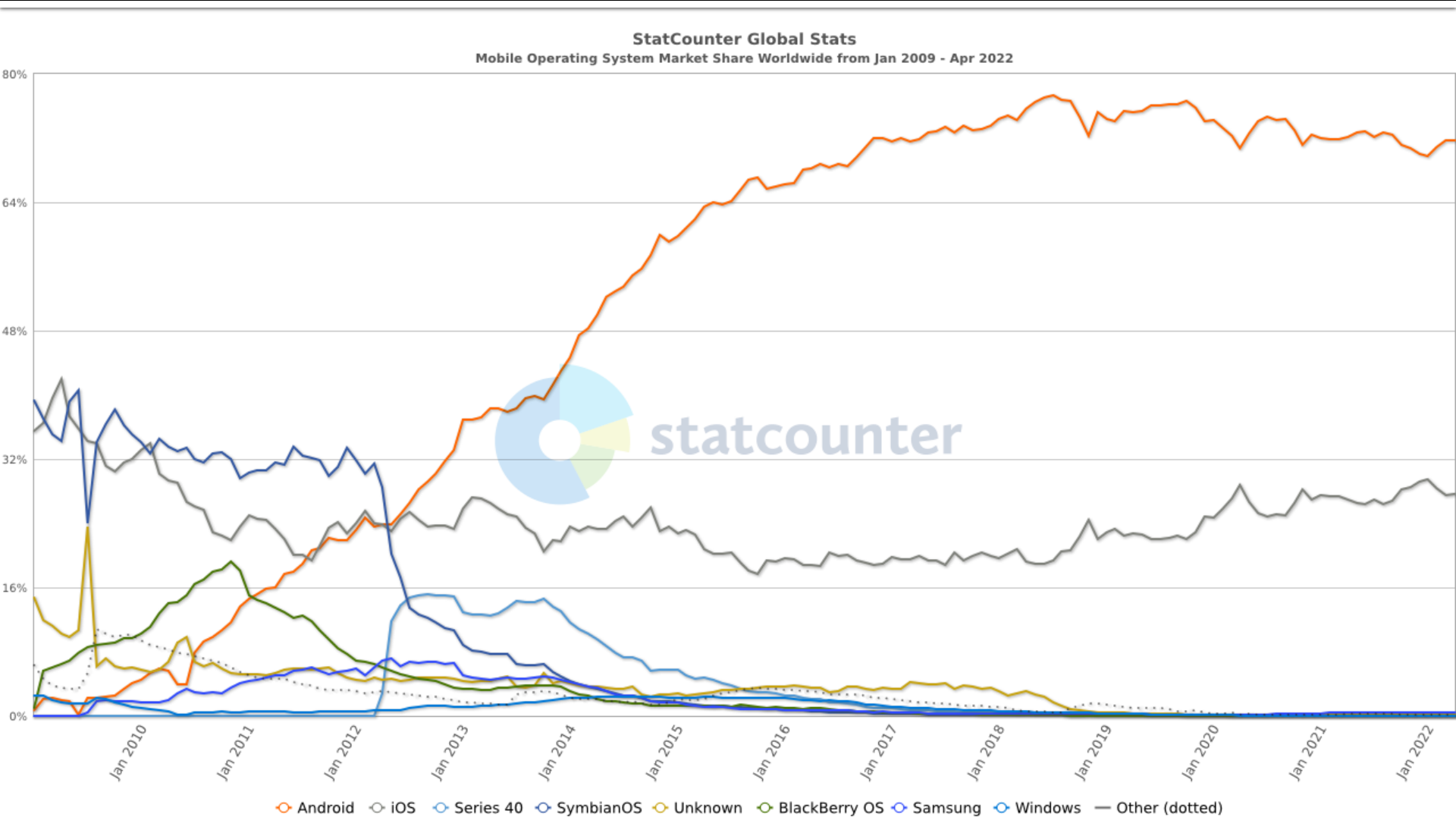# Facts on Mobile Application Development
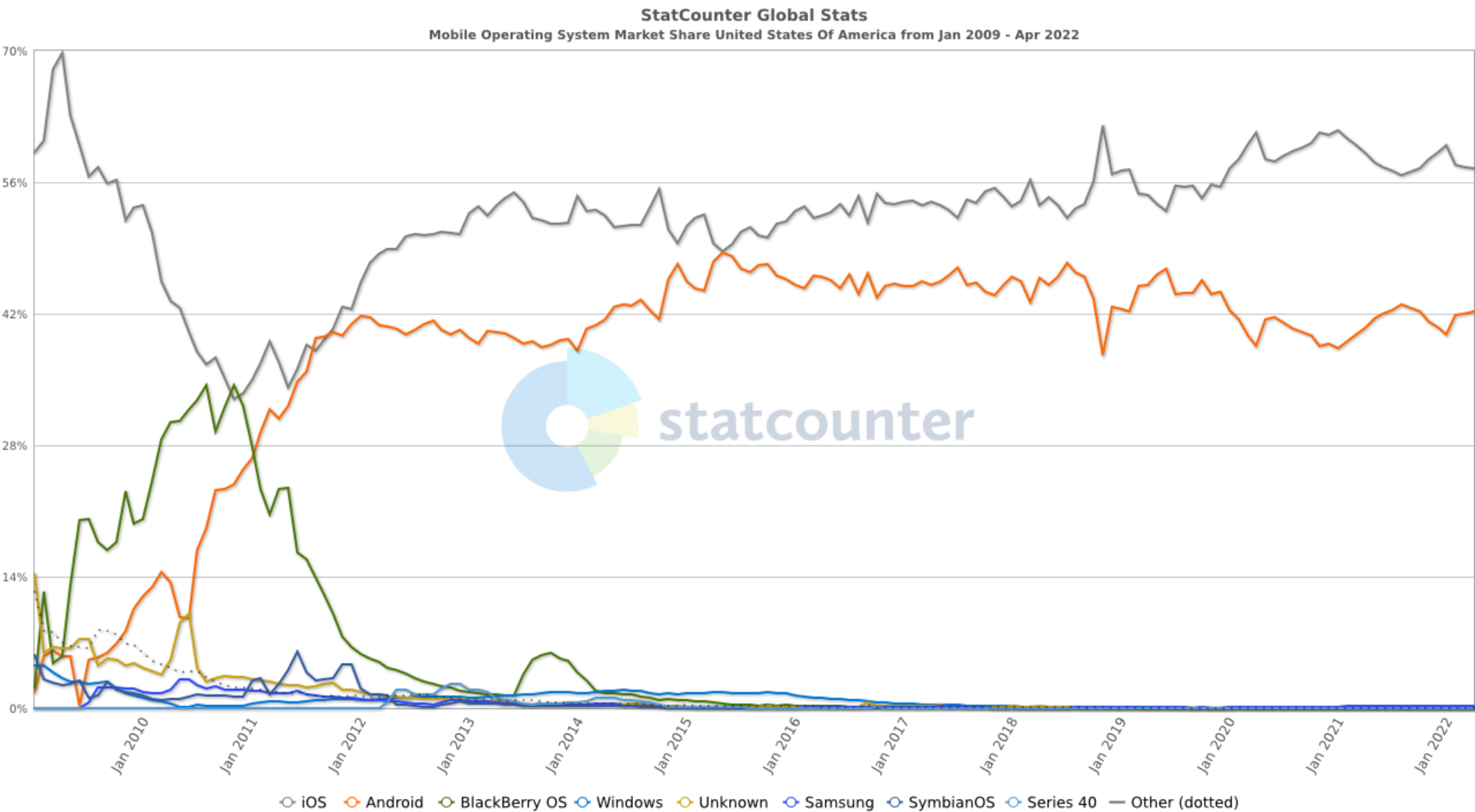
Outline

