Comparative Analysis of Smartphone Operating system Android Apple iOS and Windows

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ABSTRACT

A smart phone is a mobile phone with highly advanced features. A smart phone has a High resolution touch screen display, Wi-Fi connectivity, web browsing capabilities and the ability to accept the sophisticated applications. The majority of these devices run on any of these popular mobile operating systems such as Android, iOS, Blackberry operating system and Windows operating system. Today the smart phone world is categorized into three aspects depends upon the mobile operating system which is used in a particular smart phone. These three major mobile operating systems are Android from Samsung, iOS from Apple and Windows from Microsoft. Technology and features may vary from one type of mobile operating system to another type of mobile operating system. This paper produces a comparative study on smart phone operating systems android, iOS, Windows. Big differences are highlighted when iOS is developed but Android are not developed. The present time we can see that iOS providing so much security for the user but we can see that Android (Google) given as security features "security patch system" which is coming at inbuilt in new mobile at present time. "SERCURTIY PATCH" system is a new tech for the Android user by this we can secure over mobile in case told over mobile than no one kind access. It is works as the iOS security.

I. INTRODUCTION

The term smart phone was first described by the company Ericsson in 1997. The term was given to the handsets which has difference from other feature handsets. The most significant difference was that the advanced "Application Programming Interfaces (APIs)". The first phone to feature cellular + Personal Digital Assistance (PDA) was developed by IBM in 1992 naming 'simon personal communicator' which could be referred as 'smart phone'. Later in 1996, Nokia released 'Nokia 9000' which has also PDA device with a QWERTY keypad with it. Later then mobile phone operating systems were introduced. Depends upon the operating systems the mobile phones (now a day's Smart phones) are classified. More than 80% of the world mobile market consists of smart phones as they're more reliable and easier to use. Today in world about 43% there are Android users, 40% there are iOS users and are other users. They have easier User Interface (UI) which makes every task easier. The user interface is everything designed into an information device with which a human being may interact.

II. TECHNOLOGY

The technology and features of the smart phones are varies to one operating system to another. Depends upon the operating system used in the smart phones the smart phones are classified. This classification mainly focuses on three major operating systems such as Android, iOS and Windows OS.

A part from these three major smart phone operating systems the Symbian operating system and blackberry operating systems are used worldwide.Totally there are five steps involved in smart phones application development.

1. Strategy
2. Design
3. Development
4. Marketing
5. Maintenance

At present various smart phone applications available. There are n number of smart phone applications are available today. Some of the basic applications are in-build with the operating systems. Mobile app (smart phone app) is nothing but a computer program run on mobile devices such as smart phones and tablet PCs. Most such devices are sold with several apps included as pre-installed software such as Web browser, e-mail client, and calendar, mapping program and an app for buying music or other media or more apps.

III. PLATFORM PRESENTATION

Our research focuses on four of the main mobile platforms: Android, Windows Phone, iOS and Firefox OS. The next sections will give a short introduction to each of these.

