

Phone**Gap**

# Matthieu Lux

JavaScript: jQuery, RequireJS, BackboneJS, NodeJS

Java: Spring, Spring Data, Spring MVC, Spring \*

Mobility: Android, PhoneGap, jQuery Mobile



twitter @Swiip

www swiip.github.com

github github.com/swiip



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# jQuery Mobile & PhoneGap

Create mobile cross-platform applications using the web code you know and love: HTML, CSS and JavaScript.

Matthieu Lux  
Consultant, Zenika

# "The" mobile cross-platform application



HOLY GRAIL *Indiana Jones and the Last Crusade*™  
© 2011 Lucasfilm Ltd. & TM. All rights reserved. Used under authorization.

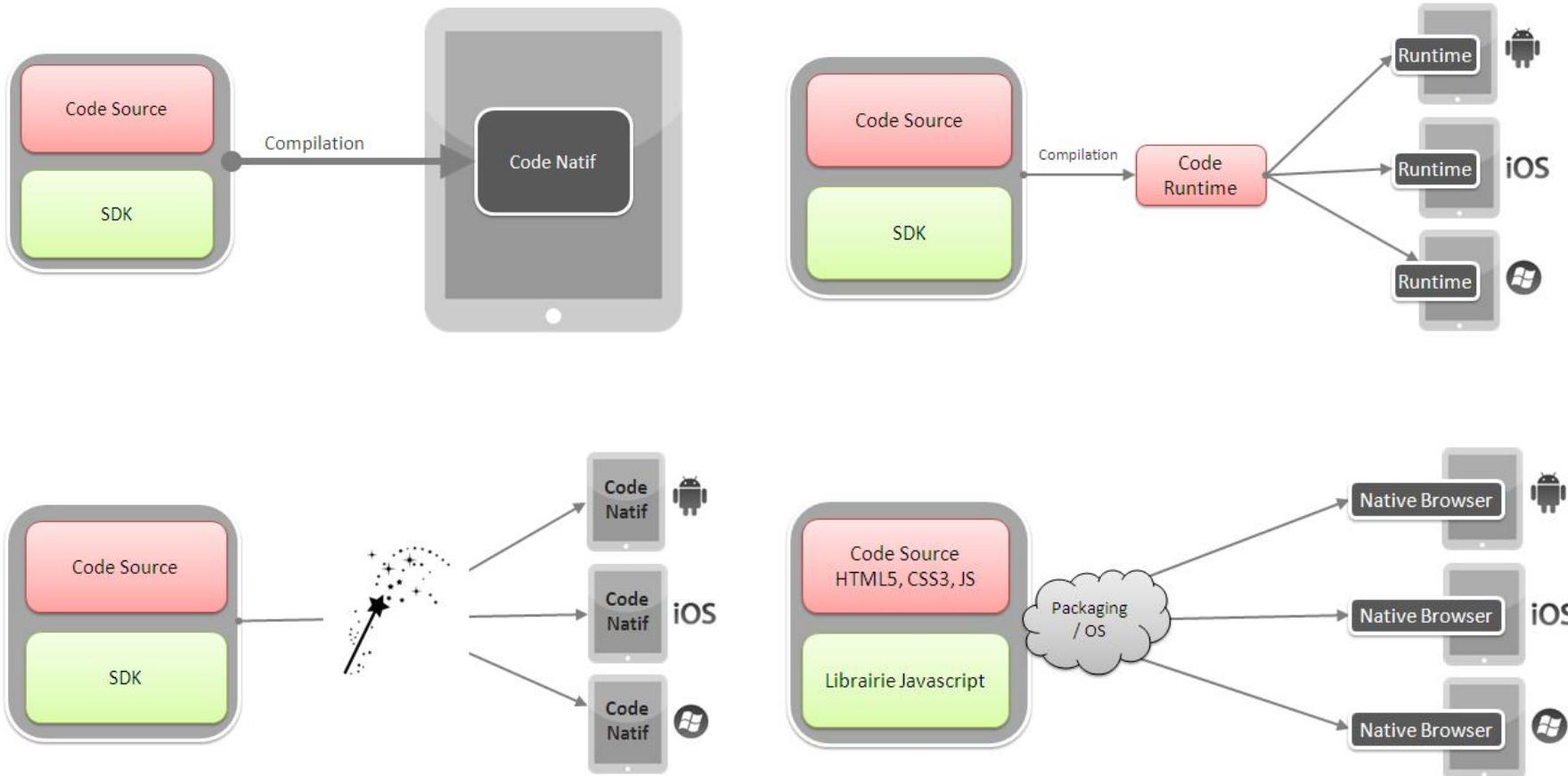
# How to reach it?





**PhoneGap**

# Mobile Application Types



# The project

## Bootstrap

- Bootstrapped at the San Francisco iPhoneDevCamp in August 2008
- "Make native iphone features available to web apps"
- Brock Whitten, Rob Ellis and Andre Charland
- October 2008: support of Android and BlackBerry
- February 2009: first stable release 0.6
- Support of Windows Mobile, Symbian, WebOS, approval for AppStore
- July 2011: release of version 1.0



# The project

## Adobe

- Adobe announced the acquisition of Nitobi Software in October 2011
- PhoneGap code is contributed to the Apache Software Foundation
- PhoneGap and Apache Cordova current versions is 2.1.0



## Apache Cordova



- Apache License V2 project
- Currently the same sources than PhoneGap
- You can think of Apache Cordova as the engine that powers PhoneGap

## PhoneGap



- PhoneGap is a distribution of Apache Cordova
- Over time, the PhoneGap distribution may contain additional tools

# Features

101

- Package Web application in native mobile applications
- Embed static resources (HTML, CSS, JS) in application
- Seriously cross-platform: iOS, Android, Windows Phone, BlackBerry, Bada, WebOS, Symbian even Tizen
- JavaScript API to access (all) native features
- Compatible with all Mobile Web Frameworks
- Approved for all major markets including AppStore



