

Community Experience Distilled

Creating Mobile Apps with jQuery Mobile

Second Edition

Create fully responsive and versatile real-world apps for smartphones with jQuery Mobile 1.4.5

Andy Matthews
Shane Gliser

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PUBLISHING

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I'd like to thank my wife for putting up with me through all my conferences and travel, and the time spent typing into this magic box we call the Internet. Thanks to my kids for premature gray. Thanks to all the people I've learned from over the years. It's because of you that I do this.

Find out about my exciting new card game, *Startup*, coming to Kickstarter in 2015 http://startupcardgame.com.

Shane Gliser graduated from Washburn University in 2001, specializing in Java development. Over the next few years, he developed a love of web development and taught himself HTML, CSS, and JavaScript. Having shifted his focus again, Shane's primary passions are user experience and the mobile web. Shane began working with jQuery Mobile while it was still in the Alpha 2 phase, and deployed American Century Investments' mobile site while the framework was still in Beta 2. Since then, he has rebranded and relaunched his own personal business, Roughly Brilliant Digital Studios (http://roughlybrilliant.com), as a place where he could start blogging tips about using jQuery Mobile.

Major thanks goes to Todd Parker, Scott Jehl, and the rest of the crew at Filament Group, and the many other volunteers who have given their time and talent to creating jQuery Mobile. Jim Tharp, thank you for being my mobile partner in crime, and for your continuous, epic sense of humor.

To the leadership team at American Century Investments, thank you for believing in my little two-week demo and trusting us to march down this unknown path.

About the Reviewers

Anne-Gaelle Colom is an open web enthusiast, advocate for good documentation, passionate about mobile and web development and the use of technology in higher education. Anne-Gaelle has been developing for the web since 1995 and wrote her first mobile application in 1996. She naturally combined these two areas of development as soon as mobile devices were capable of browsing the web.

Currently, Anne-Gaelle is a senior lecturer at the University of Westminster in London, UK where she specializes in teaching mobile and web-related topics, with an emphasis on advanced client-side web development, mobile development and mobile user experience. Anne-Gaelle is the documentation lead for jQuery Mobile and a member of the jQuery Board of Directors.

I would like to thank my friends from the jQuery teams for their inspiration and support, my colleagues for their encouragement, and my family for their love and understanding.

Shameemah Kurzawa started programming since she was at high school. Being motivated to be a system analyst, she pursued both undergraduate and postgraduate studies in business information system and software engineering respectively.

She has been working as a web developer/analyst for the past 8 years; she had worked in the past for Australia's renowned broadcasting company, SBS, and freelances for her own company since 2010. She is currently working in the financial sector with exposure to Business Process Modeling (BPM) tools in addition to her wealth of experience in the web space. Besides work, she enjoys spending her time around family, traveling, cooking, as well as reading about and trying new web technologies.

She previously reviewed *Query UI themes* and *PHP jQuery Cookbook* for Packt Publishing.

I would like to thank my husband and the PacktPub team for the support and understanding in reviewing this book.

Troy Miles, aka the Rockncoder, began writing games in assembly language for early computers such as the Apple II, Vic20, C64, and the

IBM PC, over 35 years ago. Currently he fills his days writing web apps for a Southern California based automotive valuation and information company. Nights and weekends he can usually be found writing cool apps for mobile and web, or teaching other developers how to do so. He likes to post interesting code nuggets on his blog, http://therockncoder.com and videos on his YouTube channel, https://www.youtube.com/user/rockncoder. He can be reached at <rockncoder@gmail.com>.

This is the first book that Troy has ever reviewed, and it was fun and fascinating to get to look over an author's shoulder while he worked.

I would like to thank the great people at Packt Publishing for asking me to be a reviewer and my beautiful wife Janet for putting up with my insomniac pursuits.

M. Ali Qureshi, is a web designer and developer based in Lahore, Pakistan. Since 2001, Ali has developed creative, interactive, and usable web solutions, making them a successful technology investment for clients. He has also worked on a number of successful web apps, Facebook apps, web portals, and authored WordPress plugins and themes and osCommerce add-ons.

In Oct, 2014, he left a full-time job as a software architect to concentrate on his freelance work and company, PI Media (http://www.parorrey.com), that he founded in 2002. He currently runs a number of websites, including http://www.wppim.com, http://www.flash-greetings.com/, http://www.eventsinsydney.com/, and http://traveltourism.com/. He regularly makes contributions to the latest tips and trends in web design, PHP, WordPress and CMS development, Flash ActionScript, and Facebook App Development on his blog, http://www.parorrey.com/blog/.

Ali works as a consultant, project manager, PHP and Flash AS3 developer, and sometimes as a designer. He has previously done two technical reviews for Packt Publishing's books, *jQuery Mobile Framework Beginner's Guide* and *jQuery for Designers - Second Edition*.

When not working, he spends his time blogging and exploring new technologies. He is an avid sports fan and especially likes watching cricket. Pakistan and Australia are his favorite teams. Running along Lahore canal early in the morning and the occasional stroll in Lawrence Gardens, Lahore are things he enjoys a lot.

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Preface

Can we build it? Yes, we can!

Mobile is the fastest growing technology sector in existence. It is a wave of change that has shattered all analysts' expectations. You have the choice to harness that wave or to be swept under. In *Creating Mobile Apps with jQuery Mobile*, we'll take you through several projects of increasing complexity, across a variety of industries. At the same time, we'll tackle several mobile usability and experience issues that are common to all mobile implementations, not just jQuery Mobile.

By the end you will have all the skills necessary to take jQuery Mobile and a host of other technologies and techniques to create truly unique offerings. This will be fun. It will be challenging, and by the end, you will be quoting Bob the Builder, "Can we build it? Yes we can!"

What this book covers

Chapter 1, *Prototyping jQuery Mobile*, harnesses the power of rapid prototyping before you start coding. Come to a quicker, better, and shared understanding with your clients.

Chapter 2, *Making a Mom-and-Pop Mobile Website*, implements the prototypes from Chapter 1, *Prototyping jQuery Mobile* . The design is unique and begins to establish a base server-side template.

Chapter 3, *Analytics, Long Forms, and Frontend Validation*, takes the casual implementation of Chapter 2, *A Mom-and-Pop Mobile Website* and adds in Google Analytics, the jQuery Validate framework, and a technique for dealing with long forms.

Chapter 4, *QR Codes, Geolocation, Google Maps API, and HTML5 Video*, will have you implement a site for a movie theater chain.

Chapter 5, *Client-side Templating, JSON APIs, and HTML5 Web Storage*, creates a social news nexus, tapping into the API powers of Twitter, Flickr, and the Google Feeds API.

Chapter 6, *Automating Your Workflow with Grunt*, introduces you to the Grunt automation framework, and will show you how to automate repetitive tasks such as concatenation, minification, and CSS builds.

Chapter 7, *Working with HTML5 Audio*, takes HTML5 Audio and progressive enhancement to turn a very basic web audio player page into a musical artist's showcase.

Chapter 8, *Fully Responsive Photography*, explores the use of jQuery Mobile as a mobile-first, Responsive Web Design (RWD) platform. We also take a very quick look at typography as it applies to RWD.

Chapter 9, *Integrating jQuery Mobile into Existing Sites*, explores the methods of building jQuery Mobile sites for clients who want their pages mobilized, but don't have a Content Management System (CMS). We also dig deep into mobile detection methods including client-side, server-side, and a combination of the two.

Chapter 10, *Content Management Systems, Static Site Generators, and jQM*, teaches us how to integrate jQM into WordPress and Drupal. It also introduces the notion of developing a dynamic site locally but outputting, and hosting, plain HTML.

Chapter 11, *Putting It All Together – Community Radio*, builds on the knowledge of the previous chapters and creates, adds a little more, and considers compilation using PhoneGap Build.

What you need for this book

You really only need a few things for this book.

- **A text editor**: All you need is a basic text editor for your code; Notepad++ is great on Windows. I really like Sublime Text 2. Eclipse will work, though it's a bit heavy-handed. Dreamweaver is pretty good, but pricey. It really doesn't matter much; you can pick whatever text editor makes you happy.
- **A web server**: You could use a hosted solution such as HostGator, Godaddy, 1&1, and many more, or keep your entire testing local, using something like XAMPP, WAMP, MAMP, or LAMP on your development box.
- **JavaScript libraries**: Here and there in the chapters we'll introduce a few JavaScript libraries. In each case, I'll tell you what they are and where to find them.
- **A developer's sense of humor**: We all think of it, we all say it. You'll find a rant or two in here. Take them for what they're worth and never too seriously.

Who this book is for

If you are already fairly good with web development (HTML, CSS, JavaScript, and jQuery), that's good enough for me. You can pick up jQM along the way in this book and I think you'll be fine.

What we will cover

- Ideation and prototyping techniques
- Integrating custom fonts and icon sets
- Integrating client-side form validation using jQuery Validate
- Google Analytics, Maps, and Feeds APIs
- Geolocation
- Embedding HTML5 video and audio
- Using client-side templates and JSON
- Digesting Really Simple Syndication (RSS) feeds
- Integrating lightGallery
- Media queries
- Mobile detection techniques
- Integrating with Wordpress, Drupal, and Harp.io softwares
- Integrating with pre-existing sites

Why jQuery Mobile

Kings rise and fall so fast in the mobile sector, that it's almost impossible to predict who and what will win. Just ask RIM (makers of BlackBerry devices), who went from total domination down to just 1 percent of the world's market share. With this level and speed of change, how can you know that you are choosing the right platform for your projects?

- A safe bet: The core jQuery library is used on over 60 percent of the top 1 million websites in existence, and the growth rate shows no signs of slowing. (http://trends.builtwith.com/javascript/jQuery). It is, by far, the most trusted name in open source JavaScript libraries. Now that they have tossed their hat into the mobile ring, you can bet that jQuery Mobile is a pretty safe choice for reaching the most people with the smallest effort. It is also worth noting that you will probably move on from most of your projects after a time. Using jQM will increase the likelihood that whoever comes after you will already have the skill set to pick up where you left off.
- Broadest device support: jQuery Mobile has the broadest range of device support. This has always been part of their mission through their exceptional adherence to Progressive Enhancement (PE). When an escalator breaks, it doesn't become completely useless, it simply becomes stairs. In the same way, jQuery Mobile does some really awesome things for those who have smartphones. But what about the rest? They will see a fully functional web page without all the bells and whistles. At the end of the day, a well-crafted jQM page can work for everyone.
- Mobile first but not mobile only: jQM was designed from the ground up with mobile in mind, but with some judicious use of Responsive Web Design (RWD), a single jQM project can service mobile, tablet, and even desktop.
- Declarative, not programmatic: Most of what you want to do in jQM can be done without writing a single line of code. This makes it an ideal tool for even the newest of newbs to jump in and get their feet wet in the mobile space. Designers with no real programming experience can easily turn their visions into skinned, working prototypes. For those of us who can program, it means that there is much less coding we need to do, and that is always a good thing. jQM perfectly fits the jQuery core motto of write less, do more.
- jQM versus other frameworks: There are many choices for your consideration if you want to use a mobile framework. Check out http://www.markus-falk.com/mobile-frameworks-comparison-chart/ for a breakdown tool comparing all the options. The bottom line is this: if you want to support everybody and do it easily, jQuery Mobile is the right choice of framework.
- jQM versus responsive web design: Much is being said these days about RWD. I'm all for it. A single unified site is every developer's

dream. However, this usually requires that the website be built from the ground up with RWD in mind. This also presumes that every page of the site is worth serving to a mobile audience. If you ever have such a growth opportunity, enjoy it. The sad truth is, most of the rest of us don't get the luxury of starting a whole new site from scratch, nor the time and tripled budget to do the job right. And, if we're being quite honest…many sites have a lot of useless pages that have no business being in the ultra-focused, task-oriented, get-in-get-out-world that is the mobile web. You know it. I know it. A custom crafted solution that perfectly fits the users' needs and context is usually a better way to go.

- jQM versus rolling your own: You certainly could choose to roll out your own mobile sites from scratch, but that would be tantamount to felling a forest with an axe so you could make the boards to build your own house. You are no less of a craftsman for using premade components to make your masterpiece. Mobile frameworks exist for a reason, the amount of development time and cross-device testing that goes into them will save you more time and headaches than you can fathom. It is worth noting that two out of the three top industry leaders highlighted in Kasina's report, *Mobile Leadership for Asset Managers and Insurers* (http://www.kasina.com/Page.asp?ID=1415), were crafted using jQuery Mobile. Franklin Templeton, American Century Investments, and Vanguard were highlighted. The first two were implemented using jQM.

> **Note**
>
> Full disclosure: I (Shane) was part of the team that created the referenced version of the mobile site for American Century Investments, so I'm rather proud of this report.

Progressive enhancement and graceful degradation

Resistance is futile. It is going to happen to you. Every year, there are new exploits announced at the Black Hat conferences (http://www.blackhat.com/). Just like clockwork, companies neuter their smartphone users by turning off JavaScript until a patch can be provided. One or more people within your mobile audience will be affected.

While this situation can be annoying, jQuery Mobile can help, thanks to its masterful use of progressive enhancement. If you have coded your pages in accordance with the framework's design, then you will have nothing to fear by the loss of JavaScript. The site will still work. It may not be as pretty, but it will function for everyone from the smartest of smartphones to the dumbest of dumbphones.

It is our responsibility (as distasteful as it may be) to test our offerings with JavaScript turned off, to ensure that people can always access our product. It is not hard to flip the settings on our phones and just take a look at what happens. Frequently, it's trivial to fix whatever is wrong.

All that being said, we are going to mercilessly break that rule in this book, because we are going beyond the basics of the framework. When possible, we will try to keep this principle in mind and provide fallback alternatives, but some of what we are going to try just can't be done without JavaScript. Welcome to the 21st century!

Accessibility

Smartphones are excellent tools for those with accessibility needs. The jQuery Mobile team has made every effort to support the W3C's WAI-ARIA standards for accessibility. At the very least, you should test your finished product with your phone's voice assist technologies. You will be shocked at just how well your site can perform. Your customers who need the help will be thrilled.

Conventions

In this book, you will find a number of styles of text that distinguish between different kinds of information. Here are some examples of these styles, and an explanation of their meaning.

Code words in text, database table names, folder names, filenames, file extensions, pathnames, dummy URLs, user input, and Twitter handles are shown as follows: "We'll also need to add this definition to our `custom.css` file."

A block of code is set as follows:

```
<div data-role="footer">
    <h4>Call Us: <a href="+18167816500">(816)
781-6500</a></h4>
</div><!-- /footer -->
<p class="fullSite">
    <a class="fullSiteLink" rel="external"
href="<?=$fullSiteLinkHref?>">View Full Site</a>
</p>
```

When we wish to draw your attention to a particular part of a code block, the relevant lines or items are set in bold:

```
$.mobile.activePage.attr("data-url")]);
} else {
_gaq.push(['_trackPageview']);
}
}
  //if there is an error, let's dump it to the
console
catch(err) {console.log(err);}
});
```

Any command-line input or output is written as follows:

```
harp init boilerplatetest -b
commadelimited/jQuery-Mobile-Harp- Boilerplate
```

New terms and **important words** are shown in bold. Words that you see on the screen, in menus or dialog boxes for example, appear in the text like this: " Let's make our first link **Home** and the second link **Call.**"

> **Note**

Warnings or important notes appear in a box like this.

Tip

Tips and tricks appear like this.

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Chapter 1. Prototyping jQuery Mobile

On November 22, 2011, I (Shane) started my blog at roughlybrilliant.com as a way to share everything I was learning about **jQuery Mobile** and **Mobile UX** (**User Experience**). I had no idea what it would turn into and what would strike a chord. Since it's a developer-centric blog, it came as a bit of a surprise to me that the remarks I made about stepping away from the keyboard and sketching our designs first would spark the most positive comments. It is my firm belief that the best way to start your jQuery Mobile projects, is on a pad of **Post-it notes**.

There is a good chance that this chapter will feel like the most work and feel the most foreign. But ultimately, I believe it will probably be the chapter that gives you the most growth. It's normal for developers to sit down and start coding, but it's time to grow past that.

In this chapter, we will cover the following topics:

- The changing mobile playing field
- The mobile usage pattern
- Paper prototyping
- Key components for a small business mobile site
- Drawing the jQuery Mobile UI
- Other prototyping methods

The game has changed

There was a time, not so long ago, when developers could make a product and people would use it no matter how bad it was. It would generally garner some level of success simply by virtue of its existence. We now live in an age where there is a lot more competition. Now, with tools like jQuery Mobile, anyone can quickly craft impressive looking mobile sites in a matter of hours.

So, how do we differentiate ourselves from the competition? We could certainly compete on price. People love good value. But there is something that has always seemed to trump price, and that is the user's experience. User Experience (UX) is what differentiates most of the world's most successful brands.

Which computer company is not only staying afloat but is absolutely swimming in success? Apple. Sure their products are expensive, but

ultimately they are successful because they've always been at the forefront of designing around the user.

Amazon provides a great experience by helping you find what you're looking for quickly. They give great reviews and recommendations for your purchasing decisions. Google could promote whatever they want on their homepage, but instead, they have kept their homepage almost as clean as it was on the day they started.

It's hard! We like to think that how we make a program or web page is crucial. We like to think that, by shaving off 10 percent of our code, we're making a big difference. But have you ever tried to explain the details of your current project to a friend and just watched their eyes glaze over? Nobody cares but us. All they hear is faster, smaller, easier, simpler, and so on. They only care about things that have a direct bearing on their life: their user experience.

The most important lesson we can learn as developers is that we can write the most elegant code, create the most efficient systems, accomplish small miracles in less than 1K of JavaScript, but if we fail in the area of usability, we will fail completely.

The mobile usage pattern

jQuery Mobile is not a magic bullet. It will not create instant magnetism for our products. Technologies and libraries will not save us if we fail to realize the environment and usage patterns of our users.

Think about this: when was the last time you spent more than three continuous minutes on any one site or app on your phone that wasn't a game? We all know how addictive **Flappy Bird** can be but, aside from that, we tend to be in and out in a hurry. The nature of mobile usage is short bursts of efficient activity. This is because our smartphones are the perfect time reclamation devices. We whip them out wherever we have a spare minute including:

- Around the house (recipes, texting, boredom)
- While waiting in lines or waiting rooms (boredom)
- Shopping (deal hunting, boredom)
- During work (meetings, bathroom-we've all done it)
- Watching TV (every commercial break)
- Commuting (riding mass transit or stuck in traffic jams)

We can easily see the microburst activity through our own daily lives. This is the environment that we have to tailor our products to if we hope to succeed. Above all else, this will require us to focus. What did the user come to us to do while they are waiting in line? What can they accomplish in a single commercial break? What task would they consider number one during their number two?

HTML prototyping versus drawing

Do not start with the code. Being a developer, this is really hard to say. jQuery Mobile is very fast and easy. Refactoring is also very fast. However, there is something that happens when you jump right into HTML prototyping.

People who don't know code will assume that we're much closer to a complete product than we actually are. This is especially true with jQuery Mobile because even the most rudimentary stab at a project comes out looking polished and complete.

People fixate on minutiae like spacing, margins, colors, logo size, and so on. Due to the sunk cost of our time in the current design, we are less likely to make significant changes from whatever we initially coded, because refactoring is easier than a make-over.

Instead, get a pen and paper. Wait, what? Isn't this a web developer book? Relax; you don't have to be an artist. Trust the process. There will be plenty of opportunities to code later. For now, we are going to draw our first jQuery Mobile wireframe.

The following are a few great things about starting with paper-based ideation:

- We are more willing to simply throw out a drawing that took less than 30 seconds to create
- Actually sketching by hand uses a different part of the brain and unlocks our creative centers
- We can come up with three completely different designs in the time it takes to create one HTML page
- Everyone can contribute their best ideas even if they're not skilled in graphic design or coding
- We will naturally begin by drawing the most important things first
- More attention is paid to the ideas and flows that actually make our site work instead of the myriad details, which few would even notice
- We will probably end up with a more User-Centered Design (UCD) since we're drawing what we would actually want

Ideally, 3x5 Post-it notes are perfect because we can easily lay them out on walls or tables to simulate site structure or process flows. We could even use them to conduct usability testing. A little later, we'll lay out our drawing for the owner to see how the whole thing could work before we get buy off.

Getting our hands dirty with small businesses

The significance of small businesses is defined as follows in Katherine Kobe http://archive.sba.gov/advo/research/rs299tot.pdf:

"Small businesses continue to play a vital role in the economy of the United States. During the 1998-2004 time period, small businesses produced half of private nonfarm GDP."

An article at http://www.msnbc.msn.com/id/16872553/ talks of the following statistics:

"While some two-thirds of small firms make it past the two-year mark, just 44 percent can hack it for four years, according to the latest data from the Bureau of Labor Statistics."

Even in the land of big business, it bodes well for our craft; there is such a volume and churn of small businesses. That means an almost endless supply of mom-and-pop shops that are trying to compete. That's where we come in.

Take Nicky's Pizza for example. Like so many other businesses, the owner realized that he should have a website before he opened his doors for business. His friend built the website and it's actually pretty good; it's just not mobile optimized yet.

The pizza is great and while we sit there enjoying a slice, we bust out a pen and grab a napkin. We're going to sketch out a mobile website right here, right now, and win some business. Let's get started.

For any small, local business, there are certain staples that should probably be first and foremost on their mobile site:

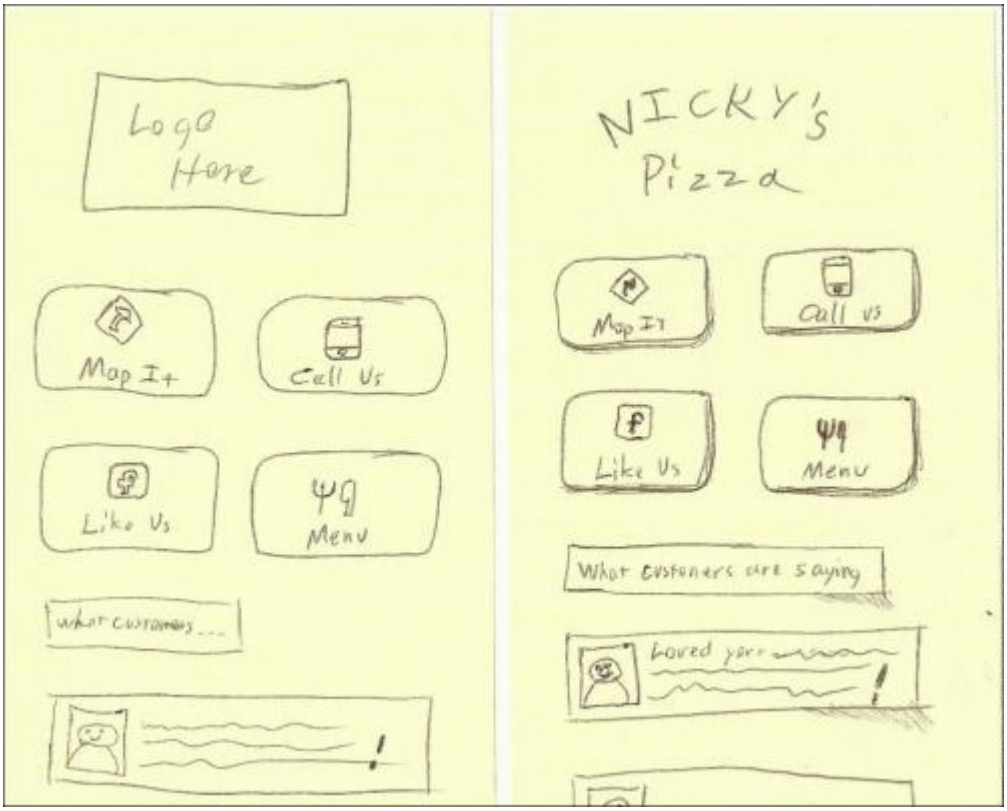
- Location
- Contact information
- Services/goods provided

Since this is a restaurant, services will be the menu. They also were smart enough to create a Facebook page. So, we'll link to that and bring in some testimonials.

Since we're drawing and not using a tool, you can choose to be as detailed as you like. Either works to communicate the core ideas.

When working with our own team, the first is probably just enough since we all know what jQuery Mobile can do. We know what details the framework will fill in and we can draw just enough to tell each other what we're thinking. However, when drawing for customers (or people who you know are more visual and detail-oriented), we would do well to take the few extra seconds to add the finer details like shadows, gradient shading, and, especially, the logo. Business owners are very proud of their babies, and your effort to include it will instantly grant your drawing that little bit of extra gravity.

The following figures are two examples of drawing the same page:

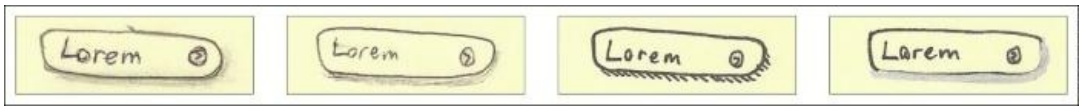


The first is certainly good enough to pick up, hold in the hand, and pretend it's a smartphone screen. In the second figure, we can see how much difference actually drawing out the logo can make and how adding harder edges and shadows give a sense of depth. A little polish goes a long way.

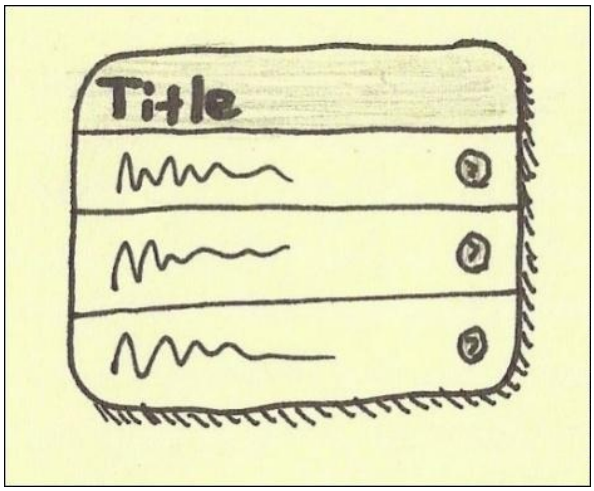
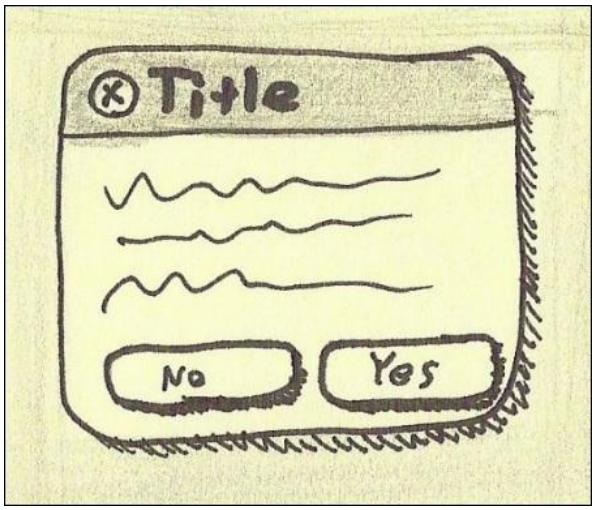
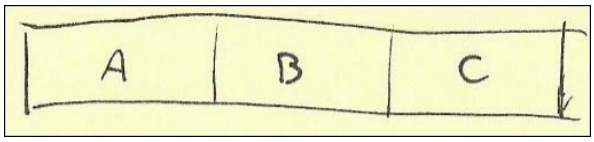
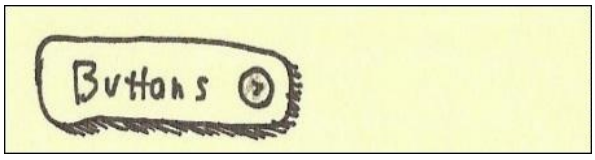
There are several ways to go about adding drop shadows to your drawings. The most artistic way is to use a pencil but the problem with drawing in pencil is that it leads to smudging, and paying too much attention to fine detail. These drawings are supposed to be rough. If you screw up slightly, no big deal. After all, you've probably spent less than a minute on each

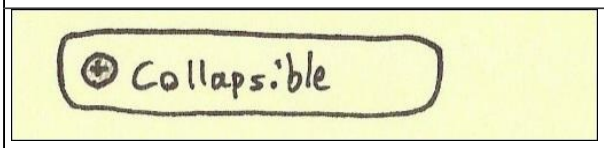
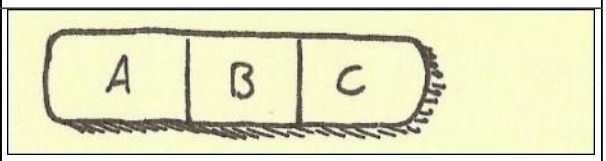
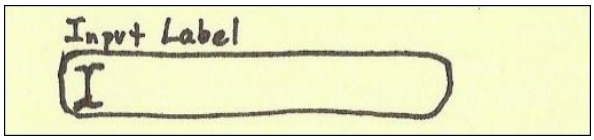
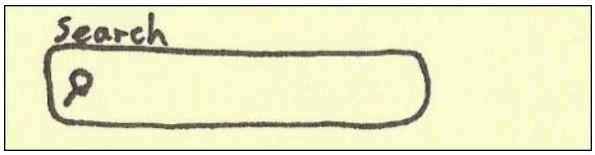
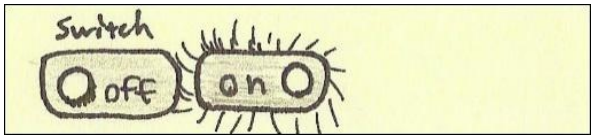
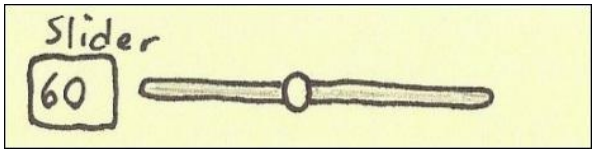
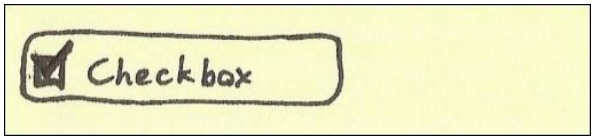
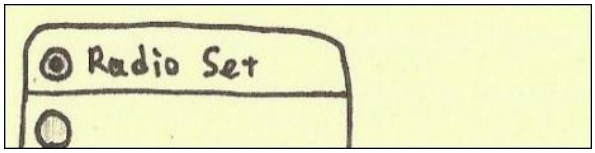
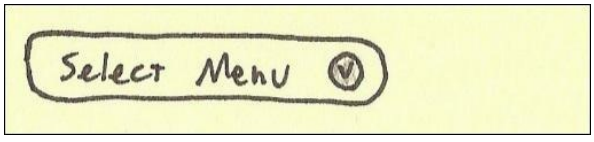
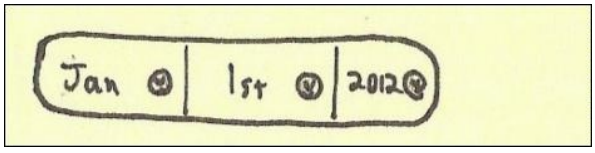
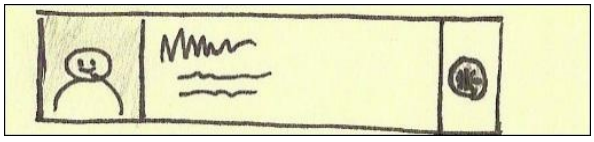
drawing and that's the idea. The goal is to get to a shared, visual understanding, quickly.

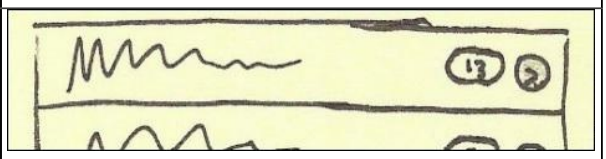
Here are four different ways to draw the same button. From left to right: pencil, pen, Sharpie, and markers. My personal preference is to use a fine point Sharpie.



Here are some other jQuery Mobile elements and ways to draw them:

jQuery Mobile elements with examples	**jQuery Mobile elements with examples**
Listviews 	Dialog 
Navbars 	Buttons 
Collapsible	Grouped Buttons

jQuery Mobile elements with examples	jQuery Mobile elements with examples
	
Input 	Search 
Flip switch 	Slider 
Checkbox set 	Radio set 
Select menu 	Multi-select 
Split listviews 	Bubble count list views

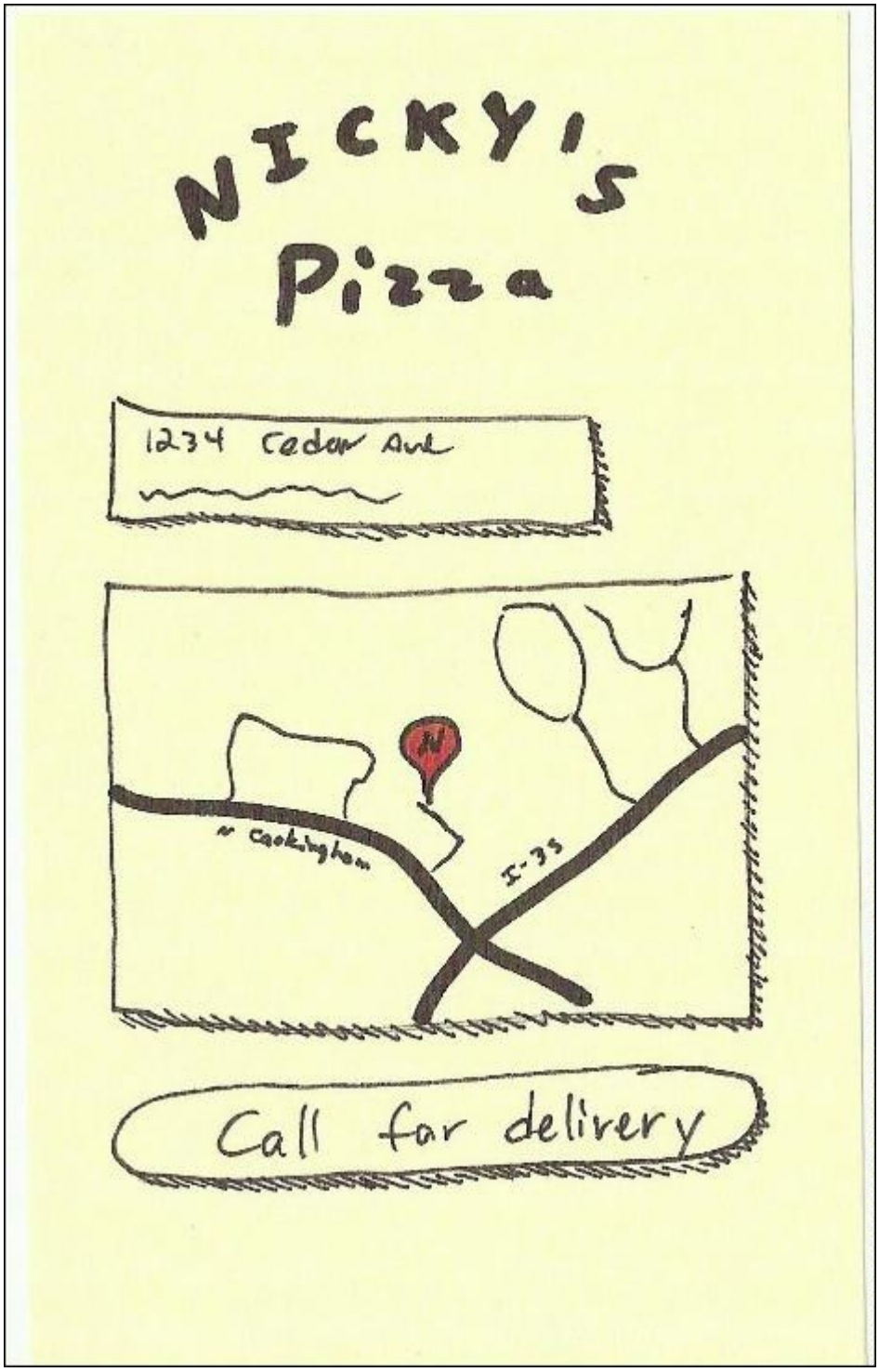
jQuery Mobile elements with examples	jQuery Mobile elements with examples
	

Designing the remaining components

The **Map It** button will lead the user to this page where we will list the address and have a static Google map. Clicking on either the address or the map will link to the full Google Maps location.

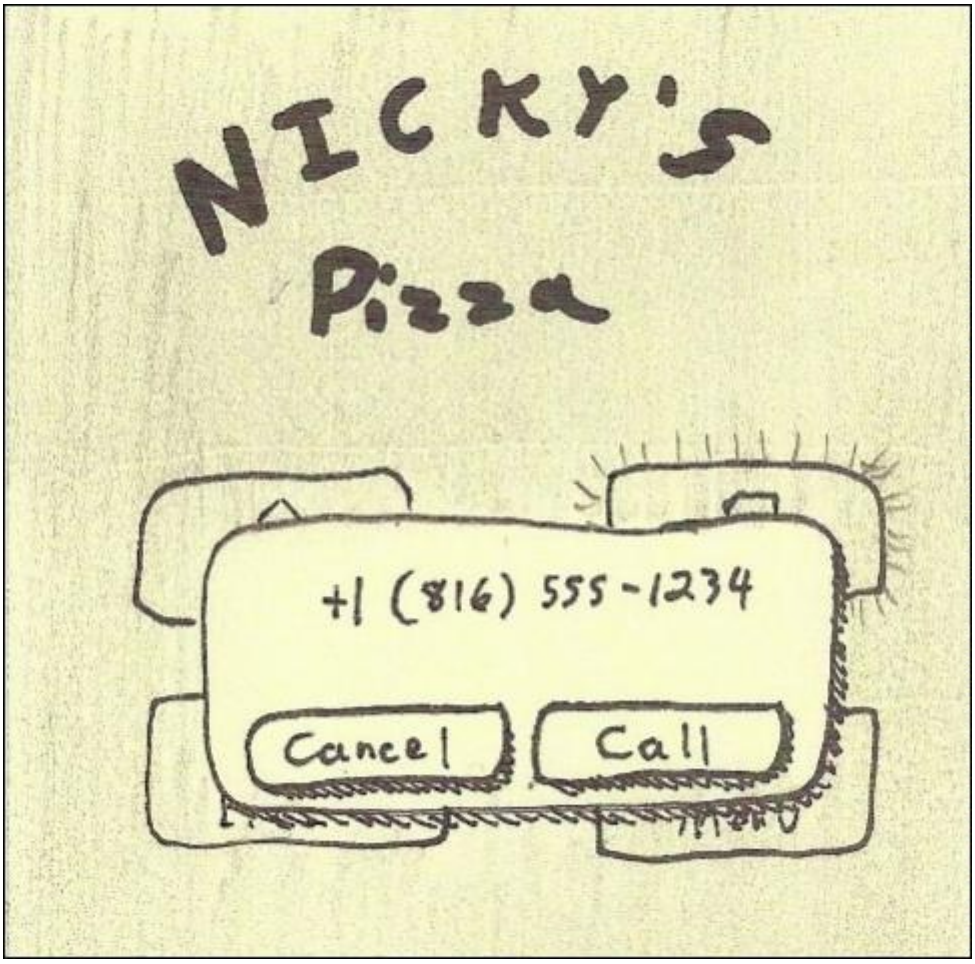
As an added bonus, in case users don't want to go to the physical location, let's throw a telephone link on the button labeled **Call for delivery**.

You can see the different thicknesses of lines. Also, a touch of color and our typical drop shadows. Adding these little details is not particularly hard and can make a big difference:

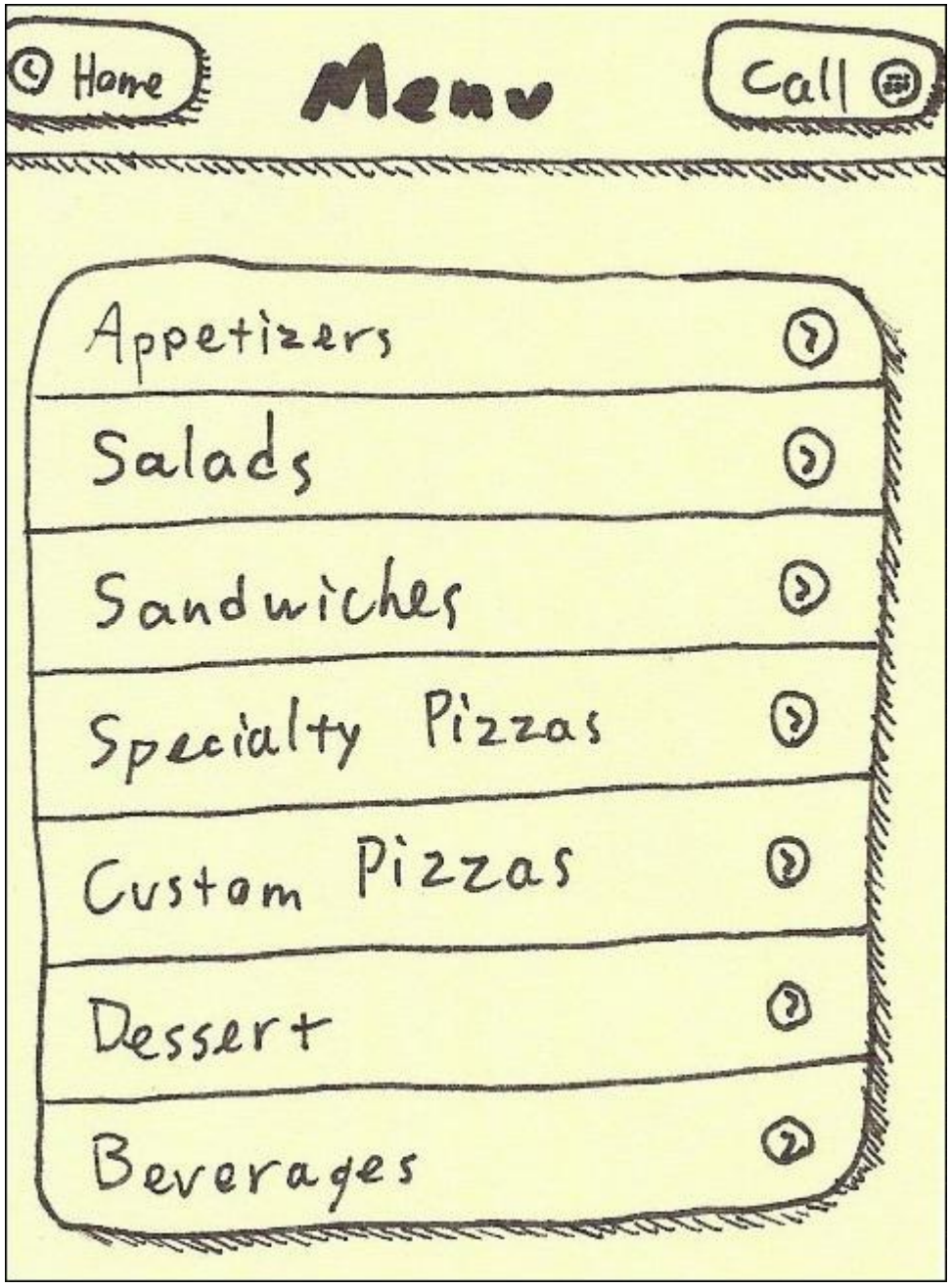


All of the **Call** buttons throughout the site will launch the `native call` interface. The next drawing is of the iOS view of a call dialog. Android is pretty similar.

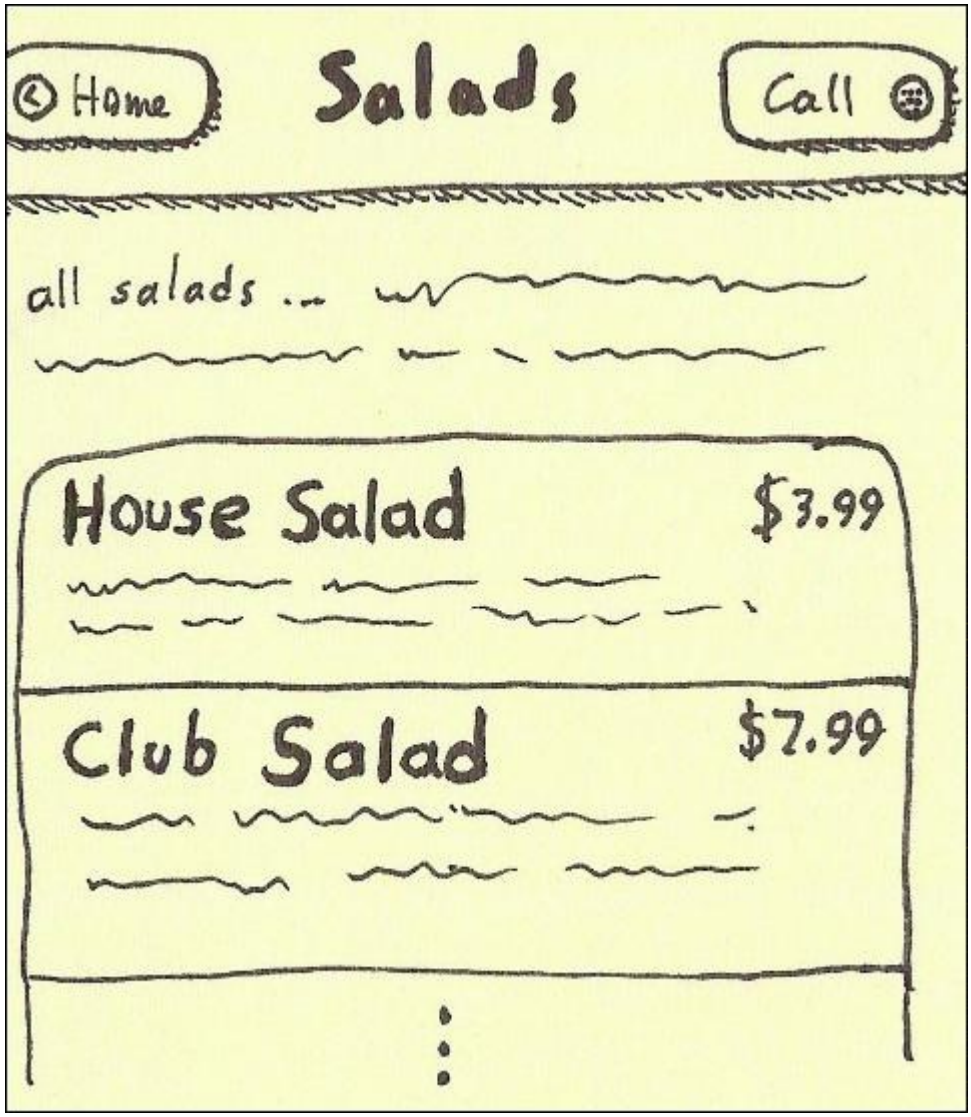
Notice the little shiny lines on the button in the background indicating that it was clicked. Also, we've shaded out the background (pencil work) to indicate its modal status:



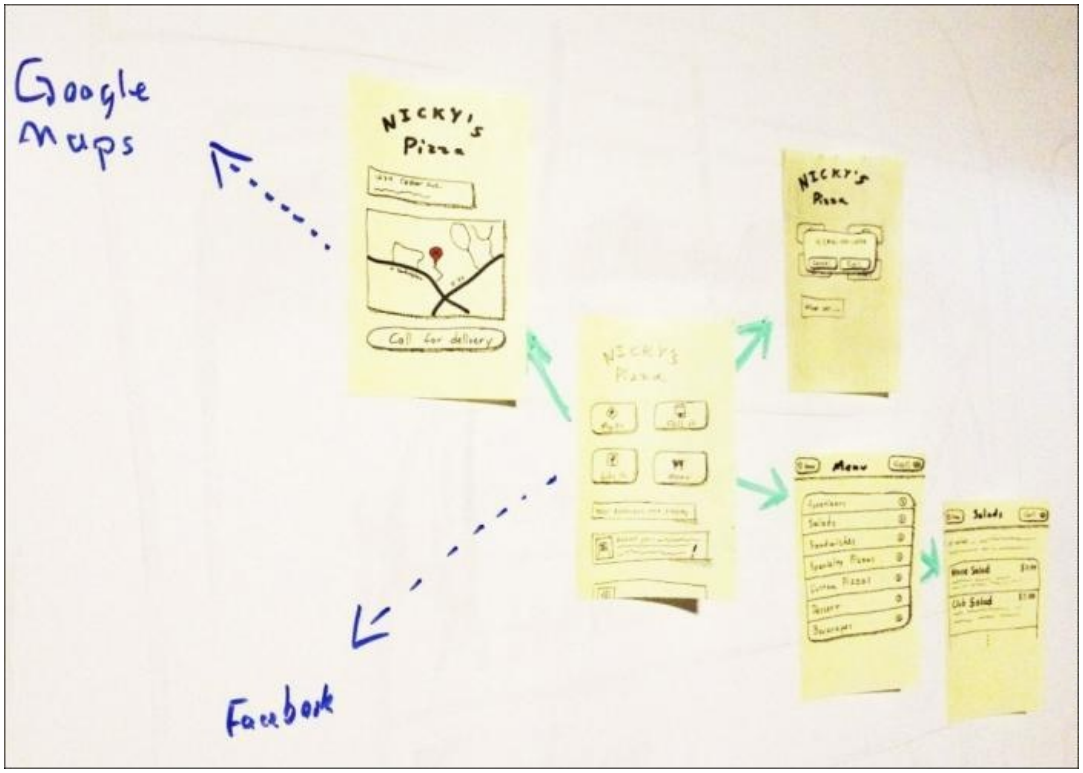
Now, let's consider the menu and what will serve as a global header. The first two links that you put into the global header will be turned into buttons. Let's make our first link **Home** and the second link **Call**.



Here we see the detailed view for salads. It's pretty much the same as before but we've done some formatting within the list views. We'll see the actual code for that in the next chapter.



Naturally, we could use a whiteboard and markers to do all this work. We can collaboratively draw our ideas on the board and take snapshots with the very smartphones we intend to target. My recommendation is to use our faithful Post-it notes and simply stick them to the whiteboard and use the markers to indicate screen flows. The following figure shows how my board looked after mapping out the project:



If we need to remap our application flows, all we have to do is shuffle the notes and redraw our lines. It's a lot less work than redrawing everything a few feet farther down the whiteboard.

Design requirements

Consider what we've laid out so far. Considering the screens we've drawn and the fact that the owner was able to view and sign-off that this is what he wants, how many more questions are there to ask? Do we really need some excel document listing out requirements or a 30-page **Functional Design Specification** (**FDS**) document to tell you exactly what everything is supposed to be and do? Wouldn't this be enough? Does it have to really be done in Photoshop and produced as a slide deck?

Consider also that what we have done so far has cost us a grand total of five Post-it notes, one Sharpie, one pencil, and 20 minutes. I believe the case here has been abundantly made that for most sites, this is all you need and you can do it yourself.

Alternates to paper prototyping

If the speed and simplicity of paper prototyping are not enough to convince you to step away from the keyboard, then consider two other options for rapid prototyping:

- **Balsamiq Mockups** (http://www.balsamiq.com/)
- **Axure RP** (http://www.axure.com/)

I personally recommend Balsamiq Mockups. The prototypes it produces have a uniform but hand-drawn look. This will accomplish the same thing as paper prototyping but with more consistent output and easier collaboration across distributed teams. Both of these tools can produce fully interactive mockups, as well as allow the user to actually click through the prototype. Ultimately, paper prototyping is still faster and anyone can contribute.

Summary

For those of us who have never encountered paper prototyping as a serious discipline, this can feel very weird at first. With any luck, the lessons learned here have expanded your mind and given you a new zeal for crafting a good user experience. If you would like to delve deeper into ideation techniques, the best book I can recommend on the topic is *Gamestorming*, *Dave Gary*. This book is available on the following link:

https://www.goodreads.com/book/show/9364936-gamestorming.

You should now be able to effectively sketch a jQuery Mobile interface for both, your colleagues and customers. In the next chapter, we'll translate what was drawn here into a real jQuery Mobile implementation that goes beyond the normal jQuery Mobile look and feel. Just remember, the user experience and usability come first. Go for quick, focused bursts of intuitive productivity.

Chapter 2. Making a Mom-and-pop Mobile Website

The previous chapter taught us some valuable lessons about paper prototyping and gave us a solid ground to start our development with. Now, we will take those drawings and turn them into an actual **jQuery Mobile** (**jQM**) site that acts responsively and looks unique.

In this chapter, we cover:

- Writing a new jQuery Mobile boilerplate
- A new way of thinking about full site links
- Breaking the boilerplate into a configurable server-side PHP template
- Using alternate icon sets
- Custom fonts
- Performance optimization tips
- Mobile detection and redirection techniques

Writing a new jQuery Mobile boilerplate

The jQuery Mobile docs have a lot of hidden gems. They make a great starting point but there are actually several ways of doing your base template. There is the single page template, the multipage template, templates with global configuration, and dynamically generated pages.

So, let's start out with a new jQM single-page boilerplate based on the original single-page template (http://view.jquerymobile.com/1.4.5/demos/pages/). We will evolve this as we move into other chapters so it becomes an all-encompassing template. Following is the basic directory structure we'll create for this chapter and the files we'll use:



For now, here is the base HTML; let's store it in `template.html`:

```
<!doctype html>
<html>
<head>
    <meta charset="utf-8">
    <meta name="viewport"
content="width=device-
width, initial-scale=1, maximum-scale=1.0,
user-scalable=no">
    <link rel="stylesheet"
href="css/jquery.mobile-1.4.5.css" />
```

```
    <link rel="stylesheet"
href="css/custom.css" />
    <script src="js/jquery-1.10.2.js"></script>
    <script
src="js/jquery.mobile-1.4.5.js"></script>
    <title>Boilerplate</title>
</head>
<body>
    <div data-role="page">
        <div data-role="header">
            <h1>Boilerplate</h1>
        </div>
        <div role="main" class="ui-content">
            <p>Page Body content</p>
        </div>
        <div data-role="footer">
            <h4>Footer content</h4>
        </div>
        <a href="{dynamic location}"
class="fullSiteLink" View Full Site</a>
    </div>
</body>
</html>
```

Tip

Downloading the example code

You can download the example code files from your account at http://www.packtpub.com for all the Packt Publishing books you have purchased. If you purchased this book elsewhere, you can visit http://www.packtpub.com/support and register to have the files e-mailed directly to you.

Meta viewport differences

The `meta` viewport tag is what really makes mobiles, well, mobile! Without it, mobile browsers will assume that it is a desktop site and everything will be small and will require pinch-and-zoom:

```
<meta name="viewport"
content="width=device-
width, initial-scale=1, maximum-scale=1.0,
user-scalable=no">
```

This `meta` viewport tag actually prevents pinch-and-zoom actions. Why? It does this because modern smart phones are now used by more than just the technical elite. I've seen people accidentally zoom in, while just trying to tap a link; and they had no idea what they had done, or how to get out of it. Regardless, if you use jQuery Mobile, your users have no need of zooming anyway.

