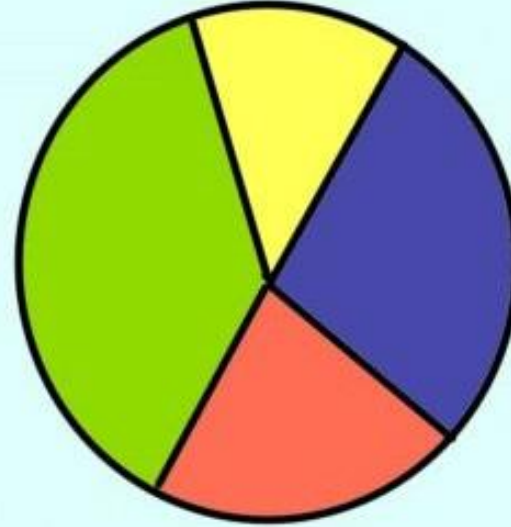

INTRODUZIONE



Corso di
Programmazione di Dispositivi Mobili
prof. Ignazio Gallo

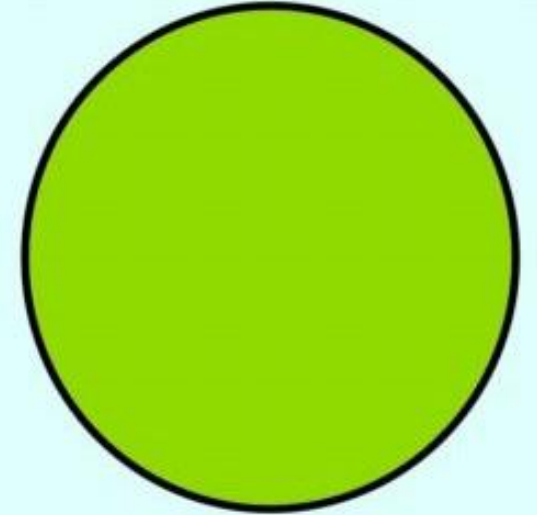
ANDROID OR IPHONE?


**Why people buy an
Android Based Phone**



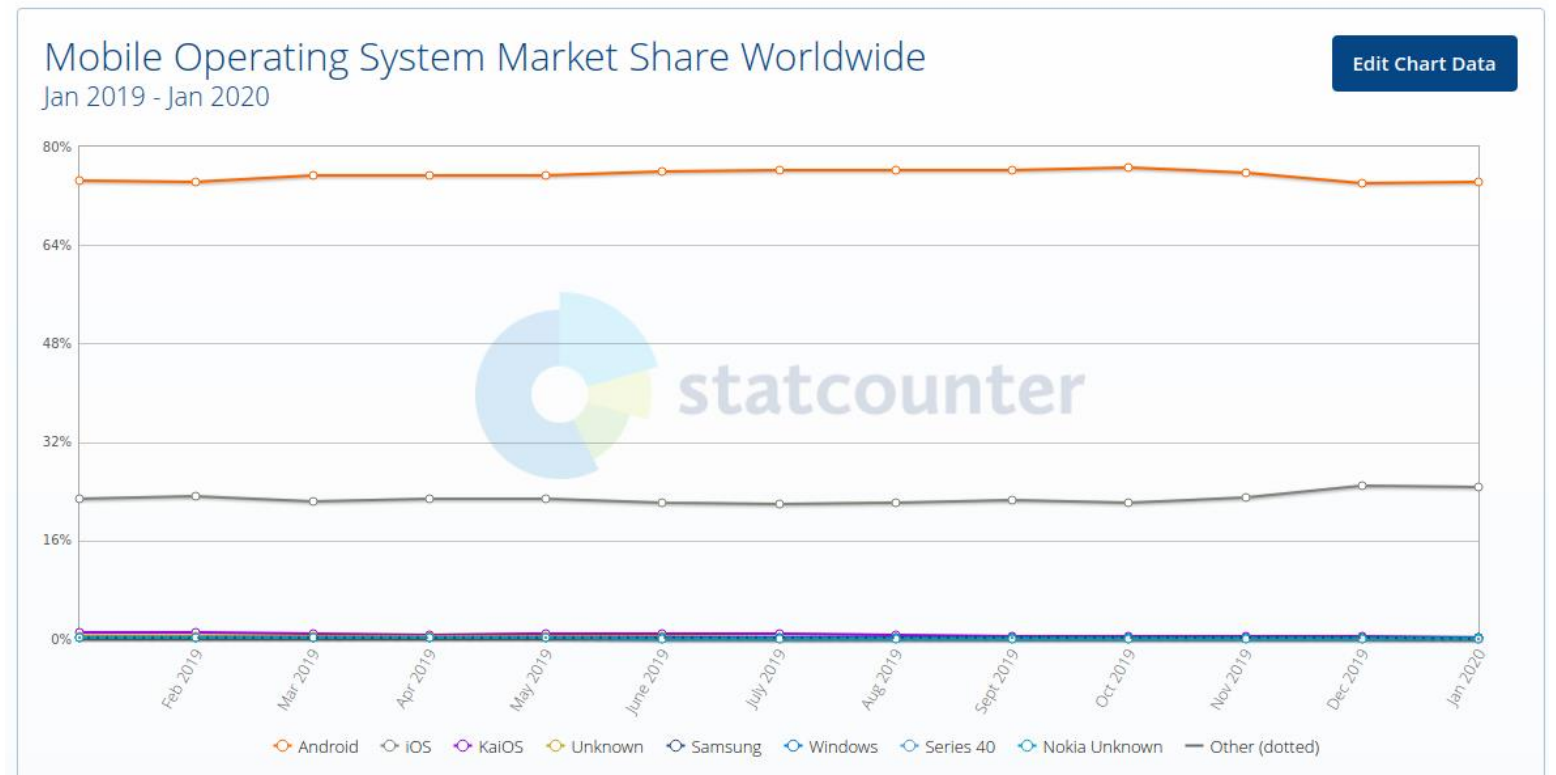
-  **UI Customizability**
-  **Value for Money**
-  **Free Apps**
-  **Free (Pirated) Apps**

**Why people buy an
iPhone**



-  **Because Dude!
It's an iPhone!**

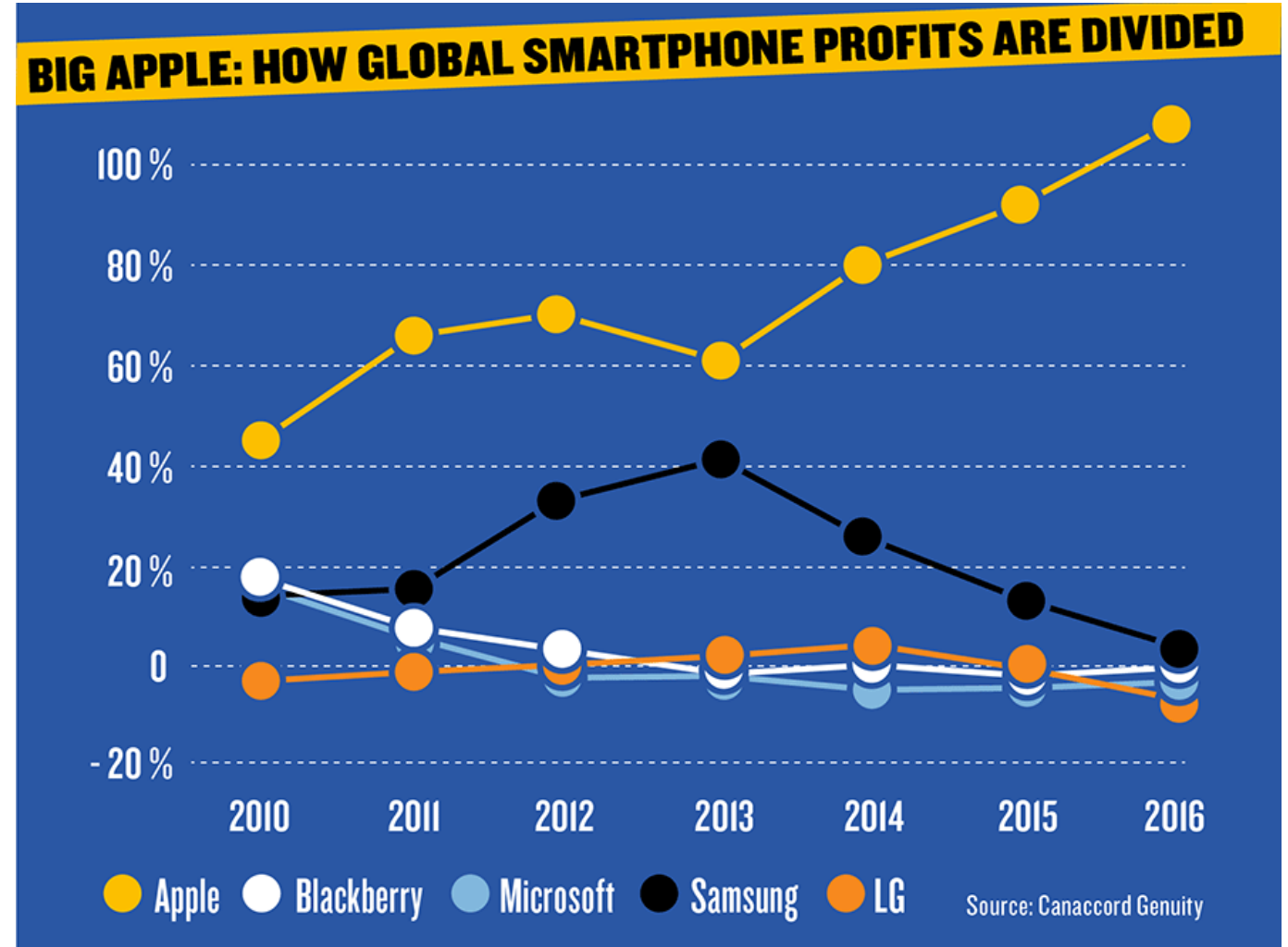
SMARTPHONES OS MARKET SHARE



SMARTPHONES OS MARKET SHARE

- Apple sells just 12.4% of the world's smartphones, but it has been the most valuable company in the world almost continuously since 2010.

Its operating margins are over 40%. In 2015 its revenues reached \$235bn.



CROSS-PLATFORM APP DEVELOPMENT

Why build natively for every different platform, if you can build it once and deploy on as many platforms as you want?



CROSS-PLATFORM APP DEVELOPMENT

Why build natively for every different platform, if you can build it once and deploy on as many platforms as you want?

