A PROJECT ON

A STUDY ON ANDROID AND IOS MOBILE PHONE

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1051-20-467-101

Project submitted in partial fulfillment for the award of the degree of

BACHELOR OF SCIENCE

By

Osmania University, Hyderabad-500007

CERTIFICATE

This is to certify that Project work entitled

A STUDY ON ANDROID AND IOS MOBILE PHONE

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During Third Year B.SC (2022-2023)

As a Part of their Curriculum in the Department of

Physical Science

AURORA'S DEGREE & PG COLLEGE

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This work has been carried out under my Guidance

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(MENTOR)

EXTERNAL EXAMINER

ANNEXURE-1

DECLARATION

I hereby declare that the project entitled **A STUDY ON ANDROID AND IOS MOBILE PHONE** an original work done by us and has been submitted to the Department of Statistics, Osmania University, Hyderabad in partial fulfillment of the award of the Degree of Bachelor of Science. This report has not been submitted anywhere else for the award of any other degree or diploma or certificate.

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ANNEXURE-2

CERTIFICATION

This is to certify that project report titled **A STUDY ON ANDROID AND IOS MOBILE PHONE** submitted in partial fulfillment for the award of Degree of Bachelor of Science, Osmania University, Hyderabad was carried out by T. ARUN bearing roll.no: 1051-20-467-097, P. SRUJAN bearing roll.no: 1051-20-467-099, K. SAKETHRAM bearing roll.no: 1051-20-467-101, P. SAIKIRAN bearing roll.no: 1051-20-467-098, CH. NIKHIL bearing roll.no:1051-20-467-102 under my guidance. This has not been submitted to any other University or institution for the award of any degree or diploma or certificate.

NAME OF THE MENTOR **SIGNATURE OF THE MENTOR**

MRS. Y. ARUNAREKHA

ACKNOWLEDGEMENT

I Would like to express my Gratitude to all those who have helped me to accomplish this project.

Firstly, I Extend My Gratitude to DR VISWANADHAM BULUSU Principal, Aurora's Degree & PG College, for his Encouragement

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My Special thanks to MS J VINITA, HEAD OF THE DEPARTMENT Management and Faculty Members for their Valuable Suggestions and Cooperation In doing the Project.

I would especially thank my Parents and Friends for extending their warm support In completing my Project successfully.

INDEX

S.NO	TOPIC	PAGE NO
1	ABSTRACT	7
2	SOURCES OF DATA	8
3	OBJECTIVE	9
4	INTRODUCTION	10-11
5	LITERATURE OF THE PROJECT	12-29
6	TABLES	30-33
7	DIAGRAMMATIC REPRESENTATION	34-38
8	METHODLOGY	39-40
9	DATA ANALYSIS	41-43
10	CONCLUSION	44

ABSTRACT

Title: A Study on Android and iOS mobile phone

The increasing importance of Smartphone has triggered intense competition among technology like Symbian, Google, Microsoft and Apple. The project title is all about a brief review and comparison of the Android operating system from Google and iPhone operating system from Apple. The comparison is done on the basis of their platform, their performances and the growth in mobile land.

Google's Android and Apple's iOS are operating systems used primarily in mobile technology. such as smartphones and tablets, Android, which is Linux-based and partly open source, is more PC-like than iOS, in that its interface and basic features are generally more customizable from top to bottom. However, iOS uniform design elements are sometimes seen as being more user-friendly. Android is now the world's most commonly used different phone manufactures. iOS is only used on Apple devices, such as the iPhone.

The main criteria of the project is to represent the number of users of Android and iOS, the profit of android and iOS and also comparison between the Android vs iOS. We have also applied few statistical techniques and Statistical tools for the data we have collected. Since the data follows normal distribution, we have applied Non-Parametric like wilcoxon rank sum test and chi-square test.

Finally, both Android and the Apple iOS have their own best Pluses and Minuses. Both are equally strong contenders and are bound to rule the app marketplace with their smart strength and perspectives.

SOURCES OF DATA

https://theappsolutions.com/blog/development/ios-vs-android/https://www.arkasoftwares.com/blog/android-vs-ios/https://onesignal.com/blog/the-benefits-and-challenges-of-ios-vsandroid-app-development/

https://www.geeksforgeeks.org/difference-between-ios-and-android/https://www.statista.com/topics/4600/smartphone-market-inindia/#topicHeader__wrapper

I had conducted a survey on Android and IOS Mobile phones:

https://docs.google.com/forms/d/1J-hiJbu1jjb2OVdDzVySRLmxAwBMU1VC9F4GGmVfvOA/edit?chromeless=1#responses

OBJECTIVES AND OUTCOMES OF THE PROJECT

Our primary objective is to find whether there is a significance difference in proportion of Android and Ios Mobile Phones across India and comparison of both Android and Ios on basis of their performance and growth in mobile land the main criteria is to represent the number of users, sales, and profits of Android& Ios , To do this we use non-parametric test like wilcoxon rank sum test and chi-square test to get outcome of the project. In this project we will discuss about various factors of Android and Ios Mobile phones.

INTRODUCTION

Android and IOS are two of the most popular mobile operating systems in the world. They are used to power smartphones, tablets, and other mobile devices.

Android is an open-source operating system developed by Google. It is used by many different manufacturers, including Samsung, Huawei, and LG, among others. Android offers a wide range of customization options and allows users to download apps from the Google Play Store.

iOS, on the other hand, is a proprietary operating system developed by Apple exclusively for its iPhones and iPads. It offers a more closed ecosystem compared to Android, but it is known for its ease of use, security, and seamless integration with other Apple devices.

Both Android and iOS offer a variety of features, such as voice assistants, messaging apps, and mobile payment systems. Users can also customize their device with various themes, wallpapers, and widgets.

Ultimately, the choice between Android and iOS comes down to personal preference and the specific features and functionality that you need for your device.

Android:

As mentioned, Android is an open-source operating system developed by Google. This means that the code for the operating system is freely available for anyone to use, modify, and distribute. Because of this, many different manufacturers use Android as the operating system for their mobile devices

One of the main advantages of Android is its customization options. Users can change the look and feel of their device by installing different launchers, themes, and icon packs. They can also install apps from the Google Play Store, which offers a vast selection of free and paid apps for different purposes, such as productivity, entertainment, communication, and more.

Android also offers features like Google Assistant, which is a virtual assistant that can help with tasks like setting reminders, sending messages, and playing music. Android devices also support different messaging apps like WhatsApp, Facebook Messenger, and SMS.

In terms of security, Android has improved its security features over the years, with features like Google Play Protect, which scans apps for malware before they are installed on the device. Android also allows users to set up screen locks, PINs, or passwords to protect their data.

iOS:

iOS is a proprietary operating system developed by Apple. It is exclusive to Apple devices, including iPhones, iPads, and iPods. Unlike Android, Apple controls the hardware and software of its devices, which results in a more seamless user experience.

One of the main advantages of iOS is its ease of use. The operating system is designed to be intuitive, and the interface is consistent across all Apple devices. iOS devices also offer a range of features like Siri, Apple's virtual assistant, which can perform tasks like setting reminders, playing music, and answering questions.

Apple also offers its own messaging app, iMessage, which allows users to send and receive messages, photos, and videos over Wi-Fi or cellular data. iOS devices also support other messaging apps like WhatsApp and Facebook Messenger.

In terms of security, Apple takes a strong stance on user privacy and data protection. iOS devices are designed to be secure, with features like Face ID, Touch ID, and passcodes to protect data. The App Store is also curated by Apple, which ensures that all apps are reviewed and vetted before they are made available for download.

MARKET SHARE ON ANDROID AND IOS MOBILE PHONE

According to a report published by Stat Counter in March 2022, Android dominates the mobile operating system market share in India with a share of 92.46% as of February 2022. Meanwhile, iOS has a market share of 6.71% in India during the same period. This data indicates that Android is the most popular mobile operating system in India, while iOS has a relatively smaller market share.

It's worth noting that these figures may change over time as new devices and operating system updates are released, and consumer preferences and purchasing behaviours evolve.

Android:

Android has been the dominant mobile operating system in India for many years. The platform's open-source nature and availability on devices from a range of manufacturers has made it an attractive option for consumers looking for affordable smartphones with a wide range of features.

In recent years, many Chinese smartphone brands such as Xiaomi, Real-me, Oppo, and Vivo have gained significant market share in India, thanks to their affordable yet feature-packed Android devices. These brands have been able to offer high-end features like multiple cameras, large displays, and powerful processors at relatively lower price points, which has helped them gain traction in the highly competitive Indian smartphone market.

Furthermore, Google's aggressive push to promote Android in India, with initiatives like Android Go, which is a lightweight version of the operating system designed for entry-level smartphones, has also helped drive adoption of Android in the country.

iOS:

While iOS has a smaller market share in India compared to Android, it has a dedicated user base, especially among high-end smartphone users.