We will need custom styles. There's no way around it. Even if we use the jQuery Mobile ThemeRoller (http://jquerymobile.com/themeroller/), there's always something that needs overriding. This is where you put it:

```
<link rel="stylesheet" href="css/custom.css" />
<script src="js/custom-scripting.js"></script>
```

Originally mentioned under the section regarding global configuration (http://api.jquerymobile.com/global-config/), this is where you put your global overrides, as well as any scripts you may want to run, or have available universally:

```
<a href="{dynamic location}"
class="fullSiteLink">View Full Site</a>
```

Most mobile websites follow the best practice of including a link to the full site. It's usually in the footer and it usually links to the homepage of the full site. OK, great! The job is done, right? Wrong! The best practice would be better labeled as the industry standard, because there is a better way.

Full-site links beyond the industry standard

The industry standard of simply including a full-site link fails to support the user's mental state. When a user navigates around on the mobile site, they're giving a pretty clear indication of what they want to look at. Supporting the user's mental model, as they transition from mobile to full site, is more tedious, but crafting a good user experience always is.

Picture this. Sally is looking around on our mobile site because she wants to buy from us. She has actually taken time to surf down or search for the product she wants to see. However, due to the constraints of mobile, we made a few conscious choices to not put all the information there. We only included the high points that market research showed people really cared about. At this point, she might be a little bit frustrated as she taps on the full-site link to try to get more information. The full-site link was coded the traditional (lazy) way and took her to the root of the full site where she now has to find the product again. Now, she has to do this using pinch-and-zoom, which only adds to the aggravation level. Unless Sally is desperately interested, what's the chance she'd continue looking on her mobile, and what's the chance she'd come back to the site from a desktop browser after such a miserable experience?

Instead, picture that same mobile product page having been thoughtfully crafted to point the full-site link at the product page desktop view. This is exactly what we did at my place of employment. Every mobile page was explicitly mapped to its desktop equivalent. The seamless transition was taken to user testing with actual customers and was met with a mix of 50 percent ambivalence, and 50 percent delight. There was certainly surprise on the users' side because it did violate their expectations, but there was not a single negative reaction. If this does not successfully argue the case for rethinking the way full-site links are traditionally approached, I don't know what does. Preserve the user's mental model. Preserve the contextual relevance.

If the evidence from the user tests does not convince any who doubt, give them a dose of the following philosophy:

- **Consistency**: This approach is consistent within itself. Every full-site link maps to that page on the full site.
- **Best practices**: A practice is only best until a new practice comes along that is better. If they would rather keep the old best practices, then perhaps they should sell their car, and get a horse and buggy.
- **Industry standards**: Industry standards are the crutch upon which the rest of the world tries to hobble along, while trying not to fall too far

behind the innovators. Good is often the enemy of great. Don't settle for it.

- **Violating user's expectations**: If we tell our users that we're going to send them a free MP3 player, and we send them a 128 GB iPad 4, have we violated their expectations? Yep! Think they'll mind? Some expectations are worth violating.

Let's consider the flip side. What if the user really did want to go to the desktop version's starting page? Well, they're only one step away, because all they have to do now is hit the home button. So, in all likelihood, we will have saved the user several steps of navigation and, at worst, cost them one extra step to get back to the beginning.

It's the little details that take a product from good to great. This is certainly a little detail, but I challenge you to spend the extra 30 seconds per page to do this part of the job right.

The global JavaScript

Thanks to the AJAX navigation and progressive enhancement inherent in jQuery Mobile, there are a lot of different and extra events. Let's consider the three unique jQuery Mobile events I've found most useful. We're not going to immediately use them, just be aware of them and be sure to read the comments. Follow along by opening `/js/global.js` and reading the following script:

```
$(document).on('pagecreate',
'div[data-role="page"]', function(event){
/* Triggered when the page has been created in
the DOM (via ajax or other) and after all widgets
have had an opportunity to enhance the contained
markup. */
});

$(document).on('pagecontainerbeforeshow',
'div[data-role="page"]', function(event){
/* Triggered before the actual transition
animation is kicked off. */
});

$(document).on('pagecontainershow',
'div[data-role="page"]', function(event){
/* Triggered after the transition animation has
completed. */
});
```

The global CSS

If this is your first exposure to responsive web design, you'll notice that most of your custom styles will be in the default section. The other sections are for overriding your default styles to tweak for other device widths and resolutions. The `Horizontal Tweaks` section is for overriding styles for landscape orientation. The `iPad` section is geared for tablet resolutions between the `768px` parameter and the `1024px` parameter. In the `HD` and `Retina Tweaks` section, you will most likely be only overriding background image styles to substitute higher resolution graphics. We'll soon see examples of these in action, and put what we use into `/css/custom.css`. In the mean time, just look at the following structures:

```
/* CSS Document */
/* Default Styles   -------------*/


/* Horizontal Tweaks   ----------*/
@media all and (min-width: 480px){

}
/* HD and Retina Tweaks ---------*/
@media only screen and
(-webkit-min-device-pixel-ratio: 1.2),
only screen and (min--moz-device-pixel-ratio:
1.2),
only screen and (min-resolution: 240dpi) {

}

/* iPad ----------------*/
@media only screen and (min-device-width: 768px)
and (max-device-width: 1024px) {

}
```

Breaking the HTML into a server-side template

Normally, I'm a Java guy, but I've chosen **Hypertext Preprocessor** (**PHP**) due to the prevalence of the **Linux, Apache, MySQL, PHP** (**LAMP**) platform. All we're really doing here is using variables and Server Side Includes to give our templates consistency and flexibility.

Let's break down the initial HTML into a nice PHP boilerplate. If you want to save this to a file for now, may I suggest the `/boilerplate.php` file:

```
<?php
    /* the document title in the <head> */
    $documentTitle = "jQuery Mobile PHP
Boilerplate";

    /* Left link of the header bar
     *
     * NOTE: If you set $headerLeftLinkText =
'Back' then it will become a
       back button, in which case, no other field
for $headerLeft need be defined.
     */
    $headerLeftHref = "/";
    $headerLeftLinkText = "Home";
    $headerLeftIcon = "home";

    /* The title text which shows up in the
header bar */
    $headerTitle = "Boilerplate";

    /* Right link of the header bar */
    $headerRightHref = "tel:8165557438";
    $headerRightLinkText = "Call";
    $headerRightIcon = "grid";

    /* The href to the full-site link */
    $fullSiteLinkHref = "/";
?>
<!doctype html>
<html>
  <head>
    <?php include "includes/meta.php" ?>
  </head>
  <body>
    <div data-role="page">

      <?php include "includes/header.php" ?>

      <div role="main" class="ui-content">
```

```
            <p>Page Body content</p>
          </div>

          <?php include "includes/footer.php" ?>
        </div>
      </body>
    </html>
```

Now we'll extract most of the header and put it into the `/includes/meta.php` file:

```
<meta charset="utf-8">
<meta name="viewport"
content="width=device-
width, initial-scale=1, maximum-scale=1.0,
user-scalable=no">
<link
href='http://fonts.googleapis.com/css?
family=Ubuntu
+Condensed' rel='stylesheet' type='text/css'>
<link
href='http://fonts.googleapis.com/css?
family=Marvel' rel='stylesheet' type='text/css'>
<link
href='http://fonts.googleapis.com/css?
family=Marvel|Delius
+Unicase' rel='stylesheet' type='text/css'>
<link rel="stylesheet"
href="css/jquery.mobile-1.4.5.css" />
<link rel="stylesheet" href="css/custom.css" />
<script src="js/jquery-1.10.2.js"></script>
<!-- from
https://raw.github.com/carhartl/jquery-
cookie/master/jquery.cookie.js-->
<script src="js/jquery.cookie.js"></script>
<script src="js/global.js"></script>
<script src="js/jquery.mobile-1.4.5.js"></script>
<title><?=$documentTitle?></title>
```

Note

Have a look at the cookies plugin in JavaScript / `jquery.cookie.js`. You'll want to download this from https://github.com/carhartl/jquery-cookie. We'll use it later in mobile detection.

Now, let's take the page header, make it dynamic, and drop the contents into the `/includes/header.php` file, as shown here:

```
<div data-role="header">
```

```
    <?php if(strtoupper ($headerLeftLinkText) ==
"BACK"){?>
        <a data-icon="arrow-l"
href="javascript://"
data-rel="back"><?=$headerLeftLinkText?></a>
    <?php } else if($headerLeftHref != ""){ ?>
        <a <?php if($headerLeftIcon != ""){ ?>
               data-icon="<?=$headerLeftIcon ?>"
           <? } ?>

 href="<?=$headerLeftHref?>"><?=
$headerLeftLinkText?></a>
    <?php } ?>
    <h1><?=$headerTitle ?></h1>
    <?php if($headerRightHref != ""){ ?>
        <a <?php if($headerRightIcon != ""){ ?>
               data-icon="<?=$headerRightIcon ?>"
data-iconpos="right"
           <? } ?>

 href="<?=$headerRightHref?>"><?=
$headerRightLinkText?></a>
    <?php } ?>
</div><!-- /header -->
```

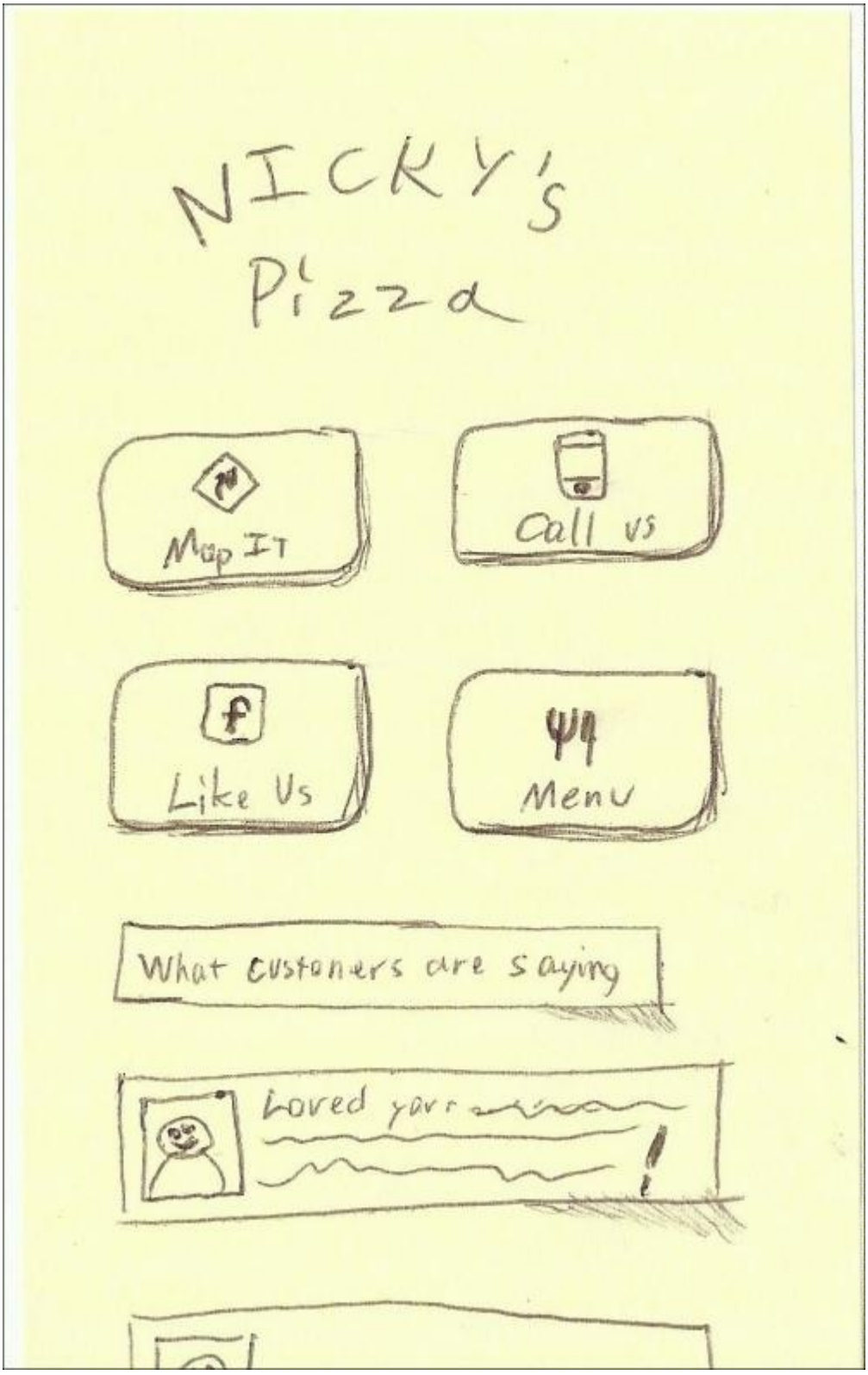
Next, let's take the footer content and extract it into the `/includes/footer.php` file, as shown in the following code:

```
<div data-role="footer">
    <h4>Call Us: <a href="+18167816500">(816)
781-6500</a></h4>
</div><!-- /footer -->
<p class="fullSite">
    <a class="fullSiteLink" rel="external"
href="<?=$fullSiteLinkHref?>">View Full Site</a>
</p>
```

The header and footer PHP files are set-and-forget files. All we have to do is fill in a few variables on the main page and the `meta.php`, `header.php`, and `footer.php` files will take care of the rest. The `headers.php` file is coded such that, if your `$headerLeftLinkText` tag is set to the `Back` word regardless of casing, it will turn the left side button of the header into a **Back** button.

What we need to create our site

We have a viable boilerplate. We have a customer. Let's get to work and code what we drew in Chapter 1, *Prototyping jQuery Mobile*. For this chapter, we'll stick to just the home screen to learn the core concepts:



Here's what we need to think about:

- **Logo**: We'll simply include the logo from the desktop view.
- **Buttons**: There are several ways we could accomplish this. At first glance, we might think about using standard `data-role="button"` links. We could leverage a ui-grid

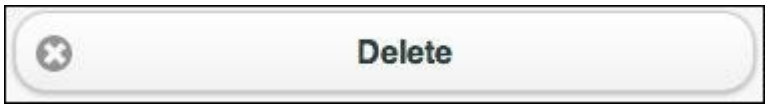
(http://demos.jquerymobile.com/1.4.5/grids/) to add the formatting. If we were only intending to optimize for phones held vertically, this would be a great approach. However, we're going to think outside the box here and create a responsive menu that will react well at different resolutions.

- **Icons**: These are not standard jQuery Mobile icons. There are countless icon sets online that we could use, but let's go with Glyphish (http://glyphish.com/). They make high quality icons that include multiple sizes, retina display optimizations, and the original Adobe Illustrator files just in case you want to tweak them. It's an excellent value.
- **Customer testimonials**: This looks like it would be perfectly suited to a list-view, with images. We'll pull this content from their Facebook page.

Getting Glyphish and defining custom icons

Glyphish has a license that allows for free use with attribution. The free set (http://www.glyphish.com/download/) has only one size and 200 icons, the Pro set has multiple sizes, 400 icons, and an unlimited license. (For only $25 dollars, that's a no-brainer.)

Creating a button with an icon is simple:



Adding the `data-icon` attribute will yield a button as shown in the preceding figure:

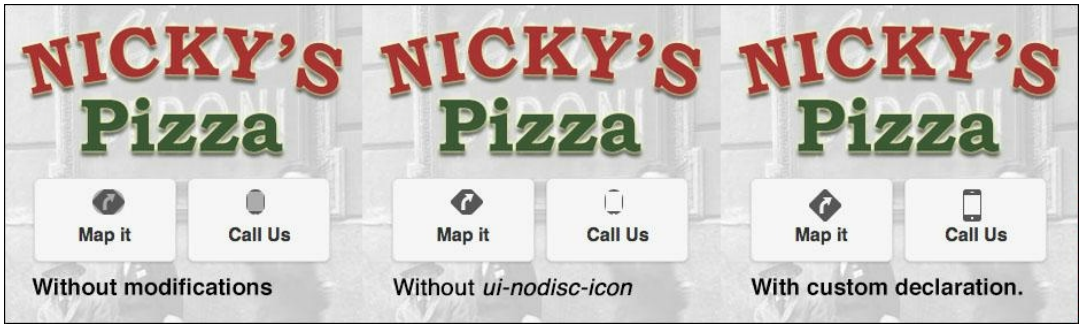
```
<a href="index.html" data-role="button"
data-icon="delete">Delete</a>
```

Whatever you insert as the value for the `data-icon` attribute will become a class name on the button. If you have an attribute of `data-icon="directions"`, then the class that is applied by jQM is `ui-icon-directions`. Naturally, you'll need to craft this in your own custom **Cascading Style Sheets** (**CSS**) file as shown in the following code (we'll put this, and others like it, into the `css/custom.css` file):

```
.ui-icon-directions{
    background-image:
    url(../icons/icons-gray/113-navigation.png);

    height:28px;
    width:28px;
    background-size:28px 28px;
    margin-left: -14px !important;
}
```

We'll need to get rid of the colored disk around the typical icons. jQuery Mobile has an optional class which takes care of this for you. Add the `ui-nodisc-icon` class to each link to remove the colored background.

jQuery Mobile masks icons with a circular border. This works well for smaller icons, but for larger ones, we'll need to remove the mask. To do this, we'll add a `glyphishIcon` class to each link we want to customize, in this fashion:



We'll also need to add this definition to our `custom.css` file:

```
.glyphishIcon:after {
    height: 28px;
    -moz-border-radius: 0px;
    -webkit-border-radius: 0px;
    border-radius: 0px;
}
```

In the end, our code for the four buttons on the front page would look as follows:

```
        <div class="homeMenu">
            <a class="glyphishIcon
ui-nodisc-
icon" data-role="button" data-icon="directions"
data-
inline="true" data-iconpos="top"
href="http://maps.google.com/maps?q=9771+N+Cedar
+Ave,+Kansas
+City, +MO+64157&hl=en&sll=39.20525,-
94.526954&sspn=0.014499,0.033002&hnear=9771+N
+Cedar+Ave,+Kansas
+Ci ty,+Missouri+64157&t=m&z=17&iwloc=A">Map
it</a>
            <a class="glyphishIcon
ui-nodisc-icon" data-
role="button" data-icon="iphone"
data-
inline="true" data-iconpos="top"
href="tel:+18167816500">Call Us</a>
            <a class="glyphishIcon
ui-nodisc-
icon" data-role="button" data-icon="facebook"
data-
inline="true" data-iconpos="top"
href="https://touch.facebook.com/nickyspizzanickyspizza">Like
Us</a>
            <a class="glyphishIcon
ui-nodisc-
icon" data-role="button" data-icon="utensils"
data-
```

```
        inline="true" data-iconpos="top" rel="external"
        href="menu.php">Menu</a>
                </div>
```

It would be rendered on the screen, as shown in the following screenshot:



Linking to phones, e-mails, and maps

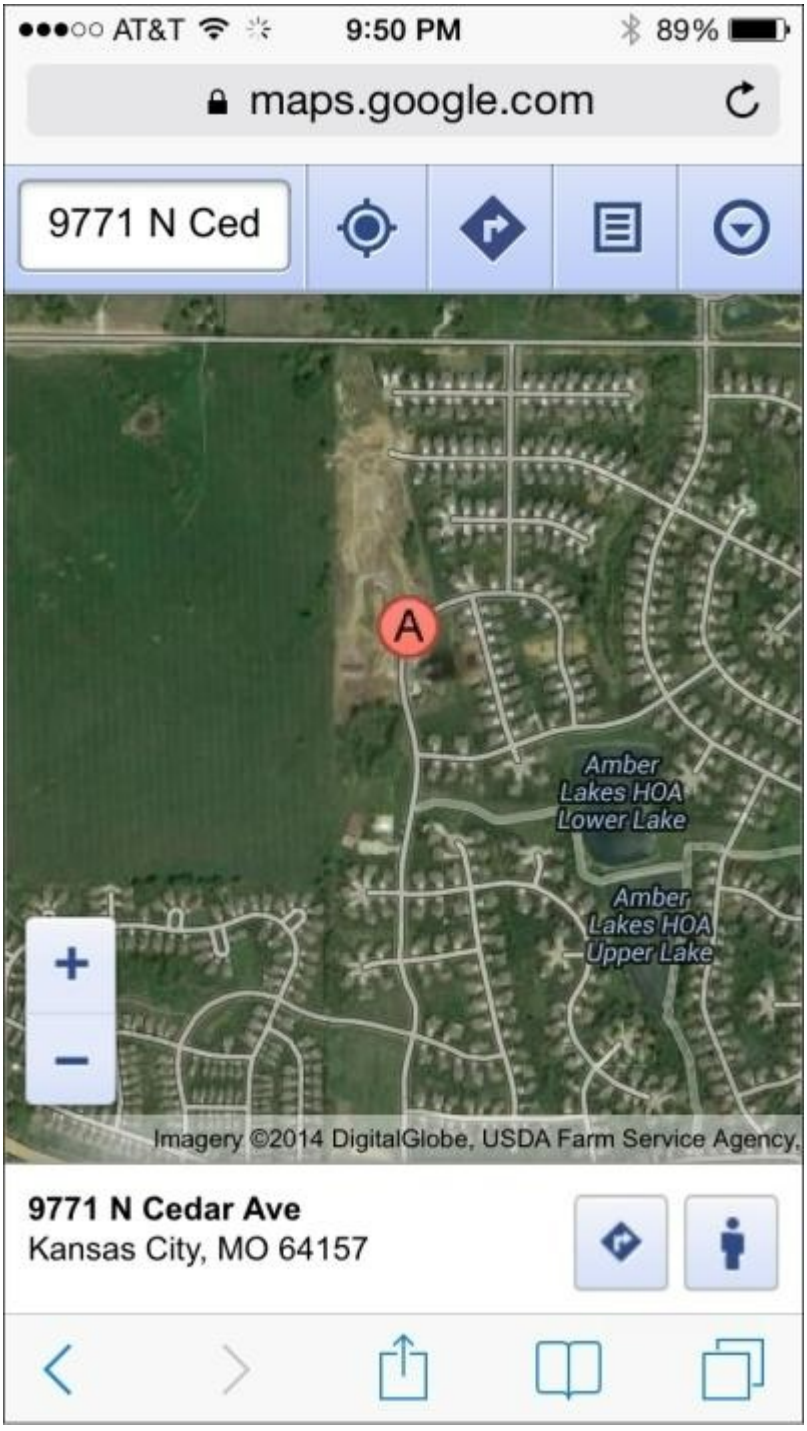
Mobile browsers have a distinct usability advantage. If we want to link to an e-mail address, the native e-mail client will instantly pop up. The following code is an example:

```
<a href="mailto:shane@roughlybrilliant.com">email
me</a>
```

We can do the same thing with phone numbers and every device will instantly pop up an option to call that number. This is the functionality unmatched on desktops, since most do not have telephony. Here is the `href` element from the preceding code:

```
href="tel:+18167816500"
```

Maps are another specialty in mobile, since virtually, all smart phones have built-in GPS software. Link to Google Maps, and the users will be shown the web view and prompted to open it in Google Maps for iOS, as shown in the following screenshot:



Here's the `href` attribute for the maps link which is just a standard link to Google Maps:

```
href="https://maps.google.com/maps?q=9771+N+Cedar
+Ave,+Kansas+City ,+MO+64157"
```

In iOS and Android, the OS will intercept that click and will bring up the location in the native maps app. For platforms other than iOS and Android, the user will simply be taken to the Google Maps site. This is good because

Google has done an amazing job of making the site usable on any device, including non-smart phones.

Of course, we could leave it at this and call it good enough, but we could do a little more work to give the Apple users a better experience by sending them to the native Apple Maps application. This code will create an object with configurable properties for configuration and future adaptations. It works by version sniffing to see if the major version of the OS is greater than five. If so, it will assimilate the Google Maps links.

There are two ways these links can be converted. First, it will look for an attribute of `data-appleMapsUrl` on the hyperlink and use it. If that is not present on the link, it will check the `forceAppleMapsConversionIfNoAlt` configuration option to see if you have configured the switcher object to convert the Google Maps link directly.

Once the system realizes that this phone needs switching, it stores that fact into the `localStorage` attribute so it won't have to do the work of version checking again. It will simply check the value in the `localStorage` attribute for `true` value.

Following is the code which is located in the `/js/global.js` file:

```
var conditionalAppleMapsSwitcher = {
  appleMapsAltAttribute:"data-appleMapsUrl",
  forceAppleMapsConversionIfNoAlt:true,
  iPhoneAgent:"iPhone OS ",
  iPadAgent:"iPad; CPU OS ",
  process: function(){
    try{
      var agent = navigator.userAgent;
      if(window.localStorage &&
localStorage.getItem("replaceWithAppleMaps")){

 if(localStorage.getItem("replaceWithAppleMaps")
== "true"){
          this.assimilateMapLinks();
        }
      }else{
        var iOSAgent = null;
        if(agent.indexOf(this.iPhoneAgent) > 0){
          iOSAgent = this.iPhoneAgent
        }
        else if(agent.indexOf(this.iPadAgent) >
0){
          iOSAgent = this.iPadAgent
        }
        if(iOSAgent){
          var endOfAgentStringIndex =
(agent.indexOf(iOSAgent)+iOSAgent.length);
```

```
          var version =
agent.substr(endOfAgentStringIndex,
agent.indexOf(" " , endOfAgentStringIndex));
          var majorVersion =
Number(version.substr(0, version.indexOf("_")));
          if(majorVersion > 5){

 localStorage.setItem("replaceWithAppleMaps",
"true");
            this.assimilateMapLinks();
          }
        }
      }
    }catch(e){}
  },
  assimilateMapLinks:function(){
    try{
      var switcher = this;

 $("a[href^='http://maps.google.com']").each(function(index,
element) {
        var $link = $(element);

 if($link.attr(switcher.appleMapsAltAttribute)){
          $link.attr("href",
$link.attr(switcher.appleMapsAltAttribute));
        }else
if(switcher.forceAppleMapsConversionIfNoAlt){
          $link.attr("href",
$link.attr("href").replace(/maps\.google\.com
\/maps/,"maps.apple.com/"));
        }
      });
    }catch(e){}
  }
}
```

With this code, it is now very easy to simply call it on the `pagecreate` attribute from our `/js/global.js` file:

```
$(document).on("pagecreate", function(){
    conditionalAppleMapsSwitcher.process();

});
```

This approach is completely seamless to the user. No matter what system they are on, they will have a frictionless experience in trying to reach your client's business.

Custom fonts

Custom fonts are present on their full site (and, thus, part of their branding). These fonts will work just as well on mobile. Platforms like iOS, Android, and the latest BlackBerry fully support **@font-face** CSS. Older editions of BlackBerry and Windows Phone may or may not support @font-face depending on the model that users have. For anyone that does not support @font-face, they will simply be presented with standard web fonts as you specify in the font-family rule. There are many different web font providers. A few are mentioned as follows:

- Google Web Fonts (http://www.google.com/webfonts/)
- TypeKit (https://typekit.com/)
- Font Squirrel (http://www.fontsquirrel.com/)
- Fonts.com web fonts (http://www.fonts.com/web-fonts)

For our project, we're going to use Google Web Fonts. We'll need to include these lines in the `<head>` tag of every page that we want to use them in. Since we'll probably be using them everywhere, let's just include these lines in our `/includes/meta.php` file.

```
<link
href='http://fonts.googleapis.com/css?
family=Marvel' rel='stylesheet' type='text/css'>
```

Once we have linked our fonts in the `<head>` tag, we'll need to specify their usage in a font-family rule within our `/css/custom.css` file as follows:

```
h1, h2, h3, .cardo { font-family: Marvel,
sans-serif; }
```

Now, for any browser (which is most these days) that supports it, they'll see something as follows:

Note

A word of caution: Web fonts are not exactly lightweight. Marvel weighs in at 20 KB. Not huge, but not small. You would not want to include too many of these.

Optimization - why you should be thinking of it first

I believe that optimization is important enough for you to know, and be aware of, in the beginning. You are going to do some awesome work and I don't want you or your stakeholders to think it's any less awesome, or slow, or anything else because you didn't know the tricks to squeeze maximum performance out of your systems. It's never too early to impress people with the performance of your creations. Mobile is a very unforgiving environment and some of the tips in this section will make more difference than any of the best coding practices.

From a performance perspective, there is absolutely nothing worse than an HTTP request. That's why CSS sprites are a good idea. Every request we make slows us down because the TCP/IP protocol assumes that each request's available bandwidth starts somewhere near zero. Not only do we have the initial delay in pulling assets from the server, there is also a ramp-up time before that asset is transmitted at full possible speed. **Long Term Evolution** (**LTE**) isn't going to save us from these facts. Sure, their transfer rates are great once they get going, but the lag time it takes to actually begin the process of transfer is what kills us. We also have to consider how often users find themselves with few or no bars of reception. This is especially true in buildings. So here are some tips for optimizing your mobile site:

- The first thing jQuery Mobile developers can do to optimize their site is to create a custom build of jQuery Mobile (http://jquerymobile.com/download-builder/). Beginning a few versions back, the website started allowing developers to create a build that was unique to the needs of the site that was using it. So, remove unneeded event definitions, components, and more; streamline your code from the beginning!

  > **Note**
  >
  > *The custom download option is great, but a little confusing if you're not sure what you need. Thankfully, the builder will manage dependencies for you.*

- Reduce HTTP requests by combining as many assets as possible. Aside from downloading large files, individual HTTP requests are the most expensive thing happening on your site. Group like files together to reduce HTTP requests and speed up perceived and real download times for your users.

- Turn on **gzip** compression on your server. This will shrink your text-based assets (HTML, CSS, JavaScript) by up to 70 percent for transmission. It actually makes more of a difference than minifying your code. There's a pretty good chance that any given server has gzip compression enabled, but you should check. For more on gzip, visit https://developers.google.com/speed/articles/gzip.
- Minify: Minifying is the process by which a perfectly human-readable piece of code is stripped of all the useful whitespace, formatting, and comments. All that is pushed to the browser is the code. Some go so far as actually changing the variable and function names to one or two-letter substitutions. This is a good idea only for longstanding, highly stable codes. Libraries such as jQuery, that have a tendency to be large in the first place will definitely benefit. However, for your own code, it's a good idea to leave it human-readable so you can debug things if you have to. Just try to keep the size of your HTML pages lower than 25 KB (uncompressed) and your JavaScript and CSS files under 1 MB (also uncompressed). A study conducted by Yahoo shows that across all platforms, this seems to be the lowest common denominator that devices will allow to be cached between visits (http://www.yuiblog.com/blog/2010/07/12/mobile-browser-cache-limits-revisited/). Chapter 6, *Automating Your workflow With Grunt* contains information on how to automate the process of minifying your own code.
- Caching and microcaching: If you're on Apache, like most of the rest of the web (http://news.netcraft.com/archives/2012/01/03/january-2012-web-server-survey.html), you can easily set up caching using an `htaccess` file. If you specify a caching time of one month for a type of asset, then browsers will attempt to hold those assets in cache for one month without even checking to see if there is anything new on the server. Be careful here. You don't want to set long cache times for anything you might want to be able to change quickly. However, things like JavaScript libraries and images that don't change, can certainly be cached without any ill effects.

  In order to protect yourself from unnecessary requests, you can use the `htaccess` file caching rules to make pages last for something as small as a minute using code such as the following:

```
# 1 MIN
<filesMatch "\.(html|htm|php)$">
  Header set Cache-Control "max-age=60,
private, proxy-revalidate"
</filesMatch>
```

Note

You can learn more on caching with the `htaccess` file at http://www.askapache.com/htaccess/speed-up-sites-with-htaccess-caching.html.

- Don't use images if it can be done in CSS. The CSS3 standard started back in 1999. The **World Wide Web Consortium** (**W3C**) started working on its first draft for the CSS4 recommendation back in 2009. It's time to move the web forward and leave legacy browsers behind. If someone is using a browser that doesn't support CSS gradients, let them default back to a solid background. If their browser doesn't support rounded corners in CSS, then they'll just have to make do with square corners.

  If a potential client wants you to go beyond the web standards to support ancient technologies, or insists on pixel perfect designs, fire the client or charge them enough extra to make it worth your time. Pixel perfect designs are hard enough on desktops. Mobile is the Wild, Wild West where everybody is implementing their solutions just differently enough that you'll never achieve pixel perfect solutions. Use CSS3 in lieu of images when possible to save on weight and HTTP requests. Most modern smart phones support it now (iOS, Android, BlackBerry 6+, Windows Phone 8+). By 2015 and 2016, virtually, all early smart phones will be replaced.

The final product

We now have all the requirements, knowledge, and assets to make the first page. We'll place this code as the first page by naming it `index.php` file. All images are provided in the source folders for the example.

Following is the final code for `index.php` file:

```
<?php
 $documentTitle = "Nicky's Pizza";

 $headerLeftHref = "/";
 $headerLeftLinkText = "Home";
 $headerLeftIcon = "home";

 $headerTitle = "Boilerplate";

 $headerRightHref = "tel:8165077438";
 $headerRightLinkText = "Call";
 $headerRightIcon = "grid";

 $fullSiteLinkHref = "/";

?>
<!doctype html>
<html>
<head>
 <?php include("includes/meta.php"); ?>
</head>

<body>
<div data-role="page">
    <div role="main" class="ui-content">

     <div class="logoContainer"><img
src="images/LogoMobile.png" alt="Logo"
width="290" style="margin:0" /></div>

        <div class="homeMenu">
            <a class="glyphishIcon
ui-nodisc-
icon"
href="http://maps.google.com/maps?q=9771+N+Cedar
+Ave,+Kansas+City,+MO+64157&hl=en&sll=39.20525,-
94.526954&sspn=0.014499,0.033002&hnear=9771+N
+Cedar+Ave,+Kansas+City,+Missouri
+64157&t=m&z=17&iwloc=A" data-role="button"
data-
icon="directions" data-inline="true"
data-iconpos="top">Map it</a>
            <a class="glyphishIcon
ui-nodisc-
```

```
icon" href="tel:+18167816500" data-role="button"
data-
inline="true" data-icon="iphone"
data-iconpos="top">Call Us</a>
            <a class="glyphishIcon
ui-nodisc-
icon"
href="https://touch.facebook.com/nickyspizzanickyspizza"
data-
role="button" data-icon="facebook"
data-iconpos="top" data-inline="true">Like Us</a>
            <a class="glyphishIcon
ui-nodisc-
icon" href="menu.php" data-role="button"
data-
inline="true" rel="external" data-icon="utensils"
data-iconpos="top">Menu</a>
        </div>

        <h3>What customers are saying:</h3>
        <div class="testimonials">
            <ul class="curl">
                <li><img class="facebook"
src="images/fb2.jpg" alt="facebook photo"
width="60" height="60" align="left" />I recommend
the Italian Sausage Sandwich. Awesome!! Will be
back soon!</li>
                <li><img class="facebook"
src="images/fb0.jpg" alt="facebook photo"
width="60" height="60" align="left" />LOVED your
veggie pizza Friday night and the kids devoured
the cheese with jalapenos!!! salad was fresh and
yummy with your house dressing!!</li>
                <li><img class="facebook"
src="images/fb1.jpg" alt="facebook photo"
width="60" height="60" align="left" />The Clarkes
love Nicky's pizza! So happy you are here in
liberty.</li>
            </ul>
        </div>

    </div>

    <?php include("includes/footer.php"); ?>
</div>

</body>
</html>
```

The custom CSS

This code from the `/css/custom.css` file houses everything we've done to customize our look and feel. It includes the definitions for the custom icons and custom fonts. Any images referenced were provided by the client and are provided in the final source.

Pay particular attention to the comments here because I have spelled out each section's purpose and how it plays into a responsive web design:

```
@charset "UTF-8";

h1,h2,h3,.cardo{font-family: Marvel, sans-serif;}
.logoContainer{font-
family: Marvel, sans-serif;
text-align:center;margin:auto}
.makersMark{margin:1.5em auto;font-family:
Marvel, sans-serif; text-align:center;}
.testimonials{ margin:0 auto;}
.ui-content{ background-
image:url(../images/cropfade.jpg);
background-repeat:no-
repeat; background-size: 100%;}
.ui-li-desc{white-space:normal;}
.price{font-
weight:bold; float:right; padding-left:10px;}
.homeMenu{ text-align:center;}
.homeMenu .ui-btn{ min-width:120px;  margin:.5em;}

.glyphishIcon:after {
    height: 28px;
    -moz-border-radius: 0px;
    -webkit-border-radius: 0px;
    border-radius: 0px;
}
.ui-icon-directions:after {
  background-image:
url(../icons/icons-gray/113-navigation.png);
  width: 28px;
  background-size: 28px 28px;
}
.ui-icon-iphone:after {
  background-image:
url(../icons/icons-gray/32-iphone.png);
  width: 16px;
  background-size: 16px 28px;
}
.ui-icon-facebook:after {
  background-image:
url(../icons/icons-gray/208-facebook.png);
  width: 22px;
  background-size: 22px 22px;
```

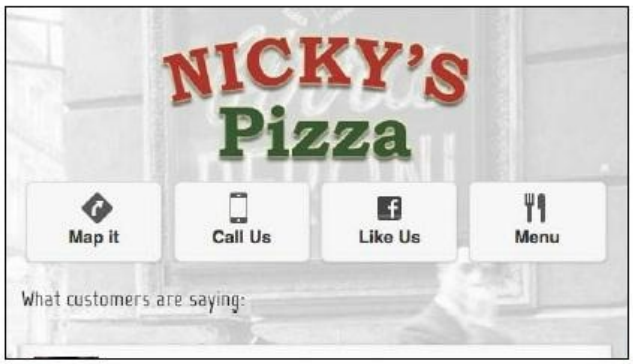
```
}
.ui-icon-utensils:after {
  background-image:
url(../icons/icons-gray/48-fork-and-knife.png);
  width: 18px;
  background-size: 18px 26px;
}

/* customer comments CSS */
  ul.curl {
    position: relative;
    z-index: 1;
    list-style: none;
    margin: 0;
    padding: 0;
  }

  ul.curl li {
    position: relative;
    float: left;
    padding: 10px;
    border: 1px solid #efefef;
    margin: 10px 0;
    background: #fff;
    -webkit-box-shadow: 0 1px 4px rgba(0, 0, 0,
0.27), 0 0 40px rgba(0, 0, 0, 0.06) inset;
    -moz-box-shadow: 0 1px 4px rgba(0, 0, 0,
0.27), 0 0 40px rgba(0, 0, 0, 0.06) inset;
    box-shadow: 0 1px 4px rgba(0, 0, 0, 0.27), 0
0 40px rgba(0, 0, 0, 0.06) inset;
    text-align:left;
  }

  ul.curl li:after {
    left: auto;
    right: 10px;
    -webkit-transform: skew(15deg) rotate(6deg);
    -moz-transform: skew(15deg) rotate(6deg);
    -ms-transform: skew(15deg) rotate(6deg);
    -o-transform: skew(15deg) rotate(6deg);
    transform: skew(15deg) rotate(6deg);
  }
/* end customer comments CSS */

li img.facebook{padding:0 10px 10px 0;}
.fullSite{ text-align:center; }
.copyright{ text-
align:center; font-family: Marvel, sans-serif;
margin-top:2em; }


/* Horizontal ----------*/
@media all and (min-width: 480px){
  .homeMenu .ui-btn{ min-width:100px;
margin:.2em;}
```

```
}

@media only screen and
(-webkit-min-device-pixel-ratio: 1.5),
   only screen and (min--moz-device-pixel-ratio:
1.5),
   only screen and (min-resolution: 240dpi) {
  .ui-icon-directions{
    background-image:
url(../icons/icons-gray/113-navigation@2x.png);
  }
  .ui-icon-iphone{
    background-image:
url(../icons/icons-gray/32-iphone@2x.png);
  }
  .ui-icon-facebook{
    background-image:
url(../icons/icons-gray/208-facebook@2x.png);
  }
  .ui-icon-utensils{
    background-image:
url(../icons/icons-gray/48-fork-and-knife@2x.png);
  }
}

/* iPad -----------------*/
@media only screen and (min-device-width: 768px)
and (max-device-width: 1024px) {
    .homeMenu .ui-btn{ min-width:120px;
margin:.7em;}
}
```

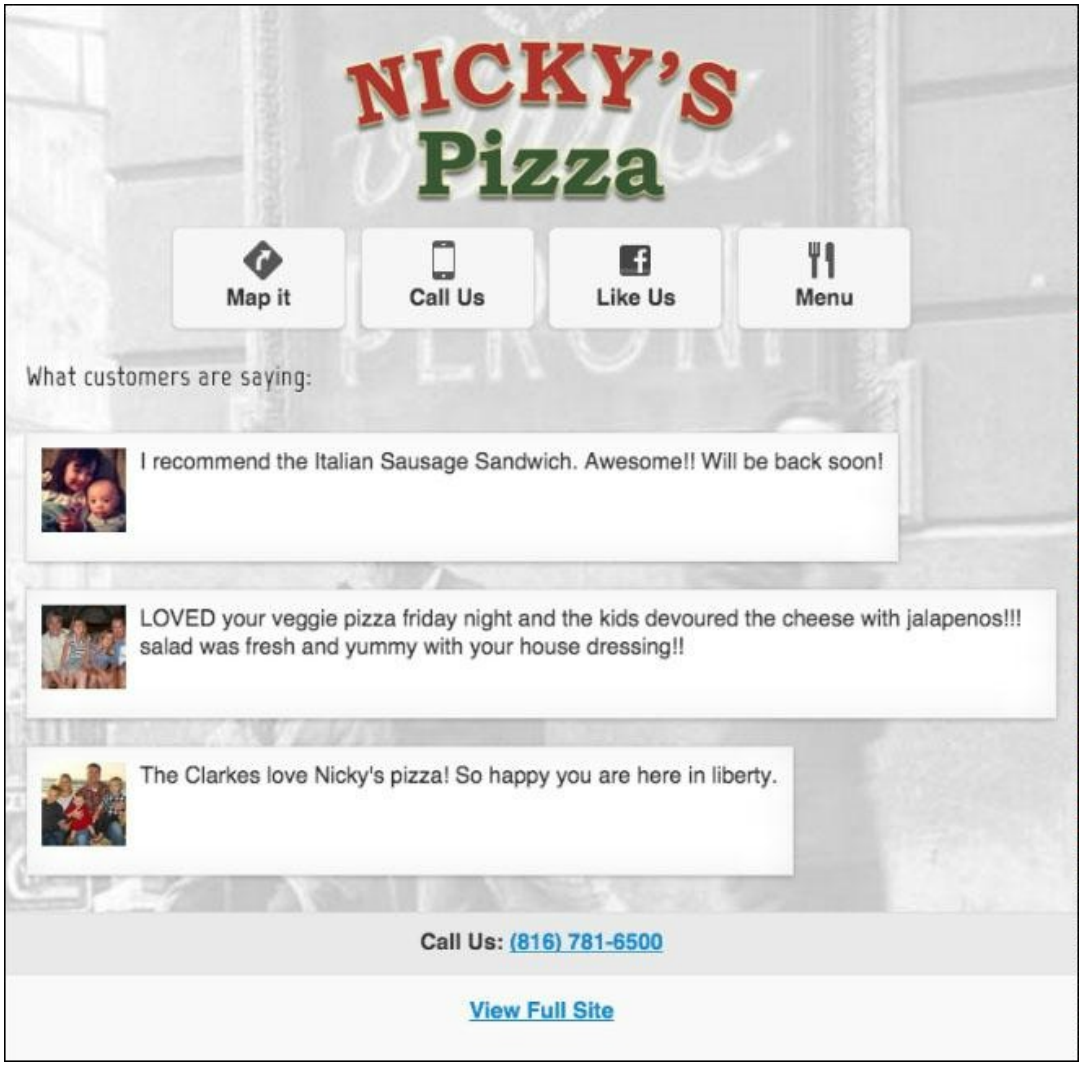
The resulting first page

Let's have a look at the final product of our work. On the left side, we have the rendered page in portrait view; and on the right, we have the landscape view:





It is important to test your designs in both orientations. It can be rather embarrassing when someone comes along later and breaks your work by doing nothing more than turning their phone.



This is how it looks on the iPad. There is some matter of debate in the industry as to whether or not the iPad counts as mobile, since it has enough resolution and a large enough screen to view normal desktop sites, especially if viewed in landscape mode. People who advocate the desktop view are forgetting a very important fact. The iPad and all the other tablets, such as Kindle Fire, Nook Color, and Google Nexus devices, are still touch interfaces. While full sites are still perfectly readable, interaction points may still be tiny targets. If it's a touch interface, your customer will be better served by jQuery Mobile.

Getting the user to our mobile site

Now that we've got this great start to a mobile site, how does the user get there? `yourdomain.mobi?` `m.yourdomain.com?` The truth is, users don't go to mobile sites. They typically do one of two things; Google the site, or enter in the primary domain into the address bar, the same behavior they use on desktop sites. So, it falls on us to properly detect a mobile user and give them the appropriate interface.

There is much debate in the industry as to how this should be done. Most experts seem to agree that you do not want to get into the business of detecting specific platforms, a practice known as user-agent sniffing. At first, it doesn't seem such a bad idea. After all, there are only four major platforms, namely: iOS, Android, Windows Phone, and BlackBerry. Even still, this approach can quickly become a nightmare as new platforms are developed in the future or come into dominance. Here's the real question, why would we care what platform they're on? What we really care about is device capability.

Detecting and redirecting using JavaScript

Naturally, this is not going to hit everyone in the mobile market. Even in the United States, the smart phone penetration rate is only 56 percent (check http://en.wikipedia.org/wiki/List_of_countries_by_smartphone_penetration); but does it really matter?

If this approach only reaches 56 percent of the market at best, is it truly an appropriate solution? Yes, but how can this be? The following two reasons explain it best:

- People who do not have a smart phone don't usually have a data plan. Surfing the web becomes financially prohibitive. Most people without smart phones and data plans won't be reaching you.
- People who have old smart phones like BlackBerry 5 or earlier, may have a data plan. However, those devices have browsers that are barely worth the name and their users know it. They might hit your site, but it's not likely, and their existence is dropping quickly.

It's likely that almost anyone who hits your site with a smart phone will respond as intended. The exceptions are not worth mentioning. For basic detection the following code is sufficient, but Chapter 9, *Integrating jQuery Mobile into Existing Sites* offers a more robust solution.

If the device supports media queries and has a touch interface, then it's well suited for our mobile site. The only exception to this rule is, of course, Internet Explorer on Windows Phone 7. So, we'll make a slight concession for them. First, we'll need to download the cookie plugin for jQuery. If you haven't, get it from https://github.com/carhartl/jquery-cookie and put it in the `/js/` folder. This code will be placed at the top of any page on which you want to do mobile redirection:

```
<script>
  // First, we check the cookies to see if the
user has
  // clicked on the full site link.  If so, we
don't want
  // to send them to mobile again.  After that,
we check for
  // capabilities or if it's IE Mobile
if("true" != $.cookie("fullSiteClicked") &&
      ('querySelector' in document &&
       'localStorage' in window &&
'addEventListener' in window &&
('ontouchstart' in window ||
```

```
window.DocumentTouch && document instanceOf
DocumentTouch
)
)
|| navigator.userAgent.indexOf('IEMobile') > 0
)
{
location.replace(YOUR MOBILE URL);
}
</script>
```

We can also customize the mobile destination on a per-page basis. Pairing this technique with the dynamic full-site link we created earlier, will result in a seamless transition between the mobile and desktop view whenever a user wants to switch. We just have one problem now. We need to set a cookie so that, if they tap the full-site link, they won't be pushed right back into mobile. Let's put this into the `/js/global.js` file:

```
$("[data-
role='page']").on('pagecreate', function (event,
ui) {
    $("a.fullSiteLink").click(function(){
       $.cookie("fullSiteClicked","true", {path:
"/", expires: 3600});
    });
});
```

It's a good idea to set the expiration for any cookie that you write for mobile devices. On desktops PCs, people tend to close their browsers. On mobile, people click the home button, which may or may not actually close that browser's session. On Android, the browser never gets shutdown, unless the user does so explicitly.

Detecting on the server

If you simply must get all mobile people to your mobile site, you'll need to do detection on the server using a tool like **Wireless Universal Resource File** (**WURFL**) (http://wurfl.sourceforge.net/). It is the ultimate community-maintained database of wireless device descriptors. It's basically user-agent sniffing, but with an up-to-date, well maintained, community database. WURFL can tell you all kinds of useful things about each device that visits you.

The link http://www.scientiamobile.com/wurflCapability/ will give you a complete listing of WURFL's capabilities. We'll get into the nuts and bolts of this in Chapter 9.

Summary

We covered a lot of ground in this chapter and we now have all the skills and tools to take, what would have been a pretty generic-looking mobile site, and turn it into something unique. We know how to make it look unique, how to host it, how to get the user there, and how to give them a more functional parachute if they're unhappy. Already, we're several steps ahead of the average developer who's just getting started and this is only the second chapter.

In the next chapter we'll start looking into more in-depth topics that bigger businesses usually care about, such as validation, analytics, and many more.

Chapter 3. Analytics, Long Forms, and Frontend Validation

Time for growth! Business is picking up and nothing says big business like massive forms, metrics, and customized experiences.

In this chapter, we will cover:

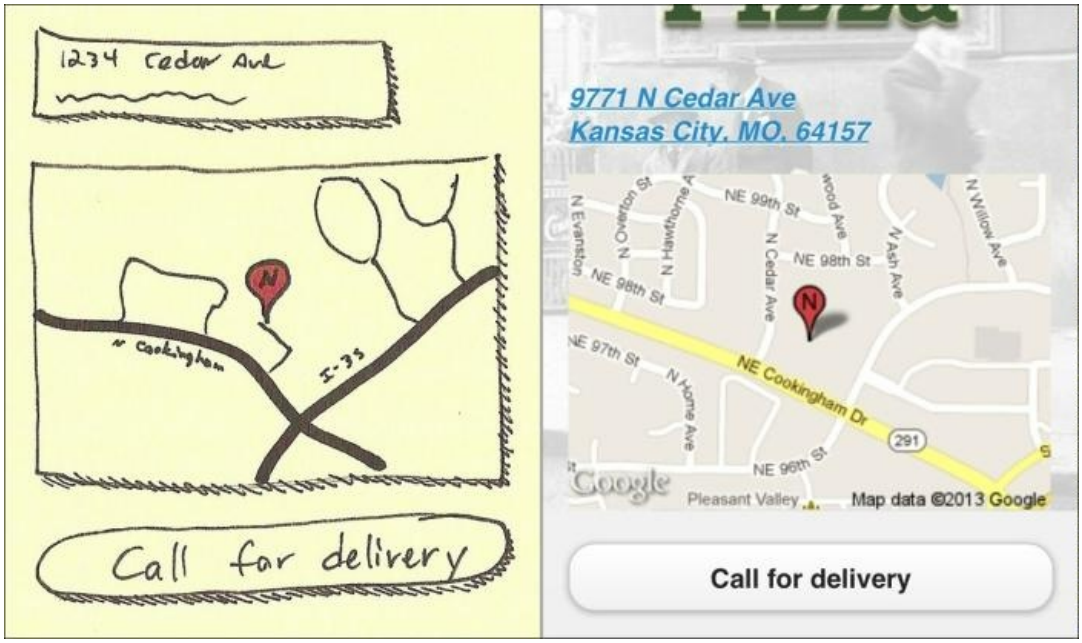
- Google Static Maps
- Google Analytics
- Long and multi-page forms
- Integrating jQuery Validate
- E-commerce tracking with Google Analytics

Google Static Maps

In the last chapter, we completely geeked out on how to dynamically link directly into the native GPS systems of iOS and Android. Now, let's consider another approach. The client wanted the opportunity to show the user the street address, a map, and give them another chance to call for delivery. In this case, simply linking to the native GPS systems won't suffice. We can still trigger that type of behavior if the user clicks on the address or the map, but as a step in between, we can inject a static map from Google (https://developers.google.com/maps/documentation/staticmaps/)

Is it as whizz-bang as bringing up the app directly to start the turn-by-turn directions? Nope, but it's a heck of a lot faster and may be all that the user needs. They may instantly recognize the location and decide that, yes actually, they would rather call instead. Remember to always approach things from the user's perspective. It's not always about doing the coolest thing we can.

Let's take a look at the drawing that was approved by the client:



Let's look at the code for this page, which we'll put into the `/map.php` file:

```
<?php
  $documentTitle = "Map | Nicky's Pizza";

  $fullSiteLinkHref = "/";

  $mapsAddress =
"https://maps.google.com/maps?q=9771+N+Cedar+Ave,
+Kansas+City,+MO
+ 64157&hl=en&sll=39.20525,-
94.526954&sspn=0.014499,0.033002&hnear=9771+N
+Cedar+Ave,+Kansas
+Ci ty,+Missouri+64157&t=m&z=17&iwloc=A";
  $staticMapUrl =
"https://maps.googleapis.com/maps/api/staticmap?
center=39.269109,-
94.45281&amp;zoom=15&amp;size=288x200&amp;markers=color:0xd64044%7
Clabel:N%7C39.269109,-94.45281&amp;sensor=true;"
?>
<!doctype html>
<html>
<head>
  <?php include("includes/meta.php"); ?>
</head>

<body>
<div data-role="page">
  <div role="main" class="ui-content">
    <div class="logoContainer"><img
src="images/LogoMobile.png" alt="Logo"
width="290" style="margin:0" /></div>
    <p>
      <a href="<?=$mapsAddress ?>">
```

```
        <address class="vcard">
          <div class="adr">
            <div class="street-address">9771 N
Cedar Ave</div>
            <span class="locality">Kansas
City</span>,
            <span class="region">MO</span>,
            <span
class="postal-code">64157</span>
            <div class="country-name">U.S.A.</div>
          </div>
        </address>
      </a>
    </p>
    <p><a href="<?= $mapsAddress ?>"><img
src="<?=$staticMapUrl ?
>" width="288" height="200" /></a></p>
    <p><a href="tel:+18167816500"
data-role="button">Call for delivery</a></p>
  </div>
  <?php include("includes/footer.php"); ?>
</div>
</body>
</html>
```

Note

Take note of the use of the **microformat** (http://microformats.org/) used to markup the address. This is not necessary, but it has been pretty standard since 2007, and it's a good way to give your information a little more semantic value. That means that not only can people read it, but even computers can read it and make sense of it. If you'd like to learn more about microformats, you can read this article from Smashing Magazine: http://coding.smashingmagazine.com/2007/05/04/microformats-what-they-are-and-how-to-use-them/.

Adding Google Analytics

The following quote is taken from http://en.wikipedia.org/wiki/Analytics

"Analytics is the discovery and communication of meaningful patterns in data. This is especially valuable in areas rich with recorded information, analytics relies on the simultaneous application of statistics, computer programming and operations research to quantify performance. Analytics often favors data visualization to communicate insight."

Every website should have analytics. If not, it's difficult to say how many people are hitting your site, if we're getting people through our conversion funnels, or what pages are causing people to leave our site.

