International Journal on Wireless, Networking & Mobile Communication Innovations
Vol. 1, Issue 1 - 2017

A SURVEY: OPERATING SYSTEM OF SMARTPHONE

RUPALI G BHOPLE[*], VISHAL G CHAVAN[*], SARITA T SAWALE[*]

ABSTRACT

The operating system is an program that manages the computer hardware. Nowadays smartphone is an important part of everyones life. Asmartphone is nothing but a mobile phone with an advanced mobile operating system which combine features of personal computer operating system with other features useful for mobile.No smartphone can run without operating system. There are mainly three categories on which the smartphone can be divided,these are Android from Samsung,iOS from Apple and windows from Microsoft. This paper gives an overview of various operating system used in different smartphone.A comparative analysis of features of smartphone based on opearing system is also covered.In the recent years,however radical changes driven by the advancement in technology,witnessed the introduction and furthermore development of smartphones.This paper also discussed various mobile phones technologies and their operating system available in market and their comparison.

KEYWORDS: Operating System, Smartphone.

INTRODUCTION

Smartphones are presently partaking almost in every last circle of life like business, instruction, working environment and human services. At show there are numerous cell phones working frameworks accessible in the market. The reason towards this change is credited to its shifted usefulness, usability and utility. There are number of assignments performed on it like making call, sending or accepting SMS, music, charging, web based shopping, web based booking, playing amusements, web perusing utilizing diverse applications like whatsapp, facebook or Applock and so forth. Subsequently a lot of client touchy information is put away inside the gadgets [1]. Expanded utilization of cell phone has driven towards higher worries about security of client private information. This paper is to look at the most recent cell phone working framework like android, iOS, blackberry, Symbian, windows telephone, webOS, Ubuntu and firefox.

The examination between various cell phone working framework is finished utilizing diverse parameters like OS family, Environment and piece of the pie. In the wake of summing up discoveries through the examination, the decision about which working frameworks are in rivalry and reach a few inferences from it. For correlation, different parameters of existing work like OS family, IDE, GUI, SDK stage, CPU Architecture, and so forth and some new parameters like Market Size,Market share,

[*]Department of Information Technology, Anuradha Engineering College, Chikhli.
Correspondence E-mail Id: editor@eurekajournals.com

Debugger accessibility, Cross stage arrangement, Reverse Engineering instrument, future Scope and so forth have been considered. Since these parameters gives new research patterns of cell phone based working frameworks. This versatile innovation is expanding quickly around the entire world by the progression of time. We can without much of a stretch see close around us in our day by day life that even a needy individual can profit a cell phone or he/she approaches cell phone One type of media transmission is cell phone gadgets or call telephone gadgets which are utilized on remote association through systems that are communicating towers which spread inside a particular territory on neighborhood, national or multinational level we backpedal to 1947 for the historical backdrop of cell phone when an organization named Lost Technology began its tests in New Jersey plane.

However, the 1st person that achieved mobile device was Martin Cooper. He was a researcher from Motorola in Chicago and he made his first wireless call from cell phone on 3rd April 1973. Mobile networks are consuming a large amount of data in order to enhance their communications and compress the data coverage. Continuously, enhancement in mobile device technology day by day has great impacts on human being. The movement of mobile phone operating system has rapidly increased to contain challengers such as Google Android, Symbian, Apple, BlackBerry, Microsoft, Palm, etc. Such operating system's platforms have come in a very long way because no company provides an operating system that is perfect for the mobile phone users.The operating system mainly havingfive stages in which it can perform the operation,which are as

- **New**:-process is being created
- **Ready**: process waiting to run
- **Running**:-instruction are being executed
- **Waiting**:-process waiting for some event to occur
- **Terminated**:-the process has finished execution

HOW DO MOBILE OPERATING SYSTEMS DIFFER FROM COMPUTER OPERATING SYSTEMS?

