

# **Week 8: iOS vs Android**

UFCF7H-15-3 Mobile Applications

*Dr Kun Wei*

# What OS are we all using?



# The old debate

- ❑ The iPhone vs Android debate raged hard in the early days of smartphones.
- ❑ Traditionally Apple products were the expensive one and Android were the cheaper ones.
- ❑ Phone like the Samsung Galaxy S23 Ultra lower this and Apple products are no longer the most expensive.
- ❑ We've all grown up a bit since then as has the industry, so let's leave this argument behind us.



**It is a personal preference.**

# Entry levels

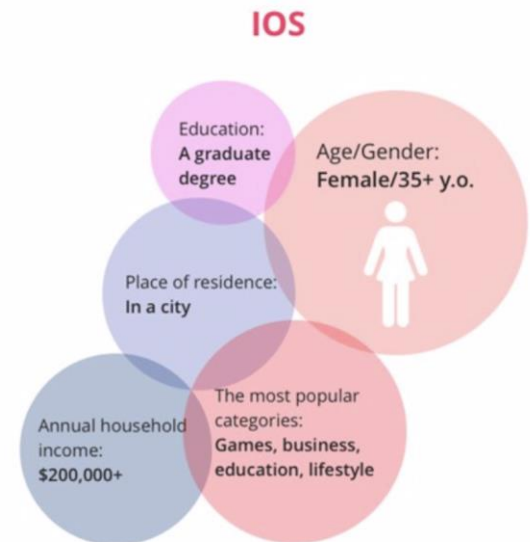
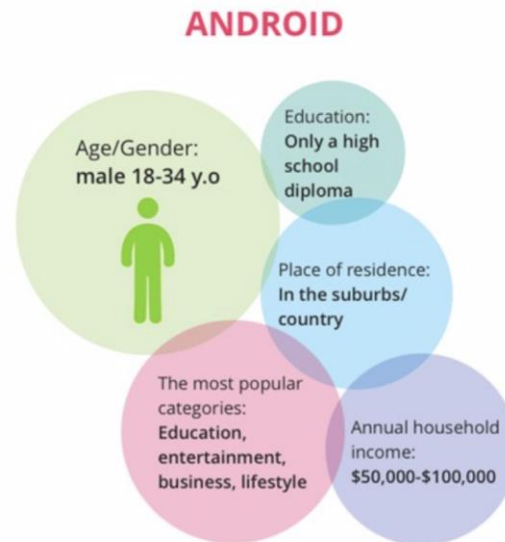
- ❑ Entry-level: £100-350
  - Android is still the bargain-hunter's choice. Budget manufacturers include Redmi, Realme, Oppo and Motorola. Spot a trend?
- ❑ Mid-range: £400-650
  - Apple joins in. The iPhone SE is powerful but has a small screen. Android's strong area with offerings OnePlus, Xiaomi, OPPO and Google Pixel. No 5G with Apple at this level.
- ❑ High-end: £700+
  - iPhone 15's and Samsung Galaxy S23. Essentially now include better cameras, more storage and better screens. Apple finally gain 5G at this level.