Let's enhance the global JavaScript (`/js/global.js`) file to automatically log each page as it is shown. This is a very important distinction. In the desktop world, every analytics hit is based on the document ready event. That will not work for jQM because the first page in an AJAX-based navigation system is the only one that ever triggers a page load event. In jQM, we need to trigger this on the `pagecontainershow` event, using the following code:

```
/*********************************************/
/* Declare the analytics variables as global */
/*********************************************/
var _gaq = _gaq || [];

/*********************************************/
/* Initialize tracking when the page is loaded*/
/*********************************************/
$(document).ready(function(e) {
(function() {
var ga = document.createElement('script');
ga.type = 'text/javascript';

//Call in the Google Analytics scripts
asynchronously.
ga.async = true;
ga.src = ('https:' ==
document.location.protocol ?
'https://ssl' :
'http://www')
+'.google-analytics.com/ga.js';
var s =
document.getElementsByTagName('script')[0];
s.parentNode.insertBefore(ga, s); })();
});

/*********************************************/
/* On every pagecontainershow, register a page
view in GA */
/*********************************************/
$(document).on('pagecontainershow', function
(event, ui)
{

//wrap 3rd party code you don't control in
try/catch
try {
_gaq.push(['_setAccount', 'YOUR ANALYTICS ID']);
if ($.mobile.activePage.attr("data-url")) {
_gaq.push(['_trackPageview',
```

```
//Pull the page to track from the data-url
attribute
//of the active page.
$.mobile.activePage.attr("data-url")]);
} else {
_gaq.push(['_trackPageview']);
}
}
  //if there is an error, let's dump it to the
console
catch(err) {console.log(err);}
});
```

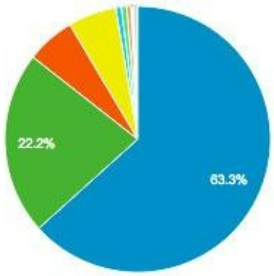
By using an asynchronous call to pull in Google Analytics, we are allowing the user to proceed, even if tracking is non-functional or taking a while to load. Typically, a call to a JavaScript file will pause all further asset loading and JavaScript execution until the requested script has been fully loaded and executed. We really don't want to have our otherwise well-crafted, speedy, and functioning page held up because some ad network or analytics tracking is taking a while to respond.

We pull the location to be tracked from the `data-url` attribute of the current page because you cannot reliably use the `document.location` function for your page hit tracking. jQM's AJAX-based navigation leads to some very strange URLs in your tracking.

The jQM team is working on that, but it will be a while until the needed technology is present on all devices. Instead, just pull the URL to track from the `data-url` attribute of the jQM page. If you dynamically create your pages, this is where you would also put the custom name for your page for tracking purposes. If you're using multi-page templates, each page's ID will be tracked as the page view.

We really haven't done much analytics work yet, but let's look at some of the insights we can already start to glean. Here is just a sample of the technology breakdowns:

Browser		Sessions	Contribution to total: Sessions
1.	Chrome	6,061	63.34%
2.	Firefox	2,127	22.23%
3.	Internet Explorer	565	5.90%
4.	Safari	562	5.87%
5.	Opera Mini	64	0.67%
6.	Opera	62	0.65%
7.	Android Browser	48	0.50%
8.	Maxthon	17	0.18%
9.	Safari (in-app)	15	0.16%
10.	UC Browser	12	0.13%



Tracking and firing page views

We'll now look at how we can track and fire page views. The following image shows a full report of the same view broken down a little further, to show which devices are most popular:

Mobile Device Info	Sessions	% New Sessions	New Users	Bounce Rate
1. Apple iPhone	152 (29.17%)	86.18%	131 (31.49%)	72.37%
2. (not set)	106 (20.35%)	70.75%	75 (18.03%)	66.98%
3. Apple iPad	82 (15.74%)	81.71%	67 (16.11%)	74.39%
4. LG Nexus 5	18 (3.45%)	77.78%	14 (3.37%)	72.22%
5. Samsung GT-N7100 Galaxy Note II	9 (1.73%)	44.44%	4 (0.96%)	66.67%
6. Samsung SM-N9005 Galaxy Note 3	8 (1.54%)	25.00%	2 (0.48%)	37.50%
7. Google Nexus 7	7 (1.34%)	71.43%	5 (1.20%)	71.43%
8. Samsung GT-I9505 Galaxy S IV	5 (0.96%)	80.00%	4 (0.96%)	80.00%
9. Meizu M032 MX	4 (0.77%)	75.00%	3 (0.72%)	75.00%
10. Opera Opera Mini for S60	4 (0.77%)	100.00%	4 (0.96%)	100.00%

Pay attention to the **Bounce Rate** column, in the previous image, on each platform as a whole. If one is significantly higher than the other, it could be an indicator that we need to look a little closer at our site on that device.

Tip

> Making a mobile website is about much more than simply making it look pretty on mobile browsers. The best indicator of a well-tailored mobile site is that people are able to get in and find what they need quickly. That makes the Top Content report our new best friend.

Unsurprisingly, most people who come to the site are hitting the menu, as shown in the report in the previous image. However, the menu is nothing but a starting point. What are they most interested in within the menu? Specialty pizzas. It is this kind of an insight that can lead you to a successful first redesign. Perhaps, we should think about featuring the specialties on the homepage and save our users time.

The bottom line is, without good analytics, you have no idea if you're building the right thing. The site, as designed right now, is making them go two clicks deep to see what's most cared about, or is it?

So far, we've only tracked page views. But, in the mobile world, that's not the whole picture. What about the links that dial the phone number but do not fire a page view? What about the links that go off-site to Facebook or to mapping software, such as Google Maps? Those certainly count as further interactions, but it would be nice to have numbers on all of these kinds of clicks too. We're already tracking page views differently, let's continue.

Naturally, we want to track custom events and not have to write JavaScript for every event we want to track. Let's make our links like this:

```
<a href="tel:+18167816500"
data-pageview="call">Call Us</a>
```

Then, let's add a little more to the `pagecreate` handler using the following code:

```
$(document).on('pagecreate', function(event, ui) {
  $page = $(event.target);

  $page.find("[data-pageview]").click(function() {
    var $eventTarget = $(this);
    if ($eventTarget.attr("data-pageview") ==
"href") {
      _gaq.push(['_trackPageview',
$eventTarget.attr("href")]);
    } else {
      _gaq.push(['_trackPageview',
$eventTarget.attr("data-pageview")]);
    }
  });
});
```

Note

There is a lot more that can be done with analytics tracking such as custom event tracking, e-commerce campaign tracking, goals tracking, and so on. Now that you know the basics of how to tie Google Analytics into jQuery Mobile, you can continue to explore more tracking, as wisdom dictates, by looking here: https://developers.google.com/analytics/devguides/collection/gajs/.

Creating long and multi-page forms

On desktops, long forms are pretty normal. We've all seen registration pages and e-commerce ordering processes. The longer the form is, the greater the tendency to try to break them up into smaller, more logical pieces. This is usually done in a couple of ways:

- Leave it as a full page, but inject enough whitespace and grouping that it doesn't look quite so intimidating
- Either physically break the form into multiple pages or use show/hide techniques to accomplish the same thing

Neither of these approaches makes a lot of difference with regards to task completion. Either way, both methods are particularly unfavorable strategies within the constraints of mobiles. As a rule, users dislike filling out forms, so the best things we can do to increase success are:

- Completely eliminate all optional fields
- Reduce the number of required fields as much as possible (get vicious about it)
- Pre-fill elements with reasonable defaults
- Validate fields immediately instead of waiting until the end
- Give the user upfront notice about how long the task is likely to take

Even doing this, sometimes forms are just going to be long. If you run into this situation, here is a useful way of taking a long form and breaking it into several pages using jQuery Mobile. Here is the code from the `ordercheckout.php` file:

```
<body>
 <form action="/m/processOrder.php" method="post">
  <div data-role="page" id="delivery">
    <?php $headerTitle = "Deliver To"; ?>
    <?php include("includes/header.php"); ?>
    <div role="main" class="ui-content">
    <h2>Where will we be delivering?</h2>

      <!-- form elements go here -->

      <p>
        <div class="ui-grid-a">
          <div class="ui-block-a"><a
data-
role="button" href="index.php">Cancel</a></div>
          <div class="ui-block-b"><a
data-
role="button" href="#payment">Continue</a></div>
```

```
        </div>
      </p>

    </div>
    <?php include("includes/footer.php"); ?>
  </div>

  <div data-role="page" id="payment">
    <?php $headerTitle = "Payment"; ?>
    <?php include("includes/header.php"); ?>
    <div role="main" class="ui-content">
      <h2>Please enter payment information</h2>

        <!--form elements go here -->


      <p>
        <div class="ui-grid-a">
          <div class="ui-block-a"><a
data-
role="button" data-theme="a"
href="index.php">Cancel</a></div>
          <div class="ui-block-b"><input
type="submit" data-theme="b"
value="Submit"/></div>
        </div>
      </p>

    </div>
      <?php include("includes/footer.php"); ?>
  </div>

 </form>
<body>
```

The first thing to note here, is that the body and form tags are outside all jQuery Mobile pages. Remember, all of this is just one big **Data Object Model** (**DOM**). All the crazy progressive enhancements and page shifting in the UI don't change that. This page, at its heart, is one massive form that we will use to submit the entire order process all at once.

Integrating jQuery Validate

It's always been important to the user experience to validate as much as possible on the client. HTML5 goes a long way to this end by giving far greater control over input types. As good as HTML5 input types are, we'll need more. Enter jQuery Validate. (http://bassistance.de/jquery-plugins/jquery-plugin-validation/)

The Validate plugin is a staple in the jQuery community, but there are certain things that will help our mobile implementation. Let's start with automatically adding validation to any page that has a `form` element with a `validateMe` class:

```
 $("form.validateMe").each(function(index,
element) {
  var $form = $(this);
  var v = $form.validate({
    errorPlacement: function(error, element) {
      var dataErrorAt =
element.attr("data-error-at");
      if (dataErrorAt)
        $(dataErrorAt).html(error);
      else
        error.insertBefore(element);
    }
  });
});
```

Since it is possible that a page might contain multiple forms, let's just deal with it now by hooking it into every form that requests validation, using the following command:

```
$("form.validateMe").each
```

By default, the `ValidateMe` class places errors after the invalid field. That won't do in mobile because the errors would show up underneath the form element. On BlackBerry and some Android systems, the `form` element is not necessarily centered vertically within the space between the keyboard and the field itself. If the user has botched it, the feedback won't be immediate and obvious. That's why we are making two changes to the error placement using the following code line:

```
errorPlacement:
```

On any given element, we can specify where we want the error to be placed using standard jQuery selectors, as shown in the following code line. Perhaps we'll never use it but it's handy to have:

```
element.attr("data-error-at");
```

If no error placement has been specified at the element level, we'll insert `error` before the element itself, as shown in the following code line. The error language will show up between the label text and the `form` element. This way, the keyboard will never eclipse the feedback:

```
error.insertBefore(element);
```

In a single form, multi-page environment, we want to be able to validate one jQM page at a time before proceeding to the next page. The first thing we'll need to do, is give an alternate way of dealing with the `required` function, since we're clearly not validating the entire form at once.

This can be declared outside any functions in our global script:

```
$.validator.addMethod("pageRequired",
function(value, element) {
var $element = $(element);
  if
($element.closest("."+
$.mobile.subPageUrlKey).hasClass($.mobile.activePageClass))
{
    return !this.optional(element);
}
  return "dependency-mismatch";
}, $.validator.messages.required);
```

Adding additional `validator` methods like this are very handy. We can declare our own validation methods for just about anything.

For your quick reference, here are the other Validate options:

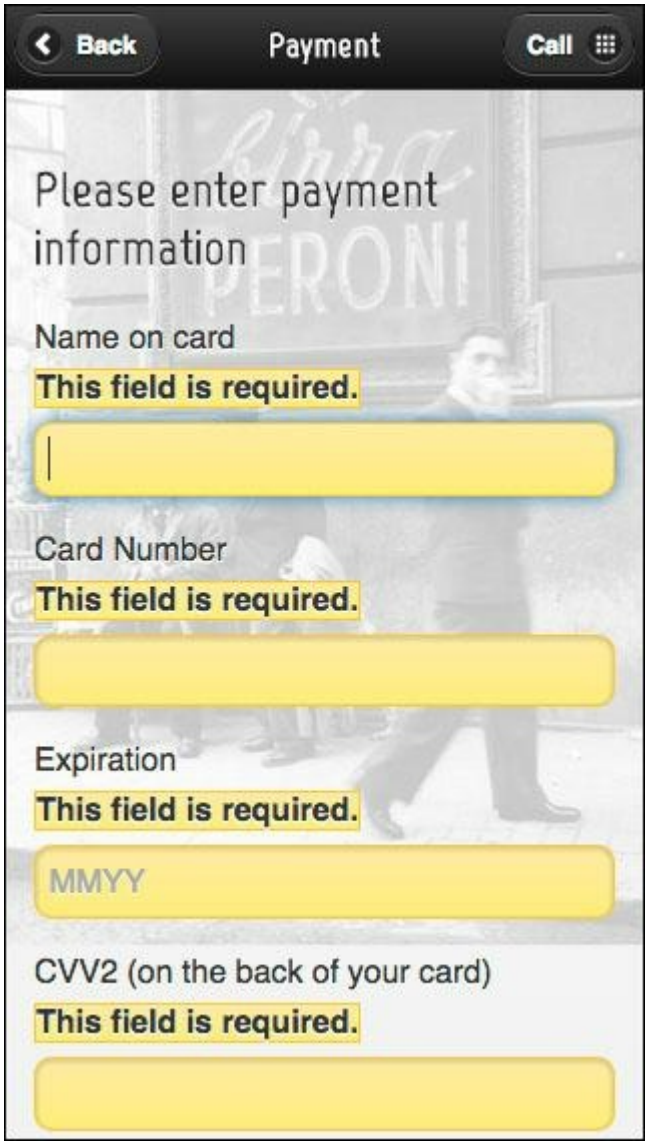
- `required`
- `remote`
- `email`
- `url`
- `date`
- `dateISO`
- `number`
- `digits`
- `creditcard`
- `equalTo`

- `accept`
- `maxlength`
- `minlength`
- `rangelength`
- `range`
- `max`
- `min`

> **Note**
>
> For more inspiring demos, please check out http://bassistance.de/jquery-plugins/jquery-plugin-validation/ and consider making a donation to the project. It has made all of our lives better.

Creating the first page of our multi-page form

Now that we have properly integrated jQuery Validate into our multi-page form, we need to make our errors look like proper errors. We could go with something really simple, such as a red color on the text, but I much prefer keeping with the style of jQuery Mobile.



Their default theme set has a `data-theme="a"` element that is just begging to be used for error states. It might seem like a good idea to just add our error classes onto the very definitions of their `ui-bar-b,` element but don't. jQuery Mobile is upgraded regularly and if we were to take that approach it would cause friction with every upgrade.

Instead, let's just copy the definition of the `ui-bar-b` element right into our custom style sheet, as shown in the following code:

```
label.error,input.error{
background-color: #1d1d1d;
border-color: #1b1b1b;
color: #fff;
text-shadow: 0 1px 0 #111;
font-weight: bold;
}
```

We're almost ready to go with our fancy forms. Now, we just need to be able to make it validated before moving from page to page. We don't have to worry about the submit link, as that will naturally trigger validation, but let's add a class to the continue link using the following code:

```
<a data-role="button" data-theme="b"
href="#payment"
class="validateContinue">Continue</a>
```

Then, in our global scripts, let's add this function to our `pagecreate` handler using the following code:

```
$page.find(".validateContinue").click(function(){

 if($(this).closest("form").data("validator").form())
{
    return true;
  }else{
    event.stopPropagation();
    event.preventDefault();
    return false;
  }
});
```

What happens if the user refreshes in the middle of this process? The fields will be empty but we'll already be on to the next page. One little script at the bottom of the page, as shown in the following code, should handle that:

```
//page refresh mitigation
$(document).on("pagecontainerbeforeshow",
function(evt, ui){
  if(document.location.hash != ""){
    var $firstRequiredInput =
$("input.pageRequired").first();
    if($firstRequiredInput.val() == ""){
      var redirectPage =
$firstRequiredInput.closest("[data-
role='page']");
      $(redirectPage).pagecontainer("change");
    }
  }
});
```

Now that we have the basic concepts and have overcome a few minor pitfalls, let's see the finished code of the `ordercheckout.php` file:

```
<!doctype html>
<html>
<?php
```

```
  $documentTitle = "Check Out | Nicky's Pizza";

  $headerLeftHref = "";
  $headerLeftLinkText = "Back";
  $headerLeftIcon = "";

  $headerRightHref = "tel:8165077438";
  $headerRightLinkText = "Call";
  $headerRightIcon = "grid";

  $fullSiteLinkHref = "/";

?>
<head>
  <?php include("includes/meta.php"); ?>
  <style type="text/css">
    #ordernameContainer{display:none;}
  </style>
</head>

<body>
  <form action="thankyou.php" method="post"
class="validateMe">
```

Here is the first page of our multi-page form. Remember that these pages will all be submitted at once.

Validating each page

Validation checks whether a page is built in accordance with web standards. It also guarantees that future web platforms will handle it as designed.

We'll be validating each page using the following code, before the user can move to the next page:

```
<div data-role="page" id="delivery">
  <?php $headerTitle = "Deliver To"; ?>
  <?php include("includes/header.php"); ?>
  <div role="main" class="ui-content">
    <h2>Where will we be delivering?</h2>

    <p>
      <label for="streetAddress">Street
Address</label>
      <input type="text" name="streetAddress"
id="streetAddress" class="pageRequired" />
    </p>

    <p>
      <label for="streetAddress2">Address Line 2
| Apt#</label>
```

```
      <input type="text" name="streetAddress2"
id="streetAddress2" />
    </p>

    <p>
      <label for="zip">Zip Code</label>
      <input type="number" name="zip" id="zip"
maxlength="5" class="pageRequired zip" />
    </p>

    <p>
      <label for="phone">Phone Number</label>
      <input type="tel" name="phone" id="phone"
maxlength="10" class="number pageRequired" />
    </p>

    <p>
      <div class="ui-grid-a">
        <div class="ui-block-a"><a
data-
role="button" data-icon="delete"
data-
iconpos="left" data-theme="d"
href="javascript://">Cancel</a></div>
        <div class="ui-block-b"><a
data-
role="button" data-icon="arrow-r"
data-
iconpos="right" data-theme="b" href="#payment"
class="validateContinue">Continue</a></div>
      </div>
    </p>

  </div>
  <?php include("includes/footer.php"); ?>
</div>
```

This is the second page of the form for collecting payment information. Note the validation of the credit card. All we have to do is add the `creditcard` class to make the framework check if the card number validates with the **Luhn** algorithm (http://en.wikipedia.org/wiki/Luhn_algorithm).

Let's take a minute to offer this public service reminder. Collecting credit card information is a serious issue. At a minimum, make sure you're submitting the form over HTTPS, and validating the credit card on the server. But, if at all possible, you should be letting the pros do it for you. Stripe, for example, can integrate into your existing workflow and charges a reasonable fee…plus they're quite secure. Now, back to our regularly scheduled program:

```
<div data-role="page" id="payment">
  <?php $headerTitle = "Payment"; ?>
  <?php include("includes/header.php"); ?>
```

```
  <div role="main" class="ui-content">
    <h2>Please enter payment information</h2>

    <p>
      <label for="nameOnCard">Name on card</label>
      <input type="text" name="nameOnCard"
id="nameOnCard" class="pageRequired" />
    </p>

    <p>
      <label for="cardNumber">Card Number</label>
      <input type="tel" name="cardNumber"
id="cardNumber" class="pageRequired creditcard" />
    </p>

    <p>
      <label for="expiration">Expiration</label>
      <input class="pageRequired number"
type="tel" name="expiration" id="expiration"
maxlength="4" size="4" placeholder="MMYY" />
    </p>

    <p>
      <label for="cvv">CVV2 (on the back of your
card)</label>
      <input class="pageRequired number"
type="number" name="cvv" id="cvv" minlength="3"
maxlength="4" />
    </p>

    <p>
      <input type="checkbox" value="true"
name="savePayment" id="savePayment" /><label
for="savePayment">Save payment info for easier
ordering?</label>
      <input type="checkbox" value="true"
name="saveOrder" id="saveOrder"
onchange="showHideOrderNameContainer()" /><label
for="saveOrder">Save this order to your
favorites?</label>
    </p>

    <p id="ordernameContainer">
      <label for="ordername">Give your order a
name</label>
      <input type="text" name="ordername"
id="ordername" placeholder="example: the usual" />
    </p>

    <p>
      <div class="ui-grid-a">
        <div class="ui-block-a"><a
data-
role="button" data-icon="delete"
data-
```

```
iconpos="left" data-theme="a"
href="javascript://">Cancel</a></div>
        <div class="ui-block-b"><input
type="submit" data-icon="arrow-r"
data-
iconpos="right" data-theme="b"
value="Submit" /></div>
      </div>
    </p>

  </div>
  <?php include("includes/footer.php"); ?>
</div>

</form>
```

These are the scripts we mentioned earlier in the chapter:

```
 <script>
  function showHideOrderNameContainer(){
   if($("#saveOrder").attr("checked")){
    $("#ordernameContainer").show();
   }else{
    $("#ordernameContainer").hide();
   }
  }

  //page refresh mitigation
  $(document).on("pagecontainerbeforeshow",
function(){
   if(document.location.hash != ""){
    var $firstRequiredInput =
$("input.pageRequired").first();
    if($firstRequiredInput.val() == ""){
     var redirectPage =
$firstRequiredInput.closest("[data-role='page']");
     $(redirectPage).pagecontainer("change");
    }
   }

  });
 </script>
</body>
</html>
```

The meta.php file

Let's now look at the `meta.php` file, since integrating jQuery Validate:

```
<meta charset="utf-8">
<meta name="viewport"
content="width=device-
```

```
width, initial-scale=1, maximum-scale=1.0,
user-scalable=no">
<link
href='http://fonts.googleapis.com/css?
family=Marvel' rel='stylesheet' type='text/css'>
<link rel="stylesheet"
href="css/jquery.mobile-1.4.5.css" />
<link rel="stylesheet" href="css/custom.css" />
<script src="js/jquery-1.10.2.js"></script>
<script src="js/jquery.cookie.js"></script>
<script src="js/jquery.validate.min.js"></script>
<script src="js/global.js"></script>
<script src="js/jquery.mobile-1.4.5.js"></script>
<title><?=$documentTitle?></title>
```

After three chapters, here is what could conceivably be called the master JavaScript file (`global.js`). It is essentially the one I use in every project with only minor variations:

```
var _gaq = _gaq || [];
var GAID = 'UA-XXXXXXXX-X';


/*******************************************************/
/* Load Google Analytics only once the page is
fully loaded.
/*******************************************************/
$(document).ready(function(e) {
    (function() {
        var ga =
document.createElement('script');
        ga.type = 'text/javascript';
        ga.async = true;
        ga.src = ('https:' ==
document.location.protocol ?
        'https://ssl' : 'http://www')
+'.google-analytics.com/ga.js';
        var s =
document.getElementsByTagName('script')[0];
        s.parentNode.insertBefore(ga, s);
    })();
});



/*******************************************************/
/* Upon jQM page initialization, place hooks on
links with
/* data-pageview attributes to track more with GA.
/* Also, hook onto the full-site links to make
them cookie
/* the user upon click.
/*******************************************************/
```

```
$(document).on('pagecreate', function (event, ui)
{
$page = $(event.target);

$page.find("[data-pageview]").click(function(){
var $eventTarget = $(this);
if($eventTarget.attr("data-pageview") == "href"){
_gaq.push(['_trackPageview',
$eventTarget.attr("href")]);
}else{
_gaq.push(['_trackPageview',
$eventTarget.attr("data-pageview")]);
}
});

$page.find("a.fullSiteLink").click(function(){
$.cookie("fullSiteClicked","true", {
path: "/",
expires:3600
});
});

/*********************************************************/
/* Hook in the validateContinue buttons.
/*********************************************************/
$page.find(".validateContinue").click(function(){
if($(this).closest("form").data("validator").form())
{ return true;
}else{
event.stopPropagation();
event.preventDefault();
return false;
}
});
});


/*********************************************************/
/* Every time a page shows, register it in GA.
/*********************************************************/

$(document).on('pagecontainershow', function
(event, ui) {

 /*********************************************************/
  /* Find any form with the class of validateMe
and hook in
  /* jQuery Validate.  Also, override the error
placement.

 /*********************************************************/
  //Any form that might need validation
  $("form.validateMe").each(function(index,
element) {
    var $form = $(this);
```

```
    var v = $form.validate({
      errorPlacement: function(error, element) {
        var dataErrorAt =
element.attr("data-error-at");
        if (dataErrorAt)
          $(dataErrorAt).html(error);
        else
          error.insertBefore(element);
      }
    });
  });

  try {
    _gaq.push(['_setAccount', GAID]);
    if ($.mobile.activePage.attr("data-url")) {
      _gaq.push(['_trackPageview',
$.mobile.activePage.attr("data-url")]);
    } else {
      _gaq.push(['_trackPageview']);
    }
  } catch(err) {}
});


/*********************************************************/
/*  Add the custom validator class to allow for
validation
/*  on multi-page forms.
/*********************************************************/
$.validator.addMethod("pageRequired",
function(value, element) {
    var $element = $(element);
    if(

 $element.closest("."+$.mobile.subPageUrlKey)
            .hasClass($.mobile.activePageClass)
    ) {
        return !this.optional(element);
    }
    return "dependency-mismatch";
}, $.validator.messages.required);
```

E-commerce tracking with Google Analytics

So far, all we've tracked is page views. Very useful to be sure, but most managers and owners love their reports. On the **Thank You** page, we should include some simple e-commerce tracking. Again, because of jQuery Mobile's AJAX-based navigation system, we'll need to tweak the default examples, just a hair, to make it work perfectly with jQM. Here is the full code for the **Thank You** page (the `thankyou.php` file) with e-commerce tracking set to only run once the page is shown:

```
<!doctype html>
<html>
<?php
  $documentTitle = "Menu | Nicky's Pizza";

  $headerLeftHref = "index.php";
  $headerLeftLinkText = "Home";
  $headerLeftIcon = "home";

  $headerRightHref = "tel:8165077438";
  $headerRightLinkText = "Call";
  $headerRightIcon = "grid";

  $fullSiteLinkHref = "/index.php";
?>
<head>
  <?php include("includes/meta.php"); ?>
</head>

<body>
<div data-role="page" id="orderthankyou">
  <?php
    $headerTitle = "Thank you";
    include("includes/header.php");
  ?>
  <div role="main" class="ui-content" >
    <h2>Thank you for your order. </h2>
    <p>In a few minutes, you should receive an
email confirming your order with an estimated
delivery time.</p>

    <script type="text/javascript">
      $("#orderthankyou").on('pagecontainershow',
function(){
        _gaq.push(['_addTrans',
          '1234',                    // order
ID - required
          'Mobile Checkout',  // affiliation or
store name
```

```
          '21.99',                    // total -
required
          '1.29',                     // tax
          ' ',                          //
shipping
          'Kansas City',       // city
          'MO',              // state or province
          'USA'              // country
          ]);
        _gaq.push(['_trackTrans']); //submits
transaction to the Analytics servers
      });
    </script>
  </div>
  <?php include("includes/footer.php"); ?>
</div>

</body>
</html>
```

Summary

Forms are nothing new. We've had them since the dawn of the Internet. They are not glamorous, but they can be elegant, effective, and responsive. jQuery Mobile takes you a long way toward effective forms in touch-based interfaces. Now, you can take it farther with multi-page forms and client-side validation. Do not underestimate the power of these two techniques when paired together. When the client is able to do virtually everything they need, without having to go back to the server, the experience is automatically improved.

Mixing in the ability to watch how users are surfing your site, their favorite content, and their fallout points will help you make an even more compelling experience. Just remember, when you're thinking about analytics, it is not the absolute numbers that are important. It's all about the trends; with these basics done, let's get to some more interesting tech. In the next chapter we'll start looking at geolocation and more.

Chapter 4. QR Code, Geolocation, Google Maps API, and HTML5 Video

We have discussed many of the core concerns of small and big businesses. Let's now turn our eyes now to other concepts that would concern media companies. In this chapter, we'll look at a movie theater chain, but really, these concepts could be applied to any business that has multiple physical locations.

In this chapter, we will cover:

- QR Codes
- Basic geolocation
- Integrating Google Maps API
- GPS monitoring
- Linking and embedding video

QR codes

We love our smartphones. We love showing off what our smartphones can do. So, when those cryptic squares, as shown in the following figure, started showing up all over the place and befuddling the masses, smartphone users quickly stepped up and started showing people what it's all about in the same overly enthusiastic manner that we whip them out to answer even the most trivial question heard in passing. And even though **Near Field Communication** (**NFC**) is here now in the form of Apple Pay and Google Wallet, we'd better be familiar with **Quick Response Code** (**QR**) codes and how to leverage them.

Let us take a look at the following QR codes image:



The data shows that knowledge and usage of QR codes is very high according to surveys: (http://researchaccess.com/2012/01/new-data-on-qr-code-adoption/)

- More than two-thirds of smartphone users have scanned a code
- More than 70 percent of the users say they'd do it again (especially for a discount)

What does this have to do with jQuery Mobile? Traffic. Big-time successful traffic. A banner ad is considered successful if only two percent of people click through (http://en.wikipedia.org/wiki/Clickthrough_rate). QR codes get more than 66 percent! I'd say it's a pretty good way to get people to our creations and, thus, should be of concern. But QR codes are for more than just URLs. Here we have a URL, a block of text, a phone number, and an SMS in the following QR codes:



There are many ways to generate QR codes (http://www.the-qrcode-generator.com/, http://www.qrstuff.com/). Really, just search for **QR Code Generator** on Google and you'll have numerous options. Note that to read a QR code on your phone, you'll need a QR code reader app.

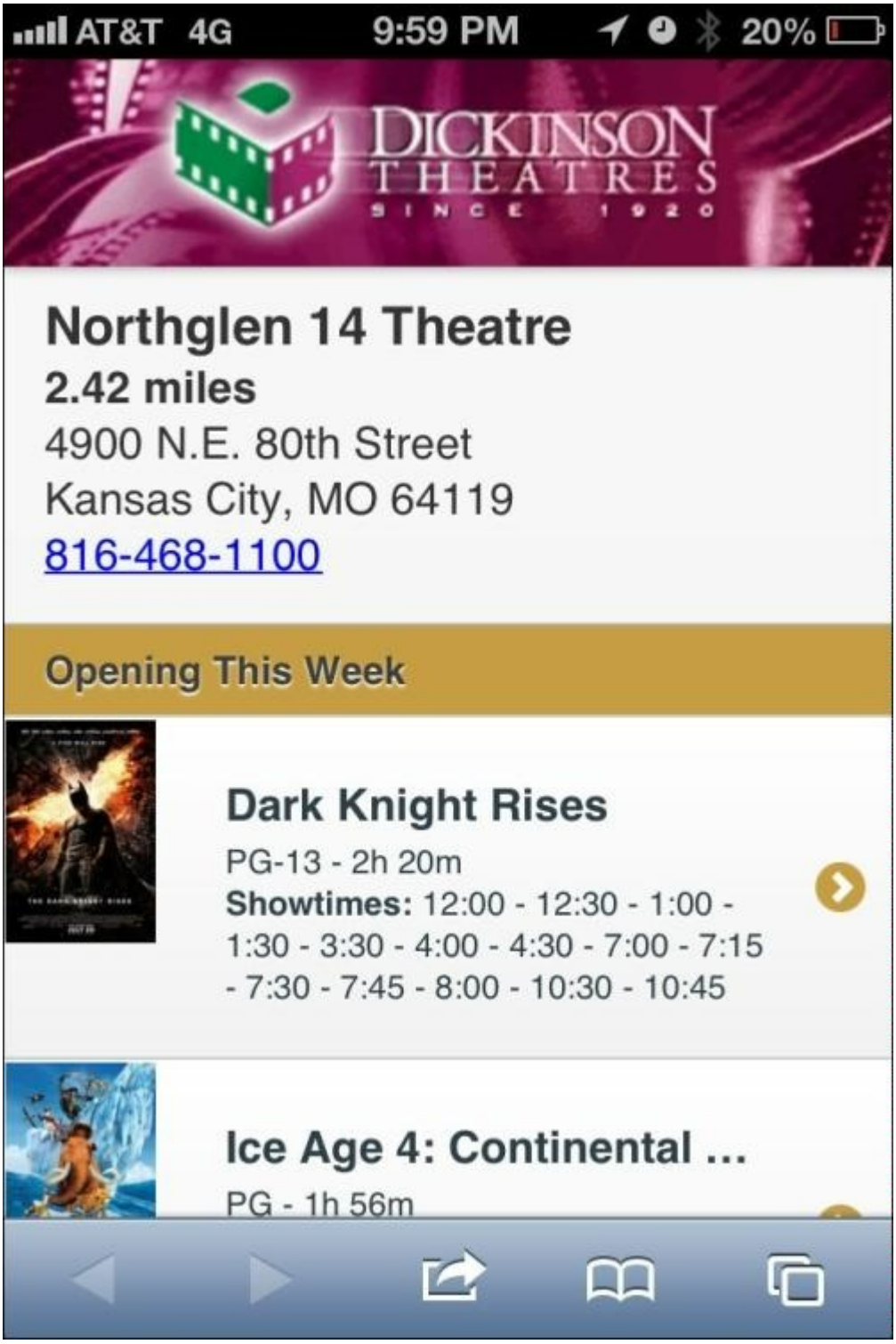
Let us consider a local movie theater chain. Dickinson Theatres (www.dtmovies.com) has been around since the 1920s and is considering

throwing its hat into the mobile ring. Perhaps they will invest in a mobile website, and go all-out in placing posters and ads in bus stops and other outdoor locations. Naturally, people are going to start scanning, and this is valuable to us because they're going to tell us exactly which locations are paying off. This is really a first in the advertising industry. We have a medium that seems to spur people to interact on devices that will tell us exactly where they were when they scanned it. By using unique codes for each ad we place, we can determine exactly where a user was when they scanned the code.

Geolocation

When GPS first came out on phones, it was pretty useless for anything other than police tracking in case of emergencies. Today it is making the devices that we hold in our hands even more personal than our personal computers. For now, we can get a latitude, longitude, and timestamp very dependably. The geolocation API specification from the W3C can be found at http://dev.w3.org/geo/api/spec-source.html.

For now, we'll pretend that we have a poster prompting the user to scan a QR code to find the nearest theater and show the timings. It would bring the user to a page like this:



Since there's no better first date than dinner and a movie, the movie going crowd tends to skew a bit to the younger side. Unfortunately, that group does not tend to have a lot of money. They may have more feature phones than smartphones. Some might only have very basic browsers. Maybe they have JavaScript, but we can't count on it. If they do, they might have geolocation. Regardless, given the audience, progressive enhancement is going to be the key.

The first thing we'll do is create a base level page with a simple form that will submit a zip code to a server. Since we're using our template from before, we'll add validation to the form for anyone who has JavaScript using the `validateMe` class. If they have JavaScript and geolocation, we'll replace the form with a message saying that we're trying to find their location. For now, don't worry about creating this file. The source code is incomplete at this stage. This page will evolve, and the final version will be in the source package for the chapter in the `qrresponse.php` file as shown in the following code:

```
<?php
  $documentTitle = "Dickinson Theatres";
  $headerLeftHref = "/";
  $headerLeftLinkText = "Home";
  $headerLeftIcon = "home";

  $headerTitle = "";
  $headerRightHref = "tel:8165555555";
  $headerRightLinkText = "Call";
  $headerRightIcon = "grid";

  $fullSiteLinkHref = "/";
?>
<!doctype html>
<html>
<head>
  <?php include("includes/meta.php"); ?>
</head>
<body>
<div id="qrfindclosest" data-role="page">
  <div class="logoContainer ui-shadow"></div>
  <div role="main" class="ui-content">
    <div id="latLong>
      <form id="findTheaterForm"
action="fullshowtimes.php""method="get"
class="validateMe">
        <p>
          <label for="zip">Enter Zip Code</label>
          <input type="tel" name="zip"
id="zip""class="required number"/>
        </p>
        <p><input type="submit" value="Go" /></p>
      </form>
    </div>
    <p>
      <ul id="showing" data-role="listview"
class="movieListings""data-dividertheme="g">
      </ul>
    </p>
  </div>
  <?php include("includes/footer.php"); ?>
</div>
```

```
<script>
  //We'll put our page specific code here soon
</script>
</body>
</html>
```

This is what users without JavaScript would see; nothing special. We could spruce it up with a little CSS but what would be the point? If they're on a browser that doesn't have JavaScript, there's a pretty good chance their browser is also miserable at rendering CSS. That's fine really. After all, progressive enhancement doesn't necessarily mean making it wonderful for everyone, it just means being sure it works for everyone. Most will never see this but if they do, it will work just fine as shown in the following screenshot:



Using JSON

For everyone else we'll need to start working with JavaScript to get our theater data in a format we can digest programmatically. **JavaScript Object Notation** (**JSON**) is perfectly suited for this task. If you are already familiar with the concept of JSON, you can skip to the next paragraph now. If you're not familiar with JSON, it's another way of shipping data across the Internet. It's like XML, but more useful. It's less verbose and can be directly

interacted with and manipulated using JavaScript because it's actually written in JavaScript.

> **Note**
>
> A special thank you goes out to Douglas Crockford (the father of JSON). XML still has its place on the server but it has no business in the browser as a data format if you can get JSON. This is such a widespread view that at the last developer conference I went to, one of the speakers chuckled as he asked, "Is anyone still actually using XML?"

The example code for this chapter has the full list of theaters, but this should be enough to get us started. For this example, we'll store the JSON data in the `/js/theaters.js` file as shown in the following code:

```
{
  "theaters":[
    {
      "id":161,
      "name":"Chenal 9 IMAX Theatre",
      "address":"17825 Chenal Parkway",
      "city":"Little Rock",
      "state":"AR",
      "zip":"72223",
      "distance":9999,
      "geo":{"lat":34.7684775,"long":-92.4599322},
      "phone":"501-821-2616"
    },
    {
      "id":158,
      "name":"Gateway 12 IMAX Theatre",
      "address":"1935 S. Signal Butte",
      "city":"Mesa",
      "state":"AZ",
      "zip":"85209",
      "distance":9999,

 "geo":{"lat":33.3788674,"long":-111.6016081},
      "phone":"480-354-8030"
    },
    {
      "id":135,
      "name":"Northglen 14 Theatre",
      "address":"4900 N.E. 80th Street",
      "city":"Kansas City",
      "state":"MO",
      "zip":"64119",
      "distance":9999,
      "geo":{"lat":39.240027,"long":-94.5226432},
      "phone":"816-468-1100"
```

```
    }
  ]
}
```

Now that we have data to work with, we can prepare the on-page scripts. Let's put the following chunks of JavaScript in a script tag at the bottom of the HTML where we had the comment `We'll put our page specific code here soon` as shown in the following code:

```
//declare our global variables
var theaterData = null;
var timestamp = null;
var latitude = null;
var longitude = null;
var closestTheater = null;

//Once the page is initialized, hide the manual
zip code form
//and place a message saying that we're
attempting to find //their location.
$(document).on("pagecreate", "#qrfindclosest",
function(){
  if(navigator.geolocation){
     $("#findTheaterForm").hide();
     $("#latLong").append("<p
id='finding'>Finding your location...</p>");
  // Once the page displays, grab the theater
data and find out which one is closest.
  $(document).on("pagecontainershow", function(){
    // The getJSON method not only retrieves the
specified JS file, but it also converts the text
of the file into actual JavaScript objects
    theaterData = $.getJSON("js/theaters.js",
function(data){
      theaterData = data;
      selectClosestTheater();
    });
  });

  }
});

function selectClosestTheater(){
  navigator.geolocation.getCurrentPosition(
  function(position) { //success
  latitude = position.coords.latitude;
  longitude = position.coords.longitude;
  timestamp = position.timestamp;

  for(var x = 0; x < theaterData.theaters.length;
x++) {
 var theater = theaterData.theaters[x];
    var distance = getDistance(latitude,
longitude,"theater.geo.lat, theater.geo.long);
```

```
    theaterData.theaters[x].distance = distance;
  }}
  theaterData.theaters.sort(compareDistances);
  closestTheater = theaterData.theaters[0];
    _gaq.push(['_trackEvent', "qr",
"ad_scan","("+latitude+","+longitude) ]);
  var dt = new Date();
  dt.setTime(timestamp);
  $("#latLong").html("<div class='theaterName'>"
    +closestTheater.name+"</div><strong>"
    +closestTheater.distance.toFixed(2)
    +"miles</strong><br/>"
    +closestTheater.address+"<br/>"
    +closestTheater.city+",
"+closestTheater.state+" "
    +closestTheater.zip+"<br/><a href='tel:"
    +closestTheater.phone+"'>"
    +closestTheater.phone+"</a>");
  $("#showing").load("showtimes.php", function(){
    $("#showing").listview('refresh');
  });
},
function(error){ //error
  switch(error.code)
  {
    case error.TIMEOUT:
      $("#latLong").prepend("<div
class='ui-bar-
b'>"Unable to get your position: Timeout</div>");
      break;
    case error.POSITION_UNAVAILABLE:
      $("#latLong").prepend("<div
class='ui-bar-
b'>"Unable to get your position: Position
unavailable</div>");
      break;
    case error.PERMISSION_DENIED:
      $("#latLong").prepend("<div
class='ui-bar-
b'>"Unable to get your position: Permission
denied."You may want to check your
settings.</div>");
      break;
    case error.UNKNOWN_ERROR:
      $("#latLong").prepend("<div
class='ui-bar-
b'>"Unknown error while trying to access your
position.</div>");
      break;
   }
   $("#finding").hide();
   $("#findTheaterForm").show();
},
{maximumAge:600000}); //nothing too stale
```

```
}
```

The key here is the `geolocation.getCurrentPosition` function, which will prompt the user to allow us access to their location data, as shown here on iPhone.



If somebody is a privacy advocate, they may have turned off all location services. In this case, we'll need to inform the user that their choice has impacted our ability to help them. That's what the error function is all about. In such a case, we'll display an error message and show the standard form again.

Once we have our user's position and the list of theaters, it's time to sort the theaters by distance and show the closest one. The following is a pretty generic code that we may want to use on more than one page. So we'll put this into our `global.js` file:

```
function getDistance(lat1, lon1, lat2, lon2){
  //great-circle distances between the two points
  //because the earth isn't flat
  var R = 6371; // km
```

```
  var dLat = (lat2-lat1).toRad();
  var dLon = (lon2-lon1).toRad();
  var lat1 = lat1.toRad();
  var lat2 = lat2.toRad();
  var a = Math.sin(dLat/2) * Math.sin(dLat/2) +
    Math.sin(dLon/2) * Math.cos(lat1) *
    Math.cos(lat2);
  var c = 2 * Math.atan2(Math.sqrt(a),
Math.sqrt(1-a));
  var d = R * c; //distance in km
  var m = d * 0.621371;  //distance in miles
  return m;
}
if (typeof(Number.prototype.toRad) ===
"undefined") {
  /* The prototype property is mainly used for
inheritance; here we add a new function to the
Number class to make it available to all
instances of that class */
  Number.prototype.toRad = function() {
    return this * Math.PI / 180;
  }
}

function compareDistances(a,b) {
  if (a.distance<b.distance) return -1;
  if (a.distance>b.distance) return 1;
  return 0;
}
```

Picking a user's location

With all of these pieces in place, it is now simple enough to get the user's position and find the closest theater. It will be the first in the array, as well as stored directly in the `closestTheater` global variable. If they have JavaScript turned off we'll have to use some server-side algorithms or APIs to figure out which is closest (which is beyond the scope of this book). Regardless, we are keeping every theater's show times as a set of list items in a flat file (`showtimes.php`). In a real world situation, this would be database driven and we would call the page with a URL that has the ID of the correct theater. For now, the following code is all we need:

```
<li data-role="list-divider">Opening This
Week</li>
<li>
  <a href="movie.php?id=193818">
    <img src="images/darkknightrises.jpeg">
    <h3>Dark Knight Rises</h3>
    <p>PG-13 - 2h 20m<br/>
      <strong>Showtimes:</strong>
      12:00 - 12:30 - 1:00 - 1:30 - 3:30 - 4:00 -
4:30 -
```

```
      7:00 - 7:15 - 7:30 - 7:45 - 8:00 - 10:30 -
10:45
    </p>
  </a>
</li>
<li>
  <a href="moviedetails.php?id=193812">
    <img src="images/iceagecontinentaldrift.jpeg">
    <h3>Ice Age 4: Continental Drift</h3>
    <p>PG - 1h 56m<br/>
      <strong>Showtimes:</strong> 10:20 AM -
10:50 AM -
      12:40 - 1:15 - 3:00 - 7:00 - 7:30 - 9:30
    </p>
  </a>
</li>
<li data-role="list-divider">Also in Theaters</li>
<li>
  <a href="moviedetails.php?id=194103">
    <img src="images/savages.jpeg">
    <h3>Savages</h3>
    <p>R -
7/6/2012<br/><strong>Showtimes:</strong>
      10:05 AM - 1:05 - 4:05 - 7:05 - 10:15
    </p>
  </a>
</li>
<li>
  <a href="moviedetails.php?id=194226">
    <img src="images/katyperrypartofme.jpeg">
    <h3>Katy Perry: Part of Me</h3>
    <p>PG - 7/5/2012<br/>
      <strong>Showtimes:</strong> 10:05 AM - 1:05
-
      4:05 - 7:05 - 10:15
    </p>
  </a>
</li>
<li>
  <a href="moviedetails.php?id=193807">
    <img src="images/amazingspiderman.jpeg">
    <h3>Amazing Spider-Man</h3>
    <p>PG-13 - 7/5/2012<br/>
      <strong>Showtimes:</strong> 10:00 AM - 1:00
-
      4:00 - 7:00 - 10:00
    </p>
  </a>
</li>
```

We pull in this page fragment using the following on-page scripts:

```
$("#showing").load("showtimes.php", function(){
    $("#showing").listview('refresh');
```

```
});
```

In this case we have the `showtimes.php` file containing only the `listview` items, and we are injecting them directly into the `listview` item before refreshing. Another way to accomplish the same thing would be to have another `fullshowtimes.php` file, be a fully rendered page with headers, footers, and everything. This would be perfect for the situations where JavaScript or geolocation is not available and we have to revert back to standard page submissions:

```
<?php
  $documentTitle = "Showtimes | Northglen 16
Theatre";
  $headerLeftHref = "/";
  $headerLeftLinkText = "Home";
  $headerLeftIcon = "home";
  $headerTitle = "";
  $headerRightHref = "tel:8165555555";
  $headerRightLinkText = "Call";
  $headerRightIcon = "grid";
  $fullSiteLinkHref = "/";
?>
<!doctype html>
<html>
<head>
  <?php include("includes/meta.php"); ?>
</head>
<body>
  <div id="qrfindclosest" data-role="page">
    <div class="logoContainer ui-shadow"></div>
    <div role="main" class="ui-content">
      <h3>Northglen 14 Theatre</h3>

      <p><a
href="https://maps.google.com/maps?q=Northglen
+14+Theatre,"+Northe
ast+80th+Street,+Kansas+City,
+MO&hl=en&sll=38.304661,"-
92.437099&sspn=7.971484,8.470459&oq=northglen
+&t=h&hq=Northglen
+"1
4+Theatre,&hnear=NE+80th+St,+Kansas+City,
+Clay,"+Missouri&z=15">49 00 N.E. 80th Street<br>
        Kansas City, MO 64119</a>
      </p>

      <p><a
href="tel:8164681100">816-468-1100</a></p>
      <p>
        <ul id="showing"
data-
role="listview""class="movieListings"
data-dividertheme="g">
```

```
          <?php
include("includes/showtimes.php"); ?>
        </ul>
      </p>
    </div>
    <?php include("includes/footer.php"); ?>
  </div>
</body>
</html>
```

Then, using the following code, instead of loading in a fragment of the page, we could load the entire page and select only the elements we wish to inject:

```
$("#showing").load("fullshowtimes.php #showing li",
function(){
  $("#showing").listview('refresh');
});
```

Certainly, this would be a less efficient way of doing things, but it's worth noting that such a thing can be done. It almost certainly will come in handy in the future.

Driving directions with the Google Maps API

We've done well up to this point on our own. We can tell which theater is closest and how far it is as the crow flies. Sadly though, despite all its promise, the 21st century has not led to us all having private jet packs. Therefore, it is probably best that we not display that distance. Most likely, they're going to drive, ride a bus, bike, or walk.

Let's leverage the Google Maps API (https://developers.google.com/maps/documentation/javascript/). If your site is going to have a lot of API hits, you might have to pay for the business pricing. For us, while we are in development, there's no need.

Here's a look at what we're about to build.

First we'll need another page to show a map and directions, as well as the script that will actually load the maps from Google Maps API. Let's use the following code:

```
<div id="directions" data-role="page">
  <div data-role="header">
    <h3>Directions</h3>
  </div>
  <div data-role="footer">
    <div data-role="navbar" class="directionsBar">
      <ul>
        <li>
          <a href="#"
id="drivingButton""onClick="showDirections('DRIVING')">
            <div class="icon driving"></div>
          </a>
        </li>
        <li>
          <a href="#"
id="transitButton""onClick="showDirections('TRANSIT')">
            <div class="icon transit"></div>
          </a>
        </li>
        <li>
          <a href="#"
id="bicycleButton""onClick="showDirections('BICYCLING')">
            <div class="icon bicycle"></div>
          </a>
        </li>
        <li>
          <a href="#"
id="walkingButton""onClick="showDirections('WALKING')">
            <div class="icon walking"></div>
```

```
          </a>
        </li>
      </ul>
    </div>
  </div
  <div id="map_canvas"></div>
  <div role="main" class="ui-content"
id="directions-panel">
  </div>
</div>
<script
src="https://maps.googleapis.com/maps/api/js?
sensor=true"></script >
```

There are several important parts to this page. The first is the `navbar` attribute within a `footer` attribute for directions to the theater. What you may not realize, is that footers don't actually have to be at the bottom of the page. When you use a `navbar` attribute within a `footer` attribute, the link that you clicked on will retain its active state. Without the footer surrounding it, the link will only blink the active state once and then go back to normal. The `map_canvas` and `directions-panel` attributes will be filled in by the Google Maps API.

Now, we need to update the CSS code for the extra icons and map constraints. As before, we're keeping them in the `/css/custom.css` location.

```
.directionsBar .icon{
  height:28px;
  width:34px;
  margin:auto;
  background-repeat:no-repeat;
  background-position:center center;
}

.directionsBar .driving{

 background-image:url(../icons/xtras-white/16-
car.png);
  background-size:34px 19px;
}
.directionsBar .transit{

 background-image:url(../icons/xtras-white/15-
bus.png);
  background-size:22px 28px;
}
.directionsBar .bicycle{

 background-image:url(../icons/xtras-white/13-
bicycle.png);
  background-size:34px 21px;
```

```
}
.directionsBar .walking{

 background-image:url(../icons/icons-white/102-
walk.png);
  background-size:14px 27px;
}
.theaterAddress{
  padding-left:35px;

 background-image:url(../icons/icons-gray/193-
location-arrow.png);
  background-size:24px 24px;
  background-repeat:no-repeat;
}
.theaterPhone{
  padding-left:35px;

 background-image:url(../icons/icons-gray/75-
phone.png);
  background-size:24px 24px;
  background-repeat:no-repeat;
  height:24px;
}

#map_canvas { height:150px; }

@media only screen and
(-webkit-min-device-pixel-ratio: 1.5),
  only screen and (min--moz-device-pixel-ratio:
1.5),
  only screen and (min-resolution: 240dpi) {
    .directionsBar .driving{

 background-image:url(../icons/xtras-white/16-
car@2x.png);
    }
    .directionsBar .transit{

 background-image:url(../icons/xtras-white/15-
bus@2x.png);
    }
    .directionsBar .bicycle{

 background-image:url(../icons/xtras-white/13-
bicycle@2x.png);
    }
    .directionsBar .walking{

 background-image:url(../icons/icons-white/102-
walk@2x.png);
    }
    .theaterAddress{
```

```
 background-image:url(../icons/icons-gray/"193-
location-arrow@2x.png);
    }
    .theaterPhone{

 background-image:url(../icons/icons-gray/75-
phone@2x.png);
    }
  }
```

Next we'll add a few more global variables and functions to our current on-page scripts:

```
var directionData = null;
var directionDisplay;
var directionsService = new
google.maps.DirectionsService();
var map;

function showDirections(travelMode){
  var request = {
    origin:latitude+","+longitude,
    destination:closestTheater.geo.lat+","
      +closestTheater.geo.long,
    travelMode: travelMode
};

  directionsService.route(request,
    function(response, status){
      if (status ==
google.maps.DirectionsStatus.OK){
        directionsDisplay.setDirections(response);
      }
    });

  $("#directions").on("pagecontainershow",
    function(){
      directionsDisplay = new
google.maps.DirectionsRenderer();
      var userLocation = new
google.maps.LatLng(latitude, longitude);
      var mapOptions = {
        zoom:14,
        mapTypeId: google.maps.MapTypeId.ROADMAP,
        center: userLocation
      }
      map = new google.maps.Map(
        document.getElementById('map_canvas'),
mapOptions);
        directionsDisplay.setMap(map);
        directionsDisplay.setPanel(

 document.getElementById('directions-panel')
```

```
            );
            showDirections(
            google.maps.DirectionsTravelMode.DRIVING
        );
        $("#drivingButton").click();
    });
```

Here we see the global variables for holding the Google objects. The `showDirections()` method is made to take a string representing one of four different travel modes: `DRIVING`, `TRANSIT`, `BICYCLING`, and `WALKING`.

We could populate the map and directions at the same time we figure out which theater is closest. It would actually make for a great user experience. However, without analytics to show that the majority of people actually want directions, it makes no sense to incur the costs. Ultimately that is a business decision, but a company with a customer base of any size could get hammered with API costs. For now it seems best to trigger the loading of maps and directions when the users go to the **directions** page.

Geek out moment - GPS monitoring

Let's geek out for a minute. What we've done is probably good enough for most circumstances. We show a map and turn-by-turn directions, but let's take it a step further. The geolocation API does more than just determine your current location. It includes a timestamp (no biggie) and can allow you to continuously monitor the user's position using the `navigator.geolocation.watchPosition` method (http://dev.w3.org/geo/api/spec-source.html#watch-position). This means that with only a little bit of effort, we can turn our previous direction page into a continuously-updating directions page. In the example code, this is all contained within the `qrresponse2.php` file.