iOS



android



BlackBerry



bada



Windows Phone



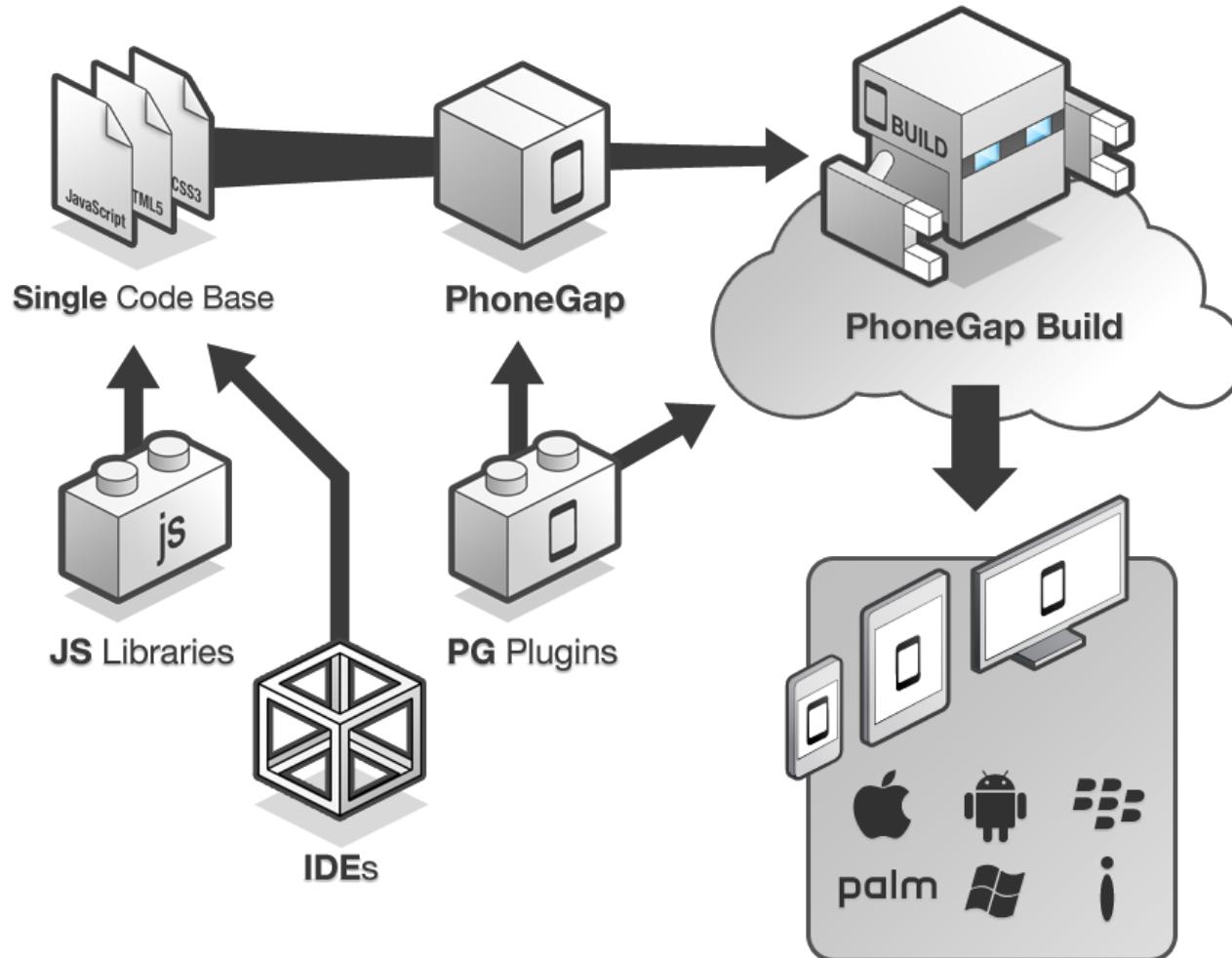
palm webOS™

**symbian**

MeeGo™

# Features

## Build

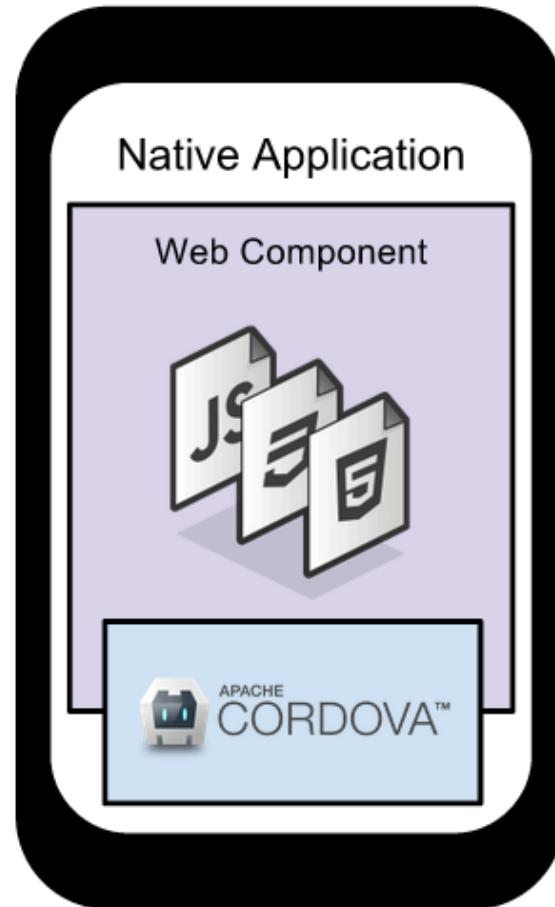


# Features

	iPhone / iPhone 3G	iPhone 3GS and newer	Android	Blackberry OS 5.x	Blackberry OS 6.0+	WebOS	Windows Phone 7	Symbian	Bada
Accelerometer	✓	✓	✓	✓	✓	✓	✓	✓	✓
Camera	✓	✓	✓	✓	✓	✓	✓	✓	✓
Compass	✗	✓	✓	✗	✗	✓	✓	✗	✓
Contacts	✓	✓	✓	✓	✓	✗	✓	✓	✓
File	✓	✓	✓	✓	✓	✗	✓	✗	✗
Geolocation	✓	✓	✓	✓	✓	✓	✓	✓	✓
Media	✓	✓	✓	✗	✗	✗	✓	✗	✗
Network	✓	✓	✓	✓	✓	✓	✓	✓	✓
Notification (Alert)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Notification (Sound)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Notification (Vibration)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Storage	✓	✓	✓	✓	✓	✓	✓	✓	✗

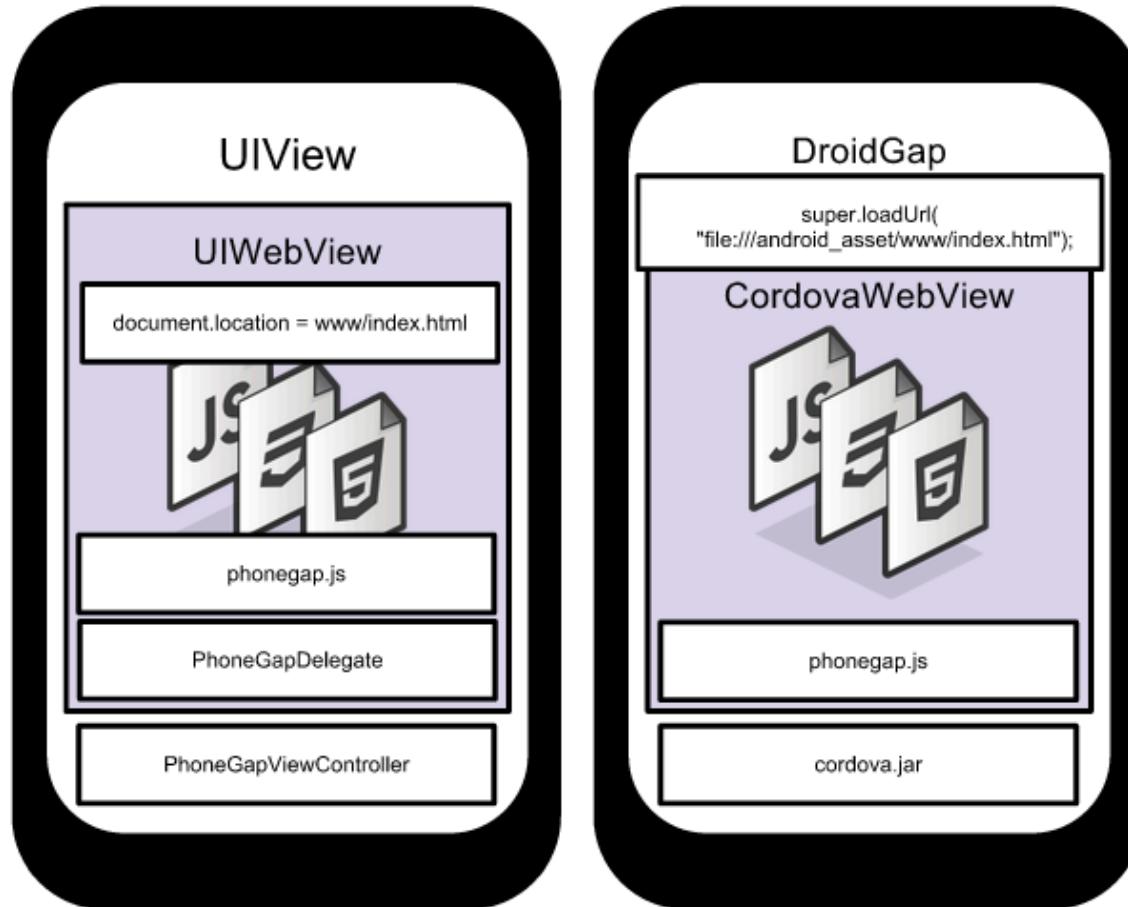
# Architecture

Generic diagram



# Architecture

Android and iOS adaptations



# Architecture

## Android integration

```
public class CordovaWebView extends WebView {  
    ...  
    private void setup() {  
        ...  
        this.addJavascriptInterface(new ExposedJsApi(pluginManager, jsMessageQueue), "_cordovaNative");  
    }  
    ...  
}
```

JAVA

- Official Android JavaDoc:

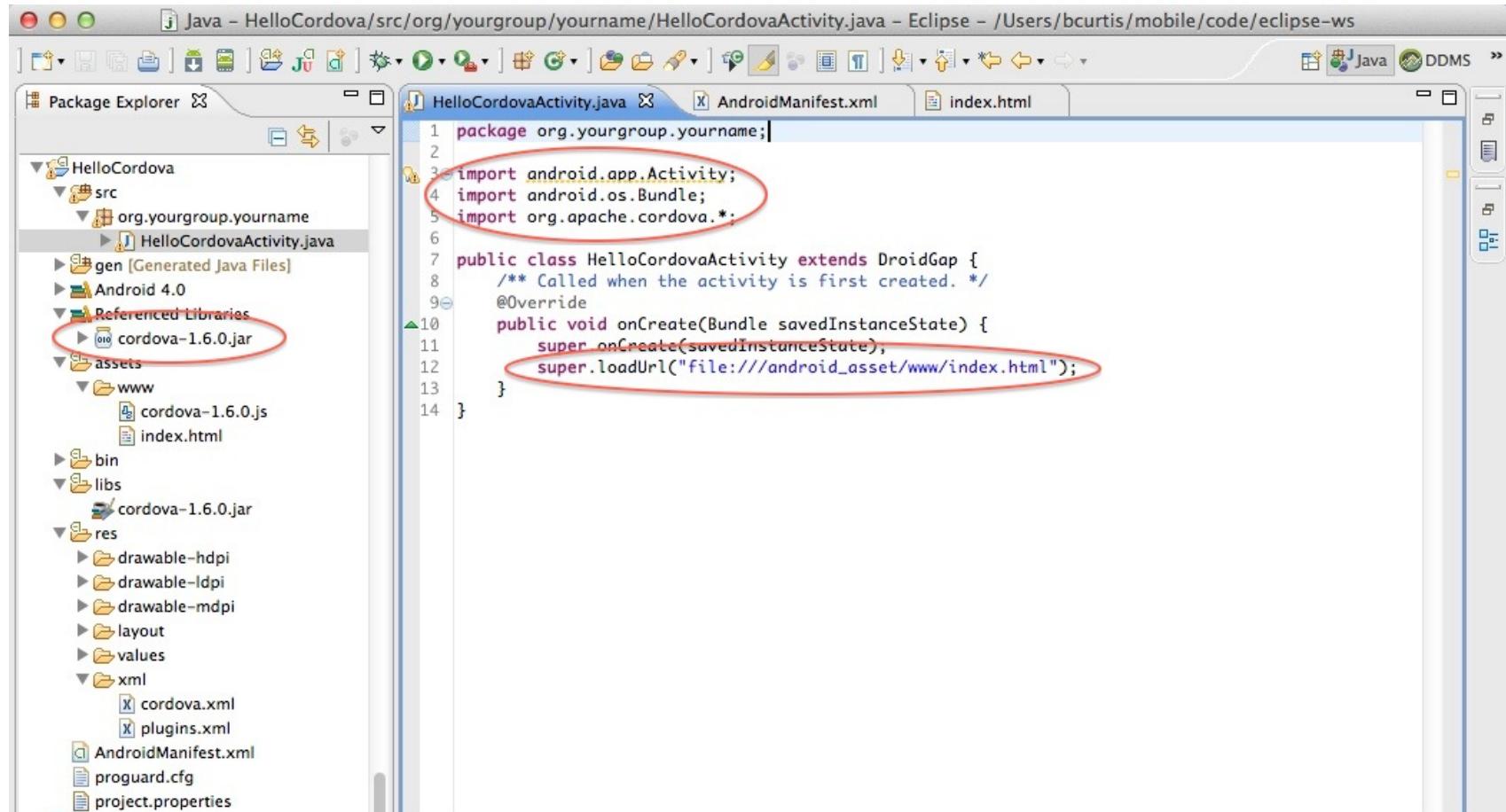
```
public void addJavascriptInterface (Object object, String name)
```

JAVA

Injects the supplied Java object into this WebView. The object is injected into the JavaScript context of the main frame, using the supplied name. This allows the Java object's public methods to be accessed from JavaScript.

