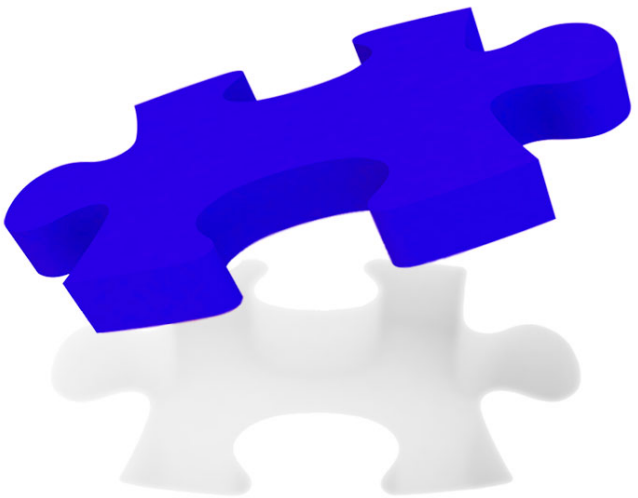
Cross-platform mobile development
with the power of jQuery

Pro jQuery Mobile

Brad Broulik

Apress®

Pro jQuery Mobile



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To my parents, Luke and Reone for their unconditional love and support.
Mom, you'll be forever missed (1936 – 2010).

—Brad

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About the Author

Brad Broulik is a senior developer specializing in enterprise mobile development at HealthPartners. Prior to mobile development he was the lead software architect at a financial services organization. He has extensive experience with most mobile technologies, particularly jQuery Mobile. He has contributed multiple pull requests to the jQuery Mobile project on GitHub and is actively developing several enterprise mobile apps with jQuery Mobile. He blogs regularly at `http://bradbroulik.blogspot.com`, tweets as @BradBroulik, and can be contacted at `BradBroulik@gmail.com`. He lives with his wife and daughter in Minnesota and enjoys exercising, outdoor activities, and spending time with family.

About the Technical Reviewer

Jorge Ramon is the founder of a small technology company that focuses on software development and developer education on mobile, web, and desktop technologies. He is also the author of the *Ext JS 3.0 Cookbook*.

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Introduction

We are currently witnessing a shift in the way enterprises and individuals build and distribute mobile applications. Initially, the strategy was to build separate native apps for each major platform. However, teams quickly realized that maintaining multiple platforms was unsustainable as mobile teams lost their agility. The mobile teams that can build once and ship to all devices tomorrow will have a competitive advantage and jQuery Mobile can help get you there.

jQuery Mobile is a framework for delivering cross-platform mobile web applications with a unified interface. jQuery Mobile combines responsive layouts with progressive enhancement to render the best possible user experience from a single code base. With jQuery Mobile, we will see how to create themable, responsive, native-looking applications for iOS, Android, Windows Phone, Blackberry, and more. We will discover what sets jQuery Mobile apart from other mobile web development platforms and we will walk through practical examples of jQuery Mobile features, including design elements and event handling.

What you'll learn

- Unique features of jQuery Mobile
- jQuery Mobile core features, including page structure, navigation, form elements, lists, and grids
- How to create themable designs
- The entire jQuery Mobile API, including data attributes, methods, and events
- Integrating web services, Google Maps, and Geolocation into your jQuery Mobile apps
- How to extend jQuery Mobile with PhoneGap when you need to distribute to an app store or access device functionality
- How to apply jQuery Mobile to specific cases, including iOS and Android apps

Who This Book Is For

Mobile developers who want to master jQuery Mobile and build cross-platform mobile web applications from a single code base.

Downloading the code

The source code for this book is available to readers at `http://www.apress.com` in the Source Code section of the book's home page. Please feel free to visit the Apress web site and download the code there.