Updating the user's device too often could impact battery life. So we should really limit how often we redraw the map and directions. For each transportation mode, there is a difference in the amount of meaningful time needed between updates. While we're at it, let's re-do the buttons to contain these options. Here is the entire page's code:

```
<?php
  $documentTitle = "Dickinson Theatres";

  $headerLeftHref = "/";
  $headerLeftLinkText = "Home";
  $headerLeftIcon = "home";

  $headerTitle = "";

  $headerRightHref = "tel:8165555555";
  $headerRightLinkText = "Call";
  $headerRightIcon = "grid";

  $fullSiteLinkHref = "/";
?>
<!doctype html>
<html>
<head>
  <?php include("includes/meta.php"); ?>
  <script
type="text/javascript""src="http://maps.googleapis.com/maps/api/js ?"key=
</head>
<body>
  <div id="qrfindclosest" data-role="page">
    <div class="logoContainer ui-shadow"></div>
    <div role="main" class="ui-content">
      <div id="latLong">
```

```
        <form id="findTheaterForm"
action="fullshowtimes.php""method="get"
class="validateMe">
          <p>
            <label for="zip">Enter Zip
Code</label>
            <input type="tel" name="zip" id="zip"
class="required number"/>
          </p>
          <p><input type="submit" value="Go"></p>
        </form>
      </div>
      <p>
        <ul id="showing"
data-
role="listview""class="movieListings"
data-dividertheme="g">
        </ul>
      </p>
    </div>
    <?php include("includes/footer.php"); ?>
  </div>

  <div id="directions" data-role="page">
    <div data-role="header">
      <h3>Directions</h3>
    </div>
    <div data-role="footer">
      <div data-role="navbar"
class="directionsBar">
        <ul>
          <li>
            <a href="#" id="drivingButton"
"data-transMode="DRIVING" data-interval="10000">
              <div class="icon driving"></div>
            </a>
          </li>
          <li>
            <a href="#" id="transitButton"
"data-transMode="TRANSIT" data-interval="10000">
              <div class="icon transit"></div>
            </a>
          </li>
          <li>
            <a href="#" id="bicycleButton"
"data-transMode="BICYCLING" data-interval="30000">
              <div class="icon bicycle"></div>
            </a>
          </li>
          <li>
            <a href="#" id="walkingButton"
"data-transMode="WALKING" data-interval="60000">
              <div class="icon walking"></div>
            </a>
          </li>
```

```
        </ul>
      </div>
    </div>
    <div id="map_canvas"></div>
    <div role="main" class="ui-content"
id="directions-panel"></div>
  </div>
```

So, now let's look at the on-page scripts for this GPS monitoring edition:

```
  <script>
    //declare our global variables
    var theaterData = null;
    var timestamp = null;
    var latitude = null;
    var longitude = null;
    var closestTheater = null;
    var directionData = null;
    var directionDisplay;
    var directionsService = new
      google.maps.DirectionsService();
    var map;
    var positionUpdateInterval = null;
    var transporationMethod = null;

    //Once the page is initialized, hide the
manual zip form
    //and place a message saying that we're
attempting to find "their location.
    $(document).on("pagecreate",
"#qrfindclosest", function(){
      if(navigator.geolocation){
        $("#findTheaterForm").hide();
        $("#latLong").append("<p
id='finding'>Finding your location...</p>");
      }
    });

    $(document).on("pagecontainershow",
function(){
      theaterData = $.getJSON("js/theaters.js",
        function(data){
          theaterData = data;
          selectClosestTheater();
    });

      $("div.directionsBar a").click(function(){
        if(positionUpdateInterval !
= null){
          clearInterval(positionUpdateInterval);
        }
        var $link = $(this);
        transporationMethod =
$link.attr("data-
```

```
transMode");
        showDirections();
        setInterval(function()
{
          showDirections();
        },Number($link.attr("data-
interval")));
    });

    function showDirections(){
      var request = {
        origin:latitude+","+longitude,
          destination:closestTheater.geo.lat+","
          +closestTheater.geo.long,
        travelMode: transportationMethod
      }

      directionsService.route(request,
        function(response, status) {
          if (status ==
google.maps.DirectionsStatus.OK)"{ directionsDisplay.setDirections(respon
          }
      });
    }

    $(document).on("pagecontainershow",
function(){
      directionsDisplay = new
google.maps.DirectionsRenderer();
      var userLocation = new
google.maps.LatLng(latitude, longitude);
      var mapOptions = {
        zoom:14,
        mapTypeId: google.maps.MapTypeId.ROADMAP,
        center: userLocation
      }
      map = new
google.maps.Map(document.getElementById('map_canvas'),
mapOptions);
      directionsDisplay.setMap(map);
      directionsDisplay.setPanel(

 document.getElementById('directions-panel'));
      if(positionUpdateInterval == null) {
        transportationMethod = "DRIVING";
        positionUpdateInterval = setInterval(function(){
          showDirections();
        },(10000));
      }
      $("#drivingButton").click();
  });

  function selectClosestTheater(){
      var
watchId=navigator.geolocation.watchPosition(
```

```
        function(position){ //success
        latitude = position.coords.latitude;
        longitude = position.coords.longitude;
        timestamp = position.timestamp;
        var dt = new Date();
        dt.setTime(timestamp);

        for(var x = 0; x <
theaterData.theaters.length; x++){
          var theater = theaterData.theaters[x];
          var distance = getDistance(latitude,
longitude,
            theater.geo.lat, theater.geo.long);
          theaterData.theaters[x].distance =
distance;      }


 theaterData.theaters.sort(compareDistances);
        closestTheater = theaterData.theaters[0];

        $("#latLong").html("<div
class='theaterName'>"
          +closestTheater.name
          +"</div><p class='theaterAddress'>"<a
href='#directions'>"
          +closestTheater.address+"<br/>"
          +closestTheater.city+", "
          +closestTheater.state
          +" "+closestTheater.zip
          +"</a></p><p class='theaterPhone'><a
href='tel:"
          +closestTheater.phone+"'>"
          +closestTheater.phone+"</a></p>"
        );

        $("#showing").load("fullshowtimes.php
#showing li",
          function(){
            $("#showing").listview('refresh');
        });
      }
    },
    function(error){ //error
     $("#findTheaterForm").show();
     $("#finding").hide();
     switch(error.code) {
       case error.TIMEOUT:
         $("#latLong").prepend("<div
class='ui-bar-
b'>"Unable to get your position: Timeout</div>");
         break;
       case error.POSITION_UNAVAILABLE:
         $("#latLong").prepend("<div
class='ui-bar-
```

```
b'>"Unable to get your position: Position
unavailable</div>");
          break;
      case error.PERMISSION_DENIED:
        $("#latLong").prepend("<div
class='ui-bar-
b'>"Unable to get your position: Permission
denied."You may want to check your
settings.</div>");
          break;
        case error.UNKNOWN_ERROR:
          $("#latLong").prepend("<div
class='ui-bar-
b'>"Unknown error while trying to access your
position.</div>");
          break;
      }
  });
}
</script>
</body>
</html>
```

Linking and embedding video

Previews are a staple in the movie industry. We could simply link directly to the previews on YouTube as many do. Here's a simple way to do it:

```
<p><a data-role="button"
href="http://www.youtube.com/watch?
v=J9DlV9qwtF0">Watch Preview</a></p>
```

That will work but the problem is that it takes the user away from your site. While that may not be the end of the world from a user's perspective, it's a big e-commerce no-no.

So, in order to improve the experience and keep the user on our own site, let's directly embed the HTML5 video and use the universal image for movie previews as we have depicted here.

Despite the fact that it looks like this will play in a teeny tiny segment of the page, on smartphones, the video will play in fullscreen landscape mode. The story is a little different on the iPad, where it will play inline at the embedded side.

Ultimately we'd like to push the right sized video back to the user for their device using the following code. Smartphones without high-resolution displays aren't exactly going to benefit from a 720 pixel video:

```
<video id="preview" width="100%"
controls"poster="images/preview.gif">

  <source src="previews/batmanTrailer-2_720.mp4"
type="video/mp4" "media="only screen and
(-webkit-min-device-pixel-
ratio: 1.5),"only screen and
(min--moz-device-pixel-
ratio: 1.5),"only screen and (min-resolution:
240dpi)"/>

  <source src="previews/batmanTrailer-1_480.mov"
type="video/mov" />

  <a data-role="button"
href="http://www.youtube.com/watch?
v=J9DlV9qwtF0">W atch Preview</a>

</video>
```

If the browser recognizes the HTML5 video tag, the player will start at the top and look through each source tag until it finds one that it knows how to play and matches the right media query (if media queries have been

specified). If the browser does not support HTML5 video, it will not know what to do with the video and source tags, and simply consider them to be valid XML elements. They will be treated like extraneous `div` tags and the link button will be displayed.

As you can see, we've added media queries here to different sources. If it's a high-resolution screen we'll load a prettier video. You could really geek out here by adding lots of different sources: a 480 pixel video for the average smartphone, a 720 pixel video for the iPhone and early iPads, and a 1080 pixel video for the third generation iPad. The only word of caution here is that even though the Apple Retina Display is capable of showing a much more beautiful video, it still has to come over the same pipes. Loading a smaller video might still be better because it will play sooner and cost the customer less bandwidth.

Let's add a little more CSS to this picture. We're leaving the width at 100 percent of whatever is containing it. On smartphones, the picture ratio will scale properly as the width increases; the iPad, not so much. So, let's detect its screen resolutions using media queries and give it an explicit height that will take better advantage of the real estate.

```
 /* iPad ----------------*/ @media only screen
and (min-device-width: 768px) and
(max-device-width: 1024px) {
  #preview{ height:380px;}
}
```

Summary

We've explored the boundaries of modern media on smartphones. You can now brainstorm on the uses and take advantage of QR codes, find out where the user is, monitor the user's position, get directions and maps from Google, and feed responsive videos to the user.

Think about all you have just learned. How hard would it be to create a socially connected website that would allow users to get maps to each other's positions that continue to update as they move closer or further apart. It could be valuable if packaged and marketed properly.

In the next chapter, we're going to leverage GPS to pull tweets within your geographic area. We'll also look at pulling feeds from several other sources such as reddit, RSS feeds, and suchlike. It's going to be a lot of fun. It was one of my favorite chapters to write.

Chapter 5. Client-side Templating, JSON APIs, and HTML5 Web Storage

We've come a long way already and we've got some pretty hefty default templates and boilerplates for business. In this chapter, we're going to simplify and focus on some other things. We are going to create an aggregating news site based off social media. Until now, we've paid close attention to progressive enhancement. For this chapter, we leave that behind. This will require JavaScript.

In this chapter you will learn the following:

- Client-side templating options
- JsRender
- Patching into JSON API (Twitter)
- Programmatically changing pages
- Generated pages and DOM weight management
- Leveraging RSS feeds (natively)
- HTML5 Web Storage
- Leveraging the Google Feeds API

Client-side templating

(In a grumpy old man's voice) Back in my day, we rendered all the pages on the server, and we liked it! Times are changing and we are seeing a massive ground swell in client-side templating frameworks. At their heart, they're pretty much all the same; in that they take JSON data and apply an HTML based template contained within a script tag.

If you know what JSON is, skip this paragraph. I spent a little time last chapter discussing this, but just in case you skipped ahead and don't know, JSON is JavaScript written in such a way that it can be used as a data exchange format. It's more efficient than XML and can be read natively by all modern web browsers. Web browsers can even request JSON data across domains using **JSONP**, or JSON with padding. For more on JSON, read http://en.wikipedia.org/wiki/JSON. For more on JSONP, read http://en.wikipedia.org/wiki/JSONP. Bear in mind that the responding server needs to allow JSONP or this won't work.

All these client-side libraries have some sort of notation in them to show where the data goes and gives ways to implement looping and conditionals. Some are logic-less and operate on the philosophy that there should be as little logic as possible. If you subscribe to this wonderfully academic

approach, good for you. From a purely pragmatic perspective, I believe that the JavaScript template is the perfect place for code. The more flexible, the better. JSON holds the data and the templates are used to transform it. To draw a parallel, XML is the data format and XSL templates are used for transformation. Nobody whines about logic in XSL and so, I don't see why it should be a problem in JS templates. But all of this discussion is purely academic. In the end, they'll pretty much all do what you're looking for. If you're more of a designer than a coder, you may want to look more at the logic-less templates.

Following is a list of popular client-side templating frameworks; I'll probably miss a few and there will inevitably be more by the time this book gets published, but it's a start:

- `Chibi.js`
- Closure templates
- `Dust.js`
- Embedded JavaScript (EJS)
- `Handlebars.js`
- `Hogan.js`
- Jade
- JsRender
- Mustache
- Nunjucks
- `T.js`
- Underscore templates
- `doT.js`
- `templayed.js`

Note

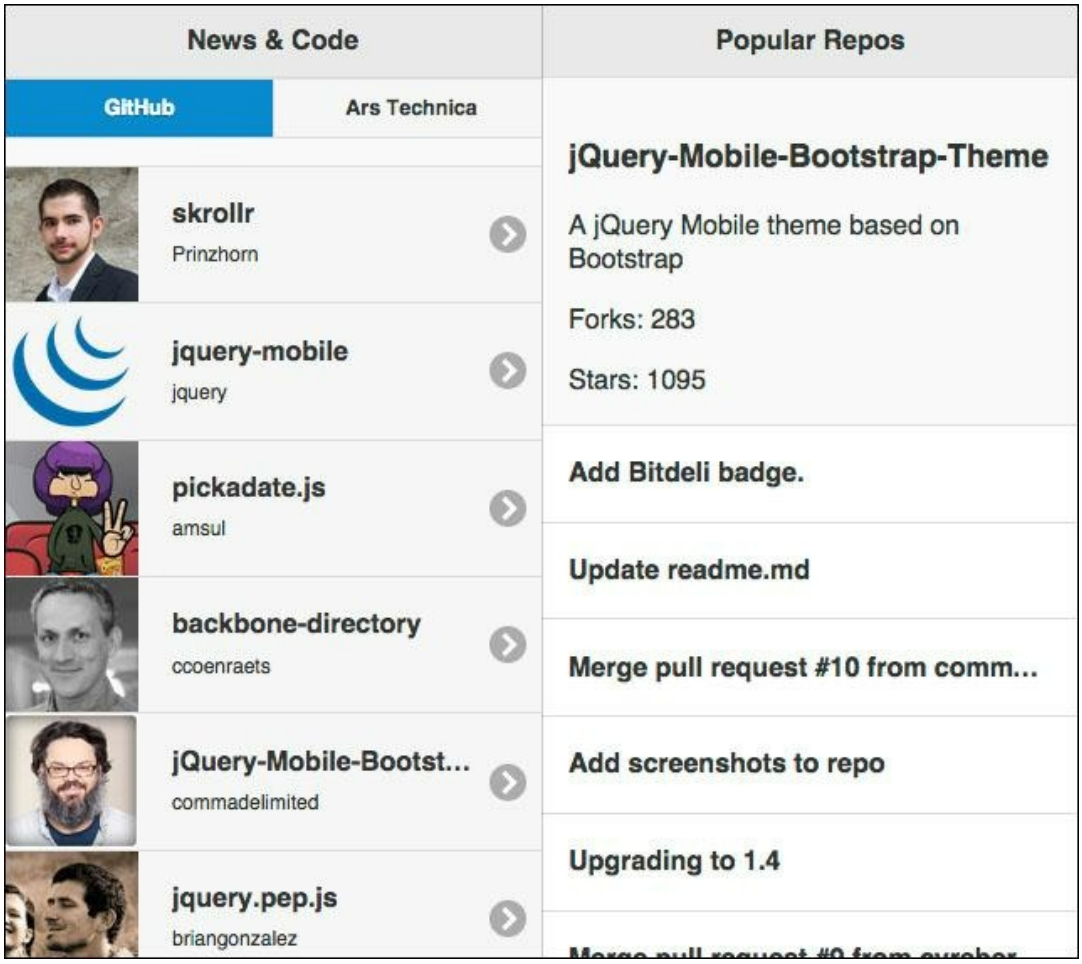
Notably absent is the jQuery template library. Sadly, shortly after learning to love it, the jQuery team abandoned the project and pointed people to JsRender as the continuation of the project.

Whether that will be the continued direction in the future is another question, but, in the mean time, the features and power of JsRender make it a compelling offering and the basis for template work for the rest of this chapter. Not to mention, it's only 14K minified and fast as lightning. You can download the latest edition from https://github.com/BorisMoore/jsrender.

Patching into JSON APIs (GitHub)

It's always interesting to visit GitHub to check out popular repositories. GitHub, like so many other popular online destinations, has a JSON API.

Let's build a simple application which lets us view the most popular jQuery Mobile repositories. You can see the list view containing repositories on the left side and the details view on the right side.



The following code is our starting base page, `index.html`. It can be found in the code bundle for this chapter. It contains the jQuery Mobile page definition, along with a single JsRender template; identified with a `text/x-jsrender` type. The code is:

```
<!doctype html><html><head>
<meta charset="utf-8">
<meta name="viewport"
content="width=device-
width, initial-scale=1, maximum-scale=1.0,
user-scalable=no">
<title>Chapter 5 - Repos</title>
```

```
<link rel="stylesheet"
href="css/jquery.mobile-
1.4.5.css" /><script
src="js/jquery-1.10.2.js"></script>
<script src="js/jsrender.min.js"
type="text/javascript"></script>
<script src="js/jquery.mobile-1.4.5.js"></script>
<script src="js/application.js"></script>
<style>  .ui-content .ui-listview {   margin-top:
0;}
</style>
</head>
<body>
<div id="repo_listing" data-role="page">
<div data-role="header"><h1>Popular
Repos</h1></div>
<div role="main" class="ui-content">
<ul id="results" data-role="listview"
data-dividertheme="b"></ul>
</div>
</div>
<script id="repositories" type="text/x-jsrender">
<li class="trendingItem">
<a
href="repo.html?
owner={{>owner.login}}&repo={{>name}}"
class="githubSearch" data-search="{{>name}}">
<img src="{{>owner.avatar_url}}"></img>
<h3>{{>name}}</h3>
<p>{{>owner.login}}</p>
</a>
</li>
</script>
</body>
</html>
```

The following code, found at the top of the `js/application.js` file, is the processing core of the `index.html` file:

```
$(document).on("pagecontainerbeforeshow",
function()
{    var repoUrl =
'https://api.github.com/search/repositories?
q=jquery
+mobile&sort=s tars&order=desc';
$.getJSON(repoUrl)        .done(function(data){
        var context = data.items, template =
$("#repositories").render(context);

 $("#results").html(template).listview("refresh");
});});
```

Normally, to pull data into a web page, you are subject to the same-domain policy even when you're pulling JSON. However, if it's coming from another domain, you'll need to bypass the same-domain policy. To bypass the same-domain policy, you could use some sort of server-side proxy such as PHP's **cURL** (http://php.net/manual/en/book.curl.php) or the Apache HTTP core components (http://hc.apache.org/) in the Java world.

In GitHub's case, they allow JavaScript to make requests directly to their API using **Cross Origin Resource Sharing** (**CORS**), (https://developer.mozilla.org/en-US/docs/Web/HTTP/Access_control_CORS). CORS defines a way in which the browser and the server can interact to determine whether or not to allow the cross-origin request. CORS allows servers, via additional HTTP headers, to describe the set of origins that are permitted to read that information using a web browser. Luckily GitHub has robust support for CORS and allows AJAX requests to be made with zero modifications to our code. That's convenient for us!

Because we know GitHub's API will respond with JSON, we can use jQuery's `$.getJSON()` method which will perform the GET request and parse the JSON for us. Handy, isn't it? Upon receiving the data from GitHub, we whittle down the response to the part we want and pass that array into JsRender for, well, rendering. It may seem more simple to just loop through the JSON and use string concatenation to build your output; but take a look at the following template and tell me that's not going to be a lot cleaner to read and maintain:

```
<script id="repositories" type="text/x-jsrender">
  <li class="trendingItem">
    <a
href="repo.html?
owner={{>owner.login}}&repo={{>name}}"
class="githubSearch" data-search="{{>name}}">
      <img src="{{>owner.avatar_url}}"></img>
      <h3>{{>name}}</h3>
      <p>{{>owner.login}}</p>
    </a>
  </li>
</script>
```

The `text/x-jsrender` type attribute on the script will ensure that the page does not try to parse the inner contents as JavaScript. Since we passed in an array to JsRender, the template will be written for every object in the array. After putting this code in place, you should be able to load up the `index.html` file in a browser window and see a list of jQuery Mobile repositories. But we wanted to be able to dive into one of them didn't we?

Open up the `repo.html` file containing the code to view the details of a repository.

Passing query params to jQuery Mobile

The functionality in the `repo.html` file is much the same as the `index.html` file; (page definition and JsRender templates) so it's the differences we'll focus on. Clicking on any link within the `index.html` file opens that specific repository, along with its most commit activity. jQuery Mobile has built in the ability to pass URL parameters between pages. Let's see how that works. Notice that in the JsRender template for the `index.html` file, we're defining `owner`, and `repo` parameters:

```
<a
href="repo.html?
owner={{>owner.login}}&repo={{>name}}"
class="githubSearch" data-search="{{>name}}">
```

This matches up with the information GitHub needs to retrieve repository details.

These URL parameters are accessed by jQuery Mobile and stored as a data attribute on the current page. They can be accessed like:

```
$(this).data('url')
```

If you open the `application.js` file you can see where we're referencing those query params and passing them through a helper method to convert them into usable key/value pairs. The object containing those pairs is then passed as context into a JsRender template which returns the URL of the GitHub repository selected by the user on the `index.html` file.

Note

These are simple implementations. Check out http://borismoore.github.com/jsrender/demos/ for more detail on creating more complex templates. This is a rapidly changing library, so don't be surprised if, by the time you read this, there are a lot more options and slightly changed syntaxes.

Programmatically changing pages

With the release of jQuery Mobile 1.4.x, the way you changed pages programmatically changed. Prior to 1.4.x, you used the `$.mobile.changePage` function. Now, it's much simpler:

```
$('body').pagecontainer('change', "container id
or url");
```

In our case, we'll use the following line:

```
$('body').pagecontainer('change',
"#ars"+storyIndex);
```

Generated pages and DOM weight

In the normal course of events while surfing traditional mobile sites, jQuery Mobile will mark each page as the external page, which will cause the page to be removed from the **Document Object Model** (DOM) once the user navigates away from that page. The idea behind this is that the browser will manage DOM weight because low powered devices may not have as much memory to dedicate to their browsers. External pages will likely still be in the device cache for quick recall. So reloading them should be lightning fast. If you want to learn more about how jQuery Mobile handles this behavior, check out http://api.jquerymobile.com/page/#option-domCache.

jQuery Mobile has done a great job at managing DOM weight through normal means. However, when we dynamically create pages, they are not automatically deleted from the DOM on exit. This can become especially overwhelming if there are a lot of them. We could easily overwhelm the browsers on those low powered devices. If a dynamically-created page is likely to be viewed again within a session, then it may well be worth leaving in the DOM. However, since we're generating it in the browser to begin with, it's probably safer and faster to just re-render the page.

Leveraging RSS feeds

What can I say? My editors made me do it. I hadn't initially planned on building anything around **Really Simple Syndication** (**RSS**). I'm glad they made me do this because after looking around, there's a lot more information out there being fed by RSS, than by JSON feeds. I figured the digital world had advanced a little more than it really had.

First things first. If we don't use a server-side proxy, we will crash right into the unforgiving wall of the same-origin policy. Examples include cURL in PHP systems, Apache HTTP core components in Java, or something like the HttpWebRequest parameter on .NET.

Following is the page created in PHP to grab the Ars Technica feed and output the XML.

1. The source for this file is in the `ars.php` file in the chapter code bundle.

```
<?PHP
    $url =
"http://feeds.arstechnica.com/arstechnica/index?
format=xml" ;
    $response = file_get_contents($url);
    print_r($response);
?>
```

2. Next, let's add some buttons to the top; one for GitHub, and one for Ars Technica. The final source for this next part will be in the `index.html` file in the code bundle for the chapter:

```
<div data-role="header"><h1>News &amp;
Code</h1></div>
<div data-role="footer">
  <div data-role="navbar">
    <ul>
      <li><a id="github" href="#"
class="ui-btn-active">GitHub</a></li>
      <li><a id="ars" href="#">Ars
Technica</a></li>
    </ul>
  </div>
</div>
<div role="main" class="ui-content">
  <ul id="results" data-role="listview"
data-dividertheme="b"></ul>
</div>
```

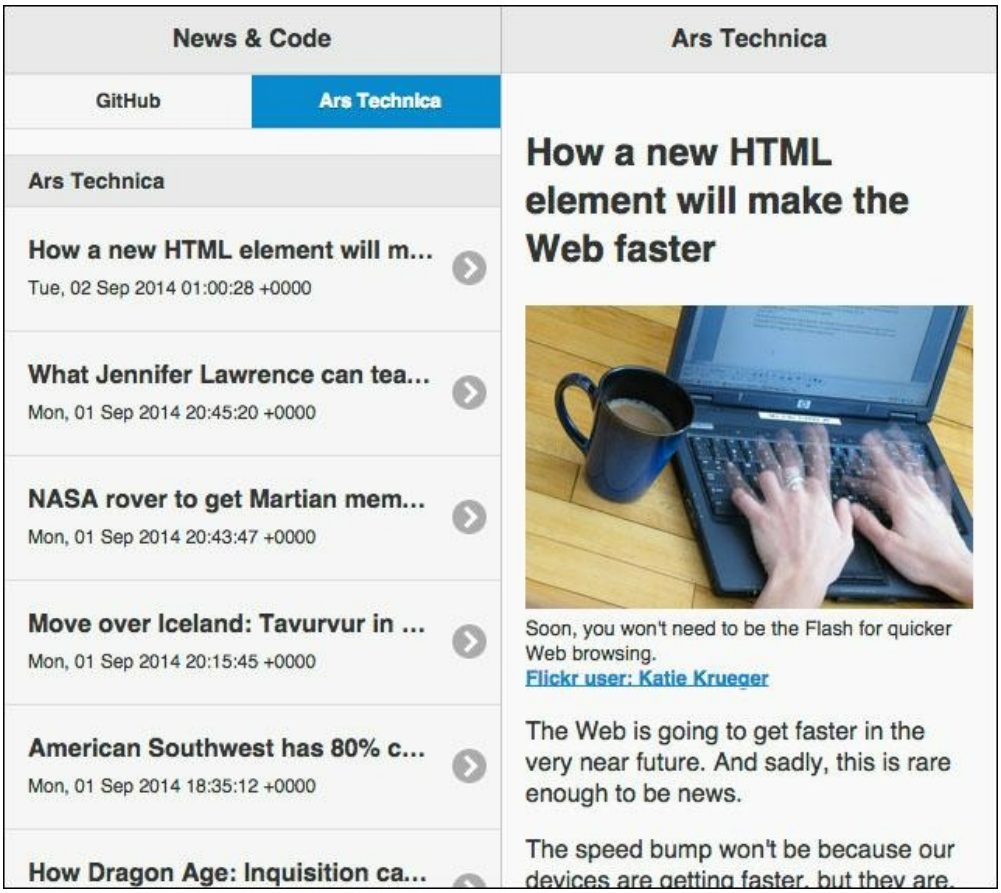
3. Next, let's add the script used to load the Ars feed to the `application.js` file:

```
$(document).on('click', '#ars', loadArs);

function loadArs(){
    //scroll back up to the top
    $.mobile.silentScroll(0);

    //Go get the Ars Technica feed content
    $.ajax({
        url: "ars.php",
        dataType:"xml",
        success: function(data, textStatus,
jqXHR) {
            //Store the response for later use
            localStorage.setItem("ars",
jqXHR.responseText);

            //prepare the content for use
            var $feed = $(data);

            //prepare a list divider with the
title of the feed.
             var listView = "<li
data-role='list-divider'>"+
$feed.find("channel>title").text()+"</li>";

            //loop through every feed item and
            //create a listview element.

 $feed.find("channel>item").each(function(index)
{
                var $item = $(this);
                listView += "<li><a
href='javascript://' "
                    +"data-storyIndex='"+index
                    +"' class='arsFeed'><h3>"

 +$item.find("title").text()

 +"</h3><p>"+$item.find("pubDate").text()
                    +"</p></a></li>";
            });

            //put the new listview in the
main display

 $("#results").html(listView).listview("refresh");

            //place hooks on the newly
created links
            //so they trigger the display of
the
            //story when clicked
            $("#results
a.arsFeed").click(function(){
```

```
                //get the feed content back
out of storage
                var arsData =
localStorage.getItem("ars");

                //figure out which story was
clicked and
                //pull that story's content
from the item
                var storyIndex =
$(this).attr("data-storyIndex");
                var $item =

 $(arsData).find("channel>item:eq("+storyIndex
+")");
                //create a new page with the
story content
                    var storyPage = "<div
id='ars"+storyIndex+"' "
                    +"data-role='page'
data-add-back-btn='true'>"
                    +"<div
data-role='header'><h1>Ars Technica</h1>"
                    +"</div><div role="main"
class="ui-content" ><h2>"

 +$item.find('title').text()+"</h2>"

 +$item.find('content\\:encoded').html()
                    +"</div></div>";

                //append the story page to
the body
                $("body").append(storyPage);

                //find all the images in the
newly
                //created page.
                $("#ars"+storyIndex+"
img").each(function(index, element) {
                    var $img = $(element);
                    //figure out its
currentWidth
                    var currentWidth =
Number($img.attr("width"));
                    //remove any explicit
width and height
                    //make the image scale to
the width
                    $img.removeAttr("width
height")

 .css({"max-
width":currentWidth +"px","width":"100%"});
```

```
                    });

                    //switch to the new page

 $('body').pagecontainer('change',
"#ars"+storyIndex);
                });
            }
        });
}
```

4. Here's what our new feed reader looks like:



Forcing responsive images

When you're importing from a page where you have no control over the images embedded in the content, you may have to tweak them to get it to look right in mobile. As in the previous example, I've found it's best to remove the explicit width and heights on the image itself and use CSS to make it fill 100 percent of its current container. Then use a CSS `max-width` property to ensure the image is never scaled beyond its original intended size.

While not truly being responsive in terms of loading a different size of the image that is appropriate for the resolution, based on media queries, we've accomplished the same visible effect with the limited resources at our disposal for cases like this.

HTML5 Web Storage

HTML5 Web Storage is ridiculously simple if you haven't messed with it already. If you have, skip to the next paragraph. There are only two forms of web storage:

- `localStorage`: It will store the information indefinitely.
- `sessionStorage`: It will store only for the length of a single session.

> **Note**
>
> It's a simple key/value paired system. Everything is string-based. So you'll need to convert the values to other formats as needed, once you've extracted them back out of storage. Check out http://www.w3schools.com/html/html5_webstorage.asp.

Now, this gets interesting with the definition of session. Do not confuse the session on your server with the browser session. The user session on your server might be set to expire within 20 minutes or so. However, just because your server session has expired, doesn't mean that your browser knows anything about that. HTML5 session storage will persist until the browser is actually closed.

This gets especially tricky on mobile browsers. In both, Android and iOS, when you switch tasks or press the **home** button, the browser doesn't actually close. In both cases, you have to actually use the task killer functions to completely close the browsers. This is something that the end user might not actually do on their own.

But what's the big deal about web storage? Why not just use cookies to store information of the client? After all, it will work with everyone, right? Yes, cookies will work for everyone. However, they were never meant to store massive amounts of data, like we're using in this example, and there is a soft limit to the number of cookies you can even store per domain (anywhere from 20-50 depending on the browser).

> **Note**
>
> The worst part about trying to use cookies for client-side storage is that they are sent back to the server as part of the request for every single asset served from that domain. That means that every CSS, JavaScript, image, and page/AJAX request will carry every cookie with its payload. You can see how this could quickly start to degrade your performance.

Adding one cookie could result in that data's transmission many times, just to render a single page.

Browser-based databases (work in progress)

Browser-based databases are in a state of extreme flux right now. There are actually two different standards available at the moment. The first is **Web** SQL Database (http://www.w3.org/TR/webdatabase/). You could use it, but, according to the W3C, this spec is no longer active. Many browsers have implemented Web SQL Database, but how long will it be around?

The W3C has, instead, stated that the direction for database on the browser will be Indexed Database (http://www.w3.org/TR/IndexedDB/). The working draft has editors from Microsoft, Google, and Mozilla; so, we can expect broad support in the future. The problem here is that the working draft was published May 24, 2012. As of the time of writing this chapter, only Firefox, Chrome, and Internet Explorer 10 are supporting **IndexedDB** (http://en.wikipedia.org/wiki/Indexed_Database_API).

JSON to the rescue

For now, we find ourselves in a terrible position of either using a doomed database, or waiting for everyone to catch up with the new spec. Web Storage looks like the only safe bet in the near future. So, how can we best leverage that? With JSON, of course! All major browsers support JSON natively.

Think about the way we've always had to deal with relational databases in the past. As object-oriented programmers, we've always done our query and then taken the results data and turned it into an object in memory. We can do almost the exact same thing by simply storing JSON directly to a key in Web Storage by using the `JSON.stringify()` method.

Here is an example to test if your system natively supports JSON (the source is the `jsonTest.html` file in the chapter code bundle):

```
<!doctype html>
<html>
<head>
  <title>JSON Test</title>
</head>
<body>
<script>

  var myFeedList = {
    "lastUpdated":"whenever",
```

```
    "feeds":[
    {
       "name":"ars",
"url":"http://feeds.arstechnica.com/arstechnica/index?
format=xml"
    },
    {
      "name":"rbds",
      "url":"http://roughlybrilliant.com/rss.xml"
    }
    ]
  }

myFeedList.lastUpdated = new Date();

localStorage.feedList =
JSON.stringify(myFeedList);

var myFeedListRetrieved =
JSON.parse(localStorage.feedList);
alert(myFeedListRetrieved.lastUpdated);
</script>
</body>
</html>
```

If all is well, you'll see an alert containing a timestamp.

If, for some reason, you find yourself in the unlucky position of having to support some massively out-of-date system (Windows Phone 7 and BlackBerry 5 or 6, I'm looking at you), go get the `json2.js` file from https://github.com/douglascrockford/JSON-js and include it with your other scripts. Then you'll be able to stringify and parse JSON.

Summary

You have been presented with a very wide array of choices for client-side templating. At this point, you now know how to leverage JSON and JSONP and combine them effectively to create pages on the fly. RSS should present no real challenge to you at this point either.

In the next chapter, we'll combine some of these techniques as we continue to build our technical tool chest and turn our eyes to HTML5 Audio.

Chapter 6. Automating Your Workflow with Grunt

We've accomplished a lot in the last few chapters, but now we're going to pause for a moment and think about our workflow and process. For websites these days, it's not enough just to write JavaScript and CSS; it needs to be lean and mean, and as small as possible, so as to be accessible to the largest number of devices. There's also an increasing amount of work which needs to be done to make that possible (processes such as concatenation, minification, and linting). These are the stock in trade of the modern web developer. Grunt, a JavaScript based task runner, makes automating these tasks much easier and pain free. Let's find out more.

In this chapter, you will learn the following:

- Installing Grunt via Node.js
- Configuring your project for Grunt
- Common Grunt plugins and how to use them

Introducing Grunt - a JavaScript task runner

Grunt is a relative newcomer to the make scene. It was created by Ben Alman (`@cowboy`) (https://github.com/cowboy) and released to the world in March 2012 (http://bocoup.com/weblog/introducing-grunt/) and is currently on version v0.4.5. Grunt uses a plugin style architecture, which exports specific paths and variables out to the various plugins, so that they can all work in sync, similar to Node's ecosystem. Its original purpose was to automate the tasks of linting code, running unit tests, concatenating JavaScript files, and minifying those files: basically everything that web developers were doing by hand.

"After a lot of experimentation and failed attempts, I learned that writing and maintaining a suite of "javascript build process" tasks in a gigantic, monolithic Makefile / Jakefile / Cakefile / Rakefile / ?akefile that was shared across all my projects was overwhelming, especially considering how many projects I have. That approach just wasn't going to scale to meet my needs."

--Ben Alman

So, Grunt was created, and the job of web developers would become much, much simpler.

Installing Grunt

The first thing you need to know about Grunt is that it's built atop Node.js. This allows Grunt to be truly cross-platform; it's equally at home on Mac, Nix or Windows. Some plugins might not play well with different operating systems, but Grunt, and its associated official plugin set, will all work just fine. Before you can install and begin using Grunt, you'll first need to install the Node.js . If you're a web developer already, there's a really good chance you already have Node. If you know that you have Node.js, then you can skip the next section. If you're not sure, read on and find out.

A brief aside about Node.js

If you've been involved in the web development scene any time in the last 3-4 years, then there's a good possibility you've heard about Node.js. It's a hot topic, and for good reason. Node.js brings server-side functionality to traditional web developers. Node.js is an open source, cross-platform runtime engine, built to run JavaScript on the web server, rather than the web browser. It's fast, scalable, and useful for a wide range of web applications.

Installing Node.js

Before you go through the trouble of trying to install Node, let's check if your system has it. Open the terminal application on your operating system and type the appropriate command:

- OS X or Linux: The `which node` command
- Windows: The `where.exe node` command

If it turns out that you have Node, let's make sure you're using a recent enough version. Grunt versions 0.4.x and up require Node 0.8.0 or higher. Go back to the terminal and type the `node -v` command to check your version. If you're using a new enough version, skip to the next section. If you don't have Node, or have an older version, then continue reading this:

- **Installing Node.js via Nodejs.org**: The simplest way to download Node is to get it directly from the Node.js website (http://nodejs.org/). You should see an **INSTALL** button on the home page which, when clicked, will deliver the correct binary for your operating system. Download and install that binary, then skip on to the next section when you're finished.
- **Installing Node.js via Homebrew (OS X)**: If you're using OS X, and for some reason downloading the Node package from the website isn't desirable, you can also install Node via Homebrew

(http://brew.sh/). We won't go through the steps to install Homebrew, but you can install Node with a single `brew install node` command.
- **Installing Node.js via Chocolatey or Scoop (Windows)**: If you're a Windows user, never fear; you have package managers as well. You can install Node via Chocolatey (https://chocolatey.org), or Scoop (http://scoop.sh/). Use the `choco install node` command or the `scoop install nodejs` command.
- **Installing Node.js for Linux users**: There are so many distributions of Linux, and so many different package managers that it would be difficult to list them all. It's a safe bet that if you're using Linux, you know which package manager to use, and how to use it. Pick your favorite one and install Node, following its instructions.

Installing Grunt using NPM

Now that you've got Node.js on your machine, it's time to install Grunt. This is a simple process, but worth calling out. All recent installations of Node.js ship with software called **Node Package Manager** (**NPM**). Just like Homebrew, or Chocolatey, it allows you to install Node modules into your project with a single `npm install <module-name>` command.

You can find modules for your project by using the search functionality on the NPM website (https://www.npmjs.org/) or by searching NPM using the `npm search <search term>` command via your terminal. After finding the module you'd like to install, the `npm install <module-name>` command will download that package into your current project folder. NPM also offers a global `install` flag, which allows packages like Grunt to also be used as command line tools (just like NPM itself). We'll take advantage of that in just a moment.

NPM packages are enumerated using a special file called `package.json`. Let's walk through the process of creating a `package.json` file for your project. Begin by browsing to your project's root folder in your shell, then typing the `npm init` command. You'll be presented with a wizard that starts off with text similar to this:

```
This utility will walk you through creating a
package.json file.
It only covers the most common items, and tries
to guess sane defaults.
See `npm help json` for definitive documentation
on these fields and exactly what they do.
Use `npm install <pkg> --save` afterwards to
install a package and save it as a dependency in
the package.json file.
Press ^C at any time to quit.
name:
```

The wizard will you ask you a series of questions about your project, such as name, version, author, repository, etc. Answer them as desired, then hit **OK** when you're satisfied. In your project folder, you'll notice your first `package.json` file. It should look something like this:

```
{
  "name": "My awesome website",
  "version": "0.0.1",
  "description": "The most awesome website ever",
  "author": "Andy Matthews",
}
```

Tip

Windows users, be aware. The `npm init` command has issues on your operating system. You might need to run the command as administrator. Additionally, you might be required to manually create a folder as part of the process. See this Stack Overflow post for details: http://goo.gl/WZSHJp.

After creating your `package.json` file, it's finally time to install Grunt. Remember that global flag from earlier? Grunt actually has two components. One, the command line tools, gets installed globally and will allow us to begin commands with the `grunt` keyword. Type the `npm install -g grunt-cli` command and let NPM work its magic. This will only need to be run a single time.

Next, type the `npm install grunt -save` command to install Grunt into your project; this is the second component and will need to be run for each distinct project. The first portion of this command installs Grunt into a folder called `node_modules`, while the second portion tells NPM to modify your `package.json` file; adding (or updating) a section called `dependencies`. The `dependencies` section includes the package name, and version, and can also be updated manually:

```
{
  "name": "My awesome website",
  "version": "0.0.1",
  "description": "The most awesome website ever",
  "author": "Andy Matthews",
  "dependencies": {
    "grunt": "~0.4.5"
  }
}
```

You can install every package listed in your `package.json` file with a single `npm install` command.

Now that you're finished with the installation, let's put Grunt through its paces.

Configuring Grunt

As mentioned previously, Grunt is a task runner, and has a healthy ecosystem of tasks in the form of plugins. Each Grunt plugin (task) is actually an NPM module and can be identified and installed in the same manner as installing Grunt itself. You can find a listing of Grunt plugins on the Grunt website (http://gruntjs.com/plugins), where there are currently 4,116 plugins available for you.

You tell Grunt what to do by using a Gruntfile, literally `Gruntfile.js`, in your project root. The most basic Gruntfile looks something like this:

```
module.exports = function(grunt) {

    grunt.initConfig({
        pkg: grunt.file.readJSON('package.json')
    });

    grunt.registerTask('default', []);
};
```

The outer portion is a wrapper function, while the inner portion is your Grunt config, the part that contains references to each task you plan on using. The Grunt config block will mainly contain task definitions but can contain any arbitrary properties you might need.

The final line allows you to register a default task; what you want to happen when you simply type the `grunt` command on the command line. If you save these lines to the `Gruntfile.js` file, you should be able to type the `grunt` command and see the output `Done, without errors`.

Common tasks and their plugins

So, what can Grunt do for you? In addition to the large number of community created plugins, Grunt has a series of officially created plugins for most common tasks. In this section, we'll examine a few of them, and review their options and configurations.

Concatenation using grunt-contrib-concat

Concatenation refers to the process of merging two distinct files into a single file. This is quite useful when you have multiple JavaScript files and you want to merge them into one. This reduces the number of HTTP requests made to your website and speeds up load times. Grunt's `concat` plugin is fast, flexible, and makes combining files a snap. The steps are as follows:

1. Go ahead and install the plugin using the `npm install grunt-contrib-concat –save` command, saving the reference to your `package.json` file.
2. Then, open up your Gruntfile and add the following line to the top of your Gruntfile, just preceding the `grunt.initConfig` block:

```
grunt.loadNpmTasks('grunt-contrib-concat');
```

   This line tells Grunt to look for this package in the `node_modules` folder and import it. A basic concat configuration will look like this:

```
concat: {
    dist: {
        src: ['js/file-01.js',
'js/file-01.js'],
        dest: 'build/application.js',
    },
}
```

3. Add the previous code block immediately after the `pkg` definition in your Gruntfile. Save it, then type the `grunt concat` command in your terminal. You should see the following output:

```
Running "concat:dist" (concat) task
File build/application.js created.
Done, without errors.
```

   You might note something odd about the first line; `concat:dist` appears instead of simply `concat`. Some Grunt plugins allow each task to contain multiple definitions, or targets. These are called multitasks, and allow you to utilize the same plugin to perform multiple iterations of the same task.

   You can even have a second concat task that concatenates a file created by the first task (more on that later). You can also call this target directly from the terminal as well. Try it out. Type the `grunt concat:dist` command and you'll get the same output. The target can be any arbitrary string: dist, build, make, etc.

> **Note**
>
> Calling the task without passing a target will cause Grunt to run all available targets.

The `concat` plugin has several useful options, which are listed as follows:

- `separator`: Concatenated files will be joined together using this string. It defaults to a new line.
- `banner`: A string which is added to the beginning of the outputted file. This is useful for copyright info. It defaults to an empty string.
- `footer`: A string which is added to the end of the outputted file. It defaults to an empty string.
- `nonull`: If you pasted in the config block, saved it and ran it without changes, you might have noticed something else: Grunt didn't throw an error when it encountered a missing file. In fact, it ignored missing files on purpose. It defaulted to false.

Each target can use each of these options, based on your needs:

```
concat: {
    options: {
        banner: '/* <%= pkg.name %> - v<%=
pkg.version %> - ' +
        '<%= grunt.template.today("yyyy-mm-dd")
%> */',
    },
    dist: {
        src: ['js/file-01.js', 'js/file-01.js'],
        dest: 'build/application.js',
    },
}}
```

This example implements a really nice feature of Grunt, dynamic strings. Within strings, any property name can echo a variable by placing it inside the `<%= pkg.name %>` tag. This can also be used for file names, both input and output. You'll continue to see this usage throughout the other examples. Run the `grunt concat` command again and you'll note that the outputted file now contains a string which looks something like this:

```
/* Andy-Matthews - v0.0.1 - 2014-10-14 */
```

> **Note**

Additional documentation for the `concat` plugin can be found in the grunt-contrib-concat repository: https://github.com/gruntjs/grunt-contrib-concat.

Minification using grunt-contrib-uglify

Minification, or uglification, refers to the process of removing all unnecessary characters from the source code without changing its functionality. These characters include spaces, tabs, comments, etc. In addition to replacing unnecessary characters, minification also compresses code by shortening variable names. Take, for example, the following function:

```
function foobar(one, two, three) {
    var foo = one + two;
    var bar = two + three;
    var baz = foo + bar;
    return baz;
}
```

After being run through uglification, it will look like this:

```
function foobar(a,b,c){var
d=a+b,e=b+c,f=d+e;return f}
```

Note

In the external representation, the function name itself is left alone, but all internal variables have been reduced to single character representations. This is completely non-human readable, but just fine for computers that will happily execute this code.

The process of installing the `uglify` plugin is identical to the `concat` plugin. Use NPM (don't forget to use the `--save` command), then add the following line to your Gruntfile:

```
grunt.loadNpmTasks('grunt-contrib-uglify');
```

Add the following code to your Gruntfile's `config` section:

```
uglify: {
    dist: {
        files: {
            'build/final-build.js': ['
build/application.js']
```

```
            }
        }
    }
```

`uglify` is another multitask plugin and it allows you to minify a number of file groups distinctly. The `files` property takes the output file path as the key, and an array of file names to minify. The observant among you might wonder if this means that uglify also concatenates, and you'd be right. Some plugins do have overlaps, but it all depends on your use case. Let's take a look at some of the options available to us for this plugin:

- `mangle`: Rewrites variable and function names to increase file size reduction. It defaults to false.
- `compress`: Allows you to more explicitly define elements of your code which will be left alone. It defaults to `{}`. For the full list of options, refer to http://lisperator.net/uglifyjs/compress#global-defs.
- `beautify`: Beautifies your code for debugging/troubleshooting purposes. It defaults to the `false` parameter.
- `report`: Displays the file size reduction. This option is currently only displayed when Grunt's verbose mode is toggled with the `-v` flag such as: `grunt -v uglify`. It defaults to the `false` parameter.
- `banner`: A string which is added at the beginning of the outputted file. This is useful for copyright info. It defaults to an empty string.
- `footer`: A string which is added at the end of the outputted file. It defaults to an empty string.

One nice feature of the `mangle` property is the option to exclude certain names from mangling. The example shown excludes the `jQuery` and the `Backbone` names:

```
    uglify: {
        options: {
            mangle: {
                except: ['jQuery', 'Backbone']
            }
        },
        dist: {
            files: {
                'build/final-build.js': ['
build/application.js']
            }
        }
    }
```

Note

Additional documentation for the `uglify` plugin can be found in the grunt-contrib-uglify repository: https://github.com/gruntjs/grunt-contrib-uglify.

CSS preprocessors using grunt-contrib-sass / grunt-contrib-less

You've worked with CSS in nearly every chapter so far in this book, but we haven't yet mentioned CSS preprocessors. If you're not already familiar with them, CSS preprocessors offer a superset of the CSS language which includes variables, additional property types (booleans, lists, maps), as well as control directives such as `if`, `for`, `while`, and `each`.

A more detailed discussion about preprocessors is outside the scope of this chapter, or even this book; but suffice to say that preprocessors are awesome, and these two plugins allow Grunt to interact with, and compile them into, nicely formatted CSS. `sass` and `less` are at the top of the preprocessor food chain, but functionally speaking, they both perform most of the same tasks. The primary differences revolve around syntax. While I personally prefer `sass`, the plugin requires some additional dependencies, which could deter some from trying it out. If you'd rather use `sass`, read the docs and jump straight in: https://github.com/gruntjs/grunt-contrib-sass.

Install the `grunt-contrib-less` package and add the NPM task to your Gruntfile as you did with the `concat` and `uglify` plugins. Then, add the following `config` block:

```
less: {
    dist: {
        files: {
            "css/main.css": "css/main.less"
        }
    }
}
```

The `less` plugin `files` property uses the path to the output files as the key, and a single input file as the value. Because the `less` plugin allows the import of additional files using the `@import` directive, there's no reason to allow multiple input files as part of the task. Because you might not have a `less` file handy, here's a set of statements for you to use; drop these into the `css/main.less` file and run the `grunt less` command:

```
@base: #f938ab;
@bg: blue;
body {
    background: @bg;
```

```
}
.box-shadow(@style, @c) when (iscolor(@c)) {
    -webkit-box-shadow: @style @c;
    box-shadow:         @style @c;
}
.box-
shadow(@style, @alpha: 50%) when
(isnumber(@alpha)) {
    .box-shadow(@style, rgba(0, 0, 0, @alpha));
}
.box {
    color: saturate(@base, 5%);
    border-color: lighten(@base, 30%);
    div { .box-shadow(0 0 5px, 30%) }
}
```

Let's take a look at some of the options available to us for the `less` plugin:

- `paths`: Lists specific directories which should be scanned for `@import` directives. Allows for a single string value, an array of values, or a function for more advanced logic. It defaults to the current directory of the input file.
- `rootpath`: A path to add on to the beginning of every URL in the compiled output. It defaults to an empty string.
- `optimization`: Increases or decreases the amount of compression; useful for debugging output. The higher the number, the greater the compression. It defaults to the `null` parameter.
- `banner`: A string which is added to the beginning of the outputted file. This is useful for copyright info. It defaults to an empty string.

> **Note**
>
> Additional documentation for the `less` plugin can be found in the grunt-contrib-less repository: https://github.com/gruntjs/grunt-contrib-less.

LiveReloading using grunt-contrib-watch

Now that you've gotten concatenation, uglification, and CSS compiling up and running, you're probably feeling that Grunt is a great option in your toolbox. After reading about LiveReloading, you'll soon realize that Grunt becomes indispensable. LiveReloading refers to a process by which files, of any number of types, are watched for changes: CSS, JavaScript, Less, HTML, and so on.

When Grunt recognizes changes, it executes a command. For JavaScript files, you might want to run JSHint on them (`grunt-contrib-jshint`), or

you might want to run your unit tests (`grunt-contrib-qunit`). For `less` or `sass` files, you'll want to compile them into CSS each time you make a change. All of that is fine, but in addition to automatically running the corresponding task, LiveReload will also reload your currently active browser window so that you don't have to. Let's dive in!

Install the `grunt-contrib-watch` plugin and add it to your Gruntfile. Then, drop it in the following code block:

```
watch: {
    css: {
        files: ['css/*.less'],
        tasks: ['less'],
    },
},
```

The `files` property takes an array of paths to watch. File names can be explicitly declared (if you only have a single file), or you can use a wild card to watch all files in a directory. The `tasks` property allows you to execute a number of tasks, in order. If you run the `grunt watch` command, you'll see some output to the terminal which reads: `Running watch task. Waiting...`. Open up your `less` file, make a change, then save it, and watch your terminal. (It might happen so fast that you won't even notice it, but it will happen.) The following code explains this:

```
>> File "css/main.less" changed.
Running "less:dist" (less) task
```

There are a number of options for the `watch` plugin, but the only one we're interested in, at this moment, is the `livereload` property. Let's look at how to set that up. Add the option to your watch `config` block:

```
watch: {
    options: {
        livereload: true,
    },
    css: {
        files: ['css/*.less'],
        tasks: ['less'],
    },
},
```

The `livereload` property can take either a `true` parameter, or a port number. The default, and recommended port, is `35729`. When LiveReload is enabled, a local server will be started automatically and behind the scenes. You'll also need to add a script to include your HTML file, pointed at either default port, or the one you specified.

```
<script
src="//localhost:35729/livereload.js"></script>
```

This allows the watch server to communicate with all of the browsers listening to it. When a change is detected, the watch server runs the appropriate task, and tells the browsers to reload. You'll need to make sure your HTML file is running in a local development environment before watch will work. Simply dragging the file into your browser isn't going to cut it. If you already have a local environment set up, then reload your HTML page, fire up grunt watch, and make a change. Then, watch the browser window magically change.

Oh, you're running a local environment! You're lucky that the Grunt team loves you. There's a `grunt-contrib-connect` plugin that will fire up a local web server for your use. We won't go into detail about it, other than to show you how to get it working. You can read the docs for more details, on your own (https://github.com/gruntjs/grunt-contrib-connect). Install the plugin, add it to your Gruntfile, and then include the following `config` block:

```
connect: {
    server: {
        options: {
            livereload: 35729
        }
    }
},
```

Finally, you'll need to register a new task. Grunt allows you to define your own keywords which can execute any number of other tasks in sequence. In our case, we'll want to run the `connect` local web server and watch it at the same time. Add the following lines of code to your Gruntfile, after the existing `config` block:

```
grunt.registerTask('server', [
    'connect',
    'watch'
]);
```

Now, when you type `grunt server` from your command line, you should get the following output:

```
Running "connect:server" (connect) task
Started connect web server on http://0.0.0.0:8000

Running "watch" task
Waiting...
```

If, for some reason, the port gives you trouble, you can specify an alternate port number in the options block of the connect config, `port: 12493`, or any other valid port you like. Once you start using a LiveReload component in your local development, you'll quickly wonder how you ever managed without it.

> **Note**
>
> Additional documentation for these two plugins can be found at their respective repositories: https://github.com/gruntjs/grunt-contrib-watch and https://github.com/gruntjs/grunt-contrib-connect.

Comparing Grunt, Gulp, and Broccoli

If you follow web development at all, you might have heard the words Gulp and Broccoli, and not in conjunction with Big Gulp or broccoli with cheese (my favorite holiday casserole). Gulp (http://gulpjs.com/) and Broccoli (https://github.com/broccolijs/broccoli) are task runners just like Grunt, but with their own unique spin on things. Each of them is installed with NPM, just like Grunt. Each of them contains a command line component which allows you to execute tasks defined in a configuration file. Gulp has the `gulpfile.js` file and Broccoli has the `Brocfile.js` file. Finally, each of them uses a plugin architecture with an existing ecosystem of plugin developers.

Gulp was created in July 2013 and calls itself *The streaming build system*. Gulp considers your code to be a grouping of files and lets you run tasks in sequence, piping the result of one task into the next. The configuration file, `gulpfile.js`, is similar to Grunt's. It has a moderately active community and is being actively maintained on GitHub.

Broccoli was created in November 2013 and calls itself a *fast, reliable asset pipeline*. Broccoli's stated goal is to reduce compile time by using an incremental build system which only rebuilds the files which have changed (and those files downstream of the changed file). It offers a chainable syntax which allows conversions to be run in memory, instead of requiring temp files to be written to the filesystem.

There are other build tools as well, but these are three of the most well-known options.

Summary

In this chapter, we learned about Grunt and how it can turbo charge your workflow, automating repetitive tasks and reducing the chance for errors. Grunt's plugin architecture means that just about every task you could dream of, already has a plugin for it. With some clever combinations of existing tasks, you can accomplish just about anything your heart could desire. We also talked a little about other task runners like Gulp and Broccoli. Regardless of which task runner you use, there's no longer an excuse for doing things by hand. It's messy, error-prone, and time-consuming and just no fun.

In the next chapter, we'll continue to build our technical tool chest and turn our eyes to working with HTML5 Audio.

Chapter 7. Working with HTML5 Audio

Let's take what we've learned so far and turn our eyes to the music scene. We're going to take the jQuery Mobile interface, and turn it into a media player, artist showcase, and information hub that can be saved to people's home screens.