The earliest operating systems read punch-cards. The innovation at that point proceeded onward to summon line frameworks like UNIX, its open-source doppelganger, Linux, and DOS. In the 1980s, visual working frameworks started to rule the commercial center, with the Macintosh OS and visual adaptations of existing order line frameworks like DOS's Windows following behind.Today, our mobile phones have become powerful computers with touch-screen, voice, stylus and mini-keypad inputs and sophisticated full-colour visual operating systems. These devices use a whole new set of operating systems, many associated with the established personal computer platforms. While computer operating systems are geared to larger screens and keyboard and mouse input, phone operating systems are suited to smaller screens and more direct methods of interaction. The open-source movement is still going strong, with many mobile operating systems built on the freely accessible Linux system and many mobile operating systems that are themselves open-source.

TYPES OF MOBILE OPERATINGSYSTEM

There are three main types of mobile operating system:

A. Manufacturer-built proprietary operating systems where the operating systemdeveloper (the owner) is also the hardware manufacturer. This includes:

- Apple iOS
- BlackBerry OS

B. Third-party proprietary operating systems where the operating system developer

(theowner) will license its operating system, usually for a fee, to third-party hardwaremanufacturers (Original Equipment Manufacturers or OEMs)This includes:

- Microsoft Windows Phone (Mobile)

C. Free and open source operating systems where the operating system developer(owner) will release the operating system via the open source license method. Opensource operating systems are developed by a company, a group of companies or acommunity of developers. Customisation of the operating system is usually allowedto a certain degree (within the parameters of the license agreement). This includes:

- Google Android
- Symbian

OPERATING SYSTEM AND ITS FUNCTION

1. Operating system is the set of programs It provide a pleasant and effective that controls a computer. interface between the user and theMakes the computer more convenient hardware to use.
2. Command Interpreter, Security management, File Management,Memory Management, Process Management.
3. By process management OS manages many kinds of activities.All process from start to shut downCreation and deletion of user andsystem processes.
4. The major activities of an operating regard to memory- management are:-Decide which process are loaded intomemory when memory space becomes available.Allocate and deallocate memory space asneeded.
5. The file management system allows the user to perform such tasks:- Creating files and directories Renaming files Coping and moving files Deleting files.
6. Bysecurity management OS manages many tasks such as:- Alert messages Dialogue boxes Firewall Passwords.

ARCHITECTURE OF MOBILE OPERATINGSYSTEM

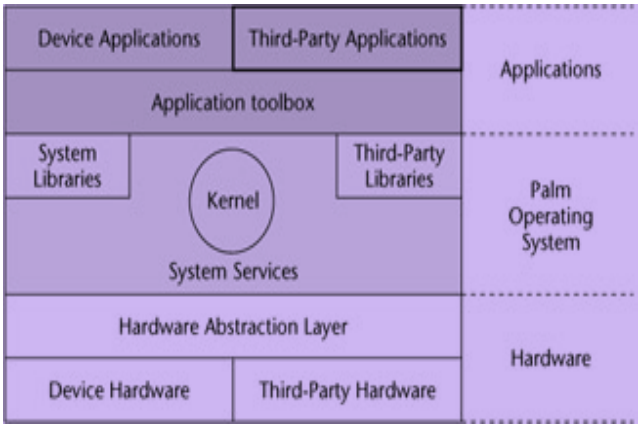

Figure 1.Architecture of mobile OS

The architecture of mobile operating system is as given in figure .The architecture of mobile operating system mainly involved four parts.The first one is user,anyone can be the user of it. The user of that particular operating system is connect with the system with applications. There are two types of applications that is device applications and third party applications. The third party applications can be downloaded various app stores. The operating system provide an interaction between user and system. The hardware part of the operating system also having two types as device hardware and third party harsware. The hardware and application part connect each other with kernel. Kernel

provide the system services and system libraries with third party libraries for their connectivity.

SYMBIAN

Symbian was introduced in the year 2000 as Nokia's proprietary operating system, used exclusively in the phones they manufactured. However, Nokia eventually made it open-source, meaning that anyone can access the code that makes up the OS. For many years, Symbian was the most popular smartphone platform, and it will be supported by Nokia at least until 2016.