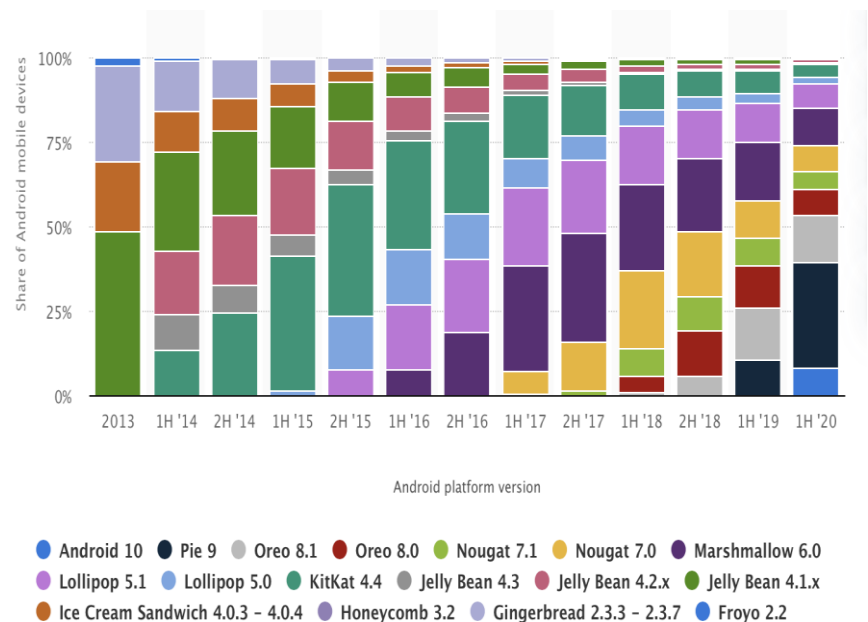
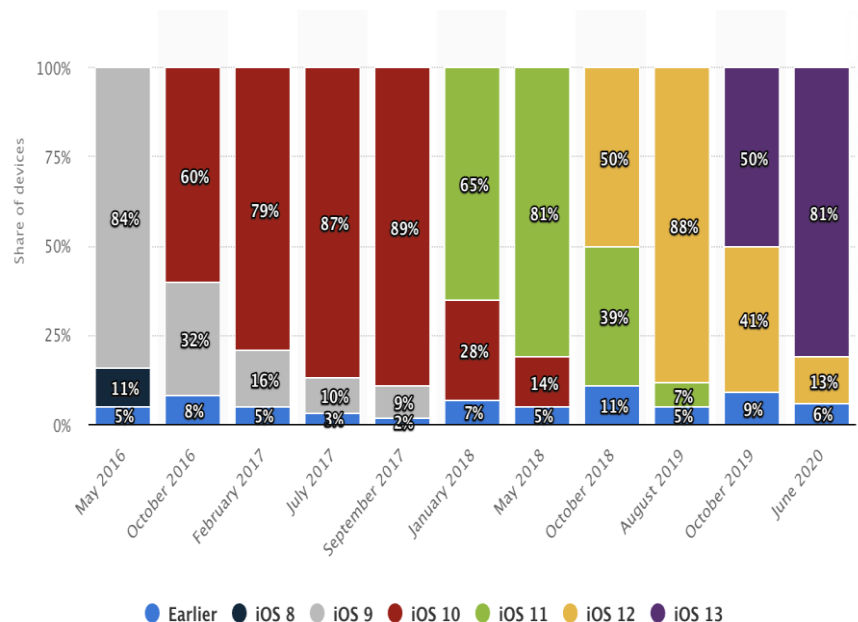
# Different audiences

The Google Play store pulled in approximately 36 billion first-time app installs in 2021. Apple app store only drove 29.6 billion.

iOS users tend to have higher engagement rates and spend more on iOS apps.



# Devices running latest OS



What does this mean for app developers?

Statista.com

# UK Mobile Devices

Between 2010 and 2020, UK household ownership of mobile phones increased from 20% to 95%.

(UK Office for National Statistics, 2021)

Market share of mobile OS in the UK:

iOS	53.63%
Android	45.82%
Samsung	0.51%
Windows	0.02%
Other/Unknown	0.01%



# Pros of developing on



- ❑ **OPEN SYSTEM:** Developers can receive access to more features that can be restricted in iOS apps.
- ❑ **DESIGN:** Devs use extensive Google design guidelines for developing an intuitive user interface (although this is changing).
- ❑ **FRAGMENTATION:** You can develop apps for a broader range of devices, including:
  - Wearables (ok, ok...Apple Watch),
  - TVs (fine....Apple TV),
  - in-car systems etc. (alright already...CarPlay)
- ❑ **RELEASE:** Android apps are easier to publish to Google Play (The whole process may take just a few hours).
- ❑ **CHEAP:** Easy to obtain devices to test on.





# Cons of developing on

- ❑ **FRAGMENTATION:** So many Android devices with different Screen sizes, Resolutions, Power / capabilities etc. (Dev teams might need more time to adjust the app's features).
- ❑ **TESTING:** Because devices might vary it takes take more time for QA specialists to test your app.
- ❑ **COST:** More time developing, and testing increase the app price (depending on the app's features and complexity – between 20-40% more time needed)
- ❑ **DEVICE CHANGES:** Each mobile company optimises the Android OS UI which can make it difficult for the user. and that they also enable the ads within the custom UIs.
- ❑ **SOFTWARE UPDATES:** Software updates are a mixed bag. Only the Android One mobiles get the updates very quickly.
- ❑ **SECURITY:** Professional hackers can easily hack android phones which often needs to be considered by developers.