Apple's iPhone's have been popular in India for their premium build quality, camera capabilities, and seamless integration with other Apple products like Mac Books, iPad's, and Apple Watches. However, one of the main challenges for Apple in India has been its high price points, which have made it difficult for the company to compete with the more affordable Android devices.

As a result, Apple has been introducing more affordable devices in the Indian market, such as the iPhone SE, which has helped the company gain some traction among budget-conscious consumers.

In addition, Apple has been working on expanding its distribution network and offering more attractive financing options to make its products more accessible to Indian consumers. For example, the company has partnered with local banks to offer no-cost EMI options and has also started manufacturing some of its products in India to reduce costs and comply with local regulations.

Finally, Android dominates the mobile operating system market share in India, thanks to its affordability, feature-rich devices, and open-source nature. However, iOS still has a dedicated user base, especially among high-end smartphone users who value premium build quality, camera capabilities, and seamless integration with other Apple products. With the Indian smartphone market expected to continue growing in the coming years, both Android and iOS are likely to remain competitive in the country.

LITERATURE OF THE PROJECT

BRANDS OF ANDROID MOBILES :

There are many brands of android mobile phone available in the market, some of the popular brands are

1.Samsung

2.Xiaomi

3.Oneplus

4.Oppo

5.Vivo

***Samsung:**

Samsung is a South Korean multinational conglomerate that is one of the world's largest manufacturers of consumer electronics, including smartphones. Samsung has a significant presence in the Indian smartphone market, offering a wide range of devices that cater to a variety of needs and budgets.

Samsung's mid-range and budget smartphones in India include the Galaxy A series and the Galaxy M series. These devices offer a balance of affordability and features, with devices such as the Galaxy A52 and the Galaxy M42 featuring large batteries, high-resolution displays, and powerful processors.

Samsung also offers a range of accessories in India, including wireless earphones, smartwatches, and smartphone cases.

In addition to its hardware offerings, Samsung also offers a variety of software and services to enhance the user experience. Samsung's One UI, which is based on the Android operating system, provides a clean and intuitive user interface that is easy to use. Samsung also offers a range of services such as Samsung Pay, Samsung Health, and Samsung Knox to help users stay productive and secure.

In summary, Samsung is a popular smartphone brand in India known for its high-quality hardware, innovative software, and extensive ecosystem of accessories and services. The company offers a wide range of devices at different price points to cater to a diverse range of consumers

***Xiaomi:**

Xiaomi is a Chinese electronics manufacturer that produces a wide range of smartphones in India. Xiaomi entered the Indian smartphone market in 2014 and has since gained a significant market share due to its high-quality products and competitive pricing.

Xiaomi's flagship smartphone series is the Mi series, which includes high-end devices such as the Mi 11 Ultra and the Mi 11X Pro. These devices feature top-of-the-line hardware and innovative features such as 5G connectivity and fast charging.

Xiaomi's flagship smartphone series is the Mi series, which includes high-end devices such as the Mi 11 Ultra and the Mi 11X Pro. These devices feature top-of-the-line hardware and innovative features such as 5G connectivity and fast charging.

Xiaomi also offers a range of accessories in India, including wireless earphones, power banks, and smartphone cases.

In addition to its hardware offerings, Xiaomi has also developed its own ecosystem of apps and services, including Mi Community, Mi Fit, and Mi Cloud. Xiaomi's MIUI user interface, which is based on the Android operating system, provides a clean and intuitive user experience.

In summary, Xiaomi is a popular smartphone brand in India known for its high-quality products, competitive pricing, and extensive ecosystem of apps and services. The company offers a wide range of devices at different price points to cater to a diverse range of consumers.

***Oneplus:**

OnePlus is a Chinese smartphone manufacturer known for producing high-quality, premium smartphones at competitive prices. The company was founded in 2013 and has since gained a strong following among consumers who value powerful hardware, sleek design, and innovative features.

OnePlus smartphones in India come with features such as high-quality cameras, powerful processors, and fast charging capabilities. The company's cameras are particularly noteworthy, with many of its devices featuring advanced camera technology, including dual-lens setups and high-resolution sensors.

One Plus's flagship smartphone series is the OnePlus series, which includes devices such as the OnePlus 9 Pro and the OnePlus 9. These devices feature top-of-the-line hardware and innovative features such as 5G connectivity, fast charging, and high-refresh-rate displays.

OnePlus also offers mid-range smartphones in India, including the OnePlus Nord series, which offers a balance of affordability and features. Devices such as the

OnePlus Nord 2 feature powerful processors, high-resolution displays, and advanced camera technology.

In addition to its hardware offerings, OnePlus has also developed its own ecosystem of apps and services, including the Oxygen OS user interface, which is based on the Android operating system. Oxygen OS provides a clean and customizable user experience with features such as a dark mode and gesture-based navigation.

OnePlus also offers a range of accessories in India, including wireless earphones, power banks, and smartphone cases.

In summary, OnePlus is a popular smartphone brand in India known for producing high-quality, premium devices at competitive prices. The company offers a range of devices at different price points to cater to a diverse range of consumers and has developed its own ecosystem of apps and services to enhance the user experience.

***Oppo:**

Oppo is a Chinese electronics manufacturer that produces a wide range of smartphones in India. Oppo entered the Indian smartphone market in 2014 and has since gained a significant market share due to its high-quality products and innovative features.

Oppo smartphones in India come with features such as high-quality cameras, powerful processors, and sleek designs. Oppo's cameras are particularly noteworthy, with many of its devices featuring advanced camera technology, including AI-powered cameras, dual-lens setups, and high-resolution sensors.

Oppo's flagship smartphone series is the Find series, which includes high-end devices such as the Find X2 Pro and the Find X3 Pro. These devices feature top-of-the-line hardware and innovative features such as 5G connectivity and fast charging. Oppo also offers a range of accessories in India, including wireless earphones, power banks, and smartphone cases.

In summary, Oppo is a popular smartphone brand in India known for its high-quality cameras, innovative features, and sleek designs. The company offers a range of devices at different price points to cater to a wide range of consumers.

***Vivo:**

Vivo is a Chinese smartphone manufacturer that has a significant presence in the Indian smartphone market. The company is known for producing smartphones with sleek designs, high-quality cameras, and innovative features.

Vivo's flagship smartphone series is the Vivo X series, which includes devices such as the Vivo X60 Pro and the Vivo X50 Pro. These devices feature top-of-the-line hardware and innovative features such as 5G connectivity and fast charging.

Vivo also offers mid-range and budget smartphones in India, including the Vivo Y series and the Vivo V series. These devices offer a balance of affordability and features, with devices such as the Vivo Y73 featuring large batteries, high-resolution displays, and powerful processors.

In addition to its hardware offerings, Vivo has also developed its own ecosystem of apps and services, including the Fun-touch OS user interface, which is based on the Android operating system. Fun-touch OS provides a clean and intuitive user experience with features such as gesture-based navigation and split-screen multitasking.

Vivo also offers a range of accessories in India, including wireless earphones, power banks, and smartphone cases.

In summary, Vivo is a popular smartphone brand in India known for producing smartphones with sleek designs, high-quality cameras, and innovative features. The company offers a range of devices at different price points to cater to a diverse range of consumers and has developed its own ecosystem of apps and services to enhance the user experience.

i) <u>Key Features Of Android:</u>

Android is a popular operating system for mobile phones, developed by Google. Here are some of the key features of Android mobile phones are,

a) Customizability: Android allows for a high degree of customization, both in terms of the home screen and the apps. Users can choose their own wallpaper, widgets, and launchers, and can install third-party apps that can change the appearance and functionality of the phone.

b) Open Source: Android is an open-source operating system, which means that developers can access the source code and modify it to create their own versions of the operating system. This has led to a large ecosystem of Android-based devices and custom ROM's.

c) App Ecosystem: The Google Play Store is the primary app store for Android, and it has a vast selection of apps and games. Many popular apps, such as Facebook, Instagram, and Whats App, are available on both Android and iOS.

d) Google Services: Android integrates with Google's suite of services, including Google Search, Google Maps, Gmail, and Google Assistant. This allows users to access a wide range of services seamlessly from their Android device.

e) Notifications: Android's notification system is highly customizable and allows users to prioritize and categorize notifications. Users can also interact with notifications without having to open the app, such as replying to a message or dismissing a reminder.

f) Multitasking: Android allows for multitasking, allowing users to run multiple apps simultaneously and switch between them easily. Some Android phones also have a split-screen mode, which allows two apps to be displayed side by side.

g) Integration with Other Devices: Android integrates well with other devices, such as smartwatches and smart home devices. This allows users to control their devices from their Android phone and receive notifications on their wrist.

Overall, Android is a highly customizable operating system with a vast ecosystem of apps and games. Its integration with Google's services, notification system, and multitasking capabilities make it a popular choice for mobile phone users.

IOS MOBILE PHONES

The iOS mobile phone is a popular smartphone operating system developed by Apple Inc. and used by several models of the iPhone. In India, the iPhone has a significant market share in the premium smartphone segment.

