

Mobile Application Development

(Introduction)

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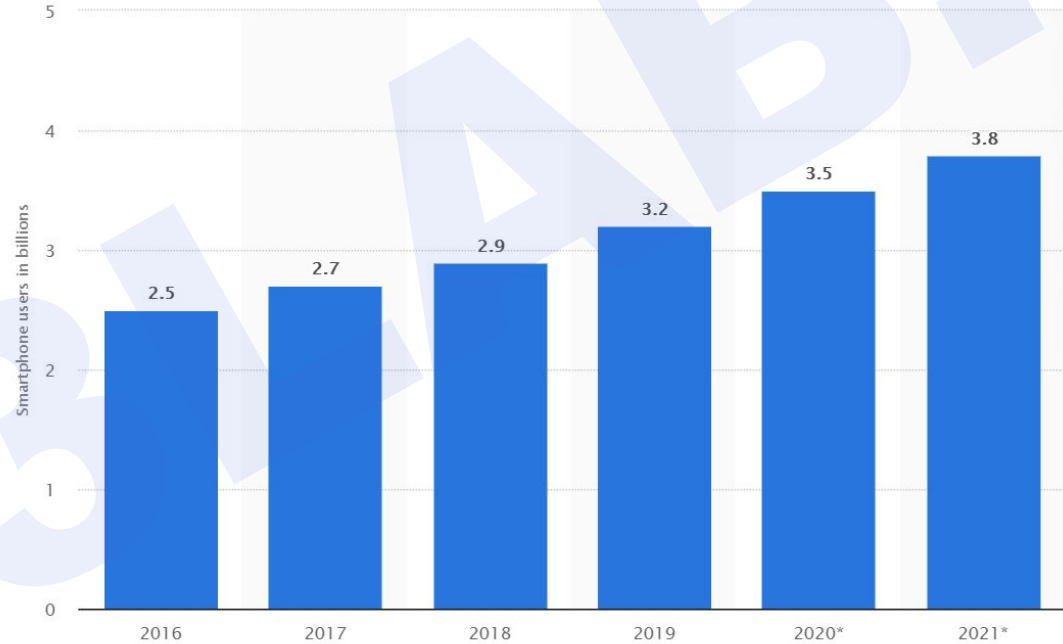


“The future of mobile is the future of online. It is how people access online content now.”

– David Murphy, Founder and Editor of [Mobile Marketing Daily](#)

Why study this course?

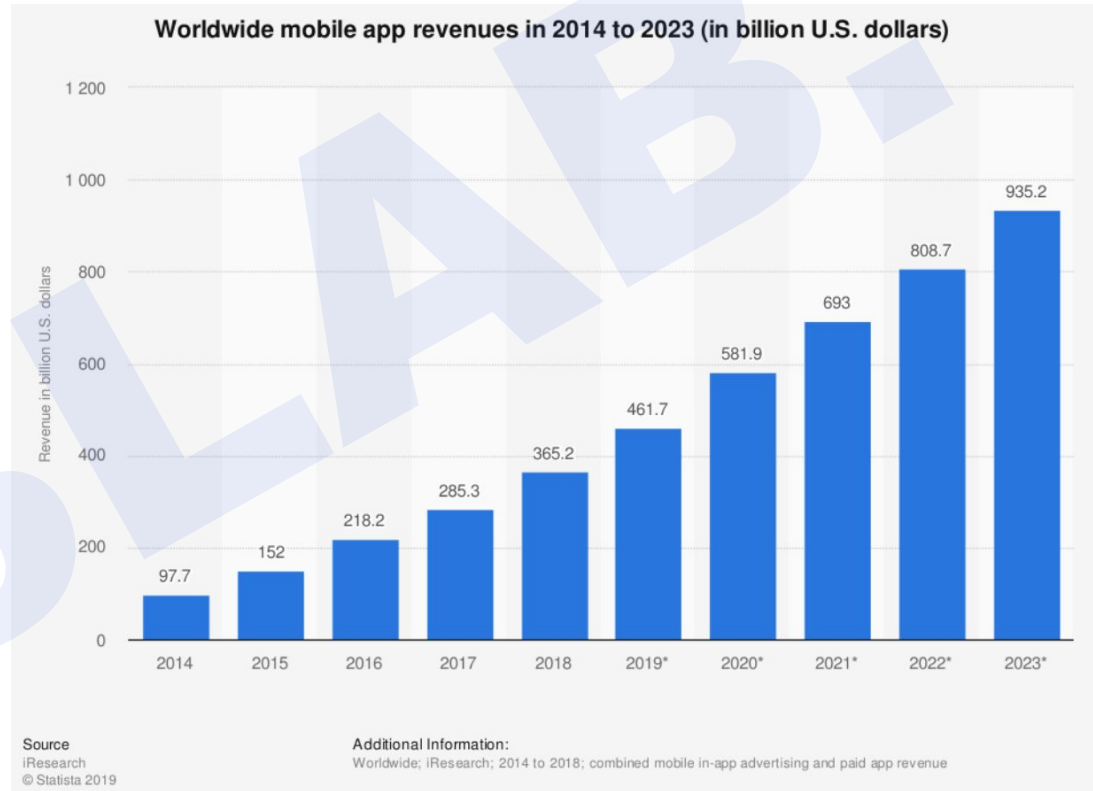
- Number of smartphone users from 2016 to 2021



© Statista 2020

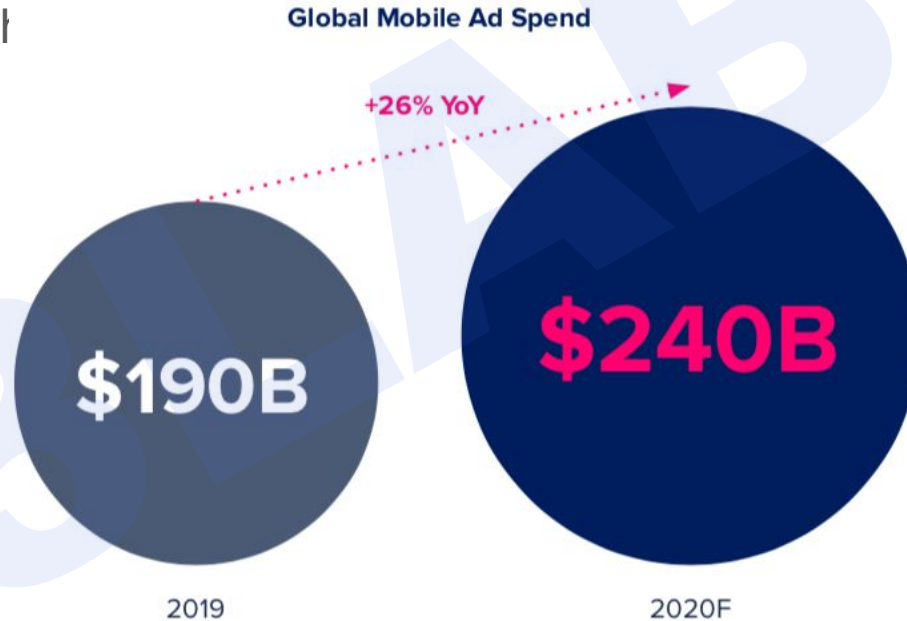
Why study this course?

- Revenues from Mobile App



Why study this course?

