

Concept Smartphone Device

Sourabh Bhardwaj¹, Pushpinder Singh²

^{1,2}Department of Electronics & Communication Engineering, Baba Farid Group of Institutions, Bathinda, INDIA

Abstract: Smartphones today are the new desktops. The time spent on smartphone is considerably large as compared to all other electronic devices we use. Android is the leading OS used on smartphones. Every year Google, Apple, Microsoft is releasing new updates to their mobile operating systems along with new Smartphones. This had led to fragmentation of various versions of the same OS in the market. This paper focuses on removing this software fragmentation and enables the end user to use different version of Mobile operating systems on a single Hardware device. The end user need not change the Hardware to get the latest update of the OS instead he/she can keep his/her old device and still use the latest update of the OS pushed by the vendor. The bottom line is “One Device running multiple operation systems”.

Keywords: Android, Fragmentation, Google, Mobile, Smartphone.

I. INTRODUCTION

A mobile operating system becomes fragmented when there are several different OS versions in use at the same time. Fragmentation is usually associated with Android because wireless carriers and device manufacturers, not OS developers, are the ones who control when OS updates are sent out to different devices. Apple/Microsoft is in control of when iOS/Windows phone OS updates are sent to devices, so there isn't much fragmentation of these OS's.[1]

Additionally, fragmentation is the result of different device manufacturers adapting a mobile OS for their own devices, as is the case with Android. For example, the version of Android that runs on some LG/Micromax/Samsung/MI devices has been modified to work closely with LG/Micromax/Samsung/MI. Each Smartphone manufacturer runs a customized version of same Android release with some cosmetic changes in the stock Android UI and some additional apps from the manufacturer. The manufacturers rarely port the new version of the OS to the older devices and if it does it takes them 6 months to 1 year to port the update to their devices from the date of release of the OS by developer (Google Inc. in case of Android)

There is a need for an ideal smartphone/Tablet that can run different versions of the same OS or run different OS's giving the end user a freedom from changing his device every year to experience the new OS.

II. FRAGMENTATION

The Android operating system is the most fragmented it has ever been. The Figure-1 below compares iOS and Android Fragmentation in the year 2014 which clearly shows that Android is the clear winner when it comes to custom ROMs. Figure-2 illustrates “Android OS Fragmentation in 2014”, Figure-3 illustrates “Brand Fragmentation of Android Devices”. These statistics makes Android the perfect choice for an “Ideal OS” for an “Ideal Smartphone”. [2] Fragmentation is both a strength and weakness of the Android ecosystem, a headache for developers that also provides the basis for Android's global reach. Android devices come in all shapes and sizes, with vastly different performance levels and screen sizes. Despite the problems, fragmentation also has a great number of benefits – for both developers and users. The availability of cheap Android phones (rarely running the most recent version) means that they have a much greater global reach than iOS, so app developers have a wider audience to build for. Android is now the dominant mobile operating system and this is because of fragmentation, not in spite of it.

