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Comparison between Google's android battery and Apple IOS Battery

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Abstract

Mobile phones have become a very important part of people's lives, as there are more than one billion people in the world who have mobile phones and have specialized programs such as operating systems. The most important of these systems is the Android system and the IOS system.

A large number of mobile phone users have a high speed of battery life. In this paper we wrote a Java code to calculate the battery life and the charge time of the device. We used 5 different devices to calculate battery life and charging time to see which devices have the best battery life.

Our main goal of this paper is for the user to choose the correct amps for his cell phone. Whatever the amps are, the battery life is large.

Key words :

Mobile,Battery,IOS,android

I. Introduction

At present mobile technology is one of the most important technologies used in telecommunications, and it is known that mobile device has a great impact on people's lives. The mobile device has wide applications useful to the individual, and provides this technology on the principle of reducing the burden of life on people, and the technology is increasing rapidly over time and helps this technology people to know everything that is going on in the world [1].

This technology helps people carry out people's tasks, for example paying bills. Knowledge can be easily obtained from a mobile phone. It is known that the production of mobile phones is growing rapidly and that there are operating systems for these devices and each mobile device has advantages [2]. One of the most important components in a mobile phone is its own operating system which is invaluable to the user and plays a very important role in the decision making process around the device. [3]

II. Related work

Mobile phones are available to all users through which to access the Internet and the ability to open e-mail and that users of smart phones rely heavily on operating systems so that the focus is on whether the system is very good or bad.

In this paper we compared the Android and IOS, and we found out that IOS is only developed by Apple on the Mac system, while Android can be developed on (Windows) and (OS.Apple), and its applications are often free and finally: all the smart phones Provides a better and more interesting interface for the user who is working on it easier for users.[1]

Mobile devices today are multifunction devices and have the ability to accommodate a large number of applications for all user work that is in need. The smart phone is the mobile phone to build the operating system to have the ability to connect, there are many operating systems for the phone and includes (OS) that use the new smart phones such as (Google android) and (apple IOS), and usually receives several updates for each operating system. These devices provide mechanisms for the development of operating systems, because each operating system faces difficult and strong competition against each other. [2]

In a remarkably short period of time, smart phones have become a curiosity for a large group of people. A group of people quickly begin to find out who is capable of manufacturing these devices; developers are able to turn their ideas into applications. There are many companies that have manufactured these devices, but only two were able to show their popularity android & IOS.[3]

The most important advantages are: battery life or battery life which is the second most important component after the operating system in the android system. The battery life is shorter compared to the IOS battery, and IOS is preferred to most users because of the longevity of their battery.

The most popular phones are Android and IOS. It is known that the Smart Phone has an operating system with the ability to computing more advanced, and the communication. Smart phones are portable media players, GPS, touch screens, WIFI and cameras. It is known that the competition between Android and IOS is very intense, that's why every period, they reveal new products and new versions of each system. The Android system supports several languages around the world, but IOS supports more languages. The IOS has one store, but the Android has more than one store, Android devices have a moderate price and very expensive, while the IOS, its devices are always .expensive and cannot anyone buy it.[4]

The competition between Android and IOS is very strong. For several years now, there are more than 1 billion users of the Android and IOS systems, but the biggest gain is for the android system which is (82.8), while IOS is (13.9).

The phones are convenient in personal use and are the most demanding technology around the world but these devices are at risk of theft or loss, making it easier to violate the personal data of the user.[5]

The smart phones have limited power, memory, resources and a small battery, which is the only thing that keeps the devices' stores running, users cannot afford the slow applications and rapid attrition of the device's battery and the developers took into account these things to improve performance, efficiency and Use the power in the device to improve the energy of the android, they made comparisons between the android devices to improve energy performance and not to drain the battery.[6]

Power on mobile phones is a great resource. Generally, the smart phone is used for wireless technologies 2G, 3G, 4G, WIFI, Bluetooth and other upcoming connections.

It is important to understand that these technologies are one of the most things that consume the battery of the device and it is a reason to make the user concerned about the life of the battery of his mobile device.

