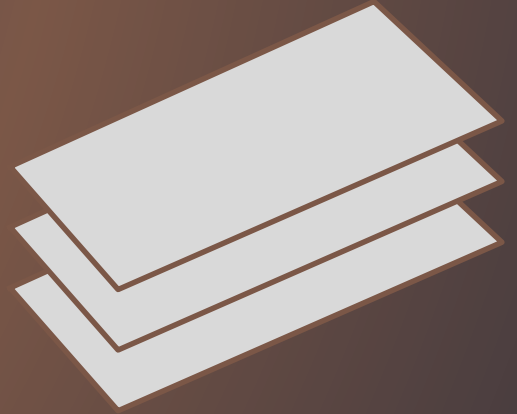


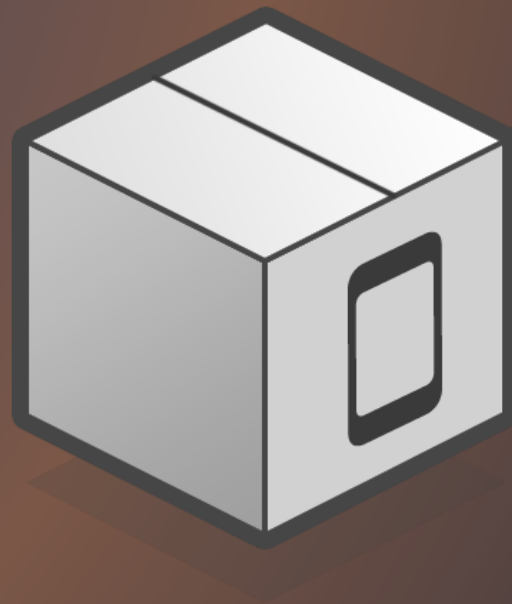
Mobile Development

June'2015, TEIATH, Greece



Presentation Overview

1. Introduction
2. Mobile Application Development
3. Cordova / Phonegap
4. Development Framework
5. Examples



1. INTRODUCTION

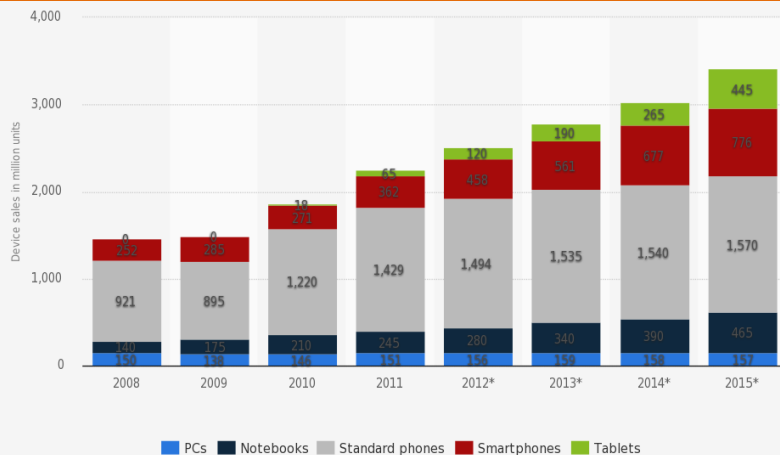
Introduction



- The world is going mobile
- Desktop sales are minimal
- Laptop sales are stable
- Smartphone sales are growing
- New types of hardware for mobility is appearing

A new connected mobile era

Number of Connected Devices

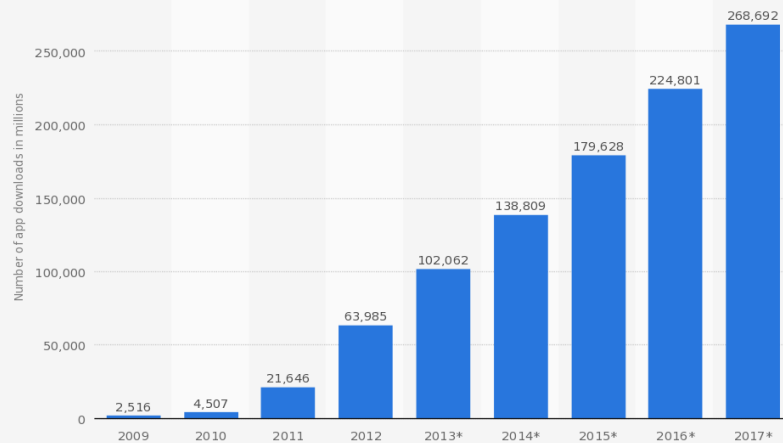


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Additional Information:
Worldwide; IDC, Gartner, iSupply, Booz & Company; 2008 to 2012

statista

App Downloads



Source:
Gartner
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Additional Information
Worldwide; Gartner; 2009 to 2013

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Motivations

- Most companies want a presence in the mobile world
- Market demands
 - Product must have a mobile app
 - App sales are increasing all over the world
 - Internet of things