# Pros of developing on



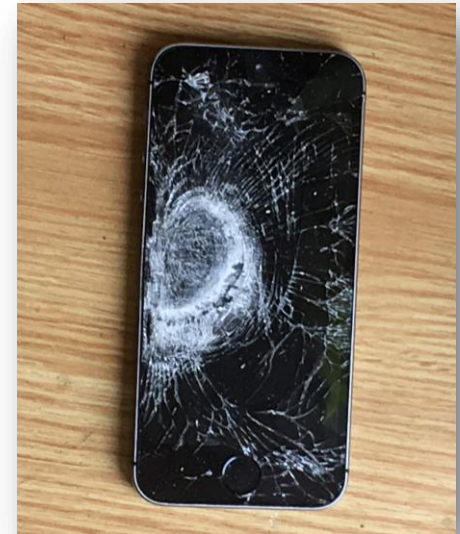
- ❑ **REVENUE:** Apple users spend more money on app purchases so more time, scope for development.
- ❑ **NUMBER OF DEVICES:** iOS powers Apple devices only. Because of this, your app should fit the limited number of screens and devices (tools help here also).
- ❑ **UI DESIGN:** Apple provides detailed developer style guide for the app UI (Dev teams need less time, making it more affordable in the app design stage).
- ❑ **SECURITY:** Hacking iOS is extremely difficult. Apple are famous for the safety they provide which carries over to registered developers.
- ❑ **BETTER PAY:** Less iOS developers out there meaning the few are better paid.



# Cons of developing on

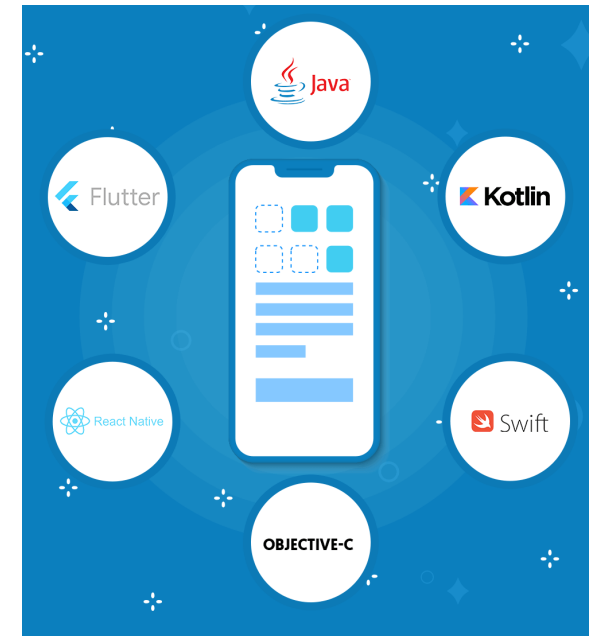


- ❑ **APP RELEASE:** App Store has (somewhat) stricter review guidelines, meaning that the App Store may reject your app due to security issues, a lack of valuable content, or poor performance (although this is much better today compared to a few years ago).
- ❑ **FLEXIBILITY:** It can be argued that iOS apps are usually hard to customise because the platform / design guidelines have restrictions (but it seems Google have started heading the same way).
- ❑ **XCODE ISSUES:** Whilst it is faster and more optimised than Android Studio constant changes mean it can be somewhat buggy... much better now in XCode 14



# Coding practices

- ❑ The fundamental difference between iOS and Android is how you build them **natively**.
- ❑ Android has **Kotlin** for building apps whereas iOS programmers depend on **Swift** to create software and mobile apps.
- ❑ The language does not place much pressure on developers since both have enormous active communities ready to assist and are modern meaning they are easy to learn and always updating.



# Tools of the trade

iOS:



Android:



There are other ways to approach development, but these are common ways to build a native applications for each OS.

