

Android Studio Implementation for Medical Record Employee Performance Measure

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Abstract—There are lots of tools to build a mobile application. There are Android Studio, Visual Studio, Unity and many more. The most common one is Android Studio which mostly supply millions of application in Play Store. Android Studio uses Java as the language to develop the app. It has so many library to use and makes developing android application so easy. The tutorials can be found easily online so that those who want to develop an app can do it without hesitation. One of the app that I have been developing is performance measure for medical record employee.

Keywords—Android, Android Studio, Java, Performance Measure, Medical Record..

I. INTRODUCTION

It has been a common knowledge that Android becomes the most used mobile operating system in the world. The amount of people using it exceeds 1.4 billion.^[1] Created by Google, Android runs on smartphone that includes touchscreen in the device. Android version begins with Cupcake (1.5) and continues by food name such Donut, Éclair, Froyo (Frozen Yoghurt), and many more. The latest version published to market is Nougat (7.0). Android has a new version almost every year. Some mobile phone companies provide updates to their device while others not. People who do not get the updates have to buy a new phone in order to not having an obsolete version on their Android phone. Also newer version has some major fix like improvement in multitasking, memory management, new features, etc. Android works on any kind of screen resolution so it can fit on any device unlike the iOs by Apple which has some kind of fixed screen resolution. So the Android development can be preferred for many purposes not only for the mid-high market.

Java is the official language that supports developing in Android Studio. Also Java is a popular developing language thus makes so many libraries available. It comes also with numerous Android and Google APIs which can be used to maximize the utility on the app. Those API including Google Maps API, Twitter API, Google Places API, etc.

Android as a major mobile application has so many users. Thus makes applications published in Play Store are highly

downloaded. The growth of mobile application nowadays has gone so fast that make development for every kind of purpose possible. One of a kind mobile apps that I have been working on is Questionnaire-based Application in which users have to answer some questions in order to retrieve an information or result from what have been submitted. The mobile application that I develop use users' answer to measure their performance on a certain field. The field that I mentioned previously is medical record. The application main users are those who work on medical record-related field. By answering the question users can retrieve the result immediately.

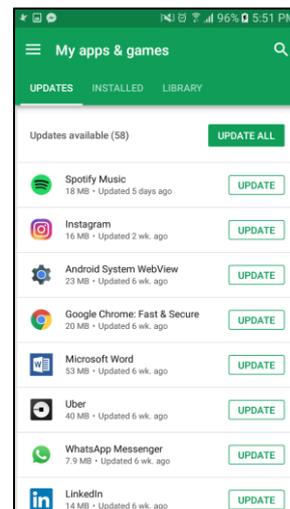


Figure 1. Google Play Store Provides alot of Free Apps

By implementing android apps to build such performance measure for those who work in medical record-related field, the employee can evaluate their performance thus they can improve by maximizing the commitment on field they still struggling to maximize their works. I develop the project in order to help a friend finishing final project to get a degree in medical record studies.

II. BASIC THEORY

A. Android Activity Life Cycle

Activity in android application has its own life cycle. Activity commonly refer to one layout. The life cycle tells us the phases how an activity lives from start to end.

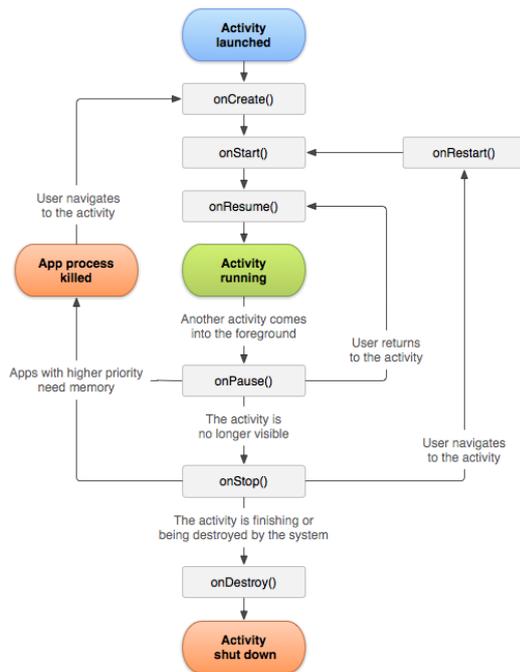


Figure 2. Android Application Life Cycle (source:

<https://developer.android.com/guide/components/activities/activity-lifecycle.html>)

The activity starts with method onCreate which the activity start to load. Then if the user open another activity, the application will run onPause until the user go back to the activity then the activity will run onResume in order to continue to make the activity running. When the activity is no longer visible, it will trigger onStop. It is the time when the activity has to run either onCreate (if the process get killed) or onRestart so that the activity will re-run itself from the beginning. Finally when the activity is no longer used by the system it will trigger onDestroy to terminate the activity.

B. Android Application Layout

Every activity in android application has its layout. The layout used to display some information or elements to the screen so users can figure out what to do with the application. The layout is displayed through an xml file which has so many elements come with its own library. The android studio has a feature to render the xml file to make the layout editing becomes easy thus the changes can be seen immediately.

Some elements used to build a layout are:

1. Relative Layout

This kind of layout makes users can place elements such form, image, etc freely in any area of the screen without considering the order. The elements can be placed anywhere and we just have to state the gravity or position for the element to place them.

2. Linear Layout

Linear layout makes us to design the layout first before start to code. This layout structure forms a tree thus considering the order of the elements is important. There are two orientation of this layout, the first one is vertical which elements are ordered vertically from up to down and the second is horizontal where elements are placed horizontally from left to right.

3. Frame Layout

This layout will make overlay elements possible. The elements are arranged as their order in the xml file in which the last element will be placed on top of the previous element.

4. Fragment

Fragment makes more than one activity active in one layout possible. It is usually used for the swipe layout on some android apps.

5. Edit Text

This is an element to create a form for users to write input. The value of the edit text can be various from regular text, number, even password.

6. Text View

Unlike the edit text, text view only shows text without getting input from user.

7. Button

As its name, button is used to trigger some function or change activity. Button is always clickable with its action for the click.

8. Image View

Image view's main purpose is for displaying an image to the screen. The image to be displayed can be referred from folder drawable using xml element android:src.

9. Spinner

Spinner commonly known as dropdown menu which contain many options to choose. Like the others, it is usually used for form.

C. Android Application Data Storage

One of the famous database service used to store data in an android application is Firebase Realtime Database. Firebase is owned by Google and can be used to store data from an android app. Since it is from Google, it fits perfectly for the Android Studio IDE. Developer just have to connect the android project to the firebase database project by installing the firebase SDK to begin storing data there.^[2] Once the firebase and android has been successfully connected we can begin to store and read data easily through the DatabaseReference. Data stored in the firebase are in JSON form (No-SQL) unlike common database schema which uses SQL with tables and views. In Firebase we have tree-structured schema for the data. When we want to write we can add a child tree with syntax DatabaseReference refName = refUser.child("name"). Need to be underlined that a child can not store empty value so the child need to assigned to a certain value such refName.setValue("Wiega"). Some features that are so useful for android app development are the SignIn and Register function that are on default available to use. By using the Register function we can grant authentication for

a user in order to be used later for sign in function. The register function automatically create an authentication with email and password given to the function so we do not have to think about storing password safely anymore because Firebase has take care of that. Sign in can be used to authenticate user to enter the main activity of the application hence only registered and valid user can use the app.

Firebase is not the only media to store data in android apps. There is SharedPreferences feature to make storing data (offline) possible. This works by saving the data into a txt file so the application will read write into the file to transfer the desired variable into other activities.^[3] This is very useful since we need to use variables / data from one activity into another.

D. Android Activities and Intents

We have known that every layout showed to the screen actually is an activity running in the app. Most of android application published in the market has more than one activity. Usually an activity has one and only purpose like sign in, sign up, walkthrough, profile and many others. Every activity run from a java class that defines the activity, defines what functions to override (onCreate, onStart, onResume, etc), and also defines which layout to use to run the java class. Basically the java class is what we customize to makes the activity runs its purpose rightfully.