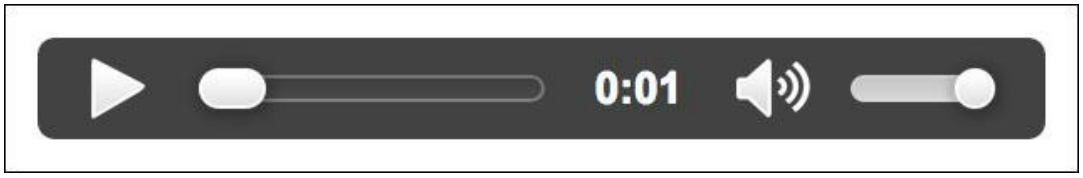
In this chapter, we will cover:

- HTML5 Audio (the progressive enhancement way)
- Fixed position, persistent toolbars
- Custom JavaScript controls for HTML5 Audio
- HTML5 Audio in iOS and how it is different
- The all-in-one solution (multipage made useful)
- Saving to the home screen with HTML5 manifest

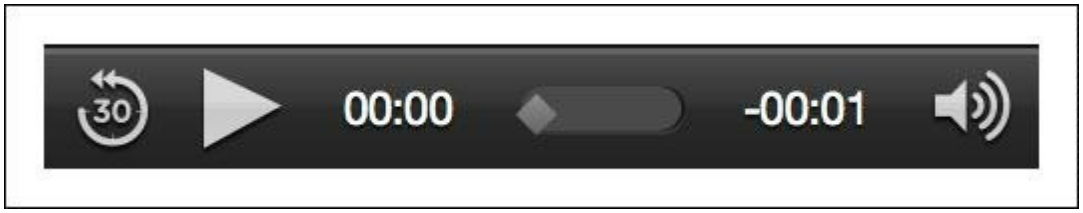
HTML5 Audio

The `<audio>` tag is a relative newcomer to HTML, like the `<video>` tag. It enables developers to add music to any page of their website. There are a few file type limitations, but currently any recent WebKit browser, like Safari, Chrome or Opera supports .mp3 files. In addition to being able to play the audio, one of the benefits of the audio tag is that modern browsers will also provide a player UI, as seen below (for Mac):

Chrome:



Safari:



Firefox:



We'll be viewing the audio player through the lens of an artist named Lindsey Stirling. Lindsey burst onto the scene on season five of America's Got Talent. Have you ever seen a violinist rock out? Since her appearance on the national stage, she's been lighting up YouTube with millions of views per video. On September 18, 2012, she released her first self-titled album. This chapter will be a fan tribute centering on her music and digital presence. If you want the full experience, go to her YouTube channel http://youtube.com/lindseystomp. Her millions of subscribers can't be wrong!



Now, back to business! As we've seen so far, jQuery Mobile makes everything easy, and while it doesn't provide direct support for the audio tag, it does streamline the process of building a custom version of the UI. You almost have to try to make things complicated. HTML5 Audio can be complicated; but let's start off slow. For now, let's see just how ridiculously simple it can be to bring audio into your jQuery Mobile pages. Consider the following code snippet:

```
<audio id="audio" controls>
  <source src="audio/electricdaisy.mp3"
type="audio/mpeg" />
  <source src="audio/electricdaisy.ogg"
type="audio/ogg" />
   Your browser is so old that you can't hear the
music.
</audio>
```

That's it. That's all it took to get that music control bar in the previous image. Let's break this down just a little.

Just like in the video from Chapter 4, *QR Codes, Geolocation, Google Maps API, and HTML5 Video*, the `audio` tags can support multiple sources and the browser will simply choose the first one it knows how to deal with. Older browsers won't have a clue what to do and will simply parse this like XML, which means that the only thing that will show up is the text, your browser is so old that you can't hear the music.

Each browser provides its own native interface for controlling the audio. Some are tiny and shiny like the iOS version you just saw, and some are completely ugly but more usable, such as Android. Regardless, they all leave something to be desired, so let's turn jQuery Mobile into a media player.

Here is our base starting page. You can find the source for this in the `electricdaisy_basic.html` file in the code files:

```
<!doctype html>
<html>
  <head>
    <meta charset="utf-8">
    <meta name="viewport"
content="width=device-
width, initial-scale=1, maximum-scale=1.0,
user-scalable=no">
    <link href='css/custom.css' rel='stylesheet'
type='text/css'>
    <title>Lindsey Stirling</title>
    <link rel="stylesheet"
href="css/jquery.mobile-1.4.5.css" />
```

```
    <script src="js/jquery-1.10.2.js"></script>
    <script type="text/javascript"
src="js/global.js"></script>
    <script
src="js/jquery.mobile-1.4.5.js"></script>
    <link rel="stylesheet"
href="css/custom.css" />
  </head>
<body>
<div id="electricdaisy" class="songPage"
data-role="page" >
  <div data-role="header">
    <a href="basic.html"
data-
transition="slidedown" data-theme="a"
data-icon="home" data-iconpos="notext">Home</a>
    <h2>Lindsey Stirling</h2>
    <a class="ui-btn-right"
data-
transition="slidedown" data-theme="a"
href="tracklist.html" data-icon="note"
data-iconpos="notext" >Music</a>
  </div>
  <div role="main" class="ui-content">
    <img alt="cover art"
src="images/electricdaisy.jpg" width="100%" />
    <p>
      <audio id="audio" controls>
        <source src="audio/electricdaisy.mp3"
type="audio/mpeg" />
        <source src="audio/electricdaisy.ogg"
type="audio/ogg" />
        Your browser is very old so you can't
hear the music.
      </audio>
    </p>
  </div>
</div>
</body>
</html>
```

This well-constructed jQuery Mobile page doesn't need JavaScript for any purpose other than beautification. You can turn off JavaScript and the whole page still works and still plays music. For all those progressive enhancement fans out there, we're starting off on the right foot. After all, everyone is a fan of music, not just people with smartphones.

Now, let's see what we can do around creating a better control interface using JavaScript and fixed position toolbars.

Fixed position persistent toolbars

I'll be honest; I have a generally low opinion of fixed position toolbars in the mobile space. From a usability standpoint, they're a disaster. Mobile screens have very little usable space to begin with. To waste that real estate without providing a strong benefit to the user, is unthinkable. Moreover, because of the CSS involved, ancient versions of Android (less than version 2.3) will not support the fixed position toolbar.

<rant>Yet, we see it all the time don't we? Companies slap their logo on a top toolbar that never goes away. They throw on a little global navigation and call it a benefit to the user when really it's all about them reinforcing their branding. You can tell because the only interactive parts on the bar are a menu button and possibly a search button (as if we couldn't have found them again at the top). There are many better techniques to provide global navigation. </rant>

Today, we have a valid use for these bars. We're going to put music controls in them that will persist as we transition tracks. If we do the job right, this music website will feel more like an app and give the user constant control over the sound coming from their device.

Making a toolbar fixed (doesn't move as you scroll) and persistent (doesn't move as you change pages) is pretty simple really. All you have to do, is add `data-position="fixed"` to make it fixed and give `data-id="whatever"` to the footers on the pages where you want the footer to hold still, as the page transitions behind it. This functionality also works with headers.

Here is the basis for our persistent footer:

```
<div class="jsShow playcontrols"
data-
role="footer" data-id="playcontrols"
data-position="fixed">
  <div class="progressContainer">
    <input data-theme="b" data-track-theme="a"
class="progressBar" type="range" name="slider-1"
value="0" min="0" max="227"
data-mini="true"/></div>
  <div data-role="navbar" class="playcontrols">
    <ul>
      <li><a data-theme="a" title="skip back"
class="skipback" href="#crystallize"
data-
direction="reverse"><img
src="images/xtras-
gray/sg_skipback2x.png" alt="Skip Back"
height="14"/></a></li>
```

```
      <li><a data-theme="a" title="seek back"
class="seekback" href="javascript://"><img
src="images/xtras-
gray/sg_rw@2x.png" alt="Seek Back"
height="14"/></a></li>
      <li><a data-theme="a" title="play/pause"
class="play" href="javascript://"><img
src="images/xtras-gray/49-
play@2x.png" alt="Play/Pause"
height="14"/></a></li>
      <li><a data-theme="a" title="seek forward"
class="seek" href="javascript://"><img
src="images/xtras-
gray/sg_ff@2x.png" alt="Seek Forward"
height="14"/></a></li>
      <li><a data-theme="a" title="skip forward"
class="skip" href="#shadows"><img
src="images/xtras-
gray/sg_skip@2x.png" alt="Skip Forward"
height="14"/></a></li>
      </li>
    </ul>
  </div>
</div>
```

See that class up at the top of the footer (`jsShow`)? Let's add another class (`jsHide`) to the paragraph surrounding the `audio` tag:

```
<p class="jsHide">
  <audio id="audio" controls>
</p>
```

In the CSS, let's add the following rules:

```
.js .jsHide{display:none}
.no-js .jsShow{display:none;}
```

Then, we'll add a line to our `global.js` file to pull the whole thing together:

```
$("html").removeClass("no-js").addClass("js");
```

This is a technique used by the HTML5 boilerplate (http://html5boilerplate.com/) and Modernizr (http://modernizr.com/). If you've not looked at these two marvels, it's worth your time. The long and short of it, is that we now have a handy, lightweight way of handling progressive enhancement.

We're very close now to having a nice universal UI for a media player, but if you've been typing along, you'll notice that the input `type="range"` is showing a textbox. On its own, this probably wouldn't be too offensive, but

the fact that HTML5 Audio keeps track of its current position in terms of seconds makes it pretty useless as a display element. So, let's hide it and expand the bar a bit with some simple CSS:

```
input.progressBar{display:none}
div.ui-slider{width:90%;}
```

Now that we're looking good, let's wire the thing together and make it work.

Controlling HTML5 Audio with JavaScript

Here's where things start to get a little bit more hairy with JavaScript. First, let's set up an interval to update the progress bar. It's going to have to serve two functions, displaying the current time and changing the time. We'll start by adding references to these objects, as well as placing event hooks for every one of the audio events that we might want to attach to. The comments describe which events are fired when:

```
//for every song page
$(document).on("pagecreate", ".songPage",
function(){
  var $page = $(this);
  var $currentAudio = $page.find("audio");

  //set references to the playing status,
progress bar, and
  //progress interval on the audio object itself
  $currentAudio.data("playing",false)
    .data("progressBar",
$page.find("input.progressBar")).data("progressThread",null);

  //loadstart and progress occur with autoload
  $currentAudio[0].addEventListener('loadstart',
function(){
    //Fires when the browser starts looking
    //for the audio/video
  }, false);

  $currentAudio[0].addEventListener('progress',
function(){
    //Fires when the browser is downloading the
audio/video
    //This will fire multiple times until the
source
    //is fully loaded.
  }, false);

  //durationchange, loadedmetadata, loadeddata,
canplay,
  //canplaythrough are kicked off upon pressing
play

 $currentAudio[0].addEventListener('durationchange',
  function(){
    //Fires when the duration of the audio/video
is changed

  }, false);
```

```
 $currentAudio[0].addEventListener('loadedmetadata',
  function(){
    //Fires when the browser has loaded metadata
    //for the audio/video

  }, false);

  $currentAudio[0].addEventListener('loadeddata',
function(){
    //Fires when the browser has loaded the
current
    //frame of the audio/video

  }, false);

  $currentAudio[0].addEventListener('canplay',
function(){
    //Fires when the browser can start playing
    //the audio/video

  }, false);


 $currentAudio[0].addEventListener('canplaythrough',
  function(){
    //Fires when the browser can play through the
audio/video
    //without stopping for buffering

  }, false);

  $currentAudio[0].addEventListener('ended',
function(){
    //Fires when the current playlist is ended

  }, false);

  $currentAudio[0].addEventListener('error',
function(){
    //Fires when an error occurred during the
loading
    //of an audio/video

  }, true);

});
```

Now, let's create the function that will run the interval:

1. Add in the following:

```
function scrubberUpdateInterval(){
  //Grab the current page
```

```
  var $page =
$(':mobile-
pagecontainer').pagecontainer('getActivePage');

  //Grab the audio element
  var $audio = $page.find("audio");
  var currentAudio = $audio[0];

  //Grab the progress monitor and the handle
  currentAudioProgress =
$page.find("input.progressBar");
  scrubberHandle = currentAudioProgress
    .closest(".progressContainer")
    .find("a.ui-slider-handle");

  //Is the user currently touching the bar?
  if(scrubberHandle.hasClass("ui-focus")){
    //Pause it if it's not paused already
    if(!currentAudio.paused){
      currentAudio.pause();
    }

    //Find the scrubber's last position
    var lastScrubPosition =
currentAudioProgress
      .data("lastScrubPosition");
    if(lastScrubPosition == null)
lastScrubPosition = 0;
    //Are we in the same place as we were
last?
    if(Math.floor(lastScrubPosition) ==
    Math.floor(currentAudio.currentTime)){
      var lastScrubUnchangedCount =
currentAudioProgress
       .data("lastScrubUnchangedCount");
      //If the user held still for 3 or more
cycles of the
      //interval, resume playing
      if(++lastScrubUnchangedCount >= 2){

 scrubberHandle.removeClass("ui-focus");
        currentAudioProgress
          .data("lastScrubUnchangedCount", 0);
        currentAudio.play();
      }else{
        //increment the unchanged counter
currentAudioProgress.data("lastScrubUnchangedCount",
        lastScrubUnchangedCount);
      }
    }else{
      //set the unchanged counter to 0 since
we're not in the same place
      currentAudioProgress
        .data("lastScrubUnchangedCount", 0);
    }
```

```
    //set the last scrubbed position on the
scrubber

 currentAudioProgress.data("lastScrubPosition",
      Number(currentAudioProgress.val()));
    //set the current time of the audio
    currentAudio.currentTime =
currentAudioProgress.val();
  }else{
    //The user is not touching the scrubber,
just update the position of the handle
    currentAudioProgress
      .val(currentAudio.currentTime)
      .slider('refresh');
  }
}
```

2. Now, we'll just kick off the interval when the **play** button is clicked and do the other necessary things. As usual, everything is well commented:

```
$(document).on('vclick', "a.play",
function(){
  try{
    var $page =
$(':mobile-
pagecontainer').pagecontainer('getActivePage');
    var $audio = $page.find("audio");

    //toggle playing

 $audio.data("playing",!
$audio.data("playing"));
    //if we should now be playing
    if($audio.data("playing")) {

      //play the audio
      $audio[0].play();

      //switch the playing image for pause
      $page.find("img.playPauseImage")

 .attr("src","images/xtras-gray/48-
pause@2x.png");
      //kick off the progress interval
      $audio.data("progressThread",
        setInterval(scrubberUpdateInterval,
750));
    }else{
      //pause the audio
      $audio[0].pause();

      //switch the pause image for the
playing audio
```

```
$page.find("img.playPauseImage")

 .attr("src","images/xtras-gray/49-
play@2x.png");
      //stop the progress interval

 clearInterval($audio.data("progressThread"));
    }
  }catch(e){alert(e)};
});
```

3. Setting seek controls:

```
$(document).on('vclick', "a.seekback",
function(){
  var $page =
$(':mobile-
pagecontainer').pagecontainer('getActivePage');
  $page.find("audio")[0].currentTime -= 5.0;
});

$(document).on('vclick', "a.seek", function(){
  var $page =
$(':mobile-
pagecontainer').pagecontainer('getActivePage');
  $page.find("audio")[0].currentTime += 5.0;
});
```

4. Now, let's create a JSON object to track our current state and track list:

```
var media = {
  "currentTrack":0,
  "random":false,
  "tracklist":[
    "electricdaisy.html",
    "crystallize.html",
    "shadows.html",
    "skyrim.html"
  ]
}
```

5. Next up, the **skipback** and **forward** buttons. We could set up the random button, but for now we'll leave that out:

```
$(document).on('vclick', "a.skipback",
function(event){
  //grab the current audio
  var $page =
$(':mobile-
pagecontainer').pagecontainer('getActivePage');
  var currentAudio = $page.find("audio")[0];
  //if we're more than 5 seconds into the
song, skip back to the beginning
  if(currentAudio.currentTime > 5){
```

```
    currentAudio.currentTime = 0;
  }else{
    //otherwise, change to the previous track
    media.currentTrack--;
    if(media.currentTrack < 0)
media.currentTrack =
      (media.tracklist.length - 1);

 $.mobile.changePage("#"+media.tracklist[currentTrack]);
  }
});

$(document).on("vclick", "a.skip",
function(event){
  //grab the current audio and switch to the
next track
  var $page =
$(':mobile-
pagecontainer').pagecontainer('getActivePage');
  var currentAudio = $page.find("audio")[0];
  media.currentTrack++;
  if(media.currentTrack >=
media.tracklist.length)
  media.currentTrack = 0;

 $.mobile.changePage("#"+media.tracklist[currentTrack]);
});
```

Note

Performance note

Notice how I've shifted away from using the `click` event and I'm now using the `vclick` event. The `vclick` event is a custom event in jQuery Mobile that attempts to bridge the performance gap between click (a desktop-based event) and tap/touchstart (touch-based events).

There is generally about a 300 millisecond gap between the two and which browser supports what is always a hard thing to figure out. By using `vclick` you can still support desktop and touch devices but you can hopefully realize a slight performance boost. For more about this, check out the blog post by one of the jQuery Mobile contributors, John Bender, at https://coderwall.com/p/bdxjzg.

HTML5 Audio in iOS

Understanding the event cycle of HTML5 Audio is critical to making it work right. This can get especially confusing when you start mixing in the odd event cycles of jQuery Mobile. Add to that a confusing set of resource restrictions that differ per device, and you've got a real recipe for confusion. As a quick and easy way of testing mobile sites, you can usually just open up Google Chrome (since its WebKit) or IE9 (for the Windows Phone) and shrink it down to mobile size. Naturally, this does not substitute for real testing. Always check your creations on real devices. That being said, the shrunken browser approach will usually get you 97.5 percent of the way there. Well, HTML5 Audio throws that operating model right out the window.

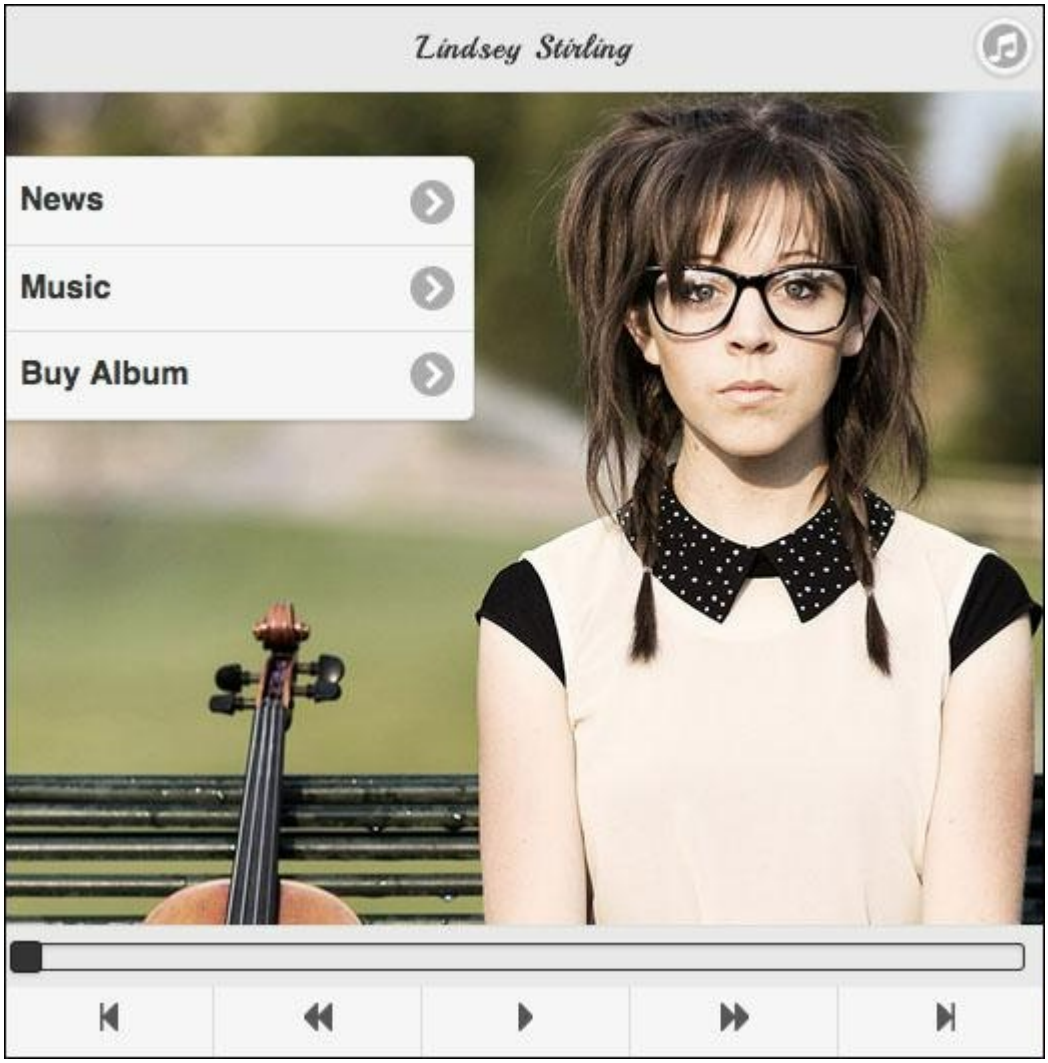
On iOS, even if you've tagged the `audio` tag to preload and autoplay, it won't. No error is thrown; no indication is given that your coded requests were completely ignored. If you look at the code included for this chapter, you'll see in the `basicPlayer.js` script how many `try`/`catch` and `debug` statements I've put in while trying to make this work, and figure out what was going wrong.

Technically, `pagecreate` is the event that the documentation says is equivalent to the `document.ready` event, but that doesn't mean that the page is actually visible yet. The end of the event chain leading to page reveal is the `pagecontainershow` event. So, no matter what, that should be the end and it should be ready for whatever you might want to do. At this time, you should (theoretically) be able to tell the song to play the (`.play()`) function using JavaScript. Alas, it just doesn't work this way. You can take the exact same function used to trigger the audio play from pressing the play button and even kick it off with a time delay and yet nothing works. It's not a timing issue. iOS requires direct user interaction to kick off the audio for the first time. Tie it directly to the click event or it won't work.

Multipage jQuery Mobile apps made useful

We now have a full-blown player with a unified interface that could be used to manage a playlist. The only real problem we have at this point, is network latency. Even in this new age of 4G and LTE, cellular latency can get ridiculous. This is especially true if you work at a place like I do, where the building pushes back signals like a Spartan phalanx. So, in order to give this an even better user experience, we're going to abandon this page-by-page business.

While we're at it, let's bring in the content from her blog. We'll use the same CSS from before but we'll change the rest.



One of the first things that starts to annoy server-side and object-oriented types is how often you have to repeat a chunk of code. This becomes a real

issue if there is a global header or footer. So, let's create a `div` tag to house the universal footer content and a script to pull it in at the right time:

```
<div id="universalPlayerControls"
style="display:none">
  <div class="progressContainer">
    <input data-theme="b" data-track-theme="a"
class="progressBar" type="range" name="slider-1"
value="0" min="0" max="227" data-mini="true"/>
  </div>
  <div data-role="navbar" class="playcontrols">
    <ul>
      <li><a data-theme="a" title="skip back"
class="skipback" href="javascript://"
data-
direction="reverse"><img
src="images/xtras-
gray/sg_skipback2x.png" alt="Skip Back"
height="14"/></a></li>
      <li><a data-theme="a" title="seek back"
class="seekback" href="javascript://"><img
src="images/xtras-
gray/sg_rw@2x.png" alt="Seek Back"
height="14"/></a></li>
      <li><a data-theme="a" title="play/pause"
class="play" href="javascript://"><img
class="playPauseImage"
src="images/xtras-gray/49-
play@2x.png" alt="Play/Pause"
height="14"/></a></li>
      <li><a data-theme="a" title="seek forward"
class="seek" href="javascript://"><img
src="images/xtras-
gray/sg_ff@2x.png" alt="Seek Forward"
height="14"/></a></li>
      <li><a data-theme="a" title="skip forward"
class="skip" href="javascript://"><img
src="images/xtras-
gray/sg_skip@2x.png" alt="Skip Forward"
height="14"/></a></li>
    </ul>
  </div>
</div>
```

Now, on any page load that wants to have these controls in the footer, we'll just copy this content right into the footer, before the page is marked up by jQM:

```
$(document).on("pagebeforecreate", function(){
  $(this).find("div[data-id='playcontrols']")
    .html($("#universalPlayerControls").html());
});
```

Finally, it's time to take every song page and make it dynamic. We remove the individual audio elements and simply link to them in data attributes of the `page` element. The footer is gone and in its place is an empty footer ready for the injection of the controls:

```
<div id="electricdaisy" class="songPage"
data-
role="page" data-mp3="audio/electricdaisy.mp3"
data-ogg="audio/electricdaisy.ogg">
  <div data-role="header">
    <a href="#home" data-theme="a"
data-icon="home" data-iconpos="notext">Home</a>
    <h2>Electric Daisy</h2>
    <a class="ui-btn-right" data-theme="a"
href="#tracklist" data-icon="note"
data-iconpos="notext" >Music</a>
  </div>
  <div with role="main" class="ui-content">
    <img src="images/electricdaisy.jpg"
width="100%" />
  </div>
  <div data-role="footer" data-id="playcontrols"
data-position="fixed"></div>
</div>
```

All this will require us to revamp our JavaScript. Some of the pieces will remain the same, but since we're down to a single audio element, the code can be simplified. Here is the final source code for the all-in-one version that is in the `index.html` file of the code bundle available at the Packt Publishing website:

```
<!doctype html>
<html>
<head>
  <meta charset="utf-8">
  <meta name="viewport"
content="width=device-
width, initial-scale=1, maximum-scale=1.0,
user-scalable=no">
  <link
href='http://fonts.googleapis.com/css?
family=Playball' rel='stylesheet' type='text/css'>
  <title>Lindsey Stirling</title>
  <link rel="stylesheet"
href="js/jquery.mobile-1.4.5.css" />
  <script src="js/jquery-1.10.2.js"></script>
  <script type="text/javascript">
    $(document).on("mobileinit", function(){
      $.mobile.defaultPageTransition = "slide";
    });
  </script>
```

```
  <script
src="js/jquery.mobile-1.4.5.js"></script>
  <script type="text/javascript"
src="js/jsrender.min.js"></script>
  <link rel="stylesheet" href="custom.css" />
</head>
<body id="body">
```

With all the usual stuff out of the way, here is the first page of the experience:

```
  <div id="home" data-role="page"
    data-mp3="audio/electricdaisy.mp3"
    data-ogg="audio/electricdaisy.ogg">

    <div data-role="header">
      <h1>Lindsey Stirling</h1>
      <a class="ui-btn-right" data-theme="a"
href="#tracklist" data-icon="note"
data-iconpos="notext" >Music</a>
    </div>

    <div role="main" class="ui-content">
      <ul id="homemenu" data-role="listview"
data-inset="true">
        <li><a href="#news">News</a></li>
        <li><a href="#tour">Tour</a></li>
        <li><a href="#crystallize">Music</a></li>
      </ul>
</div>

    <div data-role="footer"
data-id="playcontrols" data-position="fixed">
    </div>

  </div>

  <div data-role="page" id="news">
    <div data-role="header">
      <a href="#home" data-theme="a"
data-icon="home" data-iconpos="notext">Home</a>
      <h2>News/Blog</h2>
    </div>
    <div role="main" class="ui-content"></div>
  </div>
```

The following page lists all the tracks available to preview:

```
  <div id="tracklist" data-role="page">
    <div data-role="header">
      <a href="#home" data-theme="a"
data-icon="home" data-iconpos="notext">Home</a>
      <h2>Track List</h2>
```

```
    </div>

    <img src="images/lindsey-header-new1.jpeg"
width="100%" alt="signature banner" />

    <div role="main" class="ui-content">
       <ul data-role="listview">
         <li><a class="trackListLink"
href="#electricdaisy">Electric Daisy</a></li>
         <li><a class="trackListLink"
href="#shadows">Shadows</a></li>
         <li><a class="trackListLink"
href="#skyrim">Skyrim</a></li>
         <li><a class="trackListLink"
href="#crystallize">Crystallize</a></li>
       </ul>
    </div>
  </div>
```

Here are the individual song pages. I have not included every song page because that would just be a waste of pages. You'll get the idea of how this works. Note that each page has a footer with the same `data-id` attribute. The following allows for the footer to remain in place, as pages transition between songs:

```
  <div id="shadows" class="songPage"
data-role="page"
    data-mp3="audio/shadows.mp3"
    data-ogg="audio/shadows.ogg" >
    <div data-role="header">
      <a href="#home" data-theme="a"
data-icon="home" data-iconpos="notext">Home</a>
      <h2>Shadows</h2>
      <a class="ui-btn-right" data-theme="a"
href="#tracklist" data-icon="note"
data-iconpos="notext" >Music</a>
    </div>
    <div role="main" class="ui-content">
      <img src="images/shadows.jpg" width="100%"
alt="cover art" />
    </div>
    <div data-role="footer"
data-
id="playcontrols" data-position="fixed"></div>
  </div>

  <div id="crystallize" class="songPage"
data-role="page"
    data-mp3="audio/crystallize.mp3"
    data-ogg="audio/crystallize.ogg">
    <div data-role="header">
      <a href="#home" data-theme="a"
data-icon="home" data-iconpos="notext">Home</a>
      <h2>Crystallize</h2>
```

```
      <a class="ui-btn-right" data-theme="a"
href="#tracklist" data-icon="note"
data-iconpos="notext" >Music</a>
    </div>

    <div role="main" class="ui-content">
      <img src="images/crystallize.jpg"
width="100%" alt="cover art" />
    </div>

    <div data-role="footer"
data-
id="playcontrols" data-position="fixed"></div>
  </div>

  <div id="electricdaisy" class="songPage"
data-role="page"
    data-mp3="audio/electricdaisy.mp3"
    data-ogg="audio/electricdaisy.ogg">
    <div data-role="header">
      <a href="#home" data-theme="a"
data-icon="home" data-iconpos="notext">Home</a>
      <h2>Electric Daisy</h2>
      <a class="ui-btn-right" data-theme="a"
href="#tracklist" data-icon="note"
data-iconpos="notext" >Music</a>
    </div>

    <div role="main" class="ui-content">
      <img src="images/electricdaisy.jpg"
width="100%" alt="cover art" />
    </div>

    <div data-role="footer"
data-
id="playcontrols" data-position="fixed"></div>
  </div>
```

This part is not a page. It's the hidden master controls that will be imported into each page that plays songs:

```
  <div id="universalPlayerControls"
style="display:none">
    <div class="progressContainer">
      <input  data-theme="b" data-track-theme="a"
class="progressBar" type="range" name="slider-1"
value="0" min="0" max="227" data-mini="true"/>
    </div>
    <div data-role="navbar" class="playcontrols">
      <ul>
        <li><a data-theme="a" title="skip back"
class="skipback" href="javascript://"
data-
direction="reverse"><img
```

```
src="images/xtras-
gray/sg_skipback2x.png" alt="Skip Back"
height="14"/></a></li>
        <li><a data-theme="a" title="seek back"
class="seekback" href="javascript://"><img
src="images/xtras-
gray/sg_rw@2x.png" alt="Seek Back"
height="14"/></a></li>
        <li><a data-theme="a" title="play/pause"
class="play" href="javascript://"><img
class="playPauseImage"
src="images/xtras-gray/49-
play@2x.png" alt="Play/Pause"
height="14"/></a></li>
        <li><a data-theme="a" title="seek
forward" class="seek" href="javascript://"><img
src="images/xtras-
gray/sg_ff@2x.png" alt="Seek Forward"
height="14"/></a></li>
        <li><a data-theme="a" title="skip
forward" class="skip" href="javascript://"><img
src="images/xtras-
gray/sg_skip@2x.png" alt="Skip Forward"
height="14"/></a></li>
      </ul>
    </div>
  </div>

  <div style="display:none;">
    <audio id="audio" controls></audio>
  </div>
```

The following code is the template for rendering the imported blog content:

```
  <script type="text/x-jsrender"
id="googleFeedTemplate">
    <ul>
      {{for entries}}
        <li>
          <h3
class="ul-li-heading">{{:title}}</h3>

 <p>{{:publishedDate}}<br>{{:content}}</p>
        </li>
      {{/for}}
    </ul>
  </script>

  <script type="text/javascript">
    var media = {
      "playing":false,
      "debug":true,
      "currentTrack":0,
      "random":false,
```

```
      "tracklist":[
        "#electricdaisy",
        "#crystallize",
        "#shadows",
        "#skyrim"
      ]
    }

    //a handy little debug function
    var lastDebugTS = (new Date).getTime();
    function debug(str){
    try{
        if(media.debug){
 var $page =
$(':mobile-
pagecontainer').pagecontainer('getActivePage');
          $page.find("div[role='main']")
            .append(""+((new
Date()).getTime()-lastDebugTS)+": "+str+"<br/>");
          lastDebugTS = (new Date).getTime();}
      }catch(e){}
    }

    //grab the audio and control elements with
global
    //variables since everything is going to use
them
    var currentAudio = $("#audio")[0];
    var currentAudioProgress = null;
    var scrubberHandle = null;
    var scrubberUpdateSpeed = 750;
    var progressThread = null;

    //The ended and durationchange are the only
events we
    //really care about
    currentAudio.addEventListener('ended',
      function(){
        var $page =
$(':mobile-
pagecontainer').pagecontainer('getActivePage');
        $page.find(".skip").click()
      }, false);
currentAudio.addEventListener('durationchange',
     function(){

 currentAudioProgress.attr('max',currentAudio.duration)
        .slider("refresh");
     });

   //On the home page
   $(document).on('pagecontainerbeforeshow',
function(){
     var $page = $(this);
```

```
    //if we're not currently playing anything,
preload audio
    //as specified by the page's data-attributes
    if(!media.playing) {

      //load MP3 by default
      if(currentAudio.canPlayType("audio/mpeg")){
         currentAudio.src =
$page.attr("data-mp3");
      }

      //load Ogg for all those purists out there
      else{ currentAudio.src =
$page.attr("data-ogg");}
      //make it load
      currentAudio.load();

      //set the progress bar
      currentAudioProgress =
$page.find("input.progressBar");
      //set the scrubber handle
      scrubberHandle = currentAudioProgress
        .closest(".progressContainer")
        .find("a.ui-slider-handle");
    }
  });

  //on the news page
  $("#news").on('pagecontainershow', function(){
    //This import can take a while, show the
loading message
  $.mobile.loading( 'show', {
      text: "Loading Blog Content",
      textVisible: true
    });

    //load the actual content

 $.ajax({url:"https://ajax.googleapis.com/ajax/services/feed/load?
v
=1.0&output=json&q="+escape("http://lindseystirlingviolin.com/feed"),
      dataType:"jsonp",
      success: function(data) {
        //use a jsRender template to format the
blog
        $("#news .ui-content")
          .html($("#googleFeedTemplate")
          .render(data.responseData.feed));
        //for every image in the news feed, make
its width
        //dynamic with a max width or its
original size
        $("#news img").each(function(index,
element) {
         var $img = $(element);
```

```
          //figure out its currentWidth
          var currentWidth =
Number($img.attr("width"));
          //if it has a width and it's large
          if(!isNaN(currentWidth) && currentWidth
> 300){
            //remove the explicit width and height

 $img.removeAttr("width").removeAttr("height");
            //make the image scale to the width
         //of its container but never to be
         //larger than its original size

 $img.css({"max-width":currentWidth
+"px","width":"100%"});
          }
        });

        //hide the loading
        $.mobile.loading("hide");
      }
    });
  });

  function setCurrentMediaSources(){
    var $page =
$(':mobile-
pagecontainer').pagecontainer('getActivePage');

    //set the audio to whatever is playable
    var playableSource = $page.attr("data-mp3");
    if(!currentAudio.canPlayType("audio/mpeg")){
      playableSource = $page.attr("data-ogg");
    }
    //set the progress bar and scrubber handles
    currentAudioProgress =
$page.find("input.progressBar");
  scrubberHandle = currentAudioProgress
      .closest(".progressContainer")
      .find("a.ui-slider-handle");

    //change the source and load it.
    currentAudio.src = playableSource;
    currentAudio.load();

    //if we're currently playing, continue playing
    if(media.playing){
      currentAudio.play();
      progressThread =
setInterval(scrubberUpdateThread,
scrubberUpdateSpeed);
    }
  }
```

```
  $(".songPage").on("pagecontainershow",
setCurrentMediaSources);

  $("[data-role='page']").on("pagebeforecreate",
  function(){
    $(this).find("div[data-id='playcontrols']")
      .html($("#universalPlayerControls").html());
  });

  function scrubberUpdateThread(){
    //if the scrubber has focus, the scrubber
becomes
    //input instead of status display
    if(scrubberHandle.hasClass("ui-focus")){

    //pause the music for now
    if(!currentAudio.paused){
      currentAudio.pause();
    }

    //grab the last position to see if we've moved
    var lastScrubPosition =

 currentAudioProgress.data("lastScrubPosition");
    if(lastScrubPosition == null)
lastScrubPosition = 0;
    //if the user hasn't scrubbed
    if(Math.floor(lastScrubPosition) ==
Math.floor(currentAudio.currentTime)){
      var lastScrubUnchangedCount =

 currentAudioProgress.data("lastScrubUnchangedCount");
      if(++lastScrubUnchangedCount >= 2){
  //since it's been 3 cycles that we haven't
moved,
        //remove the focus and play
        scrubberHandle.removeClass("ui-focus");

 currentAudioProgress.data("lastScrubUnchangedCount",
0);
        currentAudio.play();
      }else{

        //store the the current position counter

 currentAudioProgress.data("lastScrubUnchangedCount",
lastScrubUnchangedCount);
      }
    }else{
      //reset the current position counter

 currentAudioProgress.data("lastScrubUnchangedCount",
0);
    }
```

```
    //set the position of the scrubber and the
currentTime
    //position of the song itself
    currentAudioProgress.data("lastScrubPosition",
      Number(currentAudioProgress.val()));
    currentAudio.currentTime =
currentAudioProgress.val();
  }else{
    //update the progress scrubber

 currentAudioProgress.val(currentAudio.currentTime)
     .slider('refresh');
  }
}

//play button controls
$("a.play").on('click',function(){
  try{
    //toggle the playing status
    media.playing = !media.playing;

    //if we're supposed to be playing..
    if(media.playing) {

      //do it and set the interval to watch
      currentAudio.play();
      progressThread =
setInterval(scrubberUpdateThread,
scrubberUpdateSpeed);

      //switch the playing image for pause

 $("img.playPauseImage").attr("src","images/xtras-
gray/48-pause@2x.png");
    }else{

      //pause the audio and clear the interval
      currentAudio.pause();

      //switch the pause image for the playing
audio

 $("img.playPauseImage").attr("src","images/xtras-
gray/49-play@2x.png");

      //kill the progress interval
      clearInterval(progressThread);
    }
  }catch(e){alert(e)};
});

$("a.seekback").on('vclick',function(){
  //back 5 seconds
  currentAudio.currentTime -= 5.0;
});
```

```
$("a.seek").on('vclick',function(){
  //forward 5 seconds
  currentAudio.currentTime += 5.0;
});

$("a.skipback").on('vclick',function(event){
  //if we're more than 5 seconds into the song,
skip
  //back to the beginning
  if(currentAudio.currentTime > 5){
    currentAudio.currentTime = 0;
  }else{
    //otherwise, change to the previous track
    media.currentTrack--;
    if(media.currentTrack < 0) media.currentTrack
= (media.tracklist.length - 1);

    $('body').pagecontainer('change',
media.tracklist[media.currentTrack],
    {
       transition: "slide",
       reverse: true
    });
  }
});

$("a.skip").on('vclick',function(event){
  //pause the audio and reset the time to 0
  currentAudio.currentTime = 0;

  //change to the next track
  media.currentTrack++;
  if(media.currentTrack >=
media.tracklist.length) media.currentTrack = 0;

  $('body').pagecontainer('change',
media.tracklist[media.currentTrack]);
});
</script>
</body>
</html>
```

With it all built together into one huge multipage app like this, you will feel the buttery smoothness of the interface. We're using the exact same CSS in this file that we did in the standalone song files.

Saving to the home screen with HTML5 manifest

With great power comes great responsibility. This is a power feature. If you properly leverage the HTML5 manifest and a few other `meta` tags, your application will become a fullscreen, chromeless app:



To make your apps save down and launch as fullscreen apps, you'll need icons for your home screen. They'll be squares in sizes of 144, 114, 72, and 57 pixels respectively. Link to them like so:

```
<link rel="apple-touch-icon-precomposed"
sizes="144x144" href="images/album144.png">
<link rel="apple-touch-icon-precomposed"
sizes="114x114" href="images/album114.png">

<link rel="apple-touch-icon-precomposed"
sizes="72x72" href="images/album72.png">
<link rel="apple-touch-icon-precomposed"
href="images/album57.png">
<link rel="shortcut icon"
href="images/album144.png">
```

The user's navigation buttons can be made to disappear on iOS. Be aware, that if you choose to do this, you need to provide full navigation within your app. This means you'll probably want to add a back button. If you want to make the app go full screen, use these tags:

```
<meta name="apple-mobile-web-app-capable"
content="yes">
<meta
name="apple-mobile-web-app-status-bar-
style" content="black">
```

To make the thing available in the offline mode, we'll use the manifest. The manifest uses the application cache to store the assets. There is a limit to how much you can store. This differs from device to device but it's probably less than 25 MB. List what you want saved in the order of priority just to be saved.

Here are the contents of our manifest. It is saved under the `app.manifest` file:

```
CACHE MANIFEST
# 2012-09-21:v1
js/jquery-1.10.2.js
js/jquery.mobile-1.4.5.js
js/global.js
js/jsrender.min.js

audio/shadows.mp3
audio/skyrim.mp3
audio/electricdaisy.mp3
audio/crystallize.mp3

js/jquery.mobile-1.4.5.css
css/custom.css

images/xtras-gray/sg_skip.png
images/xtras-gray/sg_skip@2x.png
images/xtras-gray/sg_skipback.png
images/xtras-gray/sg_skipback@2x.png
images/xtras-gray/sg_ff.png
images/xtras-gray/sg_ff@2x.png
images/xtras-gray/sg_rw.png
images/xtras-gray/sg_rw@2x.png
images/xtras-gray/48-pause.png
images/xtras-gray/48-pause@2x.png
images/xtras-gray/49-play.png
images/xtras-gray/49-play@2x.png
images/ajax-loader.gif
images/crystallize.jpg
images/electricdaisy.jpg
images/shadows.jpg
images/skyrim.jpg
images/wallpaper.jpg
images/cork.jpeg
images/icons-18-black.png
images/icons-18-white.png
images/icons-36-black.png
```

```
images/icons-36-white.png
images/note18.png
images/note36.png
```

To use the `manifest` file, your web server or the .htaccess extension will have to be configured to return the type of `text/cache-manifest`. In the HTML file, all you have to do is add it as an attribute to the `html` tag itself, like so:

```
<html manifest="app.manifest">
```

If you want to clear your cache, you can always do it through your browser settings. You can also control the cache with JavaScript. For a complete breakdown of what the manifest can do, check out http://www.html5rocks.com/en/tutorials/appcache/beginner/.

Summary

This was a meaty chapter, despite its simplistic start. But, you now know pretty much everything there is to know about combining HTML5 Audio with jQuery Mobile. You can create wonderful academic, progressively enhanced pages and even make complex apps to be saved to devices. If this chapter didn't scare you off, you could really start making some powerful mobile sites for media outlets and venues. The only thing this chapter could have really used is a picture gallery for artists and venues. But, don't worry; we'll approach that in the next chapter, where we'll be creating a showcase for photographers.

Chapter 8. Fully Responsive Photography

Our mobile phones are quickly becoming our photo albums. Photographers represent a somewhat untapped market for mobile web development. If you think about it, this market should have been the first to adapt to the mobile world. With the saturation of smartphones in developed nations, e-mail open rates on smartphones are over 43 percent. By the time 2017 rolls around, those rates will be a whopping 79 percent. (http://myemma.com/brainiac/mobile).

When you get that e-mail from your photographer that your photos are ready for viewing, aren't you so excited that you try to view them immediately? Yet, there are a lot of photographers who are masters at their trade, that do not have websites that are ready to meet the new mobile demands:



So, here's what we'll cover in this chapter:

- Creating a basic gallery using lightGallery
- Supporting the full range of device sizes – responsive web design
- Text readability in responsive design
- Sending only what is needed – RESS

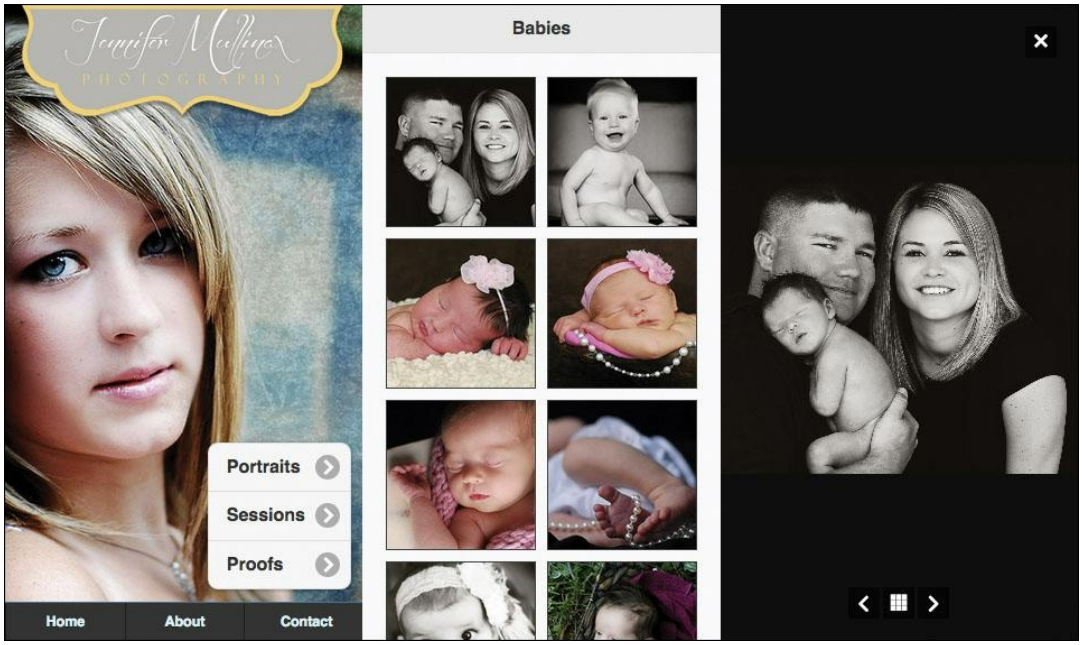
Creating a basic gallery using lightGallery

If you're looking for the single fastest way to create a photo gallery, you're not going to come up with any faster solution than lightGallery (http://sachinchoolur.github.io/lightGallery/). Weighing in at only 10K minified, it's pretty light, and works on pretty much anything that jQuery

Mobile supports, as either A or B grade. Their site says that Chrome, Safari, Firefox, Opera, IE7+, iOS, Android, and Windows Phone are all supported.

Once again I'm going to dispense with the academically correct behavior of perfectly separating JavaScript and CSS into their own files, and simply build all customized JavaScript into the page itself. It's just easier for the purposes of this book. I'm assuming if you're reading this, that you already know how to separate things properly and why.

Let's start with the basics. For the most part, this is a boilerplate from their site but we're starting with our own images from the photographer:



Let's start with the key portions of the `<head>` tag:

```
<link rel="stylesheet"
href="css/jquery.mobile-1.4.5.css" />
<link rel="stylesheet"
href="css/mullinax.min.css" />
<link rel="stylesheet"
href="css/lightGallery.css" />
<script src="js/jquery-1.10.2.js"></script>
<script src="js/jquery.mobile-1.4.5.js"></script>
<script src="js/lightGallery.min.js"></script>
```

Note

Take note, that we are now using a custom theme built with ThemeRoller (http://jquerymobile.com/themeroller/). The

`mullinax.min.css` file was produced by ThemeRoller and contains everything else needed.

Initially, your gallery's unordered lists won't look right, so we'll create a small set of CSS as an adapter. This will go into `chapter8.css`. There's not a lot in there to begin with:

```
.gallery {
list-style: none;
padding: 0;
margin: 0;
}
.gallery:after {
clear: both;
content: ".";
display: block;
height: 0;
visibility: hidden;
}
.gallery li {
float: left;
width: 33.33333333%;
}
.gallery li a {
display: block;
margin: 5px;
border: 1px solid #3c3c3c;
}
.gallery li img {
display: block;
width: 100%;
height: auto;
}
#Gallery1 .ui-content, #Gallery2 .ui-content {
overflow: hidden;
}
```

This setup is OK on an iPhone or Android phones, but if you're looking at it on any kind of a tablet or desktop size browser, the thumbnails of the gallery could get annoyingly large. Let's see what we can do with a touch of media queries to give it a more responsive design.

Supporting the full range of device sizes – responsive web design

Responsive Web Design (**RWD**) is the concept of making a single page work for every device size. That means, we're not just talking about mobile phones with a 3.5 inch screen. That's only the beginning. We are going to support tablets of all sizes, and even desktop resolutions. For more on the concept of RWD, check http://en.wikipedia.org/wiki/Responsive_web_design.

In order to make RWD work, let's set a few breakpoints based on common devices and resolution breakpoints. I'm going to start by redefining the default gallery item size to 50 percent. Why? It just feels more comfortable to me, while browsing on a smartphone in portrait mode. So, here are the breakpoints. Let's put them into the `chapter8.css` file:

```
.gallery li {
float: left; width: 50%; }

/* iPhone Horizontal -------------------*/
@media all and (min-width: 480px) {
.gallery li { width: 33.33333333%; }
}

/* iPad Vertical ----------------------*/
@media only screen and (min-width: 768px) {
.gallery li { width: 20%; }
}

/* iPad Horizontal --------------------*/
@media only screen and (min-width: 1024px) {
.gallery li { width: 16.66666666%; }
}

/* Nexus 7 Horizontal -----------------*/
@media only screen and (min-width: 1280px) {
.gallery li { width: 14.285714%; }
}

/* Laptop 1440 ------------------------*/
@media only screen and (min-width: 1440px) {
.gallery li { width: 12.5%; }
}

/* Monitor 1600 -----------------------*/
@media only screen and (min-width: 1600px) {
.gallery li { width: 11.111111%; }
}

/* Monitor 1920 -----------------------*/
```

```
@media only screen and (min-width: 1920px) {
.gallery li { width: 10%;
}
```

As I was testing this setup, I carefully considered the average viewing distance between myself and whatever screen I was viewing. These breakdowns resulted in roughly the same percentage of the field of view for a thumbnail that seemed ideal. Obviously, my focus group of one means nothing from a scientific perspective, so tweak to your heart's content.

It could be asked, why not just make each image a fixed size? Why the different resolution breakpoints? Pretty simple really, it keeps things evenly spaced instead of having a major gap on one side, because some monitors' or browsers' resizing had just enough room to force a line break, but not take up the slack. It also has the added benefit, for the book, of showing you a good way to break down a universal style sheet to turn a jQuery Mobile site into a universal site using media queries. Any other resolution-based tweaks we want to make can be put right into `chapter8.css` in its appropriate place.

Now, let us consider some of the pages themselves. We'll be putting this code, and evolving it as we go, in the `index.html` file:

```
<div id="gallery" data-role="page">
  <div class="logoContainer">
    <img class="logo" src="images/logo.png"
alt="Mullinax Photography" />
  </div>
  <div role="main" class="ui-content">
    <div class="artisticNav">
      <ul data-role="listview" data-inset="true">
        <li><a href="#babies">Babies</a></li>
        <li><a href="#families">Families</a></li>
        <li><a href="#other">Other</a></li>
      </ul>
    </div>
  </div><!-- /content -->
</div><!-- /page -->
```

> **Note**
>
> Some of the links don't exist. They're presented just to demo the UI.

The design concepts for the gallery screen are as follows:

- Full screen photo background
- Centered logo on small screens taking up no more than 90 percent of the width of the screen and not growing beyond its original size

- The navigation should still be obvious, but not get in the way of the art itself

Here's the relevant CSS that we are also putting into the `chapter8.css` file:

```
.logoContainer{text-align:center;}
.logoContainer img{width:90%; max-width:438px;}

#gallery{
background-image:url(images/backgroundSmall.jpg);
background-repeat:no-repeat;
background-position: top center;
}

.portrait #gallery{
background-size:auto 100% !important;
}

.landscape #gallery {
   background-size: 100% auto !important;
}

#gallery .ui-btn-up-c {
   background: rgba(255,255,255,.1);
   text-shadow: 1px 1px 0 white;
   background-image: -webkit-gradient(linear,left
top,left
bottom,from( rgba(255,255,255,.5) ),to( rgba(255,255,255,.7) ));
   background-image:
-webkit-linear-
gradient( rgba(255,255,255,.5),rgba(255,255,255,.7) );
   background-image:
-moz-linear-
gradient( rgba(255,255,255,.5),rgba(255,255,255,.7) );
   background-image:
-ms-linear-
gradient( rgba(255,255,255,.5),rgba(255,255,255,.7) );
   background-image:
-o-linear-
gradient( rgba(255,255,255,.5),rgba(255,255,255,.7) );
   background-image:
linear-
gradient( rgba(255,255,255,.5),rgba(255,255,255,.7) );
}

#galleryNav { position:absolute; bottom:10px;
right:10px; }
```

Now, we just need a little JavaScript to tie this all together. When the orientation changes, we want to change which direction gets 100 percent of the width for the background:

```
/*Whenever the orientation changes*/
```

```
$(window).on("orientationchange", function(event){
  $("body").removeClass("portrait")
    .removeClass("landscape")
    .addClass(event.orientation);
});

/*Prime the body with the orientation on
document.ready*/
$(document).ready(function(e) {
  if($(window).width() > $(window).height())
    $("body").addClass("landscape")
  else
    $("body").addClass("portrait")
});
```

That's good enough for our gallery entry page, now let's put together a sample gallery for baby photos. There are many entries for the gallery in the code of this chapter. However, for brevity's sake I've shortened the code here. Again, this will be in the final version of `index.html` in the code files:

```
<div data-role="page" id="babies"
class="gallery-page">
  <div data-role="page" id="babies"
class="gallery-page">
    <h1>Babies</h1>
  </div>
  <div role="main" class="ui-content">
    <ul class="gallery">
      <li><a href="images/full/babies1.jpg"
rel="external"><img
src="images/thumb/babies1.jpg"
alt="001" /></a></li>
      <li><a href="images/full/babies2.jpg"
rel="external"><img
src="images/thumb/babies2.jpg"
alt="002" /></a></li>
      <li><a href="images/full/babies3.jpg"
rel="external"><img
src="images/thumb/babies3.jpg"
alt="003" /></a></li>
      <li><a href="images/full/babies26.jpg"
rel="external"><img
src="images/thumb/babies26.jpg"
alt="026" /></a></li>
    </ul>
  </div>
</div>
```

Note

If you do not put a `rel="external"` tag on each of the links to the images, it will not work properly. The lightGallery documentation made

that pretty clear. If you're not yet familiar with the `rel="external"` tag, it is a way to tell jQuery Mobile to not follow the link with its usual AJAX-based navigation. As such, it will force a full-page load to whatever you're linking to.

Now, just for the fun of it, open this in a desktop browser at full width and then shrink it down to mobile size and watch it adapt. Try out the gallery landing page, the baby thumbnail gallery, and the slideshow that lightGallery provides. There is also a slideshow feature that will run indefinitely.