**\*\*IMPORTANT: Your project must run in Android Studio through the detailed simulator as per the assignment spec.**

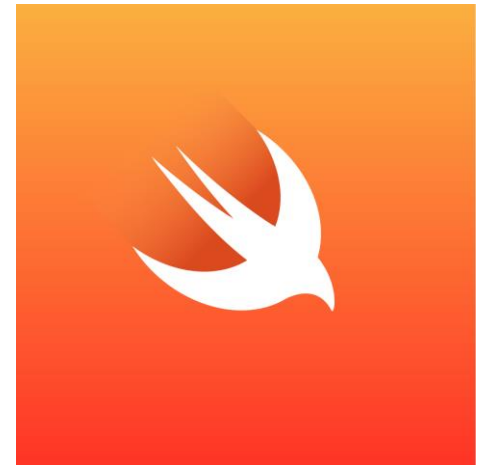
# Kotlin

- ❑ In 2017 Google announced that it will support Kotlin as an alternative first-class language for Android programming.
- ❑ Kotlin is interoperable with Java, and all Java libraries can be called from Kotlin.
- ❑ Kotlin has been called a “**tidier form of Java**”. The learning curve from Java to Kotlin is easier. At an execution level, Kotlin compiles to Java Bytecode.



# Swift

- ❑ Apple introduced Swift in 2014 as a language specification.
- ❑ After a major overhaul in 2016, Swift surpassed Objective-C as the language to write native iOS apps. Though Swift and Objective-C can coexist, Apple has stated that **Swift is the new default choice for developing iOS apps.**
- ❑ Swift is an easier, simpler, and a more compact language compared to Objective-C, but developers can move between both.



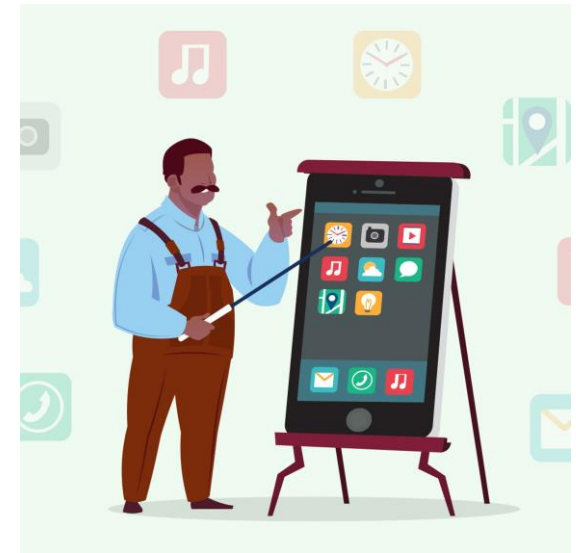
# Differences in design

Simplicity, compactness and minimalism are the three major pillars of all mobile app design.

The goal of this process is to organically integrate the app's design into the user's patterns for interacting with the target platform.

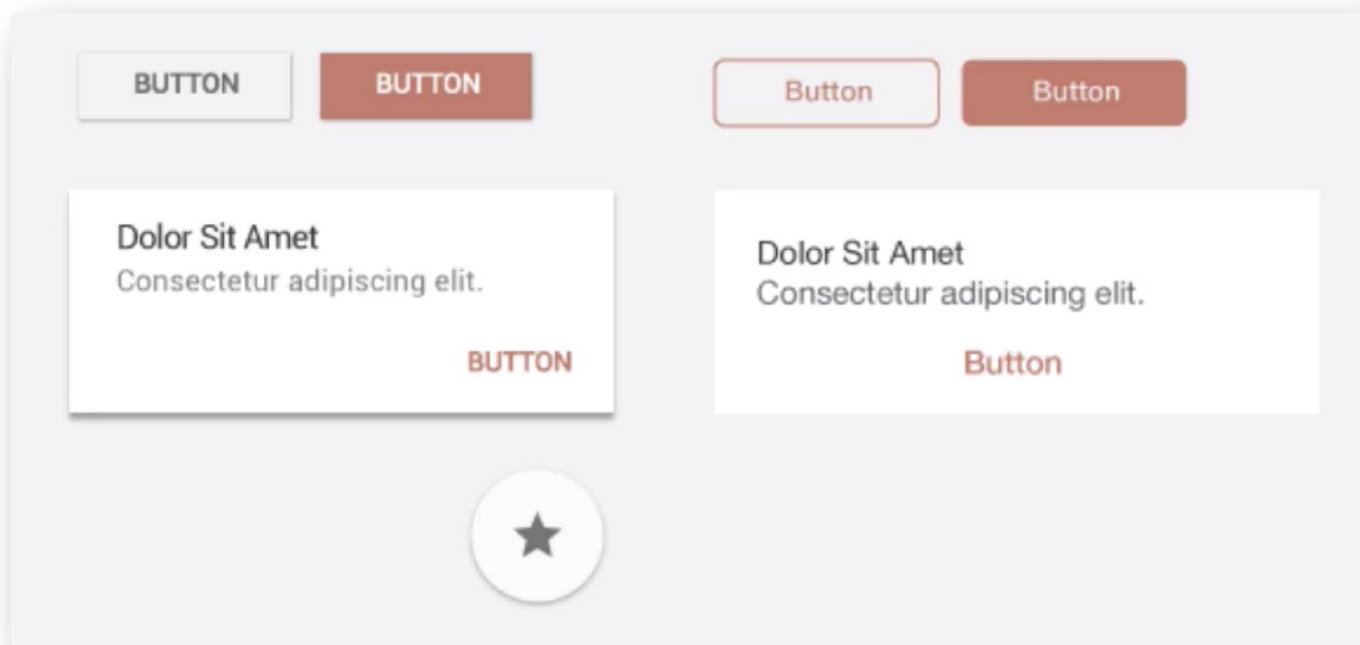
In addition, adaptation simplifies development because it makes it possible to use the platform's native components.