Parameter	Native Apps	Cross Platform Apps
Cost	High cost of development	Relatively low cost of development
Code Usability	Works for a single platform	Single code can be used on multiple platforms for an easy portability
Device Access	Platform SDK ensures access to device's API without any hindrance	No assured access to all device APIs
UI Consistency	Consistent with the UI components of the device	Limited consistency with the UI components of the device
Performance	Seamless performance, given the app is developed for the device's OS	High on performance, but lags and hardware compatibility issues are not uncommon

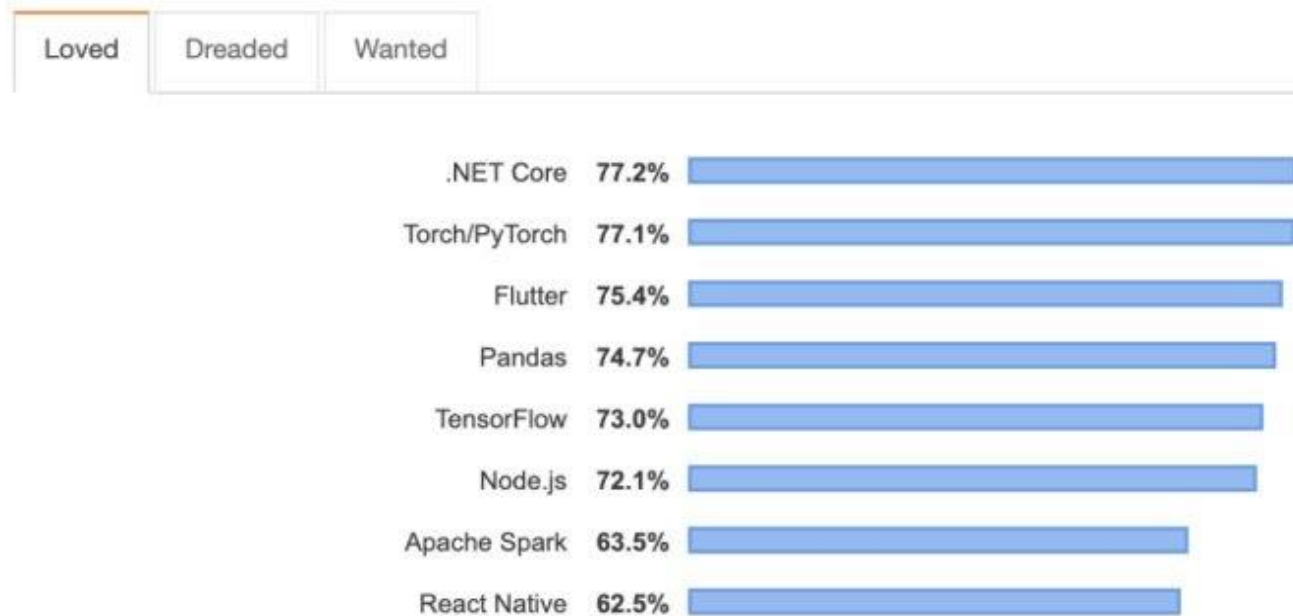
CROSS-PLATFORM APP DEVELOPMENT

Programming Language	Framework
JavaScript	React Native, Cordova, NativeScript, Appcelerator
Dart	Flutter
C#	Xamarin
Java	Codename One
Python	Kivy, BeeWare
Ruby	RubyMotion



CROSS-PLATFORM APP DEVELOPMENT

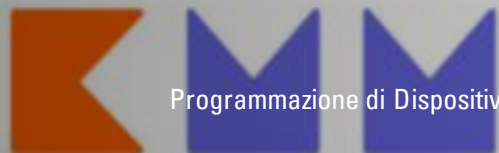
Most Loved Frameworks, Libraries, and Tools



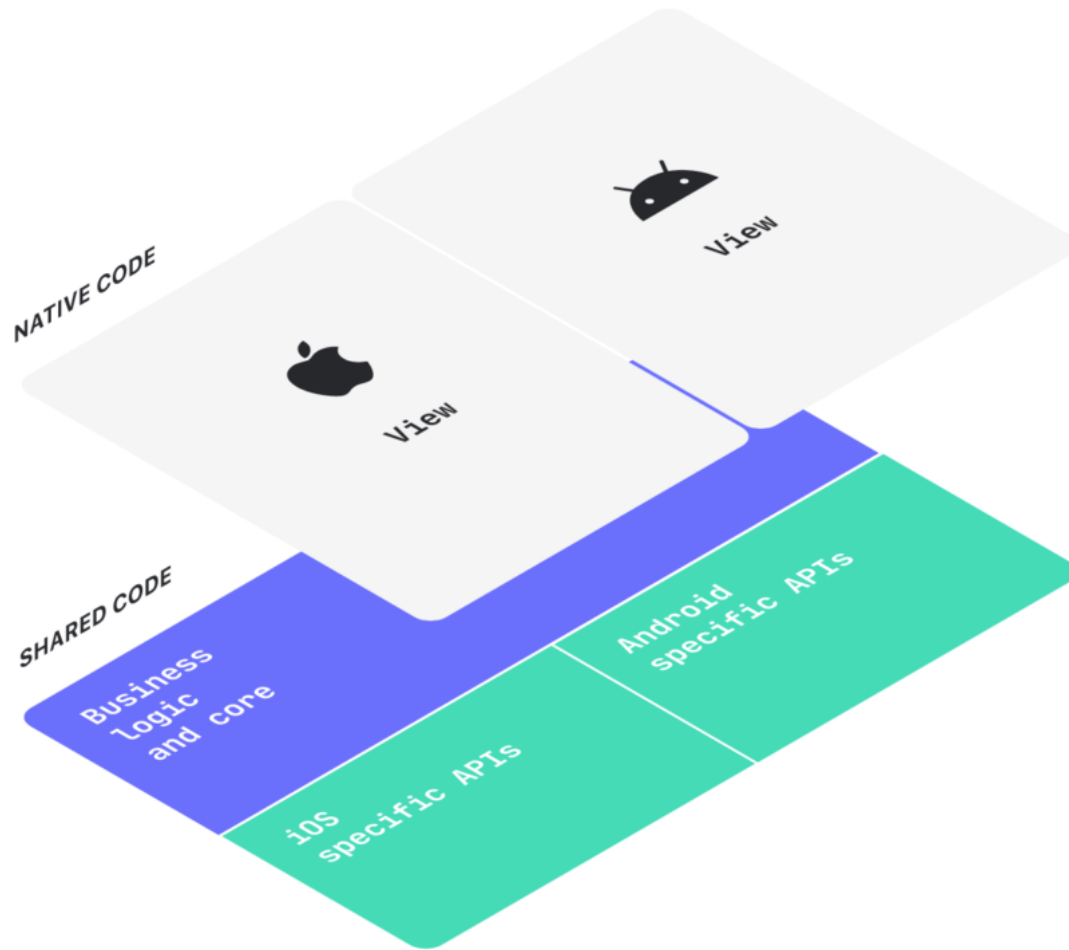
In the [Developer Survey Results](#), Flutter was amongst the top 3 most loved frameworks. Additionally, it added more competition to the already decreasing popularity of the React Native framework.



KOTLIN MULTIPLATFORM MOBILE



KOTLIN MULTIPLATFORM MOBILE

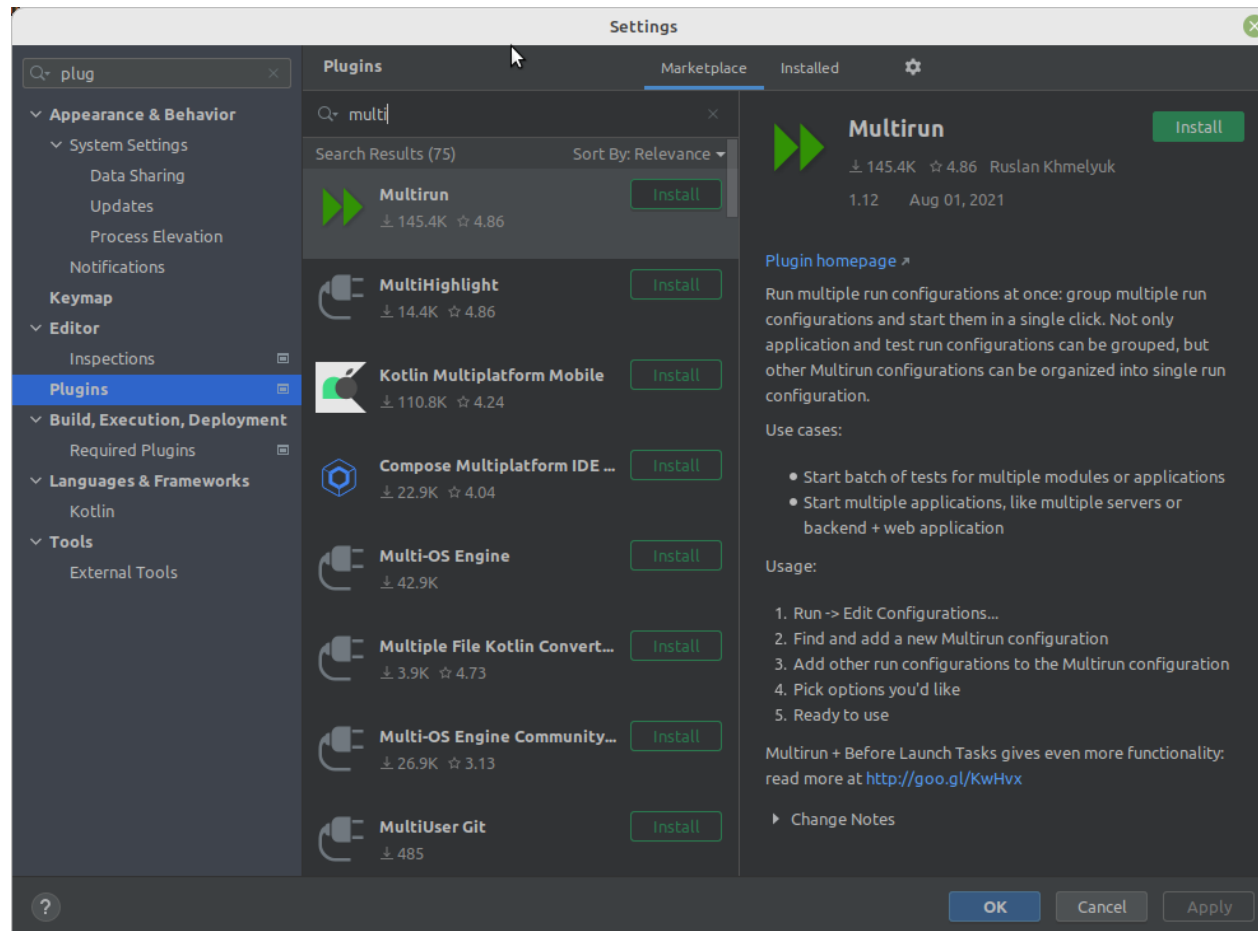


Kotlin Multiplatform Mobile (**KMM**) is an **SDK** designed to simplify the development of cross-platform mobile applications.