- Advertisement through Mobile App

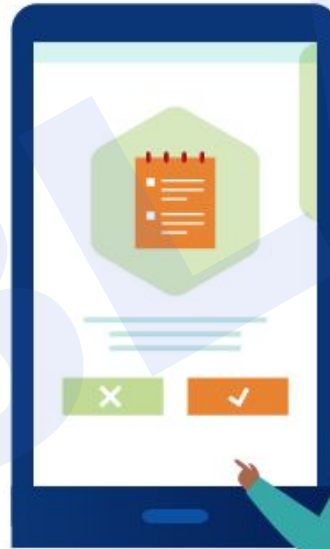


Why study this course?



HOW MANY APPS DO WE USE?

On average, a person now has more than **80 apps** installed on their phone



175B
apps are
downloaded
yearly

The average
person uses...

9

mobile apps on
a daily basis and

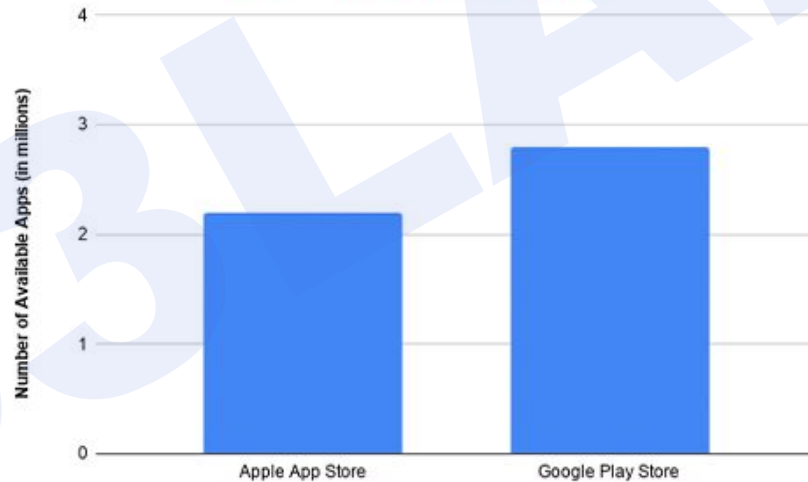
30

apps every month

Why study this course?



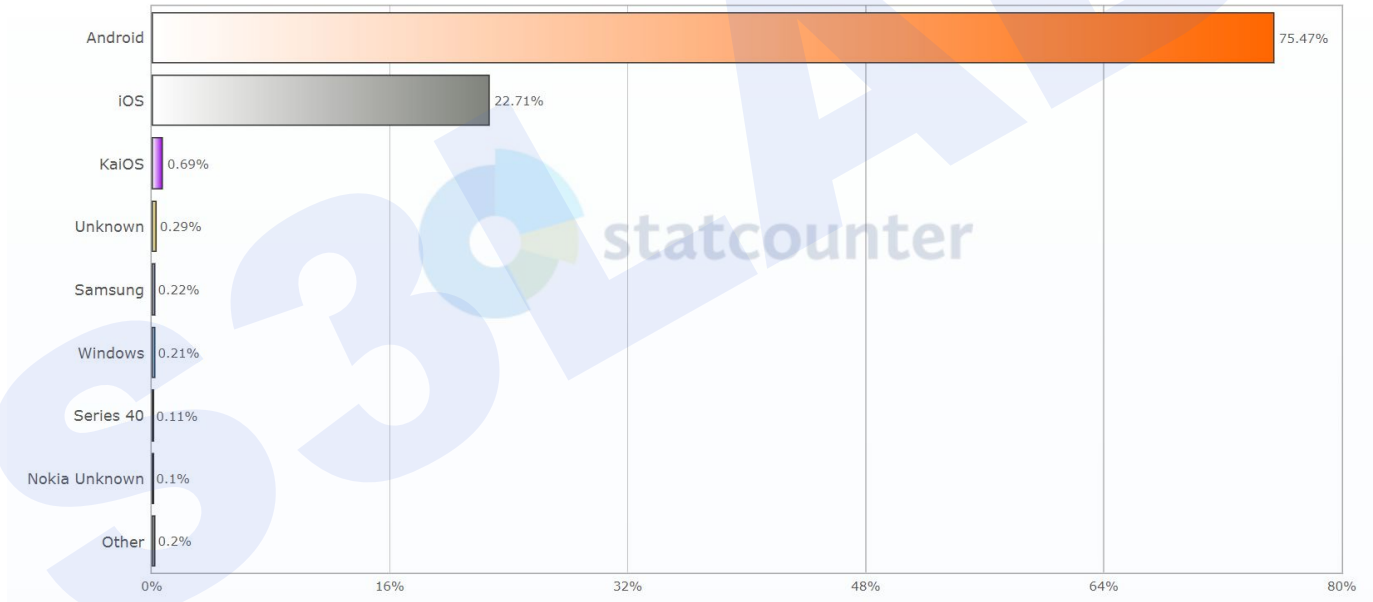
Number of Apps Available for Download



Why study this course?



Mobile Operating System Market Share Worldwide 2019



Why study this course?

- Mobile Apps are a new paradigm of application development



AN ILLUSTRATED EVOLUTION OF THE MOBILE PHONE

TEXT DEREK MALCOLM • BONNIE STARKING ILLUSTRATION KAROSHUKLA

1989 ENTER THE FIRST FLIP / CLAMSHELL STYLE PHONE

SCREEN

PRESENT THE RISE OF HIGH RESOLUTION SCREENS LIKE RETINA, SUPER AMOLED, MOBILE BRAVIA. WOW!

1780s SCREENS ARE TINY AND PRIMARILY DISPLAY NUMBERS

2000-2007 TOUCHSCREENS WITH STYLUSES EMERGE. THEN THE MULTI-TOUCH IPHONE CHANGES THE GAME

2001 COLOUR SCREENS BECOME POPULAR WHEN THE SONY ERICSSON T68 IS LAUNCHED

DESIGN

2004 THIN IS IN. A NEW DESIGN STANDARD IS SET WITH THE MOTOROLA RAZR V3

1998 THE FIRST TRUE CANDY-BAR STYLE PHONE EMERGES WITH THE NOKIA 3810

1997 THE FIRST QWERTY KEYBOARD IS REVEALED ON THE NOKIA 9000 COMMUNICATOR

COMMUNICATION

2002 YOU'VE GOT PUSH EMAIL!

1993 FIRST TEXT MESSAGE. "BURP" IS SENT

START HERE IN 1983, MOTOROLA LAUNCHED THE DYNATAC 8000X. THE BRICK THAT STARTED IT ALL

1999 GPS STARTS HELPING PEOPLE FIND THEIR WAY

PRESENT ACTION! HD VIDEO RECORDING IS HERE WITH DEVICES LIKE THE SONY ERICSSON XPERIA ARC

MEDIA

2001 THE FIRST PHONE TO PLAY MP3s IS THE SAMSUNG SPH-M100

SOCIAL MEDIA • BEYOND FACEBOOK, TWITTER, LINKEDIN. YOU NAME IT - THE SMARTPHONE IS NOW A HUB FOR EVERYTHING

1999 T9 PREDICTIVE TEXT ARRIVES

JULY 1985 ROGERS CANTEL MOBILE COMMUNICATIONS IS LAUNCHED. THE FIRST CELL PHONE COMPANY IN CANADA

1996 PROGRAMMABLE RINGTONES START IN JAPAN. THEN EVERYWHERE

2002 SMILE! THE FIRST CAMERA PHONE HITS JAPAN. NORTH AMERICA IN 2004

2003 SERIOUS MOBILE GAMING STARTS WITH THE NOKIA N-GAGE

Something we need to know

- 2008 - Apple launches App Store



The image is a screenshot of a CNET news article. At the top is a red navigation bar with the CNET logo on the left, a search bar in the center, and links for 'Reviews' and 'News' on the right. Below the navigation bar is a breadcrumb trail: 'CNET > Internet > Apple launches new iTunes with App Store'. The main headline is 'Apple launches new iTunes with App Store' in a large, bold, black font. Below the headline is a sub-headline: 'As Apple fans wait for the new 3G iPhone, the company rolls out the latest version of its music store.' At the bottom of the article snippet is the byline: 'by Margaret Kane / July 10, 2008 4:11 AM PDT / Updated: July 10, 2008 11:42 AM PDT'.