**Knowing your user's preference is important is key.**





# Which is which?



# HIG vs. MD

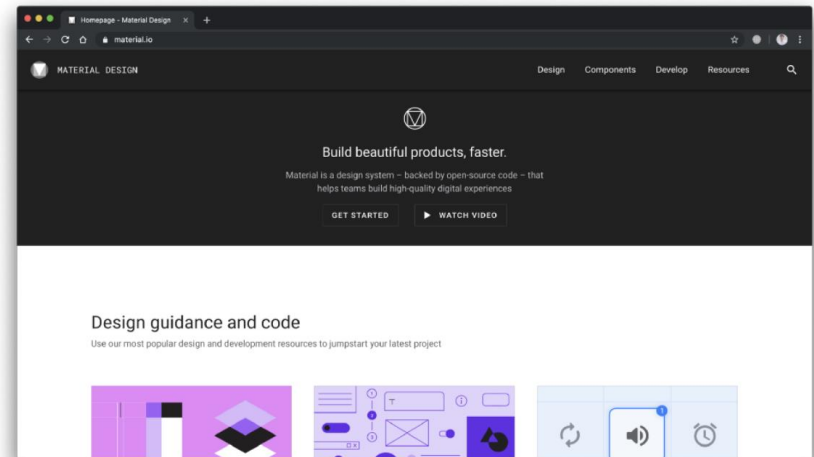
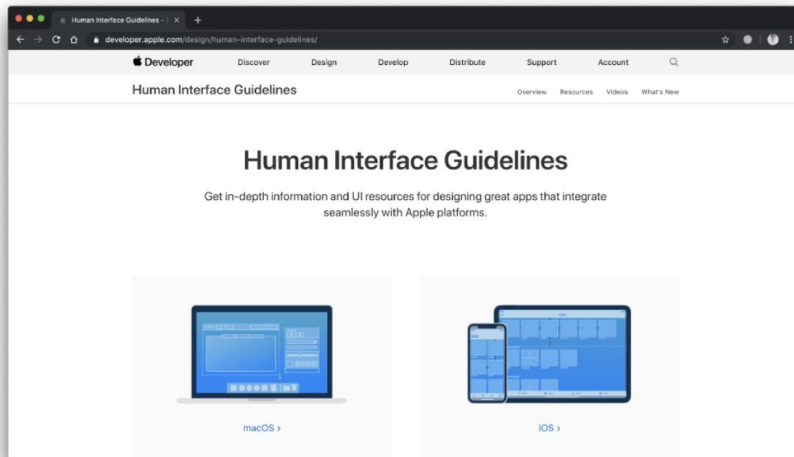
□ On the conceptual level, we can boil them down to the following:

## Human Interface Guidelines:

Is all about flat, light, friendly design, with a focus in consistency across their

## Material Design:

Use bold, graphical, conscious; flexible foundation and cross-platform functionality.