You can **share common code** between **iOS and Android apps** and **write platform-specific code only where it's necessary**.

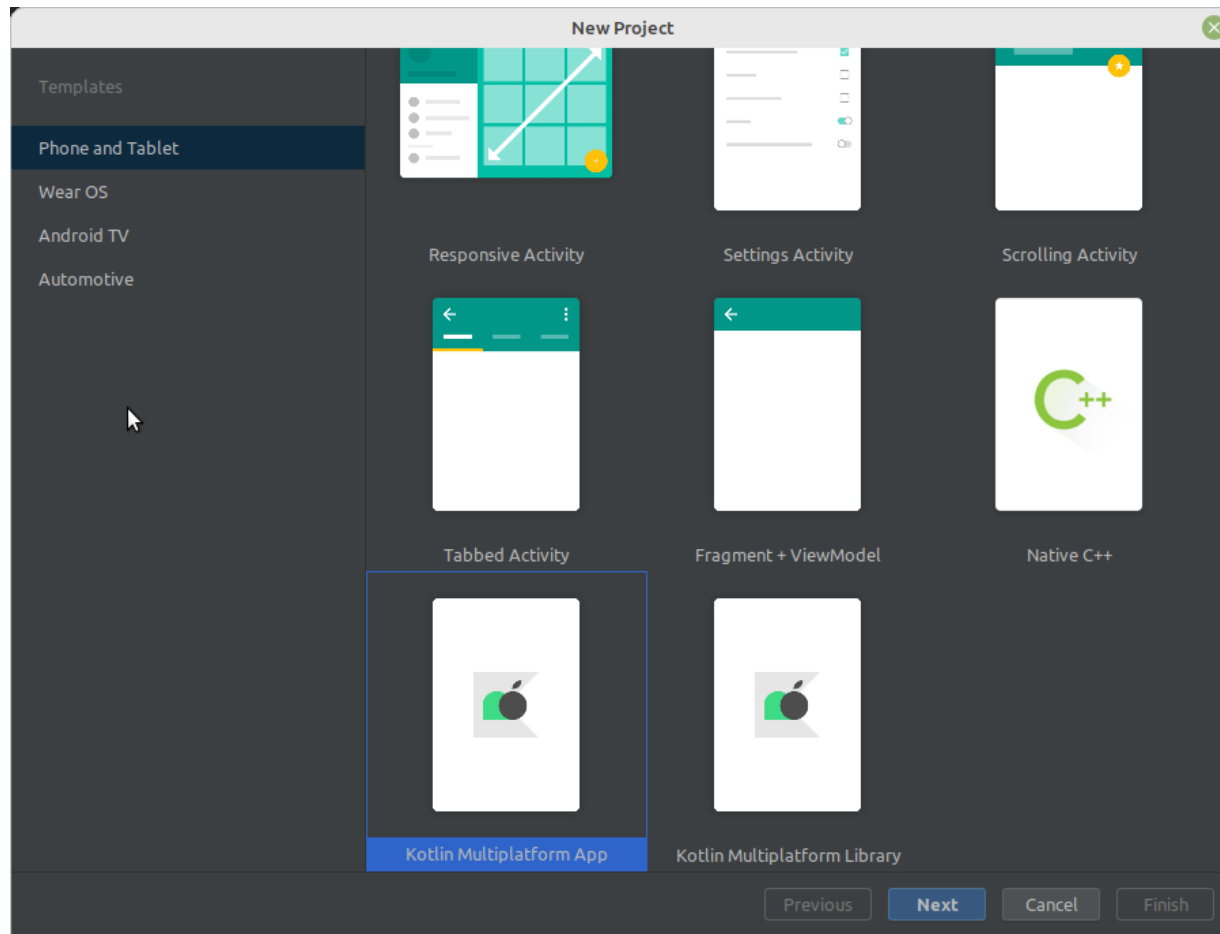
For example, to implement a **native UI** or when working with platform-specific **APIs**.

KOTLIN MULTIPLATFORM MOBILE



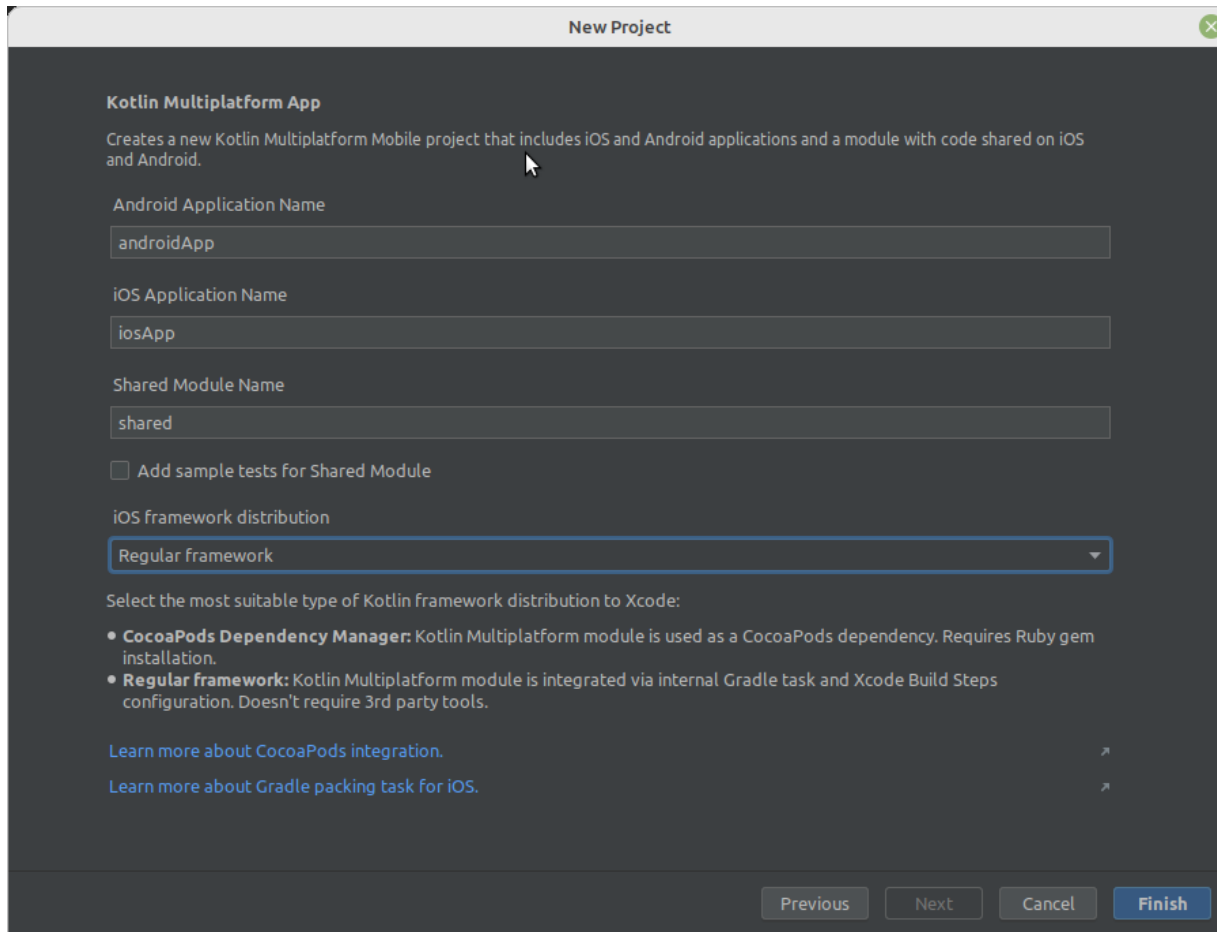
- Install Kotlin Multiplatform Mobile (**KMM**) plugin

KOTLIN MULTIPLATFORM MOBILE



- Install Kotlin Multiplatform Mobile (KMM) plugin
- Create a new "Kotlin Multiplatform App" Project

KOTLIN MULTIPLATFORM MOBILE



The screenshot shows the 'New Project' dialog in Android Studio. The title bar says 'New Project'. The main heading is 'Kotlin Multiplatform App'. Below it, a description states: 'Creates a new Kotlin Multiplatform Mobile project that includes iOS and Android applications and a module with code shared on iOS and Android.' There are three text input fields: 'Android Application Name' with 'androidApp', 'iOS Application Name' with 'iosApp', and 'Shared Module Name' with 'shared'. Below these is a checkbox labeled 'Add sample tests for Shared Module' which is unchecked. Then there is a dropdown menu for 'iOS framework distribution' with 'Regular framework' selected. Below the dropdown, a note says 'Select the most suitable type of Kotlin framework distribution to Xcode:'. There are two bullet points: 'CocoaPods Dependency Manager' and 'Regular framework'. At the bottom, there are two links: 'Learn more about CocoaPods integration.' and 'Learn more about Gradle packing task for iOS.'. At the very bottom are four buttons: 'Previous', 'Next', 'Cancel', and 'Finish'.

Kotlin Multiplatform App

Creates a new Kotlin Multiplatform Mobile project that includes iOS and Android applications and a module with code shared on iOS and Android.

Android Application Name
androidApp

iOS Application Name
iosApp

Shared Module Name
shared

☐ Add sample tests for Shared Module

iOS framework distribution
Regular framework

Select the most suitable type of Kotlin framework distribution to Xcode:

- **CocoaPods Dependency Manager:** Kotlin Multiplatform module is used as a CocoaPods dependency. Requires Ruby gem installation.
- **Regular framework:** Kotlin Multiplatform module is integrated via internal Gradle task and Xcode Build Steps configuration. Doesn't require 3rd party tools.