1. Android Google:-released Android in November 2007, under the framework of the Open Handset Alliance, with the goal of being an open source arena for software development on mobile platform. Android is an open source mobile operating system based on the Linux kernel and facilitates developers to write managed code in Java using Google developed Java libraries. The Android platform does not only provide the mobile operating system itself including the development environment, but also provides a custom built virtual machine (Dalvik Virtual Machine) for the applications to run on as well as acting as the middleware between code and operating system. For application development, Android facilitates the use of 2D and 3D graphic libraries, a customized, onboard SQL engine for persistent storage and advanced network capabilities such as3G, 4G and WLAN. The API is constantly evolving and the current release (7.1NOUGHT) is a huge increment compared with number of available features from release 1.0. Since Android is an open source mobile operating system, the community is welcomed to collaborate in the evolvement of the programming environment, the operating system and the API. Development tools for Android include the Eclipse and Intel IDEA.
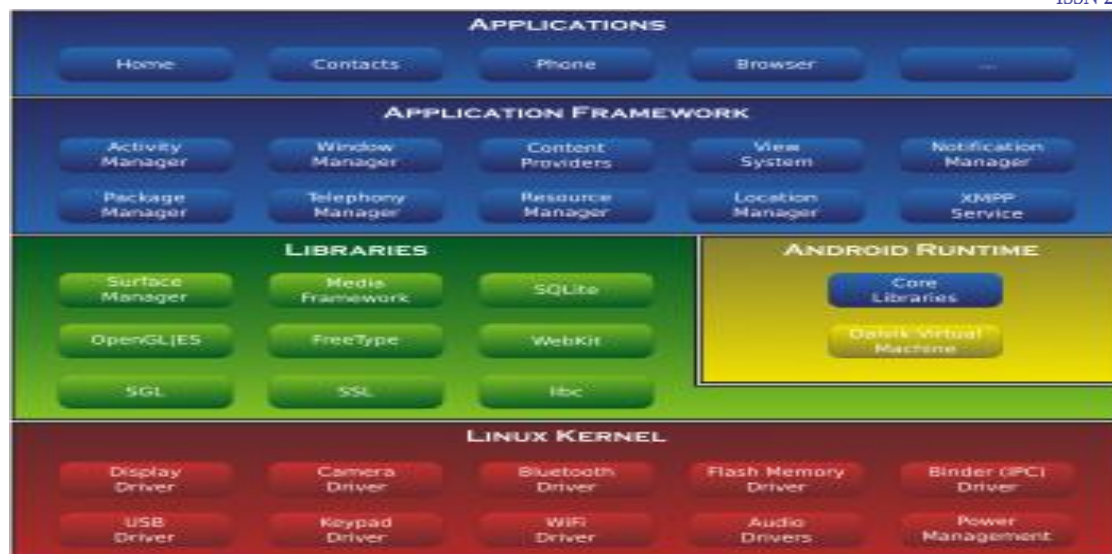
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Fig. 1 Android Architecture

2. Windows Phone:- Previously, the mobile operating system created by Microsoft was called Windows Mobile. After the changes introduced by Apple (iOS) and Google (Android) in 2007, Microsoft decided to take a new direction and created Windows Phone. Similar to other alternatives, such as iOS and Android, Windows Phone is an operating system for smartphones. It is usually used on touch screen devices, and offers functionality such as networking, sensors and camera integration. Programs for Windows Phone 7 are written in .NET managed code. Managed code is code written in languages that are available for use with the Microsoft .NET Framework, for example C#. One of the benefits is that many of the error-prone and often complex tasks, such as type safety checking, memory management and destruction of unneeded objects, are taken care of Windows Phone 7 supports two popular programming platforms, namely Silverlight and XNA. Silverlight is an evolution of the Windows Presentation Foundation (WPF). It provides developers with the ability to create sophisticated user interfaces. The second platform, XNA, is Microsoft's game platform. It supports both 2D and 3D graphics .Development for Windows Phone is done in Visual Studio. There is a range of various editions of Visual Studio, ranging from the free Visual Studio Express to the Ultimate edition. Although the Express edition if enough to get started, the limitations quickly get in the way of productivity. For example, no support for plugins is one of the main limitations. There are two languages that can be used to write programs for Windows Phone, 1) Visual Basic .NET and 2) C#. We will focus on the C# language in this paper. We chose to use this language because we were more familiar with it and also we found more resources, in books and on the Internet, for Windows Phone development with C#. Programs created for Windows Phone are packaged into XAP files, which is the Silverlight application package .According to Gartner, Microsoft currently occupies the 3rd place in regards to market share (second quarter of 2013). For the first time Microsoft has a larger market share compared to Blackberry. Even with the recent increase in popularity, the Windows Phone platform is still a relatively small player with a 3.3% market share. The step up of the iOS (14.2%) and Android (79.0%) is considerable. However, it will be interesting to see how the acquiring of Nokia will affect the further development of Windows Phone and the mobile devices.
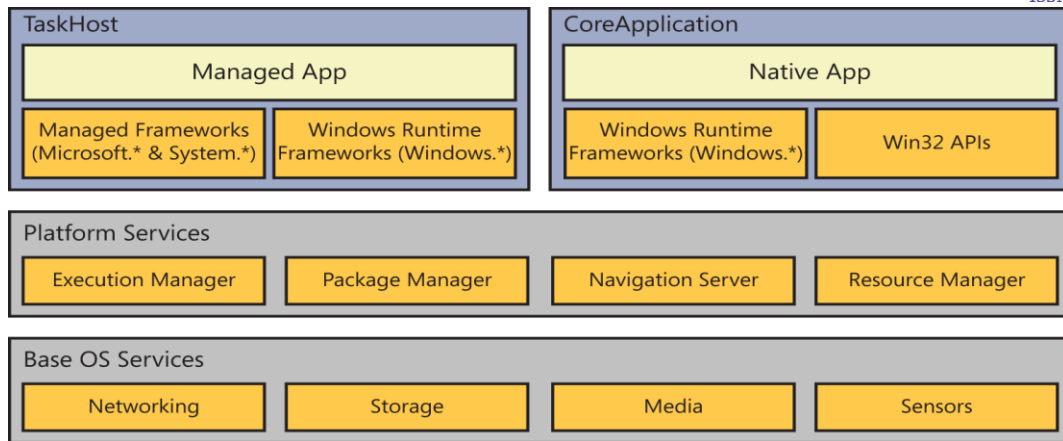
Fig. 2 Windows Phone Architecture