# Typography

## Typography

Roboto Thin  
Roboto Light  
Roboto Regular  
**Roboto Medium**  
**Roboto Bold**  
**Roboto Black**  
*Roboto Thin Italic*  
*Roboto Light Italic*  
*Roboto Italic*  
*Roboto Medium Italic*  
*Roboto Bold Italic*  
*Roboto Black Italic*

San Francisco Ultralight  
San Francisco Thin  
San Francisco Light  
San Francisco Regular  
San Francisco Medium  
San Francisco Semibold  
San Francisco Bold  
San Francisco Heavy  
San Francisco Black

**Android**

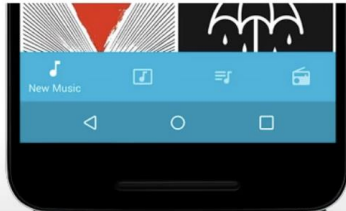
**iOS**

# Navigation

**Physical**

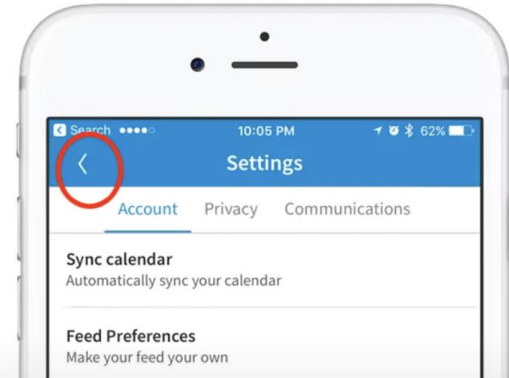


**Digital**



**AT THE BOTTOM**

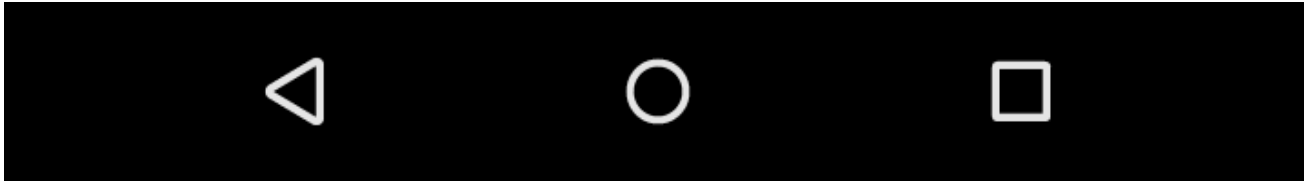
**Android**



**TOP LEFT**

**iOS**

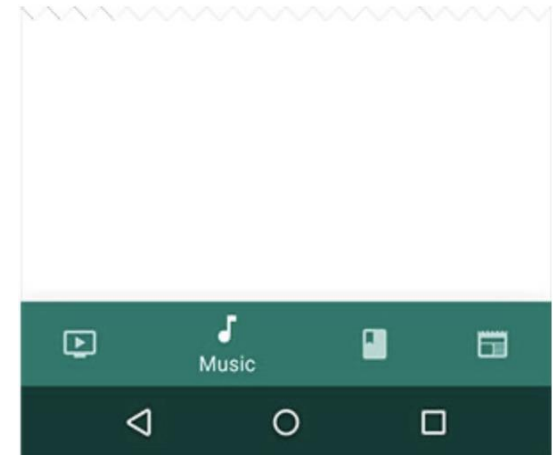
# Android Navigation Bar



Either physically built into the smartphone or part of the interface.

The user can use the arrow to move one step backward chronologically (reverse chronological navigation).

Navigation occurs the same way within an app or between apps.