- Accessibility of Symbian is found as Series 60 User Interface (S60), User Interface Quartz (UIQ) and Mobile arranged Application Platform of Symbian (MOAP(S)). Nokia portable organization find the Symbian establishment toward the finish of first 50% of 2008 with the mean to join Symbian OS, S60, UIQ and MOAP(S) to make one open versatile programming stage, however now in this present period the stage still remain distributed.[2]
- Real-time: it has an ongoing, multithreaded part.
- Data Caging [6]: it enables applications to have their own particular private information parcel. This component takes into consideration applications to ensure a protected information store. It can be utilized for internet business applications, area mindful applications and so on.
- Multimedia: it bolsters sound, video recording, playback and spilling, and Image change.
- Platform Security : Symbian gives a security instrument against malware. It permits delicate tasks can be gotten to by applications which have been affirmed by a marking expert.
- Internationalization bolster: it underpins Unicode standard.
- Client-server design: portrayed in past slides, it gives basic and high-productive between process correspondence. This element likewise facilitates porting of code composed for different stages to Symbian OS[6].

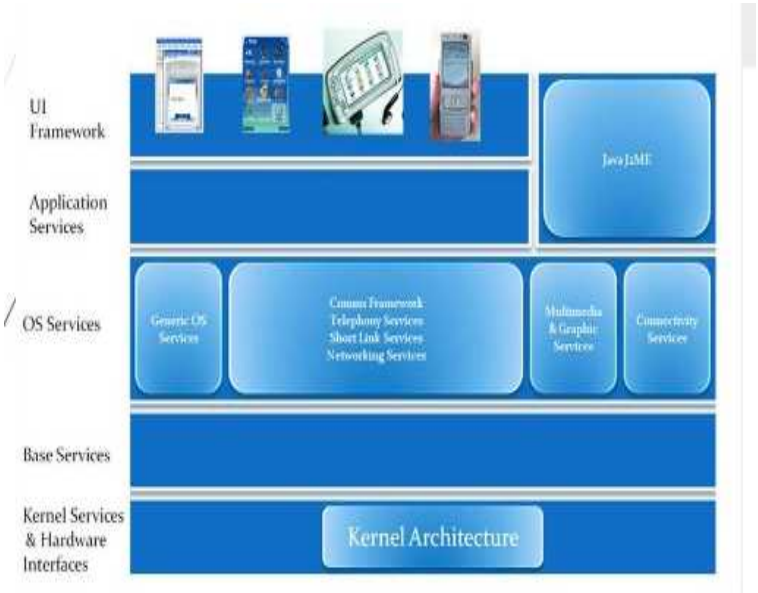

Figure 2.Architecture of Symbian Os

IPHONE O.S.

- iPhone OS is an operating system run on iPhone and iPod.
- It is based on Mach Kernel and Drawin core as Mac OS X.
- The Mac OS X kernel includes the following component:

– Mach Kernel
– BSD
– I/O component
– File Systems
– Networking components

- Mac OS X has a preemptive multitasking environment.
- It supports real-time behavior.
- In Mac OS X, each application has access to its own 4 GB address space.

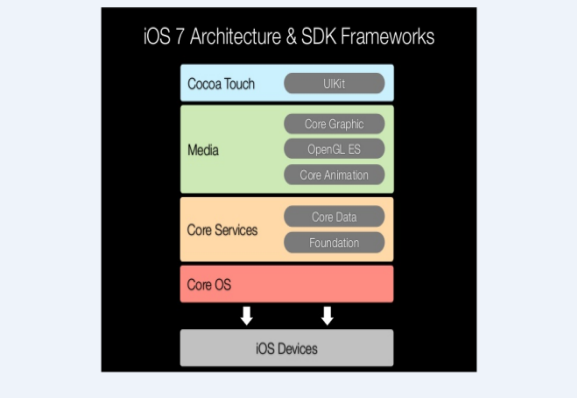

Figure 3.Architecture of iphone OS

WINDOWS MOBILE O.S.

The Windows Phone series has had poor selection in contrast with its rivals. Absence of enthusiasm for the stage likewise prompted a diminishing in outsider applications, and a few merchants finished their help for Windows Phone through and through. The most noticeable Windows Phone seller was Nokia, who solely embraced Windows Phone as its cell phone stage in 2011 as a feature of a more extensive organization with Microsoft. Nokia's Lumia arrangement was the most prominent line of Windows Phone gadgets, speaking to 83.3% of all Windows Phones sold in June 2013,and Microsoft procured Nokia's versatile business for simply finished €5.44 billion in April 2014, framing the auxiliary Microsoft Mobile under previous Nokia CEO Stephen Elop.

