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A Study on Android Application Development

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ABSTRACT

Android is a mobile operating system currently explained by Google, based on the Linux kernel and designed principally for touchscreen mobile devices such as smartphones and tablets. And as we said before, Android allows centralized access to application development for mobile devices. Android is an open-source operating system called Android. Google has made the code for all the low-level "stuff" as well as the needed middleware to power and use an electronic device, and gave Android easily to anyone who wants to write code and grow the operating system from it. There is even a full application framework introduced, so third-party apps can be built and connected, then made available for the user to run as they like. The "proper" name for this is the Android Open Source Project, and this is what people mean when they say things like Android is open and available. Android, in this repetition, is free for anyone to use as they like. There are lots of reasons why more and more people are interested in determining how to be able to develop Android applications. Unarguably, Android is the most popular mobile operating system, with almost 2 billion devices activated and it offers a combined approach to application development for mobile devices. That means, that developers need only improve for Android, and their applications will be ready to run on different devices powered by Android. This particular asset gives Android endless possibilities! This means that and application that is intended to work on mobile phone devices can be also transferred to Android-powered TV sets or Android Car systems. This is why Android is an exciting space to make apps that can help you in every phase of your life, can help you describe, organize, educate, entertain or just to get your life more convenient in every device that they might run on. In this unique example, we are going to set our Android Development Studio IDE, make our very first Android application and find the Android Development world in the most simplistic possible way. The mobile developing world can be very fun, because the direct results we see when creating our own application, can be highly motivating and rewarding

Keywords : Android, IDE, Device, Open Source Project

I. INTRODUCTION

Mobile Application Development Refers to the process of making application software to handled devices such as mobile phone & personal digital assistant. It's the way 21st communicates now. Android is a mobile operating system(os) based on linux kernel & currently developed by Google. With user interface based on direct manipulation, Android is designed primarily for touchscreen mobile phones such as Smartphones, Tablet, Ipad. Android Apps should be interactive to users. Apps can be downloaded from various platforms such as Google Playstore & ios Store. There are paid as well as free

Apps available on both Store. Android is popular with Technology companies which require ready-made, low cost & customizable operating system for high-tech devices. For Apps with a price about 20% to 30% goes to distribution provider for (ex- iTunes) & rest to the producer App. Android's oper nature has encourage a large community of developer and enthusiasts to use open source code as a foundation for community driven project ,which add new features for advanced users to bring Android devices which were officially released running other operating system.

II. LITERATURE SURVEY

The platform was officially announced and the software development kit tools were available in October 2008. Presently there is only one mobile phone that runs the Android OS, the G1 from T-Mobile. According to the official Android website (Android 2008) the platform is based into the four core features as shown in the Fig1:

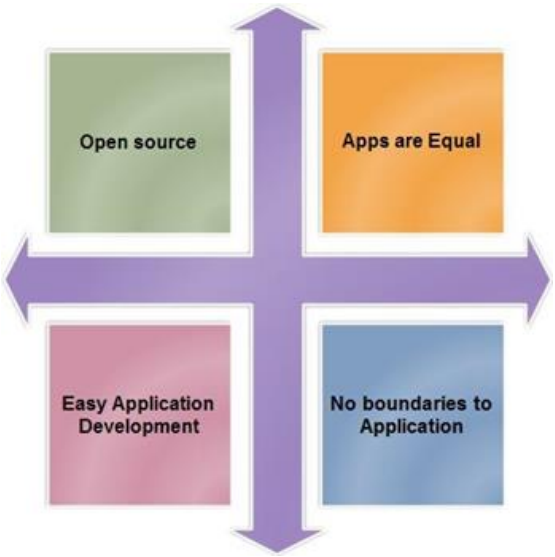

Fig. 1 Four core features of the android platform

A. Application Fundamentals

Android applications are written in Java programming language. However, it is important to remember that they are not executed using the standard Java Virtual Machine (JVM). Instead, Google has created a custom VM called Dalvik which is responsible for converting and executing Java byte code. All custom Java classes must be converted (this is done automatically but can also be done manually) into a Dalvik compatible direction set before being executed into an Android operating system. Dalvik VM takes the generated Java class files and combines them into one or more Dalvik Executable (.dex) files. It reuses identical information from multiple class files, successfully reducing the space requirement (uncompressed) by half from a traditional .jar file. Dalvikwas created to support the nature of translucent mobile operating systems require because of the limited hardware capabilities compared to standard desktops or laptops.

B. Android Platformoverview

Android is a software stack for mobile gadget that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language [3]. Android based on Linux version 2.6. The system services such as security, memory management, process management are controlled by Linux. Fig 2 shows android architecture.

Fig. 2 Architecture of android [1]

C. Developing Android Applications

The Android SDK provides an large-scale set of application programming interfaces (APIs) that is both modern and robust. Android handset core system services are exposed and convenient to all applications. When granted to the appropriate permissions, Android applications can share data among one another and access shared resources on the system securely [5]. Android applications are written in Java programming language.