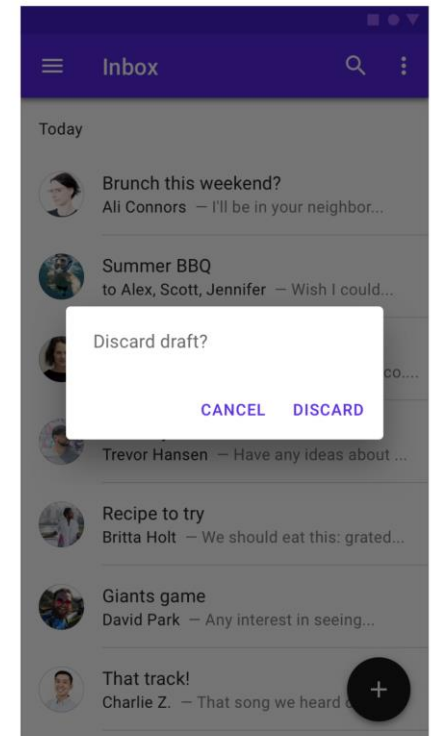
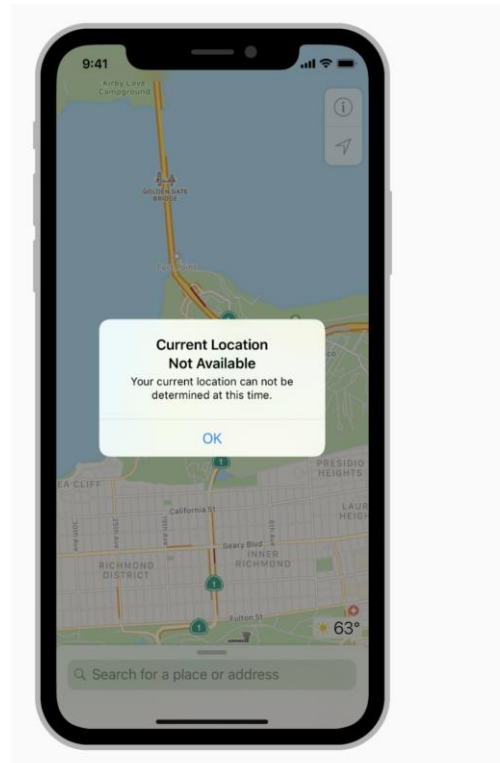
# Alerts and Dialogs

Alerts and Dialogs have some similarities across, but are different for the developer.

iOS only has “Alerts”

Android have three (Snackbars, Banners and Dialogs).

Language and information are important at this stage (check documentation) and are common routes for **rejected apps** from the respective app stores.



# Differences in design

An example of an iOS app ported directly to an Android store.

Bad design is present throughout.

Hardware buttons are ignored. It is likely our user will press something by accident.

You will become familiar with the one you use, and it may seem alien to you but remember, each OS has millions of active users.

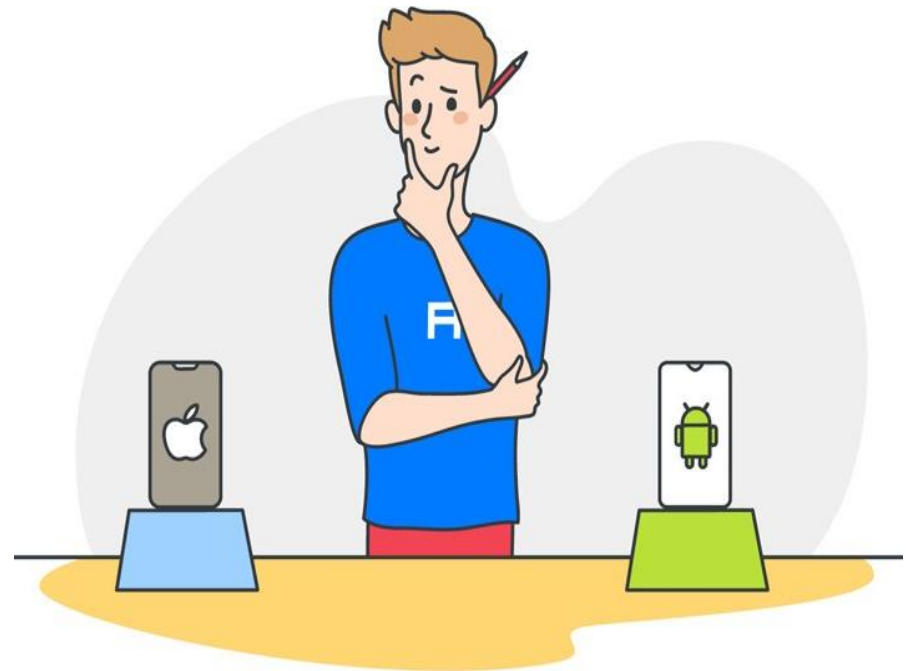


# Basically, the same...?

Apart from some navigation methods, both OS offer the same opportunities to developers / designers.

