

MOBILE OPERATING SYSTEM

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Abstract: Cellular telephony has had a significant worldwide rate of acceptance, by the year 2014 it is estimated that 3.5 of the 6.5 Billion people in the planet will have the access to a cell phone. Smartphone devices such as iPhone, BlackBerry, and those that support the Android operating system are progressively making an impact on society. In addition to their support for voice and text exchange, smartphones are capable of executing sophisticated embedded software applications, as well as provide a simple link to the internet and its resources. The (SDK) facilitated by the Android assists the developers to start developing and working on the applications instantaneously and the app can be implemented faster. Android is a product of Google and it is owned by open handset alliance group.

Keywords: Android, Dalvik virtual machine, Linux, Operating systems.

I. INTRODUCTION

One of the most widely used technologies today is mobile technology. It includes several or we can say all forms of portable technology like laptops, palmtops, cell phones, personal digital assistants, wireless card payment terminals, global positioning systems. This technology is radically increasing around the world day by day. This can be clearly seen in our day to day life as a poor man also either possess a mobile phone or has access to it. It has transformed the way of doing business. Previously people use to go to banks or offices to do their task but now they can easily do it from mobile phone. It can be seen that in the past few years the wireless technologies is highly developed. Along with the exponential improvement in performance & capacity of wireless communications systems, the information can be easily accessed using mobile devices. In order to improve their infrastructure and rolling out data coverage, the mobile networks are spending a large amount. The continuous advances in mobile technology is impacting everyone's life. The users are getting benefitted from the advances in mobile technology. This is clearly visible in our day to day life. Previously, in order to mail important documents one has to deliver it from door to door but with the advancement in mobile technology one can easily sent it in few minutes in the form of soft copy. As a boon, the use of smart phones & tablets has transformed communications, entertainment. The advances in mobile technology is affecting various other fields also like it is playing a vital role in health care systems. As an example, if a person owns a business then he is free to extend his business rather than confining it to a particular area.

II. OPERATING SYSTEMS

Before we begin on what type of "Operating System" we've researched we'll start by explaining what an operating system is. An operating system is a collection of software that manages computer hardware resources and provides common services for computer programs. The operating system is a vital component of the system software in a computer system. Application programs usually require an operating system to function also. The top operating systems in my opinion that are out today are LINUX, MICROSOFT WINDOWS, and MAC OS X. It could arguably be said that Windows' operating systems have the edge simply because it's the most common operating system that is out today amongst people who don't even know that much about computers. There are different types of operating systems [8].

Serial Processing

The Serial Processing Operating Systems are those which Performs all the instructions into a Sequence Manner or the Instructions those are given by the user will be executed by using the FIFO Manner means First in First Out. All the Instructions those are Entered First in the System will be Executed First and the Instructions those are Entered Later Will be Executed Later. For Running the Instructions the Program Counter is used which is used for Executing all the Instructions.

Batch Processing

The Batch Processing is same as the Serial Processing Technique. But in the Batch Processing Similar Types of jobs are Firstly Prepared and they are Stored on the Card. and that card will be Submit to the System for the Processing. The System then Perform all the Operations on the Instructions one by one. And a user can't be Able to specify any input. And Operating System will increments his Program Counter for Executing the Next Instruction.

Multi-Programming

As we know that in the Batch Processing System there are multiple jobs Execute by the System. The System first prepare a batch and after that he will Execute all the jobs those are Stored into the Batch. With the help of Multi programming we can Execute Multiple Programs on the System at a Time and in the Multi-programming the CPU will never get idle, because with the help of Multi-Programming we can Execute Many Programs on the System and When we are Working with the Program then we can also Submit the Second or Another Program for Running and the CPU will then Execute the Second Program after the completion of the First Program. And in this we can also specify our Input means a user can also interact with the System.

Real Time System

There is also an Operating System which is known as Real Time Processing System. In this Response Time is already fixed. Means time to Display the Results after Possessing has fixed by the Processor or CPU. Real Time System is used at those Places in which we Requires higher and Timely Response. These Types of Systems are used in Reservation. So when we specify the Request, the CPU will perform at that Time. There are two Types of Real Time System

Hard Real Time System

In the Hard Real Time System, Time is fixed and we can't Change any Moments of the Time of Processing. Means CPU will Process the data as we Enters the Data.

