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Apps Made with Android: A Look at how it Works

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Abstract

Mobile apps are a fast growing area of the global mobile market in today's technologically advanced society. Smartphones have crucial characteristics that allow users to effortlessly distribute apps through an online market store. Mobile applications are rapidly evolving to provide consumers with a rich and fast user experience. In 2007, Google introduced Android, an open-source mobile phone operating system built on a Linux architecture. The operating system, middleware, and user interface and application software are all part of it. Android aims to provide the highest service quality to customers while also providing developers with a more open platform for more convenient programme development. As a result, Android may be used to create mobile applications with more useful features. This paper discusses the Android mobile platform for mobile application development, the layered methodology, and the fundamental characteristics of the Android platform in depth.

Keywords: *Mobile apps, Mobile computing, Linux, Android*

INTRODUCTION

Mobile apps are becoming more common in today's environment, especially in the corporate sphere. As a result, many incoming business students are interested in developing mobile apps but lack the necessary skills. The Android operating system is built on the Linux kernel. It was created in 2007 by Google. The first official version of Android was released in 2008. It's a type of operating system in which each programme has its own identity. As a foundation for a mobile computing environment, the Linux kernel

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providesandroid with various security measures. The Android operating system allows users to separate their resources from one another, allowing it to function as a multiuser operating system. Each programme is assigned a unique user ID by the Android system, and it operates as a distinct process from other users.

Background

Android is a free and open source operating system that includes API libraries for running Android applications. When compared to other mobile phone operating systems, Android smart phones have superior processing and communication. Android is an operating system that was created with the goal of making communication between hardware and software with a user interface as simple as possible. Kotlin, Java, and C++ are all languages that may be used to create Android apps.

Your code, together with any data and source files, is assembled into an APK, or Android package, using the Android SDK tools. It's an.apk file with a record extension. APK files include all of the information about an Android application and are the files that Android-versions utilise to set up the app. To manage these API levels in your app, use the Android plan settings. According to the official Android website (Android2008), the platform is built on four fundamental characteristics (see Fig 1):

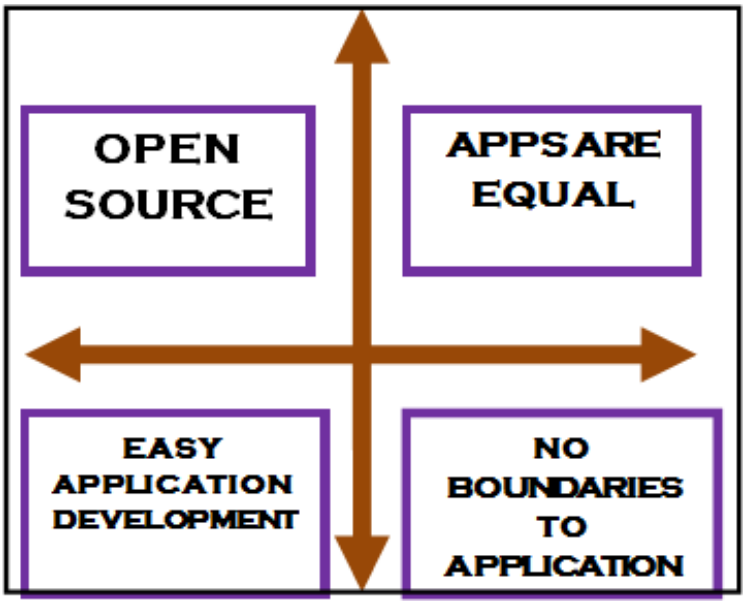

Figure 1 : Core Features of Android

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ANDROID PLATFORM ARCHITECTURE

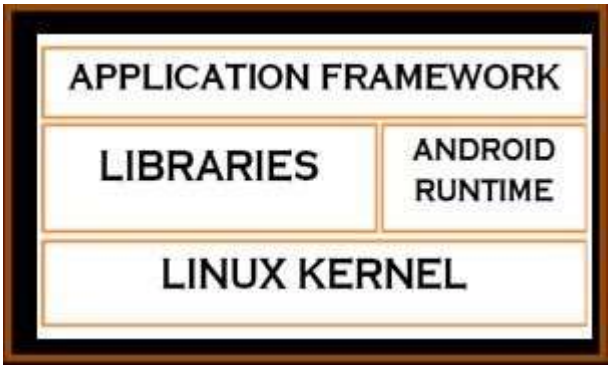

Figure 2: Android Architecture

Application Framework

The Java programming language is used to create Android apps. The java code is put together using data from the application and resource files. All of this is wrapped into an android package using the app tool. It's an.apk file that's been archived. This file serves as a delivery vehicle for applications that are deployed on mobile devices. These files are regarded as a single programme that may be used by the user.