Issues only really occur from bad design from the developer, **not because of the OS.**

Read the appropriate OS design documentation to learn more.





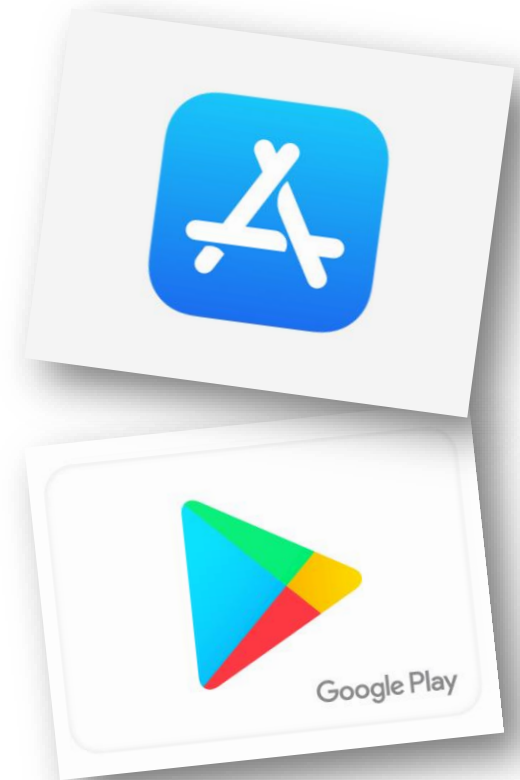
# We are all app rich!

There were around 3.48 million apps on Google Play in late 2021 and 2.22 million on the Apple App Store (Statista, 2021).

The App Store has a greater share of high-quality apps and games.

It is easier and cheaper for developers to get apps on Google Play.

Total revenue made on the App Store is far greater, giving publishers a greater incentive to create ultra-high-quality iPhone apps.



# We are all app rich!

Optimizing for iPhone is also simpler. **19 iPhone** models since 2016, but **100's of Android** phones, all with different hardware and software (a development headache).

iPhone users have a greater willingness to actually pay for apps, means we end up with more high-end productions.

Apple also offers Apple Arcade at £4.99 a month. This is intended to let users get away from the endless 'free to play' games. Such apps still dominate both app stores.

Google's more open approach to apps comes with benefits. You won't find game console emulator apps on the App Store. Apple doesn't allow them...but there are ways....



# Is Android slower?

- ❑ It was, but Android and iOS are getting closer now.
- ❑ But it is still a complex topic and can vary based on several factors
- ❑ Hardware Variability
  - Android runs on a wide range of devices manufactured by various companies, leading to diverse hardware specifications. In contrast, iOS is designed exclusively for Apple devices, allowing for tighter hardware-software integration.
- ❑ Optimization:
  - iOS is optimized specifically for Apple hardware, as Apple controls both the hardware and software. This can result in a more streamlined and efficient performance compared to Android, which must accommodate a variety of hardware configurations.

# Is Android slower?

- ❑ Fragmentation:
  - Android faces greater fragmentation due to the multitude of device manufacturers and models, each with different hardware specifications and software versions. This fragmentation can make it challenging to optimize software for every possible device configuration.
- ❑ Resource Management:
  - iOS tends to be more aggressive in managing system resources. Apple's control over the entire ecosystem allows for efficient resource allocation. Android, being an open-source platform, may face challenges in resource management across different devices.
- ❑ Updates and Upgrades:
  - Apple has a more centralized and controlled system for delivering updates to all compatible devices simultaneously. Android updates, on the other hand, depend on device manufacturers and carriers, leading to delays in software upgrades.

# Is Android slower?

- ❑ User Experience Philosophy:
  - Apple places a strong emphasis on delivering a consistent and smooth user experience. The company tightly controls design guidelines, app quality, and system performance. Android, being more open, allows for greater customization but may result in a less uniform user experience.
- ❑ App Optimization:
  - Some argue that iOS apps are often optimized more thoroughly for the platform, contributing to a perception of smoother performance. This can be attributed to the strict app review process and design guidelines enforced by Apple.
- ❑ Background Processes:
  - Android's flexibility allows for more background processes and multitasking, which can impact performance compared to iOS, which is more restrictive in background activities.