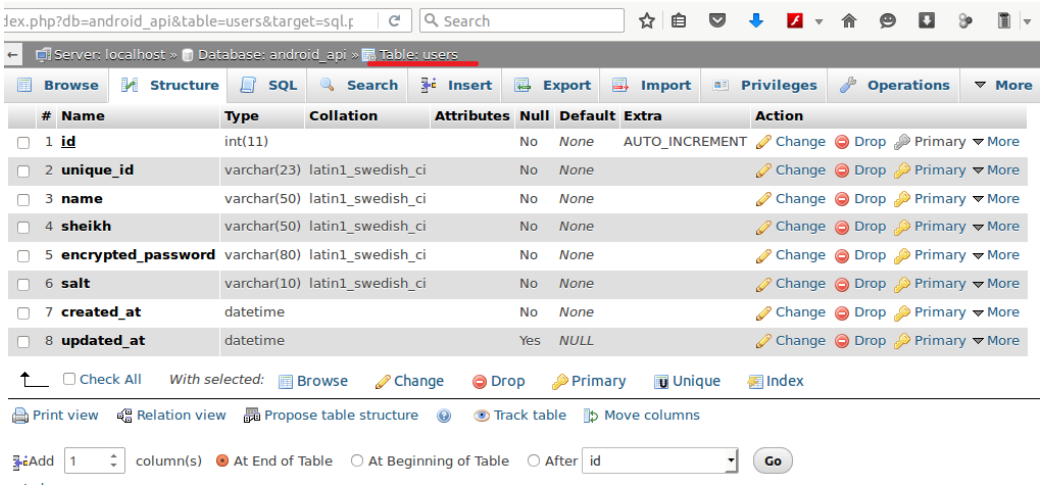

Figure 13. The "users" table structure.

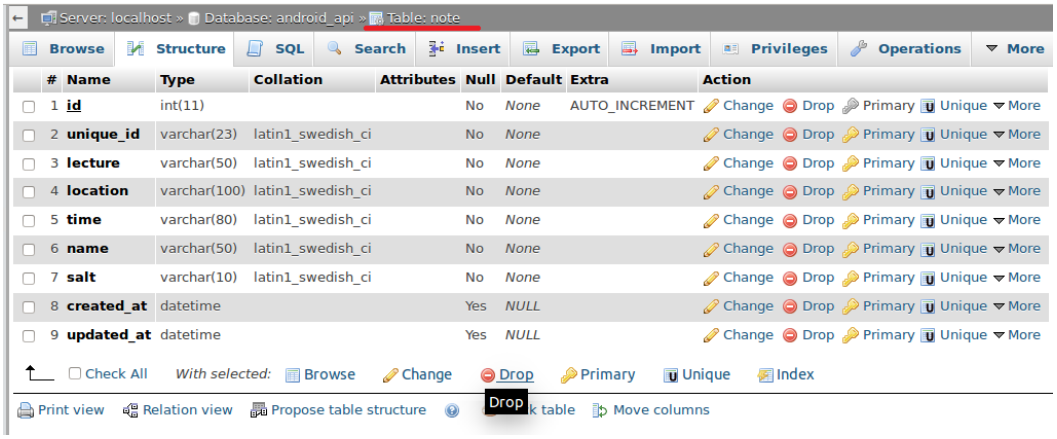

Figure 14. The "note" table structure.

2- Android studio 2.0

Android studio 2 is the environment where the code was developed. The SDK version 23.0 was used. A programmer can change the version in the build.gradle file, and can watch out for the libraries.

The Android App is made from 25 classes, where each class has its own functions. The following is the list of classes and functions:

1- FirstScreen.java: includes the main figures and the location manager that fetches the current user's location information and sends them to class number 2.
2- FirstScreenHelper.java: obtains the information regarding the figures and the location details, and organizes the main menu to connect figures to their corresponding classes.
3- MapsActivity.java: includes the function that connects the user with GOOGLE MAPS API and searches for nearby mosques to fetch these information in JSON. It then

extracts the coordinates and the names for each mosque and marks each one to be able to create a route to each mosque.

4- PrayersTime.java: includes the functions that calculates prayer times for each location based on the user's location that comes from FirstScreen.java class.
5- Compass.java: converts the sensor of the smart phone that already points north to the coordinates of the Kaaba based on the user's location information.
6- Streaming.java: includes the functions that stream live TV from Al-Haram and from Al-Madinah.
7- HowToSalah.java: includes the main figures for the process of prayer and sends them to the HowToSalahHelper.java class.
8- HowToSalahHelper.java: retrieves the figures from HowToSalah.java class and displays them.
9- How ToWodo2.java: includes the main figures for the process of wudu and sends them to the HowToWodo2Helper.java class.
10- HowToWodo2Helper.java: retrieves the figures from HowToWodo2.java class and displays them.
11- Zakat.java: includes the Zakat calculator.
12- LoginActivity.java: includes the login screen functions and connects the user to the MainActivity.java class.
13- MainActivity.java: includes the functions that navigate the user to make his notes if he is a lecturer, or to allow the user view all lectures if he is a regular user.
14- RegisterActivity.java: includes the functions that register the user information.
15- AllUsersView.java: includes the functions that show all the premium users (lecturers) for the regular users to be able to view all the lectures information, including the help of the ToDoHelperF.java class.
16- ToDoHelperF.java: includes the functions that search the server and the PHP codes for all the premium users (lecturers) and retrieves their information.
17- SimpleToDoActivity.java: includes the functions that allow the lecturers be able to create their notes and edits them, including the help of the ToDoHelper.java class.
18- ToDoHelper.java: includes the functions that register each lecture information to the server and saves them there.
19- ToDoProvider.java: includes the functions that create, delete or add tasks to allow viewing them on the application without using the server (internal database).
20- ToDoProviderF.java: provides the functions that create, delete or add tasks to allow viewing them on the application without using the server (internal database).

