

Android Operating Systems and Contemporary, A Brief Comparison

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Abstract: Android OS is open source, middleware key mobile application and based on Linux Kernel operating system. Due to its most popular application, open handset alliance and low cost it grows faster than any other operating system. Today they are so many operating systems available and provide many pictures but all of them android are most efficient operating system. Android OS in mobile provide efficient mobile handling pictures. As we know Android operating system developed by Google and provides millions of application in various sectors. In this paper we are going to present comparison between android operating system and why it optimum than other operating system. This research help to users while choosing the mobile operating system.

Keywords: Android; Operating System (OS); comparison between OS; Android reviews, Contemporary of Android OS.

I. INTRODUCTION

In today era there are so many operating system of mobile phone and tablets are available in market such as Android, Symbian, Apple iOS, BlackBerry RIM and Windows. Among them Symbian, Apple iOS, BlackBerry RIM and windows are used before of Android. But due to easily availability of most user application at free of cast and low space Android operating system more popular in user. Also there are user interface of Android is based on direct manipulation and used of touch screen it coincide to real word action, like swiping, tapping, screen pinching and reverse pinching to handling onscreen object. Android operating system used sensors hardware as accelerometers, gyroscopes and proximity to provide additional picture such as gyroscope determined earth gravity to rotating screen from portrait to landscape and vice a versa.

II. HISTORICAL IMPROVEMENT OF MOBILE OPERATING SYSTEM

There are incredibly changes in operating system of mobile from 1973 to 2015 as features, size, cost and other things. Some of their operating system as bellows:

- 1973 – First mobile phone device by Motorola
- 1978 – 1G mobile system introduced
- 1990 – 2G mobile system introduced
- 1993 – IBM introduced first touch screen smart phone
- 1996 – Windows CE Handheld device
- 1998 – Symbian OS introduced by Psion Company
- 1999 – Nokia introduced his first phone with Symbian
- 2002 – BlackBerry introduced his first smart phone
- 2002 – 3G mobile system introduced
- 2007 – Apple introduced his first phone iPhone
- 2008 – Android 1.0 launch in HTC mobile

2010 – Microsoft launches Windows Phone OS

2011 – Mee Go first Linux mobile by Nokia, Intel and Linux Foundation

2012 – Mozilla announced Firefox OS

2013 – BlackBerry release BlackBerry 10

III. COMPARISON OF ANDROID OS WITH OTHER OPERATING SYSTEM

Presently available mobile operating systems are Android, Symbian, Apple iOS, BlackBerry RIM and Windows. Without their knowledge we cannot compare between them. So, we first get history of various operating systems.

A. Symbian Operating System:

- Symbian is an open source mobile operating system and computing platform design for smart phones.
- Symbian operating system originally developed by Symbian limited.
- In 2000 many mobile companies used Symbian OS like Samsung, Motorola, Sony Ericsson and Nokia.
- Due to introducing of Android OS, Symbian users can be decreases rapidly in 2010 but before that it was most popular operating system.

B. Windows Operating System:

- Windows operating system is based on windows CE Kernel and first appeared as a pocket PC 2000 operating system.
- It is supplied with a suite of basic application developed with the Microsoft windows AIP, and design to have features and appearance somewhat similar to desktop version of windows.
- Third parties can develop software for windows mobile with no restriction imposed by Microsoft.
- Software application purchasable from windows market place for mobile during the service lifespan.
- Its hardware requirement is maximum than other operating system. Due to this reasons and also Android and iOS is coming out the popularity of Windows operating system decreases.
- Minimum hardware required of mobile for Windows OS shows in Table1.