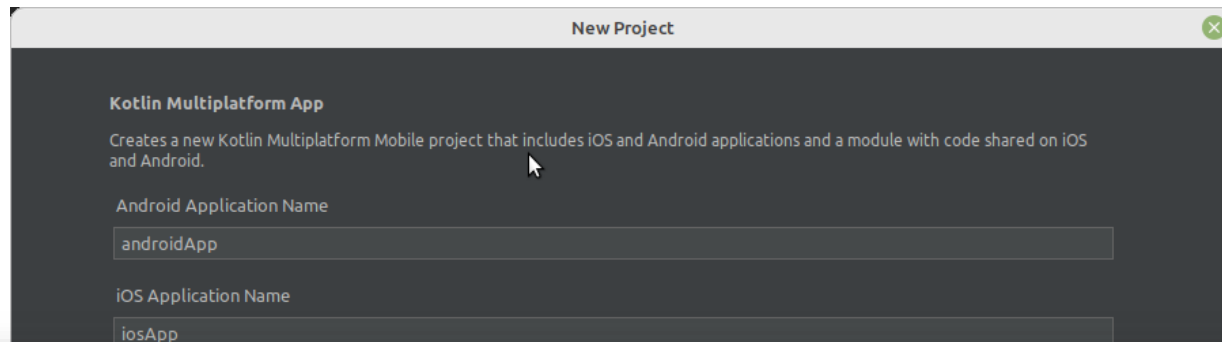
[Learn more about CocoaPods integration.](#)

[Learn more about Gradle packing task for iOS.](#)

Previous Next Cancel Finish

- Install Kotlin Multiplatform Mobile (KMM) plugin
- Create a new "Kotlin Multiplatform App" Project
- Choose "Regular framework" to leverage on Gradle task

KOTLIN MULTIPLATFORM MOBILE



Kotlin Multiplatform Mobile plugin releases

[Edit page](#) Last modified: 16 February 2022

Since Kotlin Multiplatform Mobile is now **in Alpha** we are working on stabilizing the corresponding plugin for [Android Studio](#) and will be regularly releasing new versions that include new features, improvements, and bug fixes.

Ensure that you have the latest version of the Kotlin Multiplatform Mobile plugin!

- Install Kotlin Multiplatform Mobile (**KMM**) plugin
- Create a new "**Kotlin Multiplatform App**" Project
- Choose "**Regular framework**" to leverage on Gradle task
- **You need Xcode & MacOS to run iOS App**

KOTLIN - EXPRESSIVENESS

With Kotlin, the most common patterns are covered by default in the language.

```
1 data class Artist(  
2     var id: Long,  
3     var name: String,  
4     var url: String,  
5     var mbid: String)
```



```
1 public class Artist {  
2     private long id;  
3     private String name;  
4     private String url;  
5     private String mbid;  
6  
7     public long getId() {  
8         return id;  
9     }  
10  
11     public void setId(long id) {  
12         this.id = id;  
13     }  
14  
15     public String getName() {  
16         return name;  
17     }  
18 }
```



```
19     public void setName(String name) {  
20         this.name = name;  
21     }  
22  
23     public String getUrl() {  
24         return url;  
25     }  
26  
27     public void setUrl(String url) {  
28         this.url = url;  
29     }  
30  
31     public String getMbid() {  
32         return mbid;  
33     }  
34  
35     public void setMbid(String mbid) {  
36         this.mbid = mbid;  
37     }  
38 }
```

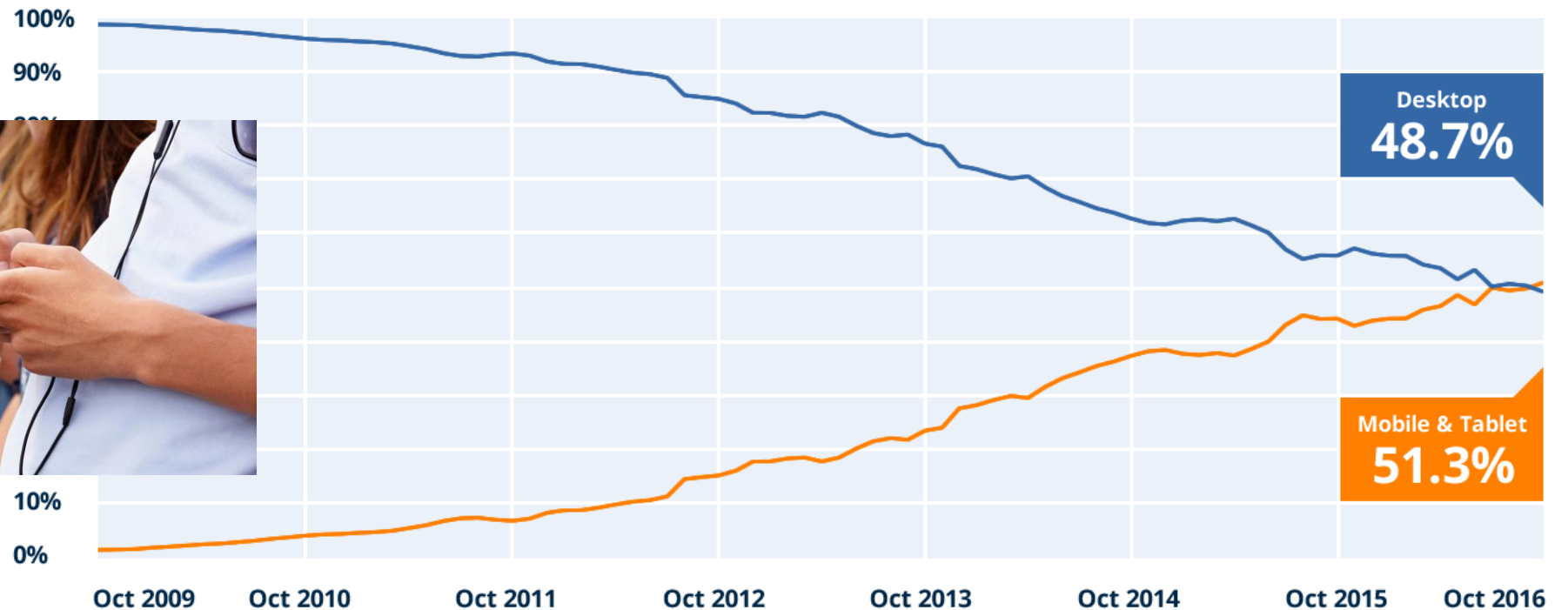
MOBILE DEVICES AND INTERNET



Internet Usage Worldwide

October 2009 – October 2016

■ Desktop ■ Mobile & Tablet



ANDROID: WHAT ?

Android is a platform for mobile devices including:

- Operating system
- Middleware
- Applications
- SDK (Software Development Kit)



ANDROID: TYPES?

Currently, the Android operating system is divided into 5 types:

- Android – for smartphone and tablets (AOSP).
- Android TV – for televisions
- Android Auto – for connected cars
- Android Wear – for connected wristwatches
- Project Brillo – embedded Android OS for low-power and memory constrained IoT devices

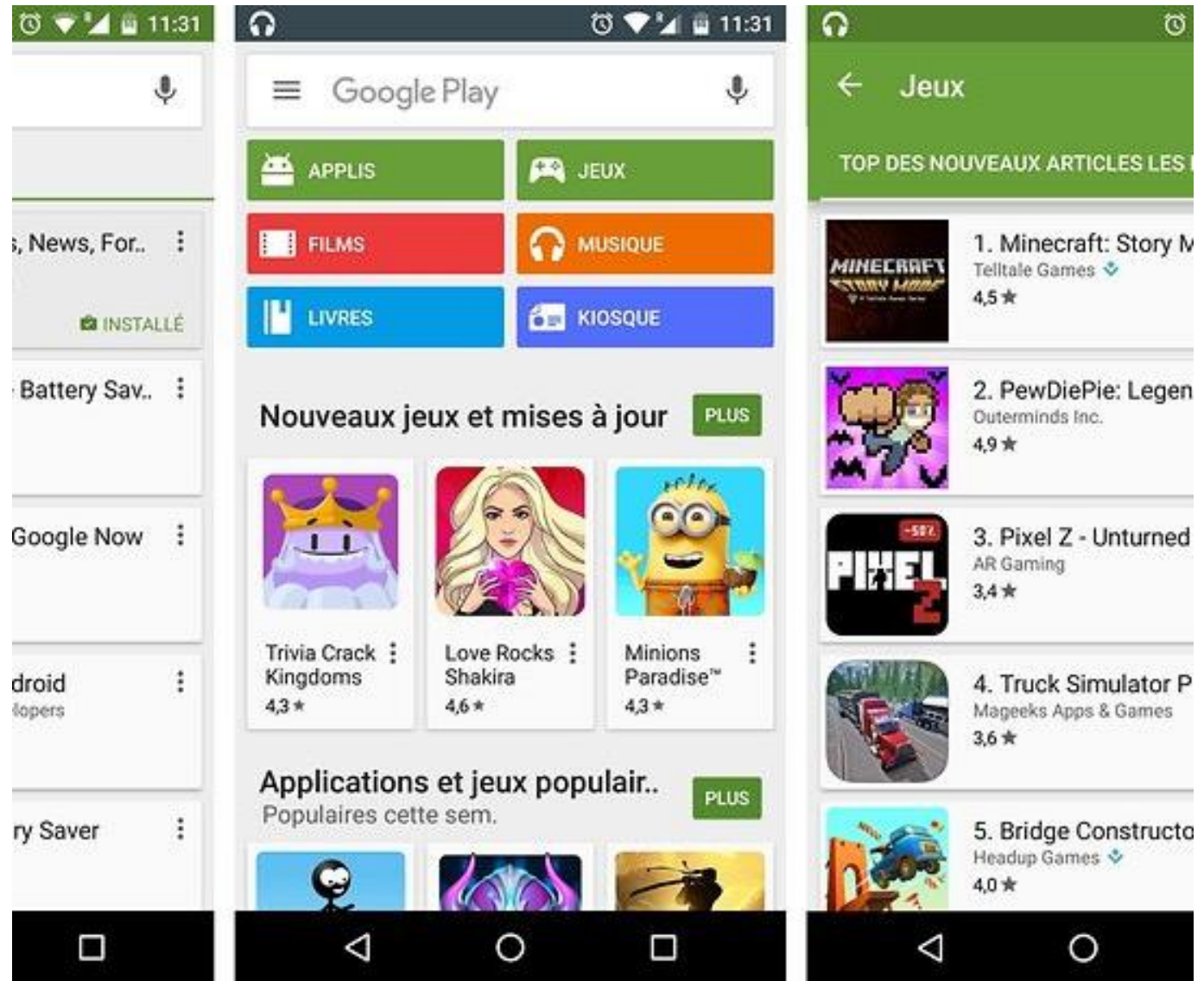


GOOGLE PLAY

Definition: Google Play is the digital and multimedia content distribution channel of Google.