Each Android app exists in its own environment in numerous ways:

- Every programme has its own Linux course by default. Android will start the application when the user requests it and will stop it when it is no longer required. The system necessitates the assets.
- Each application code is executed independently. Each process has its own Java virtual machine, or JVM for short.
- To avoid confusion, each programme is given a unique Linux Consents user ID. This ensures that the application's files are only detectable by that user.

It's conceivable for two apps to share the same user ID, allowing them to read each other's files. Applications with the same ID can also arrange to run in the same Linux process, sharing the same VM, to save system resources.

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,

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- which is invoked by Linux system.
- Media Framework: based on the Packet Video,
- OpenCORE to support the playerback 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

C. Android Runtime

The Android Run-time is similar to the Java Virtual Machine (JVM) that runs on Windows and Linux computers. The only distinction is that it's referred to as DVM (Dalvik Virtual Machine) because it's not the same software that Sun Microsystems created. The Dalvik virtual machine processes files in the Dalvik Executable (.dex) format, which is designed for small memory footprint. The Android Runtime is made up of a Core JavaLibraries and a Dalvik virtual machine. The Fundamental library provides the majority of the core java International libraries' functionalities. DVM stands for register virtual machine, and it specialises in mobile device development. The Android system library supports the application framework and serves as a vital link between the application framework and the Linux kernel. This system library is enhanced using the C or C++ programming languages. The various aspects of the Android system can also make use of these libraries.

The Linux Kernel (Kernel) (D)

The Linux Kernel is the foundation of the system. It creates a layer of abstraction between the device hardware and the Android architecture's top levels. The kernel, which was based on Linux version 2.6, provided preemptive multitasking, low-level core system functions including memory, process, and power management, as well as a network stack and device drivers for devices like device display, Wi-Fi, and audio.

Linus Torvalds created the initial Linux kernel in 1991, which was integrated with a suite of tools, utilities, and compilers built by Richard Stallman at the Free Software Foundation to produce GNU/Linux, a comprehensive operating system. Various Linux distributions, such as Ubuntu and Red Hat Enterprise Linux,

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have been created from these core principles.

It's worth noting, though, that Android only runs on the Linux kernel. It's worth mentioning, though, that the Linux kernel was designed for usage in conventional systems such as desktops and servers. Linux is presently the most extensively used operating system in mission-critical corporate server environments. We locate this programme at the heart of the Android software stack as a tribute to both the strength of today's mobile devices and the efficiency and performance of the Linux kernel. In addition, the kernel handles all of the things that Linux excels at, such as networking and a vast number of device drivers, which alleviate the strain of interacting with peripheral devices. Internal storage, process management, internet protocol, bottom-drive, and other key services are all provided by the kernel system, which is based on the Linux kernel.

FUTURE PERSPECTIVES

Android appears to be a pretty successful platform on the surface. It's the operating system that drives 85 percent of new smartphones worldwide, and it's decimated the competition, along with iOS. Android, on the other hand, has a slew of issues that Google can't seem to resolve. To begin with, there's the issue of fragmentation, which means that software must run consistently on hundreds of different devices from dozens of various manufacturers. Sure, developers could just focus on big-name devices - and some are already doing so, such as Sales Force - but that negates the idea of having a platform in the first place. Then there's the issue of updates. Google has an annual release cycle in place for Android, but it takes a year for the new version to break the 10% use level. A release might take up to four years to fully infiltrate the ecosystem. In the world of technology, four years is an eternity. While Google is quick to get new versions onto its Nexus hardware, consumers of Android smartphones from other manufacturers may have to wait months to see the update. Many people will never notice the update. In fact, outside of purchasing a Nexus smartphone, purchasing a new device is the quickest method to get your hands on a fresh Android update.

CONCLUSION

Android is one of the many tools available for developing application services. And it is only because of this standardised platform that every developer may bring their ideas to life. We may also add incredible features in an android

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application that can be utilised all over the world with the aid of numerous libraries.

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