UNIVERSIDAD NACIONAL DE COLOMBIA
SEDE BOGOTÁ

Frameworks Hybrid Mobile App Development

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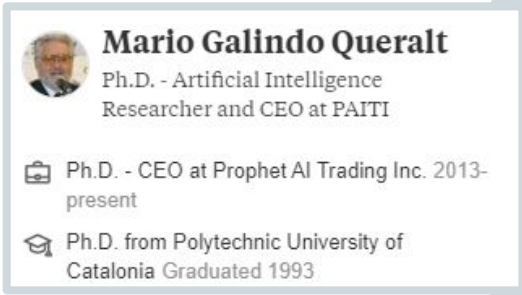
Software Framework

"An abstraction in which software providing generic functionality can be selectively changed by additional user-written code, thus providing application-specific software."



"A framework is a general *"blank"* application that can be easily customized into a wide variety of specific real applications."

Software Framework

Frameworks have key distinguishing features that separate them from normal libraries:

- ***inversion of control***: In a framework, unlike in libraries or in standard user applications, the overall program's flow of control is not dictated by the caller, but by the framework.
- ***extensibility***: A user can extend the framework – usually by selective overriding – or programmers can add specialized user code to provide specific functionality.

Software Framework

- ***non-modifiable framework code*:** The framework code, in general, is not supposed to be modified, while accepting user-implemented extensions. In other words, users can extend the framework, but cannot modify its code.

Software Framework

FRAMEWORKS

Django

★ Star 38K Fork 16K

Pyramid

★ Star 3K Fork +835

Web2py

★ Star 1K Fork +801

FRAMEWORKS

Express.js

★ Star 41K Fork 7K

Koa2

★ Star 24K Fork 2K

Sails.js

★ Star 19K Fork 1K

NestJS

★ Star 10K Fork +699

FRAMEWORKS

Laravel

★ Star 47K Fork 14K

Symfony

★ Star 19K Fork 6K

CodeIgniter

★ Star 16K Fork 7K

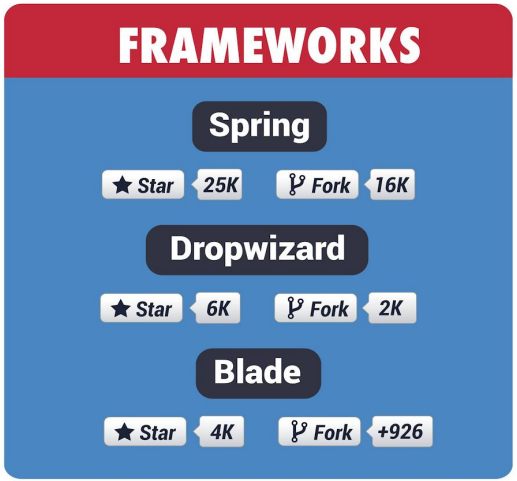
CakePHP

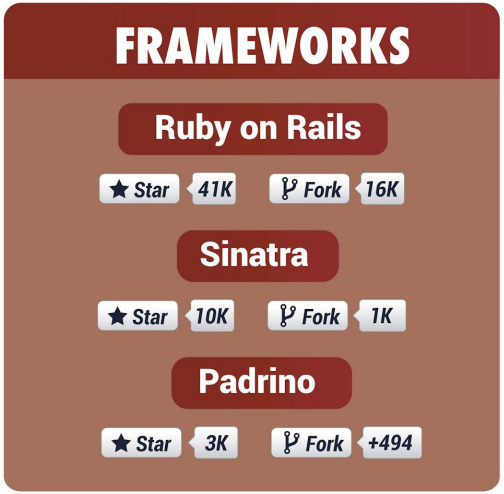
★ Star 7K Fork 3K

Phalcon

★ Star 9K Fork 1K

Software Framework

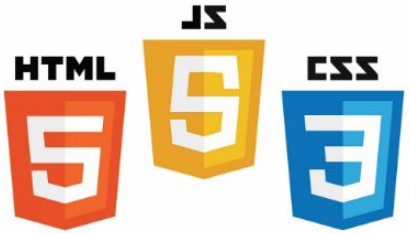




Hybrid Application

A hybrid application combines elements of both native and web applications.

- Can function whether or not the device is connected.
- Integration with a device's file system.
- Integration with Web-based services.
- An embedded browser to improve access to dynamic online content.