- Competition
- Development
- Publishing
- Native Vs. Cross-platform
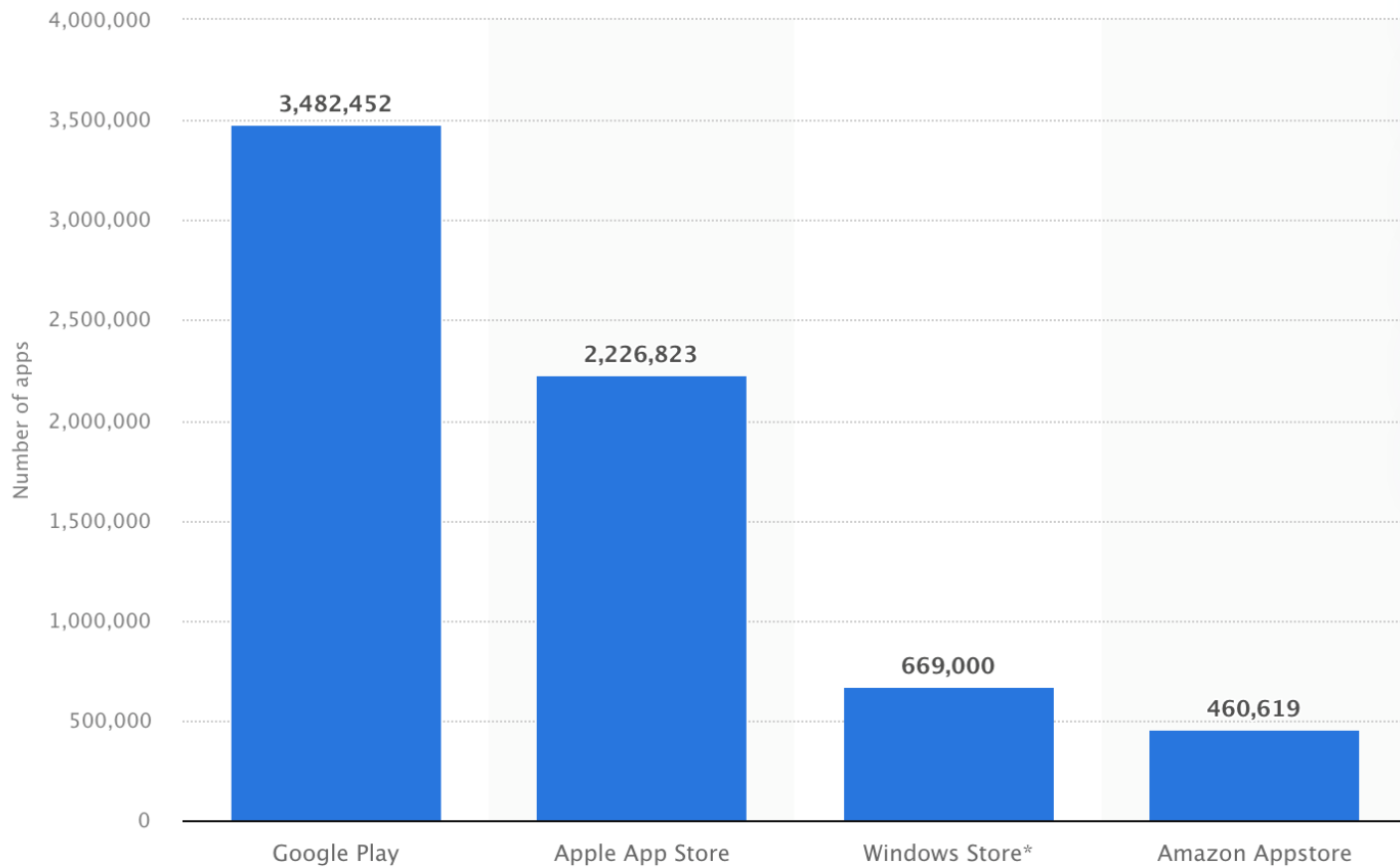
OS Market Share (World)