Chapter 1

Why jQuery Mobile?

jQuery Mobile is a new, simple to use, UI framework for building cross-platform Mobile Web applications. In a matter of minutes, you can create mobile applications (apps) that are optimized to run on nearly every phone, tablet, desktop, and e-reader device available today. That's right, with a single jQuery Mobile codebase we can create a unified experience for nearly all consumers. jQuery Mobile is an ideal framework for any Web designer or developer who needs a simple framework for creating a rich mobile Web experience. The experience also extends beyond the Web. jQuery Mobile apps can also be compiled with hybrid techniques for distribution within your favorite native app store. As we begin our journey, let's review the important features that make jQuery Mobile unique.

Universal Access

jQuery Mobile applications are universally accessible to all devices with a browser. This is a favorable reach advantage to jQuery Mobile's distribution model (see Figure 1–1). Nearly every mobile device ships with a browser. If your app is universally accessible to this broad spectrum it is a major competitive advantage. The following is a complete listing of supported devices in jQuery Mobile 1.0, which includes most phones, tablets, desktop browsers, and even e-readers.

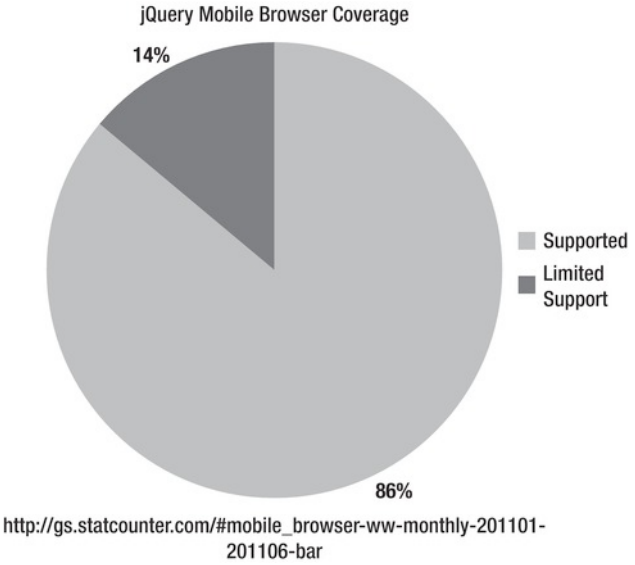


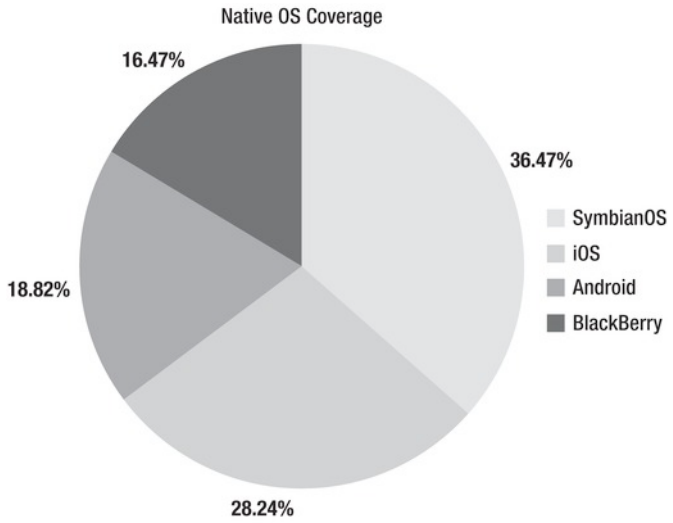
Figure 1–1. *jQuery 1.0 Mobile Browser Coverage*

Supported Devices:

- Phones/Tablets
  - Android 1.6+
  - BlackBerry 5+
  - iOS 3+
  - Windows Phone 7
  - WebOS 1.4+
  - Symbian (Nokia S60)
  - Firefox Mobile Opera Mobile 11+
  - Opera Mini 5+
- Desktop browsers
  - Chrome 11+
  - Firefox 3.6+
  - Internet Explorer 7+
  - Safari
- e-readers
  - Kindle
  - Nook

NOTE: For an up-to-date listing of all supported platforms, refer to jQuery Mobile's supported platforms page (see http://jquerymobile.com/gbs/).