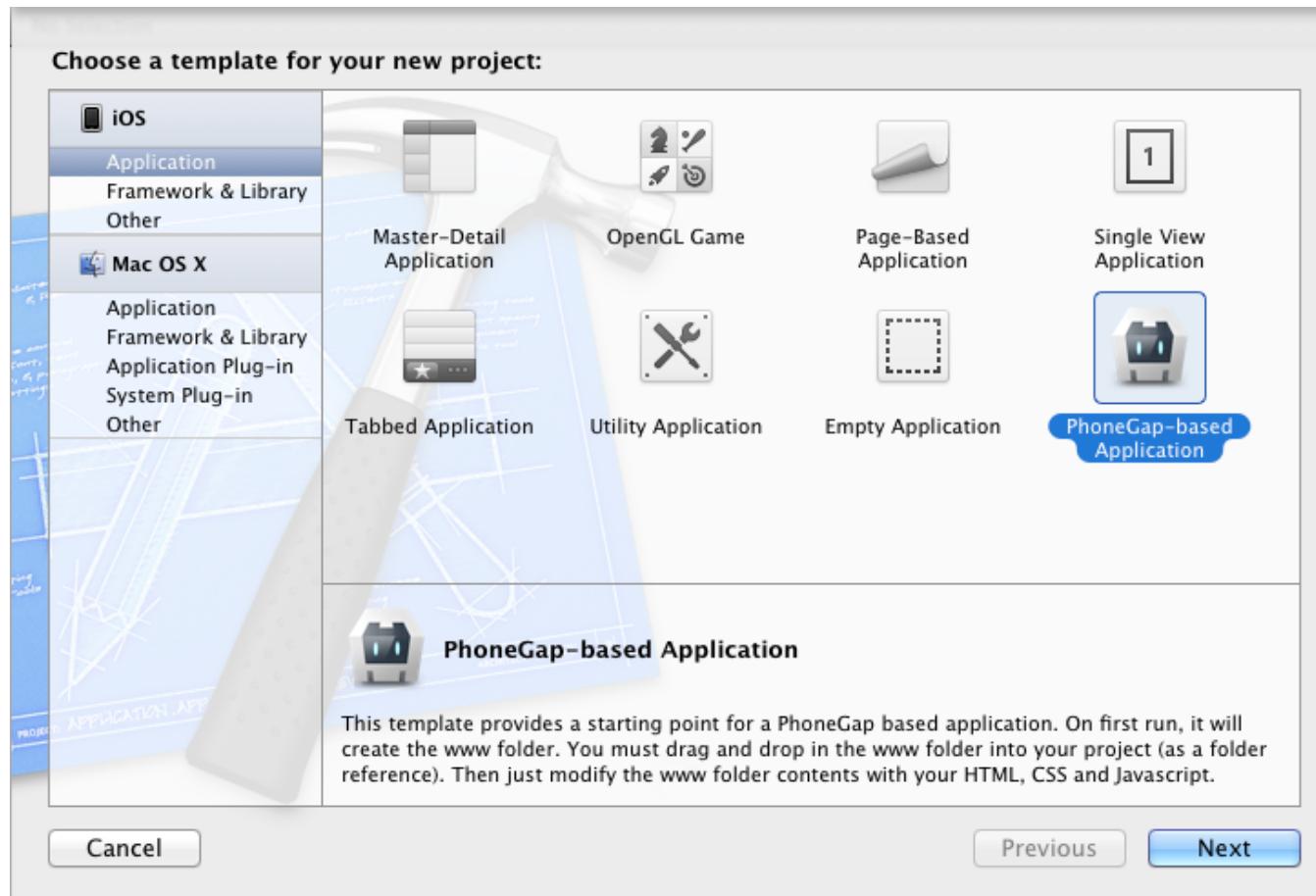
# Packaging

## Android application packaging



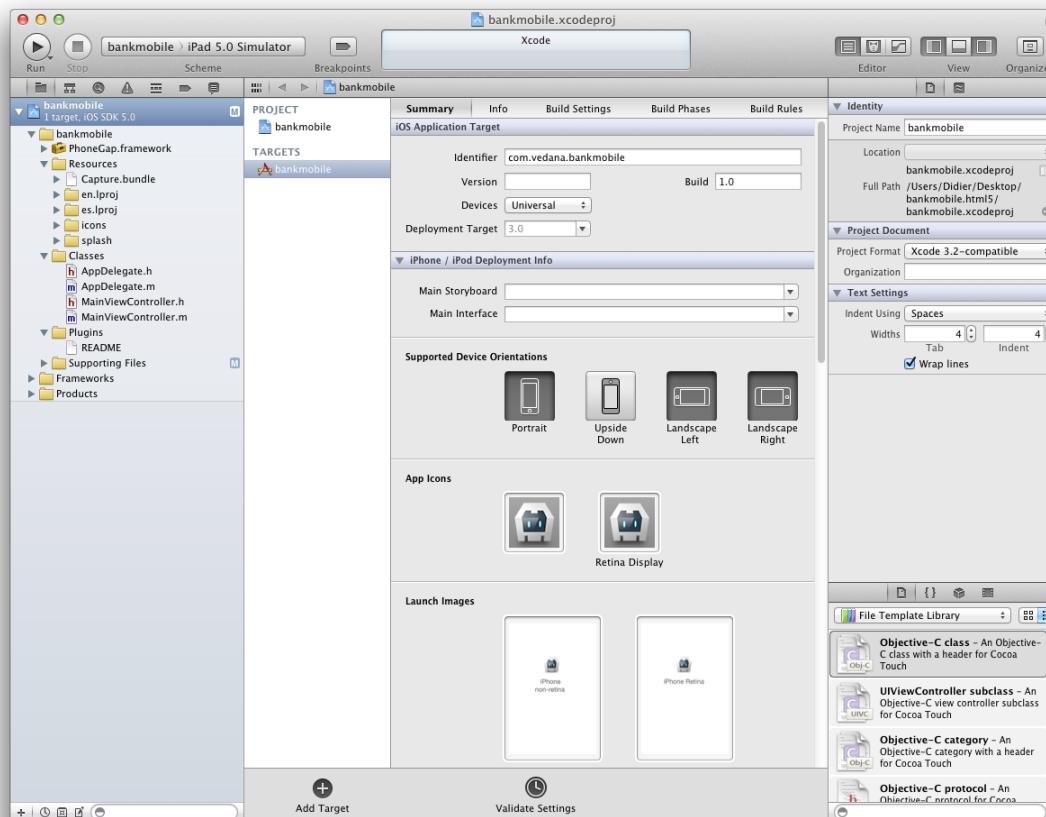
# Packaging

## iOS application packaging



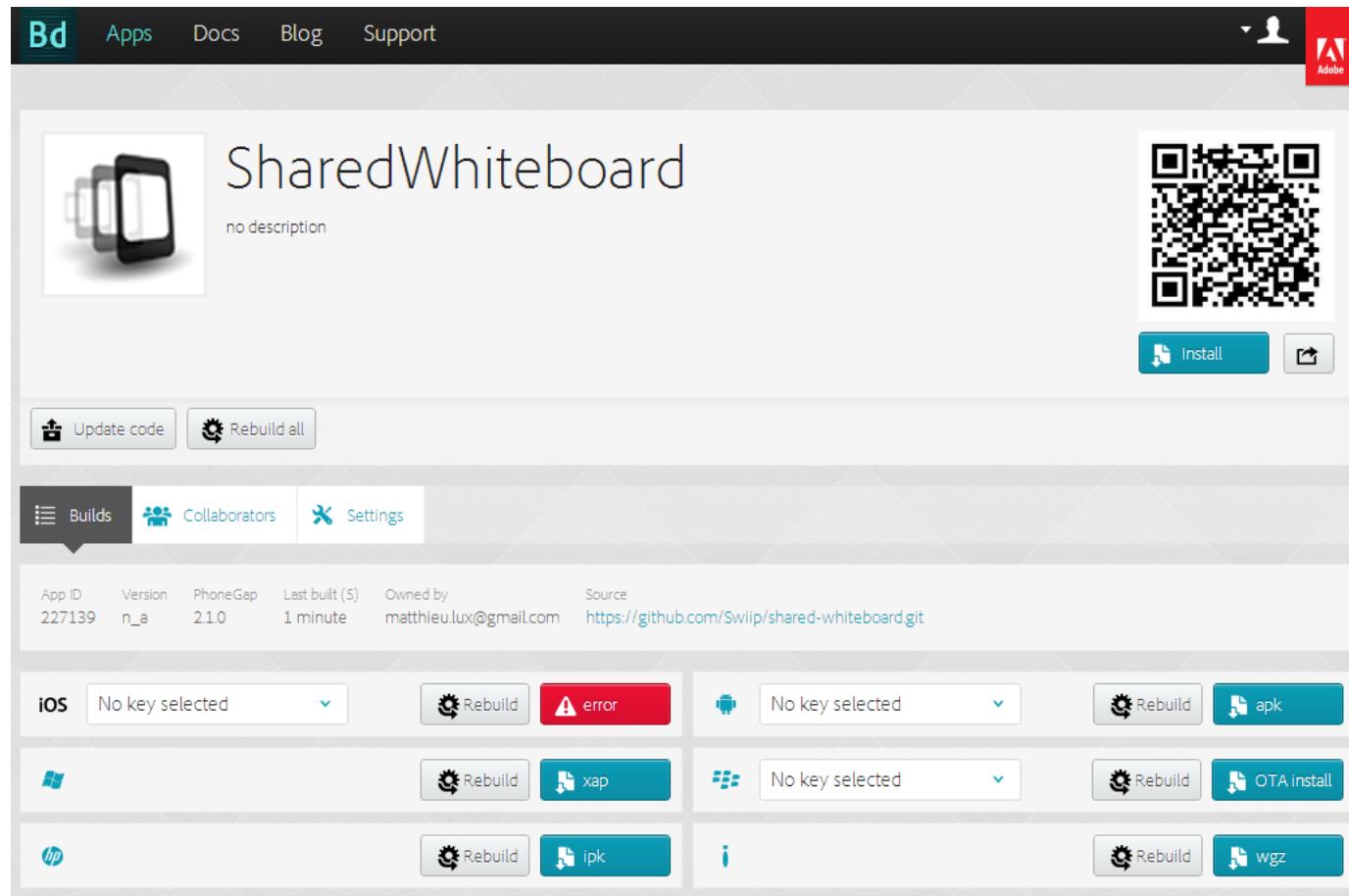
# Packaging

## iOS application packaging



# Packaging

## PhoneGap Builder



The screenshot shows the PhoneGap Builder interface for the "SharedWhiteboard" app. The top navigation bar includes links for Bd, Apps, Docs, Blog, and Support, along with user and Adobe account icons. The main content area displays the app's icon, name ("SharedWhiteboard"), and a "no description" placeholder. To the right is a QR code. Below the app details are "Install" and "Share" buttons. At the bottom of this section are "Update code" and "Rebuild all" buttons. The navigation bar below the main content includes "Builds" (selected), "Collaborators", and "Settings". The "Builds" section shows the app's metadata: App ID (227139), Version (n\_a), PhoneGap (2.1.0), Last built (5) (1 minute ago), Owned by (matthieu.lux@gmail.com), and Source (https://github.com/Swiip/shared-whiteboard.git). Below this, there are five build sections for different platforms: iOS (No key selected, Rebuild, error), Android (No key selected, Rebuild, apk), Windows (Rebuild, xap), BlackBerry (No key selected, Rebuild, OTA install), and HP (Rebuild, ipk). The "Builds" tab is highlighted with a black background and white text.

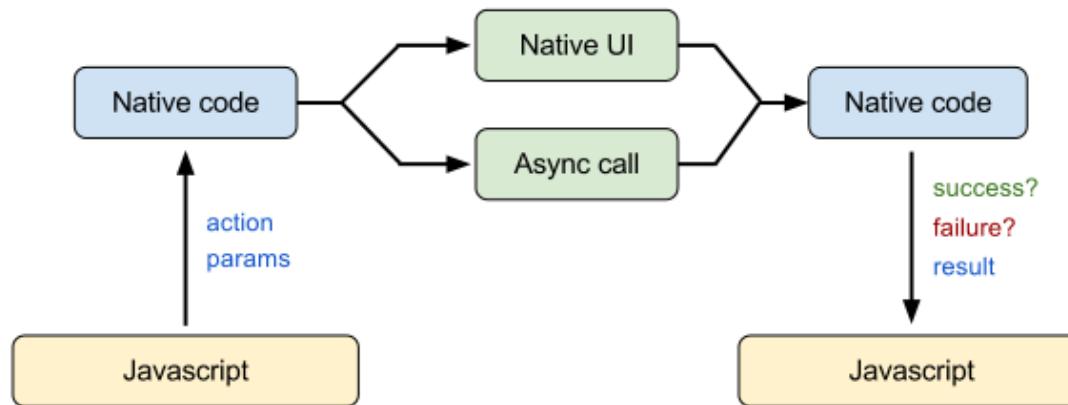
# Packaging

## PhoneGap Builder Pricing

Pricing	Developer	Starter	Team	Corporate
	<b>FREE</b>	<b>\$12</b> / mo. <b>\$120</b> / year Save \$24!	<b>\$30</b> / mo. <b>\$300</b> / year Save \$60!	<b>\$90</b> / mo. <b>\$900</b> / year Save \$180!
Public Apps	∞ infinity	∞ infinity	∞ infinity	∞ infinity
Private Apps	1	3	10	25
Private Collaborators	1	1	3	10

# PhoneGap API

## Principles



```
<script type="text/javascript" charset="utf-8" src="cordova-2.1.0.js"></script>           HTML
```

```
navigator.{component}.{action}({success}, {error});                                JAVASCRIPT
```

# PhoneGap API

## Overview

<b>Accelerometer</b> Tap into the device's motion sensor.	<b>Camera</b> <a href="#">Capture</a> a photo using the device's camera.	<b>Capture</b> <a href="#">Capture</a> media files using device's media capture applications.
<b>Compass</b> Obtain the direction that the device is pointing.	<b>Connection</b> Quickly check the network state, and cellular network information.	<b>Contacts</b> Work with the devices contact database.
<b>Device</b> Gather device specific information.	<b>Events</b> Hook into native events through JavaScript.	<b>File</b> Hook into native file system through JavaScript.
<b>Geolocation</b> Make your application location aware.	<b>Media</b> Record and play back audio files.	<b>Notification</b> Visual, audible, and tactile device notifications.
<b>Storage</b> Hook into the devices native storage options.		

