

# Mobile Application Development

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Produced  
by

David Drohan ([ddrohan@wit.ie](mailto:ddrohan@wit.ie))

Department of Computing & Mathematics  
Waterford Institute of Technology  
<http://www.wit.ie>



Waterford Institute *of* Technology  
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRCE



# Introducing Android

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Part 1



# Agenda

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- Background & History
- Latest Features
- The Mobile OS War

# Background

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- Android is a comprehensive open source platform designed for mobile devices
- It is championed by Google and owned by the Open Handset Alliance (84 companies, next Slide)
- The goal of the alliance is to “accelerate innovation in mobile and offer consumers a richer, less expensive, and better mobile experience.” (November 2007)

## Mobile Operators



## Software Companies



## Commercialization Companies



WIND RIVER



TELECA



## Semiconductor Companies



## Handset Manufacturers

Open Handset Alliance  
<http://www.openhandsetalliance.com>

# Background

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- Android, along with iOS, has (and continues to) revolutionise the mobile space.
- Unlike iOS however, Android is an open platform that separates the hardware from the software that runs on it.
- This allows for a much larger number of devices to run the same applications and creates a much richer ecosystem for developers and consumers.



ANDROID WEAR



PHONES



TABLETS



ANDROID TV



ANDROID AUTO

# Designed for Mobile Devices

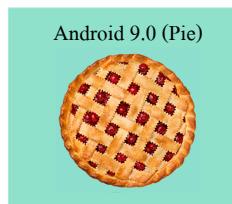
- When designing Android, the team looked at which mobile device constraints were likely *not going to change* for the foreseeable future:
  - Battery* power, and *battery* performance is probably not going to get massively better anytime soon
  - In general, the small *size* of mobile devices means that they will always be limited in terms of memory and speed
  - However, a device's screen size, resolution, chipset may vary considerably
- These constraints have been taken into consideration throughout the platform.



# Android History / Versions so Far \*



# Android History / Versions so Far \*



Android 10  
(API 29)  
as of September 3rd 2019?

# Versions – API Level \*

- The Android version number itself partly tells the story of the software platform's major and minor releases. **What is most important is the API level.** Version numbers change all the time, sometimes because the APIs have changed, and other times because of minor bug fixes or performance improvements.
- As an application developer, you will want to make sure you know which API level your application is targeting in order to run. **That API level will determine which devices can and cannot run your application.**

<https://developer.android.com/about/dashboards>

Version	Codename	API	Distribution
2.3.3 - 2.3.7	Gingerbread	10	0.3%
4.0.3 - 4.0.4	Ice Cream Sandwich	15	0.3%
4.1.x	Jelly Bean	16	1.2%
4.2.x		17	1.5%
4.3		18	0.5%
4.4	KitKat	19	6.9%
5.0	Lollipop	21	3.0%
5.1		22	11.5%
6.0	Marshmallow	23	16.9%
7.0	Nougat	24	11.4%
7.1		25	7.8%
8.0	Oreo	26	12.9%
8.1		27	15.4%
9	Pie	28	10.4%

*Data collected during a 7-day period ending on May 7, 2019.  
Any versions with less than 0.1% distribution are not shown.*

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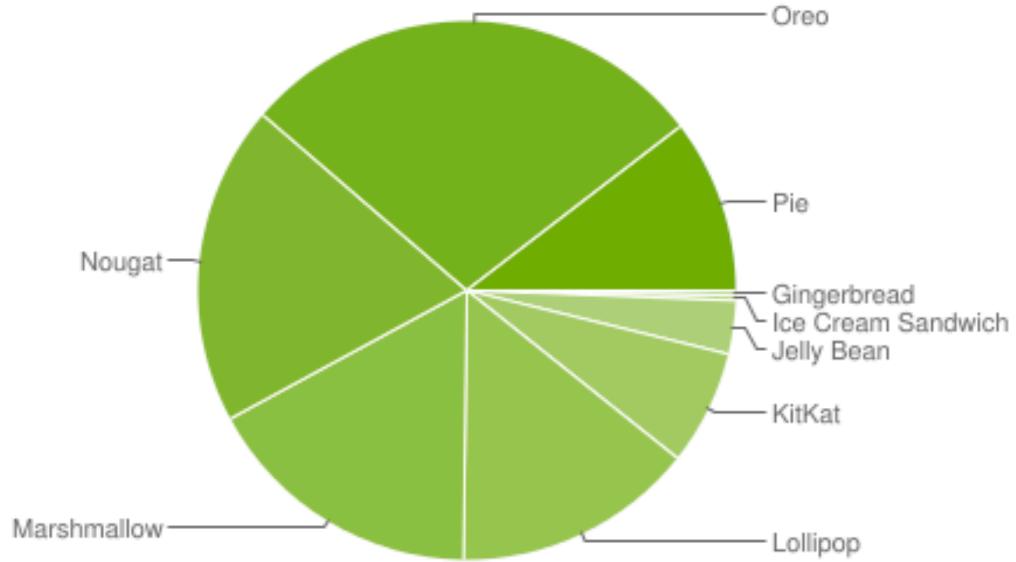
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# Versions – Platforms \*