Users need to change between activities. There is intent. Intent's main purpose is to facilitates an activity to change to another activity. It has to be done under the current activity's java class. Usually the trigger to change activity placed after users click a button or some texts. The intent class needs to be declared as it needs input current activity (class) and destination class. Thus we can code startActivity(name of intent) to change the activity into another.

We must not forget to declared those activities used in app in the manifest. Manifest is an xml file to declared what activities, dependencies, icon, launcher and many other vital things on the applications. Without declaring the activity first in the manifest, the intent will not work and it ended to a crash of the application process.

E. Resources

Resources is a folder filled with many folders such drawable, layout, values, etc. Drawable used to store images that are being used as sources for image-related layout components. File name of images in drawable must be distinct because the file name is used for an id to find them. Also the file name can not contain symbol like dash so we have to replace them with underscore. Layout used to store layouts to display the layout components. As we know, a layout contain components to make an activity show its purpose by displaying components needed such forms, image, etc. Every layout has its own distinct name and like image in drawable, the layout name used as an id to refer to them. Values contains some values to assist the designing of a layout. Those values are colors, strings, styles, and many other. Instead of hardcode the value in the

code or the layout, we can refer to the written values in order to not typing it repeatedly. Thus styling a layout becomes easier.

III. IMPLEMENTATION

Using Android Studio and Java language as the main component. I implemented questionnaire-like mobile application to measure the performance of medical record employee. The application has several activities, there are splash screen, walkthrough, sign in, sign up, main activity, questions, profile. Activities that I have finished build are splash screen, walkthrough, sign in, sign up, and main activity.

Splash screen is opening activity which only run for 2 seconds. It runs as soon as user run the app. I build the activity with the code below to make the running process can be managed by time input. The splash screen only showed up to display the logo of the app and then disappeared.

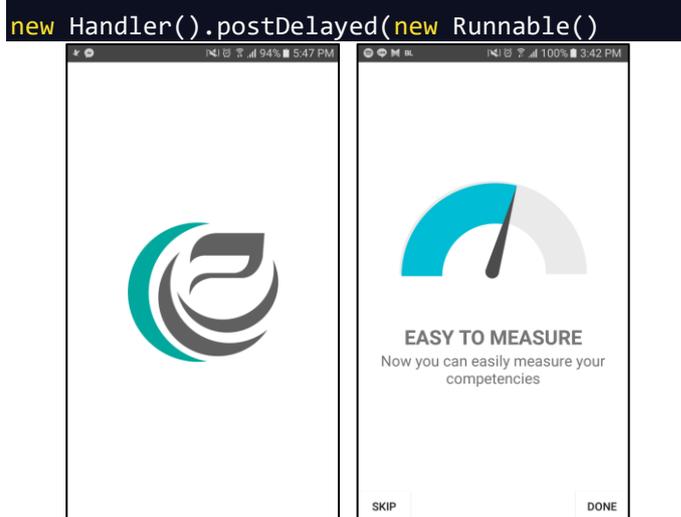


Figure 3. Splash Screen and Walkthrough

Walkthrough is activity in which the main purpose of the app is displayed to the screen hence the user can understand the use of the app. It only contains image and two buttons, skip and next/done.

Sign in provides facility for user to sign in to their account to grant access to the main activity. I uses the mAuth library from the Firebase Realtime Database to sign in by input email and password obtained from the form I have built. User can only sign in with registered email and password, otherwise there will be an error message.

```
mAuth.signInWithEmailAndPassword(email, password)
```

