

## **Android by 2012**

**A study on present and future of Google's Android**

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## Executive Summary:

This paper attempts to study the present conditions of Android OS and unveils the predicted future market possibilities for Android, based on results from several research firms, using current market statistics and popularity among developers and end-users.

All the flimflams and excitement about the costlier iPhones and Blackberrys are vanishing, after the arrival of the most anticipated, open source mobile operating system, the Google Android, which is fated to turn the industry upside down. Despite the growth and popularity for iPhones and Blackberrys, it is predicted that, Android will make a history in sales and on acquiring the market share, slicing down the markets of both Symbians and iPhones. This paper will elaborately examine the predictions about the future of Android phones, considering the present facts and reasons.



## The Android Tale:

Open Handset Alliance (OHA) a confederation of 50 Telecoms, mobile hardware, and software companies, headed by Google, was found on 5th of November, 2007. The consortium's goal is deploy, the advanced open standards for mobile devices. Android is an open source mobile OS platform, purely based on the Linux operating system, Apache harmony, and Dalvik Virtual machine and was first developed by Google, later backed by the Open Handset Alliance. A simple and attractive thing about Android, is its Java-like language based on Google-developed Java libraries. Recently, for the first time, Google released the Native Development Kit (NDK) for Android which enables programmers to develop programs and native application that could run on the device.

## Why 'Google' Android:



The advent of internet can be marked, when it was developed, nearly 3 decades ago, as a project of the US Department of Defense. But now, Internet technology has changed the way of every businesses, after the arrival of Google. When a person boots up his web browser, it's a sure thing, that his home page would be 'Google.com' page, because, everyone who uses Internet, relies on Google for its accurate web results.

So, what's all about this Google and the Android thing? Simple, It is a revenue Geyser for Google and the sweetest thing is that, it's not just for Google, since the Android apps developers are going to be the real beneficiaries. You could have heard about the Mobile phone advertisements mentioning the features like Yahoo one search and names of other big WAP and Mobile Web search Giants. Google's entry in to the Mobile OS sector is a simple strategy to acquire a good piece of the soon-to-boom, Mobile-web Advertising market. The biggest advantage of Android OS over other Mobile OS is its Open source status, and open standards

which has created some new business models for thousands of application developers and software development companies. The success of Android mobiles will be like a chain reaction, since people would prefer cost effective devices with smartphone like features rather than costly mobiles with a load of unnecessary features.

### **Android: Breaking the "Walled Garden":**

Like Apple's Appstore, Google opened its Android market, allowing the apps developers to publish their apps without any restrictions. Unlike Apple's Appstore, Google Android market will not have any restrictions for third party development and will not run an apps approval systems.

And Android will be breaking another 'Walled garden', that's the mobile carrier support. In US, AT&T had acquired the rights to sell Apple's iPhones for the next five years from the date of its release. And in case of the Blackberrys, it is not a fully carrier-independent handset, since the major part of the sale happens through its different carriers, worldwide. This approach had left people frustrated, on sticking to a monopolistic mobile carrier, irrespective of their wish to select a different carrier. Since, Android is a open source operating system, it could leverage the advantages of device-independency and service provider-independency.

### **What's so different in Android?**

The good news is for both the consumers and developers. While consumers could enjoy a low-cost Smart phones running Android, developers were given an unrestricted customization rights. From a developer's point of view, Android has several advantages, as listed below:

- The entire Application framework can be reused and replaced by selective components
- Dalvik virtual machine enhances the power management systems (Learn about Dalvik VM in the following subtitle)
- Support for 2D and 3D graphics (OpenGL ES 1.0), So lot of business for animation developers.
- Reliable and enhanced data storage ( using SQLite framework)
- Developers can create media common applications since it supports common media file formats(MPEG, MPEG3, MPEG4, H.286, AAC, AMR, JPG, PNG, GIF and more)
- GSM, EDGE, 3G, HSCSD, Wi-Fi network applications support (Depends on hardware)



#### **Open**

Android allows you to access core mobile device functionality through standard API calls.



#### **Breaking down boundaries**

Combine information from the web with data on the phone -- such as contacts or geographic location -- to create new user experiences.



#### **All applications are equal**

Android does not differentiate between the phone's basic and third-party applications -- even the dialer or home screen can be replaced.