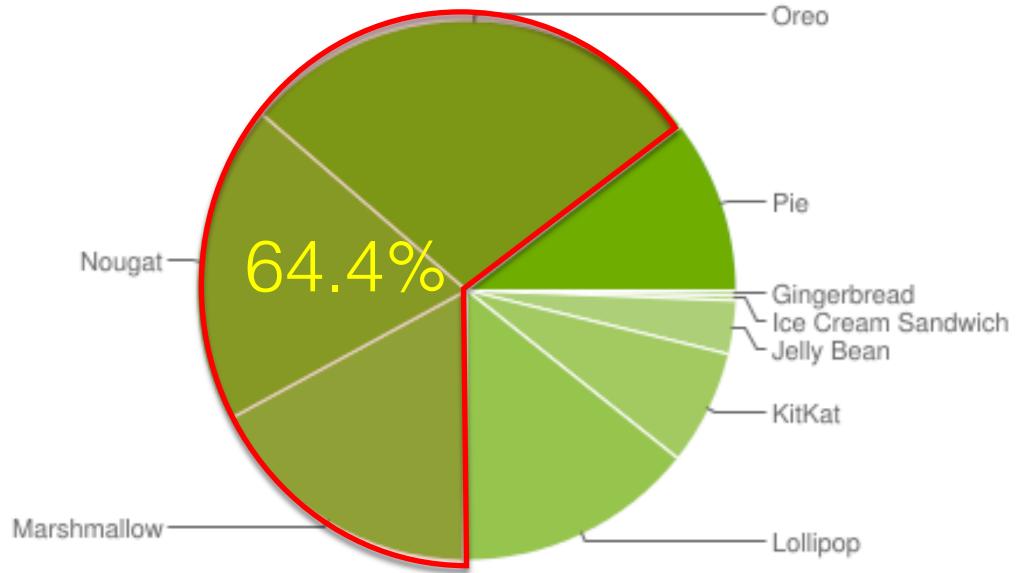
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# Versions – Platforms \*

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# Target Version

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- A developer's objective may be to have an application run on as many devices as possible.
  - shoot for the lowest API level possible. But keep in mind the distribution of Android versions on real devices out there.
- There are a lot of users (64.4%) of Android 6.x 7.x & 8.x. This places these few versions as the largest versions currently out there.
- This hasn't always been the case because OEMs tended to be very slow in upgrading their OS versions. However, this has changed with Google's strong push to get everyone onto the latest versions.
- However, there are still a not insignificant number of people (10%+) who have anything from the 2.3.3 version to the 4.4 version because they have yet to upgrade their phones to a phone with the hardware capable of handling the newer versions.