CNET > Internet > Apple launches new iTunes with App Store

Apple launches new iTunes with App Store

As Apple fans wait for the new 3G iPhone, the company rolls out the latest version of its music store.

by Margaret Kane / July 10, 2008 4:11 AM PDT / Updated: July 10, 2008 11:42 AM PDT

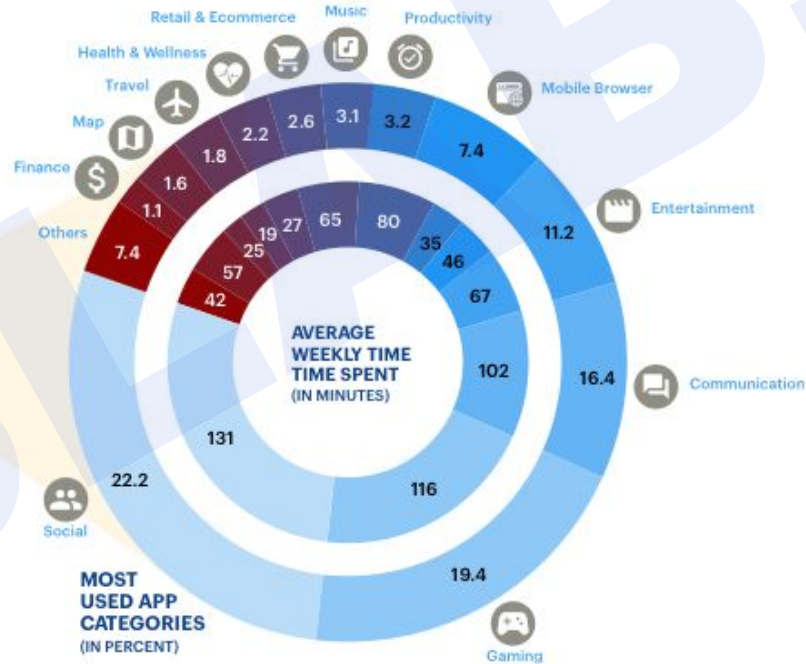
Something we need to know

Android Evolution

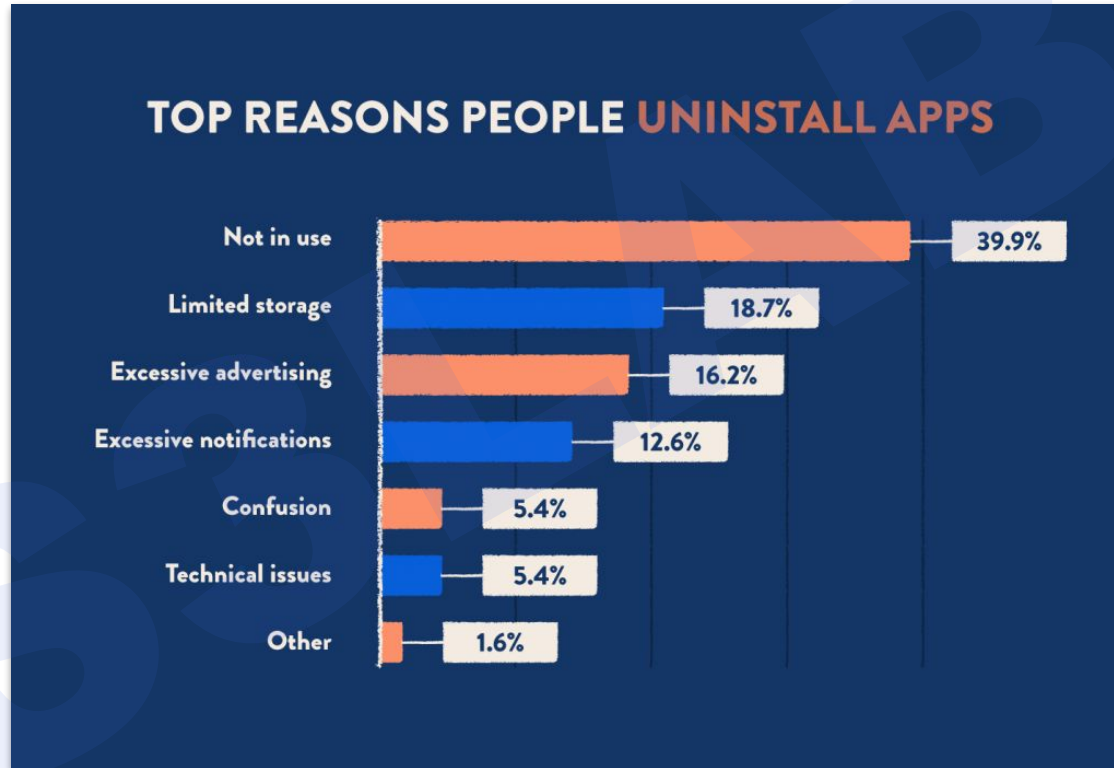


Something we need to know

What are the Most
Used App Categories &
Total Time Spent?