3.   Apple iOS: iOS is one of the best operating system from Apple. This strong but expensive operating system is developed by Apple whose native language is C. Recently released its one of the major update in iOS history that is iOS 7. iOS 7 allows us to function between various apps, a similar UI (User Interface)than previous versions. Paying electricity bills, bank accounts maintenance are a tap away. It has improved Siri, Airdrop (programming concepts) to transfer files. Control center which allows us to toggle different functions just at a tap. Up to that level it is easier than other tasks. Apple i phone 5S also contains world's first and fastest A7 chip with 64 bit architecture and M7 motion co-processor chip. Apple i phone 5S also includes a finger print sensor which is the first ever technology launched by Apple. Some of the best iOS smart phones are: i Phone 5(discontinued now), i Phone 5C, i Phone 5S, i Pad 4, i Pad Mini, Sony Xperia Z3+ etc.   Apple is now preparing to launch the update of its new software iOS 7. iOS 7 has some bugs need to be fixed, iOS 7.0.2 has been launched yet the software is not fully bus free.   Apple is preparing its next gen device fourth quarter of 2014 work on finger print sensor's efficiency is being done.
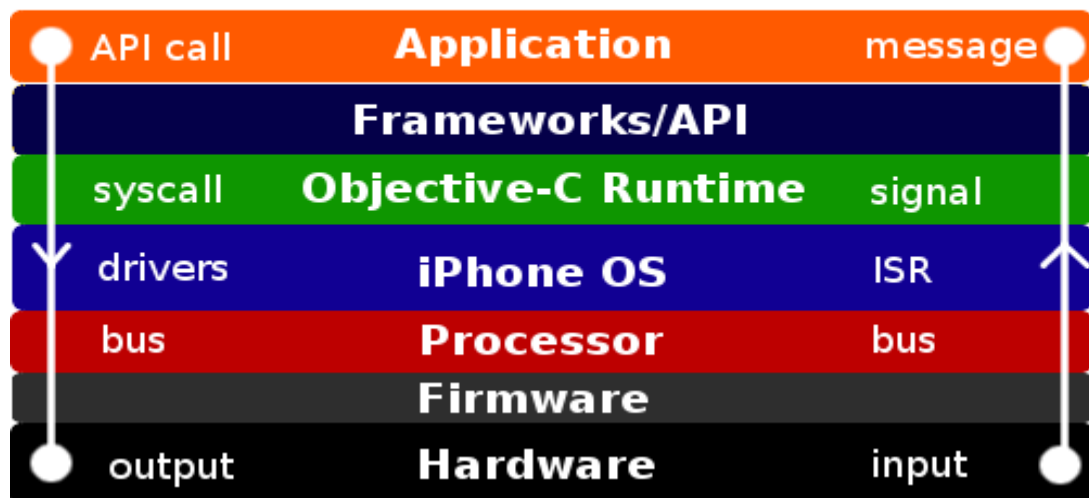