Soft Real Time System

In the Soft Real Time System, some Moments can be Change, means after giving the Command to the CPU, CPU Performs the Operation after a microsecond.

Distributed Operating System

Distributed Means Data is Stored and Processed on Multiple Locations. When a Data is stored on to the Multiple Computers, those are placed in Different Locations. Distributed means In the Network, Network Collections of Computers are connected with each other. Then if we want to Take Some Data from other Computer, Then we uses the Distributed Processing System. And we can also Insert and Remove the Data from out Location to another Location. In this Data is shared between many users. And we can also Access all the Input and Output Devices are also accessed by Multiple Users.

Multiprocessing

Generally a Computer has a Single Processor means a Computer have a just one CPU for Processing the instructions. But if we are Running multiple jobs, then this will decrease the Speed of CPU. For Increasing the Speed of Processing then we uses the Multiprocessing, in the Multi Processing there are two or More CPU in a Single Operating System if one CPU will fail, then other CPU is used for providing backup to the first CPU. With the help of Multi-processing, we can Execute Many Jobs at a Time. All the Operations are divided into the Number of CPU's. if first CPU Completed his Work before the Second CPU, then the Work of Second CPU will be divided into the First and Second.

Parallel Operating Systems

Parallel operating systems are used to interface multiple networked computers to complete tasks in parallel. The architecture of the software is often a UNIX-based platform, which allows it to coordinate distributed loads between multiple computers in a network. Parallel operating systems are able to use software to manage all of the different resources of the computers running in parallel, such as memory, caches, storage space, and processing power. Parallel operating systems also allow a user to directly interface with all of the computers in the network. A parallel operating system works by dividing sets of calculations into smaller parts and distributing them between the machines on a network. To facilitate communication between the processor cores and memory arrays, routing software has to either share its memory by assigning the same address space to all of the networked computers, or distribute its memory by assigning a different address space to each processing core. Sharing memory allows the operating system to run very quickly, but it is usually not as powerful. When using distributed shared memory, processors have access to both their own local memory and the memory of other processors; this distribution may slow the operating system, but it is often more flexible and efficient.

Mobile operating systems

Though not a functionally distinct kind of operating system, mobile OS is definitely an important mention in the list of operating system types. A mobile OS is controls mobile device and its design supports wireless communications and mobile applications. It has built-in mobile multimedia formats. Tablets, PC's, smartphones run on mobile operating system. Blackberry OS, Google's Android, and Apple's OS are some of the most common operating system.

III. MOBILE OPERATING SYSTEM

A mobile operating system (OS) is software that allows smart phones, tablet PCs and other devices to run applications and programs. A mobile operating system (OS) is software that allows smart phones, tablet PCs and other devices to run applications and programs. A mobile OS typically starts up when a device powers on, presenting a screen with icons or tiles that present information and provide application access. Mobile operating systems also manage cellular and wireless network connectivity, as well as phone access.

A mobile OS is a software platform on top of which other programs called application programs, can run on mobile devices such as PDA, Cellular phones, Smartphones etc.

There are many mobile operating systems. The following demonstrates the most important ones:

- 1) Java platform
- 2) Palm OS
- 3) Symbian OS
- 4) Windows mobile OS
- 5) Blackberry OS
- 6) iPhone OS
- 7) Google Android platform

Google's Android platform

Android is a mobile operating system (OS) based on the Linux kernel developed by Google. With a user interface based on direct manipulation, Android is designed for touch screen mobile devices such as Smartphone and tablet computers, with specialized user interfaces for televisions, wrist watches (Android Wear) etc. The OS uses touch inputs that loosely correspond to real-world actions like swiping, tapping, pinching, and reverse pinching to manipulate on-screen objects, and a virtual keyboard. Despite being primarily designed for touch screen inputs, it also has been used in gaming consoles, digital cameras, and other electronic devices.