Comparatively, native application development has a very restrictive distribution model (see Figure 1–2). Native applications are only available on their native operating system. For example, an iPhone app is only accessible from an iOS device. If your goal is to reach the most consumers possible this distribution model is limited. Fortunately, jQuery Mobile apps are not restricted by this distribution barrier.



|http://gs.statcounter.com/#mobile_os-ww-monthly-201101-201106-bar

Figure 1–2. *Native OS Coverage*

n addition to universal access, jQuery Mobile applications can take advantage of the instant deployment capabilities we have grown accustomed to on the Web. For jQuery Mobile apps, no barriers exist in regards to certification reviews that are required within the native app distribution model. Mobile Web apps can be updated and deployed instantly to your production users. For example, I was recently working on a native enterprise application that needed an update and it took a week for the re-certification process to approve the change. In all fairness, the native app stores have options to submit urgent updates but the point is you will be dependent upon a third party to push the update to their store. The instantaneous deployment model of the Mobile Web is very advantageous in this regard.

Unified UI Across All Mobile Platforms

jQuery Mobile delivers a unified user interface by designing to HTML5 and CSS3 standards. Mobile users expect their user experience to be consistent across platforms (see Figure 1–3, Figure 1–4, Figure 1–5). Conversely, compare the native Twitter apps on both iPhone and Android. The experience is not unified. jQuery Mobile applications remedy this inconsistency, providing a user experience that is familiar and expected, regardless of the platform. Additionally, a unified user interface will provide consistent documentation, screen shots, and training regardless of the end user platform. For example, if your sales staff needs training on a new mobile app that is being deployed the user documentation will contain consistent screen shots that apply to all platforms. If half the team has iPhones and the other half has Android devices, the training experience and documentation will be the same for all users.