The latest iOS phones, as of my knowledge cutoff in 2021, were the iPhone 12 and 12 Pro, which were released in October 2020. These phones feature a powerful A14 Bionic chip, 5G connectivity, and a high-quality camera system.

In terms of pricing, the iPhone is considered a premium smartphone brand in India and is generally more expensive than many other smartphone brands available in the market. However, Apple has been expanding its manufacturing operations in India, which has resulted in lower prices for some iPhone models.

In addition to its hardware, the iOS mobile phone also offers access to the App Store, which has a vast selection of apps and games. Many popular apps, such as WhatsApp and Instagram, are available on both iOS and Android, but there are also some apps that are exclusive to iOS.

Overall, the iOS mobile phone is a popular and well-regarded option in India for those who are willing to pay a premium for a high-quality smartphone with a well-designed operating system and access to a wide range of apps.

i) Key Features Of IO'S:

a) Pricing: As I mentioned earlier, the iPhone is generally considered a premium smartphone brand in India, and its prices reflect that. The latest models, such as the iPhone 12 and 12 Pro, can cost upwards of ₹70,000 ($925 USD) for the base model, while older models can be purchased for lower prices.

b) Market Share: While iOS has a smaller market share than Android in India, it still has a significant presence in the premium smartphone segment. According to a report by Counterpoint Research, the iPhone 11 was the top-selling smartphone model in India in the first quarter of 2020.

c)Manufacturing: Apple has been expanding its manufacturing operations in India in recent years, which has resulted in lower prices for some iPhone models. The company has partnered with local manufacturers such as Foxconn and Wistron to produce iPhone models such as the iPhone SE and iPhone XR in India.

d)App Store: The App Store is a key feature of iOS, and it offers access to a wide range of apps and games. Many popular apps, such as WhatsApp, Instagram, and Facebook, are available on both iOS and Android, but there are also some apps that are exclusive to iOS. Some developers also release their apps on iOS first before releasing them on Android.

e)User Experience: iOS is known for its user-friendly interface, security features, and seamless integration with other Apple devices such as Macs and iPad's. The operating system is designed to work smoothly with Apple's hardware, resulting in a consistent and reliable user experience.

f) Customer Support: Apple has a strong customer support network in India, with several Apple Stores and Authorized Service Providers located in major cities. The company also offers phone and online support for customers who need assistance with their devices.

Overall, the iOS mobile phone is a premium smartphone brand in India with a significant presence in the premium segment. Its high prices are offset by the quality of the hardware and software, as well as the access to the App Store and Apple's customer support network.

HISTORY OF ANDROID MOBILES

The history of Android mobiles began in 2003 when a team of developers led by Andy Rubin, Rich Miner, Nick Sears, and Chris White founded Android Inc. The goal was to create a new mobile operating system that would be open source and customizable, in contrast to the proprietary systems that dominated the market at the time.

In 2005, Google acquired Android Inc., and development of the Android operating system continued under the direction of Google. The first commercial Android device, the HTC Dream, was released in 2008, running Android 1.0. It had a touch screen display, a physical keyboard, and a trackball for navigation.

Over the years, Android has seen several major updates and versions, each bringing new features and improvements to the platform. Some of the notable Android versions are:

Android2.0(Eclair) released in 2009, which introduced support for multiple accounts, improved camera features, and a refreshed user interface.

Android 4.0(Ice Cream Sandwich) released in 2011, which introduced features like facial recognition for unlocking devices, the ability to take screenshots, and support for near field communication (NFC).

Android 5.0 (Lollipop) released in 2014, which introduced the Material Design user interface, improved performance, and enhanced security features.

Android 9.0 (Pie) released in 2018, which introduced features such as Adaptive Battery, Adaptive Brightness, and App Actions.

Today, Android is the most widely used mobile operating system globally, with a market share of over 70%. Android devices are manufactured by a range of companies including Samsung, LG, and Google's own Pixel line, and they come in various sizes and form factors from smartphones to tablets to foldable devices.

HISTORY OF IOS MOBILES

iOS is a mobile operating system developed by Apple Inc. for its iPhone, iPad, and iPod Touch devices. The history of iOS mobiles began in 2007, when Steve Jobs introduced the first iPhone at the Macworld Conference & Expo. The iPhone ran on the first version of iOS, originally called iPhone OS.

Here is a brief history of iOS mobiles:

***iPhone OS 1 (2007):** The first version of iOS, introduced with the original iPhone, included a multi-touch user interface, the Safari web browser, and access to the iTunes Store.

***iOS 2 (2008):** This version introduced the App Store, which allowed users to download third-party apps for the first time.

***iOS 3 (2009):** This version added features like copy and paste, MMS messaging, and the ability to search the device.

***iOS 4 (2010):** This version introduced features like multitasking, FaceTime video calling, and iBooks.

***iOS 5 (2011):** This version introduced features like Siri, iMessage, and iCloud.

***iOS 6 (2012): This** version added features like Apple Maps, Passbook, and Do Not Disturb.

***iOS 7 (2013):** This version introduced a major redesign of the user interface, along with features like Control Center and AirDrop.

***iOS 8 (2014):** This version added features like third-party keyboard support, HealthKit, and Apple Pay.

***iOS 9 (2015):** This version added features like split-screen multitasking for iPad, Siri Suggestions, and a redesigned Notes app.

***iOS 10 (2016):** This version introduced features like the Home app for home automation, an improved Siri, and a redesigned Maps app

***iOS 11 (2017):** This version introduced features like the Files app, a redesigned App Store, and support for augmented reality.

***iOS 12 (2018):** This version focused on performance improvements, along with features like Screen Time and Group FaceTime.

***iOS 13 (2019):** This version introduced features like Dark Mode, a redesigned Photos app, and improved privacy controls.

***iOS 14 (2020):** This version introduced features like App Clips, Widgets, and a redesigned Siri interface.

Today, iOS is one of the most popular mobile operating systems, known for its user-friendly interface, tight integration with Apple's hardware and software ecosystem, and strong focus on privacy and security. The latest version of iOS, as of my knowledge cutoff date of September 2021, was iOS 14.8.

ANDROID MOBILE SALES IN INDIA

As an AI language model, I do not have access to real-time data, but according to the latest available information, as of Q3 2021, Android held a dominant market share of 92.2% in India's smartphone operating system market. This is according to data from Stat Counter, a web analytics company that tracks device usage across the globe.

The popularity of Android in India can be attributed to its affordability and the fact that it is an open-source platform, which allows manufacturers to create a wide range of smartphones at varying price points. Additionally, Android's robust app ecosystem, with over 3.5 million apps available on the Google Play Store, has contributed to its success in the country.

IOS MOBILE SALES IN INDIA

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ADVANTAGES AND DISADVANTAGES OF ANDROID MOBILES

Here are some advantages and disadvantages of Android mobiles:

****Advantages:**

***Customization:** Android mobiles offer a high degree of customization and flexibility, allowing users to personalize their devices with widgets, themes, and launchers to create a unique experience.

***App ecosystem:** The Google Play Store offers a wide range of apps, including both free and paid options, giving users access to a vast selection of software.

***Integration with Google services:** Android mobiles integrate seamlessly with Google services like Gmail, Google Drive, and Google Maps.

***Multi-tasking:** Android mobiles allow users to run multiple apps simultaneously, making it easier to switch between apps and get more done.

***Open-source platform:** Android is an open-source platform, which allows developers to modify and customize the operating system and build new features and functionalities.

****Disadvantages:**

***Fragmentation:** Because Android is open-source, there are many versions of the operating system in use, leading to fragmentation in the user base and the app ecosystem.
***Security:** Because Android is so widely used, it is a frequent target for hackers and malware, making it less secure than some other mobile operating systems.

***Bloatware:** Some Android mobiles come pre-loaded with bloatware, which can slow down the device and take up valuable storage space.

***Battery life:** Some Android mobiles may have poor battery life compared to other mobile operating systems.

***Inconsistent user experience:** Because Android is so
customizable, the user experience can be inconsistent across different devices and manufacturers.

*Overall, Android mobiles offer a lot of benefits, but there are also some drawbacks that users should be aware of before choosing an Android device.

ADVANTAGES AND DISADVANTAGES OF IOS MOBILEPHONES

Here are some advantages and disadvantages of iOS mobiles:

****Advantages:**

***User experience:** iOS offers a consistent user experience across all devices, making it easy to navigate and use for both new and experienced users.

***Security:** iOS is generally considered to be more secure than Android, with built-in security features like Touch ID and Face ID, and frequent software updates to address security vulnerabilities.

***App quality:** Because iOS devices have a more limited range of hardware configurations compared to Android, app developers can optimize their software for a smaller set of devices, leading to higher quality apps.

***Integration with Apple ecosystem:** iOS devices integrate seamlessly with other Apple products like Macs and iPads, making it easy to share files and access data across devices.

***Customer support:** Apple offers a high level of customer support, including in-store tech support and Apple Care, which can provide peace of mind for users.