Windows Mobile is a minimal working framework intended for cell phones and in light of Microsoft Win32. It is keep running on Pocket PCs, Smartphones and Portable media focuses.

It provides ultimate interoperability. Users with various requirements are able to manipulate their data. The latest Windows released by Microsoft is known as Windows 8.1 which has gained immense popularity among all kind of users. With its colorful and user friendly interface it has given Windows OS a new life and it is currently in demand all over the world.

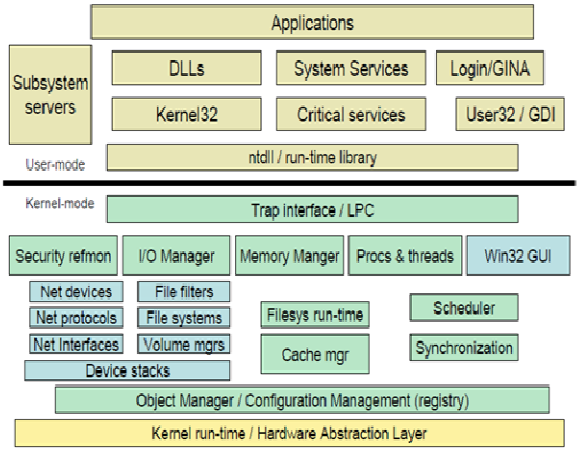

Figure 4.Architecture of Windows Mobile Os

BLACKBERRY O.S.

In 1999, RIM discharged its first BlackBerry gadgets, giving secure continuous push-email interchanges on remote gadgets. Administrations, for example, BlackBerry Messenger give the incorporation of all correspondences into a solitary inbox. In September 2012, RIM declared that the 200 millionth BlackBerry cell phone was dispatched. As of September 2014, there were around 46 million dynamic BlackBerry benefit endorsers. Most as of late, RIM has experienced a stage progress, changing its name to BlackBerry and making new gadgets on another stage named "BlackBerry 10"and in November 2015 discharged an Android cell phone, the BlackBerry Priv.

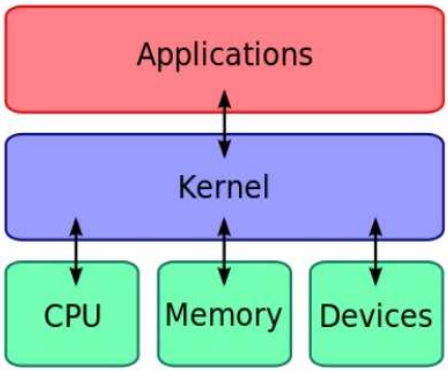

Figure 5.Architecture of Blackberry Os

ANDROID O.S.

The Android operating system isn't found on Smartphones produced by a single manufacturer, it's an open source operating system released by the mighty Google. This means that you can find the Android OS on smartphones produced by many different manufactures including Samsung, HTC, LG, Motorola, Sony, Huawei and many more. Android phones come in a wide range of products and have a wide selection to choose from which range in quality as well as price. Make sure to do some research when choosing an Android smartphone. While many Androids are similar as they run on the same software not all Androids are created equally. Android open source platform requires strong and complex security architecture to ensure security of user private data, personal information, application and network, but it has few constraints for developers which raises the security risk for the end users[1]

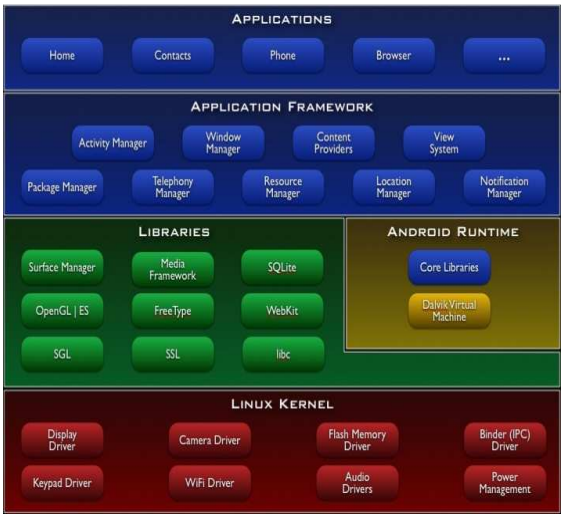

Figure 6.Architecture of Android Os

Versions of Android o.s.