# PhoneGap API

## Capture API

```
navigator.device.capture.captureAudio(                                     JAVASCRIPT
    CaptureCB captureSuccess, CaptureErrorCB captureError, [CaptureAudioOptions options]
);
```

```
navigator.device.capture.captureImage(                                     JAVASCRIPT
    CaptureCB captureSuccess, CaptureErrorCB captureError, [CaptureImageOptions options]
);
```

```
navigator.device.capture.captureVideo(                                     JAVASCRIPT
    CaptureCB captureSuccess, CaptureErrorCB captureError, [CaptureVideoOptions options]
);
```

# PhoneGap API

## Documentation

Each methods are documented with

- Supported platforms
- Permissions for each platforms
- Full example
- Platforms quircks

Example for capture

- [http://docs.phonegap.com/en/2.1.0/cordova\\_media\\_capture\\_capture.md.html#Capture](http://docs.phonegap.com/en/2.1.0/cordova_media_capture_capture.md.html#Capture)

# PhoneGap API

## Geolocation, Accelerometer

```
// Current position                                JAVASCRIPT
navigator.geolocation.getCurrentPosition(success, [error], [options]);
```

```
// Watching position
var watchID = navigator.geolocation.watchPosition(success, error, {
  maximumAge: 3000, timeout: 5000, enableHighAccuracy: true
});
navigator.geolocation.clearWatch(watchID);
```

```
// Current acceleration
navigator.accelerometer.getCurrentAcceleration(success, error);
```

```
// Watch acceleration
var watchID = navigator.compass.watchHeading(success, error, {frequency: 100});
navigator.compass.clearWatch(watchID);
```

# PhoneGap API

## Contacts

```
// Return a new contact                                JAVASCRIPT
var contact = navigator.contacts.create({displayName: "Matthieu", "name": "Lux"});

// Store new contact in the device
contact.save();

// Search filter
var options = new ContactFindOptions();
options.filter = "Matthieu";
options.multiple = true;
var fields = ["displayName", "name", "organizations"];

// Search
navigator.contacts.find(fields, onSuccess, onError, options);
```

# PhoneGap API

Storage based on W3C

- Web SQL Storage

```
var db = window.openDatabase("dashboard", "1.0", "dashboard", 200000);           JAVASCRIPT
db.transaction(function(tx) {
    tx.executeSql('DROP TABLE IF EXISTS dashboard');
    tx.executeSql('CREATE TABLE IF NOT EXISTS dashboard (id unique, data)');
    tx.executeSql('INSERT INTO dashboard (id, data) VALUES (1, "tata")');
    tx.executeSql('INSERT INTO dashboard (id, data) VALUES (2, "toto")');
}, errorCB, successCB);
```

- Web Storage

```
window.localStorage.setItem("dashboard-1", "tata");                         JAVASCRIPT
var value = window.localStorage.getItem("dashboard-1");
window.localStorage.removeItem("dashboard-1");
window.localStorage.clear();
```

# PhoneGap API

## Simulation with Ripple



# Plugins

## Existings

- <https://github.com/phonegap/phonegap-plugins>
- A directory by platform
- Android and iOS a LOT more populated
- Interesting examples:
  - AccountList
  - AugmentedReality
  - Bluetouth
  - DatePicker
  - FileUploader
  - ScreenShot
  - ...

# Plugins

## Build one

- Entry point is JavaScript

```
cordova.exec(function(winParam) {}, function(error) {}, "service",  
    "action", ["firstArgument", "secondArgument", 42, false]);
```

JAVASCRIPT

- Example for Android:

```
public PluginResult execute(String action, JSONArray args, String callbackId) {  
    try {  
        if (action.equals("beep")) {  
            this.beep(args.getLong(0));  
        }  
        return new PluginResult(PluginResult.Status.OK, "result");  
    } catch (JSONException e) {  
        return new PluginResult(PluginResult.Status.JSON_EXCEPTION);  
    }  
}
```

JAVA

# Feedback

- Dev with Android, iOS compatibility at first try
- Comprehensive API with lots of parameters
- No surprises with tests
  
- Memory and performance difficult to apprehend with emulators
- Many specificities by platforms
- Become difficult if not a standard features
- Browser differences

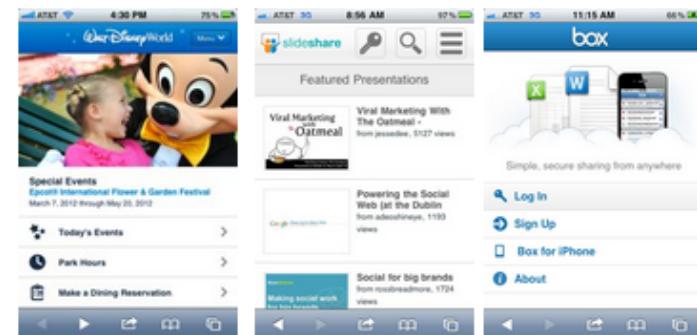


# JavaScript frameworks for the mobile Web

Touch events JavaScript Libraries



Mobile WebApps JavaScript Frameworks



# The project

## jQuery Project

- Non-profit trade association dedicated to supporting development of jQuery projects
- jQuery, jQuery UI, jQuery Mobile, QUnit, Sizzle
- <http://jquery.org>



## jQuery Mobile

- Project lead : Todd Parker (Filament Group)
- Started in 2010
- Last stable version : 1.2.0 (10/02/12)
- <http://jquerymobile.com>
- <http://github.com/jquery/jquery-mobile>