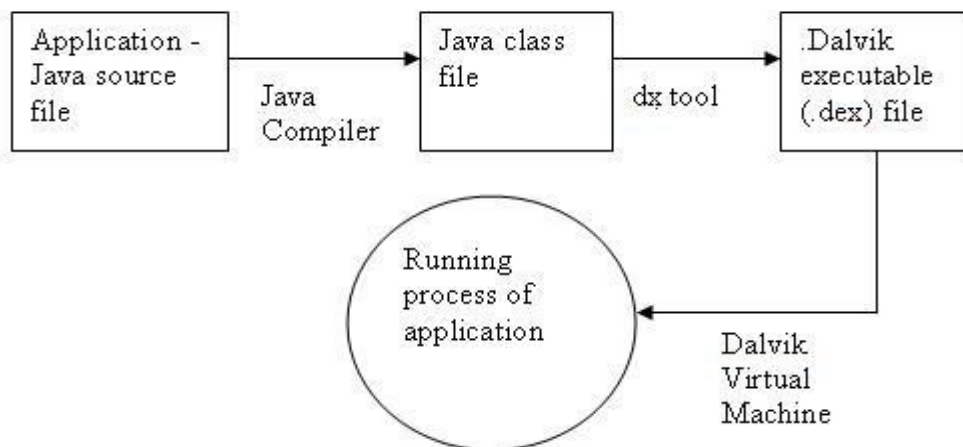
#### **Fast & easy development**

The SDK contains what you need to build and run Android applications, including a true device emulator and advanced debugging tools.

- Open source Web-Kit Engine-based web-browser
- GPS, Navigational compass, Touch-Unlock, and accelerometer applications support (Depends on hardware)
- Androids development environment includes a device emulator, debugger, performance profiling tool, and an Eclipse IDE plug-in

### Advantages of Dalvik Virtual Machine

The Dalvik virtual machine is simple Java interpreter machine, completely optimized for Android platform and which is developed to run on low-end memory mobile devices. One of the prominent aspects in Dalvik its capability to run along an application compilation enhancing the runtime performance of the applications. Dalvik is not exactly, a Java machine, because Dalvik could not read Java code, but consists its own byte code called “dex” and so the executable files compacted using Dalvik holds the file type name '.dex'. Google states that the credit for Androids successful development goes to Dalvik VM, because this type of virtual machine, delivers a good performance over various stages of an application runtime environment, conserving more battery-power during long run of an application.



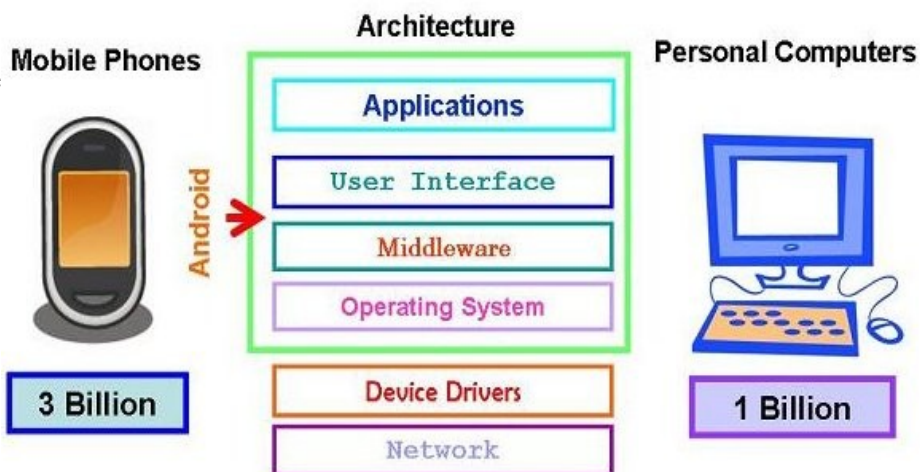
A small drawback with Dalvik, is its none-compatibility with Java SE libraries, Java ME class libraries and Swing Java libraries, while they cannot be and need not to-be run directly on this virtual machine. It uses its own Apache Harmony Java implementation libraries. Despite of the earlier reason, its escalated Android's value proposition due to its minimal-electrical power consumption, vast library resources, and non-fragmentary application programming interface, unlike its Java rivals.

Java related brands and trademarks are owned by Sun Micro Systems Inc., which is soon to be acquired by Oracle Corporation. Another significant fact that assures the open source status of Android, is that Sun Corp, cannot claim on the usage of Java-like programming language, since Android uses a Java Virtual execution environment developed by Google. So, there is are lot more opportunities than predicted.