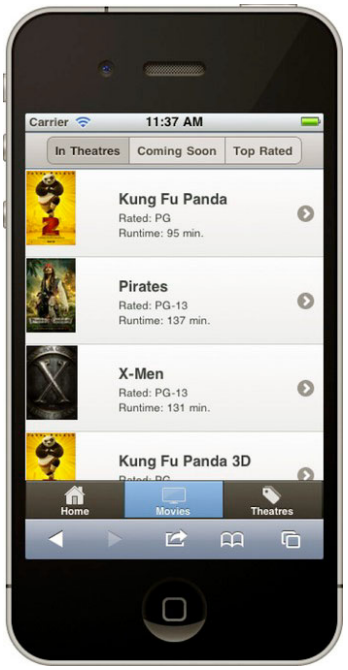


Figure 1–3. *iPhone*

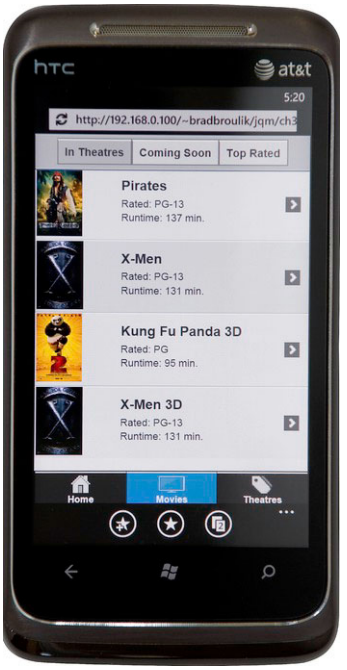


Figure 1–4. *Windows Phone*

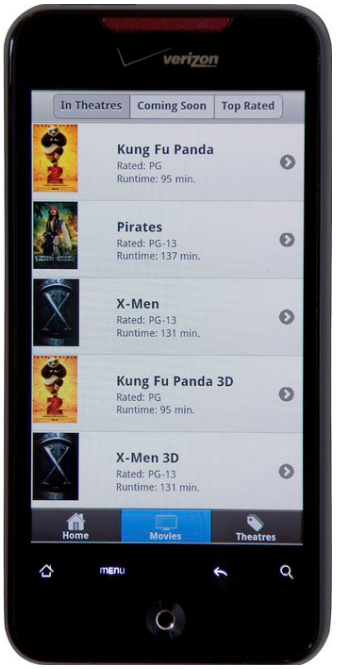


Figure 1–5. *Android*

jQuery Mobile also helps eliminate the need for device-specific UI customizations. A single jQuery Mobile code base will render consistently across all supported platforms without customizations. This is a very cost-effective solution compared to an organization supporting a native code base per OS. And supporting a single code base is much more cost-effective long term in regards to support and maintenance costs (see Figure 1–6).

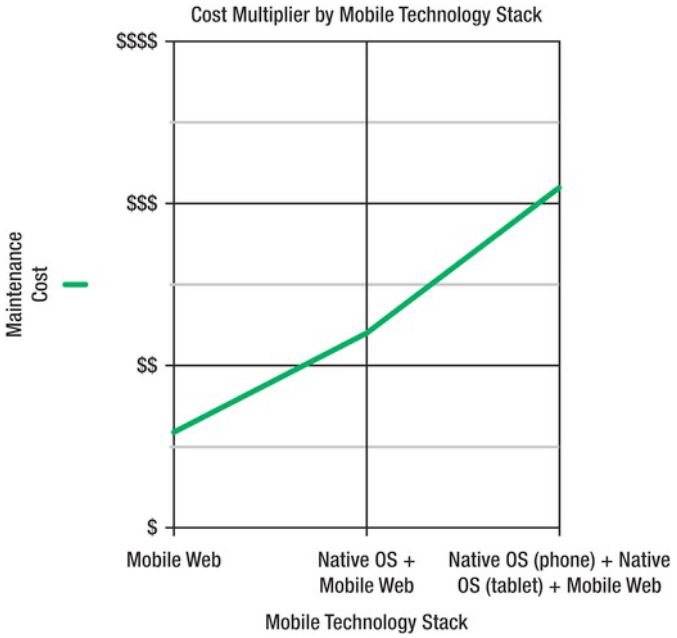


Figure 1–6. *Cost Multiplier by Mobile Technology Stack*

Simplified Markup-Driven Development

jQuery Mobile pages are styled with HTML5 markup (see Listing 1–1.). Aside from the new custom data attributes introduced in HTML5, everything should appear very familiar for Web designers and developers. If you are already familiar with HTML5 migrating to jQuery Mobile should be a relatively seamless transition. In regards to JavaScript and CSS, jQuery Mobile does all of the heavy lifting by default. However, there are instances where you may need to rely upon JavaScript to create a more dynamic or enhanced page experience. In addition to the simplicity of the markup required to design pages it also allows for rapid prototyping of user interfaces. Very quickly we can create a static workflow of functional pages, transitions, and widgets to help our customers see live prototypes with minimal effort.

Listing 1–1. *Insert listing caption here.*

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="utf-8">
  <title>Title</title>
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="stylesheet" href="jquery.mobile-1.0.min.css" />
  <script type="text/javascript" src="jquery-1.6.2.min.js"></script>
  <script type="text/javascript" src="jquery.mobile-1.0.min.js"></script>
</head>
<body>

<div data-role="page">
    <div data-role="header">
        <h1>Page Header</h1>
    </div>