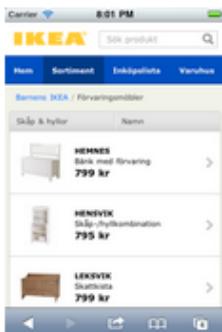


# Features

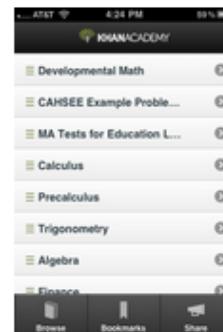
## HTML5-based user interface



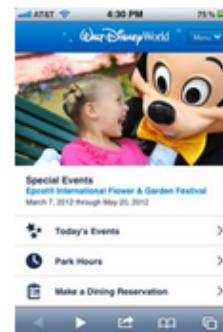
OpenTable



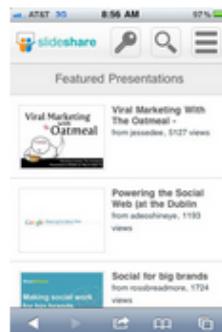
Ikea Sweden



Khan Academy



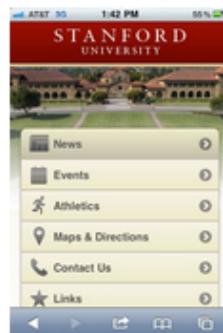
Disney World



Slideshare



Box.net



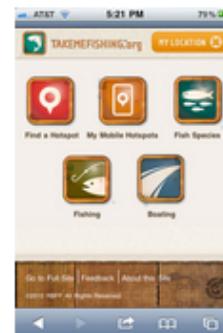
Stanford



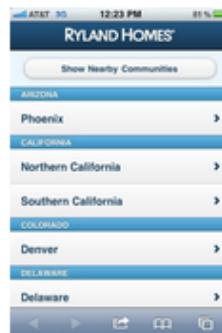
American Century



Rugby World Cup



Take Me Fishing



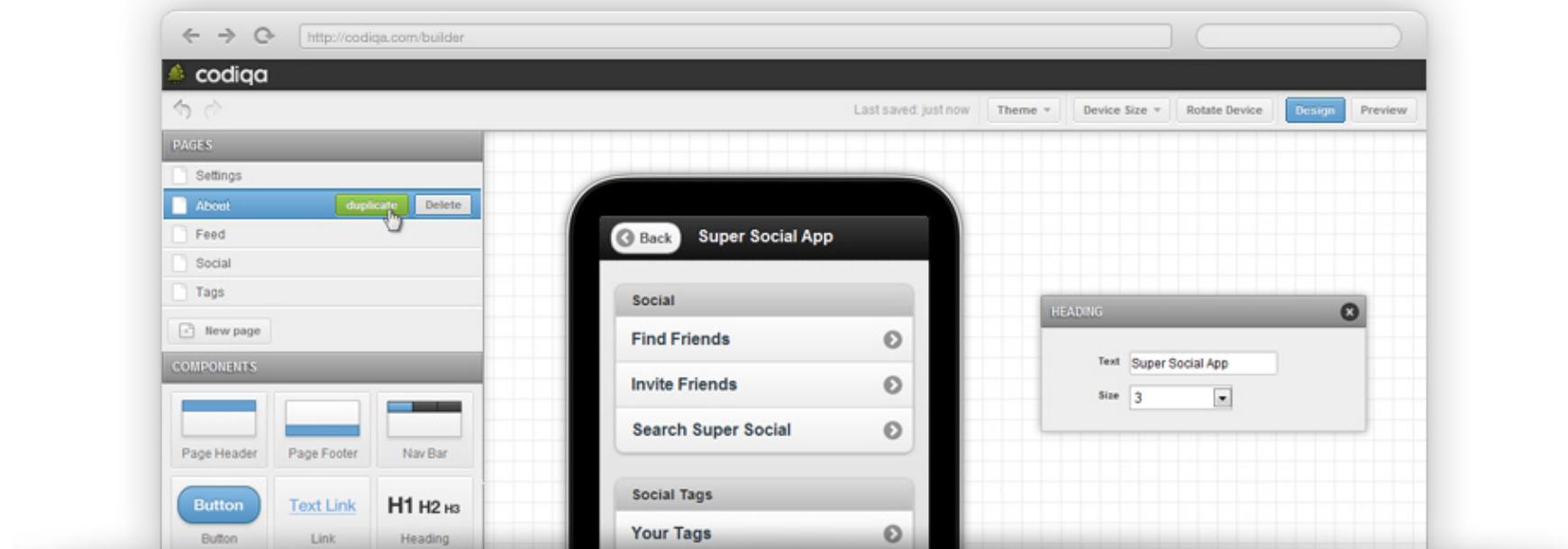
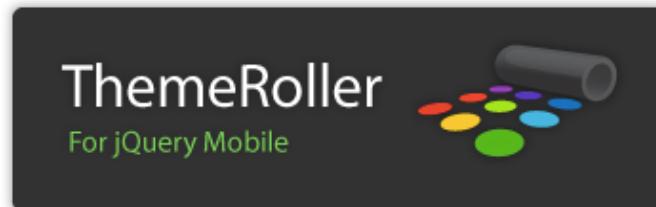
Ryland Homes



Moulin Rouge

# Features

Easily themable design



The screenshot displays the codiqa mobile app builder interface. On the left, a sidebar titled 'PAGES' lists 'Settings', 'About', 'Feed', 'Social', 'Tags', and a 'New page' button. The 'About' item is selected, with a 'duplicate' button highlighted. Below it, the 'COMPONENTS' sidebar lists 'Page Header', 'Page Footer', 'Nav Bar', 'Button', 'Text Link', and 'H1 H2 H3'. The main workspace shows a smartphone screen with a dark theme and a white content area. The content area has a title 'Super Social App' and sections for 'Social' (Find Friends, Invite Friends, Search Super Social) and 'Social Tags' (Your Tags). To the right of the smartphone, a floating 'HEADING' editor is open, showing 'Text: Super Social App' and 'Size: 3'. The top of the interface has a navigation bar with back, forward, and refresh buttons, a URL field containing 'http://codiqa.com/builder', and tabs for 'Design' and 'Preview'.

# Features

Seriously cross-platform

A-grade

- Full enhanced experience with Ajax-based animated page transitions.
- Large majority of modern OS and browsers

B-grade

- Enhanced experience except without Ajax navigation features
- Blackberry 5.0\*, Opera Mini 7, Nokia Symbian^3

C-grade

- Basic, non-enhanced HTML experience that is still functional
- Blackberry 4.x, Windows Mobile, All older smartphone platforms and featurephones

# Features

Lightweight code

jQuery core 31 KB

jQuery Mobile CSS 7 KB

jQuery Mobile JS 21 KB

jQuery Mobile Images 80 KB

# Getting started

## Download

<http://jquerymobile.com/download/>

- Good old zip (deprecated)

<http://code.jquery.com/mobile/1.2.0/jquery.mobile-1.2.0.zip>

- CDN Hosted (recommended)

```
<link rel="stylesheet" href="http://code.jquery.com/mobile/1.2.0/jquery.mobile-1.2.0.min.css" type="text/css" media="screen,handheld">
<script src="http://code.jquery.com/jquery-1.8.2.min.js">
<script src="http://code.jquery.com/mobile/1.2.0/jquery.mobile-1.2.0.min.js">
```

HTML    in.css

- Download builder (alpha)

<http://jquerymobile.com/download-builder/>

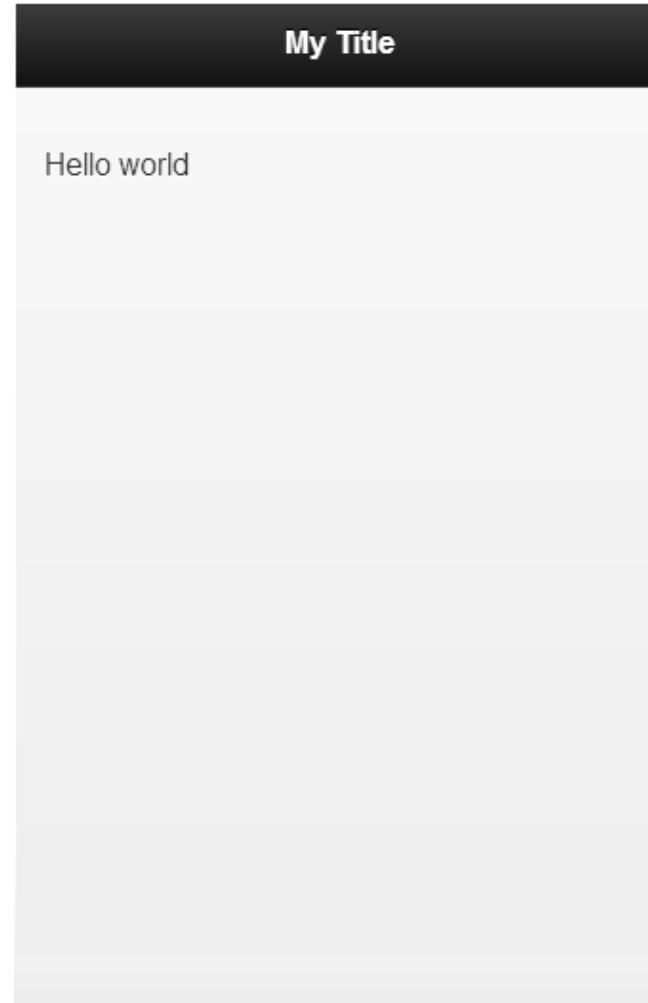
# Getting started

## Basic page

```
<!DOCTYPE html>                                                 HTML
<html>
<head>
  <title>My Page</title>
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="stylesheet" href="http://code.jquery.com/mobile/1.1.1/jquery.mobile-1.1.1.min.css">
  <script src="http://code.jquery.com/jquery-1.7.1.min.js"></script>
  <script src="http://code.jquery.com/mobile/1.1.1/jquery.mobile-1.1.1.min.js"></script>
</head>
<body>
  <div data-role="page">
    <div data-role="header"> <h1>My Title</h1> </div>
    <div data-role="content"> <p>Hello world</p> </div>
  </div>
</body>
</html>
```

# Guetting started

## Result



# Pages

- single page
- local internal linked "pages" within a page
- dialogs
- animated transitions
- prefetching and caching pages
- ajax, hashes & history

# Pages

local internal linked "pages" within a page

```
<div data-role="page" id="foo">
  <div data-role="header"><h1>Foo</h1></div>
  <div data-role="content">
    <p>I'm first in the source order so I'm shown as the page.</p>
    <p>View internal page called <a href="#bar">bar</a></p>
  </div>
  <div data-role="footer"><h4>Page Footer</h4></div>
</div>
<div data-role="page" id="bar">
  <div data-role="header"><h1>Bar</h1></div>
  <div data-role="content">
    <p>I'm the second in the source order so I'm hidden when the page loads.</p>
    <p><a href="#foo">Back to foo</a></p>
  </div>
  <div data-role="footer"><h4>Page Footer</h4></div>
</div>
```

# Pages

## dialogs

```
<a href="foo.html" data-rel="dialog">Open dialog</a>
```

HTML



# Pages

## JavaScript?

- The pageinit event is triggered on a page when it is initialized

```
$( document ).delegate("#aboutPage", "pageinit", function() {  
    alert('A page with an ID of "aboutPage" was just created by jQuery Mobile!');  
});
```

JS

- If you'd like to manipulate a page's contents before the pageinit event fires

```
$( document ).delegate("#aboutPage", "pagebeforecreate", function() {  
    alert('A page with an ID of "aboutPage" is about to be created by jQuery Mobile!');  
});
```

JS

- Changing pages

```
$.mobile.changePage( "about/us.html", { transition: "slideup" } );
```

JS

- To load an external page, enhance its content, and insert it into the DOM

```
$.mobile.loadPage( "about/us.html" );
```

JS

# Pages

## Transitions

- Setting a transition on a link or form submit

```
<a href="index.html" data-transition="pop">I'll pop
```