Fig. 3 Architecture of iOS Apple

IV. PLATFORM COMPARISON

In this section we described the actual comparison of the four mobile application development platforms and show how they relate through a common example implemented across all environments. We start off by detailing the implemented scenario, before we present our findings and finally ending this section with a discussion.

1. ANDROID v/s IOS Today mobile market provides us with so many options that it makes difficult for us to choose the best but as the saying goes "that what is wanted more is the best" and the same goes with our favorite Android. This Google's OS came into market in the year 2008 and before completing two years it has shown a remarkable growth in the market. This is all because of some reasons that I will try to elaborate in the following discussion. These are the points that are the most important that creates such a difference in my opinion. It is changing the scenario in the worldwide market as it is being adopted by major players in smartphone market like HTC, Samsung, Motorola, and Samsung and not to forget Google's Nexus One. Android, because of its highlighting features is competing against mobile platforms from Apple, Microsoft, Nokia, Palm, Research in Motion and Symbian. The android is growing faster than the iPhone. Its platform is showing a rapid growth from the last two years and the openness of the platform can account for this rapid growth. The comparison of android and iPhone can be done from different perspective but the final result is supposed to be same foe each viewpoint. Here we discuss some of the main features that make the difference between android and iPhone.
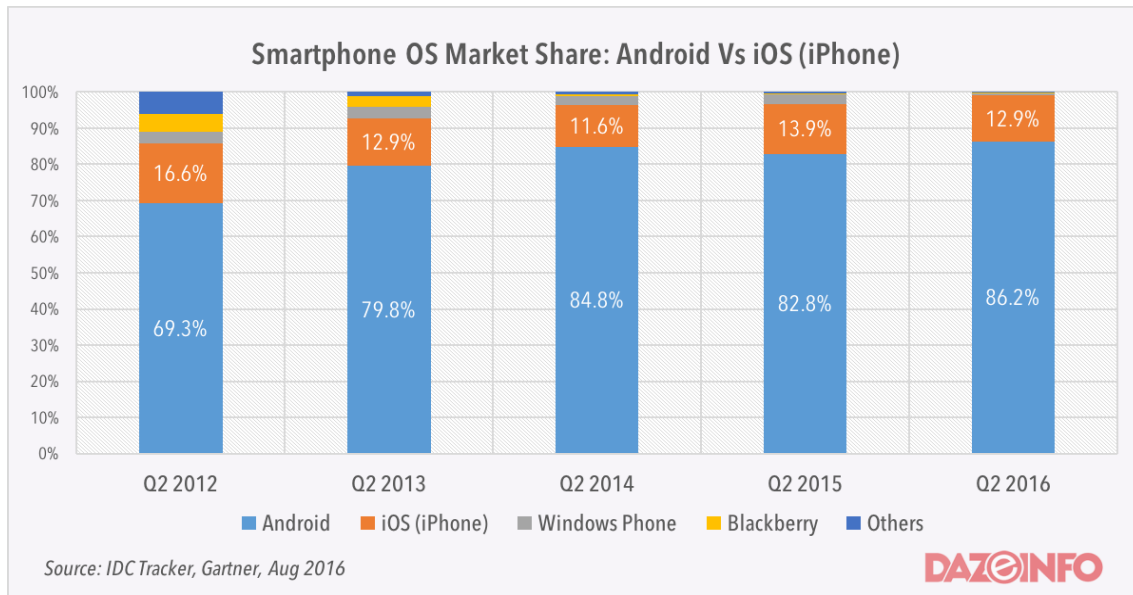