# Android Version 10 - Highlights

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- (Un)Official Release Date September 3<sup>rd</sup> 2019  
(1<sup>st</sup> Beta March 13<sup>th</sup>)
- For the first time ever, it won't be named after a sweet, treat or desert
- Rolled out for Google Pixel range (+ some other OEMs, Huawei, OnePlus, LG, Nokia)
- Improvements and updates fall into three main categories:
  - Innovation
  - Security & Privacy, and
  - Digital Wellbeing

# Android Version 10 - Highlights

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- Bid farewell to the back button (uses swipe gestures instead)
- DARK Mode is Official
- Some new theming options
- Live Caption works ☺ (all done locally on device)
- App permissions getting an overhaul (location a big one)
- There's a new share menu
- Foldable phones are natively supported

# Adoption Rates

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- Android adoption traditionally lags behind Apple's because Apple can make its latest iOS available for all users at once because it makes all the hardware and the software.
- Android, on the other hand, is much more fragmented. Because Google lets many different hardware makers use its Android software, it can't control when all phones update to the latest software. So, the newest version of Android is always made available for Google's lineup of smartphones and tablets, but it can't release software updates to every single Android phone at once.
- Smartphone manufacturers often add their own modifications to Android, which means that the update needs to be approved by each individual carrier first.
- This means that depending on which phone you own, it could take ages to receive the latest software update.
- Here's the brutal chart:

# Adoption Rates

## What Sets iOS Apart From Android

% of iOS/Android devices running the latest versions of iOS/Android

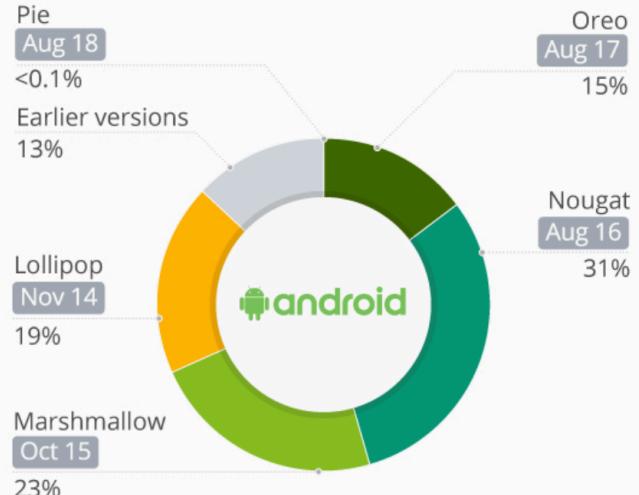


Data collected in the App Store  
on September 3, 2018



@StatistaCharts

Sources: Apple, Google



Data collected in the Google Play Store  
during a 7-day period  
ending on September 12, 2018

statista

[https://www.statista.com/  
chart/5930/adoption-of-  
ios-and-android-  
versions/](https://www.statista.com/chart/5930/adoption-of-ios-and-android-versions/)