HTML

- Global configuration of transitions

```
$(document).bind("mobileinit", function() {  
    $.mobile.defaultPageTransition = 'pop';  
});
```

JS

- Browser support and performance

- All transitions are built with CSS keyframe animations
- include both -webkit & -moz rules
- default exclusion of browsers that lack 3D transforms
- No guarantee that every browser will be 100% flicker-free

# Lists

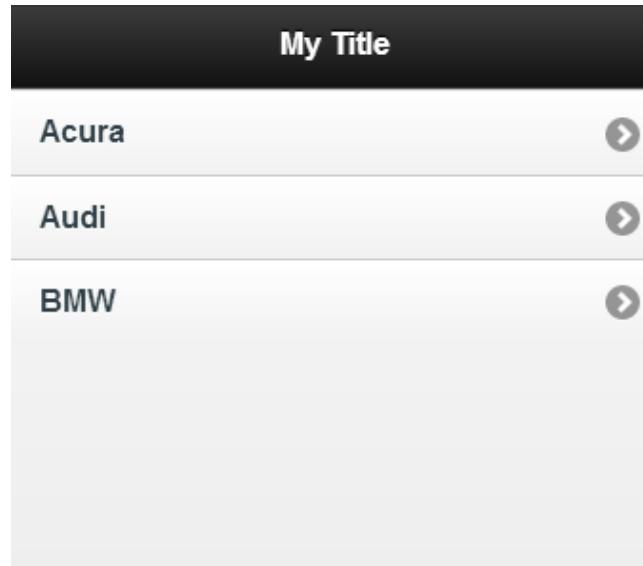
- basic linked
- nested
- numbered
- read-only lists
- divider
- search filter
- ...

# Lists

## HTML

```
<ul data-role="listview">  
  <li><a href="acura.html">Acura</a></li>  
  <li><a href="audi.html">Audi</a></li>  
  <li><a href="bmw.html">BMW</a></li>  
</ul>
```

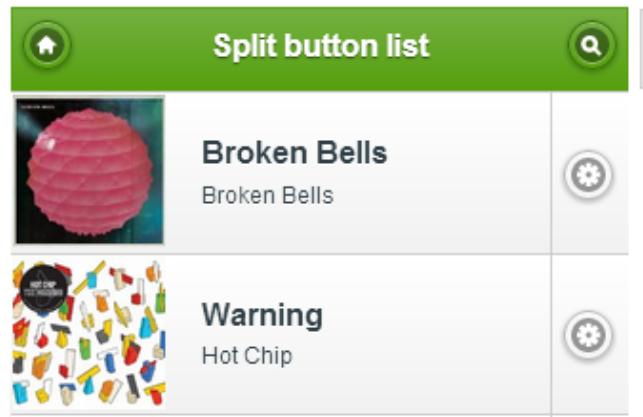
HTML



# Lists

## HTML + image + split button

```
<li> HTML  
  <a href="index.html"><h3>Broken Bells</h3><p>Broken Bells</p>  
  <a href="lists-split-purchase.html" data-rel="dialog" data-transition="slideup">Purchase album</a>  
</li>  
<li>  
  <a href="index.html"><h3>Warning</h3><p>Hot Chip</p></a>  
  <a href="lists-split-purchase.html" data-rel="dialog" data-transition="slideup">Purchase album</a>  
</li> ...
```



# Lists

## JavaScript

- Options: countTheme, dividerTheme, filter, filterCallback, filterPlaceHolder, filterTheme, headerTheme, inset, splitIcon, splitTheme, theme

```
$( document ).bind( "mobileinit", function() {
    $.mobile.listview.prototype.options.< option > = < value >;
});
```

JS

- Methods: childPages, refresh

```
$('.selector').listview('refresh');
```

JS

- Events: create

```
$('.selector').listview({
    create: function(event, ui) { ... }
});
```

JS

# Components

- toolbars: header, footer, navigation
- buttons: icons, inline, grouped
- layout
- forms
  - text input, text area, search input
  - flip switch (checkbox)
  - slider
  - radio as list
  - combo box

# Components

## Toolbars

- Header

```
<div data-role="header">  
  <a href="index.html" data-icon="delete">Cancel</a>  
  <h1>Edit Contact</h1>  
  <a href="index.html" data-icon="check">Save</a>  
</div>
```

HTML

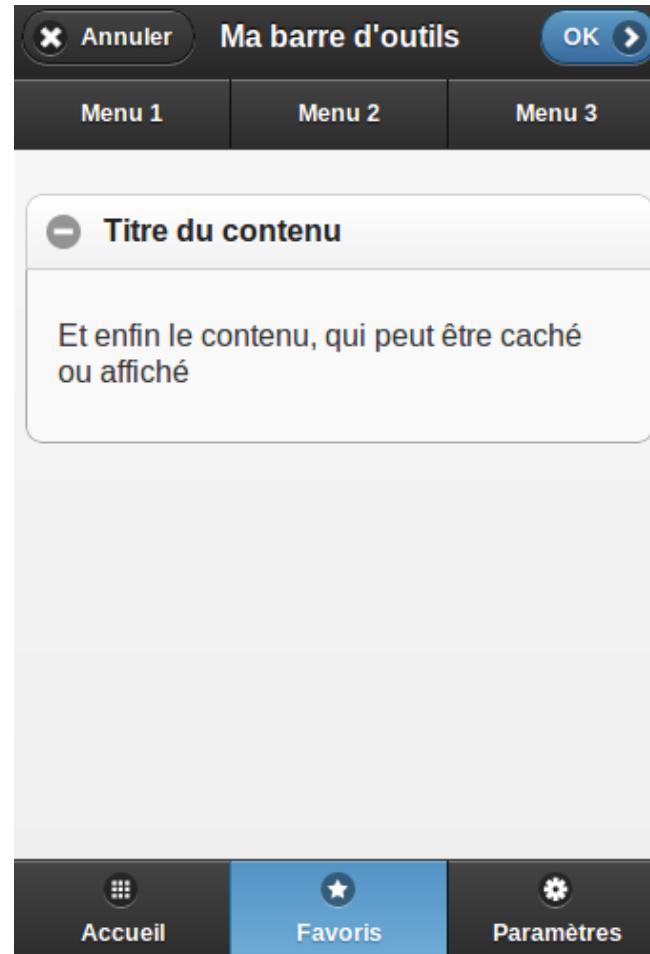
- Navbar

```
<div data-role="footer">  
  <div data-role="navbar"> <ul>  
    <li><a href="#">One</a></li>  
    <li><a href="#">Two</a></li>  
    <li><a href="#">Three</a></li>  
  </ul> </div>  
</div>
```

HTML

# Components

## Toolbars example



# Components

## Forms

```
<form action="#" method="get">  
  <div data-role="fieldcontain">  
    <label for="textarea">Textarea:</label>  
    <textarea cols="40" rows="8" name="textarea" id="textarea"></textarea>  
  </div>  
  <div data-role="fieldcontain">  
    <label for="search">Search Input:</label>  
    <input type="search" name="password" id="search" value="" />  
  </div>  
  <div data-role="fieldcontain">  
    <label for="slider2">Flip switch:</label>  
    <select name="slider2" id="slider2" data-role="slider">  
      <option value="off">Off</option> <option value="on">On</option>  
    </select>  
  </div>  
</form>
```

HTML

# Components

## Forms Demo

Textarea:

Search Input:

Flip switch:

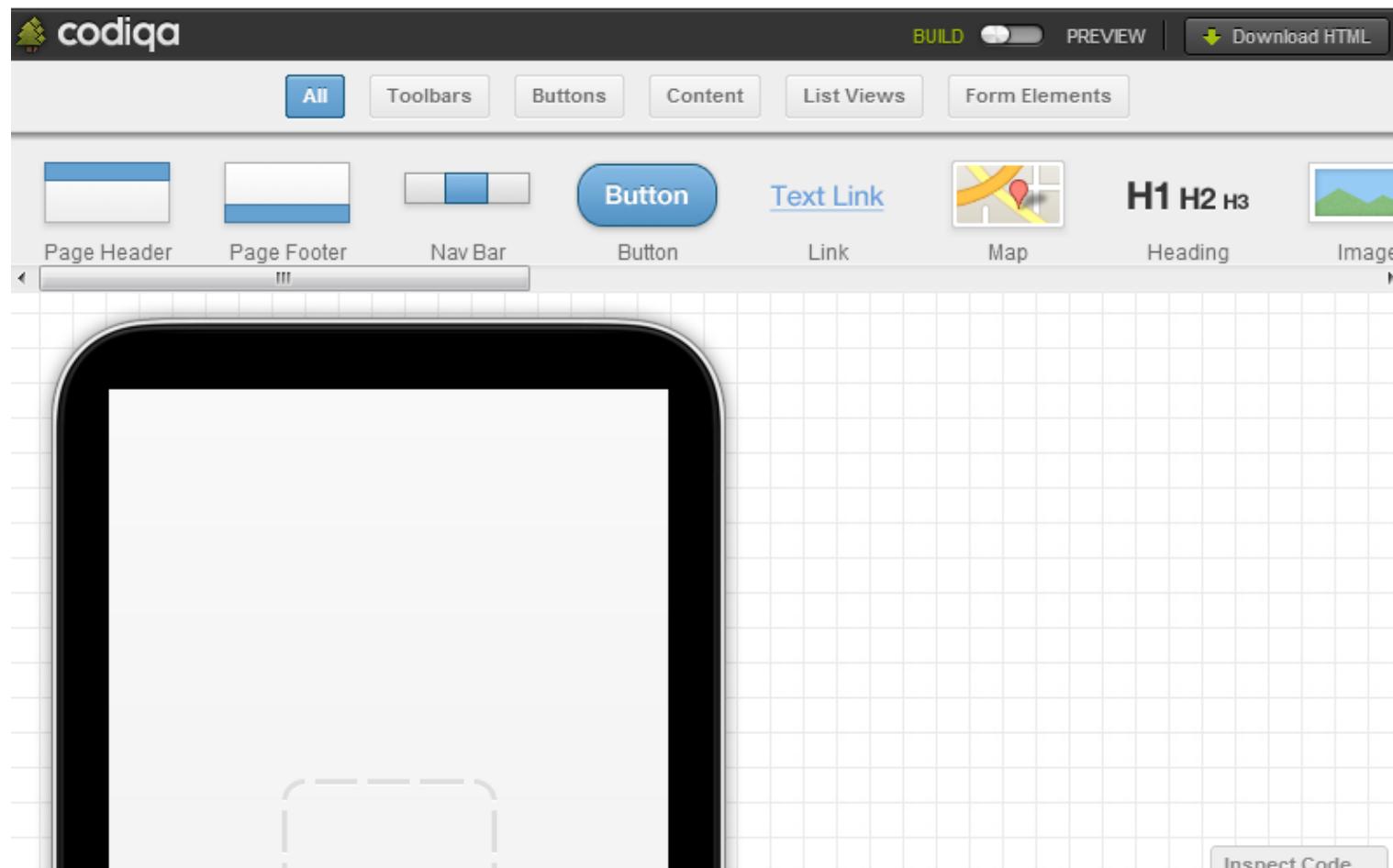
Slider:

Choose as many snacks as you'd like:

- Cheetos**
- Doritos**
- Eritos**

# Components

## Tools



# Theme framework

- enhance all default HTML components
- takes advantage of CSS3 properties
- multiple color "swatches"
- theme roller to build your own

# Theme framework

## Swatches

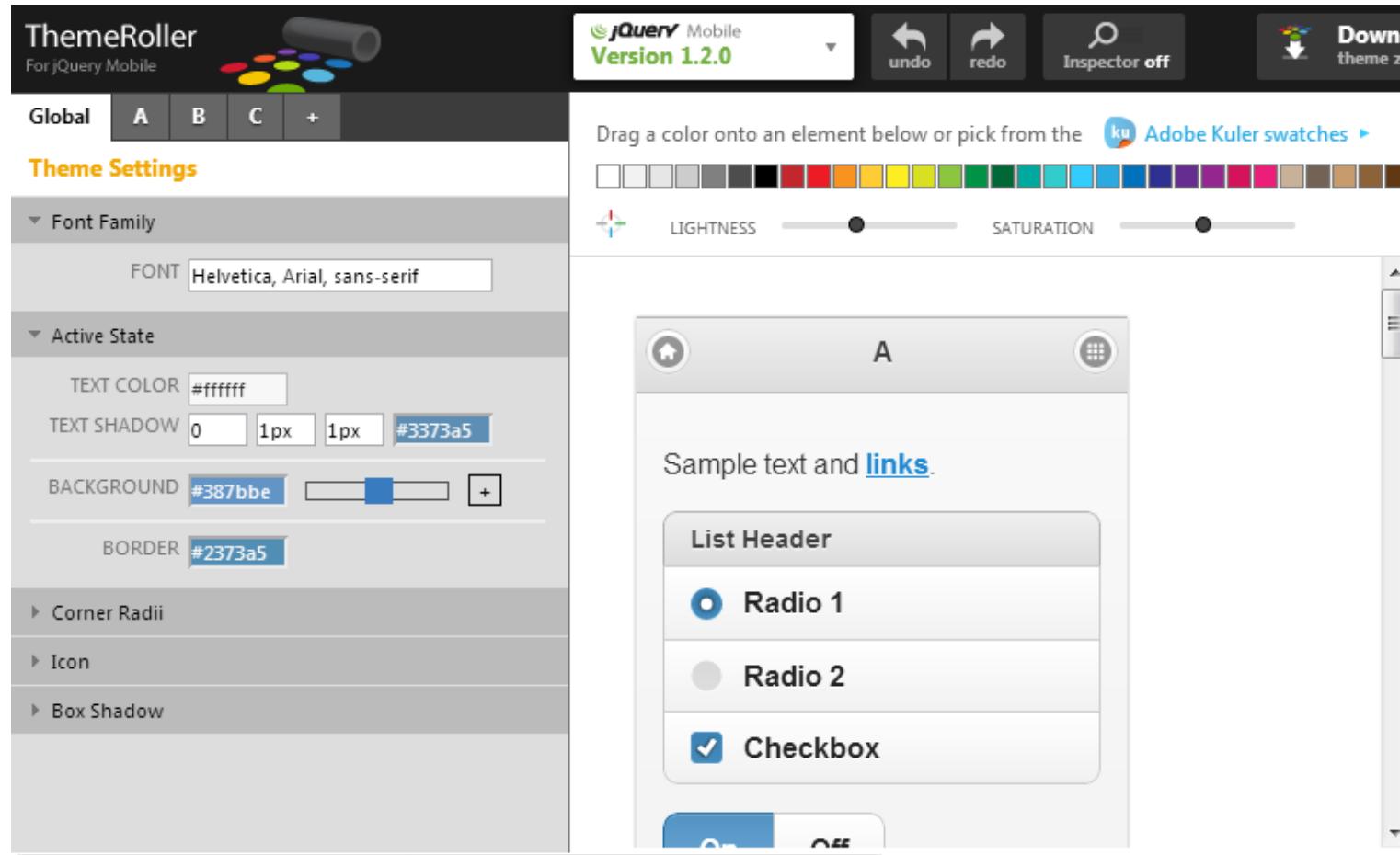
- themes include multiple color "swatches"
- each consisting of a header bar, content body, and button states
- can be freely mixed and matched to create visual texture
- each swatches is identified by a letter

```
<a href="index.html" data-role="button" data-theme="a">Swatch a</a>
```

HTML

# Theme framework

## ThemeRoller



# PhoneGap

HTML

```
...
<link rel="stylesheet" href="css/themes/default/jquery.mobile-1.0.min.css" type="text/css" />
<link rel="stylesheet" href="css/themes/default/custom.css" type="text/css" />
<script type="text/javascript" charset="utf-8" src="js/jquery-1.7.1.min.js"></script>
<script type="text/javascript" charset="utf-8" src="js/phonegap-1.8.1.js"></script>
<script type="text/javascript" charset="utf-8" src="js/custom-init.js"></script>
<script type="text/javascript" charset="utf-8" src="js/jquery.mobile-1.0.min.js"></script>
<script type="text/javascript" charset="utf-8" src="js/custom.js"></script>
<script type="text/javascript" charset="utf-8">
    $(document).ready(function() {
        document.addEventListener('deviceready', onDeviceReady, false);
    });
    function onDeviceReady() {
        $.mobile.initializePage();
    }
</script>
...
```

# PhoneGap

## JavaScript

- custom-init.js:

```
$(document).bind("mobileinit", function() {
    // Autorise les requetes cross-domain
    $.mobile.allowCrossDomainPages = true;
    // Indique que le Browser supporte le Cross-Origin Resource Sharing
    $.support.cors = true;
    // Bloque l'initialisation et l'affichage des pages,
    // jusqu'a l'appel de $.mobile.initializePage();
    $.mobile.autoInitializePage = false;
});
```

HTML

- PhoneGap integration is fully documented
- <http://jquerymobile.com/test/docs/pages/phonegap.html>

# Feedback

- Pros
  - Easy to use
  - Quick results
  - Good UI quality
  - Good performances (if done carefully)
  - PhoneGap integration
- Cons
  - Make use of prefetching (data-prefetch)
  - Difficult to think outside the box
  - Security
  - Page loading timeout with Android & Phonegap



Thank You!