Table 1: Device Requirement

Features	Minimum Requirement
Chip set	ARM-based
Memory	512 MB RAM; 1GB Flash External
Storage	Mini or Micro SD
Primary Display	FHD display with QSXGA
Navigation Keys	Power key and Volume key
Camera	2MP CMOS
USB	Standard mini-B USB interface
Bluetooth	1.2 or 2.0

C. iPhone Operating System:

- Apple Inc. developed his own operating system as iOS and in 2007 first iOS is introduced in iPhone.
- Apple Inc. extends iOS to used in devices such as IPOD Touch, IPAD and IPAD mini.
- Unlike Microsoft windows phone and Google Android, Apple does not licence iOS installation on Apple Hardware.
- In Apple app store there are more than 1 Million iOS application out of which 475,000 of optimize only for iPad.
- Also there are user interface of iOS is based on direct manipulation and used of touch screen it coincide to real word action, like swiping, tapping, screen pinching and reverse pinching to handling onscreen object.

D. BlackBerry Operating System:

- BlackBerry operating system is a proprietary mobile operating system developed by BlackBerry Ltd. For its BlackBerry line of smart phone handheld device.

- The operating system provides multitasking and support specialized input device that have been adopted by BlackBerry Ltd.
- For use in it's and handheld, particularly the track wheel, trackball and most recently track pad and touch screen.
- The BlackBerry platform provides directly synchronization with Microsoft exchange to improve and update data of email, calendar, tasks, notes and contacts, when used with BlackBerry enterprise server.
- BlackBerry operating systems also support update to operating system.
- BlackBerry allow third party developers to develop application by using available BlackBerry API classes

IV. ABOUT ANDROID OPERATING SYSTEM

- Linux-based, open source, free operating system, middleware and key mobile applications
- Originally founded by Android Inc. in 2003
- Android Os was developed by Chris White, Andy Rubin, Nick Sears and Rich Miner.
- Google purchased and developed Android since 2005
- Open Handset Alliance
- Apache v2 license
- Built-in Core Applications like Email client, Maps, Contacts, SMS, Calendar, Browser...
- User implemented Applications
- Written in Java
- Every application has its own process
- Can be killed to reclaim resources
- Direct used of internal hardware during application building
- Minimum hardware required of mobile for Windows OS show in Table2.
- It provides to build Android app by using Android OS on Android mobile.

Table 2: Device Requirement

Features	Minimum Requirement
Chip set	ARM-based
Memory	128 MB RAM and 256 MB Flash External
Storage	Mini or Micro SD
Primary Display	QVGA TFT, 16-bit colour
Navigation Keys	5-way navigation with 5 application keys, power camera and volume controls
Camera	2MP CMOS
USB	Standard mini-B USB interface
Bluetooth	1.2 or 2.0

V. APPLICATION OF ANDROID OS IN TODAY ERA

Android applications are used in various fields like business, education, health, travelling and social. In this field thousands of app available for time to time used. Some of their application as follows:

A. Business:

Android OS are used in business sector to monitoring production process. For online selling business we can build Android app for costumer to sell product without contact them and provide highest quality. His clients and visitors can directly get more information's about his services through his applications and can chat with business executive directors from any country and any city.

B. Education:

In education sector there are widely used of Android application for reading, programming, downloading, office work and other purposes. Due to it provide efficient cost and many applications to student can be used widely in today.

C. Health:

Android health app are used to Search for Physicians, Pharmacies or facilities by location, locate urgent care facilities nearest your location and Compare medication prize and find lower-cost option

D. Travelling:

Mobile users can get information's about tours and travels and also get information about exact locations from anywhere. Android application also useful for an online ticket booking, railway reservations and hotels booking etc.