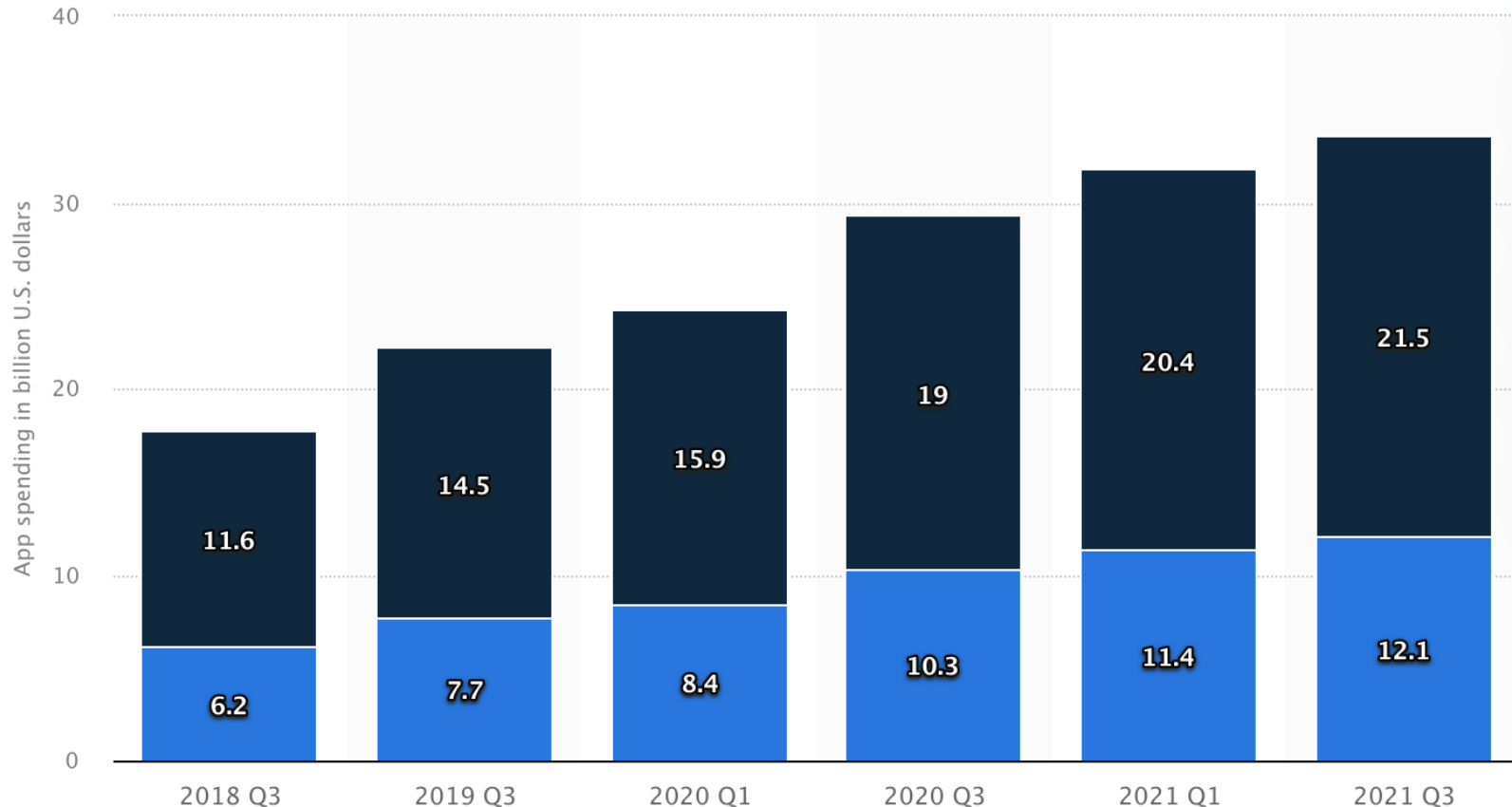

StatCounter Global Stats
Mobile Operating System Market Share Worldwide from Jan 2009 - Apr 2022

⊙ Android ⊙ iOS ⊙ Series 40 ⊙ SymbianOS ⊙ Unknown ⊙ BlackBerry OS ⊙ Samsung ⊙ Windows — Other (dotted)

OS Market Share (USA)

StatCounter Global Stats
Mobile Operating System Market Share United States Of America from Jan 2009 - Apr 2022

