



APPLICATION DEVELOPMENT WITH ANDROID: A REVIEW

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Abstract

In the advancing world of technology, Mobile applications are a rapidly flourishing segment of the global mobile market. . Smartphone comprise of an important features through which user can easily distribute applications via online market store. Mobile applications are evolving at a rapid rate to give users a rich and quick user experience. Google released Android in 2007 which is an open-source Mobile phone operating system with Linux-based platform. It consists of the operating system, middleware, and user interface and application software. Android tries to allow users experience the best service quality, and allow developers get a more open level for more convenient software developing. Thus mobile applications with more convenient functions can be developed via Android. In this paper, Android mobile platform for the mobile application development, layered approach and the details of core features of android platform is discussed in this paper.

Keywords: android, application, segment, open-source.

I. INTRODUCTION

Mobile applications are becoming increasingly prevalent today, particularly in the world of business. As such, many approaching business students are interested in creating mobile applications but lack the knowledge to do so. Android operating system is a linux-based operating system. It is developed by google in 2007. In 2008 the first version of android in launched officially. It is an operating system in which each app runs within a distinct identity. The Linux kernel provides android with several security features as a base for a mobile computing

environment . In Android operating system, it provides facility to isolate user resources from one another so acting as multiuser operating system. The Android system assigns each application with a unique user ID and runs it as a separate process from other users.[1]

II. Background

An Android is an open source operating system, key mobile applications having API libraries for executing android applications. Android smart phones offers advanced computing ability and connectivity as compares to other mobile phones operating systems. Android is operating system which designed hardware so that communication between hardware and software with user interface can easily be done. Android apps can be written using Kotlin, Java, and C++ languages.[2]

The Android SDK tools assemble your code along with any data and source files into an APK, an *Android package*. It is a record file with an *.apk* suffix. One APK file contains all the matters of an application of android and is the file that Android-version use to set up the app. Android plan settings to organize these API levels in your app. According to the official Android website (Android2008) the platform is based into the four core features as shown in the Fig 1:[3]

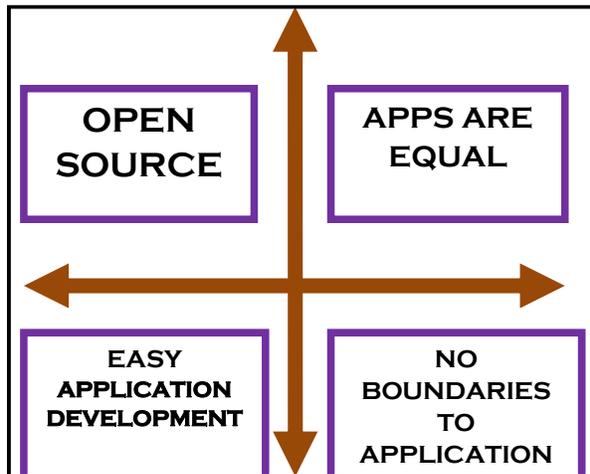


Figure 1 : core features of android
 III. ANDROID PLATFORM ARCHITECTURE

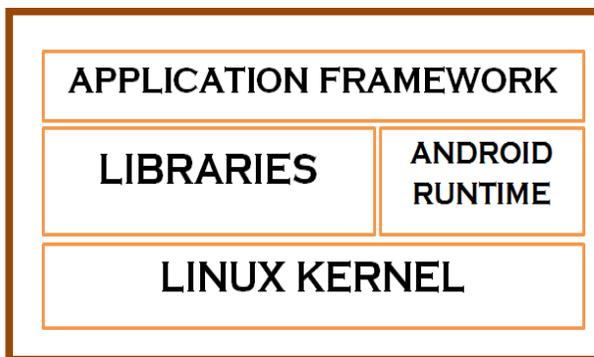


Figure 2: ANDROID ARCHITECTURE

A. Application Framework:

Android applications are written in the Java programming language. The java code is assembled with the data related to application and resource files. All these is bundled by the app tool into an android package. It is an archived file with suffix of .apk. this file works as a lorry for issuing the application which is installed on mobile devices. These file is considered to be an one application which can be taken by user

In many ways, each Android application lives in its own world:

- By default, every application has its own Linux course. Android run the application when it is desired by the user and close the application when it is no longer essential. As the assets are required by the system.
- Each application code run separately. Each process has its own JVM Java virtual machine
- By avoidance, each app is allotted a unique user ID of Linux Consents are set so that the

application's files are detectable only to that user.

It's possible to organize for two applications to part the same user ID, in which case they will be able to see each other's files. To conserve system resources, applications with the same ID can also arrange to run in the same Linux process, sharing the same VM.[4]

B. Libraries:

When applying the Android application framework,

Android will support the components via some C/C++ libraries to make them service us better.

