To Bruce and Jack Allen for their love and support.
—Sarah Allen

To my loving wife, Tara, and my children Maggie, Grace, James, and Kathleen.
—Vidal Graupera
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Foreword

The year 2010 is an exciting time for those of us who have worked in and around the mobile industry since before the, now, decade-old 21st century. Some have referred to this year as “The Year of the Mobile Developer.” It’s true that, following the creation of frictionless paths to market through Apple’s App Store, Google’s Android Market, and the other handset or OS app stores, developers and brands alike are pursuing a market previously limited in reach. The options of distribution of applications until recently included carrier decks, handset portals, third-party channels such as Motricity, or even one’s own web site.

Carriers once dominated and controlled which applications were allowed to reach eager end users via their portals—picking winners and losers by the weight of their business development and testing processes. Distribution via carriers has been difficult and costly, requiring direct relationships with carriers. Each carrier required a new business development effort and a different set of requirements for OSes and handsets supported, along with a unique testing process. Handset portals also required major effort from business development and also required joining expensive developer programs. The third-party and web-site options for distribution were easier but required individual marketing effort by developers, and the process for users to install downloaded apps on their own was a barrier for widespread adoption. Until recently, these challenges in the business of mobile development limited experimentation and innovation by all but a few hardy souls or the largest brands with the budgets to support it. Enter Apple’s App Store.

The Apple App Store not only provided a path to market, but also, a dramatic change in marketing position for developers. Apple established the new industry standard with the “There’s an App for That” campaign. Suddenly, instead of choosing a device for its hardware specs, end users considered what they could do with a phone beyond make calls and send text messages. The value of a device, now, has become its ability to run lots of applications. The iPhone didn’t initially include an App Store. End users drove this innovation, as is often the case. Early adopters of the iPhone broke open the OS and began to extend it’s capabilities with apps, but Apple was quick enough to leverage the iTunes connection for delivering $.99 songs to delivering $.99 applications.

The app store trend didn’t and couldn’t have happened without the availability of more capable devices. Nokia punctuated the importance of a new class of handset commonly referred to as smartphones in 2007 by calling their advanced handsets “Multimedia Computers.” Smartphone as computers has become a more common analogy as smartphones grew in processing and storage capability. The steady increase of smartphone marketshare hit an inflection point in 2008 by crossing the magical 20% penetration rate in both the UK and the US. Historically, any technology mainstreams at the 20% penetration level, which has clearly been demonstrated by experience since 2008. According to Morgan Stanley analyst Mary Meeker, the rest of the world (ROW) will reach 20% smartphone penetration in 2012.

It is in this context of explosive growth in smartphone marketshare, a frictionless path to market through device and OS app stores, and a viable business model that the authors take us to the next step—cross-platform development. Cross-platform frameworks are still in the early
stages of technology evolution, but the timing is perfect for developers to add cross-platform frameworks to their tool box. This is especially true for web developers and those serving brands that benefit most from the tradeoffs between wide distribution and deep integration.

In Part 1, the authors provide a survey of the top development and distribution options consisting of mainly handset and OS vendors including the iPhone, Android, BlackBerry, and Windows Mobile. Part 2 follows by introducing emerging cross-platform solutions covering both proprietary and open source frameworks with an emphasis on building native applications. And finally in Part 3, the authors address techniques for using HTML to create a native look-and-feel for web applications and services.

A key thread throughout the book is recognition that mobile development is a business endeavor and opportunity. There is a presentation of how-to instructions and code samples that will be useful to those just getting started with mobile development, but the audience that will benefit most from the pragmatic vision of the authors are professional developers and agencies. Certainly, many web developers are pursuing mobile development because it’s a good decision to grow their business and if their clients aren’t already requesting mobile applications, they will soon.

The book isn’t targeted at developers of gaming apps. While gaming is a leading category for all app stores, it’s one of those categories that benefits most from deep integration into the OS or device. Cross-platform frameworks aren’t likely to be the best solution for games. Productivity apps, branded apps, and some communications services such as social networking apps will benefit from using the tools and techniques covered in the book.