    <div data-role="content">
        <p>Hello jQuery Mobile!</p>
    </div>

    <div data-role="footer">
        <h4>Page Footer</h4>
    </div>

</div>

</body>
</html>
```

Progressive Enhancement

jQuery Mobile will render the most elegant user experience possible for a device. For example, look at the jQuery Mobile switch control in Figure 1–7. This is the switch control on an A-Grade browser.[1]

[1] An A-Grade browser supports media queries and will render the best experience possible from jQuery Mobile CSS3 styling.

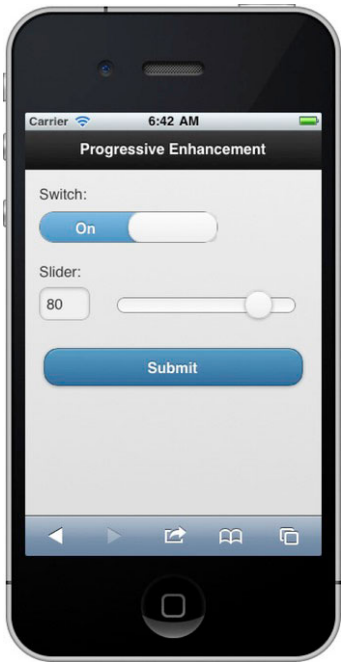


Figure 1–7. *A-Grade Experience*

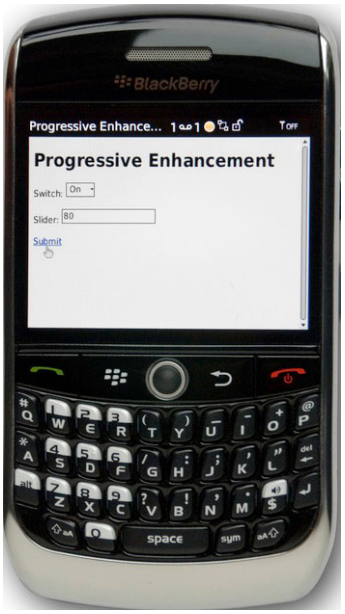


Figure 1–8. *C-Grade Experience*

jQuery Mobile renders the control with full CSS3 styling applied. Alternatively, Figure 1–8 is the same switch control rendered on a much older C-Grade browser.[2] The C-grade browser does not render the full CSS3 styling.

> **IMPORTANT:** Although the C-Grade experience is not the most visual appealing it demonstrates the usefulness of graceful degradation. As users upgrade to newer devices, the C-Grade browser market will eventually diminish. Until this crossover takes place, C-Grade browsers will still receive a functional user experience when running a jQuery Mobile app.

Native applications do not always degrade as gracefully. In most cases, if your device does not support a native app feature you will not even be allowed to download the app. For instance, a new feature in iOS 5 is iCloud persistence. This new feature simplifies data synchronization across multiple devices. For compatibility, if we create a new iOS app that incorporates this new feature we will be required to set the "minimum allowed SDK" for our app to 5.0. Now our app will only be visible in the App Store to users running iOS 5.0 or greater. jQuery Mobile applications are more flexible in this regard.

---

[2] A C-Grade browser does not support media queries and will not receive styling enhancements from jQuery Mobile.

Responsive Design

A jQuery Mobile UI will render responsively across different display sizes. For example, the same UI will display appropriately on phones (see Figure 1–9) or larger devices such as tablets, desktops, or TVs (see Figure 1–10).

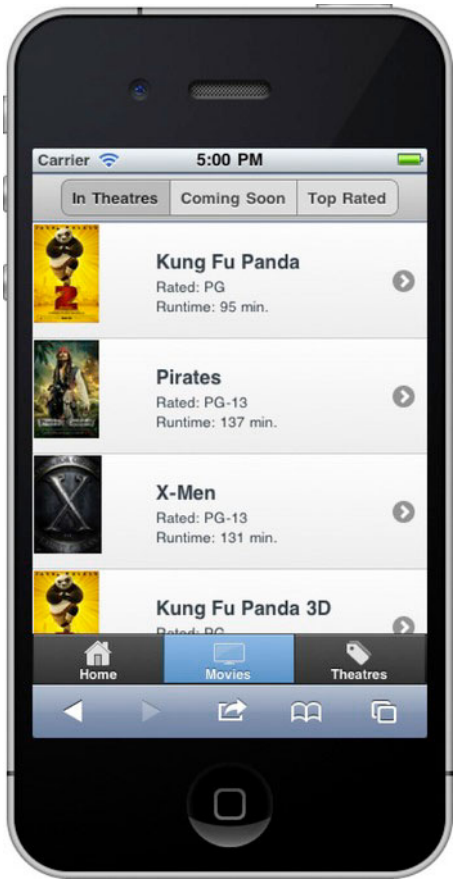


Figure 1–9. *Phone Display*

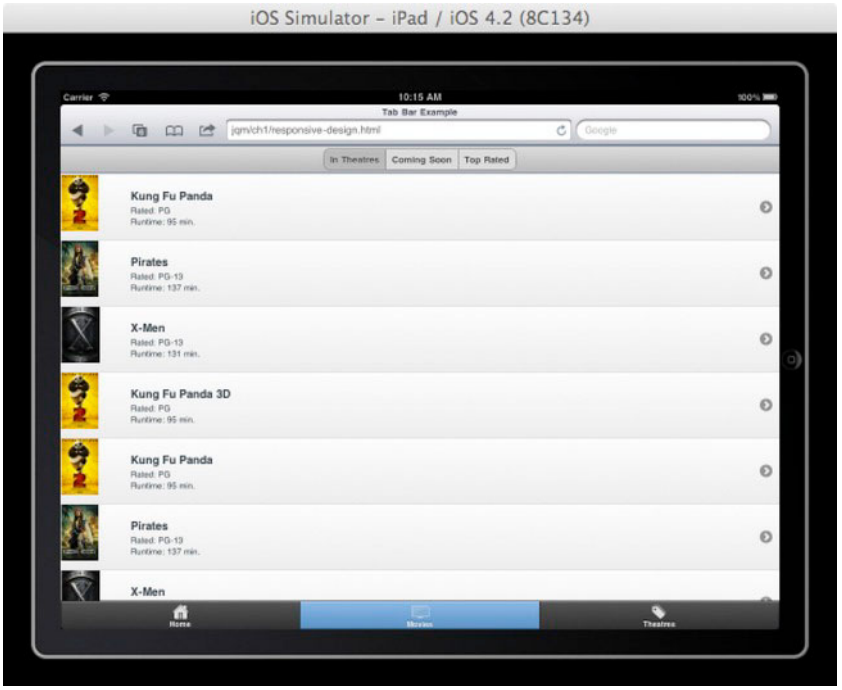


Figure 1–10. *Tablet/Desktop/TV Display*