****Disadvantages:**

***Price:** iOS devices tend to be more expensive than their Android counterparts, which can be a barrier to entry for some users.

***Customization:** iOS does not offer the same level of customization as Android, limiting users' ability to personalize their devices.

***App restrictions:** Apple has strict guidelines for the types of apps that can be distributed through the App Store, which can limit app selection for users.

***Closed ecosystem:** iOS is a closed ecosystem, which means that users are limited to the apps and services that Apple provides.

***Compatibility:** iOS devices may have compatibility issues with non-Apple devices and services, which can be frustrating for users who want to use third-party hardware or software.

Overall, iOS offers a streamlined and secure user experience, but comes with a higher price tag and less customization options compared to Android.

COMPARISONOFANDRIODANDIOS MOBILEPHONES

	Android	Ios
	current rating is 4.12/5 1 2 3 4 5	current rating is 3.92/5 1 2 3 4 5
Developer	Various, mostly Google and Open Handset Alliance	Apple Inc.
Initial release	September 23, 2008	July 29, 2007
Latest stable release and Updates	Android 12	iOS 15.3.1 and iPadOS 15.3.1
Customizability	A lot. Can change almost anything.	Limited unless jail broken
Source model	Open source	Closed, with open source components.
File transfer	Easier than iOS. Using USB port and Android File Transfer desktop app. Photos can be transferred via USB without apps.	More difficult. Media files can be transferred using iTunes (Windows and macOS pre-Catalina) desktop app (via Finder in newer version of macOS). Photos can be transferred out via USB without apps.
Widgets	Yes, except on lock screen	Yes
	Google Chrome (other browsers are available). Any browser app can be	Safari. Any browser app can be set as default but they all use the same rendering engine (Safari/Webkit) behind the scenes. Ad blocking is

Internet browsing	set as default. Ad blocking is supported with Firefox.	supported via content blockers like Firefox Focus, or by jail breaking.
Web mapping service	Google Maps	Apple Maps (default). Google Maps also available via a separate app download, but not as default.
Available language(s)	100+ languages	40 languages
Video chat	Google Meet and other 3rd party apps	FaceTime (Apple devices only) and other 3rd party apps
Virtual assistant	Google Assistant	Siri
Available on	Many phones and tablets. Major manufacturers such as Samsung, Oppo, OnePlus, Vivo, Honor and Xiaomi. Android One devices are pure Android. Pixel line of devices is made by Google, using a almost pure version of Android	iPod Touch, iPhone, iPad, Apple TV (2nd and 3rd generation)
Calls and messaging	Google Messages. 3rd party apps like Facebook Messenger, WhatsApp, Google Duo, Discord and Skype all work on Android and iOS both.	iMessage, FaceTime (with other Apple devices only). 3rd party apps like Google Hangouts, Facebook Messenger, WhatsApp, Google Duo, Discord and Skype all work on Android and iOS both.
App store , Affordability and interface	Google Play Store – 2,500,000+ apps. Other app stores like Amazon and Aptoide also distribute Android apps. ("APKs"). Apps containing	Apple App Store – 1,800,000+ apps. Apps containing virus very rare or nonexistent.

	virus occasionally to rare, but existing.	
Alternative app stores and side loading	Several alternative app stores other than the official Google Play Store. (e.g. Aptoide, Galaxy Apps)	Apple blocks 3rd party app stores. The phone needs to be jailbroken if you want to download apps from other stores.
Battery life and management	Many but not all Android phone manufacturers equip their devices with large batteries with a longer life.	Apple batteries are generally not as big as the largest Android batteries. However, Apple is able to squeeze decent battery life via hardware/software optimizations.
Open source	Kernel (Based on Linux), UI, and some standard apps	The iOS kernel is not open source but is based on the open-source Darwin OS.
File manager	Yes. (Stock Android File Manager included on devices running Android 7.1.1)	Files app, limited and less useful (iOS 12).
Photos & Videos backup	Apps available for automatic backup of photos and videos. Google Photos allows unlimited backup of photos at a compressed quality. OneDrive, Amazon Photos and Dropbox are other alternatives.	Up to 5 GB of photos and videos can be automatically back up with iCloud, more paid iCloud storage available via subscription. All other vendors like Google, Amazon, Dropbox, Flickr and Microsoft have auto-backup apps for both iOS and Android.
	Monthly security updates. Android software patches are available soonest to Pixel device users. Manufacturers tend to lag behind in pushing out these updates. So at any	Occasional security updates. Security threats rare, because iOS is locked and downloading apps out of the App Store is complicated.

Security	given time a vast majority of Android devices are running outdated OS software.	
Rooting, bootloaders, and jailbreaking	Access and complete control over your device is available and you can unlock the bootloader.	Complete control over your device is not available.
Cloud services	Native integration with Google Drive storage. 15GB free, $2/mo for 100GB, 1TB for $10. Apps available for Amazon Photos, OneDrive and Dropbox.	Native integration with iCloud. 5GB free, 50GB for $1/mo, 200GB for $3/mo, 1TB for $10/mo. Apps available for Google Drive and Google Photos, Amazon Photos, OneDrive and Dropbox.
Interface	Touch Screen	Touch Screen
Biometric Authentication	Fingerprint and/or Face Authentication. Availability depends on manufacturer's hardware.	Fingerprint or Face Authentication. Touch ID available on iPhone (5s and later) and iPad (Air 2 and later) but not on iPhone X or later. Face ID available on iPhone X and later, replacing Touch ID
OS family	Linux	OS X, UNIX
Headphone Jack	Some current Android smartphones and many don't.	None on iPhone 7 and later, lighting to 3.5mm no longer comes with phone after iPhone XS

iOS vs. Android – 2023
Jan 30, 2023

Introduction:
The world has been surfing the wave of technological advancements and innovations for the past decade, and it all pins down to one device – our mobile phone. For all mobile users, the primary choices of operating systems are Android and iOS. Android is an OS created by google in 2008 and is supported by most brands like – One+, Mi, OPPO, VIVO, Motorola, and many more and is one of the most used operating systems. iOS is an OS that was developed by Apple and was introduced in their first phone – The iPhone, in 2007. Both OS came into existence when mobile phone penetration was slow globally, and so the scope of expansion and advancements was always in favor of such operating systems.

The Evolution

***iOS:**
Ever since the advent of the iPhone, iOS has seen many changes since 2007. The current version of iOS is iOS 16. However, in the course of creating new iOS and updating the old ones, Apple has come out with various advancements like the App Store, Touch ID & Face ID, Apple Music, Podcasts, Augmented reality, Contact exposure, and many more, which have later become part of features of Android phone as well. Apple is one of the oldest tech and gadget developers in the world, most of the devices manufactured by Apple have received global recognition, and hence Apple enjoys providing services to a huge global user base.

***Android:**
The OS has been famous for using the software version names on the food items like – Pie, Oreo, Nougat, KitKat, Eclairs, etc. From Android 10 onwards, the new versions were demoted by number. The most recent Android OS is Android 13; this OS is known for its practicality and flexibility. In 2012 Android became the most popular operating system for mobile devices, surpassing Apple's iOS, and as of 2020, about 75 percent of mobile devices run Android.

Android vs. iOS

***USER INTERFACE:**

One of the most noticeable differences between Android and iPhone is their user interface. Android devices have a more customizable interface, with options to change the home screen, app icons, and overall theme. The iPhone, on the other hand, has a more uniform interface with less room for customization. Android allows users to customize their home screen by adding widgets and changing the layout of their app icons. This can be useful for people who want quick access to certain functions or information on their home screen. IOS does not have this feature, but it does allow users to organize their app icons into folders for easier navigation.

***APP SELECTION:**

Another factor to consider when choosing between Android and iOS is the app selection. Both platforms have a wide range of apps available, but there are some differences to

consider. Android has a larger selection of apps overall, including a larger selection of free apps. However, some popular apps, such as certain music streaming apps and games, may be released first or only available on iPhone. iOS also has a more curated app store, meaning that all apps must go through a review process before being accepted for download. This can result in a higher quality of apps overall, but it can also mean that it takes longer for new apps to become available on the platform. iPhone devices tend to have less processing power and RAM. But they are generally more efficient in their use of resources. This can result in longer battery life, but it may also mean that iPhones are slower at handling multiple tasks or running resource-intensive apps.

***PERFORMANCE:**

When it comes to performance, both Android and iPhone have their own strengths and weaknesses. Android devices tend to have more processing power and RAM. This can make them faster and more capable of handling multiple tasks simultaneously. However, this can also lead to Android devices having shorter battery life compared to iPhones.

***SECURITY:**

Security is an important consideration for any smartphone user, and Android and iPhone have their own measures to protect user data. Android devices are generally seen as being less secure than iPhones due to their open nature. Android allows users to install apps from sources other than the Google Play Store, which can increase the risk of downloading malicious apps. However, Android has made improvements in recent years to address this issue. Including the introduction of Google Play Protect, which scans apps for malware before they are downloaded. On the other hand, iPhone devices have a more closed ecosystem, with all apps required to go through Apple‘s review process before being available for download. This helps reduce the risk of downloading malicious apps, but it can also limit the platform’s flexibility.