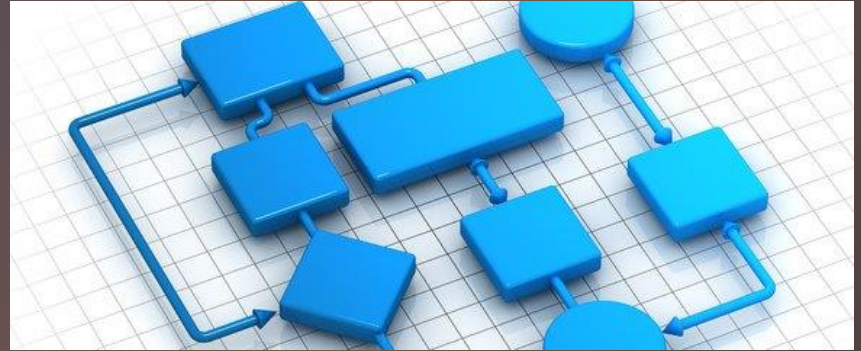
2. MOBILE APPLICATION DEVELOPMENT

Mobile Application Development Landscape



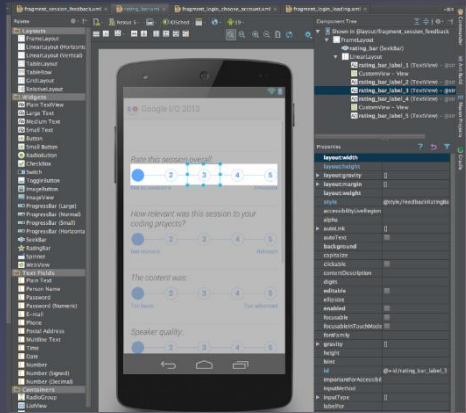
- Many operating systems
 - Android, iOS, Windows Phone, Bada, Firefox ,etc.
- Many devices
 - Phone, tablet, etc.

Mobile Application Development Landscape



- Many programming languages
 - Java
 - Objective-C, Swift
 - C#, JavaME, etc.
- Fast changing landscape
 - New OS versions
 - New operating systems
 - New features (NFC), etc.

Mobile Application Development Landscape



- Many development environments
 - Android Studio
 - XCode
 - Visual Studio

Native Mobile Application Development

Advantages

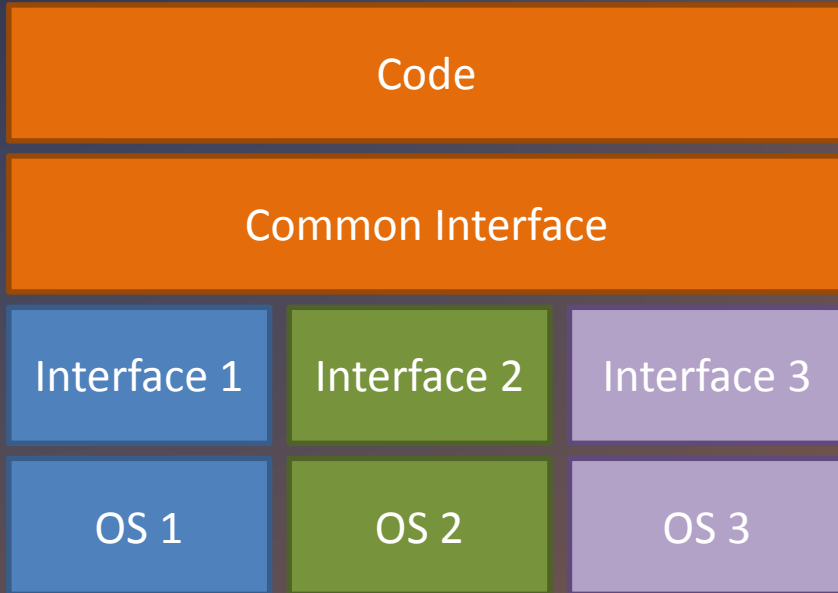
- Performance
- Native look and feel
- Small footprint
- Access to hardware