The battery load can be reduced by boosting the battery or through the OS of the device, by developing the power to save the applications and includes the battery enhancement by making more efficient applications used.[7]

Mobile devices are powered by batteries that are limited in size and power. This means that power management is good, energy is very important for mobile devices, so the authors have used realistic scenarios to validate the power measurement results from (HTC dream & Google nexus one). The results indicate how different components of the device share full battery consumption. [8]

A Suggestion of a mechanism to improve the battery of the smart device through the Internet connection from another device where the system provides the user to enjoy the highest level of battery, and it will reduce the chances of ending the battery for a short period, the results indicated that the system will reduce the interruption of the battery in a very short time of use of the smart phone. [9]

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Battery life is a key factor for any mobile device that can have either a negative or a positive impact on the device. It has been used model called in of energy, which maintains 1520 of the smart phone battery who In this paper used mechanisms and methods to learn how to discharge the energy that occurs in the phones and developed the basic method of FSM which reflects the accuracy of the distribution of energy between applications and extends the battery life of the handset and improve it. [10]

III. Android

A. History of android

An android is not a Linux operating system, but it is software for devices that contain the operating system and application.

In 2005, Google bought a team was created in Google only to develop mobile devices supported by Linux, in 2007 a group of companies include HTM, Google and Motorola agreed to form an alliance that would from an open phone.

The main was to develop the devices about a new product. One the most important updates of the android system (Cap Cake) which released 30\4\2009 helps to record video and upload it and put it on YouTube and the photo's to (Picasa) and can be connected to the Bluetooth headset by a certain area, and in 9\2009 was latched donut 1.6 SDK and used to improve the system and provides camera and contacts.[2]

B. Android architecture

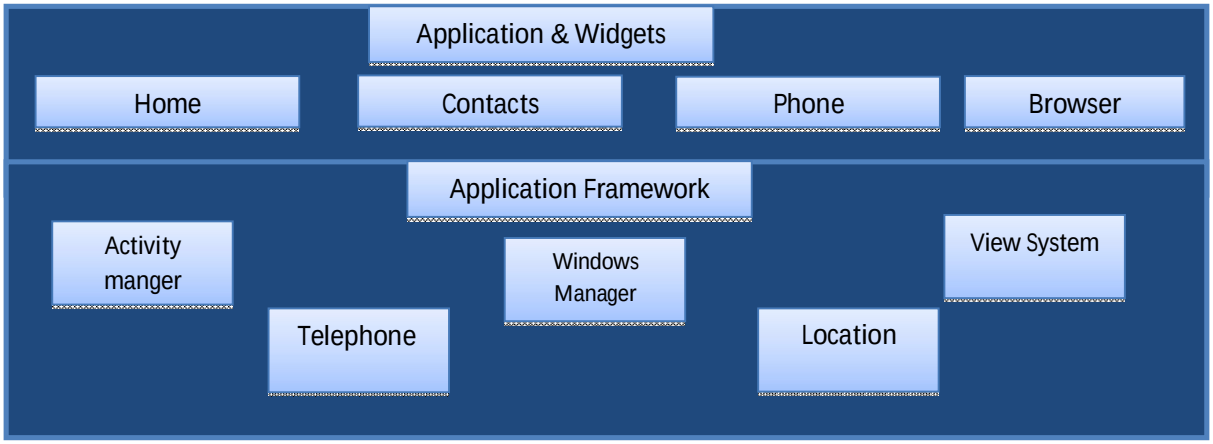
The operating system of the android system is divided into 4 layers