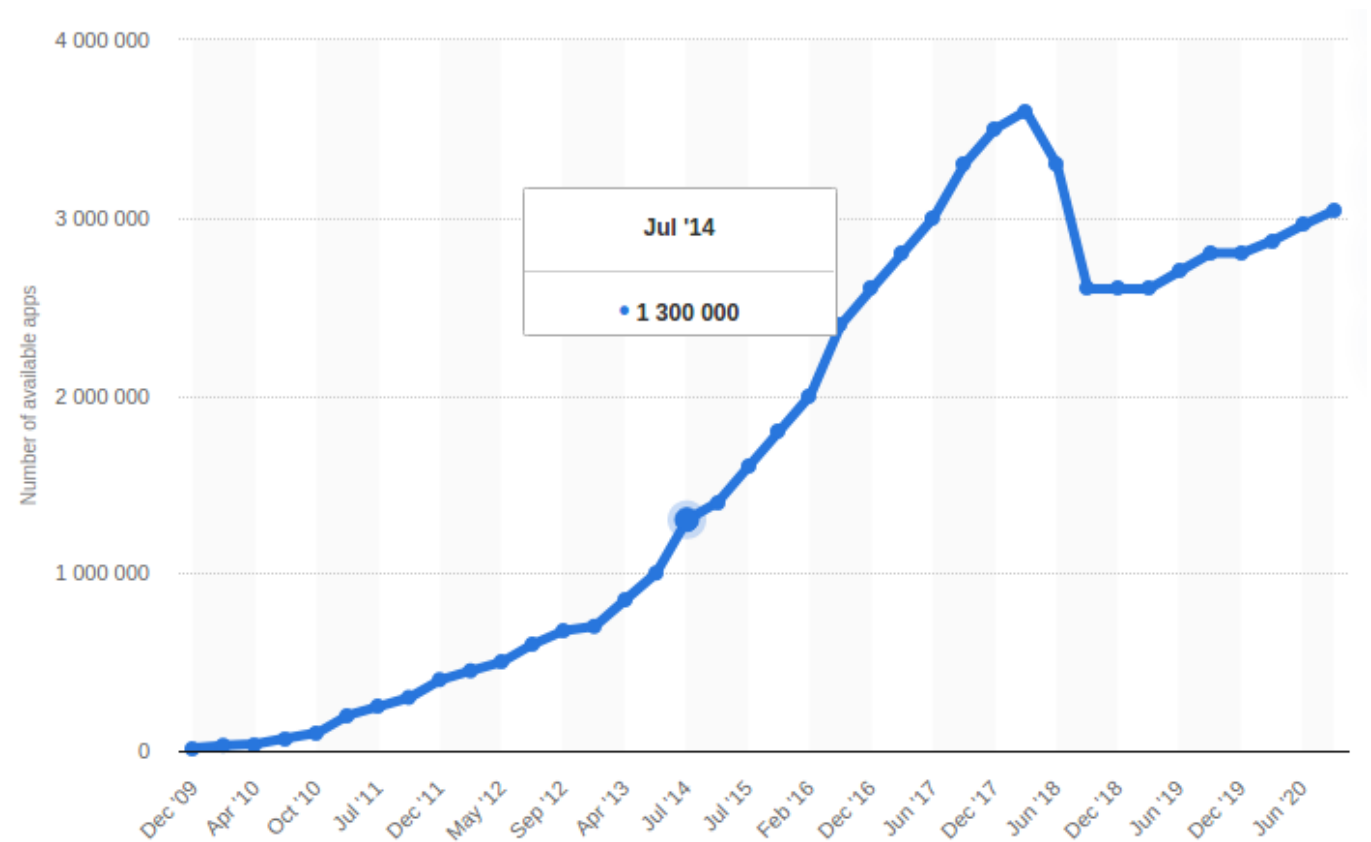
This service includes:

- online store for books, music and movies;
- a cloud media player and
- an Android app store



NUMBER OF AVAILABLE APPLICATIONS IN THE GOOGLE PLAY STORE

- 2009-2020, Google Play features over 3.5 million Android applications.
- The actual number of available apps is 3.04 million apps



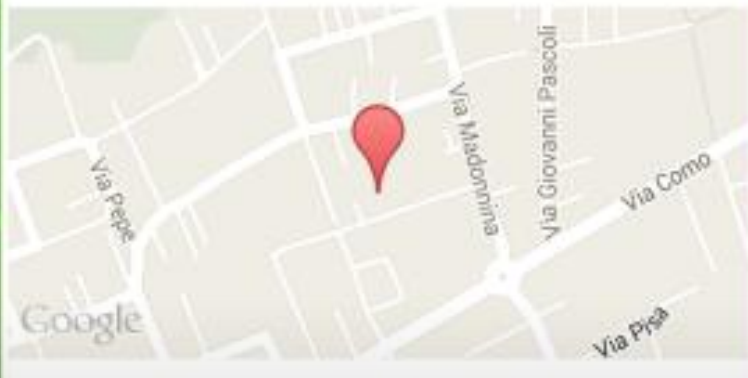
UNINSUBRIA APP EXAMPLE

Ti trovi qui:

X: 45.6813556

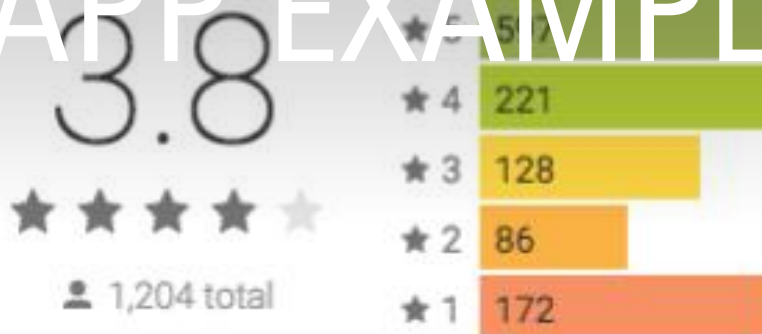
Y: 8.8405663

Via Goffredo Mameli, 8B 21050 Bolladello-peveranza VA



REVIEWS

[Write a Review](#)



ADDITIONAL INFORMATION

Updated

October 1, 2014

Size

5.2M

Installs

100,000 - 500,000

Current Version

7.3.4

Requires Android

2.3 and up

Content Rating

PEGI 3

[Learn more](#)

Interactive Elements

Users Interact, Shares
Location

Permissions

[View details](#)

Report

[Flag as inappropriate](#)

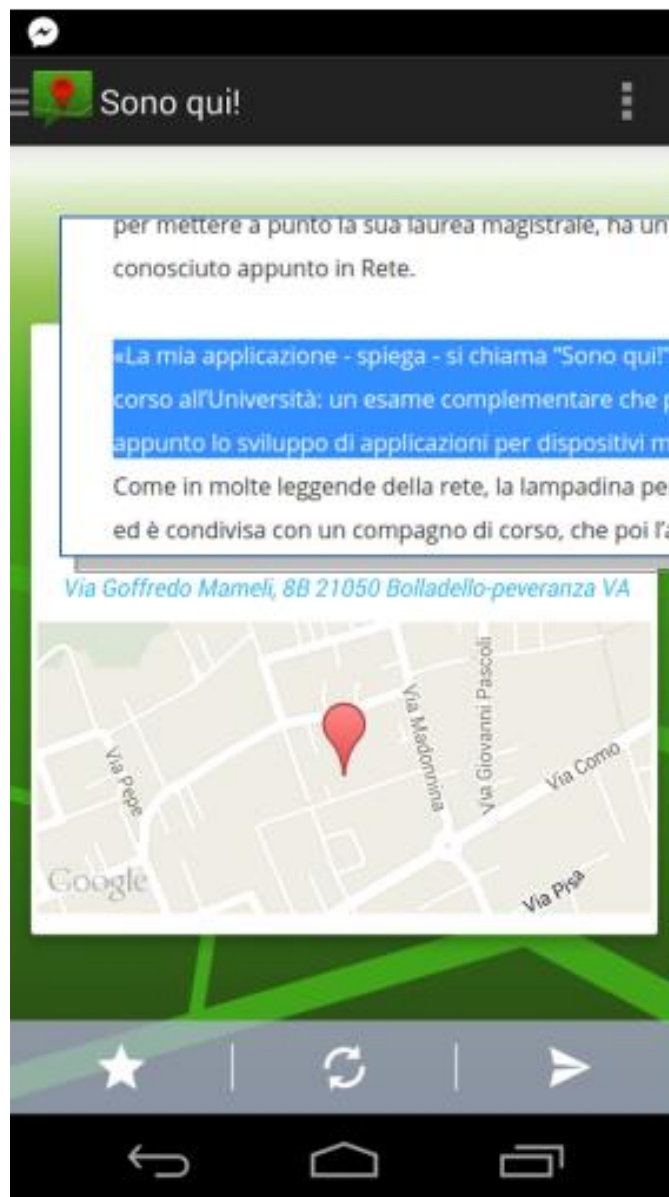
Offered By

Matteo Tosi

Developer

Email teo.4@hotmail.it

[G+](#) 1.3k



La Provincia di Varese.it

[Cronaca](#) [Economia](#) [Sport](#) [Varese](#) [Busto](#) [Gallarate](#) [Provincia](#) [Video](#) [Foto](#) [Rubriche](#)

Più letti

APP CHE VOLA IN CALIFORNIA



Matteo Tosi è uno studente della laurea magistrale in informatica dell'Insubria e la sua App è un fenomeno

Martedì 18 Novembre 2014 (1)

[Facebook](#) [Twitter](#)

Il genio e la App che vola in California

Matteo Tosi ha 23 anni, è uno studente di informatica e ha già all'attivo centomila download. Con "Sono qui" ha conquistato un socio americano e, in attesa della magistrale, costruisce il futuro