◇ iOS ◇ Android ◇ BlackBerry OS ◇ Windows ◇ Unknown ◇ Samsung ◇ SymbianOS ◇ Series 40 — Other (dotted)

Number of apps available in leading app stores as of 1st quarter 2021

Number of apps

- 4,000,000
- 3,500,000
- 3,000,000
- 2,500,000
- 2,000,000
- 1,500,000
- 1,000,000
- 500,000
- 0

Google Play — 3,482,452
Apple App Store — 2,226,823
Windows Store* — 669,000
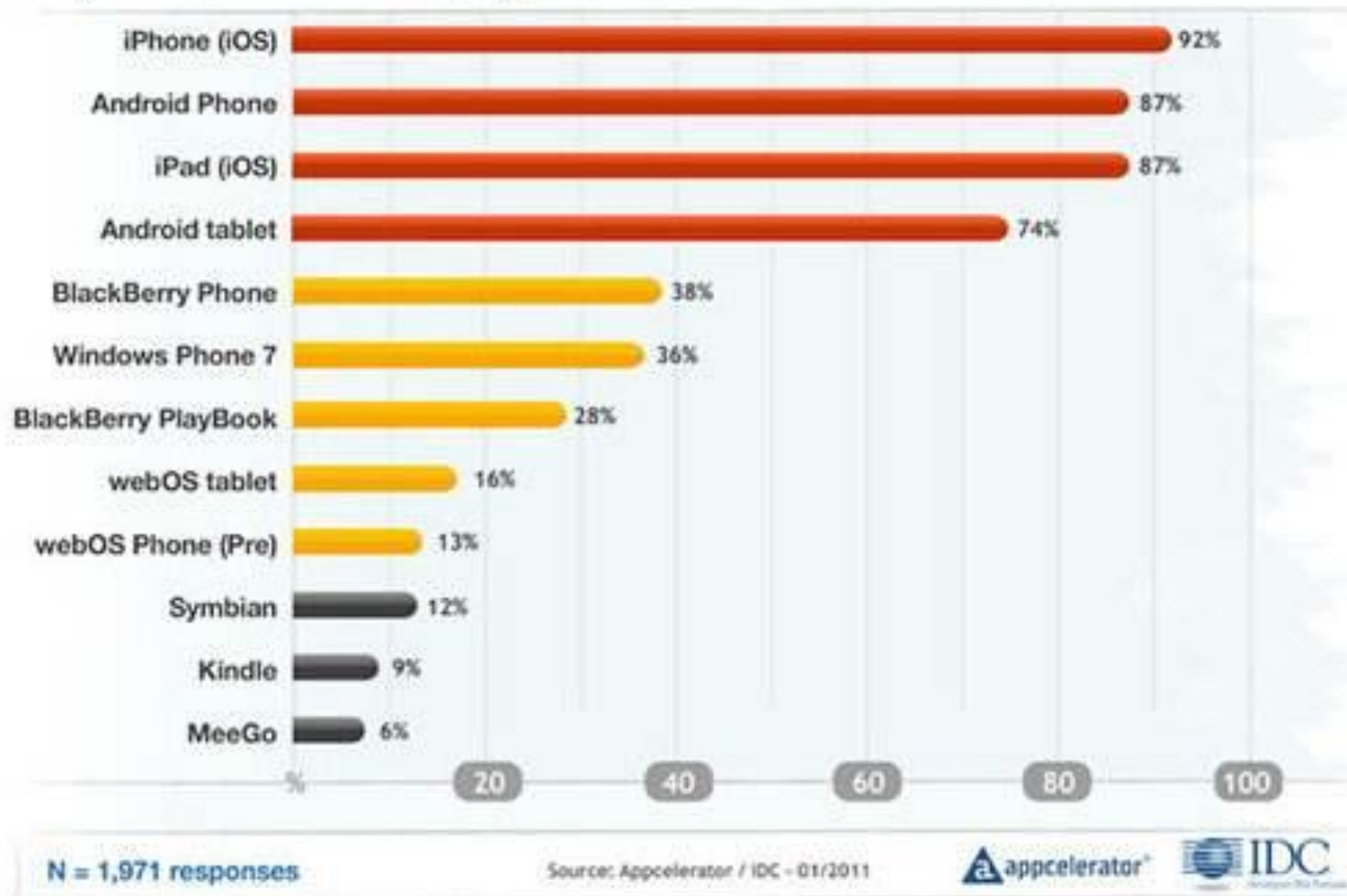Amazon Appstore — 460,619