Native vs Web vs Hybrid

Feature	Native	Web-only	Hybrid
Device Access	Full	Limited	Full (with plugins)
Performance	High	Medium to High	Medium to High
Development Language	Platform Specific	HTML, CSS, Javascript	HTML, CSS, Javascript
Cross-Platform Support	No	Yes	Yes
User Experience	High	Medium to High	Medium to High

Native vs Web vs Hybrid

Feature	Native	Web-only	Hybrid
Device Features Access	High	Limited	Limited
Development cost	Medium to High	Medium to High	Low to Medium
Code portability	Only to specific device	Multiple Platforms	Multiple Platforms
Development time	High		Low

Native apps VS Hybrid apps

Feature	Native	Hybrid
Speed	High	Medium
Advanced graphics	Low overhead acces, provides high-quality graphics	Dependent on hybrid framework
UX/UI integration	High	Low
Access to native api’s	High	Moderate

Hybrid Application

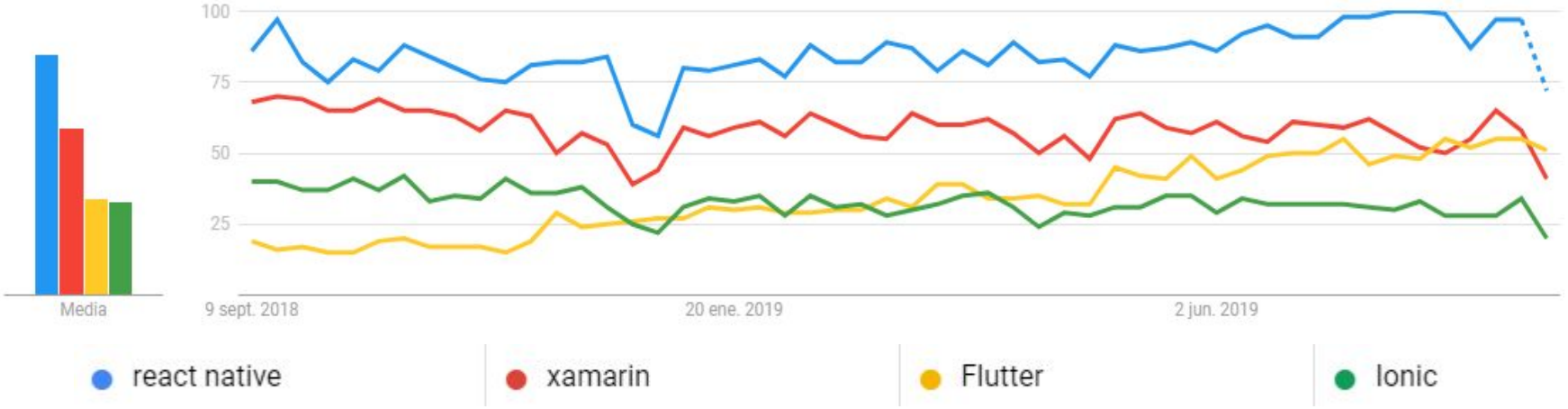
Advantage:

- Easier development approach
- Cost savings
- Low maintenance.
- Compatibility across a variety of platforms

Disadvantage:

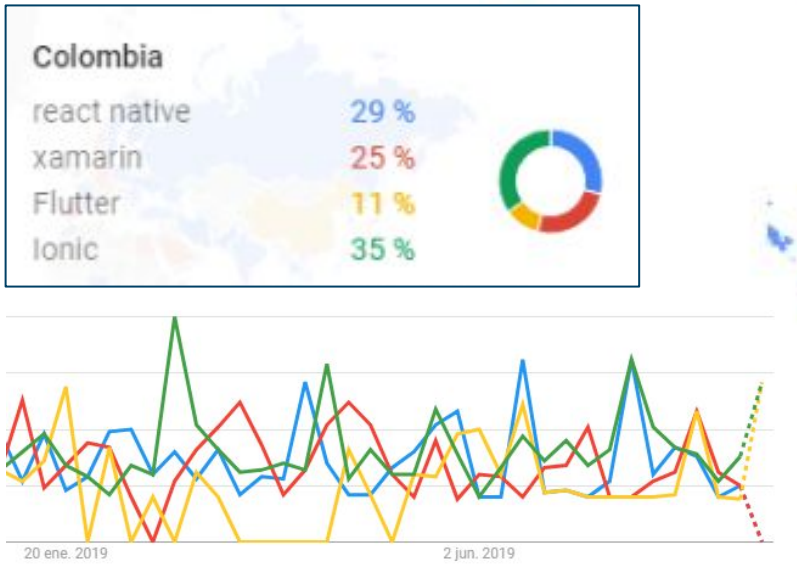
- Limited capabilities.
- Low UX/UI integration
- Low performance.
- Internet connection.