## Android: A promising haven for app developers and OEMs?

Application development companies, equipment manufacturers, and individual app developers consider, Android platform as the most promising platform due to the cost efficiency in production values. Google has given the opportunity to develop equal native applications, with which a user can replace the Google bundle with his own non-Google bundle applications. Undoubtedly, Android platform is the true open source platform, but it too has got some limitations. Google tries to hold the platform development by the third party developers. by restricting them to develop android applications using, none other than Dalvik Virtual Machine, while ironically, the major part of the Android is written in C and C++.

When Android was introduced, the openness of the platform was hyped as the main strength. Google officials, stated that the Android developers are allowed to furnish whatever they saw fit to run. This made the entire mobile industry and software development companies to dream about the fruit of the eternal development cycle and the revenue generated through it.



Now, number of Androids have began to appear. But the first Android phone G1, released by US-based T-Mobile, which was a completely packed Google phone. While recently, HTC, who is the manufacturer of the G1 handset, is offering the its own Android-based HTC Magic, ripping off the Google-based bundles and includes other features which is not seen in the other basic Android handsets. This clearly reveals that manufacturers, software developers and phone carriers want to stand different from the global competition on Android platform and customization business. So its obvious, that Android is going to grow like Linux does, offering developers, a chance to develop applications for different versions of Android by different OEMs.

Positively, Android will began sporting multiple interfaces, which will be modified by different software vendors. Some years back, the same scenario was witnessed in the Windows Mobile world, and that was to scale the awareness, a consumer has of the Windows Mobile. By 2012, Android will be completely customized (in fact, that's already happening), and it will be definitely lucrative for app developers, while the competition will heat up, on which handset or whose carrier's phone, its going to be.



## Market Predictions:

Very few but strong predictions about Android are spreading, worldwide.

Firstly, Android is going to be bigger in terms of consumer reach than its rival, the iPhone OS. Its just because of a true fact that it will be developed and marketed by all the 50 members of OHA, which includes companies like Google, Samsung, HTC, Sony Ericsson, T-Mobile, Motorola, Vodafone, Sprint, China mobile and other world leaders in telecommunication industry.

Secondly, Google's support will make everything possible in this Internet era, but up to now, they hadn't started making money from their Android-based activities.

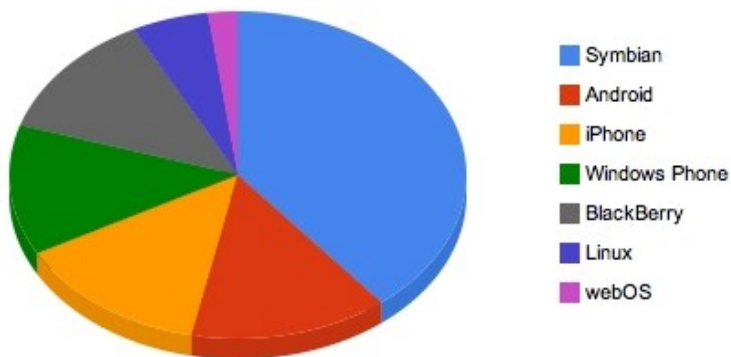
On the other hand, by 2012, apart from Symbian and Android, iPhone will target its businesses development towards its rival, the Blackberry in their segment. But predictions say that, Android is completely made for mass market, and its lack of business features (Unlike, Winslow Mobile and Blackberry, while both them has business exchange compatibility and PC-Synchronization features) will create new chances for its rivals.

According to Gartner, Android's smartphone market share will grow to 14 percent from less than 2 percent by 2012, and the Symbian's slide will continue, giving way to Android. That kind of historical performance by Android would mirror the Apple iPhone's rule. The first-generation iPhone was launched in 2007, in the U.S. and immediately, it took the world by storm. On its release, the iPhones grabbed a good 11% of the smartphone market share in the first quarter of 2009 and continued to expand day by day. But the predictions about Android's gathering momentum, will overtake Apple in just 2 years.

Almost all handset vendors are trying to board the Android's bandwagon, while the Google has effectively grown a massive android developer's community, and also, Android is backed by the America's largest mobile network carrier, the T-Mobile.