VI. USERS RATING BAR ON ANDROID OPERATING SYSTEM

1. Features of Android Operating System:

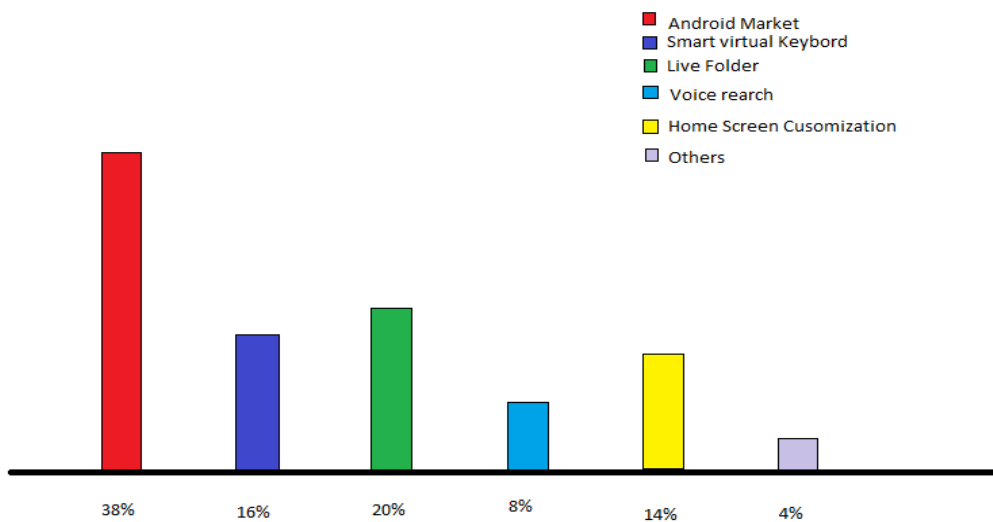


Figure 1: User Rating Bar Features of Android OS

2. User Friendliness of Android Operating System:

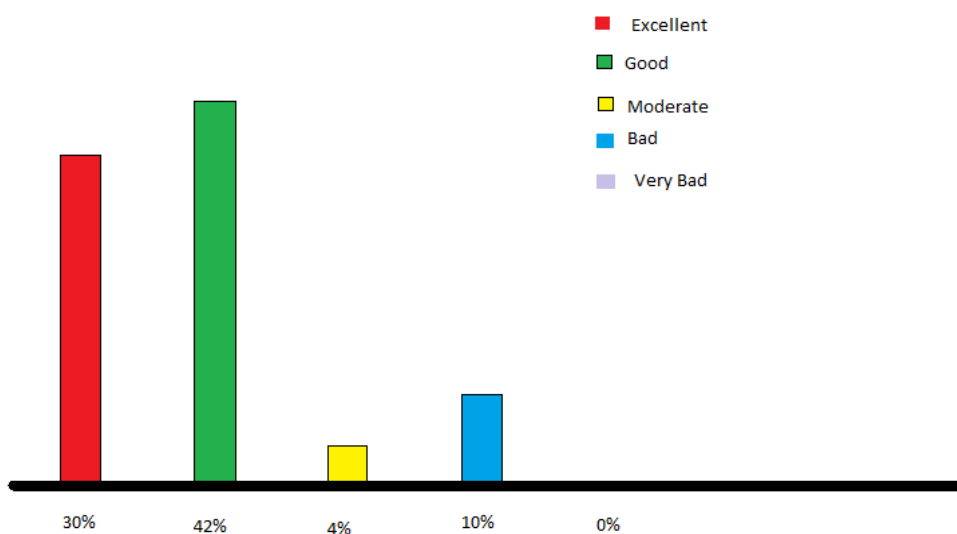


Figure 2: User Rating Bar for Features of Android OS

3. Stability of Android Operating System:

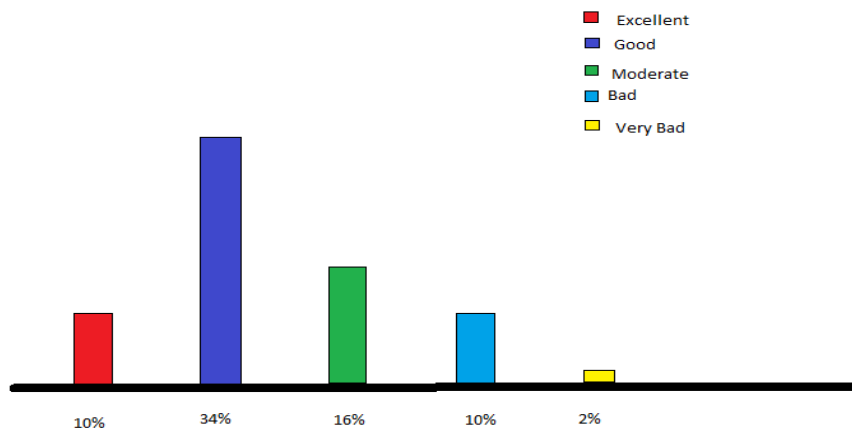


Figure 3: User Rating Bar for Stability of Android OS

4. Customer Support Service of Android Operating System:

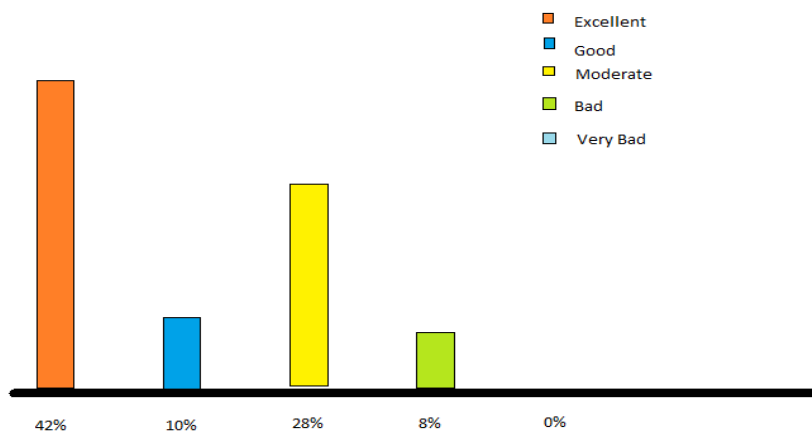


Figure 4: User Rating Bar for Customer Support Services of Android OS

5. Limitation and Problems in Android Operating System:

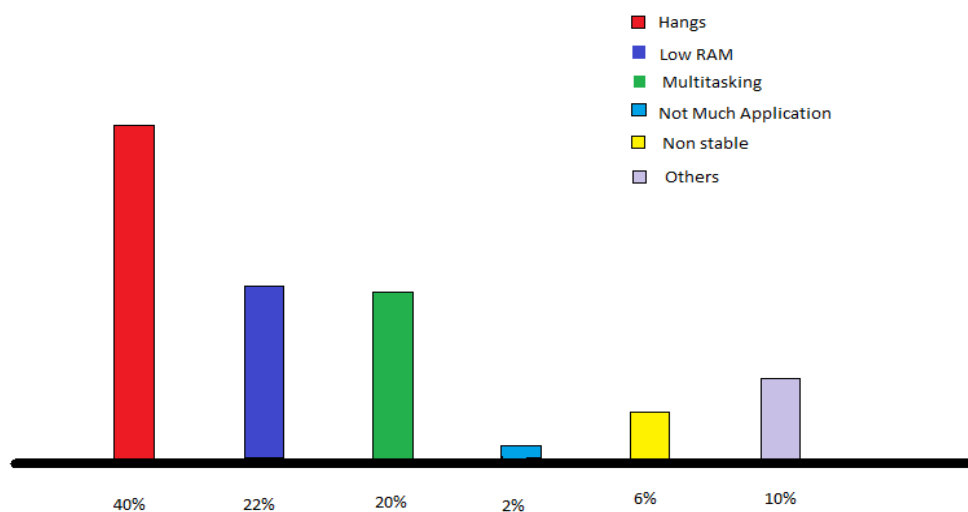


Figure 5: User Rating Bar for Limitation and Problem in Android OS

VII. CONCLUSION

- With completion of this paper, we conclude that in all mobile operating system Android operating system are best in today era.
- Due to incredible features of Android OS, its growing rapidly in mobile market
- Android applications provide Billions app in education, medical, social, industries and entertainment field.
- Hardware required for android operating system is minimum than other operating system.
- The android app makes it easier to collect and store the information from different client directly like to sales any products and which can used Android app then collecting data from buyers is easy.
- Anyone can build Android application for their uses requirement and also upload on Google Play Store to make money.
- The android OS easiest to handle and it provide low cost.
- Android OS allows building monitoring application which can be used in industries for controlling rate of production.

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