Hybrid Application



Google trends

Hybrid Application



Google trends

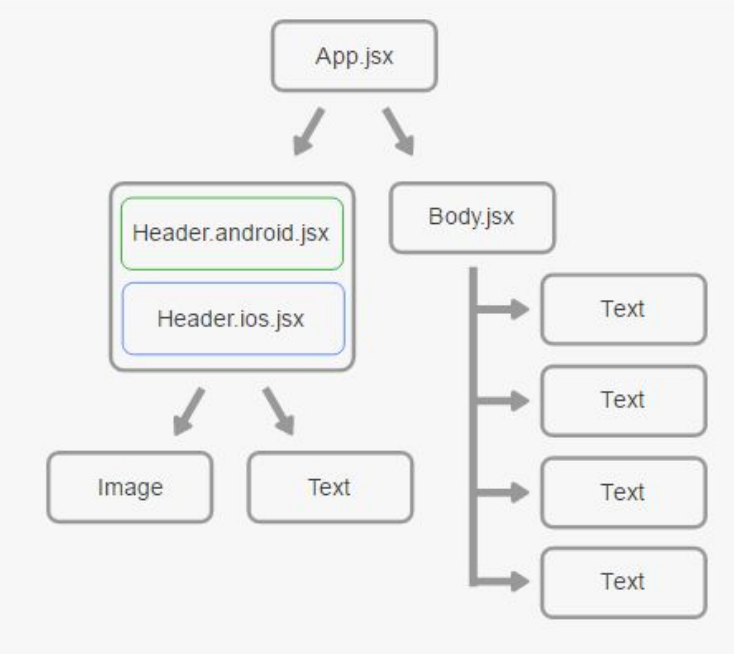
Examples apps

Native apps

Hybrid apps

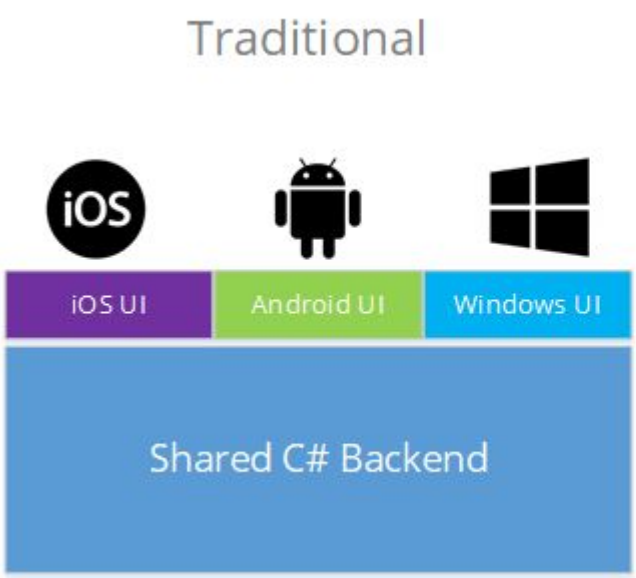
Frameworks

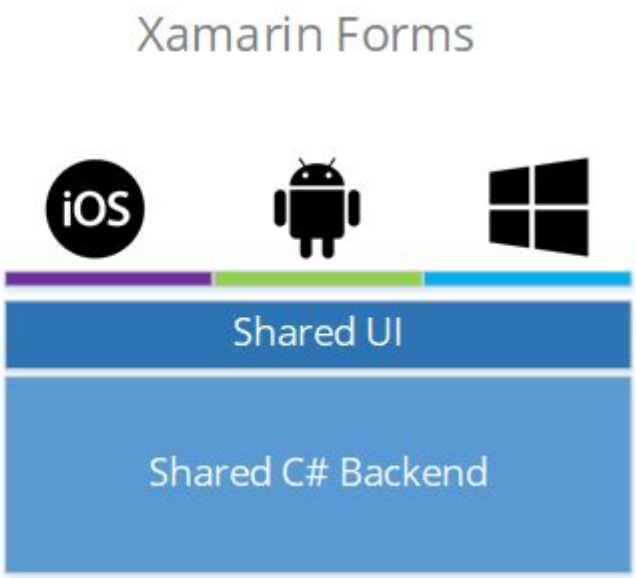
React Native



- Developed by Facebook in 2015
- Manage android and ios projects
- Interact with native APIs via React's declarative UI paradigm and JavaScript