Additional Information

Show source

Worldwide consumer spending on mobile apps and games as of 3rd quarter 2021

- Ease of purchase: Checkout vs. iTunes
- 93% iOS users have iTunes accounts with credit card info.
- Google encourages *free stuff*.

Developers' Interest


'Very Interested' In Developing For Each Platform

Platform	Percentage
iPhone (iOS)	92%
Android Phone	87%
iPad (iOS)	87%
Android tablet	74%
BlackBerry Phone	38%
Windows Phone 7	36%
BlackBerry PlayBook	28%
webOS tablet	16%
webOS Phone (Pre)	13%
Symbian	12%
Kindle	9%
MeeGo	6%

N = 1,971 responses   Source: Appcelerator / IDC - 01/2011   appcelerator   IDC

Development

Programming Language

- Android OS: Java, Kotlin

- iOS: Objective C, Swift, SwiftUI

Layout Design: Android
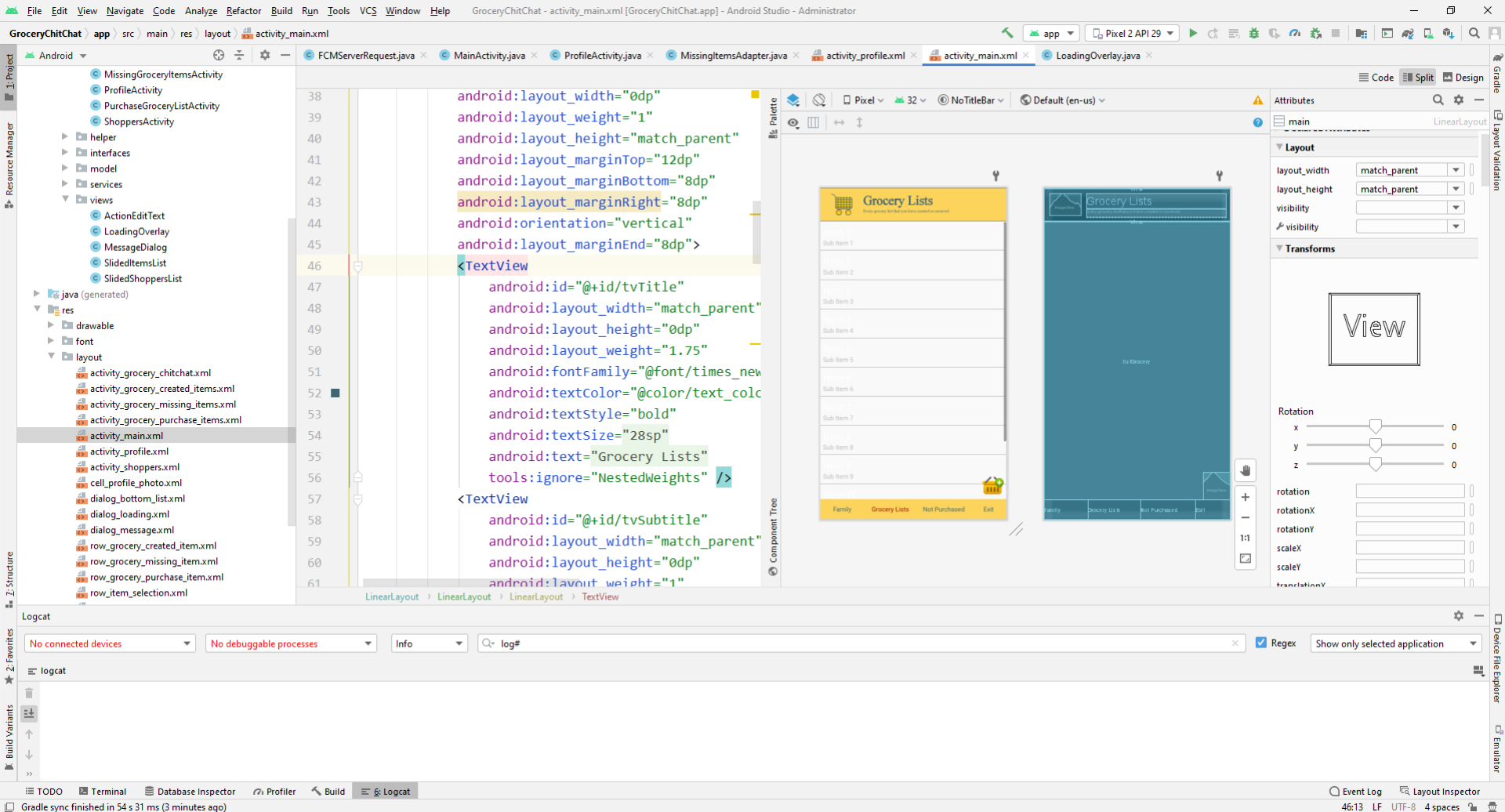
Layout Design: iOS
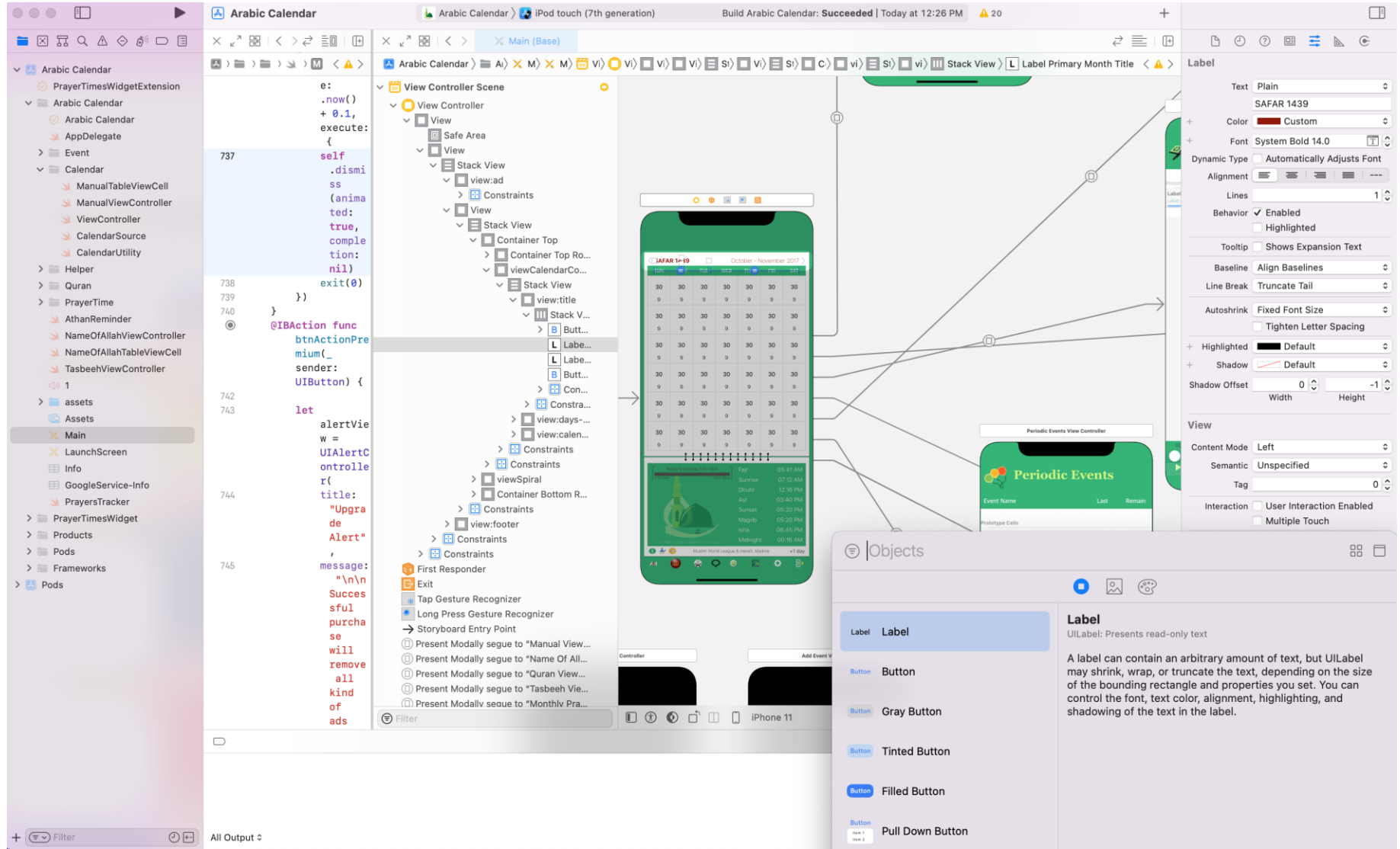
Development Platform