Something we need to know

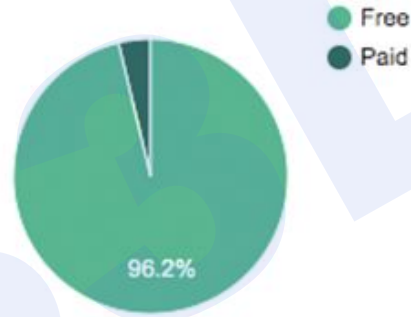


Something we need to know



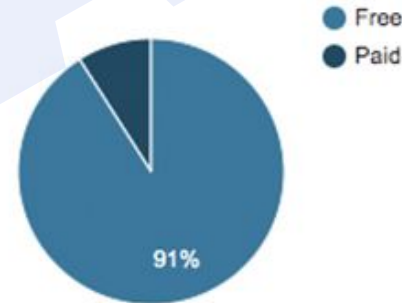
Free vs Paid Apps in App Stores

Free vs Paid



Google Play Store

Free vs Paid



Apple App Store

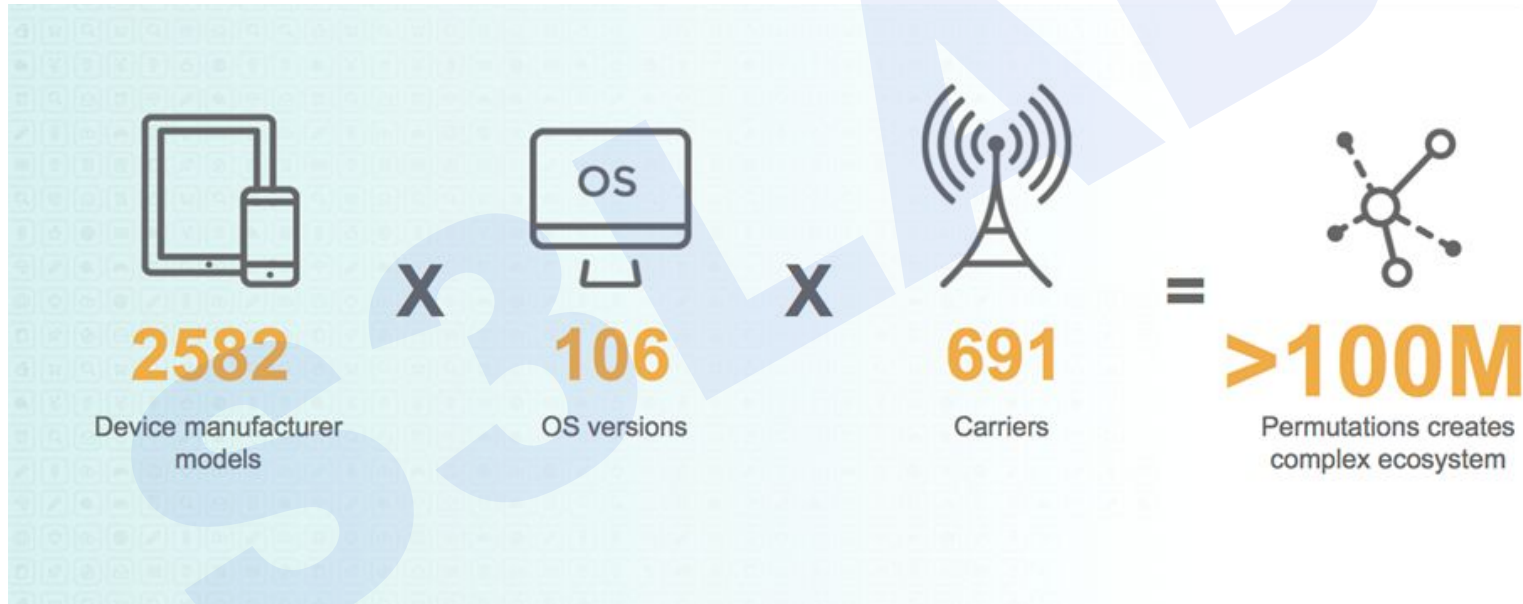
Something we need to know

- Mobile App Platforms Grow
- 40K Apps / Month Added



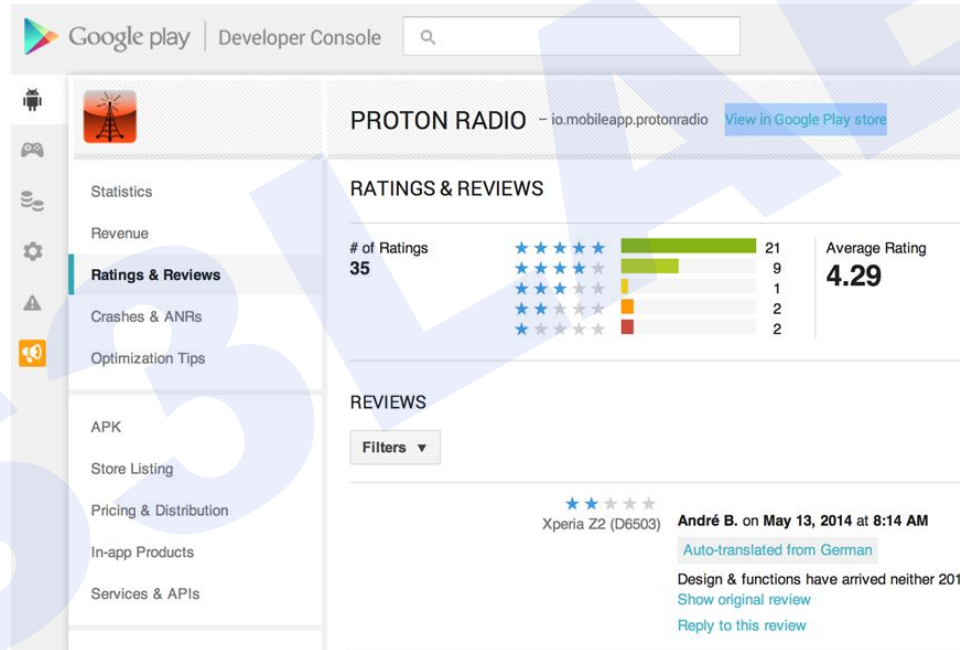
Something we need to know

- Mobile App Devices are Fragmented



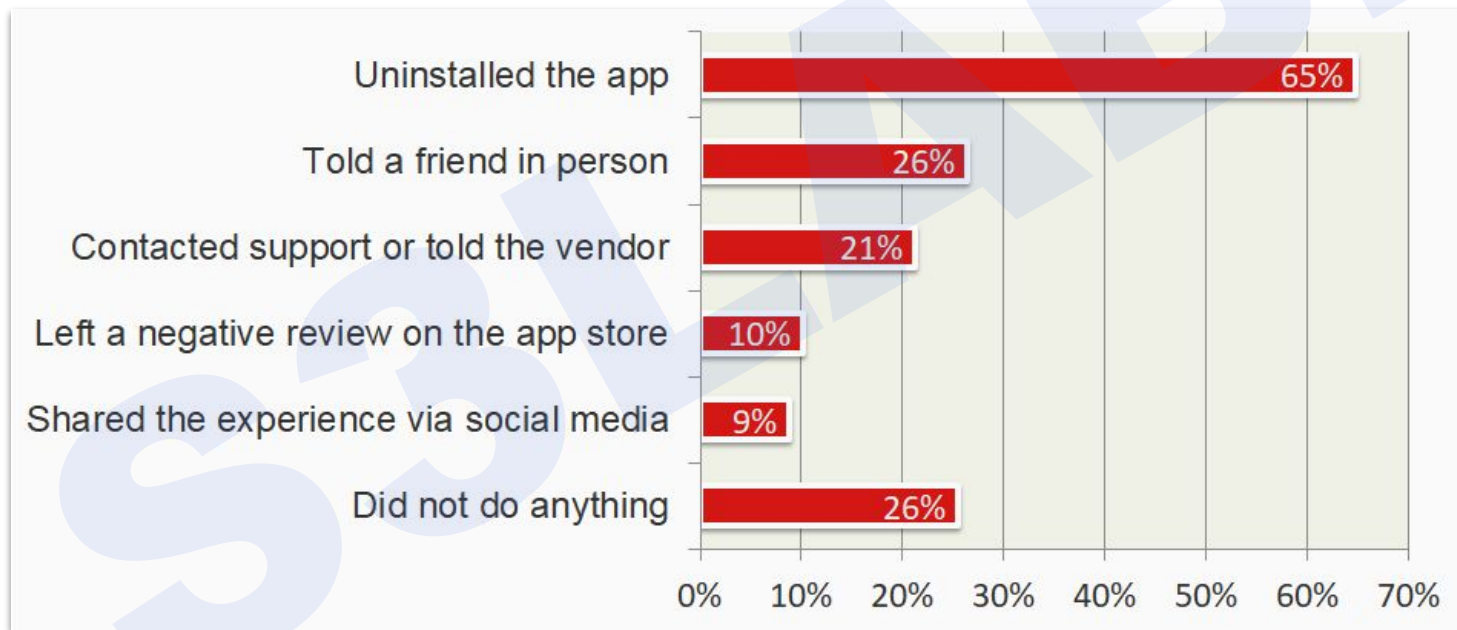
Something we need to know

- For the first time, user experience has a Feedback Loop



Something we need to know

- What do users do when the app is slow?