In 2011, Android has the largest installed base of any mobile OS and, as of 2013, Android devices also sell more than Windows, iOS, and Mac OS devices combined. As of July 2013 the Google Play store has had over 1 million Android apps published, and over 50 billion apps downloaded. A developer survey conducted in April–May 2013 found that 71% of mobile developers develop for Android. Android's source code is released by Google under open

source licenses, although most Android devices ultimately ship with a combination of open source and proprietary software. Initially developed by Android, Inc., which Google backed financially and later bought in 2005, Android was unveiled in 2007 along with the founding of the Open Handset Alliance—a consortium of hardware, software, and telecommunication companies devoted to advancing open standards for mobile devices.

Android is popular with technology companies which require a ready-made, low-cost and customizable operating system for high-tech devices. Android's open nature has encouraged a large community of developers and enthusiasts to use the open-source code as a foundation for community-driven projects, which add new features for advanced users or bring Android to devices which were officially released running other operating systems. The operating system's success has made it a target for patent litigation as part of the so-called "smartphone wars" between technology companies.

Features of Android [10]

1) General

Messaging

SMS and MMS are available forms of messaging, including threaded text messaging and Android Cloud to Device Messaging (C2DM) and now enhanced version of C2DM, Android Google Cloud Messaging (GCM) is also a part of Android Push Messaging service.

Web browser

The web browser available in Android is based on the open-source Blink layout engine, coupled with Chrome's V8 JavaScript engine.

Voice based features

Google search through voice has been available since initial release. Voice actions for calling, texting, navigation, etc. are supported on Android 2.2 onwards. As of Android 4.1, Google has expanded Voice Actions with ability to talk back and read answers from Google's Knowledge Graph when queried with specific commands. The ability to control hardware has not yet been implemented.

Multi-touch

Android has native support for multi-touch which was initially made available in handsets such as the HTC Hero [3].

Multitasking

Multitasking of applications, with unique handling of memory allocation, is available.

Screen capture

Android supports capturing a screenshot by pressing the power and volume-down buttons at the same time. Prior to Android 4.0, the only methods of capturing a screenshot were through manufacturer and third-party customizations or otherwise by using a PC connection. These alternative methods are still available with the latest Android.

Video calling

Android does not support native video calling, but some handsets have a customized version of the operating system that supports it, either via the UMTS network (like the Samsung Galaxy S) or over IP. Video calling through Google Talk is available in Android 2.3.4 and later. Gingerbread allows placing Internet calls with a SKYPE account. Skype 2.1 offers video calling in Android 2.3, including front camera support. Users with the Google+ Android app can video chat with other google+ users through hangouts.

Multiple language support

Android supports multiple languages.

Accessibility

Built in text to speech is provided by Talk back for people with low or no vision. Enhancements for people with hearing difficulties are available as are other aids.

2) Connectivity

Android supports connectivity technologies including GSM/EDGE, Wi-Fi, Bluetooth, LTE, CDMA, EV-DO, UMTS, NFC, IDEN and WiMAX.

Bluetooth

Supports voice dialing and sending contacts between phones, sending files (OPP), accessing the phone book. Keyboard, mouse and joystick (HID) support is available in Android 3.1+, and in earlier versions through manufacturer customizations and third-party applications.

Tethering

Android supports tethering, which allows a phone to be used as a wireless/wired Wi-Fi hotspot. Before Android 2.2 this was supported by third-party applications or manufacturer customizations.

3) Media

Streaming Media Support

Adobe Flash Streaming (RTMP) and HTTP Dynamic streaming are supported by the Flash plugin. Apple HTTP Live Streaming is supported by RealPlayer for Android and by the operating system since Android 3.0 (Honeycomb).

Media support

Android supports the following audio/video/still media formats: WebMD, H.263, H.264, AAC, HE-AAC (in 3GP or MP4 container), MPEG-4 SP, AMR, AMR-WB (in 3GP container), MP3, MIDI, Ogg Vorbis, FLAC, WAV, JPEG, PNG, GIF, and BMP.

