

Case Study: Development of Mobile Operating System

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Abstract: Now-a-days, mobile phone places a major role in each individual's life from agriculture to personal work. Many of us are not aware that main part in mobile phone is Operating System. This paper discusses about few Operating System used in smart phone in detail.

Keywords: Android, Smart Phone, Mobile phones, Operating system, Tablets, Versions.

I. INTRODUCTION

An operating system is system software that manages hardware and software i.e. it is an interface between user and computer hardware. It controls the execution of user programs to prevent errors and improper use of the system. The main objective of operating system is to control and coordinate the use of system resources. It provides a suitable environment for a user to access the available resources. It also increases the productivity of processing resource of device and use the hardware in an efficient manner. Each mobile has consists of an operating system. A mobile operating system is also called as mobile OS which operating system that allows devices such as phones, tablets and many other handheld devices to run applications and programs. Phone starts up when a device is turned on. It has included the features of a personal computer operating system as well.

The timeline of Mobile Operating System

- 1973-1993 – Mobile phones used embedded systems.
- 1994 – The first smartphone with touchscreen, email, PDA features.
- 1996 – Palm OS was introduced.
- 1998 – Symbian OS was developed by Symbian Ltd.
- 1999 – Nokia S40 platform was introduced.
- 2000 – Symbian OS on a smartphone with the launch of Ericsson R380.
- 2001 – Kyocera 6035, smartphone with Palm OS.
- 2002 – Introduction of Microsoft's Windows CE (Pocket PC) , BlackBerry released its first smartphone.
- 2005 – Nokia introduced Maemo OS.
- 2007 – Apple iPhone with iOS was introduced, Google formed Open Handset Alliance (OHA).
- 2008 – OHA released Android.
- 2009 – Palm introduced WebOS, Samsung announced Bada OS.
- 2010 – Windows Phone was released.
- 2011 – A mobile Linux distribution MeeGo was introduced.
- 2012 – Apple released iOS 6.
- 2013 – BlackBerry released OS, Apple released iOS 7, Google released Android KitKat 4.4.
- 2014 – Microsoft released Windows Phone 8.1, Apple released iOS 8, BlackBerry released 10.3, Google released Android 5.0 Lollipop.
- 2015 – Google released Android 5.1 Lollipop, Apple released iOS 9, Google released Android 6.0 Marshmallow, Microsoft released Windows 10 Mobile.

- 2016 – Microsoft released Windows 10 Mobile Anniversary update, Apple announced iOS 10, Google released Android 7.0 Nougat, Apple released iOS 10, Tizen released Tizen 3.0, BlackBerry released BlackBerry 10.3.3.
- 2017 – Samsung launched Android-based Samsung Galaxy S8, Microsoft released Windows 10 Creators update, Samsung introduced Tizen 4.0, Google released Android 8.0 Oreo, BlackBerry announced Android-based BlackBerry Secure, Apple introduced iPhone 8, iPhone X, iOS 11.

Some of the most common and current mobile operating system is as follows:

1. ANDROID:

It was developed by Google based on Linux kernel. It is the most popular OS in mobile phone. It is free, open source software and primarily designed for touchscreen mobiles and other electronic devices. Android was founded by Andy Rubin, Rich Miner, Nick Sears and Chris White in October 2003, in Palo Alto, California. In July 2005, Google was acquired Android and Andy Rubin, Rich Miner and Chris White joined Google. Andy Rubin led a team to developed a mobile device platform powered by Linux kernel. In 2007, the green Android logo was designed by Irina Blok who was a graphic designer. Android mobile operating system was released various versions named after dessert or sweet items.

TABLE I: ANDROID VERSIONS

SL. NO	VERSION	RELEASE DATE
1	Android 1.0 (API 1)	September 23, 2008
2	Android 1.1 (API 2)	February 09, 2009
3	Android 1.5 Cupcake (API 3)	April 27, 2009
4	Android 1.6 Donut (API 4)	September 15, 2009
5	Android 2.0 Eclair (API 5) Android 2.0.1 Eclair (API 6) Android 2.1 Eclair (API 7)	October 26, 2009 December 09, 2009 January 12, 2010
6	Android 2.2 Froyo (API 8) Android 2.2.1 Froyo Android 2.2.2 Froyo Android 2.2.3 Froyo	May 20, 2010 January 18, 2011 January 22, 2011 November 21, 2011
7	Android 2.3 Gingerbread (API 9) Android 2.3.1 Gingerbread Android 2.3.2 Gingerbread	December 06, 2010 December 2010 January 2011
8	Android 2.3.3 Gingerbread (API 10) Android 2.3.4 Gingerbread Android 2.3.5 Gingerbread Android 2.3.6 Gingerbread Android 2.3.7 Gingerbread	February 09, 2011 April 28, 2011 July 25, 2011 September 02, 2011 September 21, 2011
9	Android 3.0 Honeycomb (API 11)	February 22, 2011
10	Android 3.1 Honeycomb (API 12)	May 10, 2011
11	Android 3.2 Honeycomb (API 13) Android 3.2.1 Honeycomb Android 3.2.2 Honeycomb Android 3.2.3 Honeycomb Android 3.2.4 Honeycomb Android 3.2.5 Honeycomb Android 3.2.6 Honeycomb	July 15, 2011 September 20, 2011 August 30, 2011 August 30, 2011 December 2011 January 2012 February 2012
12	Android 4.0 Ice Cream Sandwich (API 14) Android 4.0.1 Ice Cream Sandwich Android 4.0.2 Ice Cream Sandwich	October 18, 2011 October 21, 2011 November 28, 2011
13	Android 4.0.3 Ice Cream Sandwich (API 15) Android 4.0.4 Ice Cream Sandwich	December 16, 2011 March 29, 2012