Something we need to know



*“If everything is tested, we
don’t need to monitor”*

TRUE or FALSE

Something we need to know



- The average mobile application consumes 6 different APIs / web services

(Critticism Mobile Benchmark Report 2014)

- Mobile AD SDKs
- Mobile Security SDKs
- Mobile Analytics SDKs
- Mobile Monitoring SDKs
- RESTful APIs



Approaches to build a mobile app

- Native: java for android, Swift or object C for iOS.
- Hybrid: base on WebViews, Ionic framework, javascript 'bridge'
- Cross-platform:
 - React Native: write by javascript, not webview but still javascript 'bridge'
 - Flutter: javascript but compiles native code for multiple platform
 - ...
- **Progressive Web Apps**: base on Web but can work offline, have icon, responsive, ...

Approaches to build a mobile app

Native

	Android	iOS
Programming Language	Java, Kotlin	Objective-C, swift
Integrated Development Environment (IDE)	Android Studio	Xcode
Software Development Kit (SDK)	Android SDK	iOS SDK
Popular tools available	Android Studio, Android IDE, IntelliJ IDEA	Xcode, AppCode, Atom

Approaches to build a mobile app



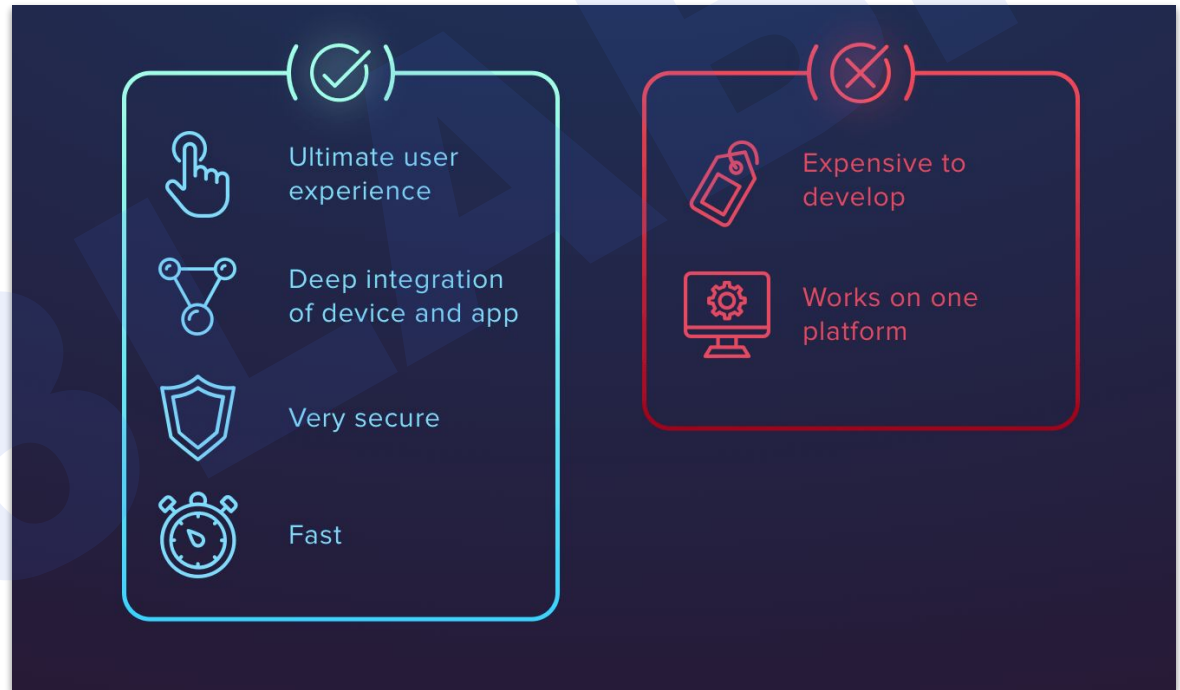
Native

- When to go native:
 - Have time and resources to have **separate teams**: iOS and android
 - Have money and are willing to spend an extra buck for **superior UI** and **performance**
 - If you need **full-access to hardware**-related features like gestures, geolocation, touch ID, go Native.
 - Building a **graphic-rich** app/game and need top most **performance** and **speed**
- Disadvantages
 - Have to maintain a separate codebase for iOS, Android and any other platform you wish to deploy your app on
 - Cost a lot more money and take a longer time-to-market

Approaches to build a mobile app

Native

- Pokemon Go
- Twitter
- Google Maps
- LinkedIn



Approaches to build a mobile app



Hybrid -> Ionic, Sencha touch 2, PhoneGap/Apache Cordova

- **Advantages:**

- The biggest advantage, manage one codebase for your application.
- Save time and money by hiring fewer developers and reaching the market quickly.
- Easily scalable if you have built the application for one platform.
- Hybrid apps also allow you access to device features.