Xamarin


Traditional
iOS
iOS UI
Android UI
Windows UI
Shared C# Backend

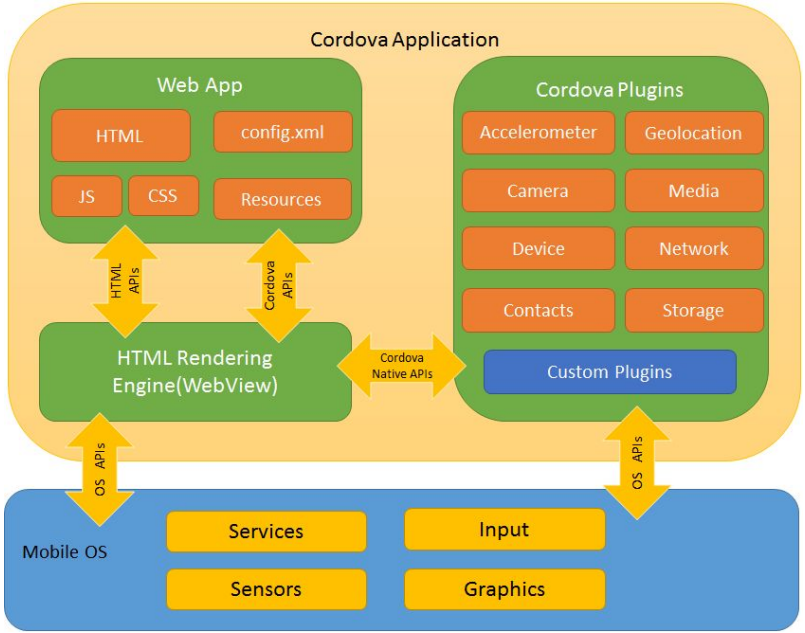

Xamarin Forms
iOS
Shared UI
Shared C# Backend

Onsen UI

- Based in Web Components
- Compatibility with JQuery and Angular
- free and open sourced

- Template upgrading is tedious

PhoneGap



PhoneGap framework is an open source distribution of Cordova

- Managed Compilation and Signing (No SDKs)
- Multiple Supported Platforms
- Quicker Development Cycle

Mobile Angular UI

Advantages

- Comes with fastclick.js and overthrow.js
- Is that it is available for free and is also an open source framework.

Disadvantages of Mobile Angular UI :

- There are internal dependencies in Bootstrap3

Mobile Angular UI is a mobile UI framework just like Sencha Touch or jQuery Mobile. If you know Angular JS and Twitter Bootstrap you already know it!

Intel XDK

Allows to create cross-platform apps

- Support Android and iOS
- Live preview with the tool

- Drag and drop tool wich creates unnecesary code

Sencha Touch

Enterprise framework for creating high-performance apps closest to native experience as possible

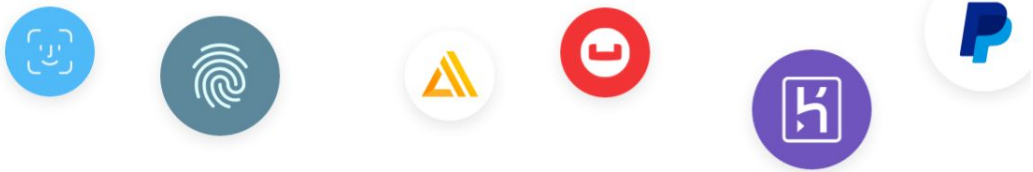
- Has a drag a drop builder tool
- widgets ready to use