Several of the tools presented in the book are currently leading this emerging category. We are in the early days of cross-platform use on mobile devices. Of the estimated 17 million software developers worldwide, according to Motorola as quoted in Forbes, around 4 million of them are developing for mobile. While Rhodes, Appcelerator, and PhoneGap have been used to deliver applications via the Apple App Store, the total number of developers using these frameworks is in the low six figures. Like the early days of the web, and to some extent, still, experimentation is vital to moving the ecosystem forward. This book is an important contribution to that effort.

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Introduction

Developing mobile applications can be tricky business. Mobile developers need to use platform-specific tools and APIs and write code in different languages on different platforms. It is often hard to understand what it takes to develop and distribute an application for a specific device without actually building one. Each platform has different processes and requirements for membership in developer programs and documentation for different parts of the development process are often scattered and hard to piece together. Therefore, we have divided the book into three main topics: Platform Development and Distribution, Cross-Platform Native Frameworks, and HTML Interfaces.

Part 1: Platform Development and Distribution

In Chapters 1–5, we provide an overview of four platforms: iOS, for building iPhone, iPad, and iPod Touch applications; the Android open source platform, created by Google; Research in Motion’s BlackBerry platform; and Windows Mobile from Microsoft. Each chapter follows the same outline:

- Building a Simple Hello World
- Running in the Simulator
- Adding a Browser Control
- Building for the Device
- Distribution Options and Requirements

This common outline allows for comparison across the operating systems and provides a feel for the patterns of the development process. If you decide to pursue native application development using only the vendor SDK, you will need a lot more details than any single chapter can provide, but this should provide the right amount of information to kick-off some experimentation or help make a decision about which platforms to pursue.

It is inevitable that developers create ways to share code across platforms when CPU power is fast enough and there is sufficient memory to support some kind of abstraction and demand fuels faster time to market. We saw this with cross-platform desktop frameworks that emerged in the 1990s, and now with cross-platform mobile frameworks.
Part 2: Cross-Platform Native Frameworks

Chapters 6–9 provide an overview and examples of applications written in three popular native frameworks. In categorizing as a “native framework,” we selected software that allows a common development approach across platforms but that build to an application that is indistinguishable by a user from one built with native code (as described in Part 1). Note that to build using these frameworks, you will still need the vendor SDK described in Part 1 and use vendor-specific techniques for code signing and distributions.

There are two chapters on the Rhomobile platform, one for the client-side Rhodes and one for the RhoSync server framework. Rhodes is covered in more depth than the other two platforms: Titanium Mobile and PhoneGap. Rhodes is at version 2 at this writing, Titanium v1.2 and PhoneGap 0.9. As with the rest of the book, these chapters are designed to provide a feel for what it is like to develop for each platform, to kick-start some experimentation, and aid in deciding what platform to spend more time with.

Part 3: HTML Interfaces

You can use the technique of adding a browser control in combination with the HTML and CSS patterns and frameworks presented in Chapters 10–14.

To develop a mobile application user interface, a mobile developer must typically learn a platform-specific language and SDK. This can become quite cumbersome if you need your application to run on more than one platform. Fortunately, there is an alternative; all smartphone platforms today include a browser control component (also known as a web view) that a developer can embed in their application that will allow them to write some or all of their app in HTML, CSS, and JavaScript.

Leveraging HTML and CSS for mobile application UI gets even better with the introduction of the mobile WebKit browser. WebKit is an open source browser engine originally created by Apple. WebKit introduces a partial implementation of HTML5 and CSS3 with full support for HTML4 and partial implementation CSS2. Note that as of this writing, HTML5 and CSS3 are still in “working draft;” however, these emerging standards have been aggressively adopted by multiple web browsers and the latest versions of WebKit-based browsers include most HTML5 and CSS3 features. The WebKit mobile browser is currently the native browser for iPhone/iPod Touch/iPad, Android, Palm, and many Symbian phones. BlackBerry plans to catch up with its own WebKit-based browser, recently demonstrated at Mobile World Congress in February 2010. Windows Mobile ships with an IE-based browser, which includes a better implementation of CSS1 and 2 compared with BlackBerry, but still has limitations. It is possible, though sometimes challenging, to build cross-platform UI in HTML and CSS that works across WebKit, mobile IE, and BlackBerry browsers. The most challenging part is differing levels of support for current HTML and CSS standards.