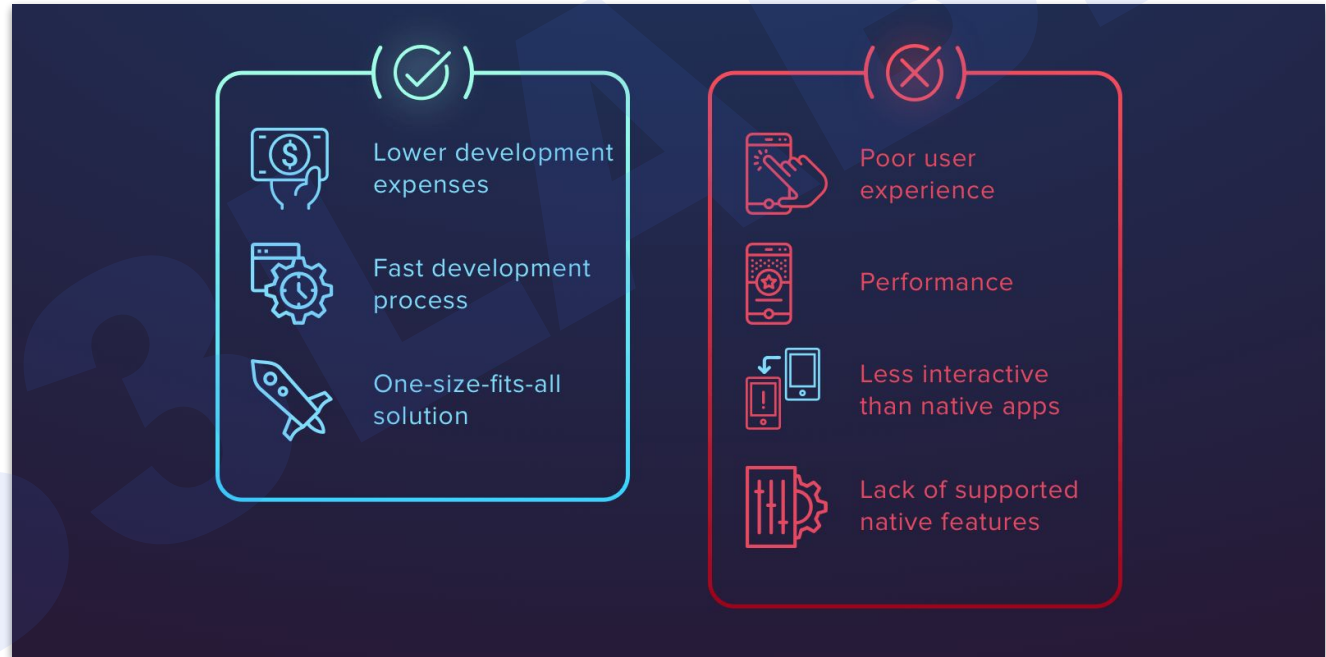
- **Disadvantages**

- The **performance** of Hybrid Applications is not at par with Native Applications.
- **UI/UX** of the application is, let's say just not the same.
- Cross-platform app development is tough especially if you are looking for “**native user experience**”.

Approaches to build a mobile app

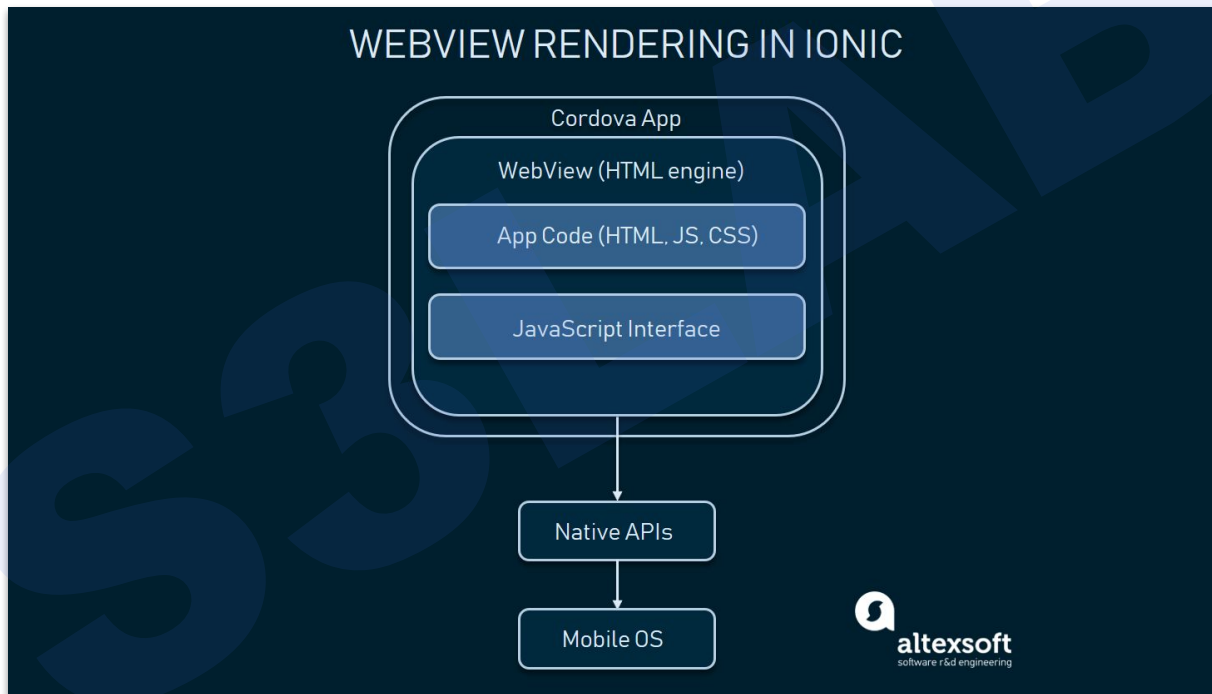
Hybrid

- Yelp
- BaseCamp
- Untappd



Approaches to build a mobile app

Hybrid -> How can they work?



Approaches to build a mobile app



Cross-platform -> Xamarin, React Native, Flutter, Titanium

- **Advantages:**

- Don't have much time? If you want to reach the market in less than six months, then a cross-platform app development could be for you.
- If you want to build a low budget app that has simple UI but heavy logic.
- Cross-platform app development can be 30% cheaper and 40% quicker than Native app development.
- Build applications on different platforms with consistent brand identity.
- It allows for up to 70% code reusability.

- **Disadvantages**

- Performance challenges
- Slow Code Performance With Limited Tool Availability
- Limited User Experience

Approaches to build a mobile app

Cross-platform -> Xamarin, React Native, Flutter, Titanium



EASY MARKETING

WHEN PROMOTING A CROSS-PLATFORM MOBILE APP, YOU CAN AVOID THE HASSLE OF CREATING DIFFERENT NICHE MESSAGES FOR EACH TARGETED GROUP OF USERS, AND USE GENERALISED MASS MESSAGES INSTEAD.



QUICK AND EASY UPDATES

WHEN YOU HAVE ONE APP THAT RUNS ACROSS MULTIPLE PLATFORMS, ALL UPDATES ARE SYNCHRONIZED ACROSS ALL THE PLATFORMS AND DEVICES.



IDENTICAL FEEL AND LOOK

A CROSS-PLATFORM APPLICATION HAS THE SAME FEEL AND DESIGN ACROSS ALL THE PLATFORMS AND DEVICES IT RUNS ON.



WORSE USER EXPERIENCE

NATIVE APPLICATIONS GIVE A BETTER USER EXPERIENCE, AS THEY ARE CREATED IN COMPLIANCE WITH SPECIFIC REQUIREMENTS OF A PARTICULAR PLATFORM.



LOWER PLATFORM FUNCTIONALITY

A CROSS-PLATFORM APP DOES NOT ALLOW ENJOYING ALL OF THE UNIQUE FEATURES AND TOOLS OF EVERY PLATFORM IT IS USED ON.



COMPLICATED INTEGRATION

INTEGRATING A CROSS-PLATFORM APP WITH LOCAL SETTING, PREFERENCES AND NOTIFICATION APPLICATIONS IS USUALLY PRETTY DIFFICULT.



REDUCED DEVELOPMENT TIME

WHEN DEVELOPING AN APP THAT CAN RUN ON DIFFERENT PLATFORMS YOU SAVE MUCH TIME AND ENERGY, AS THERE IS NO NEED TO BUILD A NEW APP FOR EACH TARGETED PLATFORM.



COST EFFICIENCY

DEVELOPMENT COSTS ARE SIGNIFICANTLY REDUCED WHEN YOU BUILD ONE APP FOR SEVERAL PLATFORMS.



EASY MAINTENANCE

DUE TO INSTANT SYNCHRONIZATION, MAINTAINING ONE APP AND DEPLOYING CHANGES IS EASIER THAN DEALING WITH TWO OR MORE SIMILAR APPS USED ON DIFFERENT PLATFORMS.



UI DISPARITIES

EACH PLATFORM HAS ITS SPECIFIC SCREEN LAYOUT, WHICH MAKES IT DIFFICULT TO DEVELOP ONE APPLICATION, FITTING EACH TARGETED PLATFORM.