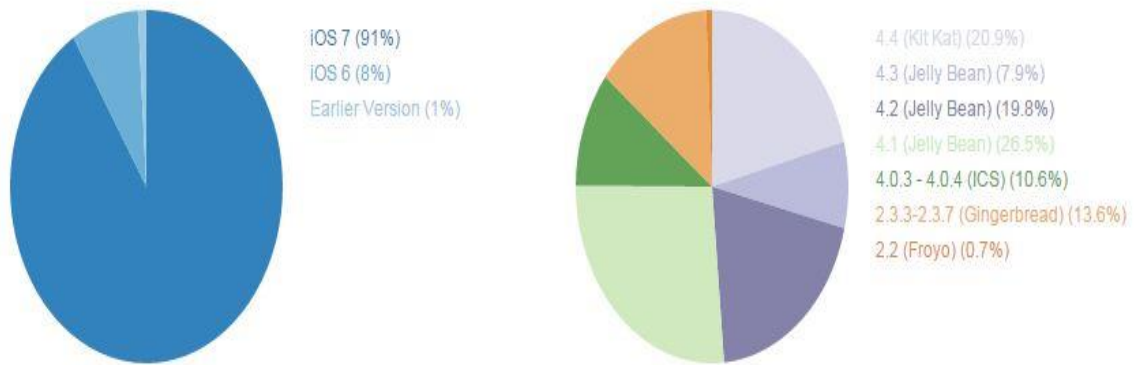


Figure-1 Apple's iOS Fragmentation as compared to Google's Android OS

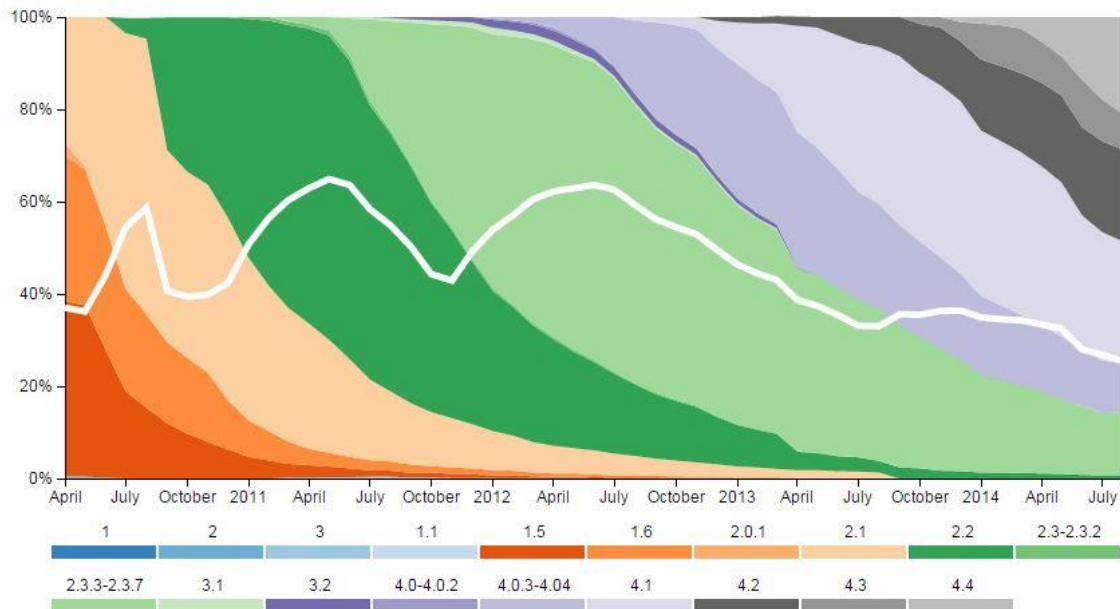
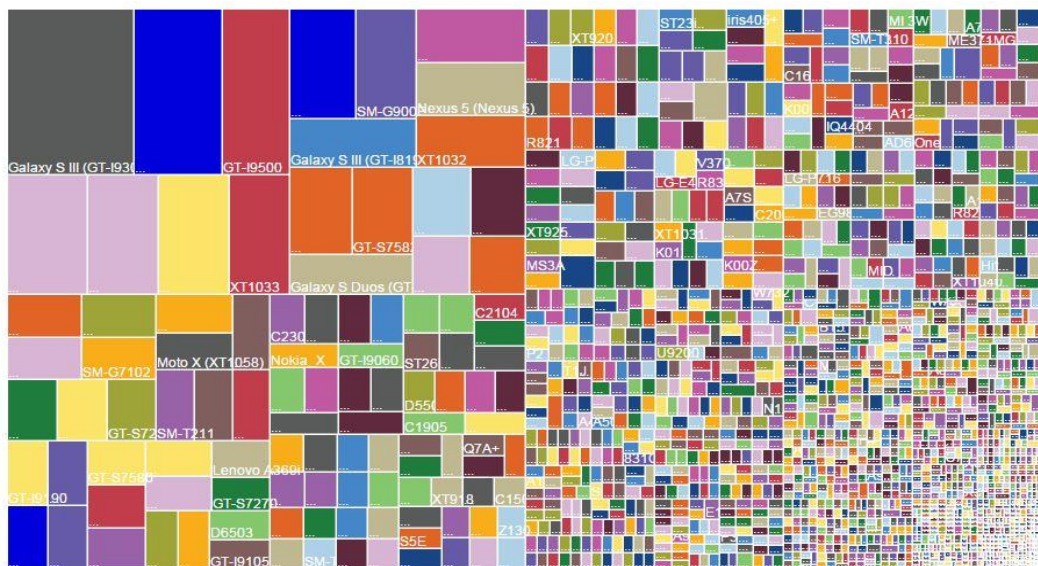


Figure-2 Android Operating System Fragmentation



[3]Figure-3: Android Device Fragmentation

III. THE SOLUTION

The Ideal device is nothing but a decent hardware device that doesn't need upgradation on the hardware front once bought by the end user but can be updated on the software front for the next few years. I chose Nexus 7 from Google Inc. as the test device as it is available in all the countries and has much wider support as compared to other OEM's. The Device originally came with Android 4.1/"Jelly Bean" on July 13, 2012. Today Google has pushed Android 5.0/"Lollipop" in 2015. As an end user I like the UI of Kitkat but at the same time I want to use the new release Lollipop, but Google doesn't permit me to use two OS on the same device. There are also different community versions of Android having features that are not available in stock android from Google like "cyanogen" which runs exclusively on Micromax Yureka/Yuphoria or OPO Devices. The Nexus 7 after Rooting gives similar access to administrative permissions as on Linux or any other Unix-like operating system such as FreeBSD or OS X. A Custom Boot loader was installed on the 16 GB Flash memory and I build the various versions of the Android Custom ROMs cm-11-20140916-M1, miui_4.8.22_grouper, saucy-armel+g, ubuntu-13.04 for the target device Nexus 7.

TEST DEVICE	ORIGINAL DEVICE	VERSION	BASE OS
Nexus 7 2013	OPO, YUREKA, YUPHORIA	cm-11-20140916-M1	Android
Nexus 7 2013	REDMI 1S	miui_4.8.22_grouper	Android
Nexus 7 2013	Ubuntu Touch	saucy-armel+g	Android
Nexus 7 2013	Laptop/Desktop	ubuntu-13.04	Android

REFERENCES

- [1] Android fragmentation: More OS versions, more problems, Margaret Jones, searchconsumerization.techtarget.com.
- [2] Jason Tyler, Will Verduzco XDA Developers' Android Hacker's Toolkit: The Complete Guide to Rooting, ROMs and Theming android Fragmentation Visualized.
- [3] Android Fragmentation Visualized by Open Signal, August 2014.