The only real problem that we have at this point, is that we have a site that scales well but the background images and full sized photos might be larger than strictly necessary. The background image isn't really a problem because we can govern which size to send back, based on our media queries. We just need to create two or three background image sizes and override which image is used in the `jquery-mobile.css` file. In the final version of the code for this chapter, I have renamed `jquery-mobile.css` to `chapter8.css` to avoid any confusion with actual jQuery Mobile library CSS files.

Text readability and responsive design

Studies have shown that there are ideal character limits per line. Ideally, you should settle on 35, 55, 75, or 95 **Characters Per Line** (**CPL**). People tend to prefer either shorter or longer lines. Since we're really trying to showcase photography here, let's go with the shorter CPL. If you want to read the full report, you can find it at http://psychology.wichita.edu/surl/usabilitynews/72/LineLength.asp.

To a large extent, the width of our text columns will be dictated by the devices themselves. On smaller devices, we really have no choice but to go to a `100%` width. Once we get to tablets in landscape mode, we'll have room to do creative things with our text. We could, for larger widths, increase our CPL to 55 and it would look great. We may also consider using larger images as well. Whatever we do, having a strong set of media query breakpoints is the key.

Let's take some paragraphs of text about sessions and make it more responsive with this study as a guideline:

```
<div id="sessions" data-role="page">
  <div class="logoContainer">
    <a href="#home"><img class="logo"
src="images/logo.png" alt="Mullinax Photography"
border="0" /></a>
  </div>
<div role="main" class="ui-content">
  <div class="textContainer ui-shadow">
    <h3>For Your Session</h3>

    <p>Portrait sessions may be held at our
Western Shawnee Studio, in the comfort of your
home, or a location of your choice. I love
capturing little ones in their natural
environment. At home, children often feel more
comfortable and are more likely to play and have
fun. It's the perfect environment for capturing
those sweet little smiles and laughs that you as
a parent adore!!</p>

     <p>I strive to make each portrait session
relaxed, fun, and beautiful. Like each child,
each session will be unique to fit your family's
needs. As a mother, I understand firsthand the
challenges that come with photographing little
ones. The perfect portrait can take time. Being
the perfect model is hard work and often breaks
are needed.  That is why each of my sessions is
```

```
held without time constraints. A one-of-a-kind
portrait cannot be rushed!! While I don't want to
overstay my welcome, I do want to stay long
enough that you and I are both satisfied with the
portraits that were captured.</p>

    <h3>After Your Session</h3>

    <p>Approximately two weeks after your
session, I will post an online gallery for you to
view your proofs as well as share with friends
and family. Your proof gallery will stay online
for 10 days. At this time you have the option of
placing your order through the website using our
shopping cart or you can schedule an in-person
appointment.</p>

  </div>
</div><!-- /content -->
<div data-role="footer">
  <div data-role="navbar" data-position="fixed">
    <ul>
      <li><a href="#home">Home</a></li>
      <li><a href="#about">About</a></li>
      <li><a href="#contact">Contact</a></li>
    </ul>
  </div><!-- /navbar -->
</div>
</div><!-- /page -->
```

Next, let's create some of the rules around its placement on the page:

```
#sessions {
  background-color: #888;
  background-repeat: no-repeat;
  background-position: center center;
}

#sessions h3 {
  font-family: 'Euphoria Script', Helvetica,
sans-serif;
  font-size: 200%;
  font-weight: bold;
  margin: 0;
}

.textContainer {
  background-color: #EEE;
  margin: -5px;
}

/* iPhone Portrait --*/
@media all and (min-width: 320px){
  .textContainer {
```

```
    padding: 120px 10px 10px 10px;
  }
  #sessions {
    background-image: none;
  }
}

/* iPad vertical --*/
@media only screen and (min-width: 768px) {
.textContainer { padding: 160px 10px 10px 10px;}
}

/* iPad Horizontal --*/
@media only screen and (min-width: 1024px) {
  .textContainer {
    float: right;
    width: 35em;
    padding: 2em;
    height :550px;
    overflow: scroll;
  }
  #sessions {
    background-image: url(images/Colleen.jpeg)
  }
}

/* Laptop 1440 --*/
@media only screen and (min-width: 1440px) {
  #sessions {
    background-image: url(images/Gliser.jpg)
  }
}
```

As before, a rule set in the lower widths will carry through to the wider widths unless a value is specified to override. You can see how I'm switching out the images used on sessions for the iPad landscape view and 1440 resolutions. Before those, every resolution inherited the `background-image: none` form and the 320px rules.

Now, let's take a look at our results.

Smartphone-sized devices

Here, we see the session content on small screens for both portrait and horizontal orientation. Either way is highly readable, but neither is really ideal for displaying anything other than the text. If we tried to squeeze in any kind of artwork, it just wouldn't show up well. We'd be violating the good text readability we just talked about. Either you or the photographer might think that perhaps having one of their images faded in the background would look good but don't! Leave the majority of the reading text as black on white in standard size fonts:



Tablet-sized devices

Here, we see the same thing rendered on tablets. On portrait orientation, it's still great for reading if we leave the text at a `100%` width. We are well within the guidelines for good readability. However, that breaks down when the user switches to landscape. In landscape, tablets finally have enough room to show some photography and the text as well:



Desktop-sized devices

This is still a jQuery Mobile page but we're looking more like a traditional desktop site. This is beneficial for devices like iPads and laptops that can take advantage of increased screen real estate. Now, we can show more than just one face, so we might as well switch out some different photos to showcase the artist's ability:



Yes, this is me and my family. Yes, I am very proud of them. And I'm pretty happy with the way the text treatment is working out on each of these resolution breakpoints and that it's all on one page.

Cycling background images

So, how do we cycle background images when the very images we're using depend on our current resolution and orientation? That pretty much rules out cycling out a single image. Instead, we're going to have to swap out entire style sheets. Here we go:

```
<link rel="stylesheet" href="rotating0.css"
id="rotatingBackgrounds" />
```

It's a pretty simple style sheet to begin with, but you could make it as complex as you like. We're not accounting for HD display versus SD displays for now. The iPhone 4 with Retina display (326 ppi) was released in June 2010. Ever since, the trend is moving toward HD screens anyway, so I'm simply assuming most people have updated their smartphone within the last two years and that they either have a high resolution screen or very soon will. Keep in mind also, that we are on the edge of the LTE (fourth generation mobile broadband) ubiquity. Someday soon, mobile speeds will rival home broadband speeds.

Now, is this really an excuse for laziness and not making smaller versions to capitalize on performance where you can? No, and most likely, some haters and academics will even take issue with the previous paragraph. I will say this, performance does matter. It is a billable feature. But think about how many images you want to be cycling through and then multiply that by how many resolution and dimension variants you want to spend time preparing and testing. Again, it's all billable unless you're doing it for free.

How much longer until such minute optimizations really make no discernible difference? If you're reading this in 2014 or later, you might already be scoffing at the idea of having to worry about bandwidth in any practical sense (depending on your market). Just some food for thought.

Here's one of the CSS files for the rotation:

```
@charset "UTF-8";
/* CSS Document */

#gallery { background-image:
url(images/homebg.jpg);}

/* iPhone Portrait --*/
@media all and (min-width: 320px){
   #home {
      background-image:
url(images/backgroundSmartphone.jpg);
   }
   #sessions { background-image: none; }
```

```
}

/* iPhone Horizontal / Some Droids --*/
@media all and (min-width: 480px){  }

/* iPad Vertical --*/
@media only screen and (min-width: 768px) {
   #home { background-image:
url(images/backgroundSmall.jpg);}
}

/* iPad Horizontal --*/
@media only screen and (min-width: 1024px) {
   #sessions { background-image:
url(images/Colleen.jpeg) }
}

/* Nexus 7 Horizontal --*/
@media only screen and (min-width: 1280px) {  }

/* Laptop 1440 --*/
@media only screen and (min-width: 1440px) {
   #sessions { background-image:
url(images/Gliser.jpg) }
}

/* Monitor 1600 --*/
@media only screen and (min-width: 1600px) {  }

/* Monitor 1920 --*/
@media only screen and (min-width: 1920px) {  }
```

Now that we've got that, we need to decide how we'll cycle them. We could use a `setInterval` JavaScript option to swap the style sheets out on a timer. Honestly, even for a photography website, I think that's being a bit optimistic. We probably wouldn't want to swap any faster than once every 5 seconds. Think about it: the mobile usage pattern involves quick, short bursts of productivity or gaming. Most people are not going to stay on any given mobile screen for more than 5 seconds unless it is either text-heavy, like an article, or is so poorly crafted that the user is having trouble navigating. So, it's pretty safe to say that the `setInterval` option is right out.

OK, so, maybe it's best to randomly choose a style sheet on the `pagebeforeshow` event? Consider the following code:

```
$(document).on("pagecontainerbeforeshow",
function(){
  $("#rotatingBackgrounds").attr("href",
"rotating" +
Math.floor(Math.random()*4) + ".css");
});
```

But what happens when we try this? We get strange, ugly image blinks. With fade transitions or slides, it really doesn't matter. Using the `pageshow` event makes no difference either. It looks terrible. Do not do it. I know it's tempting but it won't look good at all. So, after all this, it's my recommendation to keep a single, randomly assigned, per-session style sheet. Consider the following code snippet:

```
<link rel="stylesheet" href=""
id="rotatingBackgrounds" />
<script>
$("#rotatingBackgrounds")

 .attr("href","rotating"+Math.floor(Math.random()*4)+".css")
</script>
```

Notice that I did not simply use the `document.write()` function.

Tip

Pro tip

Never ever ever… ever use the `document.write()` function in a jQuery Mobile environment. It can play hell with your **Document Object Model** (**DOM**) and you'll be scratching your head wondering what went wrong. I've seen it bite people before. My friend's already thin hair was in full retreat from the head scratching this problem was causing him. Trust me, the `document.write()` function is to be avoided.

Another responsive approach – RESS

Responsive Design + **Server Side Components** (**RESS**) is an idea that makes a lot of sense. The concept is, that you use a server-side mobile detection method such as WURFL (http://wurfl.sourceforge.net/). Then, you send up a different versions of page components, different sized images, and so on. We could then change the wrappers around the page content and the navigation to use jQuery Mobile just as easily as any home-brewed markup. The beauty of this approach, is that everybody gets the content that is right for them, without the bloat of a typical responsive design and it's always on the same URL.

The first time I saw this idea proposed in writing was in an article at http://www.lukew.com/ff/entry.asp?1392 by Luke Wroblewski (https://twitter.com/lukew) in September 2011. In it, he outlines the very performance problem we now face with images. Luke meant this as a way of doing pure responsive web design without any kind of mobile framework.

WURFL can tell you the screen size of the device you're serving and you could resize (on the fly) your photographer's original 3 MB image, down to maybe 150K, 70K, and so on, depending on the device resolution. You'd still want to be sure to make it about twice as large as the screen size you're serving, or the user will only see a blurry mess when they try to zoom in on their photo in the lightGallery view.

While handy in some ways, RESS will never be a perfect solution because it depends on browser sniffing to do its work. Is that so bad? No, not really. No solution is perfect, but the database of devices is community driven and rapidly updated, so that helps. This would be a very viable solution and we'll discuss it in more depth in the next chapter.

The final code

The full code for this experience is a little on the verbose side for putting into a book and we've already explored the concepts around it. I would strongly encourage you to look at the code. At this point, there should be nothing surprising to you. Play with it. Adapt it. Go get yourself some free photography by trading services to build your portfolio.

Summary

Tackling responsive design with a mobilefirst approach, as we have here, can take what is a great mobile site and make a highly performant desktop site but it doesn't usually work the other way around. The key to it all is the media queries and starting small first. If it works that well on a mobile with the limited processor, bandwidth, and network latency, think how amazing it will be on a machine where none of the restraints exist.

In the next chapter, we'll examine WURFL and other mobile detection methods to try and adapt existing websites and make them mobile.

Chapter 9. Integrating jQuery Mobile into Existing Sites

We can't all be lucky enough to only work on new sites. Maybe the customer is unwilling to pay for a mobile first site or maybe they like their desktop site as it is and just want a mobile site. Your mobile implementation could be the gateway to future business with the client. We need to be ready with a few techniques to wedge jQuery Mobile into their existing site.

What we'll cover is as follows:

- Detecting mobile – server-side, client-side, and the combination of the two
- Mobilizing full site pages – the hard way
- Mobilizing full site pages – the easy way

Detecting mobile – server-side, client-side, and the combination of the two

Not everyone is doing responsive design, so there's a pretty good chance you're going to need to know how to detect mobile devices. We've approached the topic lightly before but now, let's get serious.

Browser sniffing versus feature detection

This topic has the potential to start a geek war. On one side, you have people who proclaim the virtues of community-maintained databases that perform mobile detection on the server side. WURFL is a prime example. Using it, we can get a lot of information about the device that is visiting our sites. Listing it all here would just be a waste of space. Check out http://www.tera-wurfl.com/explore/index.php to see it in action or view the entire list of capabilities at http://www.scientiamobile.com/wurflCapability/.

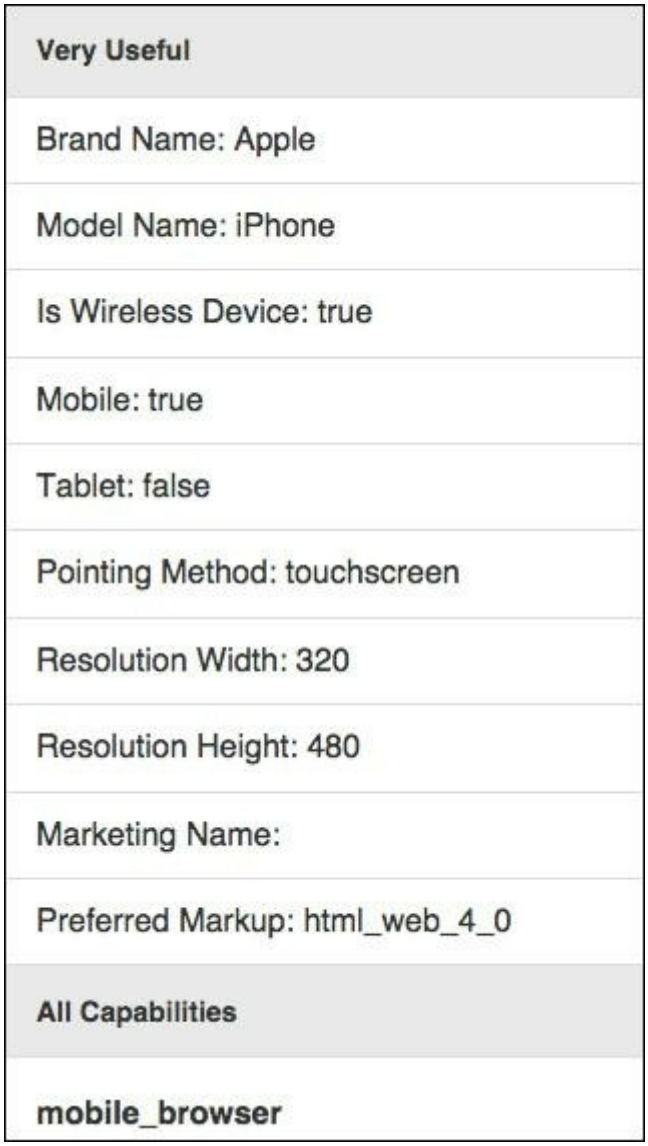
On the other side of the debate, people point out that the server-side detection (even when it is database driven) can lead to brand new devices not being recognized until they're in the database and the site administrator updates their local copy. This is not completely true. All Androids say so. It is the same with iPhone, iPad, BlackBerry, and Microsoft. Still, a much more future-friendly (http://futurefriendlyweb.com/) approach is to use feature detection. For instance, does the device support canvas or perhaps

touch events? Almost certainly, if you support such technologies and events, you're primed for a mobile experience with jQuery Mobile.

Regardless, at this point we're going to assume that we're working with a company that already has a website and now wants a mobile site too. Therefore, we'll need to be able to detect mobile and route them to the correct site.

WURFL – server-side database-driven browser sniffing

WURFL has APIs for Java, PHP, and .NET. Pick up a copy of the version that works for you at http://wurfl.sourceforge.net/apis.php. Since virtually every single hosting provider out there supports PHP out of the box, we're going to go with the PHP example:



I simply used the built-in server that comes on Mac OS X but you could also use MAMP (http://www.mamp.info/en/index.html). You can easily run the example on any hosting platform which supports PHP. If you want to try the examples on your own Windows computer, you can use XAMPP (http://www.apachefriends.org/en/xampp.html) or WAMP (http://www.wampserver.com/en/) as a quick shortcut, note that XAMPP also offers a Linux option. I'm not going to get into the particulars of server setup and environment configuration in this book. That could probably justify a book of its own.

So, PHP… here we go. Start at http://wurfl.sourceforge.net/php_index.php. From there you can download the latest copy of **WURFL API package** and unzip it. Take the entire unzipped folder and dump it anywhere in your site. If all is well, you should be able to hit the demo page (currently located at the `wurfl-php-<version>/examples/demo/index.php` path) and see details about your browser and device. On my Mac, it was `http://localhost/wurfl-php-1.4.1/examples/demo/index.php` but your path will vary. You could also access the files for this chapter, place them into the `webroot` folder of your choosing and view the `index.php` file.

When you run the default example, you can instantly see how useful it is, but let's make it even better. Let's create a file in this same directory called `improved.php`. This version will put the most useful features at the top and list all other options underneath:

```
<?php
  // Move the configuration and initialization to
  // the top so you can use it in the head.

  // Include the configuration file
  include_once './inc/wurfl_config_standard.php';

  $wurflInfo = $wurflManager->getWURFLInfo();

  if (isset($_GET['ua']) && trim($_GET['ua'])) {
    $ua = $_GET['ua'];
    $requestingDevice =
$wurflManager->getDeviceForUserAgent($_GET['ua']);
  } else {
    $ua = $_SERVER['HTTP_USER_AGENT'];

    //This line detects the visiting device by
looking
    //at its HTTP Request ($_SERVER)

    $requestingDevice = $wurflManager-
>getDeviceForHttpRequest($_SERVER); } ?>

<html>
  <head>
```

```
    <title>WURFL PHP API Example</title>
    <?php
if($requestingDevice-
>getCapability('mobile_browser') !== ""){ ?>
      <meta name="viewport"
content="width=device-
width, initial-scale=1, maximum-scale=1.0,
user-scalable=no">
      <link rel="stylesheet"
href="css/jquery.mobile-1.4.5.css" />
      <script src="js/jquery-1.10.2.js"></script>
      <script
src="js/jquery.mobile-1.4.5.js"></script>
    <?php } ?>
  </head>
  <body>
```

Here we create the only real page, in a jQuery Mobile fashion:

```
  <div data-role="page">
    <div data-role="header">
      <h1>WURFL XML INFO</h1>
    </div>
  <div role="main" class="ui-content"
id="content">

  <h4>VERSION: <?php echo $wurflInfo->version; ?>
</h4>
  <p>User Agent: <b> <?php echo
htmlspecialchars($ua); ?> </b></p>
  <ul data-role="listview">
    <li data-role="list-divider">
      <h2>Very Useful</h2>
    </li>
    <li>Brand Name: <?php echo $requestingDevice-
>getCapability('brand_name'); ?> </li>
    <li>Model Name: <?php echo $requestingDevice-
>getCapability('model_name'); ?> </li>
    <li>Is Wireless Device: <?php echo
$requestingDevice-
>getCapability('is_wireless_device'); ?></li>
    <li>Mobile:
    <?php
if($requestingDevice-
>getCapability('mobile_browser') !== ""){
       echo "true";
     }else{
       echo "false";
     }; ?>
    </li>
    <li>Tablet: <?php echo $requestingDevice-
>getCapability('is_tablet'); ?> </li>
```

```
    <li>Pointing Method: <?php echo
$requestingDevice-
>getCapability('pointing_method'); ?> </li>
    <li>Resolution Width: <?php echo
$requestingDevice-
>getCapability('resolution_width'); ?> </li>
    <li>Resolution Height: <?php echo
$requestingDevice-
>getCapability('resolution_height'); ?> </li>
    <li>Marketing Name: <?php echo
$requestingDevice-
>getCapability('marketing_name'); ?> </li>
    <li>Preferred Markup: <?php echo
$requestingDevice-
>getCapability('preferred_markup'); ?> </li>
```

Here we start to list out the entire set of known data from WURFL by looping through the array of properties:

```
    <li data-role="list-divider">
      <h2>All Capabilities</h2>
    </li>

    <?php foreach(array_keys($requestingDevice-
>getAllCapabilities()) as $capabilityName){ ?>
      <li><?php echo
"<h3>" .$capabilityName."</h3><p>" .
$requestingDevice-
>getCapability($capabilityName)."</p>"; ?>
      </li>
    <?php } ?>
    </ul>

    <p><b>Query WURFL by providing the user
agent:</b></p>
    <form method="get" action="index.php">
      <div>User Agent: <input type="text"
name="ua" size="100" value="<?php echo
isset($_GET['ua'])?
htmlspecialchars($_GET['ua']): ''; ?>" />
        <input type="submit" value="submit" />
      </div>
    </form>
  </div>
</div>
</body>
</html>
```

Note

We've conditionally made this a jQuery Mobile page by using the server-side detection to see if the user is mobile. Only then do we inject the jQM libraries.

The attributes under the **Very Useful** section are probably all you really need for most day-to-day work, but be sure you at least skim over the other options. The most useful features are as follows:

- `is_wireless_device`
- `mobile_browser`
- `is_tablet`
- `pointing_method`
- `resolution_width`
- `resolution_height`

Now, granted, this does not tell us everything about the browser/device. For instance, an iPhone 4S or 5 will be recognized as an original iPhone. There's also no distinguishing the iPad mini using WURFL. This is because the user agents have never been updated as the Apple devices have evolved. WURFL has no way of knowing that a device has a high pixel density and should thus be sent higher resolution images. Therefore, we'll still need to use media queries to determine pixel ratios and adapt our graphics appropriately. Here is a brief example:

```
.logo-large {
  background-image: url(../images/logo.png);
  background-repeat: no-repeat;
  background-position: 0 0;
  position: relative;
  top: 0;
  left: 0;
  width: 290px;
  height: 65px;
  margin: 0 auto;
  border: none;
}

/* HD / Retina
-----------------------------------------------
*/ @media only screen and
(-webkit-min-device-pixel-ratio: 1.5),
       only screen and
(min--moz-device-pixel-ratio: 1.5),
       only screen and (min-resolution: 240dpi)
{
  .logo-large {
    background-image: url(../images/logoHD.png);
    background-size: 290px 65px;
  }
```

```
}
```

> **Note**
>
> Using media queries is pretty much the only way to detect an iPad mini. It has the same resolution as the iPad 2, just in a smaller format. However, as we can see from the preceding code, we can qualify a media query using DPI. The iPad 2 has 132 dpi. The iPad mini has 163. For more on this, check out http://www.mobilexweb.com/blog/ipad-mini-detection-for-html5-user-agent.

So far, we've pretty much assumed smartphones but remember that jQuery Mobile is a framework that is also perfect for not so smartphones. You may have customers in a market that is not as developed and uses cell connections for nearly everything. There may not be as many JavaScript-enabled touchscreen phones there. In a case like that, you won't be able to use JavaScript-based feature detection. Very quickly, WURFL or some other server-side detection will become your only reasonable option for detecting wireless devices and serving them up something useful.

JavaScript-based browser sniffing

It is arguable that this may be (academically) the worst possible way to detect mobile but it does have its virtues. This pragmatic example is very useful in that it gives you a lot of options. Perhaps our budget is limited and so we've only tested for certain devices. We want to be sure we're only letting in people that we know will have a good experience. Case in point: no BlackBerry device below version 6 will be allowed because we've chosen to do some fancy JavaScript templating, that version 5 and lower just can't handle.

Perhaps we've also not taken the time yet to optimize for tablets, but in the mean time we can start providing a better experience for any smartphones. In any case, this could come in quite useful:

```
<script type="text/javascript">
  var agent = navigator.userAgent;
  var isWebkit = (agent.indexOf("AppleWebKit") >
0);
  var isIPad = (agent.indexOf("iPad") > 0);
  var isIOS = (agent.indexOf("iPhone") > 0 ||
agent.indexOf("iPod") > 0);
  var isAndroid = (agent.indexOf("Android")  > 0);
  var isNewBlackBerry =
(agent.indexOf("AppleWebKit") > 0 &&
agent.indexOf("BlackBerry") > 0);
  var isWebOS = (agent.indexOf("webOS") > 0);
```

```
  var isWindowsMobile =
(agent.indexOf("IEMobile") > 0);
  var isSmallScreen = (screen.width < 767 ||
(isAndroid && screen.width < 1000));
  var isUnknownMobile = (isWebkit &&
isSmallScreen);
  var isMobile = (isIOS || isAndroid ||
isNewBlackBerry || isWebOS || isWindowsMobile ||
isUnknownMobile);
  var isTablet = (isIPad || (isMobile
&& !isSmallScreen));
if ( isMobile && isSmallScreen &&
document.cookie.indexOf( "mobileFullSiteClicked=")
< 0 ) mobileRedirect();
</script>
```

We've done a little work here to future-proof the detection by creating a classification for unknown mobile devices as being anything running WebKit that has a small screen. Chances are, any new platform that comes out will be using WebKit as its browser. Microsoft is one of the the only exceptions that still seem to think they have something more to offer on their own and that platform is easy enough to sniff.

This approach, while flexible, would require direct intervention if a new platform was launched without a WebKit browser. But, that doesn't happen very often. Even if it does, it would take a while for that platform to gain a critical mass worth considering. If you're going by the 80/20 rule (worry about reaching 80 percent successfully and reach the last 20 percent when you can), this gets you well into the upper 90s.

JavaScript-based feature detection using Modernizr

There are several ways that you can perform feature detection. Probably the easiest way is to use a tool such as Modernizr (http://modernizr.com/). You can customize a download to only detect the features that you care about. If you want to do HTML5 Audio/video, it might be nice to know if you can:



The platform is not exactly light. Just the options shown in the preceding screenshot led to a 11K minified JavaScript. But hey, we throw around images of that size like they're nothing. At least a JavaScript library is useful. This still won't tell you if the user coming to you is mobile but is that even the right question to be asking?

Perhaps, all we need to know is that the device we're looking at supports touch events. The other options are great for knowing what you can and cannot do but if the user interface is touch, even if it's a tablet or a full sized touch based monitor, give the user the interface they deserve. Give them jQuery Mobile.

JavaScript-based lean feature detection

This useful little snippet of code is something cobbled together for detecting mobile. It is a blending of feature detection and browser sniffing. Most modern smartphones will support all the event and APIs we're looking for here. Microsoft, being the special case they always seem to be, has to be browser sniffed. According to their Windows Phone developer blog, you can simply check the user agent for IEMobile. Fair enough, here's the result:

```
if(
  ('querySelector' in document
  && 'localStorage' in window
  && 'addEventListener' in window
  && ('ontouchstart' in window ||
  window.DocumentTouch && document instanceof
DocumentTouch)
  )
  || navigator.userAgent.indexOf('IEMobile') > 0)
{
  location.replace('YOUR MOBILE SITE');
}
```

> **Note**
>
> It's recommended that developers attempt to detect individual distinct features, rather than browser and version. For example the `querySelector` feature was first added to Internet Explorer in version 8.

If, for some reason, we decided that we didn't want to send tablets to our jQM masterpieces, we could always throw in some of the other tests from the previous section.

Server-side plus client-side detection

Here's an idea, when the user first hits your server, send them a page whose only job is to run Modernizr and then send the resulting capabilities back to the server so all collected knowledge is in one place. In testing locally, speed is less of an issue, but a nice option would be to also include some sort of loading indicator on this page, so that users on slower connections don't see a blank page.

This file is `test.html` in the code files package for the chapter:

```
<!doctype html>
<html>
<head>
  <meta charset="UTF-8">
  <title>Loading</title>
  <style type="text/css">

    #sd { display:block; } /*standard def*/
    #hd { display:none; } /*high def*/

    @media only screen and
      (-webkit-min-device-pixel-ratio: 1.5),
      only screen and
(min--moz-device-pixel-ratio: 1.5),
      only screen and (min-resolution: 240dpi) {
```

```
        #sd { display:none; } /*standard def*/
        #hd { display:block; } /*high def*/
      }
  </style>
  <script
src="js/modernizr.custom.99581.js"></script>
  <script type="text/javascript"
src="js/jquery-1.10.2.js"></script>
</head>
<body>
  <div id="hd"></div>
  <div id="sd"></div>
</body>
<script>
  if($("#hd").is(":visible")){
    $("html").addClass("hdpi");
  }else{
    $("html").addClass("sdpi");
  }

  $.post("session_set.php",
    {
      modernizrData: $("html").attr("class")
    }
  )
  .success(function(data, textStatus, jqXHR) {
    console.log(data);
    location.replace("YOUR MOBILE SITE");
   })
  .error(function(jqXHR, textStatus, errorThrown)
{
    console.log(errorThrown);
    location.replace("SOMEWHERE ELSE");
  });
</script>
</html>
```

Just to make the circle complete, here is a version of the WURFL detection scripts that will return the values as JSON so we can store it to HTML5 `sessionStorage` attribute. This file is found at `session_set.php`:

```
<?php session_start();

// Move the configuration and initialization
// to the tip so you can use it in the head.

// Include the configuration file

include_once './inc/wurfl_config_standard.php';

$wurflInfo = $wurflManager->getWURFLInfo();

if (isset($_GET['ua']) && trim($_GET['ua'])) {
  $ua = $_GET['ua'];
```

```
  $requestingDevice =
$wurflManager->getDeviceForUserAgent($_GET['ua']);
} else {
  $ua = $_SERVER['HTTP_USER_AGENT'];

  // This line detects the visiting device by
looking
  // at its HTTP Request ($_SERVER)

  $requestingDevice =
$wurflManager->getDeviceForHttpRequest($_SERVER);
}

// store session data
$_SESSION['wurflData']=$requestingDevice;

$_SESSION['modernizrData']=
$_POST['modernizrData'];

$i = 0;

$capabilities =
$requestingDevice->getAllCapabilities();
$countCapabilities = count($capabilities);
?>
{
  "wurflData": <?php

  //echo json_encode($capabilities);
  foreach(array_keys($capabilities) as
$capabilityName){
    $capability =
$requestingDevice->getCapability($capabilityName);
    $isString = true;
    if($capability == "true" ||
       $capability == "false" ||
       is_numeric($capability))
    {
      $isString = false;
    }

    echo "\"".$capabilityName
      ."\":".(($isString)?"\"":"")l

 .$requestingDevice->getCapability($capabilityName)
      .(($isString)?"\"":"");

    if(($i + 1) < $countCapabilities){
      echo ",\n";
    }

    $i++;
  }
?>
```

```
}
```

> **Note**
>
> This example has commented out the easy way of JSON encoding using an associative array. Replacing that is some PHP code that will send back JSON encoding that uses real Boolean and numeric values instead of storing everything as a string.

With these files, you now know everything that can be known about your visitors on both the server side and client side.

Mobilizing full-site pages – the hard way

Why would we do it the hard way? Why? Really there's two good reasons: SEO, and to keep the content on the same page so that the user doesn't have one page for mobile and one page for desktop. When e-mails and tweets and such are flying around, the user generally doesn't care if they're sending out the mobile view or the desktop view and they shouldn't. As far as they're concerned, they're sending content to someone. This is one of the prime arguments for responsive design. But don't worry; we'll take this this into consideration later when we also do things the easy way.

Generally, it's pretty easy to tell what parts of a site would translate to mobile. Almost regardless of the site layout there are data attributes you'll be throwing onto existing tags to mobilize them. When jQuery Mobile's libraries are not present on the page, these attributes will simply sit there and cause no harm. Then you can use one of our many detection techniques to decide when to throw the jQM libraries in.

Know your role

Let's consider some of the key `data-role` attributes that are needed to mobilize a page:

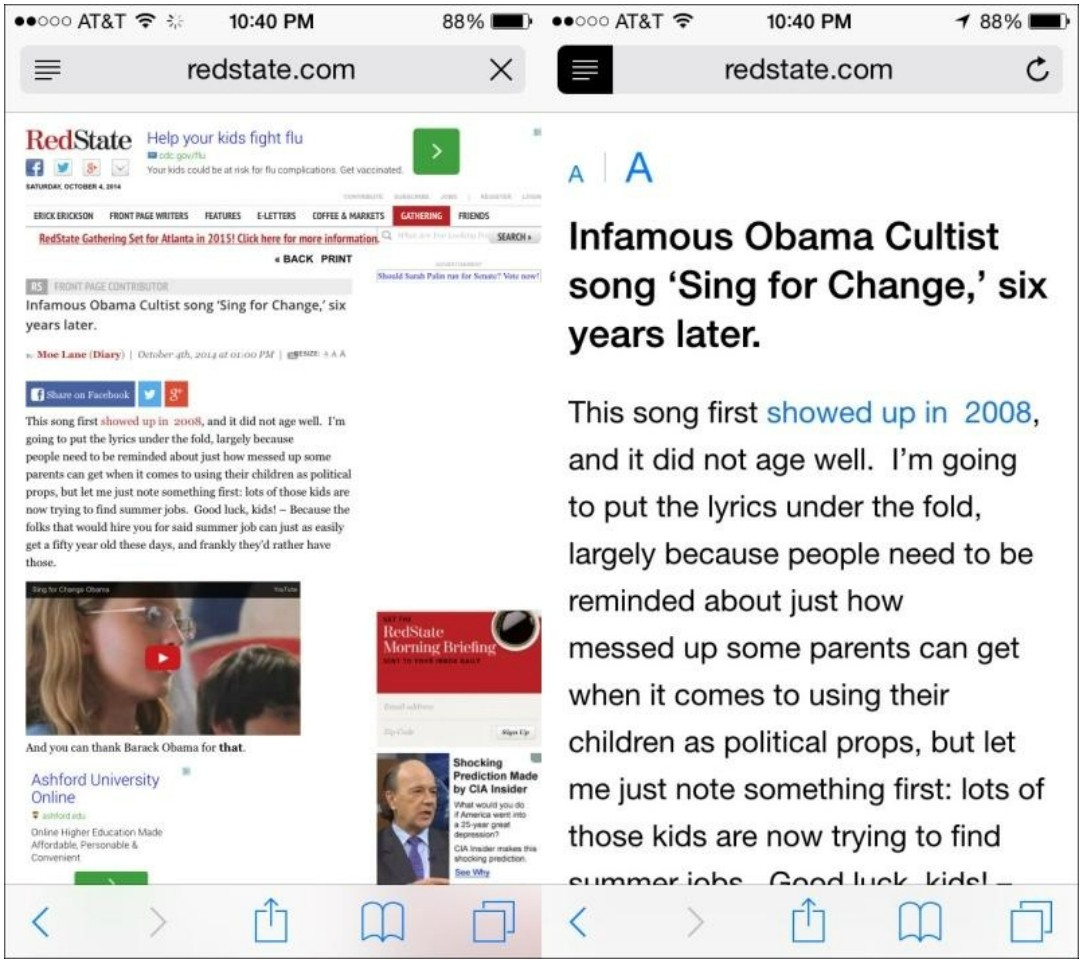
- `data-role="page"`: This contains everything that will show in the mobile view.
- `data-role="header"`: This wraps the `h1`, `h2`, `h(x)` elements, and up to two links in the appearance of a bar and turns the links into buttons. You can put more into a header but it's not advisable. If you've got that much to try to squeeze into the header, you might be better off having a single **Menu** button. Header bars can have their positions fixed. Anything within the header bar will remain fixed at the top.
- `role="main" class="ui-content"`: This provides a margin around your content.
- `data-role="button"`: This turns a link into a button.
- `data-role="navbar"`: This creates a navbar when wrapped around a list of links.
- `data-role="footer"`: This wraps anything you want at the bottom. It's a great place for secondary links, next step navigation, contact us, and copyright information that signals the end of all usefulness. This can also be given a fixed position.
- `data-role="none"`: This prevents jQuery Mobile from styling the content.

From an ideal user experience perspective, pages would contain nothing more than what was necessary for the user to accomplish the task for which they came to that page. Let us have a moment of silence for the dream lost… With that in mind, remember that anything inside of the `data-role="page"` attribute will show up on the mobile view.

So, the best thing you can do on most full-site pages, is to determine which chunk of the page the user actually came for, tag that section with a role of the `content` attribute, and then immediately wrap that with a tag whose role is the `page` attribute. In doing so, you will automatically cut out the rest of the cruft that fills the rest of most web pages.

Step 1 of 2 – focus on content, marketing cries foul!

At this point anyone with a marketing background might be crying foul because this approach cuts out their messaging and targeted advertising and such. However, it is worth noting that people have had the ability to do this very thing on their own for a while now. Controversial services such as Pocket, Instapaper, and even the simple Reader tool on iOS Safari are providing the user with exactly what they want. Here is an example of a normal desktop site on the left and how the iOS Reader strips away everything but the content itself:



We have a choice; provide the user with the content that they want, in the format they want, or possibly lose them to these tools. This will require a more creative approach to marketing activities on mobile. But make no mistake, removing all markup unrelated to the actual content of the page should be your first step.

After gutting everything but the main content of the page, we'll also need to gut the styles and scripts that are currently in the head. If we have access to modify the page itself we can easily do this on the server side using WURFL. Otherwise, we could always use JavaScript to remove the style sheets and scripts we don't want, and then inject ours. We could also simply highjack the first style sheet and then remove the rest and do the same with the scripts to first bring in jQuery and then jQuery Mobile. There are a thousand ways to tackle the situation but I'd really recommend using WURFL if you're going to mobilize an existing page in this fashion. Otherwise, it's just going to get messy.

Step 2 of 2 – choose global navigation style and insert

So, at this point, we've got the beginnings of the page but there may still be some minor things that need removing. Having a mobile style sheet to take care of those few overrides will be quite helpful, and quicker than cleaning up with JavaScript DOM manipulation. That's pretty simple, the next big question is, how do we deal with the global navigation since we just explicitly excluded it.

Global nav as a separate page

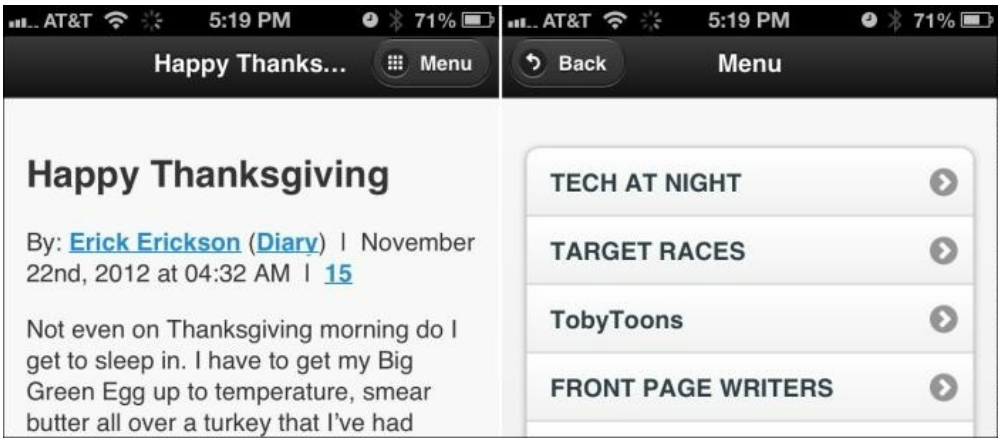
This is probably the simplest approach and keeps the interface as clean as possible (mentioned in the following steps):

1. Wrap the global nav in its own separate roles of the page element and the content element and be sure they're easily selectable.
2. At the bottom of the page (or really anywhere after the global nav and content are complete) put in a script that moves the containing page of global nav below the content. This is particularly important because we are now in a multipage view and the first page in the DOM will be shown to the user when jQuery Mobile kicks in. We want to do this before jQuery Mobile even knows it should do anything. If we don't, the user who came to the site expecting to read something will first be greeted by a global nav. Here is a very simple example based on the pages we previously saw:

```
$("#NavMainC").insertAfter("#ContentW");
```

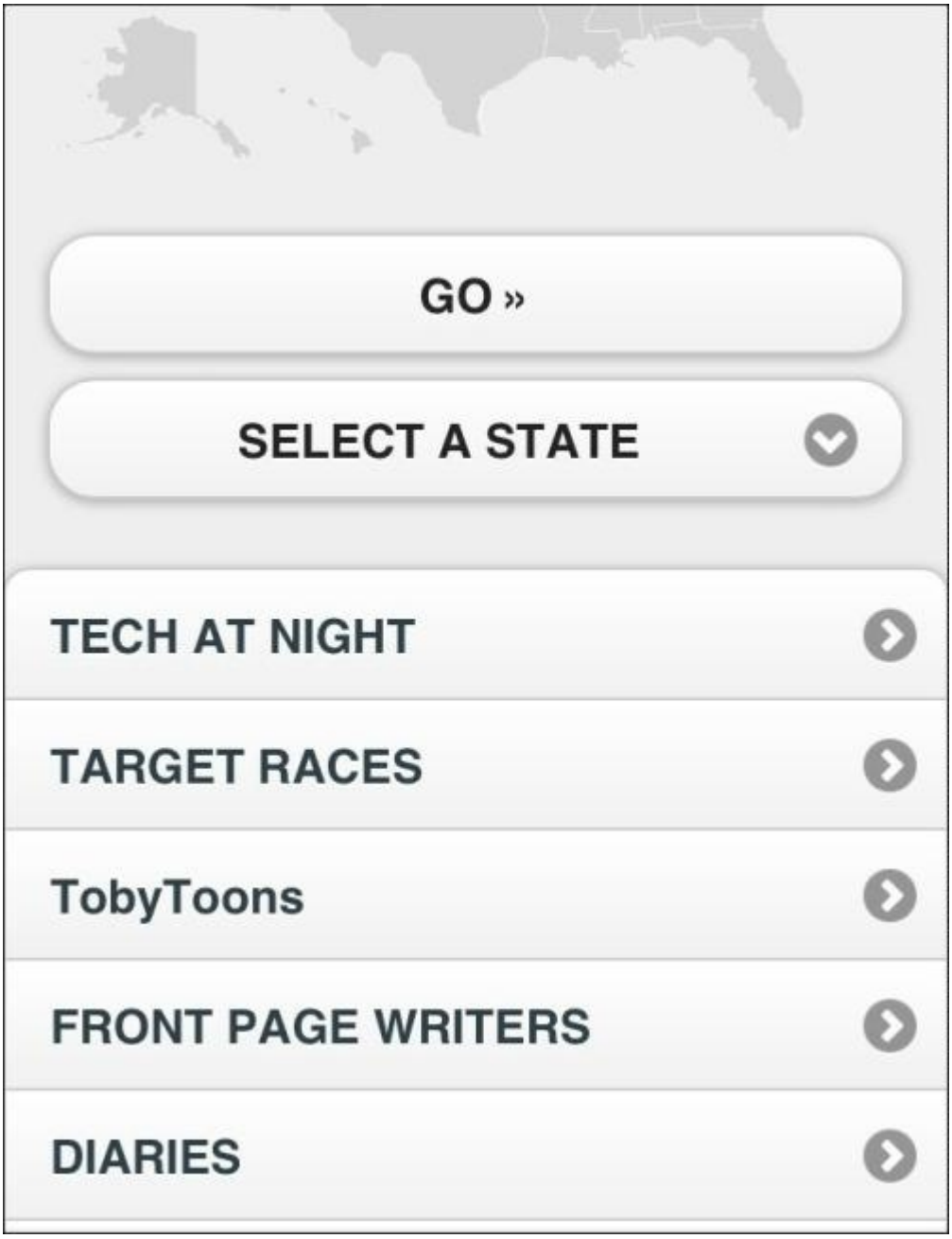
3. Append headers to these internal pages so they can link to each other:

```
$("#ContentW").prepend("<div
data-role='header'><h3>"+
$("title").text()+"</h3><a href='#NavMainC'
data-
icon='grid'
class='ui-btn-right'>Menu</a></div>")

$("#NavMainC").prepend("<div
data-
role='header'><a data-rel='back'
data-
icon='back'
href='javascript://'>Back</a><h3>Menu</h3></a>");
```



Global nav at the bottom

In pages such as articles where the user is likely to read all the way to the bottom, it is not uncommon to put the menu at the bottom of the page. It's an approach that fosters continued engagement. They're already there, right? Perhaps you might throw a link to a related article or two and then append the global menu to the bottom of the page. This would give the user something more to read without having to scroll all the way back to the top:



Personally, I think it's best to take this two-pronged approach. The menu at the top links to the bottom and the menu at the bottom includes a link to return to the top. This is accomplished by the `$.mobile.silentScroll` function.

Global nav as a panel

The `Panel` component introduced in jQuery Mobile 1.3 can be embedded directly into a page and then revealed by a button click. It's exactly like the Facebook app:



This is probably the simplest approach to global navigation. It also has the benefit of not changing pages or cluttering the interface. For the full API and options around the panel widget, check out http://demos.jquerymobile.com/1.4.5/panel/.

The hard way – final thoughts

All in all, the approach of injecting attributes into a full site page and invoking jQuery Mobile can work pretty well. The biggest problem that you will encounter is the sheer amount of cruft that is thrown onto most pages. There's a lot to remove and/or CSS out. This also has the unfortunate effect of being rather brittle.

If somebody comes along and even slightly modifies the page, it could break your implementation. I could really only recommend this approach if the pages are created using a template or a **Content Management System** (**CMS**) so that changes to the site structure won't happen often and will be uniform when they do.

Mobilizing full-site pages – the easy way

There is nothing easier and cleaner than just creating a standalone jQuery Mobile page. Let's just do that and simply import the page we want with AJAX. We can then pull out the parts we want and leave the rest.

The biggest disadvantage to this approach is mostly academic. Progressive enhancement is shot. The site completely breaks for anyone who doesn't have JavaScript on his or her device. My contention is that it probably doesn't matter. I can't speak for everywhere, but here in the United States, if you're not on a smartphone, you're not on the web with your device; simple as that. There are of course exceptions that only prove the rule. However, if your market were different, you would want to consider if this option is right for you. So, let's continue.

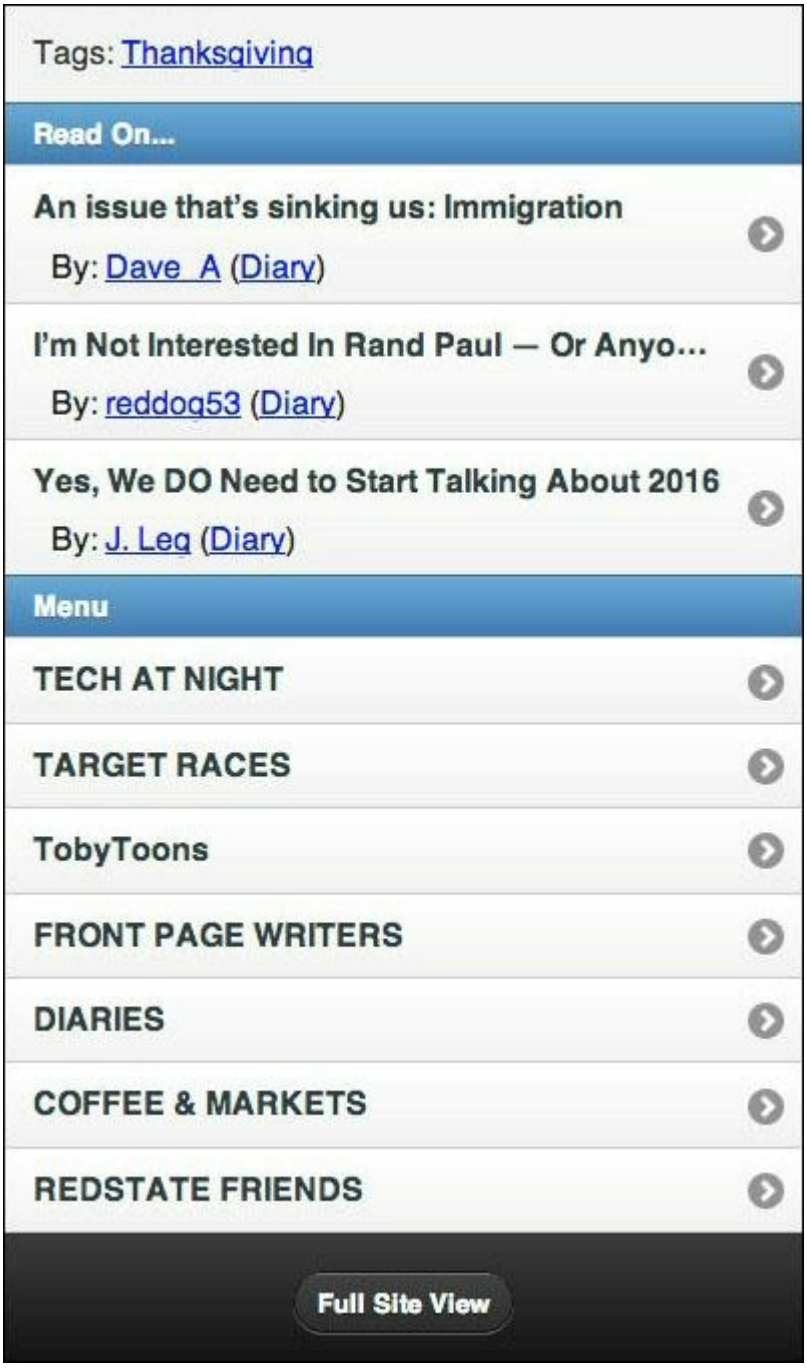
On any given page, all we'll really need is a mobile redirect using one of the methods we've laid out. Then, just use a simple `location.replace` method. This code sample does a little more than that. It checks to see if the user was on a mobile and clicked the full-site link. If so, we'll insert an `iframe` tag to allow the user to switch back to the mobile view manually. Otherwise, we're just going to bounce them to the mobile view:

```
if (isMobile && isSmallScreen){

 if(document.cookie.indexOf("mobileFullSiteClicked=")<0)
{
    location.replace("mobileadapter.php?p="
      +escape(location.pathname));
  }else{
    document.addEventListener("DOMContentLoaded",
function(){
      try{
        var iframe =
document.createElement("iframe");
        iframe.setAttribute("src","gomo.html");
        iframe.setAttribute("width","100%");
        iframe.setAttribute("height","80");
        document.body.insertBefore(
          iframe,
          document.body.firstChild);
      }catch(e){alert(e);}
    }, false);
  }
}
```

Here is the code for a page to allow the full site to link back into mobile. This file is `gomo.html` within the chapter code files:

```
<!doctype html>
<html>
<head>
  <meta charset="UTF-8">
  <style type="text/css">
    body { background-color: #000; }
    p {
      font-size: 60px;
      font-family: Arial, Helvetica, sans-serif;
      text-align: center;
    }
    a { color:white; }
  </style>
</head>
<body>
<script>
  document.write("<p><a
href='mobileadapter.php?p="
    +escape(window.parent.location.pathname)
    +"' target='_top'>Switch to mobile view</a>"
    +"<img src='32-iphone@2x.png'/></p>");
</script>
</body>
</html>
```

These two pages are both using scripts that do not require jQuery. It sure would be nice if every page had jQuery but there are competing platforms out there and we can't count on the base page that we're mobilizing to have it ready for us. Native JavaScript is faster anyway. We can put it right at the top of the page without having to pull in a library first.



Here is the jQuery Mobile page that houses the mobilized content. It also links back to the full site view and sets a cookie so the user doesn't just get bounced back to mobile if they click on the full-site link.

As mentioned earlier, we're pulling in the next top three articles and placing them before the menu at the bottom to keep the user engaged. It's far easier to do in this view.

The example also takes advantage of the `replaceState` attribute. When the user comes to the mobile page, the URL in the address bar and history will be updated to show the URL of the original article.

Now, without further delay, we will see the best example of how to easily mobilize full-site pages. It is generic enough that you could probably just take this to whatever project you're working on and only have to tweak the code that's doing the pulling and injection:

```
<!doctype html>
<html>
<head>
  <meta charset="utf-8">
  <meta name="viewport"
content="width=device-width, initial-scale=1">
  <title class="pageTitle">Loading...</title>
  <link rel="stylesheet"
href="css/jquery.mobile-1.4.5.css " />
  <script src="js/jquery-1.10.2.js "></script>
  <script src="js/jquery.mobile-1.4.5.js
"></script>
  <!-- cookie code from
https://github.com/carhartl/jquery-cookie -->
  <script src="jquery.cookie.js"></script>
  <style>
    #iscfz,.comment-bubble { display: none; }
    #bottomMenu .byline
    {
      padding: 0 0 8px 12px;
      font-weight: normal;
    }
  </style>
</head>
<body>
<div id="mainPage" data-role="page">
```

This section is the panel widget which will receive the global menu:

```
   <div data-role="panel" id="globalmenu"
data-
position="left" data-display="reveal"
data-theme="a">
      <ul data-role="listview"></ul>
      <!-- panel content goes here -->
   </div><!-- /panel -->

  <div data-role="header">
    <a href="#globalmenu"
data-icon="bars">Menu</a>
    <h1 class="pageTitle">Loading...</h1>
  </div><!-- /header -->
  <div role="main" class="ui-content"
id="mainContent">
  </div><!-- /content -->
  <div>
    <ul data-role="listview" id="bottomMenu"></ul>
```

```
  </div>
  <div data-role="footer">
    <h4>
      <a class="fullSiteLink" data-role="button"
data-
inline="true" href="<?php echo
htmlspecialchars(strip_tags($_REQUEST["p"])) ?
>" target="fullsite">Full Site View</a>
    </h4>
  </div><!-- /footer -->
</div><!-- /page -->

<script>
  $.cookie("mobileFullSiteClicked","true", {
    path:"/",expires:0}
  ); // 0 minutes - erase cookie
```

What we're doing here to replace the state in the users history is not fully supported by all mobile browsers. Just to be on the safe side, I've wrapped that line in a `try`/`catch` block. This is a good technique for anything that has partial support across your customer base.

```
  try {
    // make the URL the original URL so if the
user shares
    // it with others, they'll be sent to the
appropriate URL
    // and that will govern if they should be
shown
    // mobile view.
    history.replaceState({},"","<?php echo
htmlspecialchars(strip_tags($_REQUEST["p"])) ?>");
  } catch(e) {
    // history state manipulation is not supported
  }

  // Global variable for the storage of the
imported
  // page content. Never know when we might need
it
  var $pageContent = null;

  // Go get the content we're supposed to show
here
  function loadPageContent(){

    $.ajax({
       // strip_tags and htmlspecialchars are to
help
       // prevent cross-site scripting attacks
       url:"<?php echo
htmlspecialchars(strip_tags($_REQUEST["p"])) ?>",
       beforeSend: function() {
         // show the page loading spinner
```

```
            $.mobile.loading( 'show' );
          }
        })
      .done(function(data, textStatus, jqXHR){

          // jQuery the returned page and throw it
into
          // the global variable
          $pageContent = $(data);

          // take the pieces we want and construct
the view
          renderPage();
        })
      .fail(function(jqXHR, textStatus,
errorThrown){

          // let the user know that something went
wrong
          $("mainContent").html("<p
class='ui-bar-
b'>Aw snap! Something went
wrong:<br/><pre>"+errorThrown+"</pre></p>");
        })
       .always(function(){
          // Set a timeout to hide the image, in
production
          // it was being told to hide before it
had even been shown
          // resulting in a loading gif never hiding

   setTimeout(function()
{$.mobile.loading( "hide" )}, 300);
       });
    }
```

This next section takes care of pulling apart the imported page and injecting it to the right places. Note at the beginning where I'm selecting objects and using a dollar sign at the beginning of the name. We preselect them for the sake of performance. Anything you're going to reference more than once should be stored to a variable to reduce DOM traversal to select it again. We add a dollar sign to indicate that this variable is a jQuery object:

```
    function renderPage(){
      var $importedPageMainContent =
$pageContent.find("#main");
      var $thisPageMainContent = $("#mainContent");

      //pull the title and inject it.
      var title =
$importedPageMainContent.find("h1.title").text();

      $(".pageTitle").text(title);
```

```
    //set the content for the main page starting
    //with the logo then appending the headline,
    //byline, and main content
    var $logo = $pageContent.find("#logo-headerC
img");

    $thisPageMainContent.html($logo);
    $thisPageMainContent.append(
      $importedPageMainContent.find("h1.title")
    );
    $thisPageMainContent.append(
      $importedPageMainContent.find("div.byline")
    );
    $thisPageMainContent.append(

 $importedPageMainContent.find("div.the-content")
    );

    var $bottomMenu = $("#bottomMenu");

    // Take the next 3 top stories and place them
in the
    // bottom menu to give the user something to
move on to.
$bottomMenu.html("<li
data-role='list-divider'>Read On...</li>");
    $bottomMenu.append(
       $pageContent.find("#alldiaries li:lt(3)")
    );

    // Inject the main menu items into the bottom
menu

    $bottomMenu.append("<li
data-role='list-divider'>Menu</li>");

    var $mainMenuContent =
$pageContent.find("#NavMain");
    $bottomMenu.append($mainMenuContent.html());

    // After doing all this injection, refresh
the listview
    $bottomMenu.listview("refresh");

    // inject the main menu content into main
menu page
    var $mainMenContent = $("#mainMenuContent");
    $mainMenContent.find("ul").append(
      $mainMenuContent.html()
    );
  }

  // once the page is initialized, go get the
content.
```

```
  $("[data-role='page']").on("pagecreate",
loadPageContent);
  // if the user clicks the full site link,
cookie them
  // so they don't just bounce back.
  $("a.fullSiteLink").on("click", function(){
    $.cookie("mobileFullSiteClicked","true",
      {path:"/",expires:30});  //30 minutes
  });

</script>
</body>
</html>
```

Note

The cookie management that is being used here comes from the jQuery cookie plugin at https://github.com/carhartl/jquery-cookie.