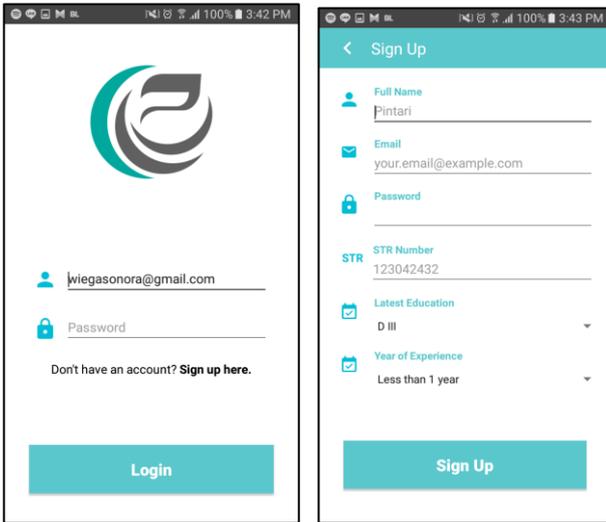


Figure 4. Sign in Using Registered Email and Password and Sign Up by Filling All Given Form Input

Sign up required to create a new account. Here users have to fill all the form input provided to create new account. Those are fullname, email, password, STR number, latest education, and year of experience as employee in medical record. I use the mAuth library to create new account/authentication in Firebase using email and password. By the time we register, the program will write numerous default value into firebase which are the result of the questions (all default : low).

```
mAuth.createUserWithEmailAndPassword(email, password)
```

The main activity is built on Fragment thus it enable to access several activities in one layout. I use View Pager to display the activities in one layout so that the user can swipe the screen to check on other activities.

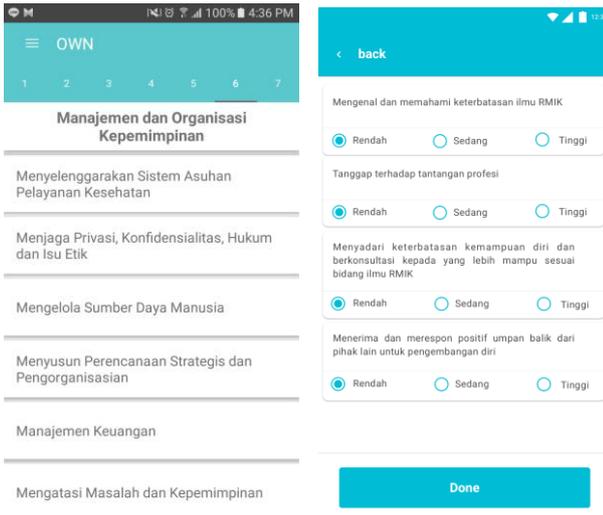


Figure 5. Main Activity Shows Categories and Questions Activity to be Answered

IV. CONCLUSION

Android Studio as very useful can be utilized to build so many useful applications. One of kind application that I have been built is this medical record employee performance measure. By using this app, the employee can do the test and find the result in no time replacing old method by answering questions on paper and waste time and energy. This application can save much efforts and makes performance measure very efficient.

V. THANK-YOU NOTE

First, I want to say thanks to God hence I can finish this paper in time without any issue. I also want to say thanks to my parent for the support they have been giving until this day. Not to mention that Dr.Ir.Rinaldi Munir, MT, Dr. Eng. Ayu Purwarianti, ST.,MT, along with Dessi Puji Lestari ST,M.Eng.,Ph.D have huge role in order to make us the participant of Course IF3280 Socio-Informatics and Professionalism obtain knowledge and benefit in social and professionalism-related studies thus we would be able to finish this paper.

REFERENCE

- [1] *Android is now used by 1.4 billion people* by James Vincent . <https://www.theverge.com/2015/9/29/9409071/google-android-stats-users-downloads-sales> accessed on May 5th 2017 at 5 p.m
- [2] *Set up Firebase Realtime Database for Android* <https://firebase.google.com/docs/database/android/start/> accessed on May 5th 2017 at 5 p.m
- [3] *Android Shared Preferences Example Tutorial* by Anupam Chugh <http://www.journaldev.com/9412/android-shared-preferences-example-tutorial> accessed on May 5th 2017 at 5p.m

STATEMENT

I (the one who signs below) state that this paper is written by myself, not a plagiarism, nor a translation of others' paper.

Bandung, May 5th 2017

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