Disadvantages

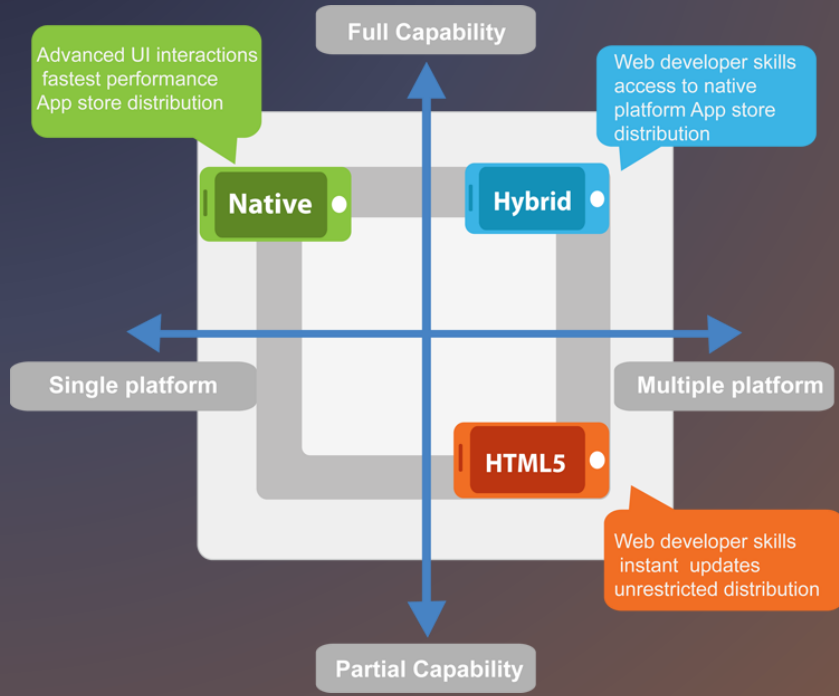
- Knowledge intensive
 - Front-end and back-end
- Expensive
 - To develop, to maintain
- Time consuming
 - To develop, to maintain

Hybrid Application Development

- Native libraries
- Common Interface
- Same code



Hybrid Application Development



- Combine native code with standard web technologies
- Offer a similar toolset
- Multiple platforms
- Code sharing

3. CORDOVA / PHONEGAP

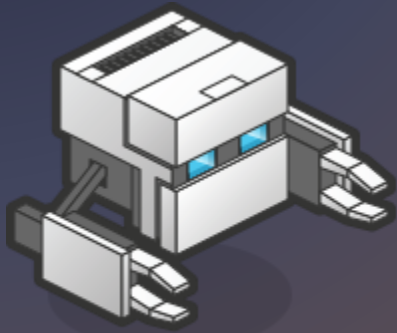


What is Apache Cordova?



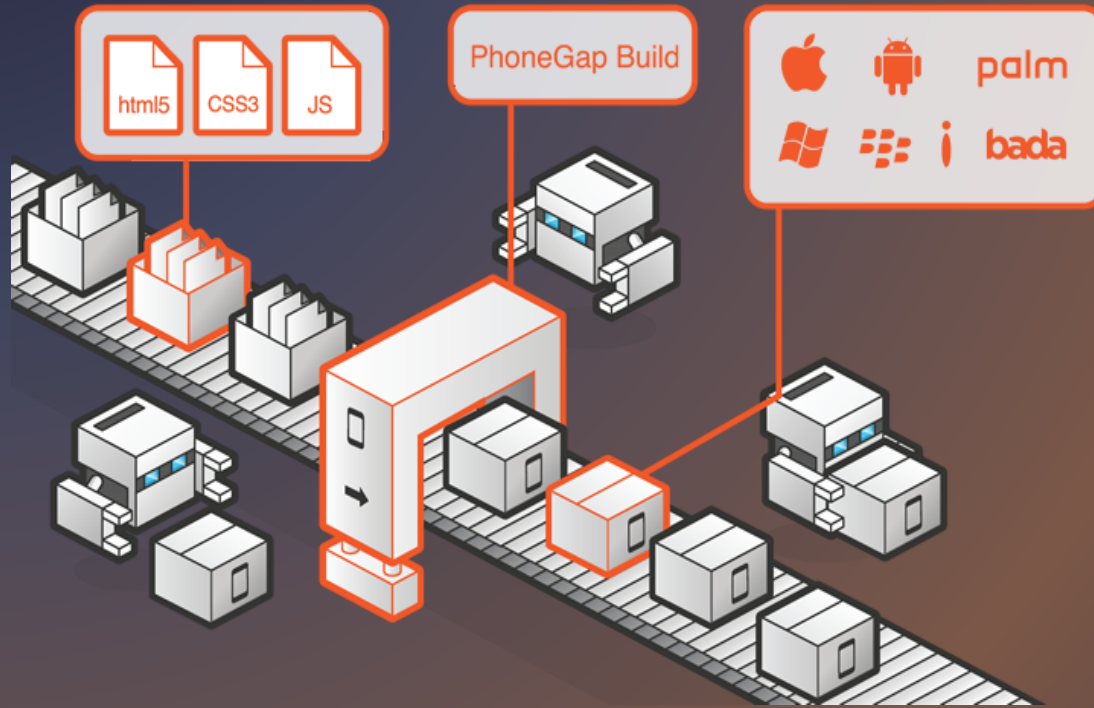
- Device APIs that allow a mobile app developer to access native device function such as the camera or accelerometer from JavaScript

What is Adobe Phonegap?