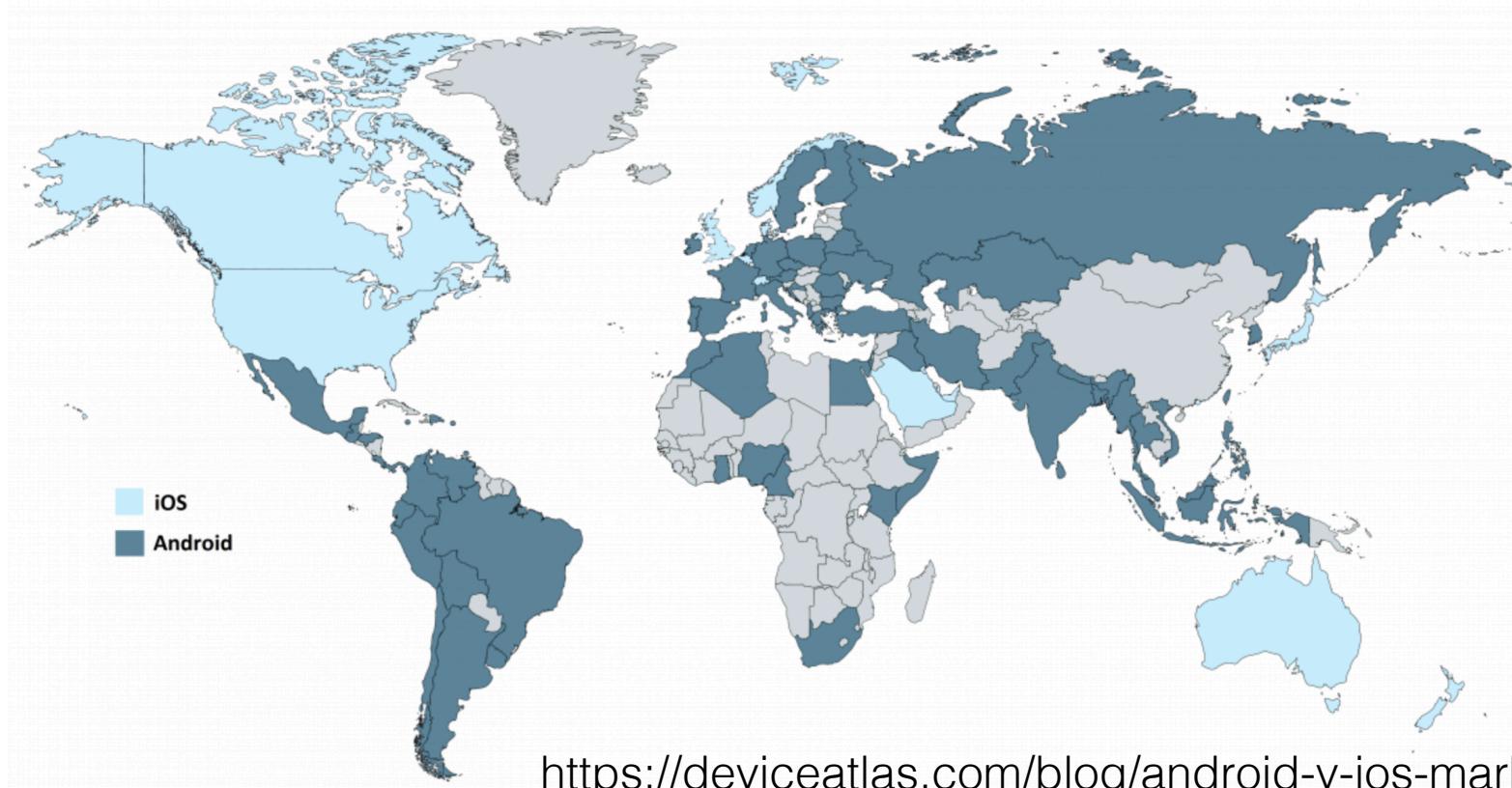
# Adoption Rates (June 04<sup>th</sup> 2019 WWDC)

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- CEO Tim Cook was keen to point out, Apple's latest numbers are in stark contrast to the latest offering from “those other guys.”