- Only for enterprise purposes
- Premium and expensive option

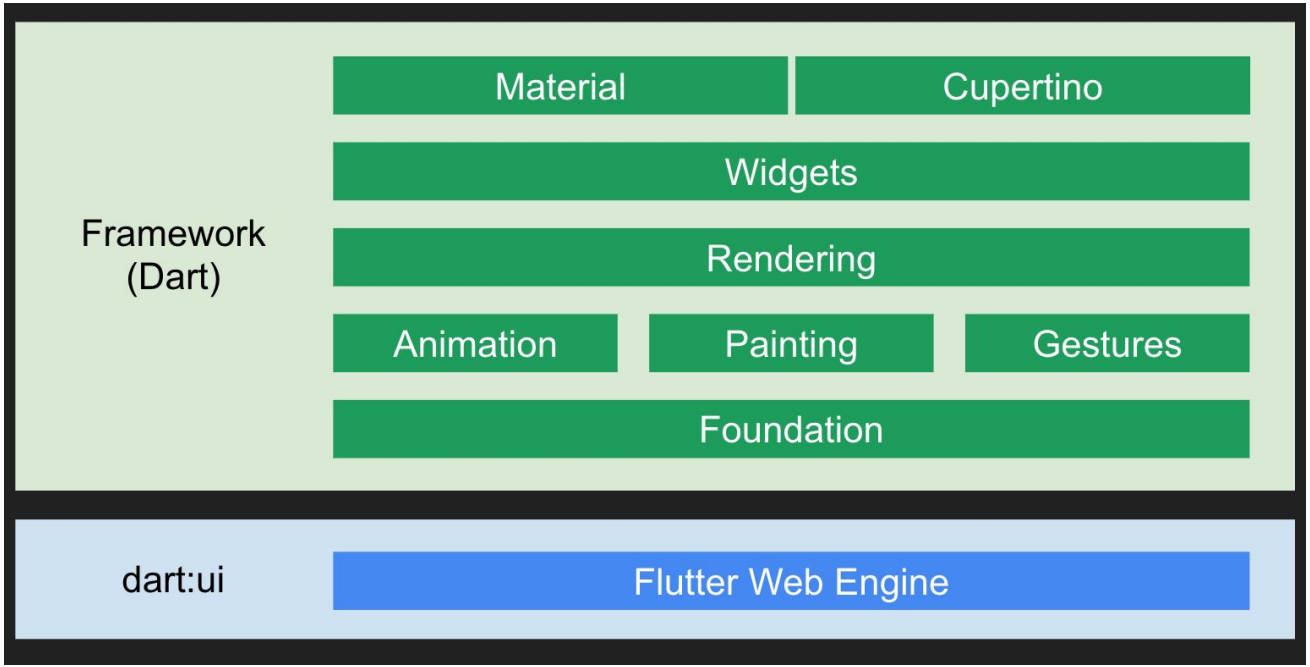
It is the premium choice for all the enterprise application developments

Ionic

Build with intuitive UI components that accelerate app development, and can be deployed virtually anywhere.



Flutter


Framework
(Dart)
Material
Cupertino
Widgets
Rendering
Animation
Painting
Gestures
Foundation
dart:ui
Flutter Web Engine

Framework 7

Advantages

- Customization is very easy to achieve
- Helps in creating native applications without the external dependencies of React or AngularJS.
- Provides many UI widgets and elements that help in developing feature rich mobile applications.

Disadvantages of Framework7 :

- For any package emulation or to provide any mobile application builder, this has to be put along with either PhoneGap or Cordova
- A necessity to work with F7 MVC framework
- It is not compatible with all the possible mobile platforms.

jQuery Mobile

Advantages:

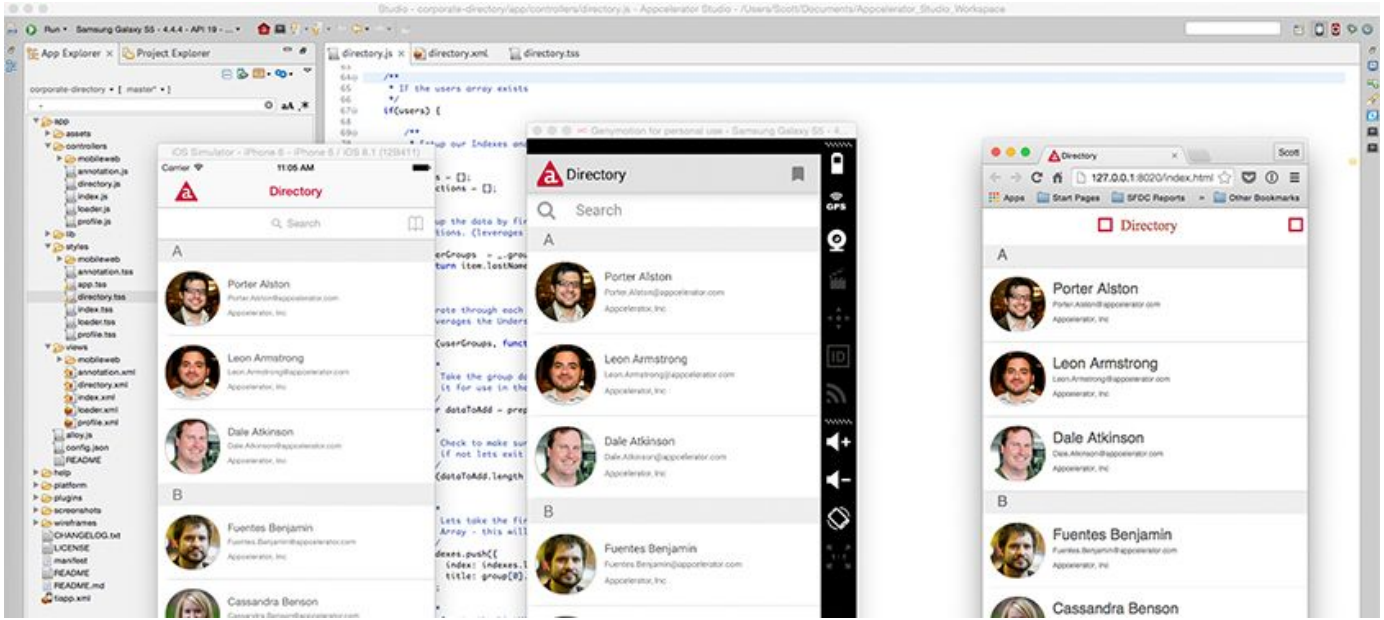
- Just write responsive websites, not native apps
- Use HTML5 tags for development
- You can modify your design easily
- Reduced sized apps
- Support most of standard Jquery events
- Support most of Web Browsers and versions

Disadvantages :

- Is not fully compatible with iOS versions later than 4.8.1
- Is not fully compatible with android versions later than lollipop

“Write less, do more... ”