Fig. 4 Android v/s iOS iPhone

The above Bar-Chat shows the marketing share of smart phone operating systems. In overall market share Android posses 86.2% in Dec2016. Apple posses 12.9% in Dec2016. Microsoft, Blackberry and other operating systems posses 0.4% in Dec2016, 0.3% in Dec2016 and 0.1% in Dec2016 respectively.

Comparison of Android, Apple iOS and Windows OS:

	Android	iOS	Windows Mobile
Language	Java (part of code can be in C/C++)	Objective-C	C#, Visual Basic, C or C++
Development Tool	Eclipse or IntelliJ IDEA	Xcode (only on Mac)	Visual Studio 2010+ (only on Windows)
Application	apk	ipa	cab/XAP/APPX
Development cost	Free	Tools are free but need publisher account	Visual Studio cost
Publisher account needed for Development	No	Yes	No
App Publisher	Google Play, Amazon Store, Samsung Store, SlideMe, F-Droid, AppsLib, etc	Apple Store	Windows Store
Publisher account cost	25$ one time payment for Google Play	$99 per year	$19 per year
Verification process	When app goes to trending	Every time app is published or updated	Every time app is published or updated
Time taken for the app to be visible in app store (approx) after publishing	2 hours	2 weeks	2 weeks

Fig. 5 Comparison btw Android, iOS and Windows Mobile

V. CONCLUSION

Smart phones like personal computer provide various functionalities like use of application, usability, web browsing, running GPS, expendable memory, multitasking, multi-processing, playing games, social networking etc. In this paper we have presented a detail review and comparative analysis of smart phone operating systems Android, and iOS. We have made comparison between Android. From this comparative analysis we have found that Android and Windows operating systems are superior to other operating systems. Android gets 80.7% and is the best smart phone operating system in world today. We can also use it as an Educational tool. Due to Android an open source operating system the user can easily install third-party applications from the market and ever from unreliable sources. Due to this it has some limitations which lead to malware attacks like viruses, warms, spywares, adware and Trojan horse.

This paper provides a comparative analysis on smart phone operating systems and through this analysis we can say that at present Android is the Best operating system for the smart phone used globally. Among Smart phone's operating systems, android, iOS, Windows many differences are highlighted when iOS is developed but Android is not developed. But in present time we can see that iOS providing so much security for the user but we can see that Android (Google) given as security features "security patch system" which is coming at inbuilt in new mobile at present time. "SERCURTIY PATCH" system is a new tech for the Android user by this we can secure over mobile in case told over mobile than no one kind access. It is works as the iOS security.

VI. ACKNOWLEDGEMENTS

REFERENCES

[1] Wei, M., Chandran, A., Chang, H.-P., Chang, J.-H. and Nichols, C. (2009) Comprehensive Analysis of Smartphone OS Capabilities and Performance.

[2] Sharma, T.N., Beniwal, M.Kr. and Sharma, A. (2013) Comparative Study of Different Mobile Operating Systems. International Journal of Advancements in Research & Technology, 2, 1-2.

[3] Maker, F., Chan, Y., "A Survey on Android vs. Linux", University of California, 2009

[4] Mr. Sumedh P. Ingale1, Prof. Sunil R. Gupta. Security In Android Based Smartphone. International Journal of Application or Innovation in Engineering & Management.

[5] Thomas Renner SNET Project Technische Universit¨at Berlin. Mobile OS - Features, Concepts and Challenges for Enterprise Environments.

[6] May, H. and G. Hearn, The mobile phone as media.

[7] Damianos Gavalas & Daphne Economou (2011), "Development Platforms for Mobile Applications: Status and Trends", IEEE Software, Vol. 28, No. 1, Pp. 77–86.