- ✓ : (API Level 1)
- o – Alpha : (API Level 2)
- o – Beta
- ✓ 1.5 – Cupcake : (API Level 3)
- ✓ 1.6 – Donut : (API Level 4)
- ✓ – Eclair : (API Level 5)
- ✓ 2.0.1 – Eclair : (API Level 6)
- o – Eclair : (API Level 7)
- ✓ 2.2.x – Frozen Yogurt ("Froyo") : (API Level 8)
- o – Gingerbread (Minor UI Tweak): (API Level 9)
- ✓ 2.3.3 – Gingerbread: (API Level 10)
- ✓ 3.0-Honeycomb (Major UI revamp): (API Level 11)
- o 3.1- Honeycomb: (API Level 12)
- o 3.2-Honeycomb: (API Level 13)
- ✓ – Ice Cream Sandwich (Minor UI Tweak): (API Level 14)
- ✓ 4.0.3 – Ice Cream Sandwich: (API Level 15)
- o 4.1– Jelly Bean: (API Level 16)
- o 4.2– Jelly Bean: (API Level 17)
- o 4.3– Jelly Bean: (API Level 18)
- ✓ 4.4.4 – KitKat: (API Level 19)
- ✓ 5.0, 5.0.1, 5.0.2 – Lollipop (Major UI revamp) : (API Level 21)
- ✓ 5.1, 5.1.1 – Lollipop : (API Level 22)
- ✓ 6.0& 6.0.1 – Marshmallow: (API Level 23)
- ✓ 7.0- Nougat (API Level 24)[9]

APPLICATIONS

- Including military and government systems.
- Might be applied to tactical situations in which there are a large number of sensors deployed, only some of which are useful at a given time, or for which particular personnel are appropriately cleared.
- Provides the infrastructure to write an application which allows certain personnel to see particular sensors based upon their clearances and perhaps location.
- Provide the infrastructure for building more complex applications that span multiple sensors and platforms.

ADVANTAGES

- Multitasking – Android telephones can run numerous applications, it implies you can peruse, Facebook while tuned in to the melody.
- Ease of Notification – Any SMS, Email, or even the most recent articles from a RSS Reader, there will dependably be a notice on the Home Screen Android telephone, don't miss the LED pointer is squinting, so you won't miss a solitary SMS, Email or even Misscall.
- Easy access to a large number of uses by means of the Google Android App Market – When you want to introduce applications or recreations, through Google's Android App Market, again can download applications for nothing. There are a large number of utilizations and recreations that are prepared for download on Android telephones You.
- Phone alternatives are assorted – Talk Android telephone, it will feel 'extraordinary' than the IOS, if the IOS is constrained to the iPhone from Apple, at that point Android is accessible on cell phones from different makers, from Sony Ericsson, Motorola, HTC to Samsung. Furthermore, every handset

producer additionally exhibits an Android telephone in the style of each, for example, Motorola with its Motoblur, Sony Ericsson with its Timescape. So You can uninhibitedly pick the Android telephone as per the 'brand' top pick.

- Can introduce an adjusted ROM – not happy with the standard perspective of Android, don't stress there are numerous custom ROM that can be utilized as a part of your cell phones Android.
- Widget – completely appropriate, with the gadgets on the homescreen, You can undoubtedly get to an assortment of settings rapidly and effortlessly.

CONCLUSION

The mobile operating system utilized for different handheld gadgets like cell phones, tablets, PDAs, or other cell phones. In later past, the examination exercises are packed in regions like correlation of different portable working frameworks, security of individual information, figuring out of versatile based application.

Systems administration is the most essential trait for applications, yet around every working framework have limitations in respect of naturally interfacing with Wi-Fi or Bluetooth organize. Windows Mobile does not have this sort of limitations and gets three focuses.

The analysis show that android and iPhone are most popular operating system among all other smartphone OS. Specifically, the Google's Android initiative of developing an OS which can run on all mobile devices has many made the Android the most used and popular mobile operating the world over.

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