- Bionic system C library: it is the C language standard
- library, and also the bottom library of the system,
- which is invoked by Linux system.
- Media Framework: based on the PacketVideo,
- OpenCORE to support the playback and recording of
- audio and video in multiple formats, such as MPEG4,
- MP3, AAC, AMR, JPG, PNG.
- SGL: 2D graphics engine library.
- SSL: located between TCP/IP protocol and other
- application protocols to support data communication.
- OpenGL ES1.0: support for 3D effect.
- SQLite: relational database.
- Webkit: Web browser engine[5]

C. Android Runtime

Android Run-time is the equivalent of JVM (Java Virtual Machine) that runs on your Windows and Linux machines. Only difference is that it's called DVM (Dalvik Virtual Machine), because its a different software than what Sun Micro-systems had developed Android Runtime is made up of a Core JavaLibraries and Dalvik virtual machine (The Dalvik VM executes files in the Dalvik Executable (.dex) format which is optimized for minimal memory footprint). Most functions of the core java International libraries is provided by Core library. DVM is register virtual machine and makes some specific developments for mobile devices.Android system library is reinforcing the application framework; it is also a main connection linking between application

framework and Linux Kernel. This system library is enlarged in C or C++ language. These libraries can also be used by the different elements in the Android system.[6]

D. The Linux Kernel

The Linux Kernel is at the bottom of the architecture. It provides a level of abstraction between the device hardware and the upper layers of the Android architecture. Based on Linux version 2.6, the kernel delivered preemptive multitasking, low-level core system services such as memory, process and power management in addition to providing a network stack and device drivers for hardware such as the device display, Wi-Fi and audio

The original Linux kernel was developed in 1991 by Linus Torvalds which was combined with a set of tools, utilities and compilers developed by Richard Stallman at the Free Software Foundation to create a full operating system referred to as GNU/Linux. Various Linux distributions have been derived from these basic underpinnings such as Ubuntu and Red Hat Enterprise Linux.

It is important to note, however, that Android only uses the Linux kernel. That said, it is worth noting that the Linux kernel was originally developed for use in traditional computers in the form of desktops and servers. In fact, Linux is now most widely deployed in mission critical enterprise server environments. It is a testament to both the power of today's mobile devices and the efficiency and performance of the Linux kernel that we find this software at the heart of the Android software stack. Also, the kernel take care of all the things that Linux is great at such as networking and a huge array of device drivers, which take the burden out of interfacing to peripheral hardware. The kernel system provides the operations like internal storage, process management, internet protocol, bottom-drive and other core service are all based on Linux kernel.[7]

IV. FUTURE SCOPE

On the face of it, Android seems like a very successful platform. It's the operating system that powers 85 percent of the new smartphones shipped, and, along with iOS, has decisively crushed the competition. But Android is also plagued by dogged problems that Google can't seem to solve. First off, there's the issue of fragmentation, which means that developers have to create software that will work reliably

on many hundreds of different devices from dozens of manufacturers. Sure, developers could just focus on devices from the big players - and some, such as Sales force, are already doing just that - but that defeats the purpose of having a platform in the first place. Then, there's the update problem. Google has a yearly release schedule in place for Android, but it takes the new version a good part of a year to break the 10-percent usage mark. And it takes about four years for a release to fully penetrate the ecosystem. Four years is a crazy long time in tech. While Google is speedy at getting new releases onto its Nexus hardware, it can take months for owners of Android devices from other manufacturers to start seeing the update. And many never see the update. In fact, outside of buying a Nexus device, the easiest way to get your hands on a new Android release is to buy a new device.[8]

V. CONCLUSION

There are number of utilities for implementing application services one of them is android. And only because of this consistent platform, any developer is able to perform their thoughts into reality. Also, with the help of various libraries, we can implement tremendous features in an android application that can be used worldwide.

REFERENCES

- [1] [https://en.wikipedia.org/wiki/Android_\(operating_system\)](https://en.wikipedia.org/wiki/Android_(operating_system))
- [2] http://file.scirp.org/Html/2-9302032_54397.htm
- [3] <https://docs.microsoft.com/en-us/xamarin/android/app-fundamentals/android-api-levels>
- [4] <https://dev.to/dhrumitshukla/android-developers-have-switched-from-the-java-programming-language-to-kotlin-4fa>
- [5] https://google-developer-training.gitbooks.io/android-developer-fundamentals-courseconcepts/content/en/Unit%201/33_c_the_android_support_library.html
- [6] <https://stackoverflow.com/questions/18271429/difference-between-android-support-v7-appcompat-and-android-support-v4>
- [7] <https://developer.android.com/studio/debug/dev-options.html>
- [8] <https://www.androidcentral.com/why-you-ll-never-have-latest-version-android>