14	Android 4.1 Jelly Bean (API 16) Android 4.1.4 Jelly Bean Android 4.1.2 Jelly Bean	July 09, 2012 July 11, 2012 October 09, 2012
15	Android 4.2 Jelly Bean (API 17) Android 4.2.1 Jelly Bean Android 4.2.2 Jelly Bean	November 13, 2012 November 27, 2012 February 11, 2013
16	Android 4.3 Jelly Bean (API 18) Android 4.3.1 Jelly Bean	July 24, 2013 October 03, 2013
17	Android 4.4 KitKat (API 19) Android 4.4.1 KitKat Android 4.4.2 KitKat Android 4.4.3 KitKat Android 4.4.4 KitKat	October 31, 2013 December 05, 2013 December 09, 2013 June 02, 2014 June 19, 2014
18	Android 4.4W KitKat, with wearable extensions (API 20) Android 4.4W.1 KitKat Android 4.4W.2 KitKat	June 25, 2014 September 06, 2014 October 21, 2014
19	Android 5.0 Lollipop (API 21)	November 12, 2014
20	Android 5.1 Lollipop (API 22) Android 5.1.1 Lollipop	March 09, 2015 April 21, 2015
21	Android 6.1 Marshmallow (API 23) Android 6.0.1 Marshmallow	October 05, 2015 December 07, 2015
22	Android 7.0 Nougat (API 24)	August 22, 2016
23	Android 7.1 Nougat (API 25) Android 7.1.1 Nougat Android 7.1.2 Nougat	October 04, 2016 December 05, 2016 April 04, 2017
24	Android 8.0 Oreo (API 26)	August 21, 2017
25	Android 8.1 Oreo (API 27)	December 05, 2017

2. IPHONE / IOS (APPLE Phone):

It was originally developed by Apple co. exclusively for its hardware. It is the most popular mobile operating system after Android OS. This mobile operating system was unveiled in 2007 for the iPhone smart phone. iOS supports many version of Apple's own manufactured devices such as iPhone, iPad and iPod Touch. The current version is iOS11, which was released on September 19, 2017. It is now available for all iOS smart phone devices.

TABLE II: IPHONE VERSIONS

SL. NO	VERSIONS	RELEASE DATE	FINAL SUPPORTED OS
1	iPhone OS 1.0	June 29, 2007	iPhone OS3.1.3
2	iPhone OS 2.0	July 11, 2008	iOS 4.2.1
3	iPhone OS 3.0	June 19, 2009	iOS 6.1.6
4	iOS 4.0	June 21, 2010	iOS 7.1.2
5	iOS 5.0	October 14, 2011	iOS 9.3.5
6	iOS 6.0	September 21, 2012	iOS 10.3.3
7	iOS 7.0	September 20, 2013	iOS 10.3.3
8	iOS 7.0	September 20, 2013	iOS 11.2
9	iOS 8.0	September 19, 2014	iOS 11.2
10	iOS 9.0	September 25, 2015	iOS 11.2
11	iOS 9.3	March 31, 2016	iOS 11.2
12	iOS 10.0	September 16, 2016	iOS 11.2
13	iOS 11.0	September 22, 2017	iOS 11.2
14	iOS 11.0.1	November 03, 2017	iOS 11.2

3. BLACKBERRY *Pone*:

BlackBerry Ltd. is a Canadian multinational company. Blackberry is originally created by Mike Lazaridis and Douglas Fregin as Research In Motion in 1984. The BlackBerry has refers to the unique physical keyboard design on early devices. It is based on Android Open Source Project. It is specialized in mobile productivity and secure communications. BlackBerry is branded for tablets, smartphones and many more products. Blackberry Secure operating system is based on Android Open Source Project, which was announced on August 2017. Blackberry Secure version 1.x (based on Android “Marshmallow” 6.x and “Nougat” 7.x) is the latest version.

TABLE III: BLACKBERRY VERSIONS

SL.NO	VERSION	RELEASE DATE
1	BlackBerry OS 1.0	January 1999
2	BlackBerry OS 3.6	March 2002
3	BlackBerry OS 5.0	August 09, 2009
4	BlackBerry OS 6.0	April 2010
5	BlackBerry OS 7.0	August 2011
6	BlackBerry OS 7.1	January 2012

II. CONCLUSION

There are varieties of Mobile phones available in market with various latest mobile Operating Systems. Year by year the versions are released and new mobile operating systems are developed by the companies for the users.

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