Appcelerator Titanium

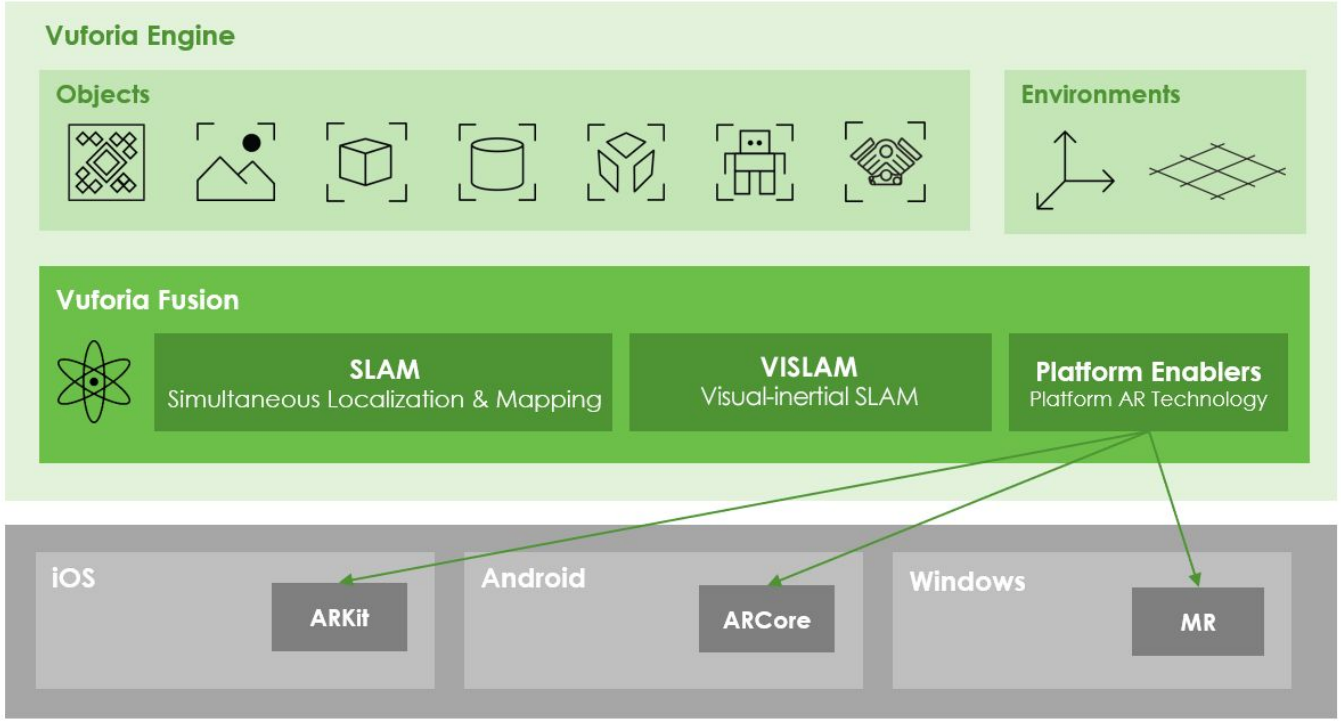


Kendo UI

hybrid mobile application development framework which is also an HTML5 framework that is widely used for cross-platform mobile application development.

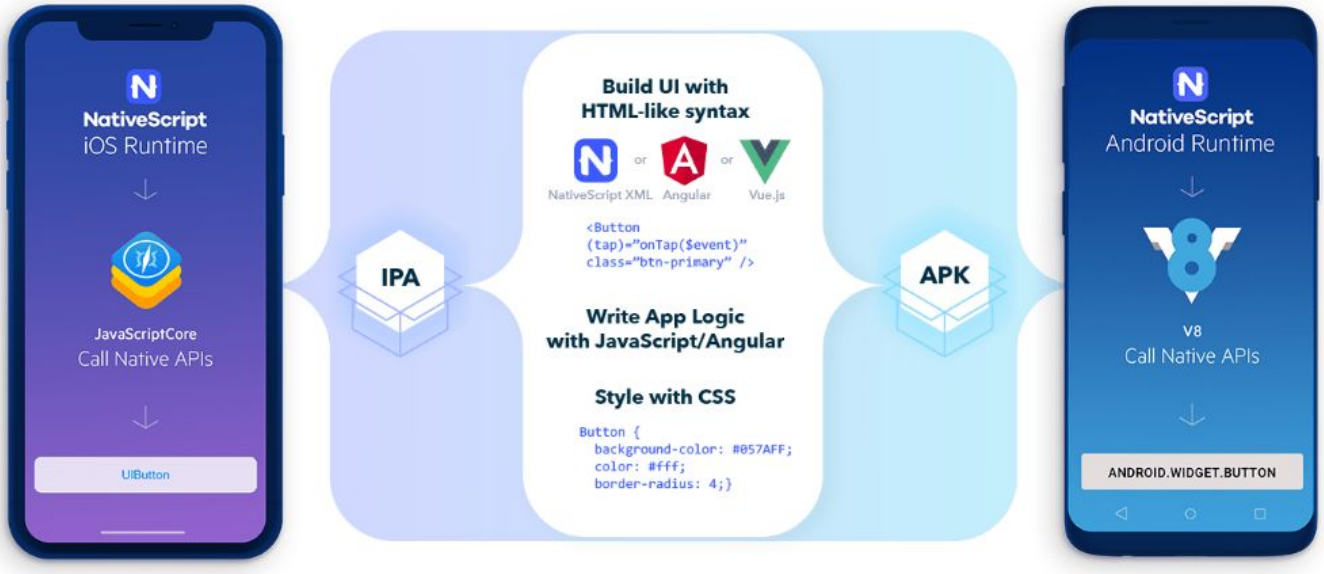
There is a strong dependency on jQuery and has around 70+ ready to use jQuery mobile app widgets from the word go

VuForia



vuforia™

NativeScript



NativeScript

Example Framework

1 Install Ionic

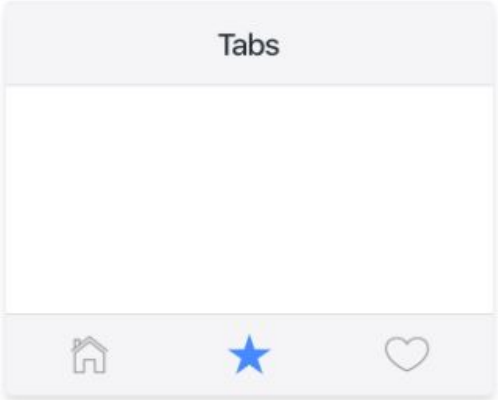
As an asynchronous event driven JavaScript runtime, Node.js is designed to build scalable network applications.
[https://nodejs.org/en/about/]

```
npm install -g ionic
```