NUMBER OF APPS RELEASED

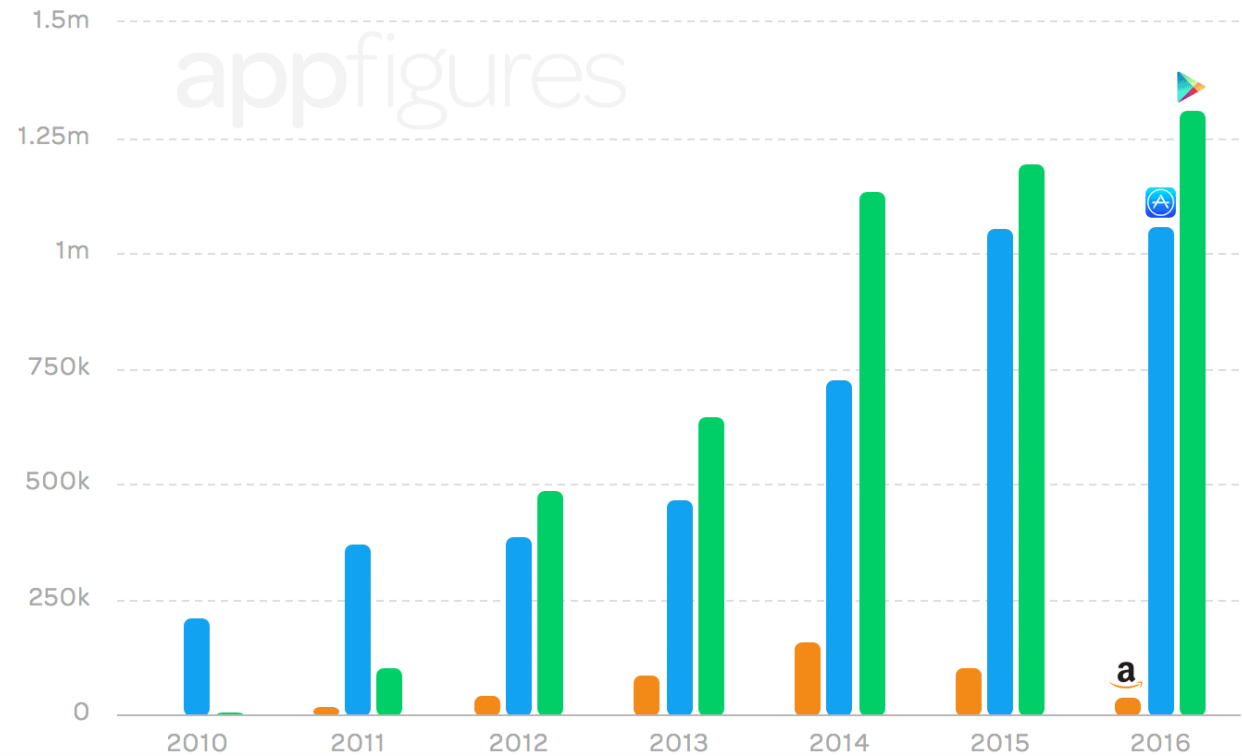
The number of app releases grow substantially year-over-year .

In 2016, new and existing developers published:

- a total of 1.1 million new iOS
- a total of 1.3 million new Android apps.



Number Of New Apps Released By Year
iOS App Store, Google Play, and Amazon Appstore

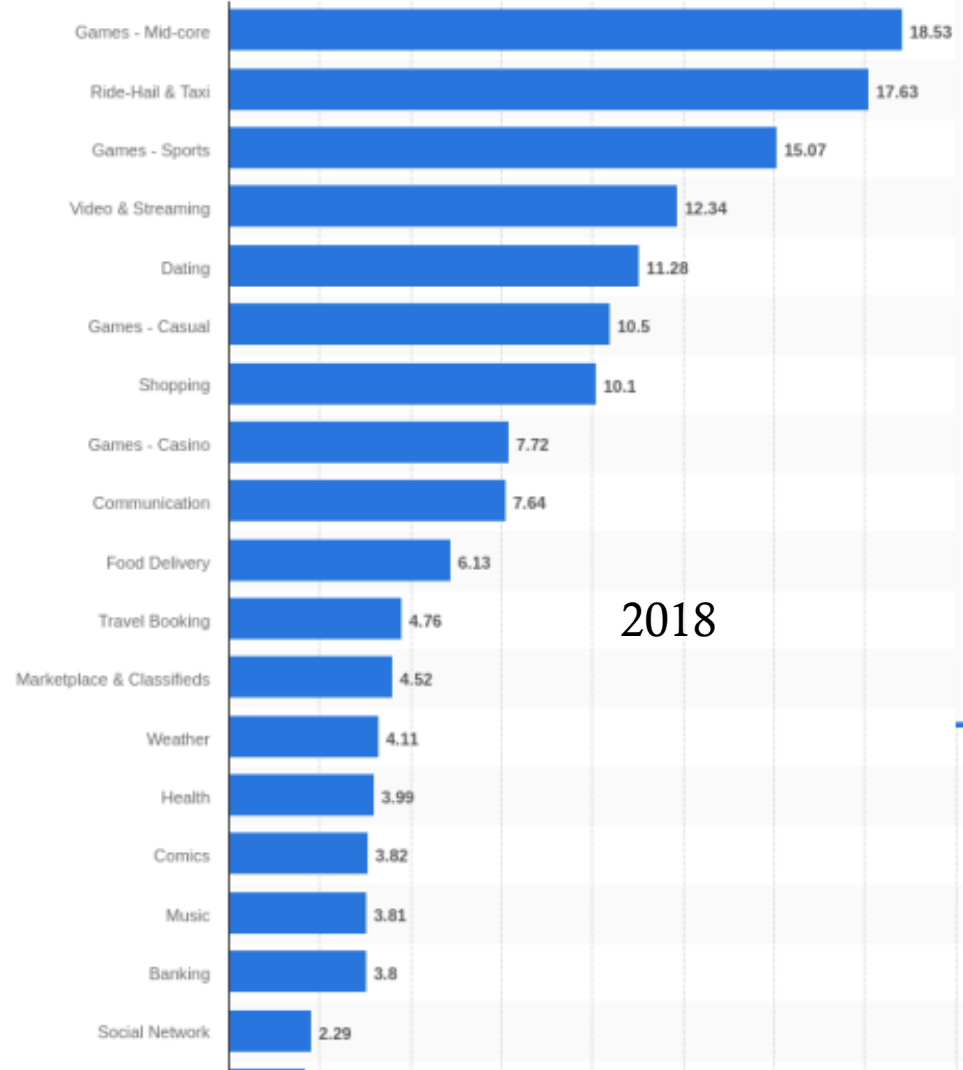


MOST POPULAR ANDROID MARKET CATEGORIES

- Smartphones and tablets have completely changed the way we interact with media.
- We may still be listening to the radio, read the news and or watch television shows, but more and more often we're doing it on our mobile devices or, to be more precise, within apps.



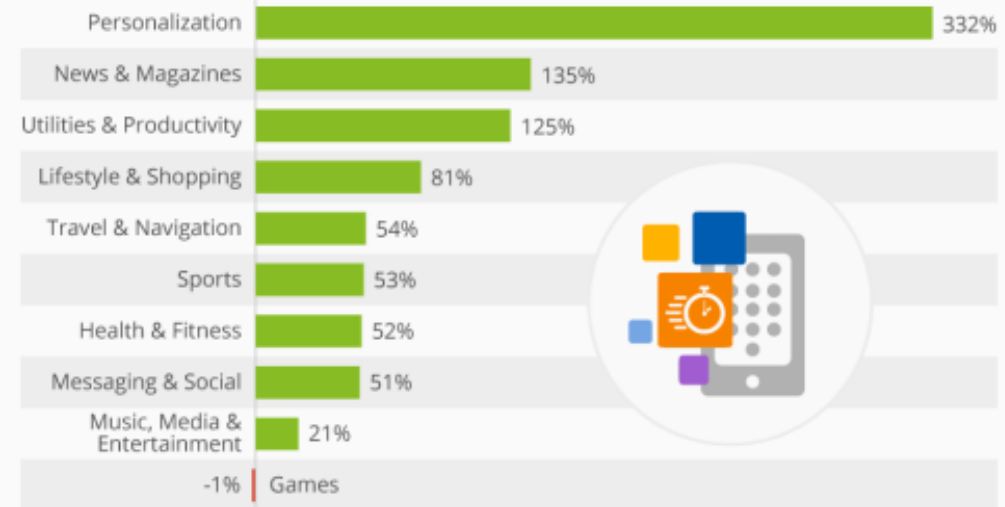
MOST POPULAR ANDROID MARKET CATEGORIES



2018

The Fastest-Growing App Categories in 2015

Year-over-year increase in app sessions by category (2015 vs. 2014)

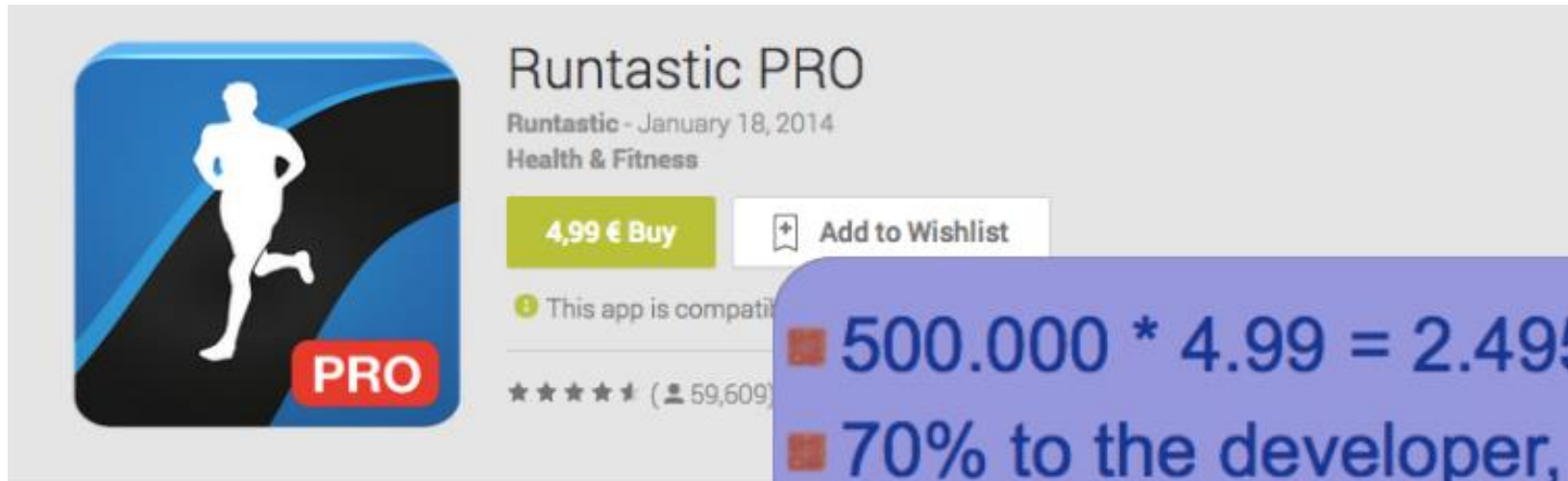


@StatistaCharts Source: Flurry Analytics

statista

Personalization apps (e.g. emoji keyboards or wallpaper apps) were the fastest-growing category in 2015.