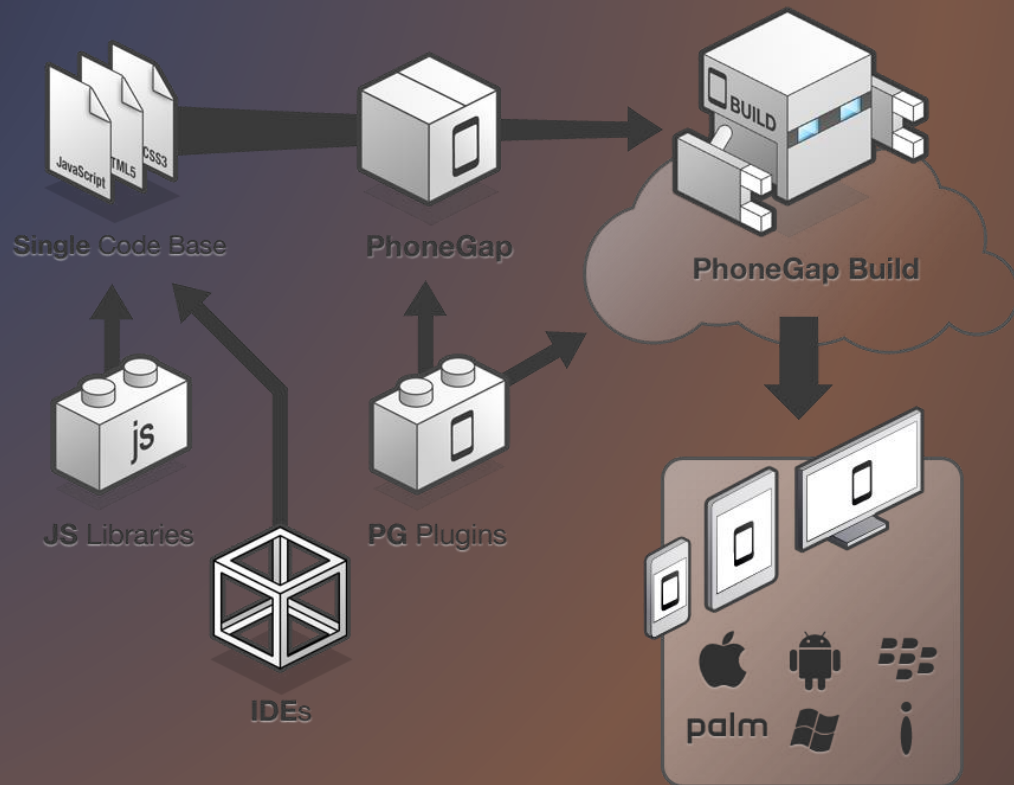
- Open-source mobile development framework
 - Developed by Nitobi Software
 - Bought by Adobe
- Enables building of mobile device applications using JavaScript, HTML and CSS
- Underlying PhoneGap there is Apache Cordova
- Others: Intel XDK, Appery.IO, appGyver Steroids, Iconic, etc.

Apache Cordova / Phonegap



- Can access hardware features
 - Accelerometer, Camera,
 - Compass, Geolocation,
 - Storage, Media, Notification, Files
 - Contacts, Barcodes,
 - Etc...
 - Many third-party extensions

How does it work?



Phonegap

Advantages

- Cross-platform
- Single code base for all platforms: iOS, Android, WP 7 Mango, mobile web
- Possible to take advantage of distribution and integrated payment via App Store or Android Market

Disadvantages

- Poor performance if app is graphically intense, i.e. a game.
- Lack of pre-built UI widgets, transitions, standard controls, etc.
- For the most part a native app is much faster/smoothen than mobile web app

Phonegap: Supported features by OS (May'2015)

Feature	iPhone /iPhone 3G	iPhone 3GS and newer	Android 1.0 – 4.4	Windows Phone	BlackBerry 10 and PlayBook OS	BlackBerry OS 4.6–4.7	BlackBerry OS 5.0-6.0+	Bada	Symbian	webOS	Tizen	Ubuntu Touch	Firefox OS
Accelerometer	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Camera	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Compass	N/A	Yes	Yes	Yes	Yes	N/A	N/A	Yes	N/A	Yes	Yes	Yes	Yes
Contacts	Yes	Yes	Yes	Yes	Yes	N/A	Yes	Yes	Yes	N/A	Yes	N/A	Yes
File	Yes	Yes	Yes	Yes	Yes	N/A	Yes	N/A	N/A	N/A	Yes	Yes	N/A
Geolocation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Media	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Yes	Yes	N/A
Network	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Notification (alert, sound, vibration)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Storage	Yes	Yes	Yes	Yes	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes	Yes