PLATFORM INTEGRATION

SINCE EACH PLATFORM HAS ITS SPECIFIC STORAGE OPTIONS, NOTIFICATION APPS, PREFERENCES AND LOCAL SETTINGS, INTEGRATING AN APP WITH ALL THE REQUIREMENTS OF EACH PLATFORM CAN BE TROUBLESOME.



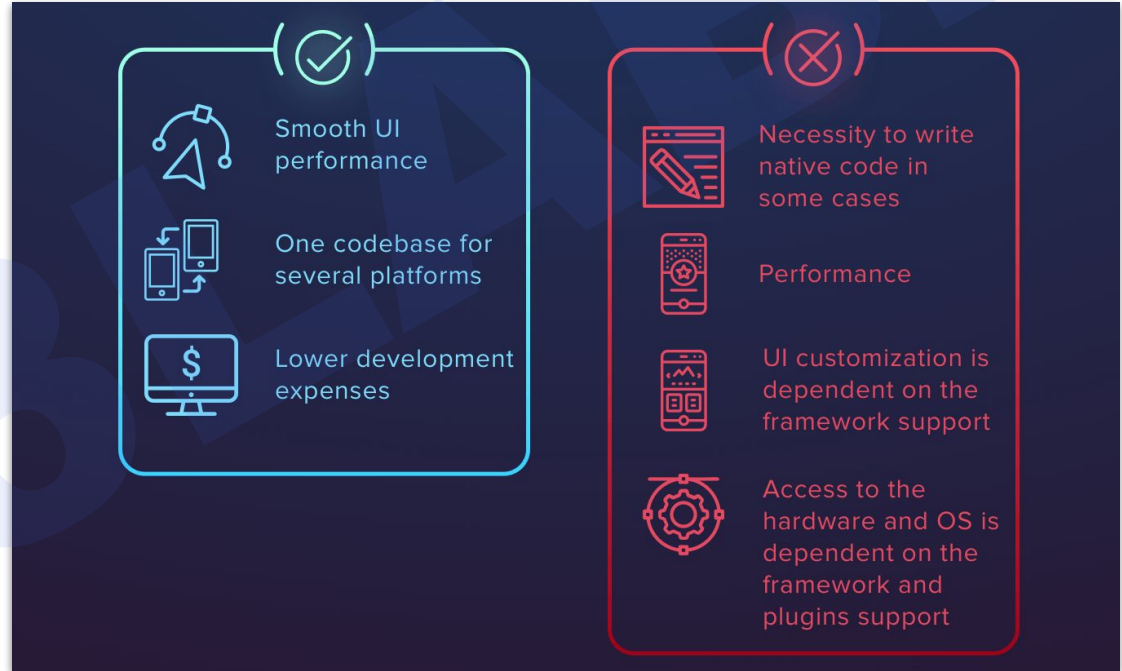
TRYING TO SATISFY EVERYONE

TRYING TO MEET THE NEEDS OF VARIOUS PLATFORM USERS, AND ADAPTING ONE APP TO THE REQUIREMENTS OF MULTIPLE PLATFORMS, YOU SACRIFICE THE UNIQUENESS AND FUNCTIONALITY OF EACH PLATFORM.

Approaches to build a mobile app

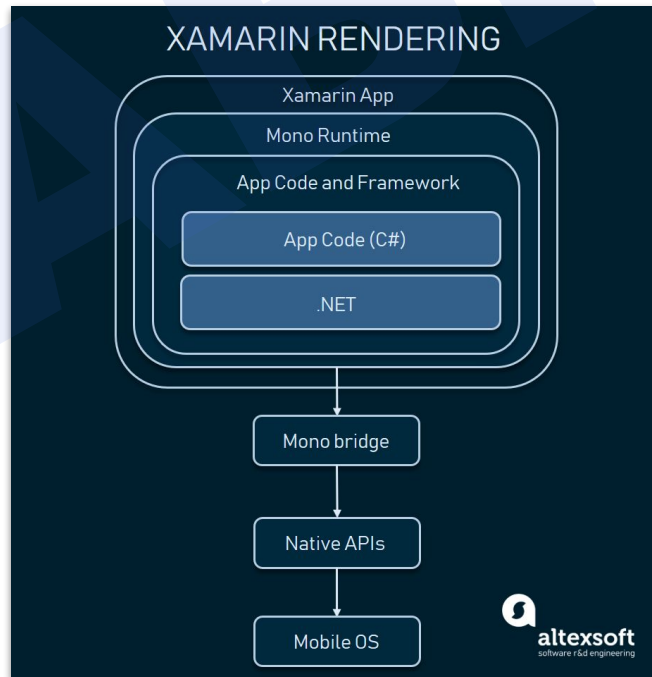
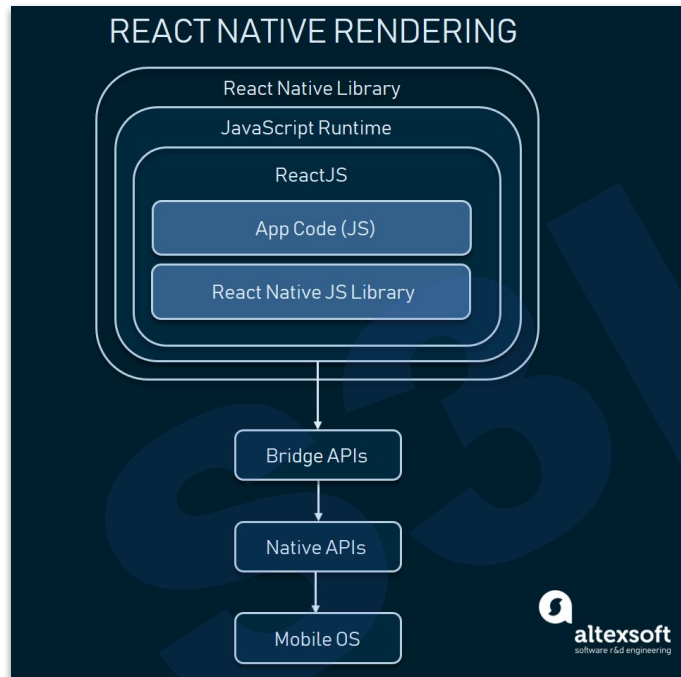
Cross-platform -> Xamarin, React Native, Flutter, Titanium

- Google Ads
- Picturex
- Reflectly
- Birch finance



Approaches to build a mobile app

Cross-platform -> How can they do the cross platform?