***Conclusion:**

The debate about the better OS has been going on for some time now, and it looks like it will get more comprehensive in the times to come, as netizens go deeper into cyberspace, they will get more aware and critical of their uses and demands, which will allow them to opt for the best OS for their convenience. Although the AndroidOS, due to its integration, stands more vulnerable to security threats as compared to iOS, no software is secure in today’s time, what is secure is its use and application hence the netizen and the platforms need to increase their awareness and knowledge to safeguard themselves and the wholesome cyberspace.

FEATURES OF Android MOBILE PHONES IN 2023

- Stacked Widgets. ...
- Make Apps Sleep Again. ...
- Battery Health Indicator. ...
- Beefed up Material You. ...
- Isolate Subject From a Photo. ...
- Make the 'Custom Launchers' great again! ...

TABLES

Table-1

ANDROID RATING	1	2	3	4	5
Performance	1	3	4	13	16
Camera	1	4	7	16	9
Cost	0	3	8	14	12
Processing	2	2	7	20	6
Display	0	5	6	15	10
Sophistication	0	6	11	15	5
Storage	0	3	7	13	14
UI	1	2	9	18	7

Table-2

IOS RATING	1	2	3	4	5
Performance	0	1	0	1	11
Camera	0	1	0	4	8
Cost	0	1	1	1	10
Processing	0	1	0	5	7
display	0	1	0	2	10
sophistication	0	1	1	3	8
storage	0	1	0	4	7
UI	0	1	0	4	8

Table-3

ANDROID ATTRIBUTE RATING	1	2	3	4	5
quality	1	2	6	14	14
battery backup	1	2	9	16	9
durability	1	1	10	14	11
design attractiveness	0	2	7	13	14
value for the price of the product	1	1	11	13	11
user friendliness	0	2	7	14	14

Table-4

IOS ATTRIBUTE RATING	1	2	3	4	5
quality	0	0	3	3	7
battery backup	0	2	4	2	5
durability	0	0	3	6	4
design attractiveness	0	0	3	3	7
value for the price of the product	0	1	4	4	4
user friendliness	0	1	1	4	6

Table-5

IOS RATING	Frequency
classy	6
easy to use	9
durable	5
light	5
others	3

Table-6

SMARTPHONE COST	Frequency
below 10,1000	1
10,000-20,000	21
20,000-30,000	10
30,000 above	18

Table-7

SMARTPHONE	frequency
Android	37
IOS	13

Table-8

QUALIFICATION	Frequency
Pursing BTech	11
Completed BTech	2
Pursing Degree	34
Completed Degree	3

Table-9

GENDER	Frequency
Males	36
Females	14

Table-10

CURRENT SMARTPHONE BRAND	frequency
Apple	13
Samsung	7
Xiaomi	11
Oppo	0
Vivo	5
One plus	7
Others	7

Table-11

Gender	Android	Ios
Male	26	10
Female	11	3

Table-12

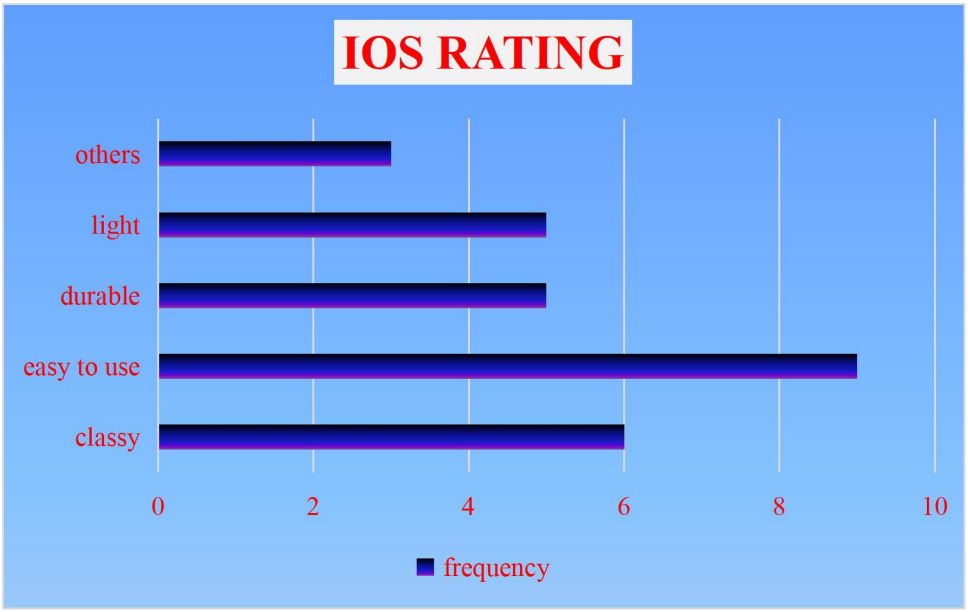
AGE	FREQUENCY
18-19	10
20-22	36
23-25	4
26-28	0

Table-13

Brand	ANDROID VENDOR MARKET SHARE
Motorola	3.70
Realme	4.30
Huawei	7.20
Vivo	9.60
Oppo	10.10
Xiaomi	14.50
Samsung	34.40
Other	16.20

DIAGRAMATIC REPRESENTATION

(Table-1)



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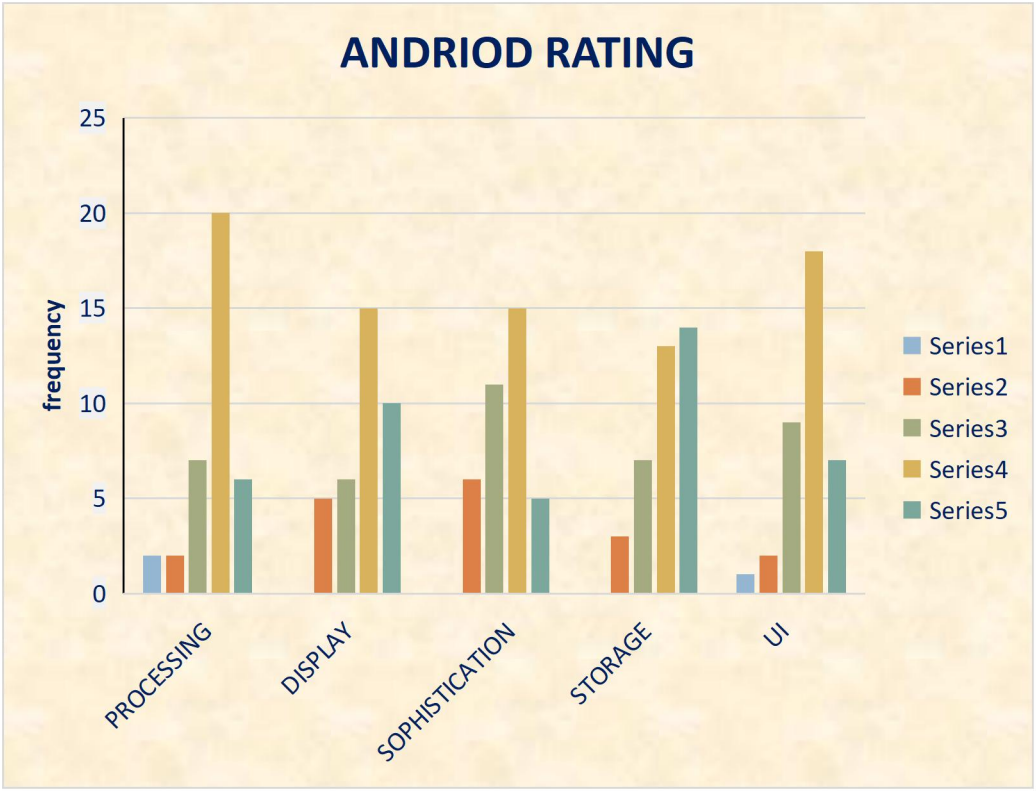