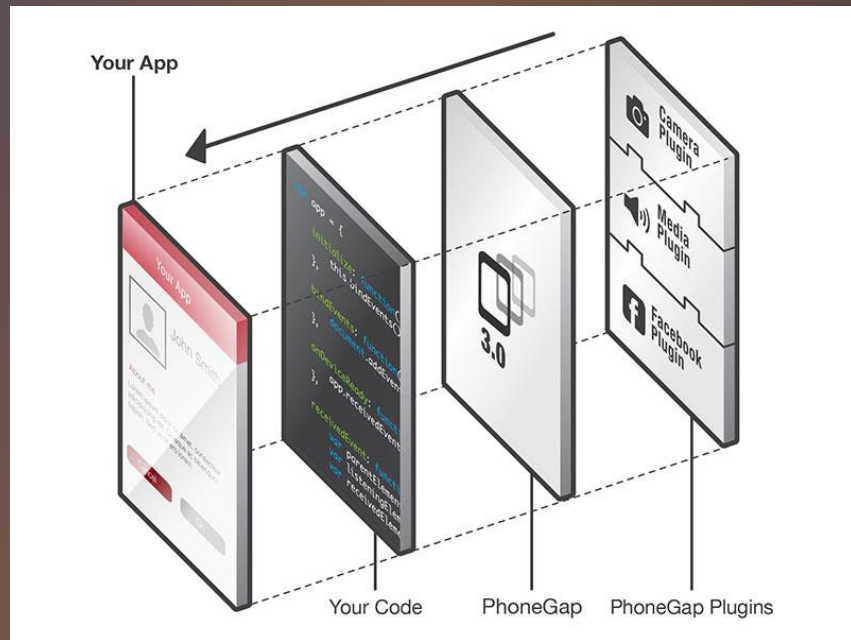
Alternatives to Phonegap

- Appcelerator Titanium
- Xamarin
- Rho
- Corona
- MoSync

4. DEVELOPMENT FRAMEWORK

Phonegap Library

- PhoneGap is just a library that you must include in your app
 - Couple of JavaScript and xml files
- What is PhoneGap doing?
 - PhoneGap generates a out-of-the-browser window that executes the HTML and JavaScript
 - Due to a couple of xml and jar/dll files it enables the usage of native APIs



Web Framework

- Based on standard technologies
- HTML5, CSS3 and JavaScript
- DOM manipulation?
 - JQuery
- User Interface?
 - JQuery Mobile, supported by W3C



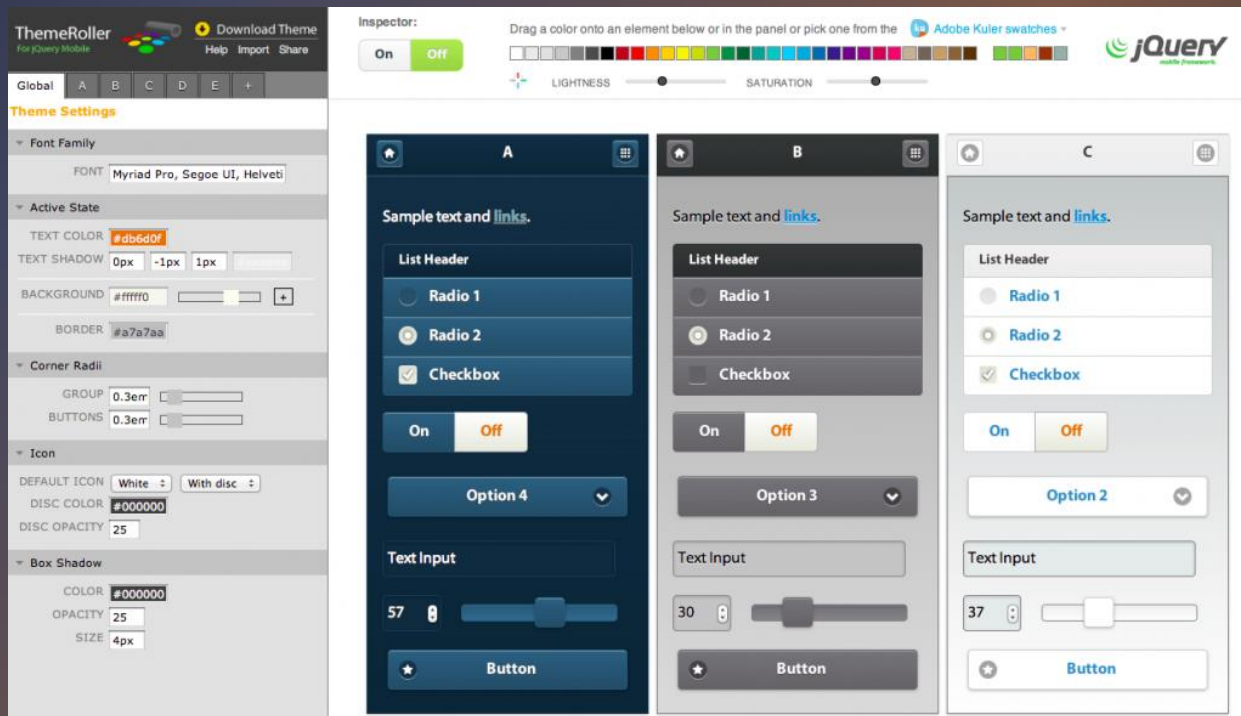
Jquery Mobile: Page structure

```
<!DOCTYPE html>
<html>
<head> <title>Page Title</title> . . .
</head>
<body>
  <section data-role="page">
    <header data-role="header">
      <h1>Some Title</h1>
    </header>
    <article data-role="content">
      <h1>The Content</h1>
    </article>
    <footer data-role="footer">
      <h1>Some Footer</h1>
    </footer>
  </section>
</body></html>
```