External storage

Most Android devices include microSD slot and can read microSD cards formatted with FAT32, Ext3 or Ext4 file system. To allow use of high-capacity storage media such as USB flash drives and USB HDDs, many Android tablets also include USB 'A' receptacle. Storage formatted with FAT32 is handled by Linux Kernel VFAT driver, while 3rd party solutions are required to handle other popular file systems such as NTFS, HFS Plus and exFAT.

Hardware support

Android devices can include still/video cameras, touchscreens, GPS, accelerometers, gyroscopes, barometers, magnetometers, dedicated gaming controls, proximity and pressure sensors, thermometers, accelerated 2D bit blits (with hardware orientation, scaling, pixel format conversion) and accelerated 3D graphics.

Other

Java support

While most Android applications are written in Java, there is no Java Virtual Machine in the platform and Java byte code is not executed. Java classes are compiled into Dalvik executables and run on Dalvik, a specialized virtual machine designed specifically for Android and optimized for battery-powered mobile devices with limited memory and CPU. J2ME support can be provided via third-party applications.

Handset layouts

The platform works for various screen sizes from smartphone sizes and to tablet size, and can potentially connect to an external screen, e.g. through HDMI, or wirelessly with Miracast. Portrait and landscape orientations are supported and usually switching between by turning. A 2D graphics library, 3D graphics library based on OpenGL ES 2.0 specifications is used.

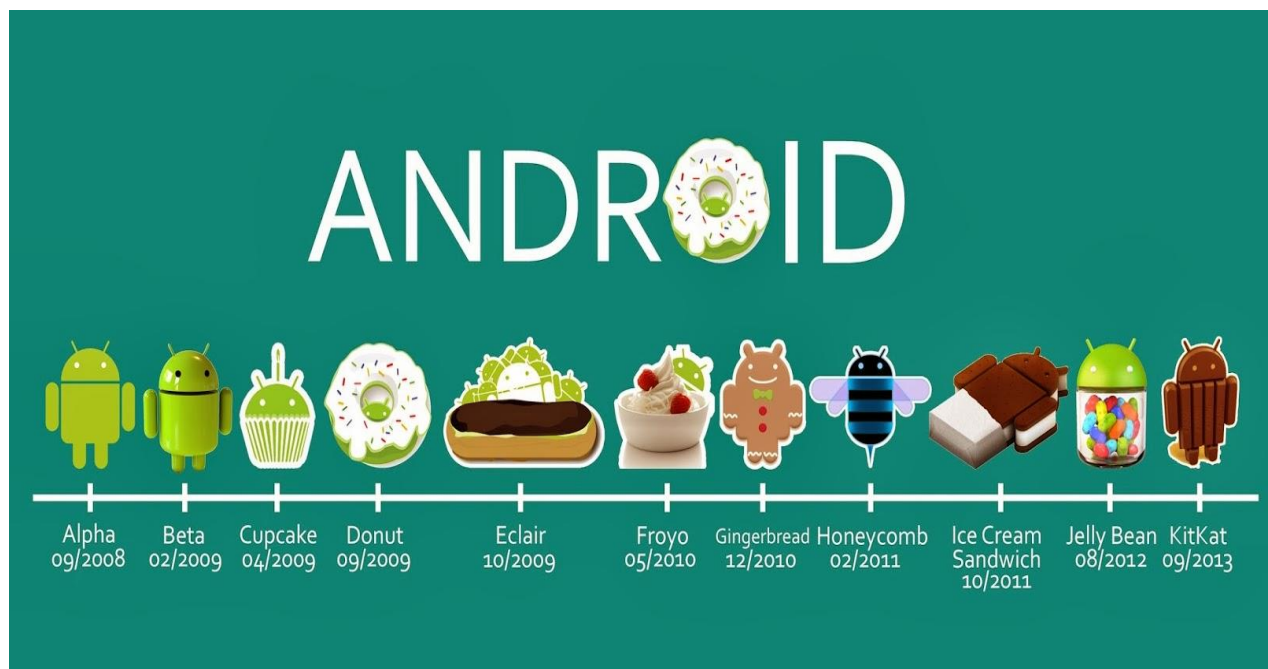
Storage

SQLite, a lightweight relational database, is used for data storage purposes.

