

The Road to Success of Android Mobile Operating System

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Abstract

This article first makes a brief analysis of the mobile phone operating system, followed by a systematic introduction to the Android mobile phone operating system, expounding the origin and version of the Android mobile phone operating system, and then a detailed analysis of the development process of the Android mobile phone operating system. Strategies implemented by mobile operating systems are analyzed. The study found that cost control is the key for Android to attract suppliers and successfully establish an ecosystem, and version upgrade compatibility is the magic weapon to deal with the "de-Google" development.

Keywords

Android; Mobile Operating System; Open Source Strategy.

1. Introduction

Since Microsoft released the Windows CE operating system in 1996 and entered the development of mobile operating systems, the field of mobile operating systems has flourished, with rapid technological updates and fierce industry competition. Shortly after the release of Windows CE, Symbian OS entered everyone's attention. Symbian S60 brought the development of smartphone systems into a new era, and it has been brilliant for nearly ten years. After that, BlackBerry, iOS, Android and other mobile operating systems flooded into the market, re-dividing the market. . In the constant competition, some mobile phone system manufacturers gradually withdraw from the system development. As a latecomer, the Android system occupies most of the market share, followed by the iOS system, and the remaining very small share is occupied by other systems. Since its release, the Android system has grown at an astonishing rate, and has continuously seized the market share of mobile operating systems. In 2018, it accounted for 70% of the global market share. Nearly 95% of the world's countries have adopted Android as the preferred smartphone operating system. Why can Android occupy market share so strongly? This article selects Android for a brief case analysis and explores the secrets behind its development.

2. Android Mobile Operating System

2.1 The Origin of Android Mobile Operating System

Android originally means "robot" in English. It is a company founded by Andy Rubin in California in 2003. Its main business is mobile phone software and mobile phone operating system. In 2005, Google spent 40 million US dollars to acquire the Android company, and since then began the glorious history of Android. The Android system is developed based on Linux's free and open source code, mainly used in mobile phone operating systems, and continues to expand to other fields (TVs, cars, game consoles, etc.).

The version update of the Android system is relatively rapid. The system version number used the dessert name as its name before 10.0, and abandoned the candy name after 10.0. The Android version names are: Android 1.0 (September 2008), Android 1.1 (February 2009), Android 1.5 Cupcake (April 2009), Android 1.6 Donut (September 2009), Android 2.1 Éclair (2009) Oct), Android 2.2 Froyo (May 2010), Android 2.3 Gingerbread (Dec 2010), Android 2.3.3 Gingerbread (Feb 2011), Android 3.0 Honeycomb (Feb 2011), Android 3.1 Honeycomb (May 2011), Android 3.2 Honeycomb (July 2011), Android 4.0 Ice Cream Sandwish (May 2011), Android 4.1 Jelly Bean (June 2012), Android 4.2 Jelly Bean (October 2012), Android 4.3 Jelly Bean (July 2013), Android 4.4 KitKat (October 2013), Android 5.0 Lollipop (October 2014), Android 5.1 Lollipop (March 2015), Android 6.0 Marshmallow (August 2015) , Android 7.0 Nougat (August 2016), Android 7.1 Nougat (October 2016), Android 8.0 Oreo (August 2017), Android 8.1 Oreo (December 2017), Android 9.0 Pie (August 2018) , Android 10.0 Q (September 2019), Android 11.0 R (September 2020), Android 12.0 S (October 2021). Each version of the Android system has been optimized in function, making it more convenient for users to use.

2.2 Development History of Android Mobile Operating System.

The Android system started in Palo Alto, California. Android Inc, a company co-founded by Rich Miner, Nick Sears, Chris White and Andy Rubin, aims to develop smart mobile devices to flexibly understand users' preferences and needs. It is for the digital camera market, but after its establishment, the digital camera market began to decline, and it turned to the mobile phone market to make mobile phone software and mobile phone operating systems.

In July 2005, Google acquired the Android company. Andy Rubin and others continued to develop the system in the new company. Andy Rubin served as the head of the Android team and decided to use Linux as the foundation of the Android system. Through the services and APPs provided in the system Make money.

In November 2007, Google took the lead in establishing the Open Handset Alliance to jointly develop and improve the Android system. The organization consists of 34 mobile phone manufacturers (HTC, Motorola, Samsung, etc.), operators (Sprint, T-Mobile, etc.), software developers, chip manufacturers (Qualcomm, Texas Instruments), and 84 hardware manufacturers Businesses, software developers and telecom operators. At the same time, Google officially released the Android source code under the authorization of the Apache free open source license.