Jquery Mobile: Touch Events

- **tap**
 - After a quick, complete touch event
- **taphold**
 - After a held complete touch event
- **swipe**
 - Horizontal drag of 30px or more, within 1 second
- **swipeleft**
 - When a swipe event occurred moving in the left
- **swiperight**
 - When a swipe event occurred moving in the right

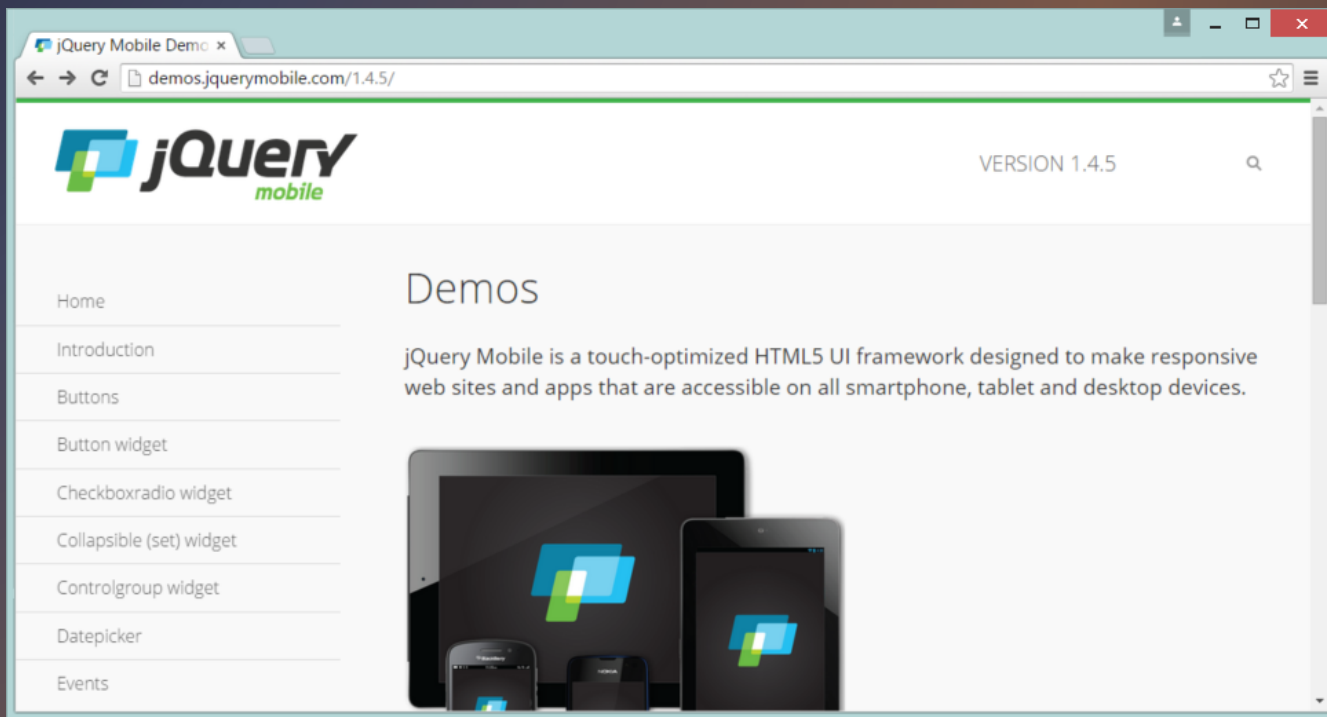
JQM: ThemeRoller



The screenshot displays the jQuery Mobile ThemeRoller interface, which is used for customizing the look of jQuery Mobile applications. The interface is divided into several sections:

- Theme Settings:** This section on the left allows users to configure various theme elements:
 - Font Family:** Set to "Myriad Pro, Segoe UI, Helveti".
 - Active State:** Includes settings for TEXT COLOR (set to #db6d0f), TEXT SHADOW (0px, -1px, 1px), BACKGROUND (#ffffff), and BORDER (#a7a7aa).
 - Corner Radii:** Includes settings for GROUP (0.3em) and BUTTONS (0.3em).
 - Icon:** Includes settings for DEFAULT ICON (White), DISC COLOR (#000000), and DISC OPACITY (25).
 - Box Shadow:** Includes settings for COLOR (#000000), OPACITY (25), and SIZE (4px).
- Inspector:** Located at the top right, it provides a color palette and sliders for LIGHTNESS and SATURATION.
- Preview Panels:** Three panels (A, B, and C) show the resulting theme applied to a sample mobile interface. Panel A is a dark blue theme, Panel B is a dark grey theme, and Panel C is a light grey theme. Each panel displays a "List Header" with radio buttons and a checkbox, an "On/Off" toggle, a dropdown menu, a "Text Input" field, and a "Button".