21 & 22 & 23- SussionManager.java & SQLiteHandler.java & SQLiteHandlerF.java: includes the functions that helps to connect the java code with the PHP code to be able to connect with the server.

24 & 25- AppConfig.java & AppControler.java: includes some important information and some functions that enables connection with the server for retrieving information.

Figure 15 illustrates the interconnection between all classes used.

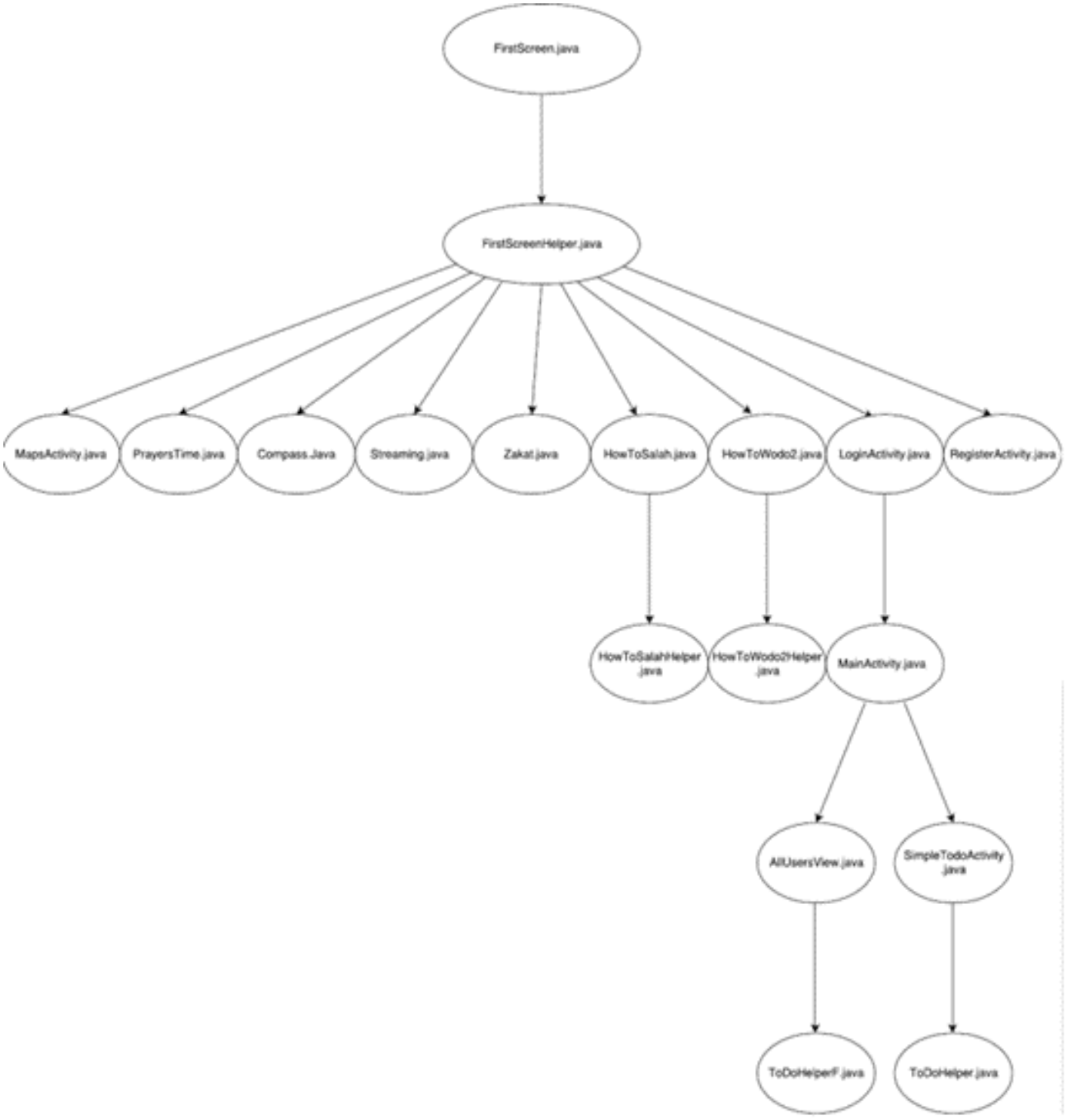

Figure 15: Classes Diagram.

3- PHP code files:

PHP files include the code that links the java code to the server. When we use PHP My Admin server, a path will be created for the server. PHP code files should be put in this path, identified as “var/www/html”.

7. CONCLUSION

An Android application was proposed and has introduced some new features to serve Muslims and make their life easier. The new proposed Android app's main features includes: streaming live TV from Makkah, Streaming live TV from Al-Madinah, a description of how to perform Salah in English and French, a description of how to perform wudu in English and French, a Zakat calculator and a service for announcing Cleric lectures (Register and Login). The source code for this Android Application are readily available so that other features can be added to serve Muslims.

8. FUTURE WORK

As part of future work, it is notable that there are many additions/modifications that can done to enhance the current application, such as; enhancing the GUI, adding Quran text/audio, including Azkar, providing a Tasbeeh calculator and additional libraries for Muslims.

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