- Android OS:
  - open platform, allowing the use of 3rd party tools
  - Key to OS success
  - can reach core components. More like PC swr

- iOS:
  - Restrictive guidelines
  - Fixed set of tools, nothing outside, nothing deep
  - No Flash!

Multitasking Abilities

- Android OS:
  - Very versatile → dynamic
  - Highly fragmented → challenging
    - In USA: **80** Android models *vs*. **9** iOS models
  - Poor battery performance
  - Best notification system (e.g. emails)

- iOS:
  - Stable and exclusive platform
  - Fixed set of tools, with clear potential and boundaries → easier

Security

- Android OS:
  - Access control, isolation, web security
  - Encryption
  - Permission-based access control:
    - Static list in manifest
    - User presented with list at installation time
  - Wild West app marketplace.
    - Nearly any app is allowed to market
    - Android-specific malware

Security

- iOS:
  - Access control, isolation, web security
  - Encryption
  - Permission-based access control:
    - Dialog box at run time.
  - Geolocation
  - Auto Erase

Security

Table 1

Resisting attack types

Resistance to:	Apple iOS	Google Android
Web-based attacks	🟢	🟢
Malware attacks	🟢	🟢🔴
Social Engineering attacks	🔴	🔴
Resource Abuse/ Service attacks	🟢🔴	🔴🟢
Data Loss (Malicious and Unintentional)	🔴🟢	🔴🟢
Data Integrity attacks	🔴🟢	🔴🟢

Table 2

Security feature implementation

Security Pillar	Apple iOS	Google Android
Access Control	🟢🔴	🔴🟢
Application Provenance	🟢	🔴🟢
Encryption	🟢🔴	🟢🔴
Isolation	🔴🟢	🟢
Permission-based Access Control	🔴🟢	🔴🟢

Semantic

OS Upgrades

- Android OS:
  - Millions of phones under contract cannot be updated
  - 0.4% run the latest version

- iOS:
  - Apple disallows old devices to update →permanently vulnerable to easy attacks
  - ~90% run one of the two latest versions

Publishing

App Approval

- Android OS:
  - Very quick! (compare to iOS)

- iOS:
  - Days.. and days.. and days..
  - Many restrictions

Payments and Availability

- Android OS:
  - Developer pays $25 one time
  - Developer earns 70% of revenue
  - Several Stores: Google Play, Amazon…
  - Paid apps available in 132 countries

Payments and Availability

- iOS:
  - Developer pays $100 annually
  - Developers earns 70% of revenue
  - App Store only
  - Paid apps available in 155 countries

Which is Better?

OS Mkt Share	Apple Android
# of Apps	Android
Revenue	Apple
Developer Interest	Apple
Easiness of PL	Android
Platform	Apple Android
Multitasking	Android
Security	Apple
OS Upgrades	Apple
App Approval	Android
Payments & Avail.	Apple Android

Native Vs. Cross-platform

Comparison Factors	Native App Development	Cross-platform App Development
Tools/Technologies	Swift/Objective C (iOS) and Java/ Kotlin(Android)	Javascript(React Native), C#(Xamarin) and Dart(Flutter)
UI/UX	Complete platform specific UI	Common UI for all kind of apps (Although Limited Customization)
Performance	Excellect performance	Performance issues are common or they can be solved with fewer workarounds
Testing	Testing is seamless with tools available in the framework itself or browser	Testing cross-platform frameworks vary with the frameworks available
Learning Curve	Easy Learning curve	Moderate Learning curve
Developer Experience	Good	Fine yet it's improving
Time to Market	Time to Market in Native apps is long as you have to build diffrent apps for both platforms	Time to Market in Cross platform apps is good as development speed increases due to single codebase
Team Size	Big Team size(Different Teams for different platforms)	Small to mid-sized Team size (1 Team for all platforms)
3rd Party SDKs availability	Excellent	Average

Platforms	Q3 Percentage
Android	25.81%
iOS	18.89%
Web app	35.23%
Hybrid (Android + iOS)	38.32%

❖ 70% of customers say they have abandoned their shopping carts because of a bad user experience

❖ 90% of smartphone users say they're more likely to keep shopping if they're having a great user experience.