Jquery Mobile: Demos



Some alternative Web Frameworks

- Ionic
- Mobile Angular UI
- Intel XDK
- Appcelerator Titanium
- Sencha Touch
- Kendo UI

5. HANDS-ON

Frameworks setup: Instalation

- Install node.js (<https://nodejs.org/>)
- On command line:
 - npm install -g phonegap
 - Npm install -g plugman

Create App & Add platform

- Go the folder where you want your app:
 - Phonegap create myapp com.home.myapp MyApp
- Enter the just created folder (myapp):
 - Phonegap platform add android
 - Phonegap platform add ios

Add plugins

- In the project folder:
 - Phonegap plugin add org.apache.cordova.device
 - Phonegap plugin add org.apache.cordova.console

Inside the project's folder

- The **www** folder contains the HTML / JavaScript application.
- Inside the **www** folder there are other folders for specific app files.
- The **platforms** folder is where Cordova will build your application for different platforms (iOS, Android, etc). The contents of these folders are automatically generated by the Cordova CLI.
- Plugins are installed in the **plugins** directory.
- Application parameters (name, author, etc) are stored in **config.xml**.

Build & Run Application

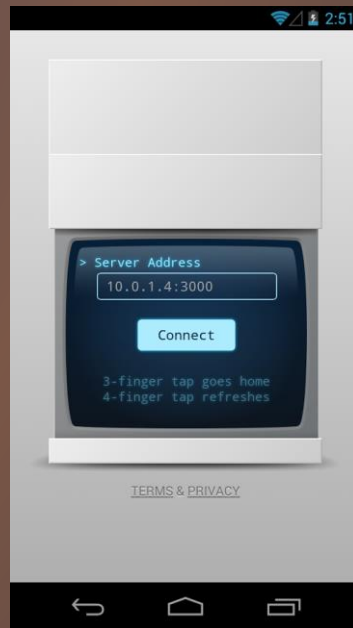
- For Android, on the project folder
 - Phonegap build
 - Phonegap run android
- For iOs, on the project folder
 - Phonegap build ios
 - Npm install -g ios-sim (or sudo npm install -g ios-sim)
 - Phonegap emulate ios

