

Study of Android Development

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Abstract—This paper is about the learning of mobile development in Android OS. Method of learning is by creating an app that satisfy a set of technical specifications that covers all aspect of mobile applications, such as responsive UI, networking, notification, sensor, location, and sharing. This paper will explain about various features of Android, how to use and when to use them. Hopefully this would help people to learn about Android application development

Keywords— learning mobile development; Android; features of Android;

I. INTRODUCTION

Nowadays, mobile device has become parts of our lifestyle. Almost everybody has a mobile device with them. There are many possibilities in mobile development, and many innovation are done there. By learning about android and android development, we will be able to contribute in future development of mobile application

II. OVERVIEW OF ANDROID

Android is a Linux-based OS, developed by Open Handset Alliance. Android application is developed in Java using Android Software Development Kit. Android app development is using Android Studio as Integrated Development Environment (IDE). Android developer could use android libraries that facilitate user interface building, graphics drawing, and database access.

Android app have Application framework to them, that provides many high-level services. The key services that are available are:

- Activity Manager, control application lifecycle and activity stack.
- Content Provider, allow application to share data with other application.
- Resource Manager, provide access to non-code resource.
- Notification Manager, allow application to display alert and notification.
- View System, an extensible set of views used to create application user interface.

There are four components that can be used in android development, which is:

- Activities, handle UI and user interaction. Like a window in desktop application, activity is where the UI is shown. An activity represents a single screen, so an application could have more than one activity. In case there are multiple activity, one must be selected to be the first activity to show when application is launched
- Services, handle background processing. Services run in the background even when the application is closed. An example is service to check new message as in chatting application, so the application could pop a notification even when not opened.
- Broadcast Receivers, handle communication between application and OS. Receive message from OS. Receiver need to be informed to the OS beforehand so the OS know that application could receive message and what type of message could be received.
- Content Providers, handle data and database management. Provide data to other application on request. Content provider must implement a standard set of APIs that enable other application to perform transaction.

There are additional components which is used in construction of the above components:

- Fragments, a portion of UI in activity.
- Views, UI element that are drawn.
- Layouts, hierarchy that control screen format and appearances.
- Intents, wiring message between components.
- Resource, external elements.
- Manifest, configure file for application.

III. THE APPLICATION

A. Specification

To better understand about Android development, a set of specifications is needed so the application could cover most of Android components.

The specifications are as follow:

- Application is built on Android platform.
- Application must use fragment.
- Application could connect to internet using HttpURLConnection.
- Application could send intent to other application.
- Application could show push notification.
- Application must use authentication for user sign in.
- Application must use minimum of 2 sensors.
- Application must use Google Location Service.
- Application have responsive display, both vertical and horizontal.
- Application must use at least one service.
- Application use Shared Preferences.

B. Implementation

The Android application were used for tracking progress of a game, show the user profile, and control the movement in the game. The Android application is called “KuyJalan”.

- The user is required to sign in to use KuyJalan, user database is in server. Sign in process is using HttpURLConnection to access the server data. User credentials is then saved in Shared Preferences, so the user does not need to login every time they open the application.
- KuyJalan would receive notification every time the user log in in the game spot. The notification is sent by services that check user status to the server.
- The main activity of KuyJalan is a menu, where the user could choose what to do with the application. The menu is implemented in one activity, with each menu item as fragment.
- Menu #1 shows the game progress, and also show the location of game spots. The game spots are sorted based on distance from user. The user current location is determined by Google Location Service.
- Menu #2 shows the user profile, where the user could change his profile info, and also share his profile.

Profile sharing is done by sending intent message to OS.

- Menu #3 is only accessible when the user is logged in in game spot. Menu #3 contain controller used to play in game. The movement and action done using buttons, while view angle is controlled via tilt sensor (Accelerometer and Magnet sensor). Connection from smartphone to game device via HttpURLConnection.

IV. CONCLUSION

From this study of Android, we are now capable of creating android application that include many features in android. We are now capable of creating android application that have fragmented UI, are location-aware, connected to the internet, use sensors, have services, able to push notification, and able to send messages to other application. The learning process is not just reading from many sources, but also hands-on experience in building an app that could be used in actual smartphone.

This level of ability is far from those android experts, but it is a good start for learning mobile development. With continuous learning, it won't be long until we catch up with mobile experts and eventually be the expert ourself.

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STATEMENT

I hereby declare that this paper is my own writing, not an adaptation nor translation from other's paper, and not a plagiarism

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