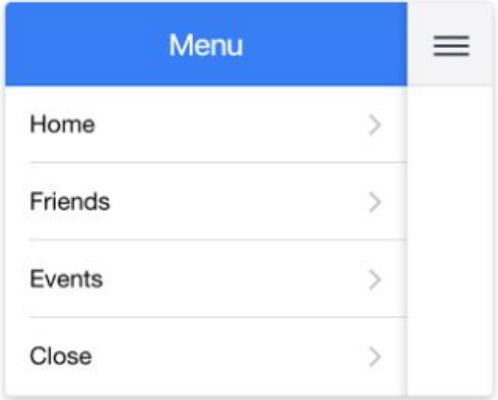
2 Start an app

```
ionic start myApp tabs
```


$ ionic start myApp blank

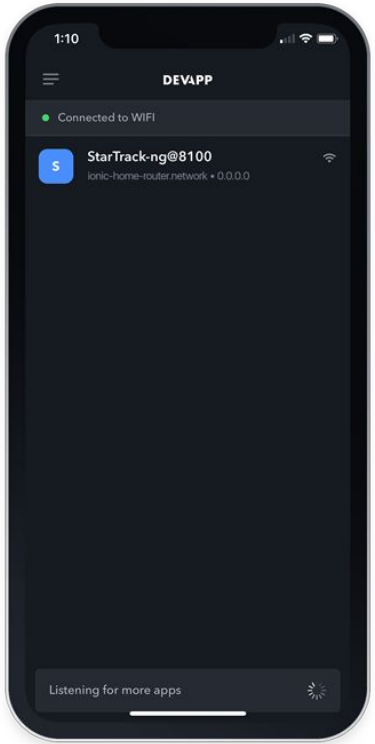


$ ionic start myApp tabs



$ ionic start myApp sidemenu

3 Run your app

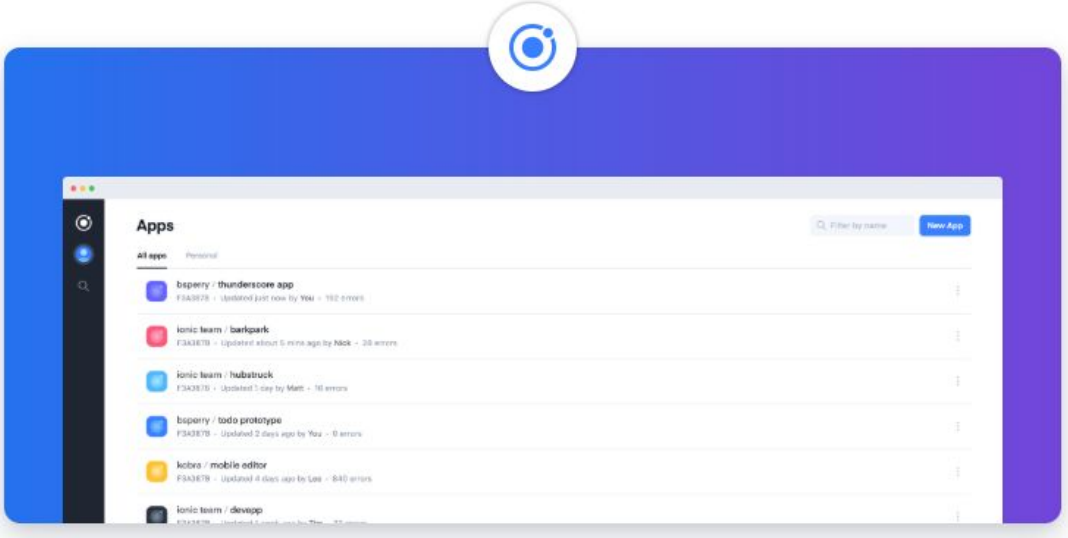



```
cd myApp
ionic serve
```

```
$ ionic serve
> ng run app:serve --host=0.0.0.0 --port=8100

[INFO] Development server running!

Local: http://localhost:8100
External: http://192.168.1.169:8100
DevApp: StarTrack-ng@8100 on ionic-home-router.network

Use Ctrl+C to quit this process

[INFO] Browser window opened to http://localhost:8100!
```

Supercharge your app

```
ionic link
```



Thanks

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