However, the Apple's iPhone remains the overwhelming choice for global users, skyrocketing the sales,

2012 Smartphone Market Share



Platform Market Share — 2012					
2012 Preliminary Forecast – 522 Million Units					
Platform	Unit Sales( M)	4Q/12 Share	1Q/09 Share	Difference	As of October 2009
Symbian	203.58	39.0%	49.3%	-10.3%	
Android	75.69	14.5%	1.6%	+12.9%	
iPhone OS	71.51	13.7%	10.8%	+2.9%	
Windows Mobile	66.82	12.8%	10.3%	+2.5%	
RIM OS	65.25	12.5%	19.9%	-7.4%	
Linux	28.19	5.4%	7.0%	-1.6%	
webOS	10.96	2.1%	0%	+2.1%	

**Gartner**

and are offered by numerous operators around the world. While Apple has successfully grabbing the market inch by inch, by offering a user-friendly, 3G and High speed Internet-capable handset, Android is still fighting in that part, not only benefiting the Apples, but also benefits the RIM's Blackberry, Windows, Palm OS and others. Presently, Android may appear to be an invincible giant, but it will take its own time grab the market in these early times of the super phone-era.

Recently, Google has fore-casted that nearly 20 Android phones, would be released by the members of OHA, before the end of this 2009. It is an amazing progress for a very young open source platform, which is like an 18 month baby fighting with giants. Googles says that the credits goes to the openness of the environment and it feels that the Android is not just an Mobile operating system, but it is a completely Open software development environment for mobile phones. Android's entry seems very successful, which is driven by the worldwide acceptance, and the thirst for an open source mobile environment backed by countless application development companies and telecommunication leaders. In fact, that every other Mobile OS vendors had identified Android as an acute and critical threat to their future.

### **Final Comments:**

- Giants like Nokia and Microsoft are not the part of the OHA, so Android won't become so powerful for now. It depends on the stability and continuous support for the platform.
- Microsoft's 'windows mobile' has a big selling point in the form of , its integrity with Microsoft Office and other Microsoft-owned tools, So, Android has to concentrate on developing PC compatibility apps using the Google Office Apps.
- We are not talking about the very success of Android, since it has its own challenges, like its development task. Though, Android is a complete mobile handset platform, encompassing a mobile operating system, a browser , some middle ware, and other application environment, that all depends upon the future investments, and innovations upon the development of an all-encompassing new technology.

Apart from Google, Apps developers and vendors are predicted to be the major beneficiaries, since they would make most out of the Android with its wider market structure backed by all the members of OHA, developing different versions of Android, and driving the Android's apps market to a new edge, defeating all the others.



DCI Logo ( here )

### **About Dot Com Infoway:**

Dot Com Infoway (DCI) is a full service custom software and mobile application development company with a specialization in Internet marketing and Mobile apps marketing segments. We are an ISO 9001:2000 certified company and our global clientèle, experiences the combined effects of our dedication, development and Innovation, that keeps them ahead in their industry.

Our Domains:

- Custom software and application development
- Mobile application development and Marketing services
- Internet Marketing services
- Web portals design and development
- and all other IT enabled services.

### Picture Sources:

- 2012 market prediction picture source : Gartner Inc.,
- Android vs PC picture source : Lisa De Lacey
- Android Desktop pictures and Google Search page pictures: www.cnet.com
- Dalvik architecture: www.cnet.com

### Interesting Android links:

- From Gizmodo's  
<http://gizmodo.com/5395801/android-20-review-almost-human>
- Learn Android  
<http://developer.android.com/guide/basics/what-is-android.html>
- Introduction to Android by Jason Chen who is developer advocate at Google  
[http://www.youtube.com/watch?v=x1ZZ-R3p\\_w8](http://www.youtube.com/watch?v=x1ZZ-R3p_w8)
- What Apple did for smartphones, Google may do for all the rest  
[http://www.economist.com/displaystory.cfm?story\\_id=12304882&fsrc=nwl](http://www.economist.com/displaystory.cfm?story_id=12304882&fsrc=nwl)

### Glossary:

- OHA - Open Handset Alliance
- GSM - Global System for Mobile
- EDGE - Enhanced Data Rates for GSM Evolution
- 3G - 3rd Generation mobile phones
- HSCSD - High Sped Circuit Switched Data
- HTC - High Tech Corporation
- OEM - Original Equipment Manufacturer
- OS - Operating System
- RIM - Research In Motion
- MPEG- Moving Picture Experts Group
- AAC - Advanced Audio Coding
- AMR - Adaptive Multi-Rate (Patented audio data compression)
- JPEG - Joint Photographic Experts Group
- PNG - Portable Network Graphics
- GIF- Graphics Interchange Format
- VM - Virtual Machine
- AT&T- American Telegraph & Telephones corporation