In the first half of 2008, in order to attract and encourage more software developers to develop software under the Android platform, Google announced on the official Android website that it would hold an Android mobile phone software contest, and would reward winners with millions of dollars.

In September 2009, Google started from the Android 1.5 version, naming each version of the mobile operating system after the dessert.

From December 2010 to September 2011, the number of software applications on the Android mobile phone operating system increased rapidly, the number of users surged, and the mobile phone market share was quickly occupied. The number of related software applications that have obtained official digital certification for the Android mobile operating system has reached 100,000. In July 2011, the number of new Android device users per day reached 550,000, and in September of the same year, the number of related applications reached 480,000, and the system accounted for the smartphone market share. As high as 43%, becoming the most used mobile phone system in the world.

In September 2014, the Google I/O developer conference announced that there were 1 billion active Android devices in the past month, and launched the Apache Cordova framework to port Google Chrome, HTML5 and web applications to Android.

In March 2017, Android's global network traffic and devices surpassed Microsoft Windows and became the world's largest operating system.

In April 2020, nearly 95% of the world's countries adopted Android as the first smartphone operating system.

3. Android Mobile Operating System Implementation Strategy

3.1 Open Source Strategy

When the Symbian mobile operating system accounted for more than half of the global market share (72% in 2007), Google launched the open source operating system Android for mobile phones for the first time and officially entered the mobile phone market. In just four years, the market share of the Symbian system dropped. More than half (only 27.4% in the first quarter of 2011), and the Android system market share exceeds that of the Symbian system (as high as 36% in the first quarter of 2011), becoming the world's largest smartphone operating system.

Google implements an open source code strategy, establishes an open handheld device alliance, reduces the production and R&D costs of various manufacturers, and attracts more partners to join the ecosystem, making long-term use of closed-source Symbian, including Motorola, HTC and other manufacturers have turned to Android. As a result, Google has established and formed a hardware innovation ecosystem with mobile phones as the core and a software innovation ecosystem with mobile Internet online application services. Under the open source code strategy, Android is rapidly deployed around the world. In 2011, it was used in 36 OEM manufacturers, 215 operators and 450,000 developers to make hardware products for Android. There are more than 310 kinds of Android in 112 countries around the world. The number of device activations is astonishing, with more than 200,000 Android mobile phone system-related applications and 4.5 billion installations. At this point, it was too late for even Sybian to adopt an open-source strategy, and it eventually went into decline.

3.2 Version Upgrade Compatibility Strategy

As an open source system, Android does not impose strict restrictions on interface standards, but controls members of the ecosystem through a version upgrade compatibility strategy. Google invested in the acquisition of Android companies and invested in the development of the Android system. Its purpose is to make a profit. It developed the Android system and made it free and open source not because it is to promote technological progress and do charity activities, but its profit-making method is different from other systems. Google closely binds its business to the Android system. The better Android develops and the more users, the more profits it will make. And each manufacturer develops on the basis of Android source code, and will make every effort to remove Google's embedded business and replace it with its own business, which will be completely opposite to the effect that Google's open source code wants to achieve. At this time, Google adopts version upgrade compatibility. strategy.

Google eliminates the excessive differentiation of the Android platform caused by the secondary development of many manufacturers through the continuous upgrade and standardization of the Android version. Through this move, Google can not only ensure the compatibility between different versions of Android, but also urge each manufacturer to move closer to the native Android standard when conducting secondary development. Google relies on the version upgrade compatibility strategy to ensure that enterprises realize the "internalization" of business through the Android system, and at the same time, it also strengthens the Android system-based ecosystem.

4. Research Conclusions and Findings

Looking at Android standing out among many mobile operating systems, the most important thing is to establish an open handheld device alliance and form an Android-based application ecosystem. Through the open source strategy, the production and R&D costs of various manufacturers are reduced, and various manufacturers are attracted to join the application. Ecology, under the containment of "old overlord" Symbian, "new star" iOS, Windows, BlackBerry, etc., quickly occupied the mobile phone market and became the overlord of the mobile operating system market. After the success of Android, in order to protect its own interests, Google adopted a version upgrade compatibility strategy to ensure its own profit channel, and found a balance with the ecological

members, making the development of Android unstoppable and occupying most of the mobile phone market share.

From the success of the Android mobile phone operating system, we can see that for the technology that relies on ecology, its final success begins with the establishment of the technology application ecology, attracting many participating companies of this technology to join the ecology. In the process of attracting participating companies to join the application ecosystem, reducing the cost of participating companies is a feasible measure, especially when the previous technology ecosystem is mature, leveraging members of the previous technology ecosystem to join the current ecosystem, consider reducing participation Enterprise costs are a good way to go.

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