The Build Once, Run Anywhere Myth

Is it possible to build a single application that is universally available for all consumers (phones, desktops, tablets)? Yes, it is possible. The Web provides universal distribution. jQuery Mobile provides cross-browser support. And with CSS media queries we can begin tailoring our UI to best fit the form factor. For example, on small devices we can serve small images with brief content whereas on larger devices we may serve up larger images with detailed content. Today, most organizations with a mobile presence typically support both a desktop Web and a mobile site. There is waste any time you must support multiple distributions of an application. The rate at which organizations are embracing mobile presences, combined with their need to avoid waste, will drive the build once run anywhere myth to fruition.

Responsive Forms

In certain situations, jQuery Mobile will create responsive designs for you. The following figures show how well jQuery Mobile's responsive design applies to form field positioning in portrait versus landscape mode. For instance, in the portrait view (see Figure 1–11) the labels are positioned above the form fields. Alternatively, when repositioning the device in landscape (see Figure 1–12) the form fields and labels appear side-by-side. This responsive design provides the most usable experience

based on the devices available to screen real estate. jQuery Mobile provides many of these good UX principles for you without any effort on your part!

Figure 1–11. *Responsive Design (portrait)*

Figure 1–12. *Responsive Design (landscape)*

Themable Styling

jQuery Mobile supports a themable design that allows designers to quickly re-style their UI. By default, jQuery Mobile provides five themable designs with the flexibility to interchange themes for all components including page, header, content, and footer components. The most useful tool for creating custom themes is ThemeRoller[3].

Restyling a UI takes minimal effort. For example, I can quickly take a default themed jQuery Mobile application (see Figure 1–13) and re-style it with another built-in theme in seconds. In the case of my modified theme (see Figure 1–14), I chose an alternate theme from the list. The only markup required was an addition of a data-theme attribute. We will discuss themes in greater detail in Chapter 7.