Debug

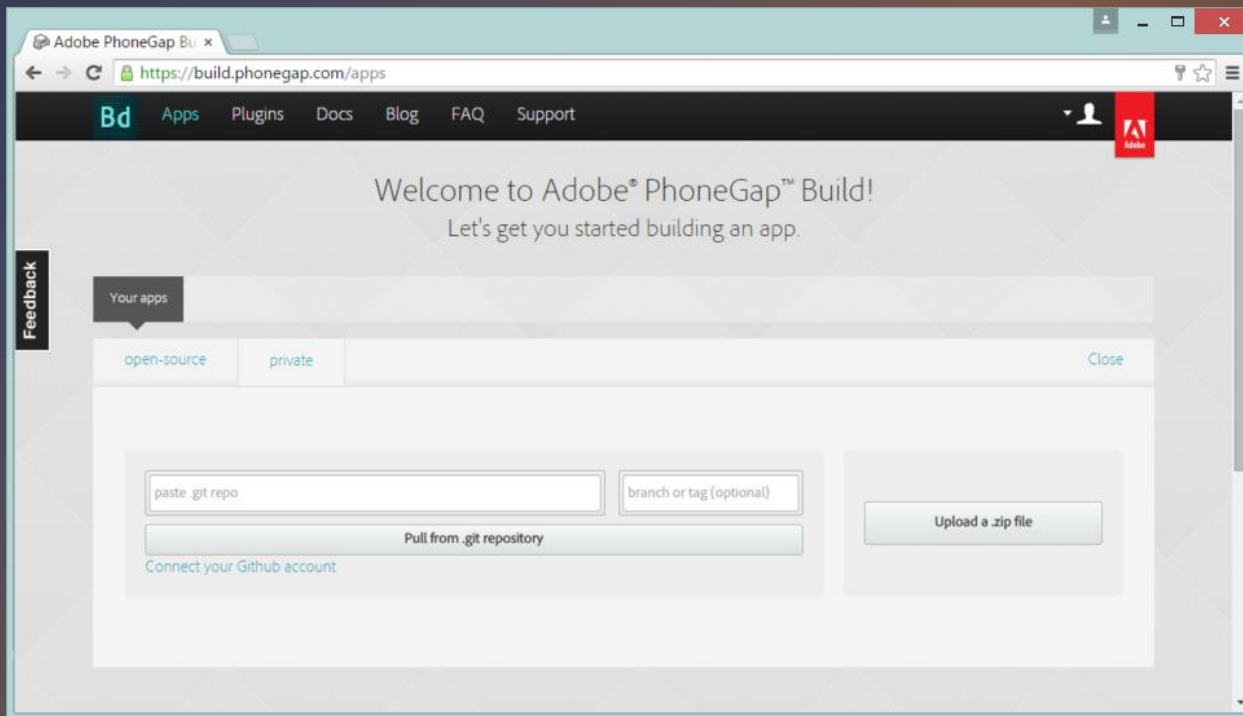
Computer

- On the project folder
 - Phonegap serve

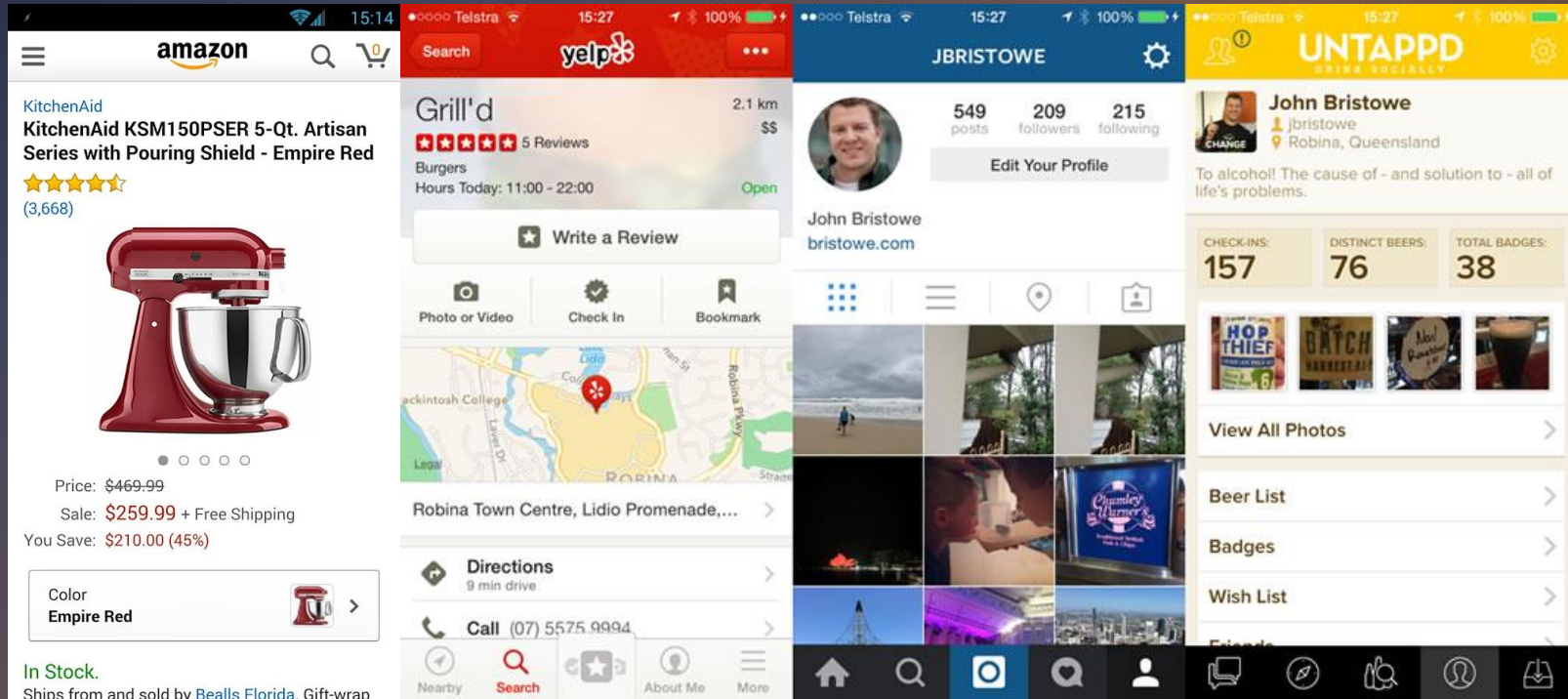
Mobile Device



Distribute: Phonegap Build



Who is using Hybrid Application Frameworks?



FINAL NOTES

Main References

- Apache Cordova
 - <https://cordova.apache.org/>
- Adobe Phonegap
 - <http://phonegap.com/>
 - <http://phonegap.com/about/artwork/>
- Apache Cordova Tutorial
 - <https://ccoenraets.github.io/cordova-tutorial/index.html>
- JQueryMobile
 - <https://jquerymobile.com/>

Thank you!

- Any questions?
- Luis Coelho (luiscoelho@eseig.ipp.pt)