Application and widgets

Application frame work

Libraries

Linux kernel



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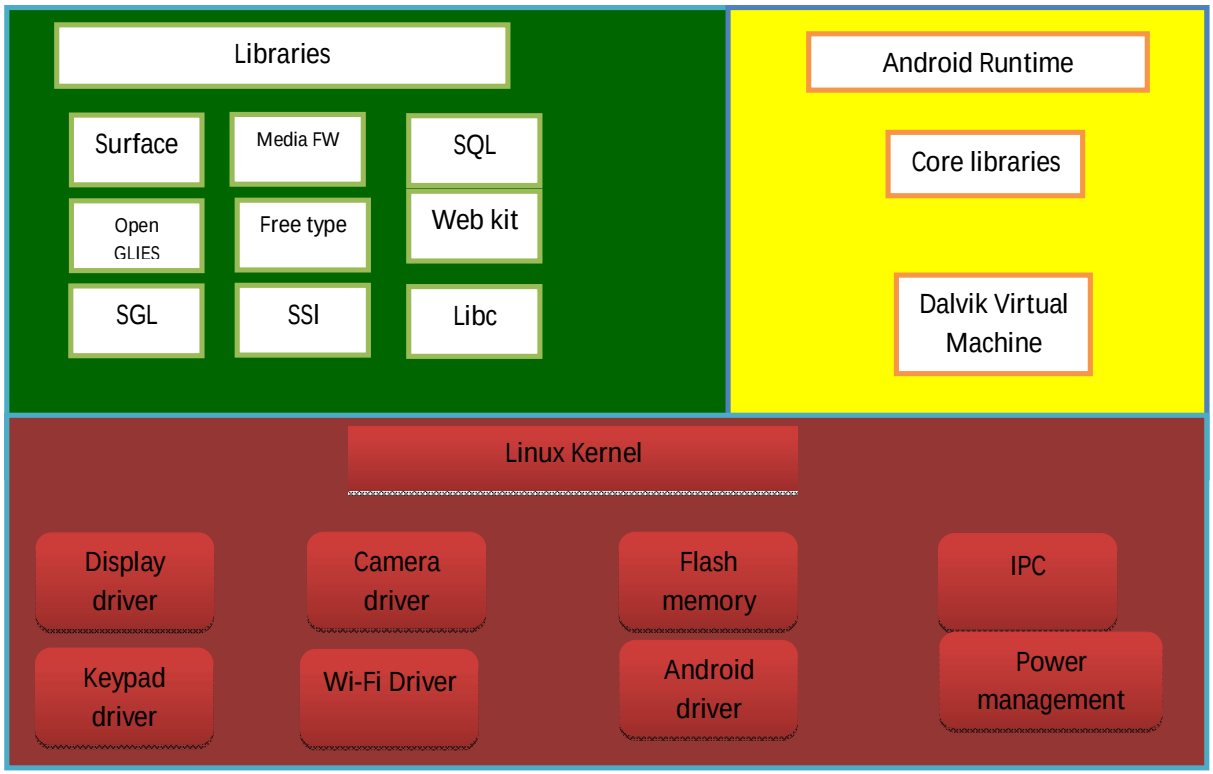

The Linux system supports basic system services such as security and memory. It is known that the kernel is stripped between devices. [4] The OS libraries provide special applications for storage and media, and within the library class there is DVM which is the source of application power. In the Android OS Linus operating system, the kernel provides a three-dimensional, editable graphic that makes web pages smaller in size and also contains Dalvik, the mobile device's virtual machine.

C. Hardwar:

Android is used as any other protected device such as Samsung, Sony, etc.
Android is based on version 2.0 as an operating system.

- **The processor**: There is a process called DRoID which is based on the high performance of the processor Arm and is to meet the requirements of the devices of the typical energy.
- **Memory & secondary storage**: The Motorola has only 250MB of memory that can be stored and cannot be run from the CD-Card, which is the secondary memory for pictures and music. The public storage in DRoID is 16 Giga Bytes and can be up to 32 GB.
- **Camera**: It has 5 mega pixels, 4 digital zoom 1x, and features have image stabilization.
- **Screen**: 3.7 inch screen with 16: 9 widescreen displays with TFT screen type.

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- **Sensor**: Close-up DRoID sensor of images.
- **Battery**: The DRoID-1400 uses up to 270 hours of standby and continuous use.
- **Time**: What can be reached in minutes and up to 358 minutes?

Network: The DRoID has audio and video streaming media and supports multi-video. [2]

D. Battery:

It is one of the most important things for users of Android phones. The battery life begins with disconnecting the phone from the charger and when the charger reaches the lowest level. There are a number of factors that cause the battery to be destroyed, and the phone is used as long as possible. The activity of the screen brightness strength which is considered the most important reason to eliminate the battery.

To maintain the battery life of the Android: reduce the brightness, with the methods can be used to maintain the battery [1], and has been issued a new feature by Google to improve the battery life and called Doze mode by forcing the phone to sleep when not in use, where it works Doze is very good but one problem is that not every user has (nougat) or even (marshmallow), if your phone was upgraded on Kit Kat.

The android battery consists of layers of the positive and negative electrode and the electricity, which is the organic mosses and is a mixture between organic carbonate and ethylene and the battery of the android battery with lithium ion. [2]

A Samsung Li-Ion battery

IV.IOS

A. History of IOS:

IPhone has an operating system tweaked by the company (Apple), Released 2008 with the unveiling of the iPhone 6 g The iPhone system was in the experimental phase before, Apple was using 05.x is a picture operating system. 2007 at the beginning of the iPod touch, specifically the 2007/9/14 version 1.1.1, which provides the speaker, battery level indicator, language and keyboard selection, after which 1.1.3 was released, which provides more features previously released. Mail, maps, weather and health. The storage speed was increased from 75,000 to 1000. [2]

A new feature has been gained on Google Maps, which is the version 1.1.15 and 1.1.4, released 2008/2/28 and 2008/6/15 to fix the bugs and improve the speed of the device.