# Which Countries Prefer What (31<sup>st</sup> May 2019)

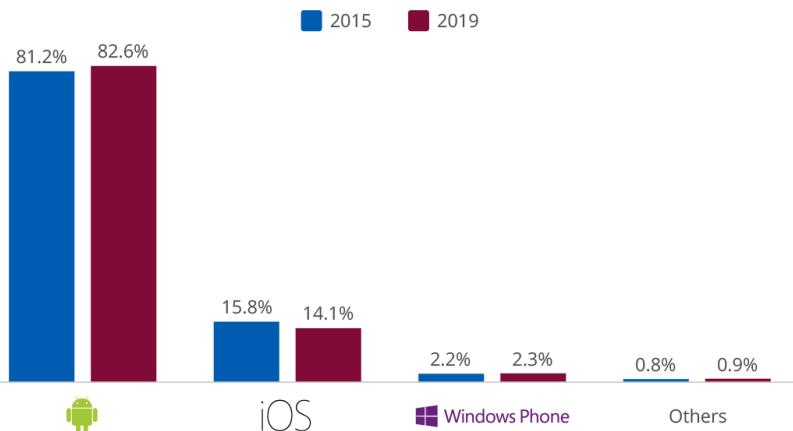


# Market Share Vs App Revenue

Tech  Chart of the Day

## Smartphone Platform Market Share

Worldwide smartphone operating system market share (% of new device shipments)\*

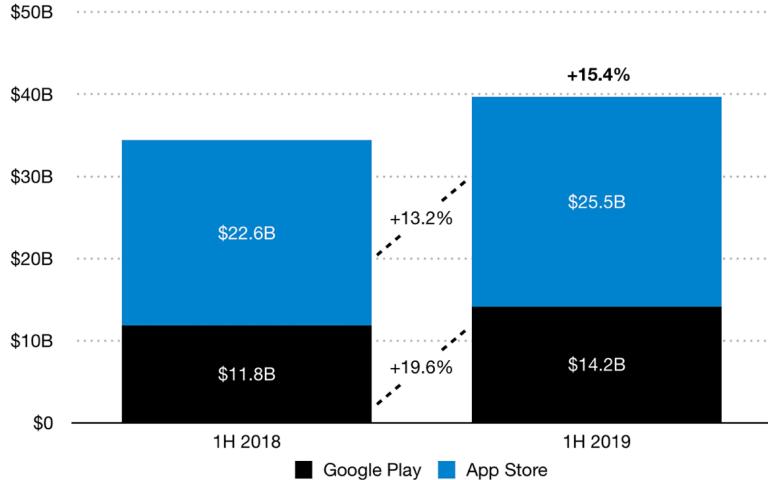


\* Forecast

BUSINESS INSIDER

Source: IDC  statista

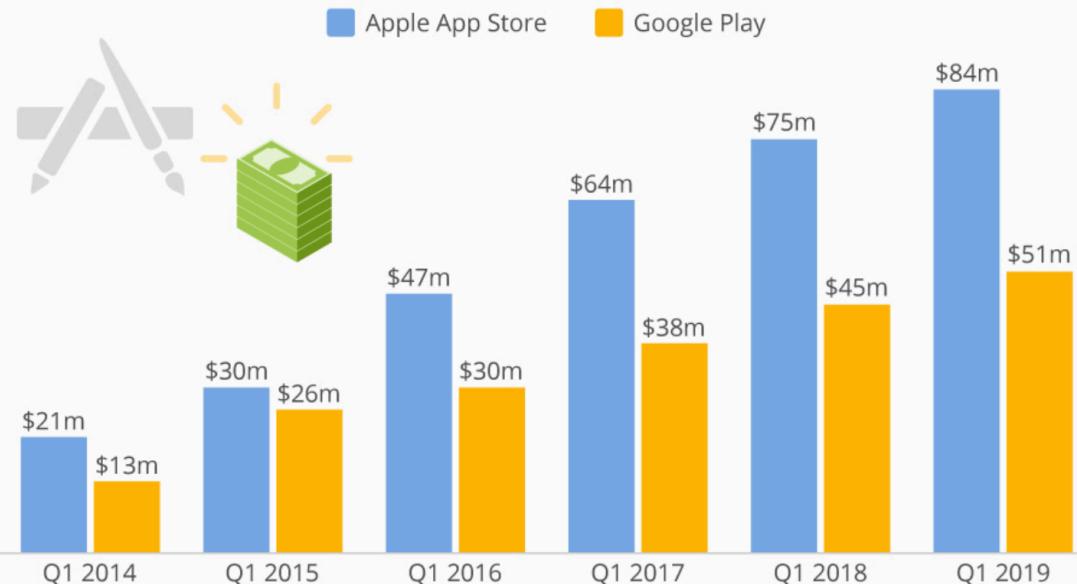
## Worldwide Gross App Revenue - First Half 2019



# App Store Vs Google Play

## Apple's App Store More Lucrative for App Makers

Average gross revenue of the top 100 app publishers, by app store\*



# A Minute on the Internet in 2019

Estimated data created on the internet in one minute



@StatistaCharts

Sources: Lori Lewis & Officially Chad via Visual Capitalist

statista

# References

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- Online references
  - <http://developer.android.com/>
    - By far the most important single reference.
- <https://www.techadvisor.co.uk/news/google-android/android-10-3689677/>
- <https://www.zdnet.com/article/android-10-release-date-features-rumors-and-everything-we-know-so-far/>
- <https://www.statista.com/chart/5930/adoption-of-ios-and-android-versions/>
- [https://www.phonearena.com/news/Apple-iOS-12-adoption-rate-85-percent-Android-comparison\\_id116546](https://www.phonearena.com/news/Apple-iOS-12-adoption-rate-85-percent-Android-comparison_id116546)
- <https://www.express.co.uk/life-style/science-technology/1136137/Android-vs-iOS-Apple-reveals-major-advantage-over-Google>
- <https://www.androidcentral.com/android-q#theme>