Comparison between Android and other mobile [2]

Android OS	iOS	Windows OS
Very customizable. Open source operating system is easily changed, hacked, manipulated, and molded to fit whatever functionality you had in mind. Your friend definitely has one to try. Found on all platforms for all prices depending on what hardware	The first smartphone that was actually smart. Always turns on and always works. Same operating experience on all iPhones. The screen has the most pixel density. Hardware is made for Apple to Apple specs and cannot be changed.	Mix of closed and open source. All apps must be created with the end user in mind in terms of functionality. Programs are arranged in alphabetical order. When you tap on a letter the alphabet is shown and you can tap on Y for YouTube for

<p>and software version you are interested in. Second largest app store. The battery is usually replaceable.[6]</p>	<p>Has the largest app store. Most phone accessories are made for iPhone ranging from alarm clock docking stations and credit card scanners to stun guns. No other phone has the accessory capability that the iPhone has due to manufacturer interest. The smartphone that made all other phone manufactures step up their game and make smartphones that actually worked for day to day business and fun. Your friend definitely has one to try [9].</p>	<p>example and go straight to the YouTube apps location. Must be fully booted in 30 seconds or less from the time you press the power button or it will not meet Windows Phone spec. Battery is replaceable on most handsets. Hardware minimum specs set forth by Microsoft must be adhered to. Same operating experience on all Windows Phones [7].</p>
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Different versions of Android [5]

Advantages of Android

- Android is open, because it is Linux based open source so it can be developed by anyone.
- Easy access to the Android App Market: Android owners are people who love to learn the phone, with Google's Android App Market you can download applications for free.
- Populist Operating System: Android Phones, different from the iOS is limited to the iPhone from Apple, then Android has many manufacturers, with their respective flagship gadget from HTC to Samsung.
- USB full facilities. You can replace the battery, mass storage, DiskDrive, and USB tethering.
- Easy in terms of notification: the operating system is able to inform you of a new SMS, Email, or even the latest articles from an RSS Reader.
- Supports all Google services: Android operating system supports all of google services ranging from Gmail to Google reader. All google services can you have with one operating system, namely Android.
- Install ROM modification: There are many custom ROM that you can use on Android phones, and the guarantee will not harm your device [1].

Disadvantages of Android

- Connected to the Internet: Android can be said is in need of an active internet connection. At least there should be a GPRS internet connection in your area, so that the device is ready to go online to suit our needs.
- Sometimes slow device company issued an official version of Android your own.
- Android Market is less control of the manager, sometimes there are malware.
- As direct service providers, users sometimes very difficult to connect with the Google.
- Sometimes there are ads: because it is easy and free, sometimes often a lot of advertising. In appearance it does not interfere with the performance of the application itself, as it sometimes is in the top or bottom of the application.
- Wasteful Batteries, This is because the OS is a lot of "process" in the background causing the battery quickly drains [4].

REFERENCES

- [1] <http://handphoneseluler.blogspot.in/2013/01/advantages-and-disadvantages-android.html>
- [2] <http://android.stackexchange.com/questions/11400/what-are-the-names-of-the-various-versions-of-the-android-os-and-how-are-these>
- [3] <http://mim.ge/glossary.php?id=180>
- [4] <http://www.techulator.com/experts/823-What-limitations-drawbacks-Android-operating-system.aspx>
- [5] <http://www.atoztricks.com/2014/02/android-versions-from-cupcake-to-lollipop.html>
- [6] http://en.wikipedia.org/wiki/Comparison_of_mobile_operating_systems
- [7] <http://www.cellularelite.com/WhatistheDifferencebetweentheAndroidBlackberryiPhoneandWindowsPhoneOperatingSystems.html>
- [8] http://docstore.mik.ua/oreilly/linux/run/ch01_08.htm
- [9] <http://community.giffgaff.com/t5/Blog/Mobile-Operating-Systems-Compared-iOS-Android-and-Windows-Phone/ba-p/2776337>
- [10] [http://en.wikipedia.org/wiki/Android_\(operating_system\)](http://en.wikipedia.org/wiki/Android_(operating_system))