The iPhone 3G was unveiled when the update 2.0 was released on July 11, 2008 and can be converted to WIFI language enhancement by providing the world's language group. Apple released an update 2.1 on 9/9/2008 that fixes the performance of the devices and provides this update features operating system such as GPRS EDGE changed 3G, which is one of the most important within the constraints.[6]

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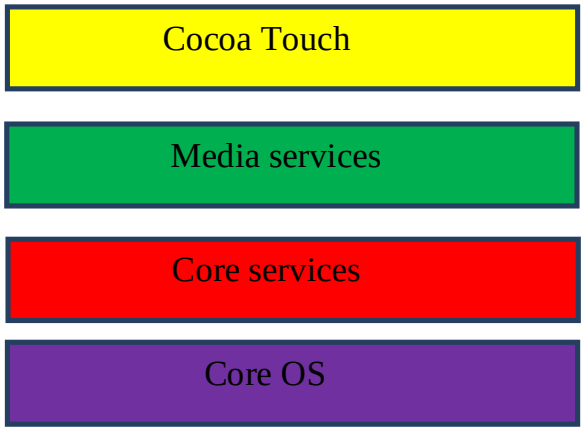
In November 2008, (2.2) was released to improve performance and add maps and mail. Apple has released its new updated (3.0 & 3G) mobile. (3.2) update was released in 2010/10/27 After that, no new update was issued except in 2012 released 6.0 & 6.1 and used for two years to issue a new update which is (8.1) in 2014/8.
(10.0, 10.1) were released in 2016 and the current version is (10.3.1) published a few days ago. [8]

B. IOS Architecture:

The operating system of the IOS system is divided into 4 layers:

- Cocoa Touch
- Media services
- Core services
- Core OS



Cocoa Touch:

The importance of (Cocoa Touch) is the top layer. The iPhone has the most common frames used by iPhone application developers. Cocoa touch is written in (C) software and standard (MAC OS X) and (Cocoa API).

Media Layer:

Is the second layer that provides OS iPhone with audio, video, animation and 3D graphics as with other layers of the operating system and media layer includes a number of iPhone applications? [2]

Core services:

Is the third layer that provides (iPhone core) that contains a lot of foundations on which the applications that mentioned above are built on.

Core OS services:

Is the basic operating system layer and is the lower tier that provides a variety of services including low-level networks, And basic operating system services such as memory management and file system management.

C. Hardwar:

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The operating system is managed by the iPhone operating system which provides the necessary technologies for the implementation of local applications on the mobile phone and the operating system contains many system applications such as e-mail provides services to the user. [7]

D. Battery:

In ios background activity means using the battery while running applications, audio playback also means using the battery, when requesting backups of I Cloud, it also uses the battery. To extend battery life, low power mode must be turned on and this reduces battery consumption and reduces power consumption. You should also reduce the brightness of your iPhone because brightness and WIFI are the two most damaging components to battery life. The battery life in IOS is different from battery life.[5] The battery life determines how long the battery takes to charge, but battery health determines how low battery life will be over time.

The iPhone is made up of a long-lasting hydrogen battery that can generate electricity through a chemical bond between hydrogen and water.

An IOS li-ion battery

- The main problem:

  The problem of battery life is a problem for most users, especially those with an android system, where there are a large number who say that their mobile phones are running very fast as the main problem of battery consumption quickly, especially when the user wakes up, finds that your battery is 40% From here we did a research to solve the problem of users through the calculation of battery life and based on the life of the battery will know how much time will work with his battery.

VI. Proposed Work

In our Paper, we wrote the Java language code, which includes (3) equations to calculate the **battery life**, the **charge time** and the **value of the UM** for a number of Android systems, also for the iPhone system, to choose the best battery between the two systems to use, and the equations are:

1. Battery Life = Battery charge time in hours / Amps Value
2. Charging time = device battery capacity \ amp
3. The value of ohm = volts \ amps

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```
} public class NameProject