Summary

Earlier in this book we looked at mobile detection in depth. Now you know all there is to know. Before, we were creating mobile sites from scratch with little care what their desktop experiences were. Now you know how to unify them. The hard part is knowing when to craft mobile experiences from scratch and when to simply mobilize the full-site experience.

It's a pity there's no simple answer to that. But, whether by using JavaScript on page to manipulate it into mobile (the hard way), or by loading in the content via AJAX and picking the pieces you want (the easy way), or by leveraging RESS as we mentioned in the previous chapter, you're ready to handle virtually every possible situation now. The only thing we haven't really tackled yet is integrating with a CMS, which we'll do in the next chapter.

Chapter 10. Content Management Systems, Static Site Generators, and jQM

Every web developer states that:

> *"I am a web developer. It is a waste of my time and talent to take a Microsoft Word document and cut and paste content to a web page every time the client wants a change."*

If this statement resonates with you, then you need to be familiar with CMS. They're an easy and powerful way to put publishing power in your users' hands, so that you can focus on less tedious, better paying work. All you have to do, is help the client set up their CMS, choose and customize their templates, and leave the content creation and maintenance to them. A CMS is often at the core of both small business websites and corporate websites.

Static site generators, on the other hand, allow developers to share the power with the client. Projects and platforms such as Harp.io allow clients to use the tools they're already familiar with, such as Dropbox for example, to publish changes to their own site and avoid the hassle of admin interfaces such as Wordpress, Drupal, and Squarespace.

For the popular platforms, there are many plugins and themes to choose from. Brochureware sites have never had it so easy. In fact, platforms such as WordPress and Squarespace are making this process so easy, that often a web developer is not needed for anything more than customizing the look and feel.

So, why even include this chapter? Because, the popularity of CMS virtually guarantees that eventually you'll come across a client who already has a CMS that you'll need to integrate with. After reading this chapter, you'll be prepared.

In this chapter, we will cover:

- The current CMS landscape
- WordPress and jQuery Mobile
- Drupal and jQuery Mobile
- Updating your WordPress and Drupal themes
- Static Site Generators (Harp.io)
- Adobe Experience Manager (AEM)

The current CMS landscape

WordPress is the world's most popular CMS, by volume. For the top 10,000 websites, as of December 2014, over 11 percent are built on WordPress. The next highest is Drupal, with 3.4 percent. Granted, that doesn't sound like much, but look at this chart from http://trends.builtwith.com/cms. Among all the sites that use a CMS, WordPress and Drupal account for nearly 60 percent.

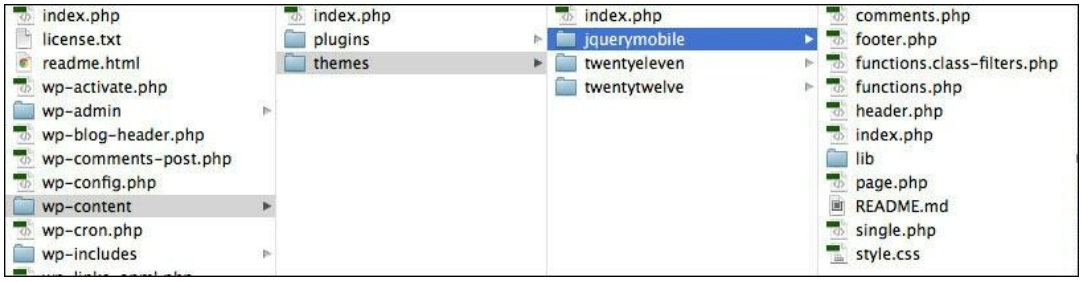
WordPress and jQuery Mobile

WordPress is popular, because it's easy and user friendly. You can get started with WordPress by creating a hosted site on https://WordPress.com, or you can download the source and install it on any machine you like by going to https://WordPress.org. While you're experimenting, I would highly recommend the latter approach. The version used in this chapter is 4.01.

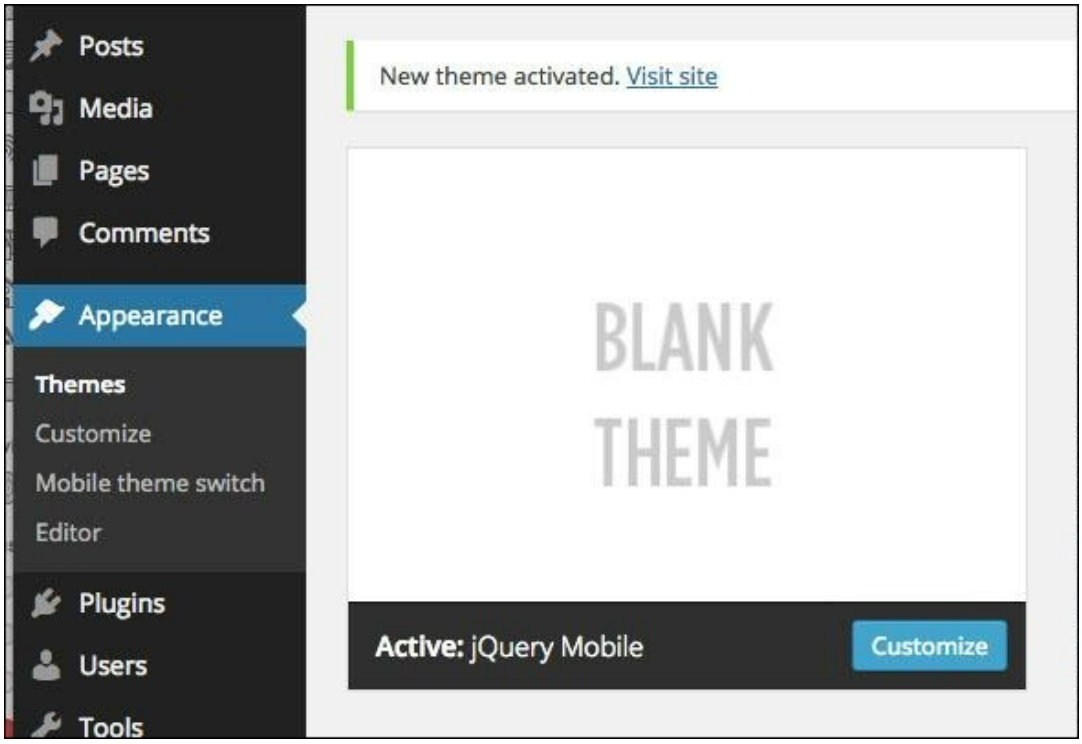
The key to getting up and running quickly with any CMS, is realizing which plugins and themes to use. There are several jQuery Mobile themes that will serve you well. Some are free, some paid. Either way, try not to reinvent the wheel. Pick a theme that is closest to what you want and then tweak it. Chances are, by now, you're more than good enough to modify existing theme files. Here are the links to some themes I found and liked:

- http://www.webdevcat.com/themes (the one we'll be using)
- http://themeforest.net/item/mobilize-jquery-mobile-wordpress-theme/3303257

Pick one, unzip it, and put it in your WordPress install directory under the **wp-content/themes/** folder, as shown in the following screenshot:



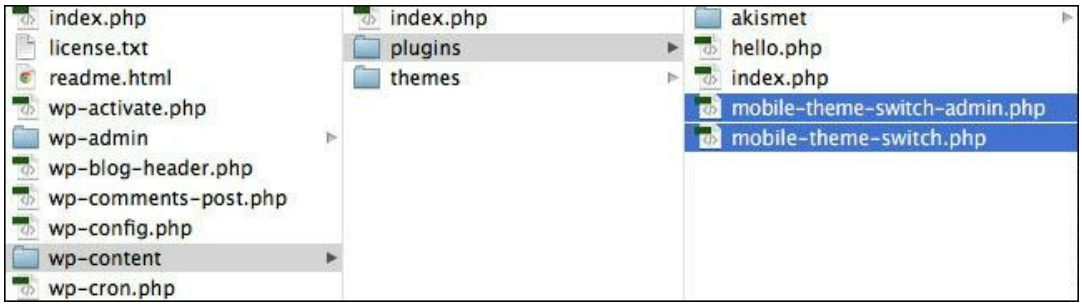
If you've successfully installed the theme, you should be able to view it on the admin interface under **Appearance** | **Themes**, as shown on the left-hand side of the next image. It should be listed under **Available Themes**:



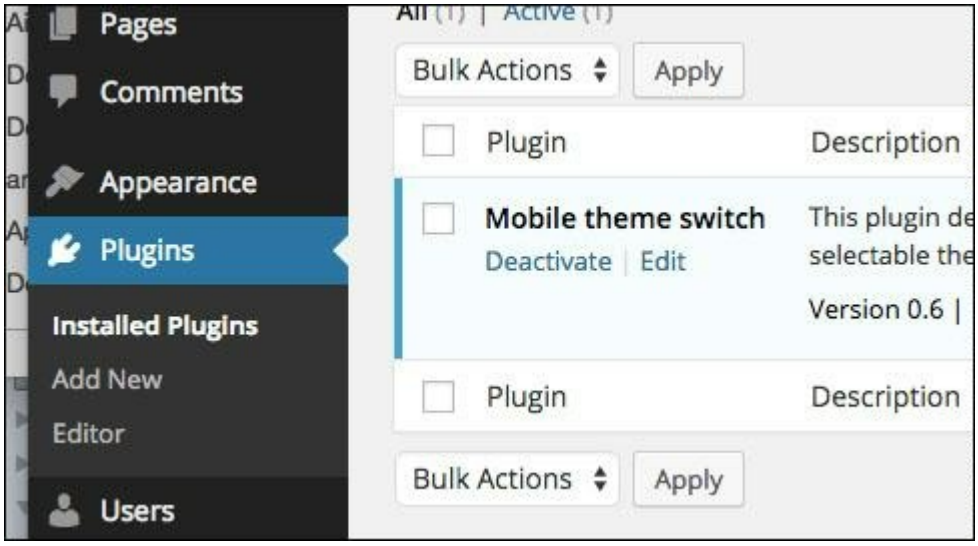
Next, we'll need a way to access the theme on mobile devices. That's where the mobile theme switcher comes in. The switcher we'll use here is simple but effective for the vast majority of people who are likely to visit your site.

Manually installing the mobile theme switcher

To manually install the mobile theme switcher, download it from https://wordpress.org/extend/plugins/mobile-theme-switcher/. Unzip the folder and put it in your WordPress install directory under the **wp-content/plugins/** folder, as shown in the following screenshot:



Next, through the admin interface, activate the plugin titled **Mobile theme switch**:



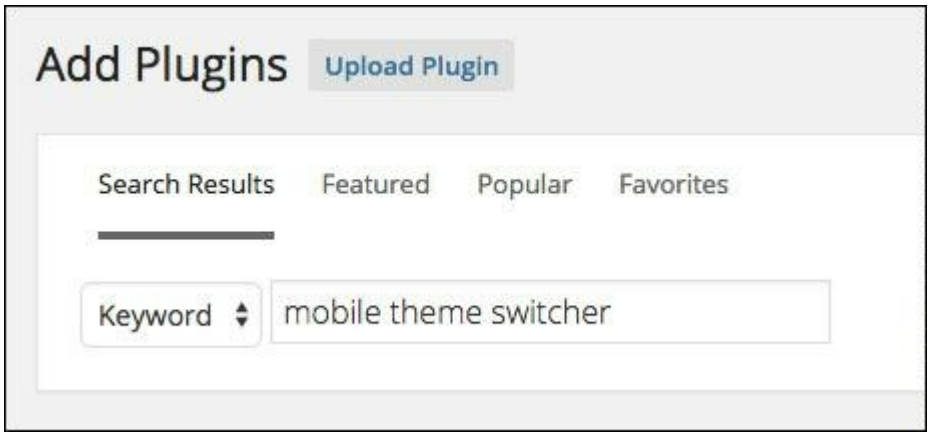
Automatically installing the mobile theme switcher

You can let WordPress do most of the work for you if you like. Personally, I like taking control of things. Here's how you can install it through the admin interface:

1. Go to the **Plugins** page and then look beside the title to find the **Add New** button, as shown in the next screenshot:



2. On the following screen, search for **mobile theme switcher**:



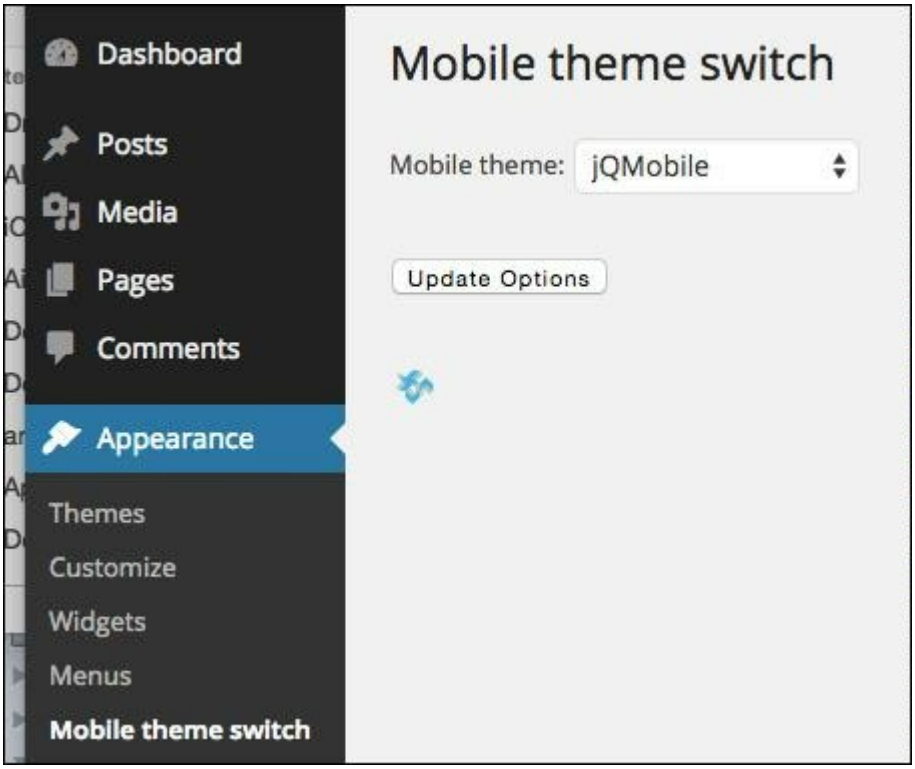
3. There are plenty of options to choose from, the one we're using is the first:



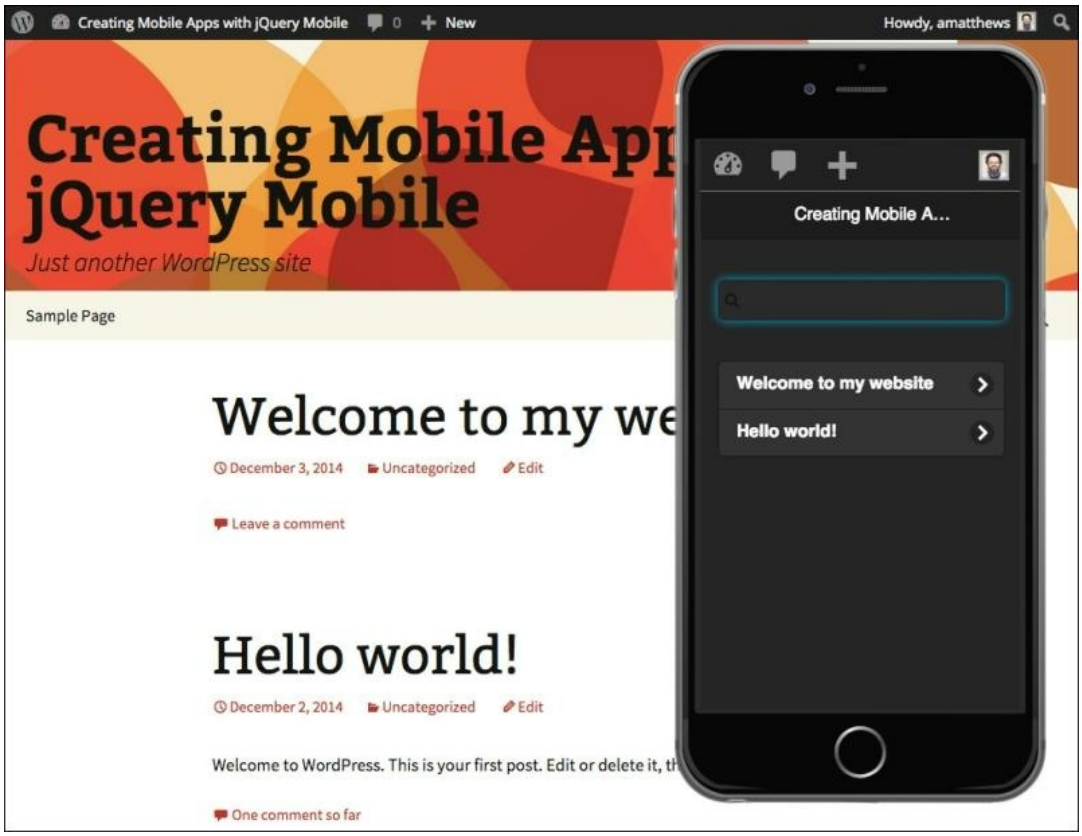
4. Enter your FTP credentials on the next page.
5. Activate your newly installed plugin.

Configuring the mobile theme switcher

If you have successfully installed and activated the plugin, it will now show up under the **Appearance** menu, as shown in the following screenshot. Then, select the mobile theme you installed and click on the **Update Options** button:



The combination of the plugin and theme is powerful, simple, and effective. Here is a screenshot of the new theme in action:



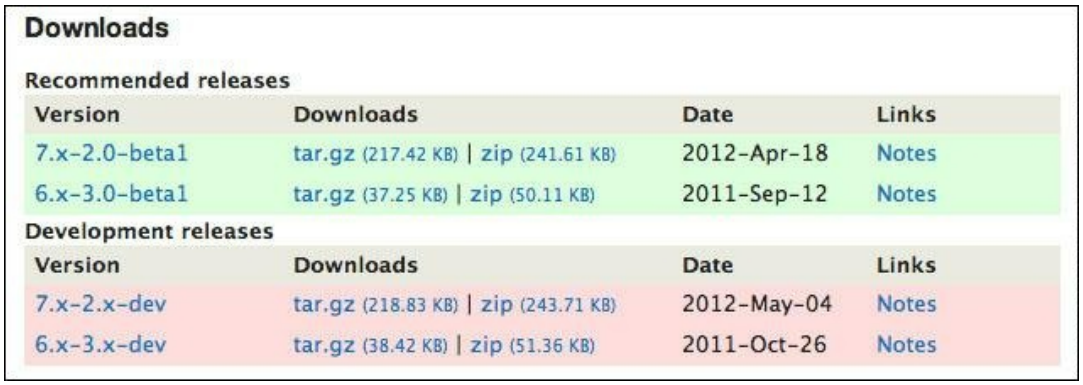
Pretty simple, eh? Now, we just have to tweak it until the client is content. Let's move on to the next CMS system.

Drupal and jQuery Mobile

Drupal is a far more powerful CMS. Using some of their standard plugins, you can easily create full blown web apps, not just brochureware sites. You want to use CAPTCHA for people to prove they're human before posting comments? There's a plugin for that. Want to create a contact form? It's built-in. Want to create a custom database table and form to save that input? As of Drupal 7, that's built-in as well.

The biggest downside to Drupal, is that it has a bit of a learning curve if you want to tap into its true power. Also, without some tuning, it can be a little slow and can really bloat your page's code. Techniques like caching can improve performance, but can also negatively impact dynamically created pages.

Configuring Drupal for jQuery Mobile is an almost identical process to that of WordPress. Again, we'll start with a theme that already exists. The people who've made these themes know the system they're coding for. Don't try to reinvent the wheel. All we have to do is use the theme and tweak it. My favorite jQM theme for Drupal can be found at https://drupal.org/project/mobile_jquery. At the bottom of that page, you will find the downloadable distributions for the theme:



Downloads

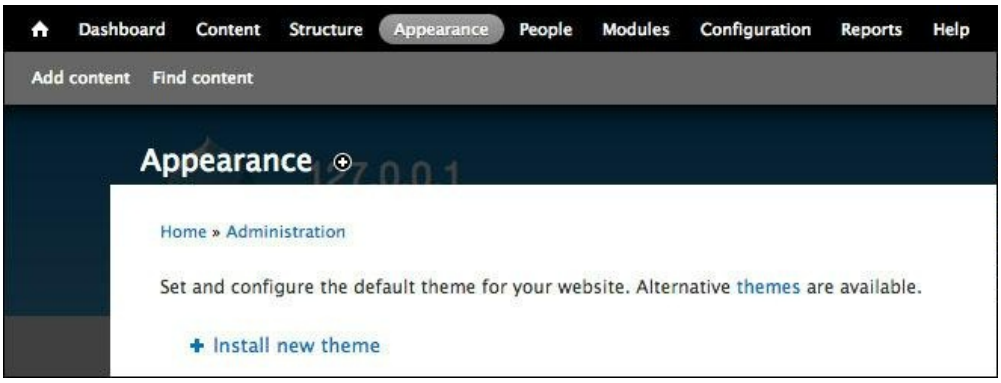
Recommended releases

Version	Downloads	Date	Links
7.x-2.0-beta1	tar.gz (217.42 KB) | zip (241.61 KB)	2012-Apr-18	Notes
6.x-3.0-beta1	tar.gz (37.25 KB) | zip (50.11 KB)	2011-Sep-12	Notes

Development releases

Version	Downloads	Date	Links
7.x-2.x-dev	tar.gz (218.83 KB) | zip (243.71 KB)	2012-May-04	Notes
6.x-3.x-dev	tar.gz (38.42 KB) | zip (51.36 KB)	2011-Oct-26	Notes

1. Copy the link to the distribution that's right for you.
2. Newer versions of Drupal require developers to jump through a hoop before adding new content. Click the **Modules** link at the top of the admin section and scroll down to **Update Manager**. Enable this first, or you won't be able to view the **Install new theme** link mentioned in the next step.
3. Log in to the admin console of your Drupal site and go to the **Appearance** section:



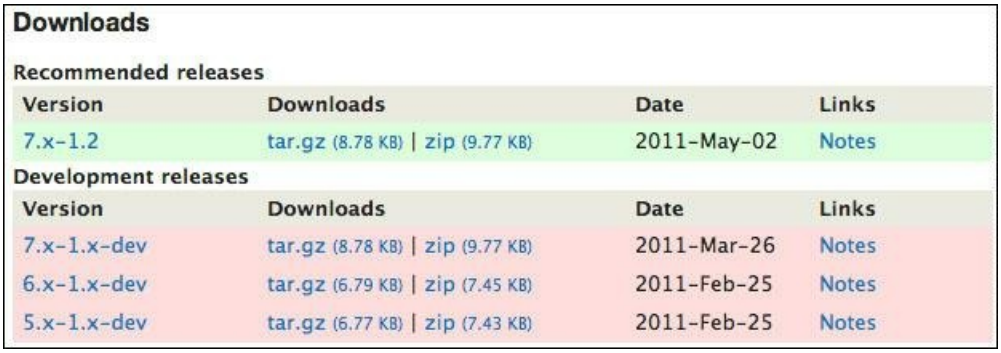
4. Click on the **Install new theme** link and paste the link you copied into the **Install from a URL** field. Click on the **Install** button and let the installation go through all its steps:



5. Chances are, that at this point, you won't be able to see the installed theme. The makers encourage you to create subthemes and not use their base installation for the theme. They don't quite indicate why this is the case, so this is one recommendation we'll be ignoring. So, in order to make the theme show up, you'll want to edit the file `mobile_jquery.info` in the `sites/all/themes/jquery_mobile/` path in your Drupal install directory and change the value of `hidden` from `1` to `0`. Once you do that, you should see the theme listed in the disabled themes section of the **Appearance** menu, as shown in the next screenshot. Click on the **Enable** link, and your theme will be ready to be configured and used:



6. Next, we have to install the theme switcher plugin. Let's use the plugin at http://drupal.org/project/mobile_theme. Again, choose the right version and copy its URL:



Downloads

Recommended releases

Version	Downloads	Date	Links
7.x-1.2	tar.gz (8.78 KB) | zip (9.77 KB)	2011-May-02	Notes

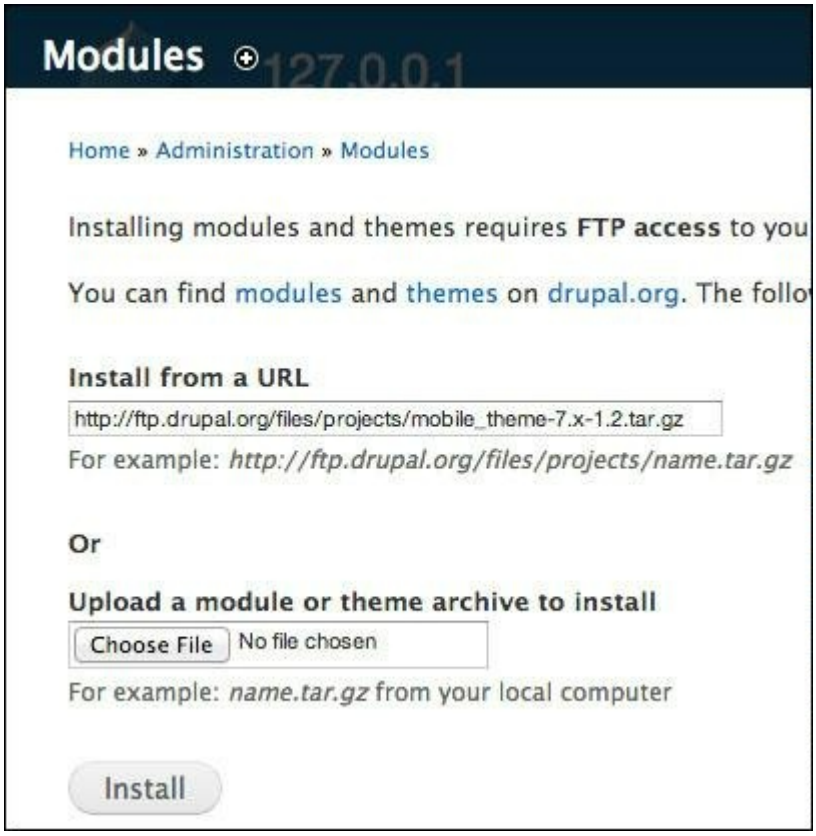
Development releases

Version	Downloads	Date	Links
7.x-1.x-dev	tar.gz (8.78 KB) | zip (9.77 KB)	2011-Mar-26	Notes
6.x-1.x-dev	tar.gz (6.79 KB) | zip (7.45 KB)	2011-Feb-25	Notes
5.x-1.x-dev	tar.gz (6.77 KB) | zip (7.43 KB)	2011-Feb-25	Notes

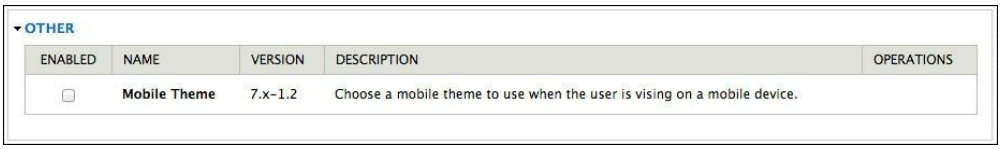
7. Open the admin interface to the **Modules** section and click on the **Install new module** link:



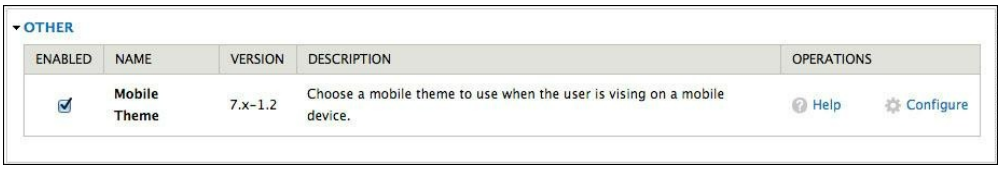
8. Paste the URL into the field labeled **Install from a URL** and click on the **Install** button. Let the installation process run its course:



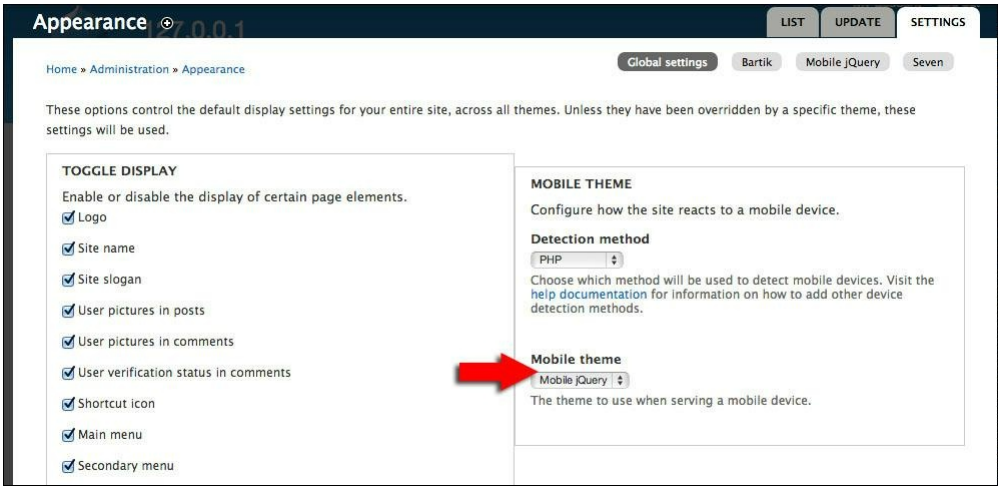
9. At the bottom of the **Modules** section, you will find the newly installed plugin:



10. Click on the checkbox to enable the module and then you'll be able to configure it:



11. Clicking on the **Configure** link will take you to a screen for configuring the **Global settings**. On the right-hand side of that screen, you will find a section for configuring the mobile theme options. The **Mobile Theme** section has been marked with a red arrow in the following screenshot:



The results speak for themselves. The theme could certainly use customization, but it works just fine for a start. We know how to do the rest.


Roughly Brilliant
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What the iPad mini means for web developers
Submitted by Shane Gliser on Sat, 11/03/2012 - 17:48
The release of the iPad mini validates an entire line of tablet sizes. Essentially, it's another case of Apple coming along and

Updating your WordPress and Drupal templates

At some point (probably right after the installation), you'll want to update these themes to use the latest versions of the jQuery Mobile library. Some are still using the beta version. The process is actually pretty straightforward. All you have to do, is find the header sections of the templates in question, and update the references to the jQuery Mobile CSS, JavaScript, and probably the core jQuery library.

WordPress – jQMobile theme

For the jQMobile WordPress theme, you only need to change two files. In the `header.php` file, find the following:

```
<script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.4.2/jquery.min.js"
type="text/javascript"></script>
<link rel="stylesheet"
href="http://code.jquery.com/mobile/1.0a1/jquery.mobile-
1.0a1.min.css" />
<script
src="http://code.jquery.com/jquery-
1.4.3.min.js"></script>
<script
src="http://code.jquery.com/mobile/1.0a1/jquery.mobile-
1.0a1.min.js"></script>
```

Update the preceding lines to these:

```
  <link rel="stylesheet"
href="http://code.jquery.com/mobile/1.4.5/jquery.mobile-
1.4.5.min.css" />
  <script
src="http://code.jquery.com/jquery-
1.11.1.min.js"></script>
  <script
src="http://code.jquery.com/mobile/1.4.5/jquery.mobile-
1.4.5.min.js"></script>
```

In the `functions.php` file, you might consider removing the footer function, as it merely contains a link back to the developer's website:

```
function footer(){
  echo '<div data-role="footer" class="ui-bar"><a
href="http://www.webdevcat.com"
data-
```

```
role="button" data-icon="info">Theme by
WebDevCat</a></div>';
} add_action('wp_footer', 'footer');
```

Drupal – jQuery Mobile theme

For the Drupal jQuery Mobile theme at http://drupal.org/project/mobile_jquery, the quickest way for you to update the theme is to edit the `template.php` file at the root of the theme folder. Find the following lines in the file and update the references to jQuery Mobile:

```
drupal_add_css('http://code.jquery.com/mobile/1.0.1/jquery.mobile.
structure-
1.0.1.min.css', array_merge($css_options,"
array('weight' => 100)));
drupal_add_css('http://code.jquery.com/mobile/1.0.1/jquery.mobile-
1.0.1.min.css', array_merge($css_options,
"array('weight' => 100)));

drupal_add_js('http://code.jquery.com/jquery-
1.6.4.min.js', "array_merge($js_options,
array('weight' => 100)));

drupal_add_js(drupal_get_path('theme',
'mobile_jquery') . '/scripts/mobile_jquery.js',
array_merge($js_options, "array('weight' =>
101)));

drupal_add_js('http://code.jquery.com/mobile/1.0.1/jquery.mobile-
1.0.1.min.js', array_merge($js_options,
array('weight' => 101)));
```

Static Site Generators

Static Site Generators (**SSG**) aren't a new option, but they have been gaining popularity in the past few years. One of the oldest of them all, Jekyll (http://jekyllrb.com/), has been around since 2008 and is used to power GitHub's pages functionality.

How do they work?

CMS software, such as Wordpress or Drupal, build each page when it's requested, gathering data from MySQL or MongoDB, then running it through a template engine. This means, that on each request to the server, the entire page is built from scratch. For the majority of sites this is unnecessary overhead as they only change when new content is added by their author(s). It can also lead to performance and security issues.

An SSG does the exact same thing, but instead of doing it on each request, it's done in advance. When changes are made to the website locally, the SSG leaps into action and renders each page. Whether the site was originally built in Python, Ruby, PHP, or .NET, the SSG delivers plain HTML. This means, that server requests are simple and lightning fast, caching becomes easier and more reliable, and security issues decrease. The resulting HTML can be uploaded to an inexpensive hosting medium such as Amazon's S3, and served for a fraction of what it would cost to host a dynamic website.

The Harp server

Just like with CMS, there are a number of options, each of which depend on the language you prefer, and how comfortable you are with the technical side of things. The SSG we'll be looking at, for this example, is called **HarpJS** (and its companion platform Harp.io). To quote from harpjs.com:

"Harp is a zero-configuration web server that is used to serve static assets.
It has a built in asset pipeline for
serving .jade, .markdown, .ejs, .coffee, .less, .styl as .html, .css, and .js.
Harp supports a template agnostic layout/partial system and metadata for dynamically building files."

While any SSG would be helpful for a standalone developer who wants to cut server costs, and avoid complicated hosting setups, Harp's true power comes in conjunction with the Harp.io platform. Harp.io connects to Dropbox and allows clients to publish changes directly to the server, simply by dragging a file into a specific folder. This might sound scary, but with

some forethought, your client can be publishing changes easily and safely without needing to call you. If that sounds appealing, then read on.

Setting up Harp locally

The Harp server runs on top of Node.js. Since you already installed Node in Chapter 6, installing Harp is as easy as the `sudo npm install -g harp` command. After the installation is completed, you can create a brand new Harp project with the name `harp init myproject`. The default directory structure is sparse, and comprised of 3 Jade (a templating engine) templates, and a **Less CSS** file. That's not bad, but we can do better. Luckily for us, Harp allows you to specify a Github repository to use as the basis for any new project. I've created a set of boilerplate files just for jQuery Mobile, to allow us to get up and running faster. Replace the previous `init` command with the following command:

```
harp init boilerplatetest -b
commadelimited/jQuery-Mobile-Harp-Boilerplate
```

This boilerplate project includes all of the jQuery Mobile files, as well as a few pages to allow you to get familiar with the setup. To view your project in the browser, you'd run the `harp server` code, which will give you the following output:

```
------------
Harp v0.14.0 - Chloi Inc. 2012-2014
Your server is listening at http://localhost:9000/
Press Ctl+C to stop the server
------------
```

The rules of HarpJS

Now that Harp is installed, and you've created your first project, perhaps you should step back and actually learn how Harp works. Harp has a quick overview on their website, cleverly called The Rules (http://harpjs.com/docs/development/rules). We'll summarize here:

1. **Convention over configuration**: Harp only needs a single file to begin; index. Adding new pages to your site is as easy as adding new files. To add new subdirectories to your site, create a new folder within your Harp project and add files as needed.
2. **The root directory is public**: By default, Harp will look for an index file at the root of your project. However, Harp also allows for **framework style** applications, which means, that if Harp finds a root directory called `public`, it will use that as the application root. This allows you to store files above the web root such as `config` files, a `readme` file, etc.

3. **Ignore those which start with underscore**: Files or folders which start with an underscore will not be available via a URL to a Harp application. They're still available internally, as partials, or includes, but cannot be accessed directly.
4. **Dead simple asset pipeline**: Harp can parse and render files with `.jade`, `.ejs`, `.styl`, `.less`, or `.coffee` extensions and convert them to their appropriate final files. It does this automatically and without developer intervention. Here's a handy map of files in your project, and what they will become after Harp is finished:

```
myfile.md  ->    myfile.html
myfile.jade  ->    myfile.html
myfile.ejs  ->    myfile.html
myfile.less  ->    myfile.css
myfile.styl  ->    myfile.css
myfile.scss  ->    myfile.css
myfile.sass  ->    myfile.css
myfile.coffee  ->    myfile.js
```

5. Files named `_data.json` offer expanded functionality, acting like data stores. Use convention based naming for content in the JSON file and make data available to all the templates in your project.

I've intentionally left details out, but the beauty of Harp, is that you find out things when you need to know them, and avoid getting bogged down in the minutiae.

Adding your first page

We're not going into a deep dive on Harp, but I would be remiss if I didn't at least cover the use case this chapter is suggesting. After running the `init` command with the boilerplate, your project should look like this:

```
public
├── 404.jade
├── _content
│   ├── page-one.md
│   └── page-two.md
├── _layout.jade
├── css
├── index.jade
├── js
├── page-one.jade
└── page-two.jade
```

Remember when I said Harp was zero-configuration? That means that you simply have to name things by convention and they'll just work. By default, Harp looks for a file called `_layout` in your project root. If it finds that file, it

will render that as part of every request to any other file. Let's take a peek at the `public/_layout.jade` file.

```
!!!
html
  head
    title jQuery Mobile Harp Boilerplate
    meta(name="viewport",
content="width=device-width, initial-scale=1.0")
    link(rel="stylesheet",
href="/css/jquery.mobile-1.4.5.css")
    link(rel="stylesheet", href="/css/main.css")
    script(src="/js/jquery-1.10.2.js")
    script(src="/js/jquery.mobile-1.4.5.js")
  body
    div(data-role="page")
        != yield
```

Jade syntax is very terse, and quite readable. In a nutshell, an HTML tag is represented by the text of the tag itself. The `<html>` tag becomes `html`, the `<body>` tag becomes `body`. Tags which require attributes are represented by the tag name, and any number of `attribute="property"` definitions, wrapped in parentheses. Thus, our main container `div` becomes `div(data-role="page")`. To represent nested tags, you indent the child tag once from its parent. Tags which can contain text use the `tag <space> text` format, so an anchor tag appears as `a(href="page-one.html") About Us`. Finally, the `!= yield` line indicates where content from the requested template will be placed. If you look at `public/page-one.jade` file, you'll see the following code:

```
div(data-role="header")
    h1 Page One
div(role="main", class="ui-content")
    p
        != partial("_content/page-one")
```

Remember the map you saw earlier? When the `page-one.html` file is requested, the `page-one.jade` file is loaded and its contents replace the yield call. The `!= partial` call is a special case, like the yield call, it replaces the call with the contents of whatever file is specified. Unlike the yield call, a partial can be used all over the place, and is particularly suited for including standalone content.

Getting the client involved

All of this is great, but we want our client to do the work, and not us. All of the templates, so far have been heavy on HTML and light on content. That's because these are the files you are responsible for. Open up the `public/_content/page-one.md` file and take a look. You won't find much, in

fact it's almost empty, but this is perfect for the client, who doesn't know HTML, and doesn't want to. In addition to supporting Jade files, Harp can also read **Markdown** files (`.md`). Markdown is a wonderful language, and really easy for people to understand. In many cases, the client will only need to hit enter to get a carriage return.

Let's create a new page in our site, an **About Us** page. Duplicate the `public/page-one.jade` file, and name it by `public/about-us.jade` file. Then, duplicate the `public/_content/page-one.md` file and name it `public/_content/about-us.md`. Next, open the `about-us.jade` file and change the text of the `h1` tag to `About Us`, and the path contained in the partial to the `_content/about-us` file. Finally, you'll need to include a link to our newly created page. Open the `index.jade` file and add the following lines to the inside of the `ul` tag:

```
li
    a(href="about-us.html") About Us
```

Reload the page and you should see the **About Us** link on the index page, click into it and you should see whatever content your client has placed in that page.

The Harp platform

Harp, by itself, is a pretty slick product, but where it really shines, is when it pairs with the Harp platform. This is a for pay web application/hosting service, which allows you, or any collaborator of your choice, to deploy code to your website simply by dragging it into the appropriate Dropbox folder. Let's set up our first Harp.io application.

Head to https://www.harp.io and sign up for a trial account. It's good for 15 days and should give you plenty of time to experiment. After you've completed the signup process, you should be looking at a page that looks something like this:



You'll be asked to create a name for your site. Pick one which is descriptive and hit **Create App**. Harp shares namespaces across their entire platform, which means that you'll also need to create a name which is unique to Harp. Luckily the `creating-mobile-apps-with-jqm` domain was available, as shown in the following screenshot:



Harp will ask to connect to your Dropbox account, and then with your approval, it will begin. Spend a few minutes watching Harp's progress on this screen:



You could also get a coffee.

Open your Dropbox folder when you get back from your coffee break and you'll see that Harp has been busy copying over a default set of files into your Dropbox folder. You should even be able to see your newly created site at `<app-name>.harp.io`, in my case it's `creating-mobile-apps-with-jqm.harp.io`.

In case you're wondering, this vanity URL is Harp's internal reference for your project. If this is for production use, then you're going to want to attach a domain name to it. This process could be a little easier, but not by much. At the root of your project create, or use, a file called `harp.json`, a container for global project variables. Add a top level key to this file with an array of domain names to be associated with your projects, `domains: [example.com]`. Next, you'll need to add an A record to your registrar, pointing at Harp's servers. I'll leave out the IP address in case it changes, and instead point you towards Harp's own documentation for this process: https://www.harp.io/docs/platform/domains.

Publishing your project

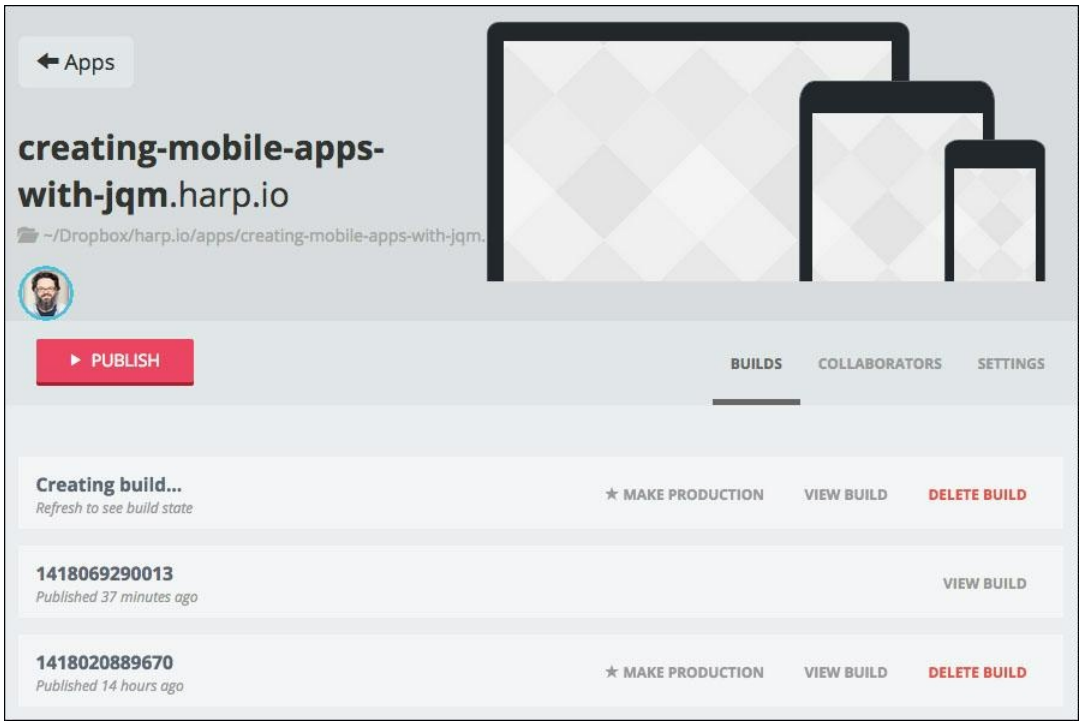
As if the creating process wasn't awesome enough, the publishing process is excellent. Remember that Harp syncs your project files via Dropbox. This means, that no matter what you do locally, as much as you test and build, Harp will have all of your updated files within minutes, without you doing a thing. Now that your changes are ready, it's time to deploy to production. Head to https://www.harp.io/ and log in. Once you've authenticated, you'll be redirected to your application dashboard. In my case it looks like this:



If your code is tight then push the **Publish** button and watch the magic happen. Harp will display the progress of your build, then tell you when it's done.



If that's not enough for you, then clicking the project name reveals even more magic:



Not only does Harp manage your build for you, it also stores past builds (approximately 30 of them), and lets you view those builds to compare changes. It even lets you easily revert to a previous build with the click of a button. Oh, and in case that wasn't enough, the Harp app dashboard is responsive. That means you can get final approval from the client via text message, deploy the app to production, call your co-workers to let them know, while riding the train to work… all without getting your laptop out of your bag! Next time you're looking for inexpensive hosting, or have a client who wants to be involved in the process, make sure to check out Harp.

Adobe Experience Manager

Adobe has always been a leader in the web space. Their premier corporate CMS is called **Adobe Experience Manager** (**AEM**) (see http://www.adobe.com/solutions/web-experience-management.html). I'm not going to get into how to install, configure, or code for AEM. That is a subject for several training manuals the size of this book. Trust me. I am only mentioning this so you know that there is at least one major CMS player that comes with complete jQuery Mobile examples.

The training materials are centered on a fictional site called **Geometrixx**, as shown in the following screenshot:



The AEM system uses a **Java Content Repository** (**JCR**) container, which helps separate content from metadata, such as versioning information, to store content (see http://en.wikipedia.org/wiki/Content_repository_API_for_Java). This means that you can create mobile sites that automatically pull content from desktop pages, simply by referencing the JCR content nodes of the desktop pages, or by allowing users to type directly into an interface that looks like a mobile screen.

The mobile example of Geometrixx is coded using jQuery Mobile; while the version of jQM is a bit outdated, it's easy to change the templates. The mobile content author interface comes with simulated phone interfaces to frame the content, so it looks roughly like it would on a real phone or tablet. You can switch device profiles right in the author interface. While this is not a true simulation of those devices, since it's all taking place in whatever browser you're using, it is still very, very handy:



If you work for a company that can afford AEM, you'll already be well-versed in the mobile implementation. The power this platform gives to content authors is astounding.

Summary

The world of mobile themes has exploded since I first started dipping into mobile development two years ago. Today, there are lots of options for jQuery Mobile; there are also some other responsive themes. I didn't bother making an exhaustive list of everything that Google can give us. By the time this book is published, that will have changed, even in the space of a month. The important thing to remember, is that we don't have to reinvent the wheel, and we don't have to saddle ourselves with content updates.

Give your clients the power to make minor updates themselves, and you get back to the business of your business. As useful as CMS is, we won't be covering it again. The next chapter, will be a return to custom development, where we'll combine everything we've learned so far.

Chapter 11. Putting It All Together – Community Radio

This is a website where listeners will be greeted with music from local, independent bands across several genres and geographic regions. Building this will take many of the skills we've developed so far, and we'll pepper in some new techniques that can be used in this new service. We've already drawn interfaces on Post-its, and used GPS and client-side templates. We've taken care of regular HTML5 Audio and video. We've even started working on multiple mobile sizes and used media queries to rework our layouts into responsive designs.

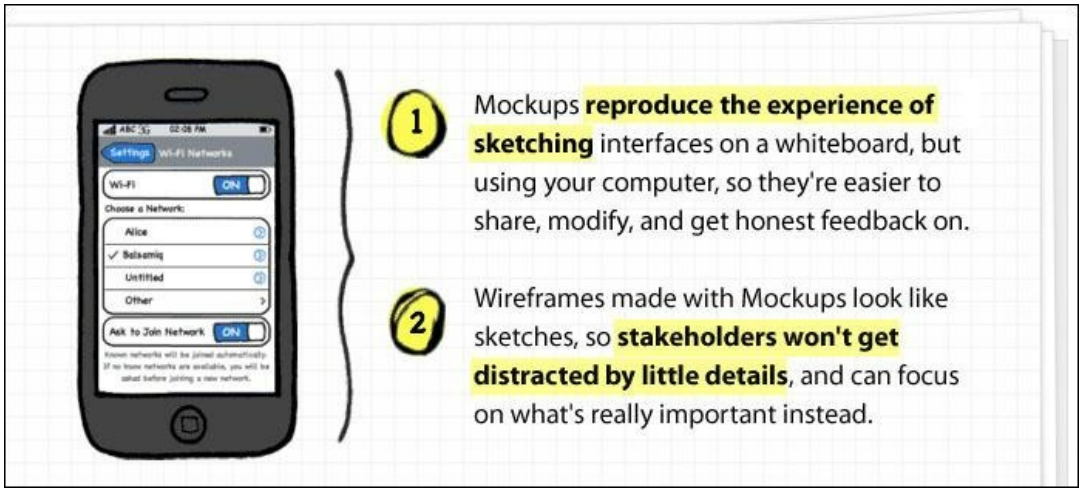
All of these were simpler implementations meant to get the job done and be as gracefully failing as possible. Let's see what technology and techniques we could bring to bear on this venture.

In this chapter, we will cover:

- A taste of Balsamiq
- Organizing your code
- An introduction to the Web Audio API
- Prompting the user to install your app
- New device-level hardware access
- To app or not to app, that is the question
- Adobe PhoneGap versus Apache Cordova

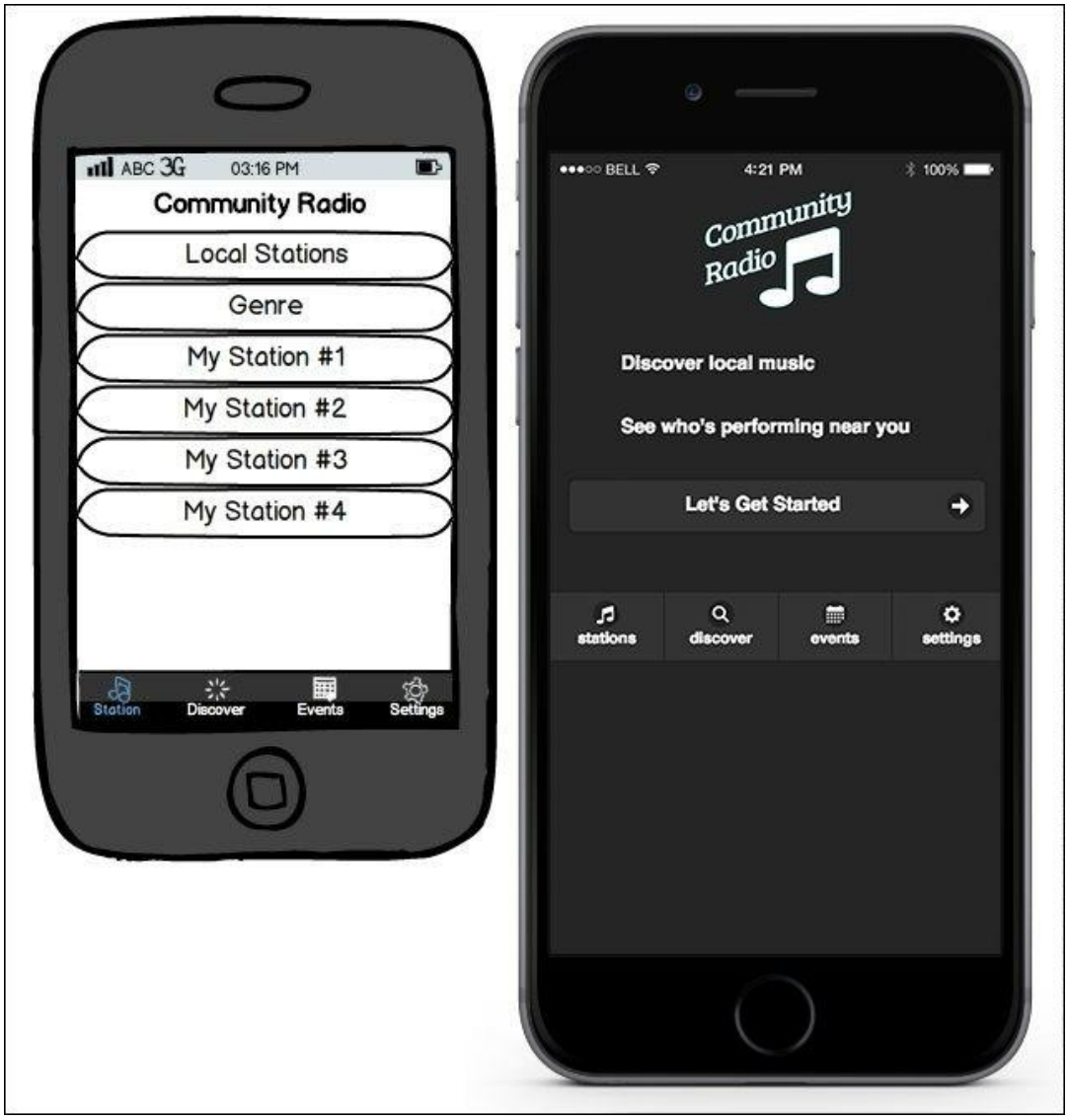
A taste of Balsamiq

We started this book by learning a technique called paper prototyping. For your own work with clients, it's a great tool. However, if you're dealing with larger, or distributed teams, you might need something more. Balsamiq (http://www.balsamiq.com/) is a very popular **User Experience** (**UX**) tool for rapid prototyping. It is perfect for creating and sharing interactive mockups:



When I say very popular, I mean lots of major names that you're used to seeing. Over 80,000 companies create their software with the help of Balsamiq Mockups.