Approaches to build a mobile app



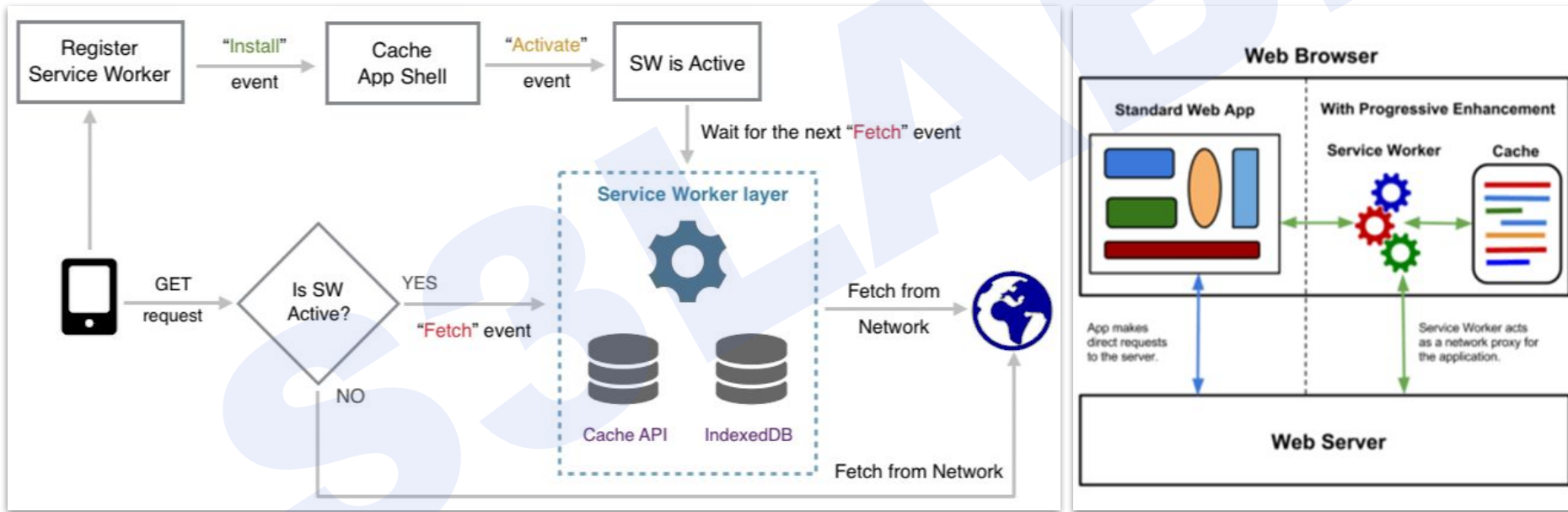
PWA

- Flipkart
- AliExpress
- Instagram
- Pinterest

PWA VS NATIVE APP		
Feature	Progressive Web App	Native App
Function offline	✓	✓
Mobile-Specific Navigation	✓	✓
Push Notifications	✓	✓
Home Screen Access	✓	✓
No Download Required	✓	✗
Bypasses The Marketplace	✓	✗
Linkable & Shareable	✓	✗
Indexed By Google	✓	✗
Low Data Requirements	✓	✗
Requires No Updates	✓	✗

Approaches to build a mobile app

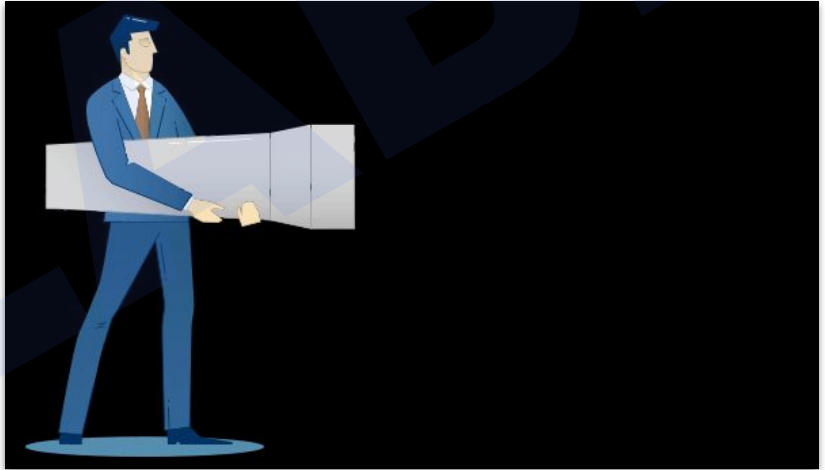
PWA



10 Important Things for Success

2. *PLANNING & TARGET AUDIENCE (MARKETING)*

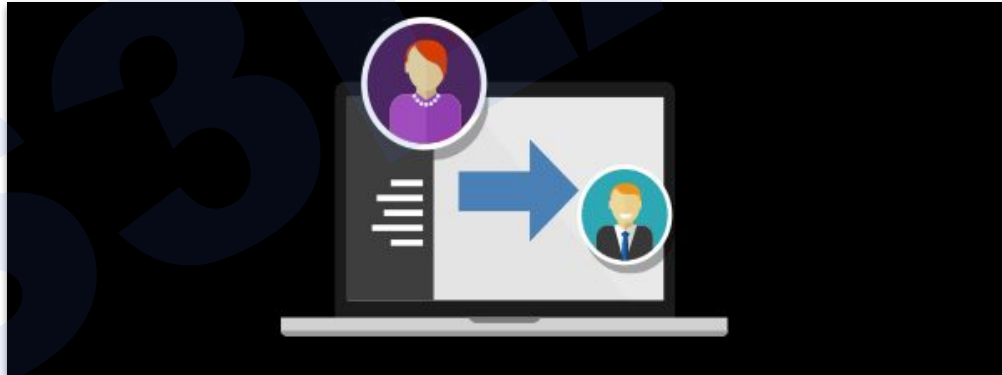
- Cost for Marketing?
- Pricing, target audience...
- Upgrading plan



10 Important Things for Success

3. APPLICATION WORKFLOW

- how your app moves from place to place
- How to a user interacts
- how all the screens will be linked together



10 Important Things for Success

4. INTUITIVE NAVIGATION

- How you will get to other pages on each page
- Imagine someone didn't understand the full functionality of what your app did. How long would it be before they stop using it all together?



10 Important Things for Success



5. COLOR SCHEME

- Search for “color psychology”
- Your colors can have the most dramatic effect of all
- First impressions are everything



10 Important Things for Success



6. *DEVICE ORIENTATION*

7. *MOBILE FIRST DESIGN*

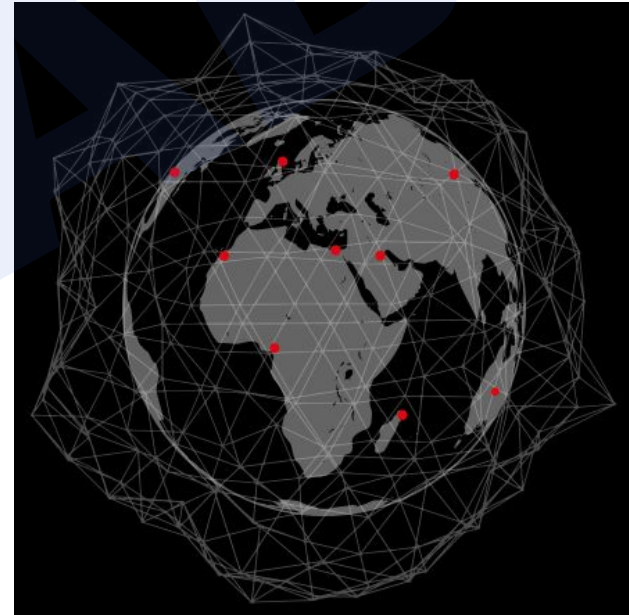


10 Important Things for Success



8. *IN THE CONSIDERATION OF YOUR USERS (PREVIOUS SOFTWARES)*

- The whole idea is to make you app as popular as possible right?
- Flexible devices, Regions, Ages, ...



10 Important Things for Success

9. *PROTOTYPE YOUR APP*

- Agile Development Model
- Make simple prototype, collect ideas from friends



10 Important Things for Success



10. WEB APP INTEGRATION



Q & A



Thank you for listening

*"Coming together is a beginning;
Keeping together is progress;
Working together is success."
- HENRY FORD*