} (public static void main(String[] args

double A = 1.5;// Enter Ampere

double Ah = 60;// Ampere hours raiting

(double LH=Ah/A;// Life (hours

;(System.out.println(LH

double V=12;// volte

;double AOME=V/A

// ;double I=V/AOME

;(System.out.println(I

double SB=3600; // size bettary

double TC=SB/A;// time charge // A is Ampere

;(System.out.println(TC

;(System.out.println(AOME

{

{
```

And resulted in the following results of the android system:

Ampere =1			
The mobile name	**Battery life**	**Charging time**	**Volume of the UM**
Galaxy S8	60 d	3 hours'	3.973 V
Arte 6	20 d	3.5 hour	10.5 V
X-cover 4	120 d	2.5 hour	11.97 V
C7- pro	180 d	3.2 hour	6.34 V
J2-prime	90 d	2,6 hour	5.91 V

Ampere =1.5			
The mobile name	**Battery life**	**Charging time**	**Volume of the UM**
Galaxy S8	40 d	2 hours'	2.6 V
Arte 6	13 d	2.3 hour	7 V
X-cover 4	80 d	1.8 hour	7.98 V
C7- pro	120 d	2.2 hour	4.2 V
J2-prime	60 d	1,7 hour	3.94 V

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Ampere =2			
The mobile name	**Battery life**	**Charging time**	**Volume of the UM**
Galaxy S8	30 d	1.5 hours'	1.9 V
Arte 6	10 d	1.7 hour	5.25 V
X-cover 4	60 d	1.4 hour	5.9 V
C7- pro	90 d	1.65 hour	3.17 V
J2-prime	45d	1.3 hour	2.9 V

And resulted in the following results of the IOS system:

Ampere =1			
The mobile name	**Battery life**	**Charging time**	**Volume of the UM**
IPhone 7	240 d	2.9 hours'	6.6 V
IPhone-Se	60 d	1.6 hour	5.79 V
IPhone 6s plus	110 d	2.7 hour	11.82 V
IPhone 5s	90 d	1.5 hour	13.2 V
IPhone 5c	40 d	1.5 hour	12 V

Ampere =1.5			
The mobile name	**Battery life**	**Charging time**	**Volume of the UM**
IPhone 7	160 d	1.9 hours'	4.4 V
IPhone-Se	40 d	1 hour	3.86 V
IPhone 6s plus	73 d	1.8 hour	7.88V
IPhone 5s	60 d	1 hour	8.8 V
IPhone 5c	26 d	1 hour	8 V

Ampere =2			
The mobile name	**Battery life**	**Charging time**	**Volume of the UM**
IPhone 7	120 d	1.45 hours'	3.3 V
IPhone-Se	30 d	0.821 hour	2.8 V
IPhone 6s plus	55 d	1.3 hour	5.91 V
IPhone 5s	45 d	0.780 hour	6.6 V
IPhone 5c	20 d	0.755 hour	6 V

VII. Conclusion

The mobile phone has become an integral part of the life of the individual and there are more than one billion users of these devices and each device has its own operating system and one of the most important operating systems android and IOS can download services such as WI-FI and games on these devices, which are heavy load On the phone battery.

We worked in this paper to compare the battery pack of the android system and IOS according to equations programmed in java language.

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And through the results that have appeared to us on the user took .

…….into account the value of amp for the device that is the basis on which the battery life

VIII. References

[1] Jin Han∗, Qiang Yan, Debin Gao, Jianying Zhou, Robert Deng," Android or iOS for better privacy protection",2016

[2] Divya Singla, Luv Mendiratta," ANDROID VS IOS",2014

[3] Mark H. Goadrich **,"**Smart Smartphone Development: iOS versus Android**",2012**

[4] Bilal Ahmed Yaseen "Technical Comparison Between Android And IOS With Respect to Their Architecture",2017

[5] Yao Liu1, Fei Li1, Lei Guo2, Bo Shen3, and Songqing Chen1

"A Comparative Study of Android and iOS for Accessing Internet Streaming Services",2015

[6] Grace Metri†*, Abhishek Agrawal* , Ramesh Peri* , and Weisong Shi," What is Eating Up Battery Life On My SmartPhone: A Case Study",2017

[7] Kandarp Singh," Mobile Phone Operating Systems: A Comparison",2015

[8] Yogita chittoria1, Neha Aggarwal2," International Journal of Advanced Research in Computer Science and Software Engineering",2015

[9] Mrs. Krantee Jamdaade1, Mr. Akshay Khairmode2, Mr. Sudhakar Kamble3," A Comparative study between Android & iOS",2016

[10] Akhilesh Kumar1, Saroj Kumar2," ENERGY SAVING MODEL AND APPLICATION FOR SMART PHONES",2016