```
<!-- Set the lists background to black -->
<ul data-role="listview" data-inset="true" data-theme="a">
```

[3] See `http://jqueryui.com/themeroller/`. ThemeRoller is a web-based tool that automates the process of generating new CSS-based themes.

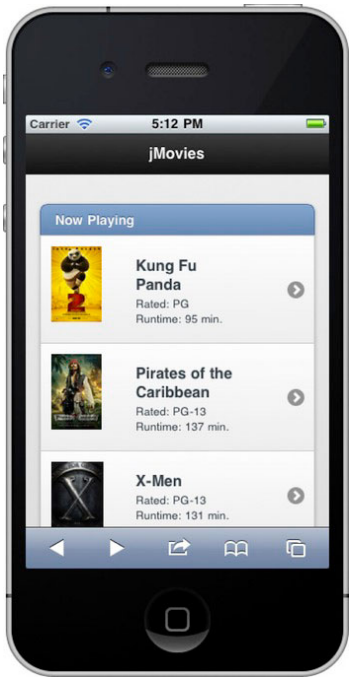


Figure 1–13. *Default Theme*

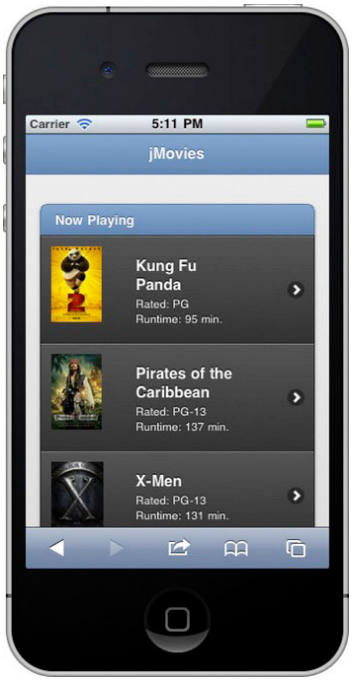


Figure 1–14. *Alternate Theme*

Accessible

jQuery Mobile apps are 508 compliant by default, a characteristic that is valuable to anyone.[4]

In particular, government or state agencies require their applications to be 100% accessible. Furthermore, mobile screen reader usage is rising. According to WebAIM,[5] 66.7% of screen reader users use the screen reader on their mobile device.

[4] 508 Compliance is a federal law that requires applications to be accessible by users with disabilities. The most commonly used assistive technologies on the mobile Web are screen readers.

[5] See `http://webaim.org/projects/screenreadersurvey3/#mobileusage`.

TIP: Interested in testing your mobile site for 508 compliance? Evaluate your mobile site with WAVE.[6]

In addition to testing your mobile apps accessibility with WAVE it is also valuable to physically test your Mobile Web application with an actual assistive technology. For example, if you have an iOS device, activate Apple's Accessibility tool, VoiceOver[7] and experience the behavior first hand.

NOTE: If you are interested in viewing existing jQuery Mobile applications, an online jQuery Mobile Gallery is available for ideas and inspiration (see `http://www.jqmgallery.com/`).

Summary

In this chapter, we reviewed the important features that make jQuery Mobile unique:

- jQuery Mobile apps are universally available to all devices with a browser and are optimized to run on nearly every phone, tablet, desktop, and e-reader device available today.
- jQuery Mobile applications can take advantage of the instant deployment capabilities we have grown accustomed to on the Web.
- A single jQuery Mobile code base will render consistently across all supported platforms without customizations. This is a very cost-effective solution when compared to the alternative of building an app for each OS or client.
- jQuery Mobile is a simplified markup-driven framework that should appear very familiar to Web designers and developers. You may be very surprised and excited by the fact that you can build jQuery Mobile apps with 100% markup!
- jQuery Mobile utilizes progressive enhancement techniques to render a very rich experience for all A-grade devices and provides a usable experience for older C-grade browsers.
- A jQuery Mobile UI will render responsively across devices of various sizes including phones, tablets, desktops, or TV's.
- jQuery Mobile supports a themable design that allows designers to quickly re-style their UI globally.
- All jQuery Mobile applications are 508 compliant.

---

[6] See `http://wave.webaim.org/`.

[7] See `http://www.apple.com/accessibility/iphone/vision.html`.

Chapter 2

Getting Started with jQuery Mobile

In Chapter 1, we reviewed the characteristics that make jQuery Mobile unique. Now we are going to review the basics of jQuery Mobile so we can get up and running quickly. We will start with an overview of the jQuery Mobile page template. There are actually two page templates you may choose from and we will discuss the advantages of each. Next, we will peek under the hood and see how jQuery Mobile enhances our semantic markup into an optimized mobile experience. Also, we will explore how the jQuery Mobile navigation model works. Although jQuery Mobile manages the entire navigational experience it is important to have an understanding of how the navigation model works. And lastly, we will show you how to make your page transitions really "pop." Anxious to get rolling? Let's begin with an example of a jQuery Mobile page.

jQuery Mobile Page Template

A jQuery Mobile page template is shown in Listing 2–1. Before we continue any further, let's get up and running. Copy the HTML template (ch2/template.html), paste it on your desktop and launch it from your favorite browser. You are now running a jQuery Mobile app that should look identical to Figure 2–1 regardless of what browser you are using! The template is semantic HTML5 and contains the jQuery Mobile specific attributes and asset files (CSS, js). Each specific jQuery Mobile asset and attribute is highlighted and explained in Listing 2–1.

Listing 2–1. *jQuery Mobile Page Template (`ch2/template.html`)*

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8">
    <title>Title</title>
    <meta name="viewport" content="width=device-width, initial-scale=1">     1
    <link rel="stylesheet" type="text/css" href="jquery.mobile.css" />       2
    <script type="text/javascript" src="jquery.js"></script>                 3
```

```
    <!--<script src="custom-scripts-here.js"></script>-->                    4
    <script type="text/javascript" src="jquery.mobile.js"></script>          5
</head>
<body>

<div data-role="page">                                                        6
    <div data-role="header">                                                  7
        <h1>Page Header</h1>
    </div>

    <div data-role="content">                                                 8
         <p>Hello jQuery Mobile!</p>
    </div>

    <div data-role="footer">                                                  9
        <h4>Page Footer</h4>
    </div>
</div>

</body>
</html>
```