So, let's take a look at what the creators of a community radio station might have in mind. They might start with a screen which looks like this; a pretty standard implementation. It features an `icon` toolbar at the bottom and a `listview` element in the content. We've done this before using Glyphish icons and standard toolbars:



Ideally, we'd like to keep this particular implementation as pure HTML/JavaScript/CSS. That way, we could compile it into a native app at some point, using PhoneGap. However, we'd like to stay true to the **Don't Repeat Yourself** (**DRY**) principle. That means, that we're going to want to inject this footer onto every page without using a server-side process. To that end, let's set up a hidden part of our app to contain all the global elements that we may want:

```
<div id="globalComponents">
    <div data-role="navbar" class="bottomNavBar">
        <ul>
            <li><a data-icon="music"
href="#stations_by_region"
data-transition="slideup">stations</a></li>
            <li><a data-icon="search"
href="#search_by_artist"
data-transition="slideup">discover</a></li>
```

```
            <li><a data-icon="calendar"
href="#events_by_location"
data-transition="slideup">events</a></li>
            <li><a data-icon="gear"
href="#settings"
data-transition="slideup">settings</a></li>
        </ul>
    </div>
</div>
```

We'll keep this code at the bottom of the page and hide it with a simple CSS rule in the stylesheet, `#globalComponents{display:none;}`.

Now, we'll insert this global footer into each page, just before they are created. Using the `clone()` method (shown in the next code snippet) ensures that not only are we pulling over a copy of the footer, but also any data attached with it. In this way, each page is built with the exact same footer, just like it is in a server-side include. When the page goes through its normal initialization process, the footer will receive the same markup treatment as the rest of the page:

```
/************************
*  The App
************************/
var radioApp = {
  universalPageBeforeCreate:function(){
    var $page = $(this);
    if($page.find(".bottomNavBar").length == 0){

 $page.append($("#globalComponents .bottomNavBar").clone());
    }
  }
}

/************************
*  The Events
************************/
//Interface Events
$(document).on("pagebeforecreate",
"[data-"role="page"]",radioApp.universalPageBeforeCreate);
```

Look at what we've done here in this piece of JavaScript code. It's a little different from what we've done before. We're actually organizing our code a little more effectively.

Organizing your code

In the previous chapters, we structured our code very loosely. In fact, I'm sure the academic types would laugh at the audacity of even calling it structured. I believe in a very pragmatic approach to coding, which leads me to use more simple structures and a bare minimum of libraries. However, there are values and lessons to be learned out there.

MVC, MVVM, MV*

For the last couple of years, serious JavaScript developers have been bringing backend development structures to the web, as the size and scope of their project demanded a more regimented approach. For highly ambitious, long-lasting, in-browser apps, this kind of structured approach can help. This is even truer if you're on a larger team.

MVC stands for **Model-View-Controller** (see http://en.wikipedia.org/wiki/Model–view–controller), **MVVM** is for **Model View ViewModel** (see http://en.wikipedia.org/wiki/Model_View_ViewModel), and **MV*** is shorthand for Model View Whatever and is the general term used to sum up this entire movement of bringing these kinds of structures to the frontend.

Some of the more popular libraries include:

- **Backbone.JS** (http://backbonejs.org/): An adapter and sample of how to make Backbone play nicely with jQuery Mobile can be found at http://demos.jquerymobile.com/1.4.5/backbone-requirejs.
- **Ember** (http://emberjs.com/): An example for Ember can be found at https://github.com/LuisSala/emberjs-jqm.
- **AngularJS** (https://angularjs.org/): Angular also has adapters for jQM in progress. There are several examples at https://github.com/tigbro/jquery-mobile-angular-adapter.
- **Knockout**: (http://knockoutjs.com/).

> **Note**
>
> A very nice comparison of these, and more, is at http://readwrite.com/2014/02/06/angular-backbone-ember-best-javascript-framework-for-you.

MV* and jQuery Mobile

Yes, you can do it!! You can add any one of these MV* frameworks to jQuery Mobile and make as complex an app as you like. Of them all, I lean toward the Ember platform for desktop and Angular for jQuery Mobile. However, I'd like to propose another alternative.

I'm not going to go in-depth into the concepts behind MVC frameworks. Ember, Angular, and Backbone, all help you to separate the concerns of your application into manageable pieces, offering small building blocks with which to create your application. But, we don't need yet another library/framework to do this. It is simple enough to write code in a more organized fashion. Let's create a structure similar to what I've started before:

```
//JavaScript Document

/********************
 * The Application
 ********************/


/********************
 * The Events
 ********************/


/********************
 * The Model
 ********************/
```

The application

Under the application section, let's fill in some of our app code and give it a **namespace**. Essentially, namespacing is taking your application-specific code and putting it into its own named object, so that the functions and variables won't collide with other potential global variables and functions. It keeps you from polluting the global space and helps preserve your code from those who are ignorant regarding your work. Granted, this is JavaScript and people can override anything they wish.

However, this also makes it a whole lot more intentional to override something like the `radioApp.getStarted` function, than simply creating your own function called `getStarted`. Nobody is going to accidentally override a namespaced function.

```
/********************
 * The application
 ********************/
var radioApp = {
  settings:{
```

```
    initialized:false,
    geolocation:{
      latitude:null,
      longitude:null,
    },
    regionalChoice:null,
    lastStation:null
  },
  getStarted:function(){
    location.replace("#initialize");
  },
  fireCustomEvent:function(){
    var $clicked = $(this);
    var eventValue =
$clicked.attr("data-appEventValue");
    var event = new
jQuery.Event($(this).attr("data-appEvent"));
    if(eventValue){ event.val = eventValue; }
    $(window).trigger(event);
  },
  otherMethodsBlahBlahBlah:function(){}
}
```

Pay attention, in particular, to the `fireCustomEvent`. function With that, we can now set up an event management system. At its core, the idea is pretty simple. We'd like to be able to simply put tag attributes on our clickable objects and have them fire events, such as all the MV* systems. This fits the bill perfectly.

It would be quite common to set up a click event handler on a link, or something, to catch the activity. This is far simpler. Just an attribute here and there and you're wired in. The HTML code becomes more readable too. It's easy to see how declarative this makes your code:

```
<a href="javascript://"
data-
appEvent="playStation"
data-appEventValue="country">Country</a>
```

The events

Now, instead of watching for clicks, we're listening for events. You can have as many parts of your app as you like registering themselves to listen for the event, and then execute appropriately.

As we fill out more of our application, we'll start collecting a lot of events. Instead of letting them get scattered throughout multiple nested callbacks and such, we'll be keeping them all in one handy spot. In most JavaScript MV* frameworks, this part of the code is referred to as the **Router**. Hooked to each event, you will see nothing but namespaced application calls:

```
/*******************
 * The events
 *******************/

//Interface events
$(document).on("click", "[data-appEvent]",

 radioApp.fireCustomEvent);"$(document).on("pagecontainerbeforeshow",

 "[data-
role="page"]",radioApp.universalPageBeforeShow);"
$(document).on("pagebeforecreate",

 "[data-
role="page"]",radioApp.universalPageBeforeCreate);"
$(document).on("pagecontainershow", "#initialize",
  radioApp.getLocation);"
$(document).on("pagecontainerbeforeshow",
"#welcome",
  radioApp.initialize);

//Application events
$(window).on("getStarted",
  radioApp.getStarted);
$(window).on("setHomeLocation",
  radioApp.setHomeLocation);
$(window).on("setNotHomeLocation",
  radioApp.setNotHomeLocation);
$(window).on("playStation",
  radioApp.playStation);
```

Notice the separation of concerns into interface events and application events. We're using this as a point of distinction between events that are fired as a result of natural jQuery Mobile events (interface events), and events that we have thrown (application events). This may be an arbitrary distinction, but for someone who comes along later to maintain your code, this could come in handy.

The model

The model section contains the data for your application. This is typically the kind of data that is pulled in from your backend APIs. It's probably not as important here, but it never hurts to namespace what's yours. Here, we have labeled our data as the `modelData` label. Any information we pull in from the APIs can be dumped right into this object, like we've done here with the station data:

```
/*******************
 * The Model
 *******************/
var modelData = {
```

```
  station:{
    genres:[
        {
         display:"Seattle Grunge",
         genreId:12,
         genreParentId:1
        }
    ],
    metroIds[14,33,22,31],
    audioIds[55,43,26,23,11]
  }
}
```

Pair this style of programming with client-side templating, and you'll be looking at some highly maintainable, well-structured code. However, there are some features that are still missing. Typically, these frameworks will also provide bindings for your templates. This means that you only have to render the templates once. After that, simply updating your model object will be enough to cause the UI to update itself.

The problem with these bound templates, is that they update the HTML in a way that would be perfect for a desktop application. But remember, jQuery Mobile does a lot of DOM manipulation to make things happen.

In jQuery Mobile, a `listview` element starts like this:

```
<ul data-role="listview" data-inset="true">
  <li><a href="#stations">Local Stations</a></li>
</ul>
```

After the normal DOM manipulation, you get this:

```
<ul data-role="listview" data-inset="true"
data-
theme="b" style="margin-top:0" class="ui-listview
ui-listview-inset ui-corner-all ui-shadow">
    <li data-corners="false" data-shadow="false"
data-
iconshadow="true" data-wrapperels="div"
data-icon="arrow-
r" data-iconpos="right" data-theme="b"
class="ui-
btn ui-btn-icon-right ui-li-has-arrow ui-li
ui-corner-top ui-btn-up-b">
        <div class="ui-btn-inner ui-li
ui-corner-top">
            <div class="ui-btn-text">
                <a href="#stations"
class="ui-link-inherit">Local Stations</a>
            </div><span class="ui-icon
ui-icon-arrow-r ui-icon-shadow"> </span>
        </div>
```

```
            </li>
        </ul>
```

And that's just a single list item. You really don't want to include all that junk in your templates; so what you need to do, is just add your usual items to the `listview` element and then call the `.listview("refresh")` function. Even if you're using one of the MV* systems, you'll still have to either find, or write, an adapter that will refresh the listviews when something is added or deleted. With any luck, these kinds of things will be solved at the platform level soon. Until then, using a real MV* system with jQM will be a pain in the posterior.

Introduction to the Web Audio API

When we touched upon the subject of HTML audio in Chapter 7, *Working with HTML5 Audio*, we were looking at it from a perspective of progressive enhancement and maximum device support. We took regular pages with native audio controls and used JavaScript to build a new interface to control the audio. We then looked at ways to combine it all and go for the better experience. Now, we'll take it a few steps further.

The Web Audio API is a fairly new development and, at the time of writing this, only existed within the mobile space on Mobile Safari and Chrome for Android (http://caniuse.com/#feat=audio-api). The Web Audio API is available on the latest versions of desktop Chrome, Safari, and Firefox, so you can still do your initial test coding there. It's only a matter of time before this is built into other major platforms.

Most of the code for this part of the project, and the full explanation of the API, can be found at http://tinyurl.com/webaudioapi2014.

Let's use feature detection to branch our capabilities:

```
function init() {
if("webkitAudioContext" in window) {
    context = new webkitAudioContext();
    // an analyzer is used for the spectrum
    analyzer = context.createAnalyzer();
    analyzer.smoothingTimeConstant = 0.85;
    analyzer.connect(context.destination);

    fetchNextSong();
  } else {
    //do the old stuff
  }
}
```

The original code for this page was designed to kick off simultaneous downloads for every song in the queue. With a fat connection, this would probably be OK. Not so much on mobile. Because of the limited connectivity and bandwidth, it would be better to just chain downloads to ensure a better experience and a more respectful use of bandwidth:

```
function fetchNextSong() {
var request = new XMLHttpRequest();
  var nextSong = songs.pop();
  if(nextSong){
    request = new XMLHttpRequest();
    // the underscore prefix is a common naming
convention
```

```
    // to remind us that the variable is
developer-supplied
    request._soundName = nextSong;
    request.open("GET", PATH + request._soundName
+ ".mp3", " true);
    request.responseType = "arraybuffer";
    request.addEventListener("load", bufferSound,
false);
    request.send();
  }
}
```

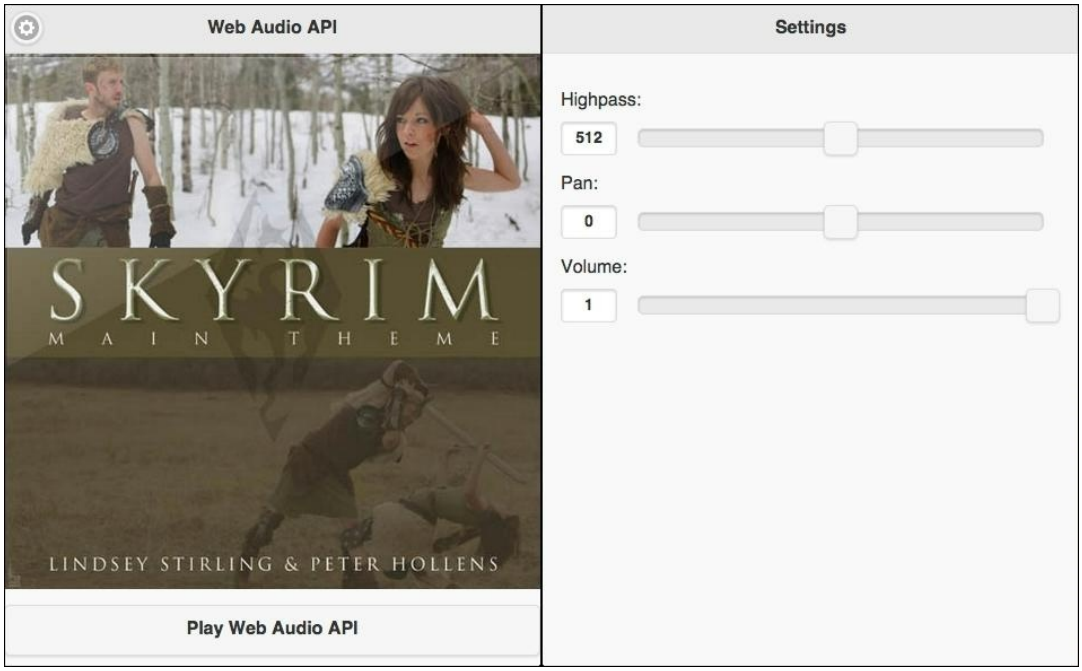
Now, the `bufferSound` function just needs to call the `fetchNextSong` function after buffering, as shown in the following code snippet:

```
 function bufferSound(event) {
    var request = event.target;
    context.decodeAudioData(request.response,
function onSuccess(decodedBuffer) {
        myBuffers.push(decodedBuffer);
        fetchNextSong();
    }, function onFailure() {
        alert("Decoding the audio buffer failed");
    });
}
```

One last thing we need to change from the original, is telling the buffer to pull the songs in the order that they were inserted:

```
function playSound() {
    // create a new AudioBufferSourceNode
    var source = context.createBufferSource();
    source.buffer = myBuffers.shift();
    source.loop = false;
    source = routeSound(source);
    // play right now (0 seconds from now)
    // can also pass context.currentTime
    source.start(0);
    mySpectrum = setInterval(drawSpectrum, 30);
    mySource = source;
}
```

For anyone on iOS, this solution is pretty nice. There is a lot more to this API for those who want to dig in. With this out-of-the-box example, you get a nice canvas-based audio analyzer that gives you a very nice professional look, as the audio levels bounce to the music. Slider controls are used to change the volume, the left-right balance, and the high-pass filter. If you don't know what a high-pass filter is, don't worry; I think that filter's usefulness went the way of the cassette deck. Regardless, it's fun to play with:



The Web Audio API is a very serious piece of business. This example was adapted from the example on Apple's site. It only plays one sound. However, the Web Audio API was designed with the idea of making it possible to play multiple sounds, alter them in multiple ways, and even dynamically generate sounds using JavaScript. Getting that deep is probably worth a book of its own. It would also require a deeper knowledge of audio processing than I am likely to ever have.

In the meantime, if you want to see this proof of concept in jQuery Mobile, you will find it in the example source in the `webaudioapi.html` file. For an even deeper look at what is coming, you can check the docs at https://dvcs.w3.org/hg/audio/raw-file/tip/webaudio/specification.html.

Prompting the user to install your app

Remember in Chapter 7, *Working with HTML5 Audio*, we added the Apple touch icons to make the Lindsey Stirling site look like an app, when bookmarked to the home screen? We even went so far as to use a manifest file to locally cache the assets for faster access and offline use:



Now, let's take a look at how we can prompt our users to download the Community Radio app to their home screens. It is very likely that you've seen it before; it's the little bubble that pops up and instructs the user with the steps to install the app.

There are many different projects out there, but the best one that I have seen is a derivative of the one started by Google. Much thanks and respect to Okamototk on GitHub (https://github.com/okamototk) for taking and improving it. Okamototk evolved the bubble to include several versions of Android, legacy iOS, and even BlackBerry. You can find his original work at https://github.com/okamototk/jqm-mobile-bookmark-bubble. However, unless you can read Japanese, or enjoy translating it, I'd recommend you just take the code from this chapter's example.

Don't worry about annoying your customers too much. With this version, if they dismiss the bookmarking bubble three times, they won't see it again. The count is stored in HTML5 LocalStorage; so, if they clear out the storage, they'll see the bubble again. Thankfully, most people out there don't even know that can be done, so it won't happen very often. Usually, it's geeks like us that clear things like LocalStorage and cookies, and we know what we're getting into when we do it.

In my edition of the code, I've combined all the JavaScript into a single file meant to be placed between your import of jQuery and jQuery Mobile. At the top, the first non-commented line is:

```
page_popup_bubble="#welcome";
```

This is what you would change to be your own first page, or where you want the bubble to pop up.

In my version, I have hardcoded the font color and text shadow properties into the bubble. This was needed, because in jQM the font color and text shadow color vary, based on the theme you're using. Consequently, in jQuery Mobile's original default **A** theme (white text on a black background), the font was showing up as white with a dark shadow on top of a white bubble. With my modified version, for older jQuery Mobile versions, it will always look right.

We just need to be sure we've set up our page with the proper links in the head, and that our images are in place:

```
<link rel="apple-touch-icon-precomposed"
sizes="144x144" href="images/album144.png">
<link rel="apple-touch-icon-precomposed"
sizes="114x114" href="images/album114.png">
<link rel="apple-touch-icon-precomposed"
sizes="72x72" href="images/album72.png">
<link rel="apple-touch-icon-precomposed"
href="images/album57.png">
<link rel="shortcut icon"
href="img/images/album144.png">
```

Note the Community Radio logo here. The logo is pulled from our link tags marked with `rel="apple-touch-icon-precomposed"` and injected into the bubble. So, really, the only thing in the `jqm_bookmark_bubble.js` file that you would need to alter is the `page_popup_bubble` function.

New device-level hardware access

New kinds of hardware-level access are coming to our mobile browsers every year. Here is a look at some of what you can start doing now, and what's on the horizon. Not all of these are applicable to every project, but if you think creatively, you can probably find innovative ways to use them.

Accelerometers

Accelerometers are the little doo-dads inside your phone that measure the phone's orientation in space. To geek out on this, read http://en.wikipedia.org/wiki/Accelerometer.

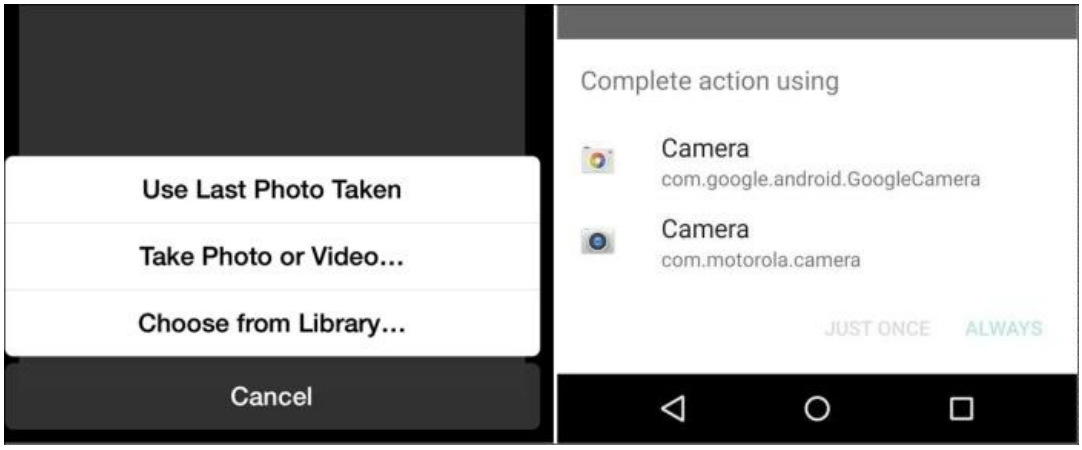
This goes beyond the simple orientation we've been using. This is true access to the accelerometers, in detail. Think about the user being able to shake their device, or tilting it as a method of interaction with your app. Maybe, Community Radio is playing something they don't like and we can give them a fun way to rage against the song. Something such as, shake a song to never hear it again. Here is a simple marble rolling game somebody made as a proof of concept. See http://menscher.com/teaching/woaa/examples/html5_accelerometer.html.

Camera

Apple's iOS 8 and Android's Lollipop can both access photos on their filesystems, as well as the cameras. Granted, these are the latest and greatest versions of these two platforms. If you intend to support the many woefully out of date Android devices (2.3, 2.4) that are still being sold off the shelves, as if brand new, then you're going to want to go with a native compilation such as PhoneGap or Apache Cordova to get that capability:

```
<input type="file" accept="image/*">
<input type="file" accept="video/*">
```

The following screenshot has iOS to the left and Android to the right:



APIs on the horizon

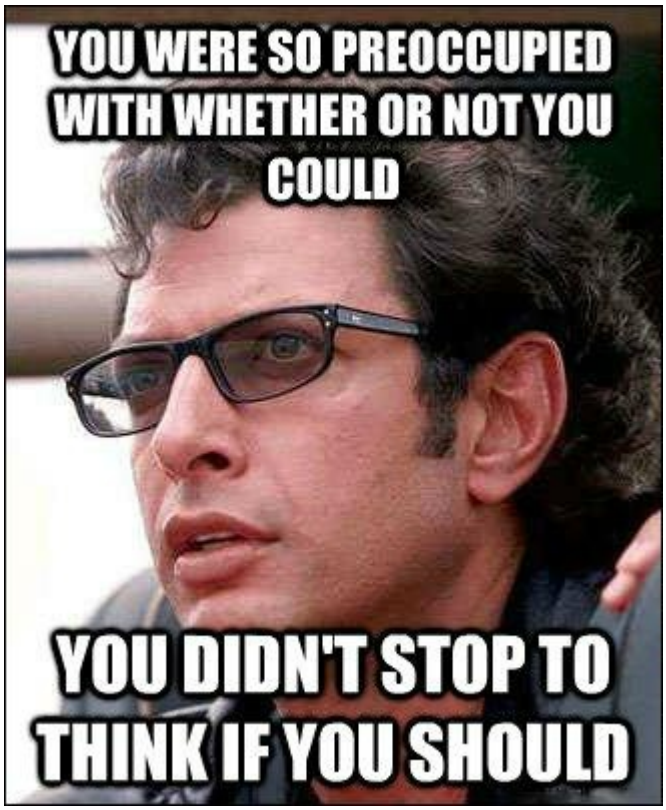
Mozilla is doing a lot to push the mobile web API envelope. You can check out what's on the horizon here: https://wiki.mozilla.org/WebAPI.

To app or not to app, that is the question

Should you, or should you not, compile your project into a native app? Here are some things to consider.

Raining on the parade (take this seriously)

When you compile your first project into an app, there is a certain thrill that you get. You did it! You made a real app! It is at this point that we need to remember the words of Dr. Ian Malcolm from the movie Jurassic Park (Go watch it again. I'll wait):



"You stood on the shoulders of geniuses to accomplish something as fast as you could, and before you even knew what you had, you patented it, and packaged it, and slapped it on a plastic lunchbox, and now [bangs on the table] you're selling it, you wanna sell it. Well... your scientists were so preoccupied with whether or not they could that they didn't stop to think if they should."

--Dr. Ian Malcolm

These words are very close to prophetic for us. In the end, their own creation ate most of the guests for lunch.

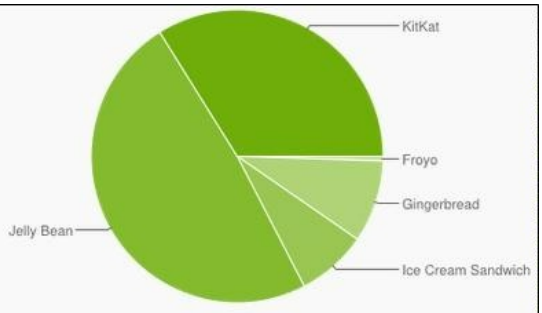
According to this report from August 2012 http://www.webpronews.com/over-two-thirds-of-the-app-store-has-never-been-downloaded-2012-08 (and several others like it that I've seen before), over two-thirds of all apps on the app stores have never been downloaded. Not even once! So, realistically, app stores are where most projects go to die.

Even if your app is discovered, the likelihood that anyone will use it for any significant period of time is astonishingly small. According to this article in Forbes (http://tech.fortune.cnn.com/2009/02/20/the-half-life-of-an-iphone-app/), most apps are abandoned in the space of minutes and never opened again. Paid apps last about twice as long, before either being forgotten or removed. Games have some staying power, but let's be honest, jQuery Mobile isn't exactly a compelling gaming platform, is it??

The Android world is in terrible shape. Devices can still be purchased running ancient versions of the OS, and carriers and hardware partners are not providing updates to them in anything even resembling a timely fashion. If you want to monitor the trouble you could be bringing upon yourself by embracing a native strategy, look here:

http://developer.android.com/about/dashboards/index.html:

Version	Codename	API	Distribution
2.2	Froyo	8	0.5%
2.3.3 - 2.3.7	Gingerbread	10	9.1%
4.0.3 - 4.0.4	Ice Cream Sandwich	15	7.8%
4.1.x	Jelly Bean	16	21.3%
4.2.x		17	20.4%
4.3		18	7.0%
4.4	KitKat	19	33.9%



Data collected during a 7-day period ending on December 1, 2014.
Any versions with less than 0.1% distribution are not shown.

Note: Because this data is gathered from the new Google Play Store app, which supports Android 2.2 and above, devices running older versions are not included. However, in August, 2013, versions older than Android 2.2 accounted for about 1% of devices that *checked in* to Google servers (not those that actually visited Google Play Store).

You can see how fractured the Android landscape is, as well as how many older versions you'll probably have to support.

On the flip side, if you're publishing strictly to the web, then every time your users visit your site, they'll be on the latest edition using the latest APIs, and you'll never have to worry about somebody using some out-of-date version.

Do you have a security patch you need to apply? You can do it in seconds. If you're on the Apple app store, this patch could take days or even weeks.

Three good reasons for compiling an app

Yes, I know I just finished telling you about your slim chances of success and the fire and brimstone you will face for supporting apps. However, here are a few good reasons to make a real app. In fact, in my opinion, they're the only acceptable reasons.

The project itself is the product

This is the first, and only, sure sign that you need to package your project as an app. I'm not talking about selling things through your project. I'm talking about the project itself. It should be made into an app. May the force be with you.

Access to native only hardware capabilities

GPS and camera are reliably available for the two major platforms in their latest editions. iOS even supports accelerometers. However, if you're looking for more than this, you'll need to compile down to an app to get access to these APIs.

Push notifications

Do you like them? I don't know about you, but I get way too many push notifications; any app that gets too pushy either gets uninstalled or its notifications are completely turned off. I'm not alone in this. However, if you simply must have push notifications and can't wait for the web-based implementation, you'll have to compile an app.

Supporting current customers

OK, this one is a stretch, but if you work in corporate America, you're going to hear it. The idea is that you're an established business and you want to give mobile support to your clients. You, or someone above you, has read a few whitepapers and/or case studies that show that almost 50 percent of people search in the app stores first.

Even if that were true (which I'm still not sold on), you're talking to a businessperson. They understand money, expenses, and escalated maintenance. Once you explain to them the cost, complexity, and potential ongoing headaches of building and testing for all the platforms and their OS versions in the wild, it becomes a very appealing alternative to simply put out a marketing push to your current customers that you're now supporting mobile, and all they have to do is go to your site on their mobile device.

Marketing folks are always looking for reasons to toot their horns at customers anyway. Marketing might still prefer to have the company icon on the customer's device to reinforce brand loyalty, but this is simply a matter of educating them that it can be done without an app.

You still may not be able to convince all the right people that apps are the wrong way to go when it comes to customer support. If you can't do it on your own, slap them on their heads with a little Jakob Nielson. If they won't listen to you, maybe they'll listen to him. I would defy anyone who says that the Nielsen Norman Group doesn't know what they're saying. See http://www.nngroup.com/articles/mobile-sites-vs-apps-strategy-shift/ for the following quote:

"Summary: Mobile apps currently have better usability than mobile sites, but forthcoming changes will eventually make a mobile site the superior strategy."

So, the $64,000 question becomes: are we making something for right now or for the future? If we're making it for right now, what are the criteria that should mark the retirement of the native strategy? Or do we intend to stay locked on it forever? Don't go into that war without an exit strategy.

Adobe PhoneGap versus Apache Cordova

Well, after all that, if you're still thinking of making a native app, I salute you. I admire your spirit and wish you the best of luck... PhoneGap started out as a project to take regular HTML, JavaScript, and CSS and package them nicely into a distributable app for any app store. Eventually, it became part of the Apache Software Foundation. At its core, PhoneGap is Apache Cordova. In addition to simply compiling down your app, you also get access to the following device-level APIs:

- **Accelerometer**: Tap into the device's motion sensor
- **Camera**: Capture a photo using the device's camera
- **Capture**: Capture media files using the device's media capture applications
- **Compass**: Obtain the direction that the device is pointing to
- **Connection**: Quickly check the network state and cellular network information
- **Contacts**: Work with the device's contacts database
- **Device**: Gather device-specific information
- **Events**: Hook into native events through JavaScript
- **File**: Hook into native file systems through JavaScript
- **Geolocation**: Make your application location aware
- **Globalization**: Enable representation of objects specific to a locale
- **InAppBrowser**: Launch URLs in another in-app browser instance
- **Media**: Record and play back audio files
- **Notification**: Visual, audible, and tactile device notifications
- **Splashscreen**: Show and hide the applications' splash screen
- **Storage**: Hook into the device's native storage options

So far, so good!!! We get a lot more stuff we can do, and we can do it all in JavaScript.

Next, we need to actually build our app. You'll need to download PhoneGap or Cordova onto your machine. Don't forget to download the SDKs for every platform you intend to support as well. No, wait, scratch that!



Just use PhoneGap Build. It's a cloud-based build service for PhoneGap. You don't have to install any SDKs at all. PhoneGap Build just took all the work out of this. If you want it to compile iOS apps, you'll still have to provide them with your developer certificates, but aside from that little hiccup, you're good to go.

1. To get started, all you have to do is log in with either your Adobe ID or your GitHub ID. Then, either paste in the URL to the GitHub repo you want to build, or upload a zip file less than 9.5 MB in size:



2. Next, you fill out a little information about the app itself:



3. Click on the **Ready to build button**. Now, just sit back and watch the pretty progress spinners do their thing.



Look, they even give you a lovely little QR code to scan for downloading the app. The only reason it's giving a red symbol on iOS is because, at this point, I have not given them my developer certificates.

Summary

I don't know about you, but I'm exhausted. I really don't think there's any more that can be said about jQuery Mobile, or its supporting technologies at this time. You've got examples on how to build things for a whole host of industries, and ways to deploy it through either the web or PhoneGap Build. At this point, you should be quoting Bob the Builder. Can we build it? Yes, we can!

I hope this book has assisted and/or inspired you to go and make something great. I hope you change the world and get filthy stinking rich doing it. I'd love to hear your success stories as you move forward. To let me know how you're doing, or to let me know of any errata, or even if you just have some questions, please don't hesitate to email us directly at <andy@commadelimited.com>. Now, go be awesome!

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  - URL / Raining on the parade (take this seriously)
- AngularJS
  - URL / MVC, MVVM, MV*
- Apache Cordova
  - versus Adobe PhoneGap / Adobe PhoneGap versus Apache Cordova
- Apache HTTP core components
  - URL / Patching into JSON APIs (GitHub)
- app
  - about / To app or not to app, that is the question
  - project, compiling / Raining on the parade (take this seriously)
  - compiling / Three good reasons for compiling an app
  - product / The project itself is the product
  - hardware capabilities / Access to native only hardware capabilities
  - push notifications / Push notifications
  - current customers, supporting / Supporting current customers

- Apple / The game has changed
- application
  - about / The application
- Axure RP
  - URL / Alternates to paper prototyping

B

- Backbone.JS
  - URL / MVC, MVVM, MV*
- background images
  - cycling / Cycling background images
- Balsamiq
  - about / A taste of Balsamiq
  - URL / A taste of Balsamiq
- Balsamiq Mockups
  - URL / Alternates to paper prototyping
- broccoli
  - and Grunt, comparing / Comparing Grunt, Gulp, and Broccoli
  - and Gulp, comparing / Comparing Grunt, Gulp, and Broccoli
  - URL / Comparing Grunt, Gulp, and Broccoli
- browser sniffing
  - versus feature detection / Browser sniffing versus feature detection
  - JavaScript-based / JavaScript-based browser sniffing

C

- camera
  - about / Camera, Adobe PhoneGap versus Apache Cordova
- capture

    - about / Adobe PhoneGap versus Apache Cordova

- Cascading Style Sheets (CSS) / Getting Glyphish and defining custom icons
- changing mobile playing field / The game has changed
- Characters Per Line (CPL)
    - about / Text readability and responsive design
- Chocolatey
    - URL / Installing Node.js
- Chocolatey or Scoop (Windows)
    - used, for installing Node.js / Installing Node.js
- client-side templating
    - about / Client-side templating
- CMS
    - landscape / The current CMS landscape
    - URL / The current CMS landscape
- code
    - organizing / Organizing your code
- compass
    - about / Adobe PhoneGap versus Apache Cordova
- compress option, uglify
    - URL / Minification using grunt-contrib-uglify
- concatenation
    - grunt-contrib-concat used / Concatenation using grunt-contrib-concat
- concat plugin
    - separator option / Concatenation using grunt-contrib-concat
    - banner option / Concatenation using grunt-contrib-concat
    - footer option / Concatenation using grunt-contrib-concat
    - nonull option / Concatenation using grunt-contrib-concat
    - URL / Concatenation using grunt-contrib-concat

- connection
    - about / Adobe PhoneGap versus Apache Cordova
- contacts
    - about / Adobe PhoneGap versus Apache Cordova
- Cross Origin Resource Sharing (CORS)
    - URL / Patching into JSON APIs (GitHub)
- CSS preprocessors
    - grunt-contrib-sass / grunt-contrib-less used / CSS preprocessors using grunt-contrib-sass / grunt-contrib-less
- custom CSS
    - about / The custom CSS
- custom fonts
    - about / Custom fonts
- custom icons
    - defining / Getting Glyphish and defining custom icons

D

- desktop-sized devices / Desktop-sized devices
- device
    - about / Adobe PhoneGap versus Apache Cordova
- directions
    - driving, Google Maps API used / Driving directions with the Google Maps API
- Document Object Model (DOM) / Cycling background images
- DOM weight
    - and pages / Generated pages and DOM weight
- Don't Repeat Yourself (DRY) / A taste of Balsamiq
- drawing

    - versus HTML prototyping / HTML prototyping versus drawing
- Drupal
    - and jQuery Mobile / Drupal and jQuery Mobile
- Drupal jQuery Mobile theme
    - URL / Drupal – jQuery Mobile theme
- Drupal templates
    - and WordPress, updating / Updating your WordPress and Drupal templates

E

- e-commerce tracking
    - with Google Analytics / E-commerce tracking with Google Analytics
- e-mails
    - linking to / Linking to phones, e-mails, and maps
- Ember
    - URL / MVC, MVVM, MV*
- events
    - about / The events, Adobe PhoneGap versus Apache Cordova

F

- @font-face CSS / Custom fonts
- feature detection
    - versus browser sniffing / Browser sniffing versus feature detection
    - JavaScript-based, Modernizr used / JavaScript-based feature detection using Modernizr
- file
    - about / Adobe PhoneGap versus Apache Cordova

- Flappy Bird / The mobile usage pattern
- Fonts.com web fonts
  - URL / Custom fonts
- Font Squirrel
  - URL / Custom fonts
- Forbes
  - URL / Raining on the parade (take this seriously)
- full-site links
  - beyond industry standard / Full-site links beyond the industry standard
- full-site pages, mobilizing
  - hard way / Mobilizing full-site pages – the hard way, The hard way – final thoughts
  - data-role attributes / Know your role
  - content, focusing on / Step 1 of 2 – focus on content, marketing cries foul!
  - global navigation style, selecting / Step 2 of 2 – choose global navigation style and insert
  - insert, selecting / Step 2 of 2 – choose global navigation style and insert
  - global nav, as separate page / Global nav as a separate page
  - global nav, at bottom / Global nav at the bottom
  - global nav, as panel / Global nav as a panel
  - easy way / Mobilizing full-site pages – the easy way
- Functional Design Specification (FDS) / Design requirements
- future-friendly approach
  - URL / Browser sniffing versus feature detection

G

- geolocation
  - about / Geolocation, Adobe PhoneGap versus Apache Cordova
  - API specification, URL / Geolocation
  - URL / Geolocation
  - JSON used / Using JSON
  - user location, picking / Picking a user's location

- global configuration
  - URL / Meta viewport differences
- global CSS
  - about / The global CSS
- globalization
  - about / Adobe PhoneGap versus Apache Cordova
- global JavaScript
  - about / The global JavaScript
- Glyphish
  - URL / What we need to create our site
  - about / Getting Glyphish and defining custom icons
- Google Analytics
  - adding / Adding Google Analytics
  - URL / Adding Google Analytics
  - page views, tracking / Tracking and firing page views
  - page views, firing / Tracking and firing page views
  - used, for tracking e-commerce / E-commerce tracking with Google Analytics
- Google Maps API
  - used, for driving directions / Driving directions with the Google Maps API
  - URL / Driving directions with the Google Maps API
- Google Static Maps
  - about / Google Static Maps
  - Google Analytics, adding / Adding Google Analytics
  - page views, firing / Tracking and firing page views
  - long and multi-page forms, creating / Creating long and multi-page forms
- Google Web Fonts
  - URL / Custom fonts
- GPS

    - monitoring / Geek out moment - GPS monitoring

- Grunt

    - about / Introducing Grunt - a JavaScript task runner
    - URL / Introducing Grunt - a JavaScript task runner, Configuring Grunt
    - installing / Installing Grunt
    - installing, NPM used / Installing Grunt using NPM
    - configuring / Configuring Grunt
    - and Gulp, comparing / Comparing Grunt, Gulp, and Broccoli
    - and broccoli, comparing / Comparing Grunt, Gulp, and Broccoli

- grunt-contrib-concat

    - used, for concatenation / Concatenation using grunt-contrib-concat

- grunt-contrib-connect plugin

    - URL / LiveReloading using grunt-contrib-watch

- grunt-contrib-sass

    - used, for CSS preprocessors / CSS preprocessors using grunt-contrib-sass / grunt-contrib-less

- grunt-contrib-uglify

    - used, for minification / Minification using grunt-contrib-uglify

- grunt-contrib-watch

    - used, for LiveReloading / LiveReloading using grunt-contrib-watch

- Gulp

    - and broccoli, comparing / Comparing Grunt, Gulp, and Broccoli
    - and Grunt, comparing / Comparing Grunt, Gulp, and Broccoli
    - URL / Comparing Grunt, Gulp, and Broccoli

- gzip

    - URL / Optimization - why you should be thinking of it first

H

- hardware-level access

    - APIs, on horizon / APIs on the horizon

- hardware-level access

    - about / New device-level hardware access
    - Accelerometers / Accelerometers
    - camera / Camera

- HarpJS

    - about / The Harp server
    - rules / The rules of HarpJS

- Harp server

    - about / The Harp server
    - setting locally / Setting up Harp locally
    - first page, adding / Adding your first page
    - client involved, getting / Getting the client involved
    - platform / The Harp platform
    - project, publishing / Publishing your project

- helper method / Passing query params to jQuery Mobile
- Homebrew (OS X)

    - used, for installing Node.js / Installing Node.js
    - URL / Installing Node.js

- home screen

    - saving to, HTML5 manifest used / Saving to the home screen with HTML5 manifest

- HTML

    - breaking, into server side template / Breaking the HTML into a server-side template

- HTML5 Audio

    - about / HTML5 Audio
    - persistent toolbars, fixed position / Fixed position persistent toolbars
    - controlling, JavaScript used / Controlling HTML5 Audio with JavaScript
    - in iOS / HTML5 Audio in iOS
    - jQuery Mobile apps / Multipage jQuery Mobile apps made useful

- HTML5 boilerplate

- URL / Fixed position persistent toolbars

- HTML5 manifest
  - used, for saving to home screen / Saving to the home screen with HTML5 manifest
  - URL / Saving to the home screen with HTML5 manifest

- HTML5 Web Storage
  - about / HTML5 Web Storage
  - localStorage / HTML5 Web Storage
  - sessionStorage / HTML5 Web Storage
  - URL / HTML5 Web Storage
  - browser-based databases / Browser-based databases (work in progress)

- HTML prototyping
  - versus drawing / HTML prototyping versus drawing

- Hypertext Preprocessor (PHP) / Breaking the HTML into a server-side template

- InAppBrowser
  - about / Adobe PhoneGap versus Apache Cordova

- Indexed Database
  - URL / Browser-based databases (work in progress)

- IndexedDB
  - URL / Browser-based databases (work in progress)

- industry standard / Full-site links beyond the industry standard
- iOS
  - HTML5 Audio / HTML5 Audio in iOS

- iPad mini
  - URL / WURFL – server-side database-driven browser sniffing

J

- Java Content Repository (JCR)
  - URL / Adobe Experience Manager
- JavaScript
  - used, for detecting / Detecting and redirecting using JavaScript
  - used, for redirecting / Detecting and redirecting using JavaScript
  - detecting / Detecting and redirecting using JavaScript
  - redirecting / Detecting and redirecting using JavaScript
  - used, for controlling HTML5 Audio / Controlling HTML5 Audio with JavaScript
- JavaScript Object Notation (JSON)
  - used, for geolocation / Using JSON
- Jekyll
  - URL / Static Site Generators
- jQMobile WordPress theme
  - about / WordPress – jQMobile theme
- jquery.cookie.js
  - URL / Breaking the HTML into a server-side template
- jQuery cookie plugin
  - URL / Mobilizing full-site pages – the easy way
- jQuery Drupal Mobile theme
  - about / Drupal – jQuery Mobile theme
- jQuery Mobile
  - usage pattern / The mobile usage pattern
  - remaining components, designing / Designing the remaining components
  - design requirements / Design requirements
  - about / Writing a new jQuery Mobile boilerplate
  - URL / Optimization - why you should be thinking of it first, Generated pages and DOM weight, Drupal and jQuery Mobile
  - query params, passing to / Passing query params to jQuery Mobile

    - and WordPress / WordPress and jQuery Mobile
    - and Drupal / Drupal and jQuery Mobile
    - and MV* / MV* and jQuery Mobile

- jQuery Mobile apps

    - about / Multipage jQuery Mobile apps made useful

- jQuery Mobile boilerplate

    - writing / Writing a new jQuery Mobile boilerplate
    - URL / Writing a new jQuery Mobile boilerplate

- jQuery Mobile elements

    - Listviews / Getting our hands dirty with small businesses
    - Dialog / Getting our hands dirty with small businesses
    - Navbars / Getting our hands dirty with small businesses
    - Buttons / Getting our hands dirty with small businesses
    - Grouped Buttons / Getting our hands dirty with small businesses
    - Flip switch / Getting our hands dirty with small businesses
    - Checkbox set / Getting our hands dirty with small businesses
    - Radio set / Getting our hands dirty with small businesses
    - Select menu / Getting our hands dirty with small businesses
    - Split listviews / Getting our hands dirty with small businesses
    - Bubble count list views / Getting our hands dirty with small businesses
    - Multi-select / Designing the remaining components
    - Slider / Designing the remaining components
    - Collapsible / Designing the remaining components
    - Input / Designing the remaining components
    - Search / Designing the remaining components

- jQuery Mobile ThemeRoller

    - URL / Meta viewport differences

- jQuery Validate

    - about / Integrating jQuery Validate
    - URL / Integrating jQuery Validate
    - multi-page form first page, creating / Creating the first page of our multi-page form
    - page, validating / Validating each page
    - meta.php file / The meta.php file

- JSON

    - to rescue / JSON to the rescue

    - URL / JSON to the rescue

- JSON APIs (GitHub)
    - patching into / Patching into JSON APIs (GitHub)
- JSONP
    - URL / Client-side templating
- JsRender template
    - URL / Passing query params to jQuery Mobile

K

- Knockout
    - URL / MVC, MVVM, MV*

L

- lean feature detection
    - JavaScript-based / JavaScript-based lean feature detection
- Less CSS file / Setting up Harp locally
- less plugin
    - paths option / CSS preprocessors using grunt-contrib-sass / grunt-contrib-less
    - rootpath option / CSS preprocessors using grunt-contrib-sass / grunt-contrib-less
    - optimization option / CSS preprocessors using grunt-contrib-sass / grunt-contrib-less
    - banner option / CSS preprocessors using grunt-contrib-sass / grunt-contrib-less
    - URL / CSS preprocessors using grunt-contrib-sass / grunt-contrib-less
- lightGallery
    - used, for creating basic gallery / Creating a basic gallery using lightGallery
    - URL / Creating a basic gallery using lightGallery
- Linux, Apache, MySQL, PHP (LAMP) platform / Breaking the HTML into a server-side template

- Linux users
  - Node.js, installing for / Installing Node.js
- LiveReloading
  - grunt-contrib-watch used / LiveReloading using grunt-contrib-watch
- Long Term Evolution (LTE) / Optimization - why you should be thinking of it first
- Luhn algorithm
  - URL / Validating each page

M

- MAMP
  - URL / WURFL – server-side database-driven browser sniffing
- maps
  - linking to / Linking to phones, e-mails, and maps
- Markdown / Getting the client involved
- media / Adobe PhoneGap versus Apache Cordova
- meta viewport tag
  - differences / Meta viewport differences
- microcaching / Optimization - why you should be thinking of it first
- microformats
  - URL / Google Static Maps
- minification
  - grunt-contrib-uglify used / Minification using grunt-contrib-uglify
- minifying
  - URL / Optimization - why you should be thinking of it first
- mobile devices, detecting
  - about / Detecting mobile – server-side, client-side, and the combination of the two
  - browser sniffing, versus feature detection / Browser sniffing versus feature detection

    - WURFL / WURFL – server-side database-driven browser sniffing
    - browser sniffing, server-side database-driven / WURFL – server-side database-driven browser sniffing
    - browser sniffing, JavaScript-based / JavaScript-based browser sniffing
    - feature detection JavaScript-based, Modernizr used / JavaScript-based feature detection using Modernizr
    - lean feature detection, JavaScript-based / JavaScript-based lean feature detection
    - server-side plus client-side detection / Server-side plus client-side detection

- mobile site
    - user, getting to / Getting the user to our mobile site

- mobile theme switcher
    - manual installation / Manually installing the mobile theme switcher
    - automatic installation / Automatically installing the mobile theme switcher
    - configuring / Configuring the mobile theme switcher

- model
    - about / The model

- Modernizr
    - URL / Fixed position persistent toolbars, JavaScript-based feature detection using Modernizr
    - used, for JavaScript-based feature detection / JavaScript-based feature detection using Modernizr

- Mom-and-Pop mobile website
    - new jQuery Mobile boilerplate, writing / Writing a new jQuery Mobile boilerplate
    - meta viewport, differences / Meta viewport differences
    - full-site links, beyond industry standard / Full-site links beyond the industry standard
    - global JavaScript / The global JavaScript
    - global CSS / The global CSS
    - HTML, breaking into server side template / Breaking the HTML into a server-side template
    - requisites / What we need to create our site
    - custom icons, defining / Getting Glyphish and defining custom icons

    - phones, linking to / Linking to phones, e-mails, and maps
    - e-mails, linking to / Linking to phones, e-mails, and maps
    - maps, linking to / Linking to phones, e-mails, and maps
    - final product / The final product
    - custom CSS / The custom CSS
    - resulting first page / The resulting first page
    - user, getting to / Getting the user to our mobile site
    - JavaScript, used for detecting / Detecting and redirecting using JavaScript
    - JavaScript, used for redirecting / Detecting and redirecting using JavaScript
    - server, detecting on / Detecting on the server

- MV*
    - about / MVC, MVVM, MV*
    - URL / MVC, MVVM, MV*
    - and jQuery Mobile / MV* and jQuery Mobile

- MVC
    - about / MVC, MVVM, MV*
    - URL / MVC, MVVM, MV*

- MVVM
    - about / MVC, MVVM, MV*
    - URL / MVC, MVVM, MV*

N

- navigator.geolocation.watchPosition method
    - URL / Geek out moment - GPS monitoring

- Near Field Communication (NFC) / QR codes
- Node.js
    - about / A brief aside about Node.js
    - installing / Installing Node.js
    - installing, Nodejs.org used / Installing Node.js
    - URL / Installing Node.js
    - installing, Homebrew (OS X) used / Installing Node.js
    - installing, Chocolatey or Scoop (Windows) used / Installing Node.js
    - installing, for Linux users / Installing Node.js

- Nodejs.org

    - used, for installing Node.js / Installing Node.js

- Node Package Manager (NPM)

    - used, for installing Grunt / Installing Grunt using NPM
    - URL / Installing Grunt using NPM

- notification / Adobe PhoneGap versus Apache Cordova
- npm init command / Installing Grunt using NPM

O

- Okamototk

    - on GitHub, URL / Prompting the user to install your app
    - URL / Prompting the user to install your app

- optimization

    - about / Optimization - why you should be thinking of it first

P

- pages

    - changing programmatically / Programmatically changing pages
    - and DOM weight / Generated pages and DOM weight

- panel widget

    - URL / Global nav as a panel

- paper-based ideation

    - considerations / HTML prototyping versus drawing

- paper prototyping

    - alternates / Alternates to paper prototyping
    - Balsamiq Mockups / Alternates to paper prototyping
    - Axure RP / Alternates to paper prototyping

- phones

    - linking to / Linking to phones, e-mails, and maps

Q

- QR codes
  - about / QR codes
  - URL / QR codes
  - generating / QR codes
- query params
  - passing, to jQuery mobile / Passing query params to jQuery Mobile

R

- Really Simple Syndication (RSS)
  - leveraging / Leveraging RSS feeds
  - responsive images, forcing / Forcing responsive images
- Responsive Web Design (RWD)
  - about / Supporting the full range of device sizes – responsive web design
  - URL / Supporting the full range of device sizes – responsive web design
  - and text readability / Text readability and responsive design
  - smartphone-sized devices / Smartphone-sized devices
  - tablet-sized devices / Tablet-sized devices
  - desktop-sized devices / Desktop-sized devices
  - background images, cycling / Cycling background images
  - code / The final code
- RESS
  - about / Another responsive approach – RESS
- router / The events
- rules
  - URL / The rules of HarpJS

S

- Scoop

    - URL / Installing Node.js

- server
    - detecting on / Detecting on the server
- site
    - creating, requisites / What we need to create our site
- small business
    - significance / Getting our hands dirty with small businesses
- smartphone-sized devices / Smartphone-sized devices
- Splashscreen / Adobe PhoneGap versus Apache Cordova
- static map
    - URL / Google Static Maps
- Static Site Generators (SSG)
    - about / Static Site Generators
    - working / How do they work?
    - Harp server / The Harp server
- storage / Adobe PhoneGap versus Apache Cordova

T

- tablet-sized devices / Tablet-sized devices
- text
    - readability / Text readability and responsive design
- theme
    - URL / WordPress and jQuery Mobile
- ThemeRoller
    - URL / Creating a basic gallery using lightGallery
- theme switcher plugin
    - URL / Drupal and jQuery Mobile
- TypeKit

    - URL / Custom fonts

U

- uglify plugin
    - mangle option / Minification using grunt-contrib-uglify
    - compress option / Minification using grunt-contrib-uglify
    - beautify option / Minification using grunt-contrib-uglify
    - report option / Minification using grunt-contrib-uglify
    - banner option / Minification using grunt-contrib-uglify
    - footer option / Minification using grunt-contrib-uglify
    - URL / Minification using grunt-contrib-uglify
- ui-grid
    - URL / What we need to create our site
- user
    - getting, to mobile site / Getting the user to our mobile site
    - prompting, to install app / Prompting the user to install your app
- user, geolocation
    - location, picking / Picking a user's location
- User Experience (UX) / The game has changed
- User Experience (UX) tool / A taste of Balsamiq

V

- video
    - linking / Linking and embedding video
    - embedding / Linking and embedding video

W

- WAMP
    - URL / WURFL – server-side database-driven browser sniffing
- Web Audio API
    - about / Introduction to the Web Audio API

    - URL / Introduction to the Web Audio API

- Web SQL Database
    - URL / Browser-based databases (work in progress)
- Wireless Universal Resource File (WURFL)
    - URL / Detecting on the server
- WordPress
    - and jQuery Mobile / WordPress and jQuery Mobile
    - and Drupal templates / Updating your WordPress and Drupal templates
- World Wide Web Consortium (W3C) / Optimization - why you should be thinking of it first
- WURFL
    - URL / Another responsive approach – RESS, Browser sniffing versus feature detection, WURFL – server-side database-driven browser sniffing
    - about / Another responsive approach – RESS, WURFL – server-side database-driven browser sniffing

X

- XAMPP
    - URL / WURFL – server-side database-driven browser sniffing