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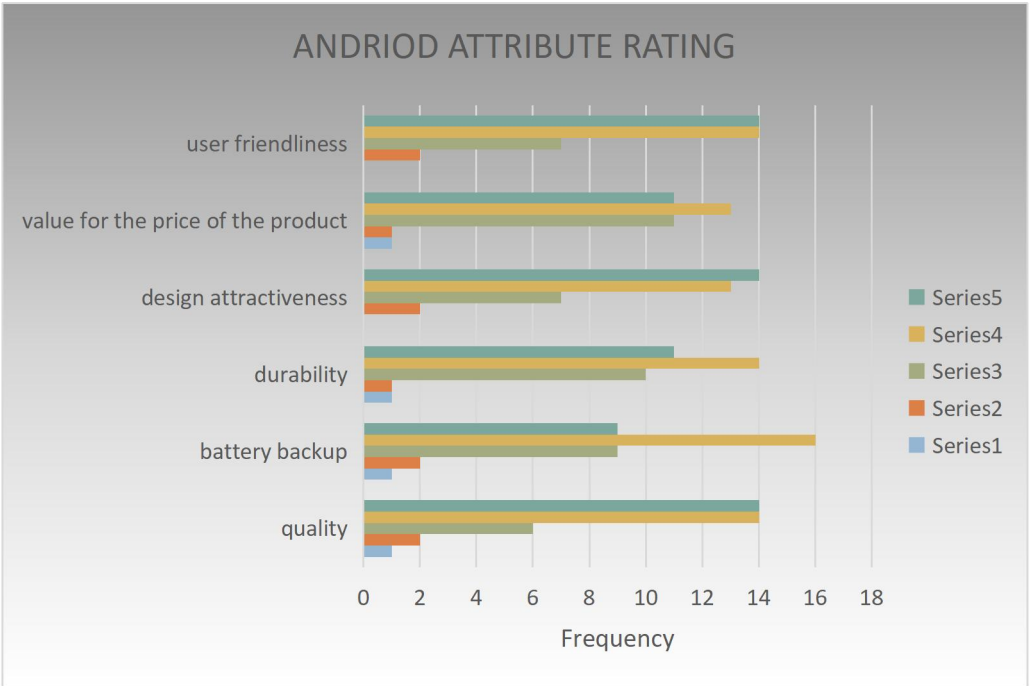

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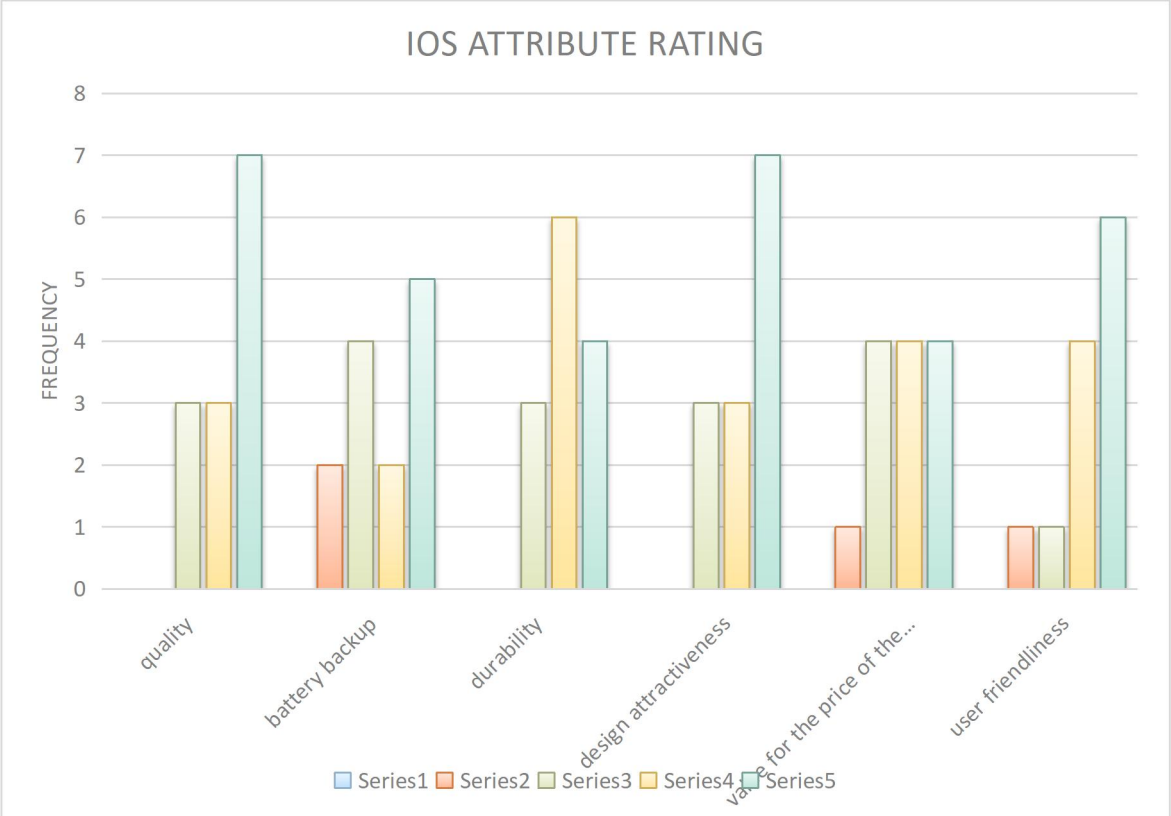

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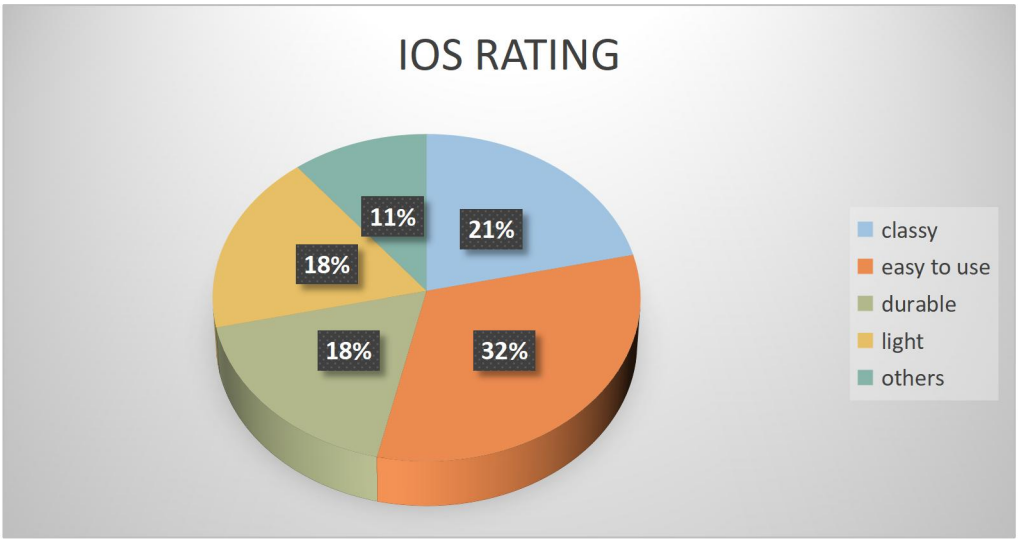

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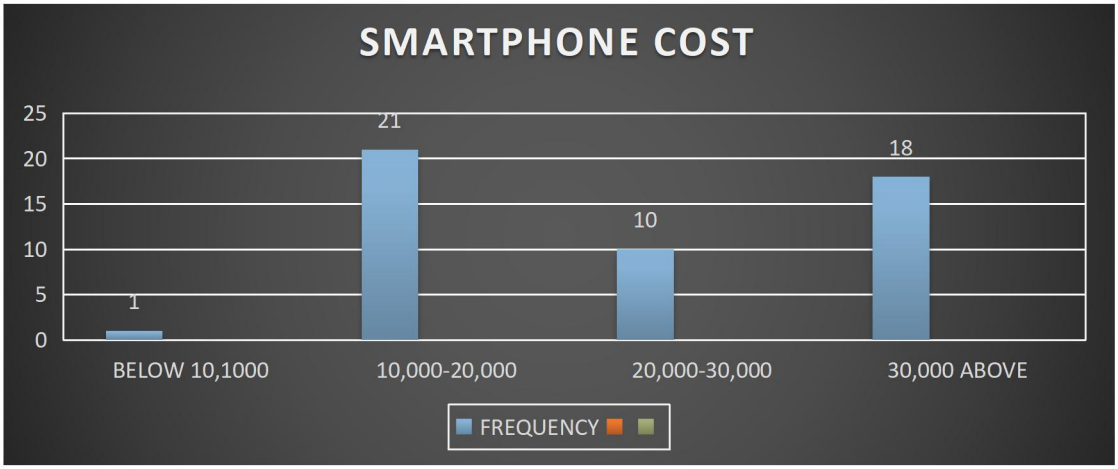