D. Application Framework

By providing an open development platform, Android offers developers the capacity to build extremely rich and innovative applications. Developers are free to take advantage of the device hardware, access location information, run background services, set alarms, add notifications to the status bar, and much, much more.Developers have full access to the same framework APIs used by the core applications. The application architecture isdesigned to simplify the reuse of components; any application can publish its capabilities and any other application may then make use of those capabilities (subject to security constraints enforced by the framework). This same mechanism allows components to be replaced by the user.

Underlying all applications is a set of services and systems, including:

- ✓ A rich and extensible set of Views that can be used to build an application, including lists, grids, text boxes, buttons, and even an embeddable webbrowser
- ✓ Content Providers that enable applications to access data from other applications (such as Contacts), or to share their owndata
- ✓ A Resource Manager, providing access to non-code resources such as localized strings, graphics, and layoutfiles
- ✓ A Notification Manager that enables all applications to display custom alerts in the statusbar
- ✓ An Activity Manager that manages the lifecycle of applications and provides a common navigation backstack.

E. Android Runtime

Android includes a set of core libraries that provides most of the functionality available in the core libraries of the Java programming language [5]. Every Android application runs in its own process, with its own instance of the Dalvik virtual machine. Dalvik has been written so that a device can run multiple VMs efficiently. The Dalvik VM executes files in the Dalvik Executable (.dex) format which is optimized for minimal memory footprint. The VM is register-based, and runs classes compiled by a Java language compiler that have been transformed into the .dex format by the included "dx" tool. The Dalvik VM relies on the Linux kernel for underlying functionality such as threading and low-level memory management.

III. APPLICATION

BASIC OPERATION

Creating , Deleting , Viewing , Sorting etc of notes in the application

SECURING

Securing you data with a password (Archiving the notes in a password protected

environment). The data can be secured with a password

VOICE NAVIGATION

Voice Navigation (Switching different activities by Voice) This feature transfers the control from one activity to other

VOICE SEARCHING

Voice based searching (Searching of contents in the note by either voice or manual operation) By speaking

keywords to search by pressing the voice button will search for the a Word throughout

OTHERS
Deleting backup on sd card and changing themes. This will delete the backup on sd card and
will change themes in background

IV. ADVANTAGES

Low Investment & High ROI –
Android comparatively have low amount of barrier to entry. Android provides free Software Development Kit (SDK) to the developer community which reduces development & licensing cost. The development cost can be divided into 3 stages

Stage 1: Application Development
Stage 2: Testing
Stage 3: Hardware costing for testing & deploying android mobile Application.

Open Source.

Get the open source benefits from licensing, royalty-free, and the best technology framework offered by the Android community. The architecture of the Android SDK is open-source which means you can usually interact with the community for the upcoming expansions of android mobile application development. This is what makes the Android platform very attractive for handset manufacturers & wireless operators, which results in a quick development of Android based phones, and better opportunities for developers to earn more. That's the main motive of Android

Easy Adoption.

Android applications are scripted in Java language with the help of abundant set of libraries. Anyone can construct Android applications with the knowledge of Java. According to a recent survey, a lot of Java programmers find it easy to adopt and script code for mobile applications in the Android OS. It is now very useful for Java developers to transition the code script into a mobile application, and can also implement android application development services in the app.

Secure Platform

The Android platform is a secured platform similar to Kernel which is based on Linux. It offers a secure and steady platform for developing the mobile application based on different business requirements. This platform is very flexible and provides a hassle free environment for delivering the best app in the market. At the enterprise level, business owners are more looking for such app development platforms whose app doesn't get vanished while users use it and Android is the best platform to deliver the best-in-class mobile app.

V. DISADVANTAGES

1. Little Memory For Storage
You have a memory card in your smartphone,but your storage system is small & you must be careful with your storage. Sometimes we need to download large Games,but due less storage available on your system it is very hard to play the game.Yes ,you can move the app data in external memory card but still there are many android device which doesn't allow you to store app data in external memory card.You need to root your device.
2. DataConnection :
Android has many process running in background, which require large amount of mobile data. And thus cost lots of money if you don't have any active unlimited data plan.
3. Battery Problem :
While Android has many processes running in background will increase the usage of RAM

And will decrease the performance of battery. While many top notch devices has good battery backup(Lithium Batteries) but still that doesn't mean that it has solve the problem

VI. CONCLUSION

Mobile apps have become an integral part of our daily life due to the various functionalities that they offer. Building a successful app which is devoid of bugs and more user-friendly is essential due to the rapid rise in number of apps. The developer should consider the challenges faced and try to overcome them by following the proper steps. Also, it is imperative for the developer to have an open-mind and should well apprised about the current technologies

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