WHERE IS THE BUSINESS ?



- $500.000 * 4.99 = 2.495.000$ euro
- 70% to the developer, 30 % to others
- 70% of 2.495.000 = 1.746.500 euro

Additional information

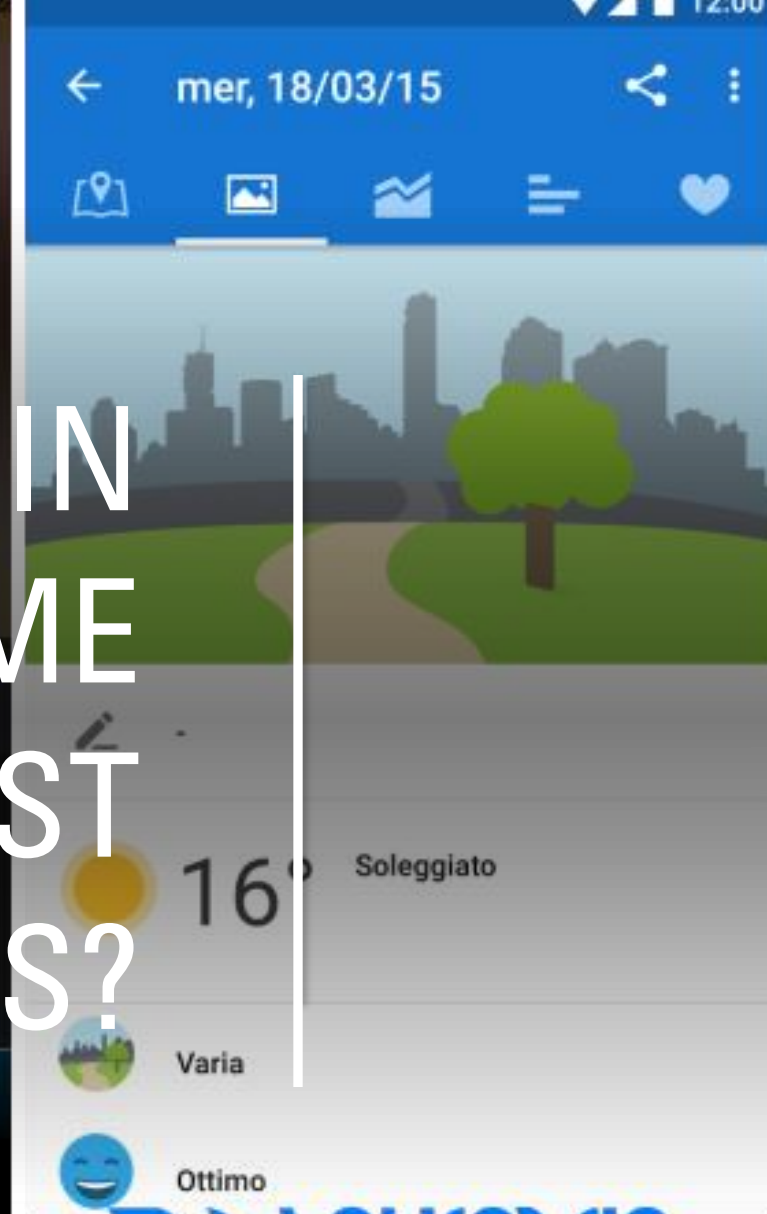
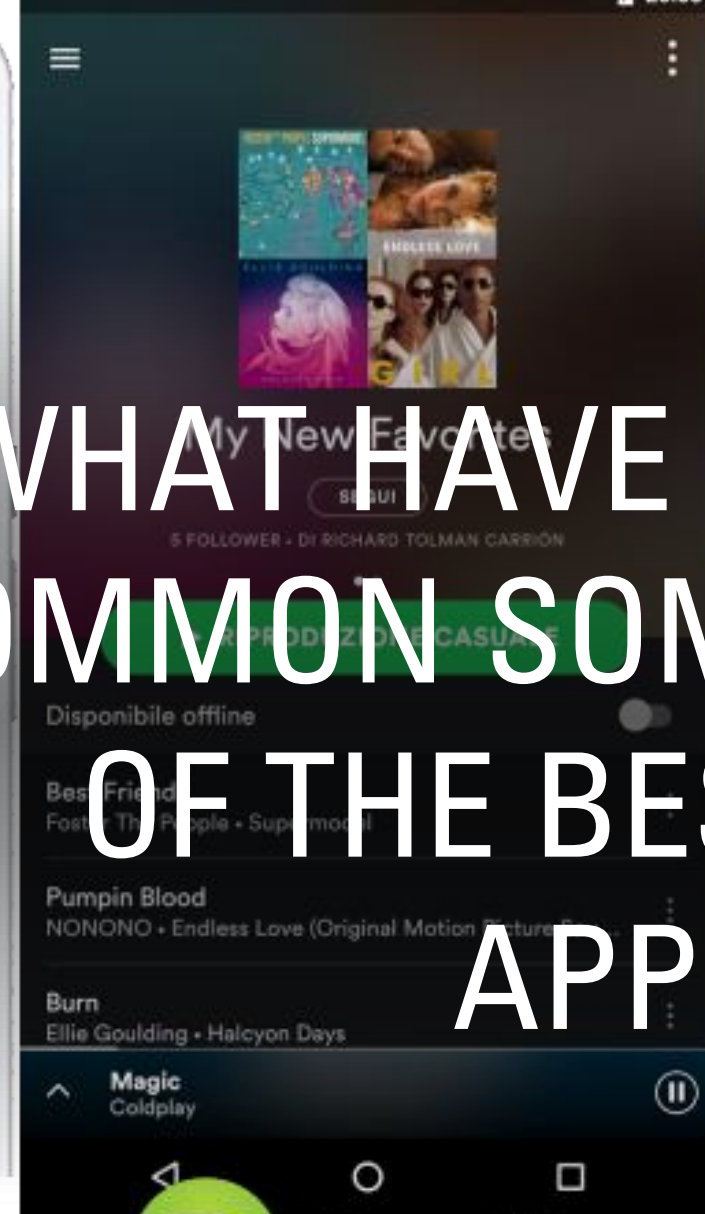
Updated	Size	Installs	Current Version	Requires Android
January 18, 2014	Varies with device	500,000 - 1,000,000	Varies with device	2.2 and up
Content Rating	Contact Developer			
Low Maturity	Visit Developer's Website Email Developer Privacy Policy			



HOW TO PUBLISH APP IN GOOGLE PLAY

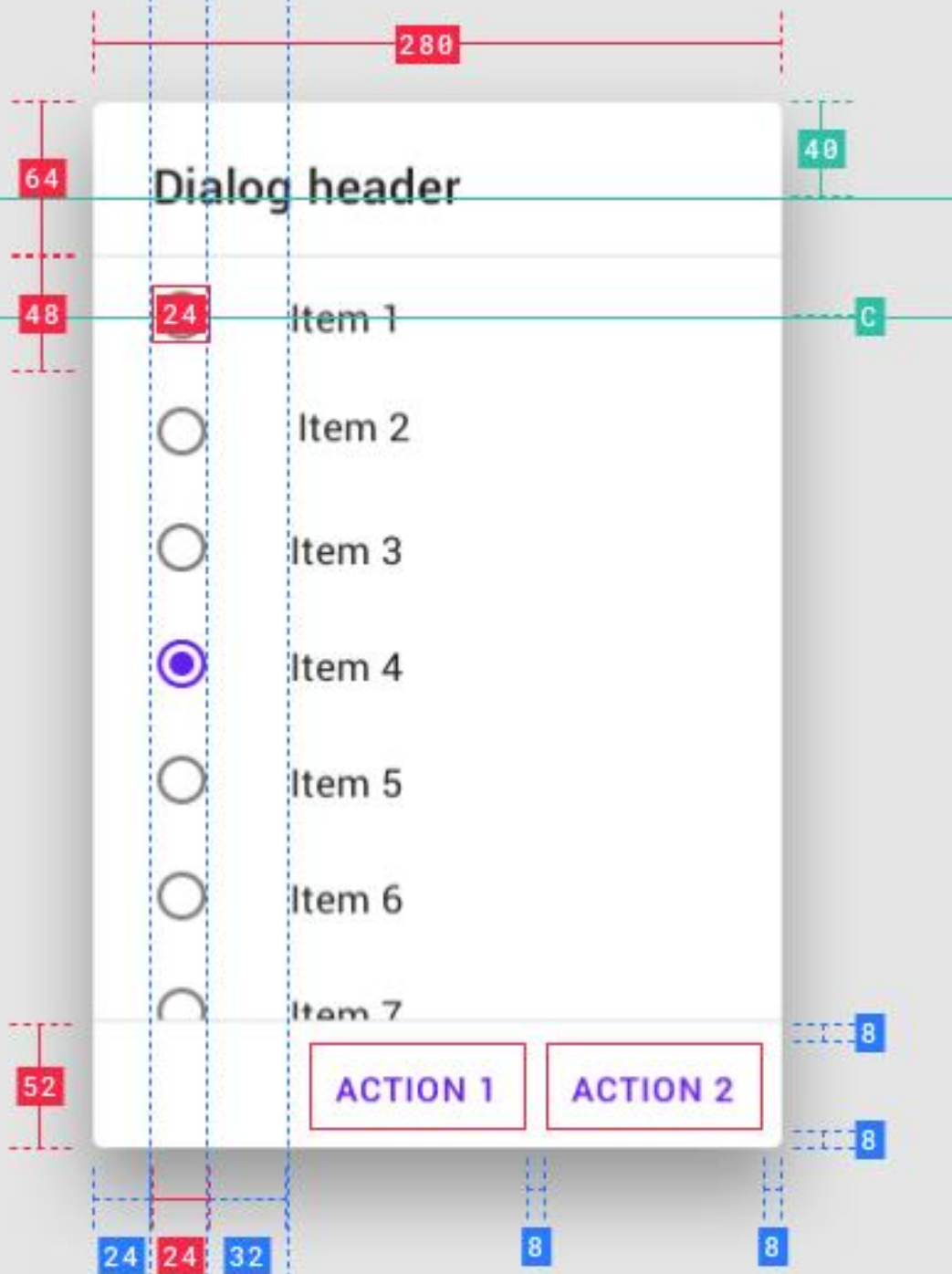


- create an account in Google Play Developer Console which will cost you 25\$.
- to keep out the fake, duplicate accounts.
- you can publish as many apps as you want.
- You can easily earn the initial fee amount.