https://www.simform.com/blog/native-vs-cross-platform-development/
https://www.netsolutions.com/insights/native-vs-hybrid-vs-cross-platform/

Cross-platform mobile frameworks used by software developers worldwide from 2019 to 2021

Share of respondents

Framework	2019	2020	2021
Flutter	30%	39%	42%
React Native	42%	42%	38%
Cordova	29%	18%	16%
Ionic	28%	18%	16%
Xamarin	26%	14%	11%
Unity	12%	11%	11%
NativeScript	11%	5%	5%
PhoneGap	11%	6%	4%
Kotlin Multiplatform		2%	2%
Apache Flex	5%	2%	1%
Kendo UI	4%	1%	1%
Kivy		1%	1%
Other		8%	10%

● 2019 ● 2020 ● 2021

Sources
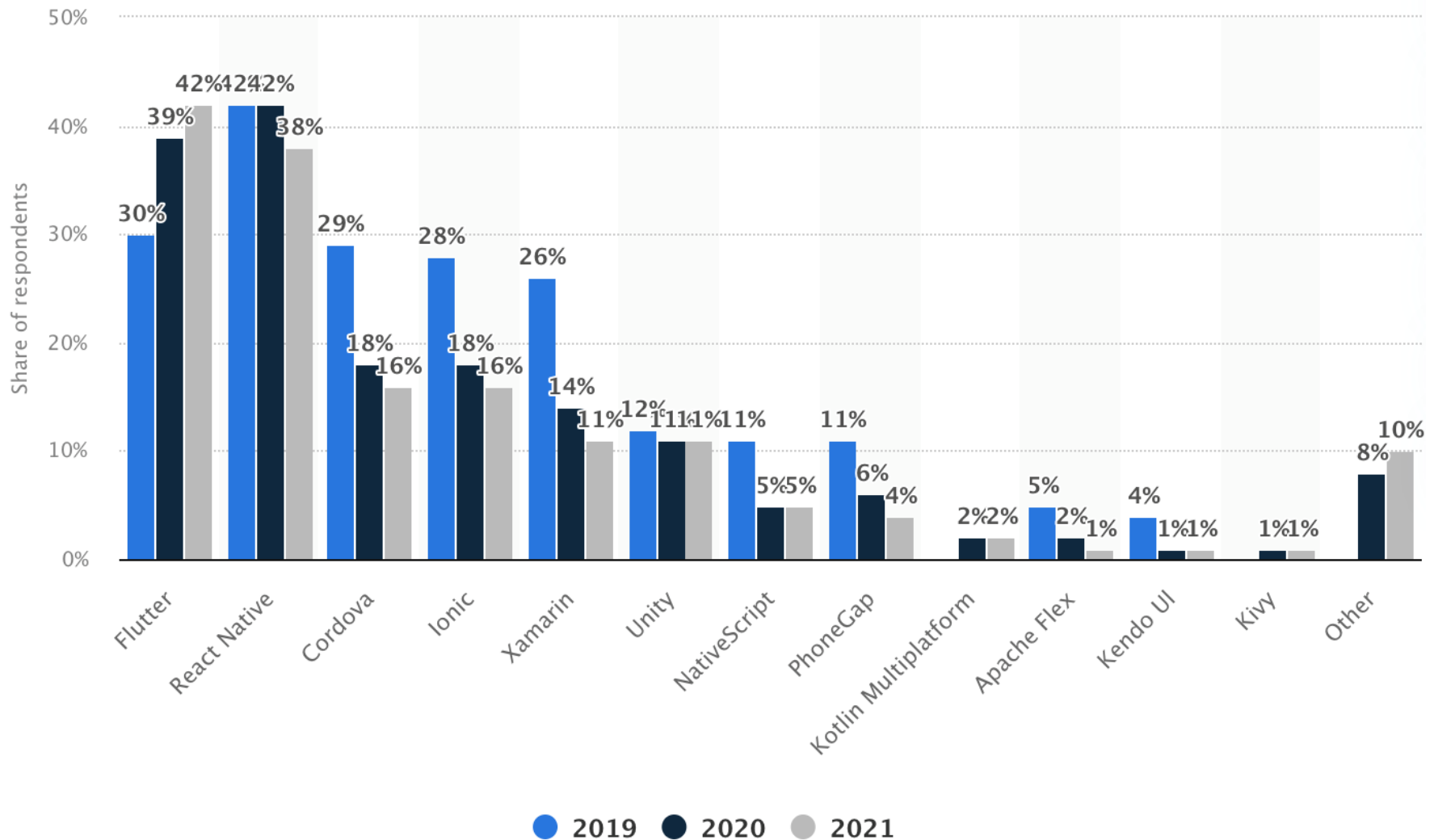
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- http://techsbot.com/android-vs-ios-pros-and-cons/
- http://www.youtube.com/watch?v=OvdjXZnbC-o