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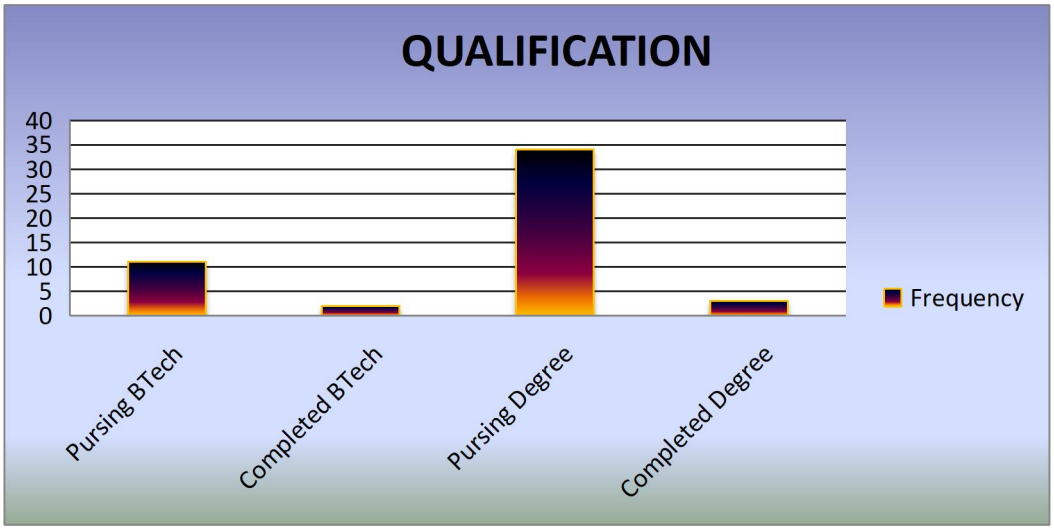

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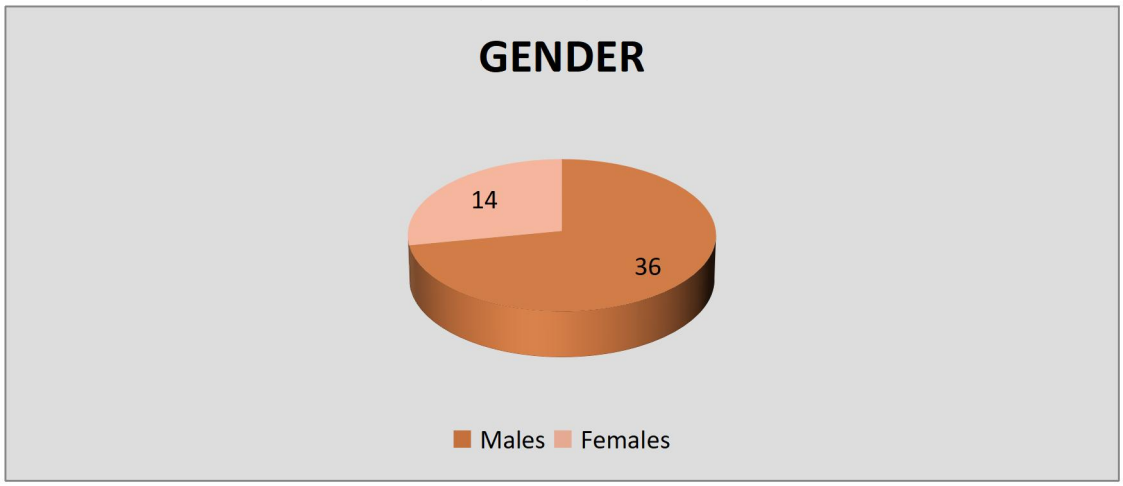

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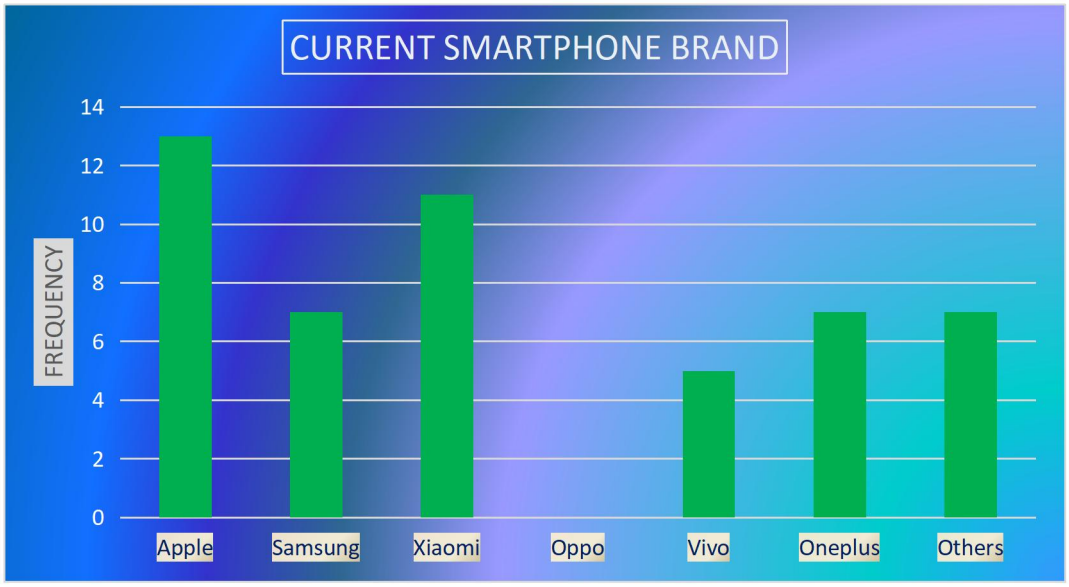

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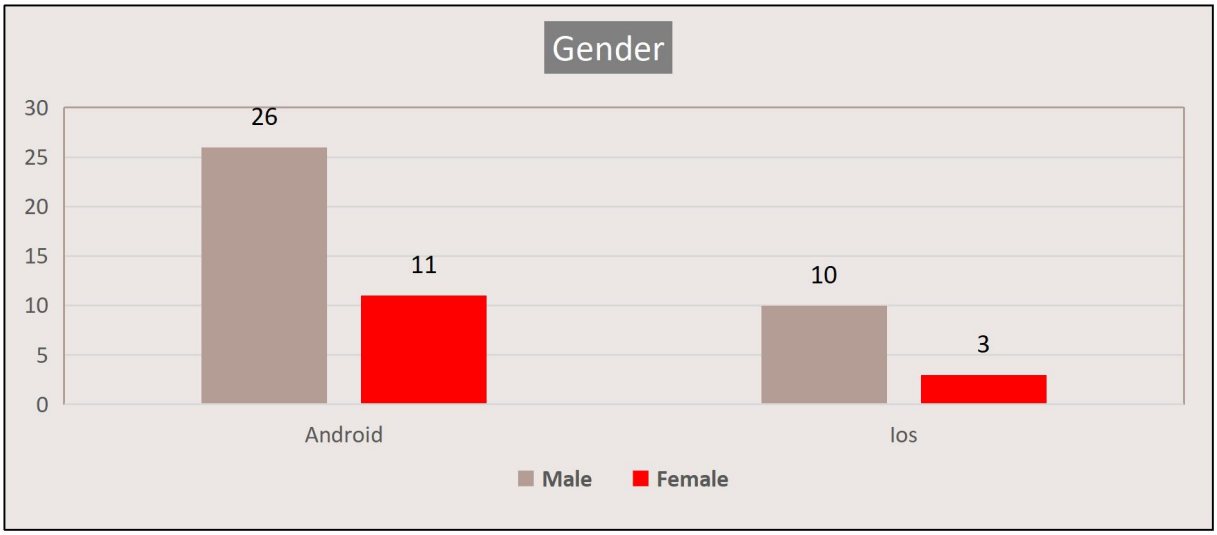

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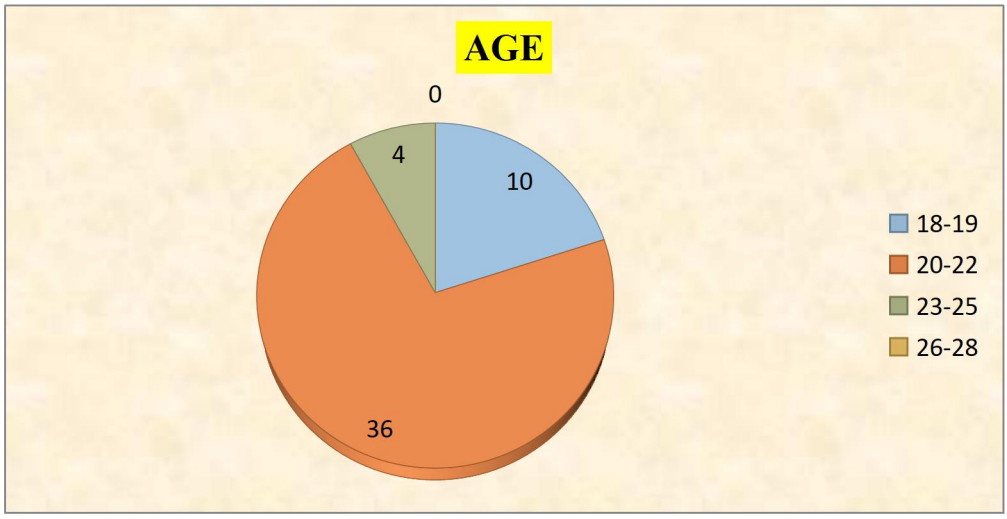