1. This is the recommended viewport configuration for jQuery Mobile. The `device-width` value indicates we want the content to scale the full width of the device. The `initial-scale` setting sets the initial scaling or zoom factor used for viewing a Web page. A value of 1 displays an unscaled document. As a jQuery Mobile developer you can customize the viewport settings to your application needs. For example, if you wanted to disable zoom you would add `user-scalable=no`. However, disabling zoom is a practice you would want to do sparingly because it breaks accessibility.

2. jQuery Mobile's CSS will apply stylistic enhancements for all A-Grade and B-Grade browsers. You may customize or add your own CSS as necessary.

3. The jQuery library is a core dependency of jQuery Mobile and it is highly recommended to leverage jQuery's core API within your Mobile pages too if your app requires more dynamic behavior.

4. If you need to override jQuery Mobile's default configuration you can apply your customizations here. Refer to Chapter 8, Configuring jQuery Mobile, for details on customizing jQuery Mobile's default configuration.

5. The jQuery Mobile JavaScript library must be declared after jQuery and any custom scripts you may have. The jQuery Mobile library is the heart that enhances the entire mobile experience.

6. `data-role="page"` defines the page container for a jQuery Mobile page. This element is only required when building multi-page designs (see Listing 2–3).

7. `data-role="header"` is the header or title bar as shown in Figure 2–1. This attribute is optional.