WHAT HAVE IN
COMMON SOME
OF THE BEST
APPS?

← Toolbar
← TabHost
← Card View



MATERIAL DESIGN

- Google has published a set of guidelines on user interfaces. They called it Material Design,
- you can read more about it at <http://material.io>.
- Material Design is a big topic.

Presentation

<https://youtu.be/Q8TXgCzxEnw>

EXPLOIT BUILT-IN SENSORS

- Most Android-powered devices have **built-in sensors** that measure motion, orientation, and various environmental conditions.

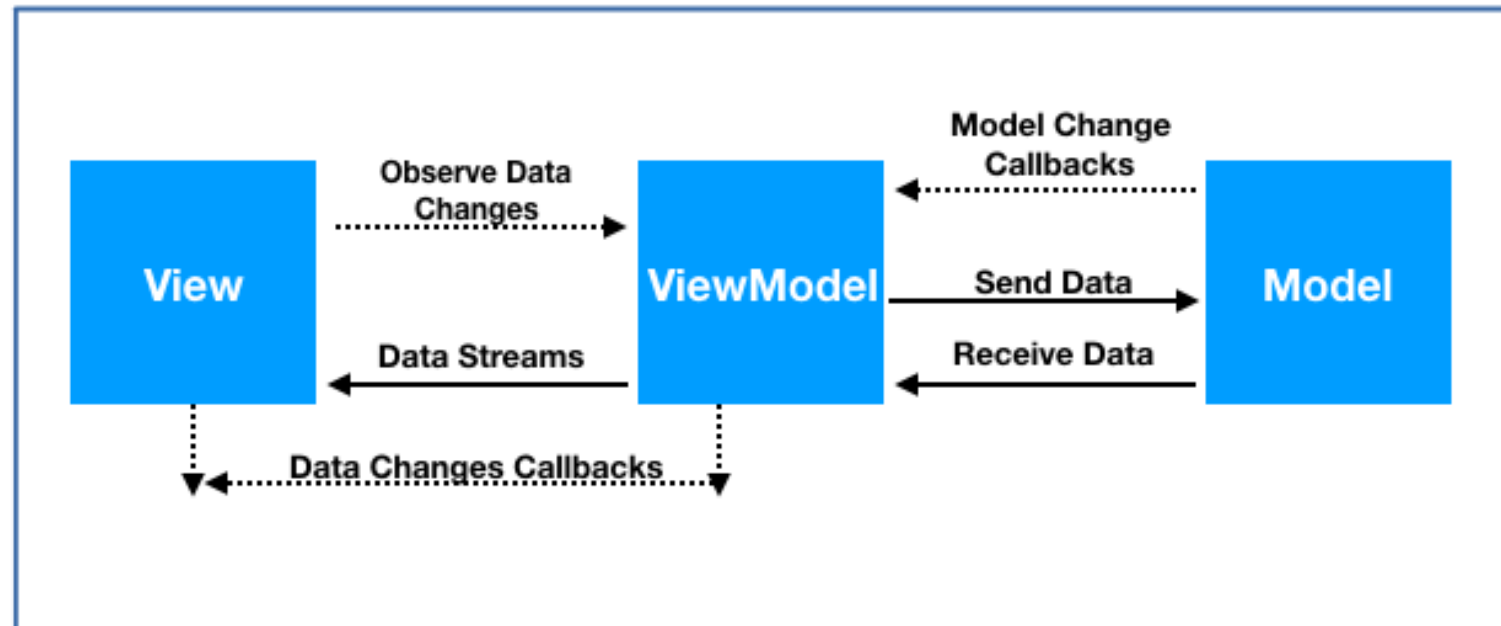
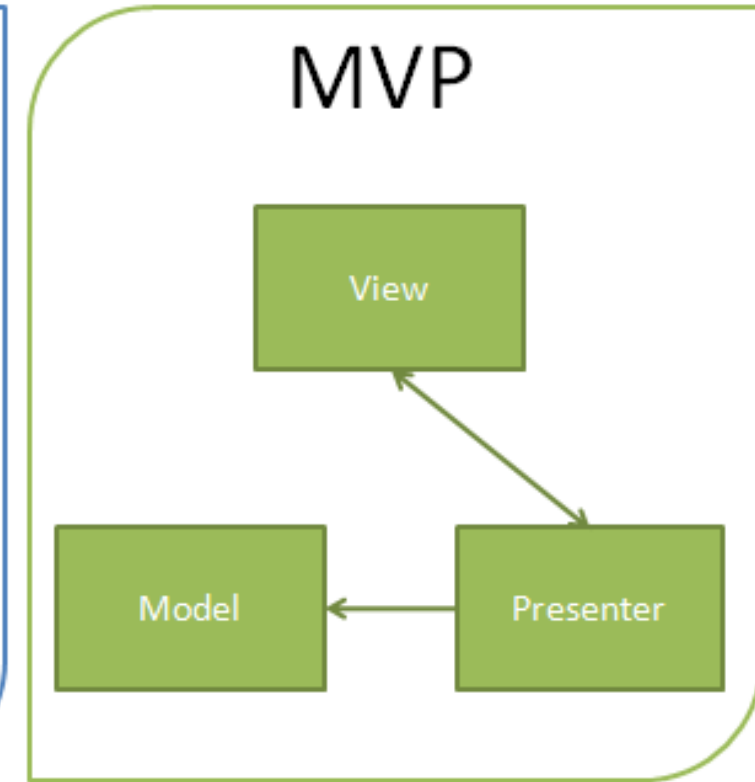
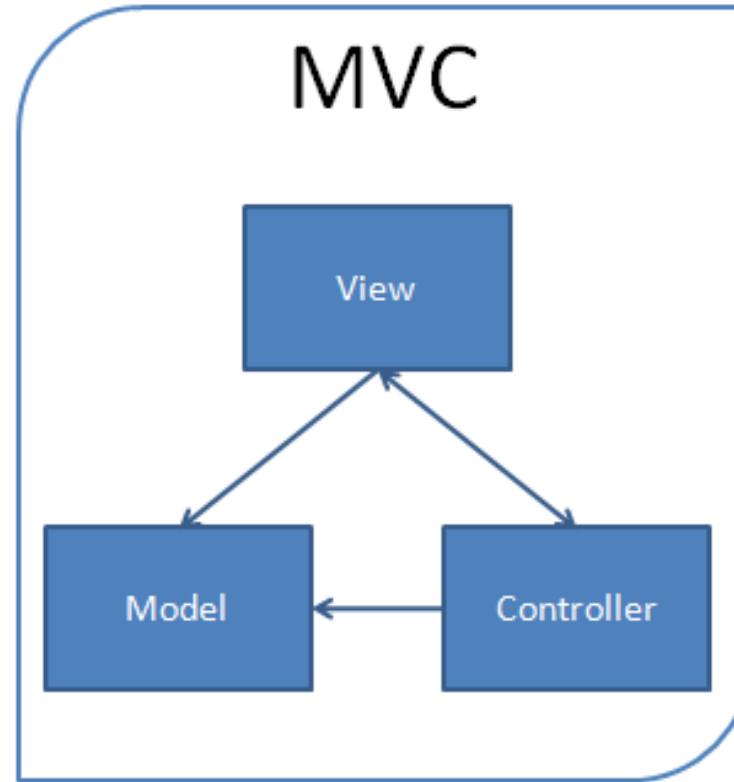
For example:

- a **game** might track readings from a device's gravity sensor to infer complex user gestures and motions
- a **weather application** might use a device's temperature sensor and humidity sensor
- a **travel application** might use the magnetic field sensor and accelerometer



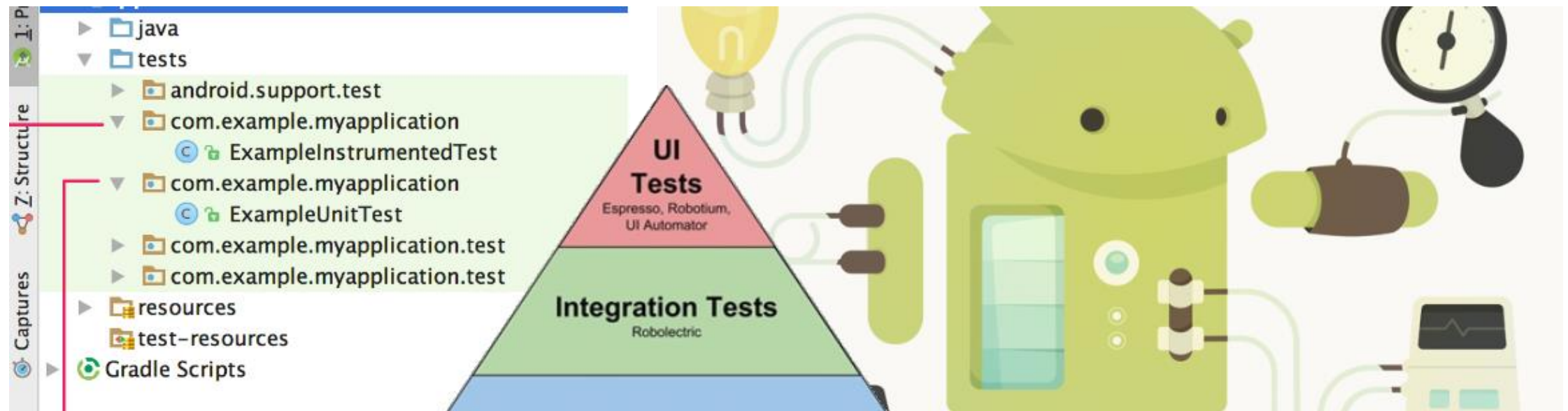
SEPARATING THE PRESENTATION LAYER FROM THE LOGIC

- MVC (Model View Controller)
- MVP (Model View Presenter)
- MVVM (Model View ViewModel)



TEST YOUR APP

- Android Studio is designed to make testing simple.
- Testing your app is an integral part of the app development process.



KEY POINTS

- Android vs iOS
- Soluzioni multi-piattaforma
- Kotlin
- Dispositivi mobili & internet
- Cos'è Android
- Quanti tipi di OS Android esistono?
- Apps & Google Play
- Quale categoria di App?
- App GUI
- Sensori
- Patterns architetturali delle App
- Testare le App