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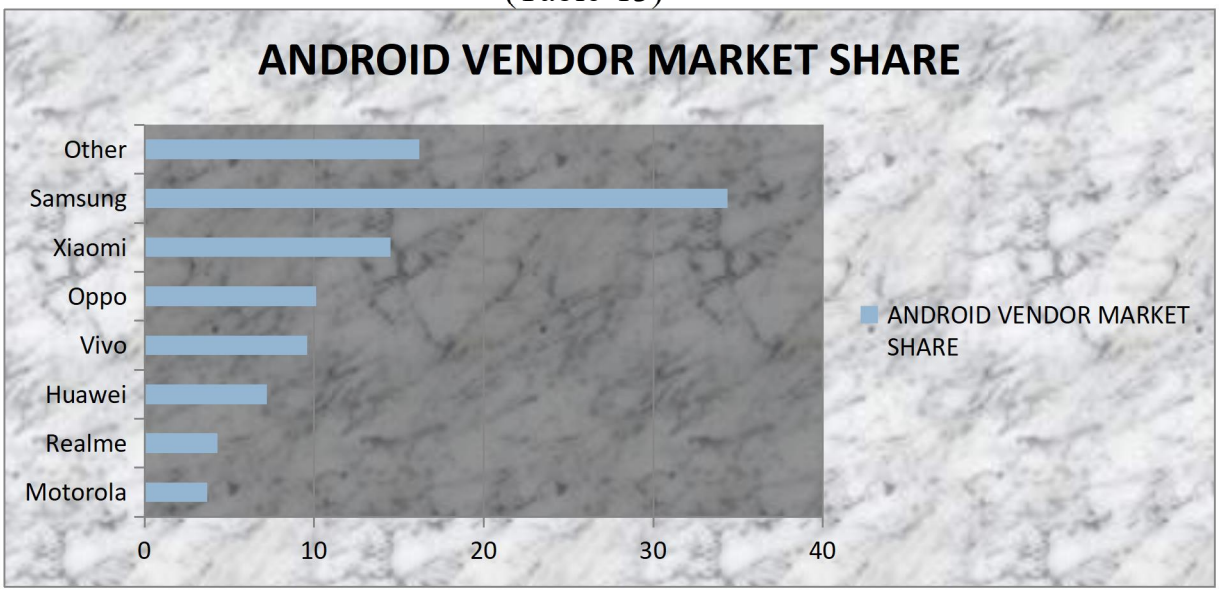

METHODOLOGY

Chi-square Test

The chi-square test is a statistical test used to determine if there is a significant association between two categorical variables. It compares the observed frequencies of categories in a sample to the expected frequencies under a null hypothesis.

It's important to note that the chi-square test assumes certain conditions, such as the independence of observations and an adequate sample size.

Performing a Chi-square test in Excel typically involves the following steps:

Step 1: Enter data into an Excel worksheet.

Enter the data for the two categorical variables of interest into an Excel worksheet. Each variable should be listed in a separate column.

Step 2: Create a contingency table.

Create a contingency table in Excel using the COUNTIF function. The contingency table should list the frequencies for each combination of categories for the two variables being analyzed.

Step 3: Calculate expected frequencies

Calculate the expected frequencies for each cell in the contingency table using the formula: (row total * column total) / sample size.

Step 4: Calculate the Chi-square statistic

Calculate the Chi-square statistic in Excel using the CHISQ.TEST function. This function requires the observed frequencies and expected frequencies for each cell in the contingency table.

Step 5: Determine the degrees of freedom. Determine the degrees of freedom in Excel using the formula: (number of rows - 1) * (number of columns - 1).

Step 6: Determine the p-value

Determine the p-value in Excel using the CHISQ.TEST function. This function requires the Chi-square statistic and degrees of freedom.

Step 7: Interpret the results

Interpret the results of the Chi-square test by comparing the p-value to the significance level (usually 0.05). If the p-value is less than the significance level, the null hypothesis is rejected,

indicating that there is a significant association between the two variables. If the p-value is greater than the significance level, the null hypothesis cannot be rejected, indicating that there is not a significant association between the two variables.

Step 8: Draw conclusions and make recommendations

Based on the results of the Chi-square test, draw conclusions and make recommendations for future research or practical applications.

WILCOXON RANK SUM TEST

The Wilcoxon rank-sum test, also known as the Mann-Whitney U test, is a non-parametric statistical test used to compare the distributions of two independent samples. It is commonly employed when the data do not meet the assumptions of normality required for parametric tests like the t-test.

The test is used to determine whether there is a significant difference between the medians of the two groups. However, unlike the t-test, it does not assume that the data are normally distributed. Instead, it focuses on the ranks of the observations.

The Wilcoxon rank-sum test is useful for comparing ordinal, interval, or ratio level data when the assumptions of parametric tests cannot be met. It is widely used in various fields, including medicine, social sciences, and engineering, to analyze data that may not follow a normal distribution or have unequal variances.

Step-1 Enter your data into two separate columns in Excel, one column for each group you want to compare.

Step-2 Select an empty cell where you want to display the test result, and click on the "Data" tab in the Excel ribbon.

Step-3 Click on the "Data Analysis" button in the "Analysis" group.

Step-4 Select "Rank and percentile" from the list of analysis tools, and click "OK."

Step-5 In the "Rank and percentile" dialog box, select the data in both columns, and check the box next to "Grouped by," and enter a label for each group.

Step-6 Under the "Output Options" section, check the boxes next to "P-values" and "Mann-Whitney Test."

Step-7 Click "OK" to run the analysis.

The output will display the test results, including the test statistic (U), the p-value, and a conclusion about whether or not the null hypothesis is rejected.

DATA ANALYSIS

i) Chi-Square test using excel

Now let us define Null &Alternative Hypothesis for the following data

NULL HYPOTHESIS: There is no significance difference between gender and mobile phones.

ALTERNATIVE HYPOTHESIS: There is a significance difference between gender and mobile phones.

Gender	Android	Ios
Male	26	10
Female	11	3

Observed Frequencies(Oi)	Expected frequencies(Ei)
26	26.64
10	9.36
11	10.36
3	3.64

After pooling we get,

Observed Frequencies	Expected frequencies(Ei)	Oi-Ei	$(Oi-Ei)^2$	$(Oi-Ei)^2/Ei$
26	26.64	-0.64	0.4096	0.015375375
10	9.36	0.64	0.4096	0.043760684
14	14	0	0	0
Total				0.059136059

Now we need to tabulated value for that we need to find degrees of freedom at 5% level of significance.

D.o.f = (rows-1)*(columns-1)

Since we are pooling only one time the d.o.f will be = (rows-1)*(columns-1)-1

Therefore d.o.f =(4-1)*(2-1)-1 = 2

2 degrees of freedom at 5% level of significance =5.991

Tabulated value =5.991 ; Chi square value =0.059136059

Therefore, Tabulated value > Chi square value (5.991 > 0. 059136059) we accept Null hypothesis.

ii) Wilcoxon Rank Sum Test

Table

ANDROID RATING	1	2	3	4	5
performance	1	3	4	13	16
processing	2	2	7	20	6
IOS RATING	1	2	3	4	5
performance	0	1	0	1	11
processing	0	1	0	5	7

Null Hypothesis: There is no significance difference between Android and ios processing frequencies

Alternative Hypothesis: There is a significance difference between Android and ios processing frequencies

Processing	Android	IOS
1	2	0
2	2	1
3	7	0
4	20	1
5	6	11

Rank1	Rank2
5	1
5	3
8	1
10	3
7	9
Total rank	52

Wilcoxon Test:

n1 = 5, n2 = 5, sum =52

Expectation = n1*(n1+n2+1)/2 = 27.5

Std error = SQRT(n1*n2(n1+n2+1)/5) = 7.416198

Stat =(Sum-Exp)/Std.error = 3.303579

P value = 1- normdist(Stat,0,1,1) = 0.000477

5 degrees of freedom at 5% level of significance = 11.071

Since p < signifance value we reject null hypothesis

Null Hypothesis: There is no significance difference between Android and ios performance frequencies

Alternative Hypothesis: There is a significance difference between Android and ios performance frequencies

Performance	Andriod	Ios
1	1	0
2	3	1
3	4	0
4	13	1
5	16	11
		50

Rank1	Rank2
3	1
6	3
7	1
9	5
10	8
Total	51

Wilcoxon Test:

n1=5,n2=5,sum=51

Expectation = n1*(n1+n2+1)/2=27-5

Std error=SQRT(n1*n2(n1+n2+1)/5) =7.416198487

Stat =(Sum-Exp)/Std.error=3.168739354

P value = 1- normdist(Stat,0,1,1)=0.000765508

5 degrees of freedom at 5% level of significance = 11.071

Since p < signifance value we reject null hypothesis

CONCLUSION

i) Chi-Square test:

We accept Null Hypothesis i.e there is no significance difference between gender and mobile because in current scenario everybody are using mobile phones irrespective to gender.

ii) Wilcoxon Rank Sum Test: We reject Null Hypothesis i.e there is a significance difference between Android and ios performance and processing. According to our analysis ios mobile phone with huge cost provides better performance and processing compared to android. But if we take price under consideration android also provide good performance and processing.