Extracted from:

Developing for Apple Watch, Second Edition

Create Native watchOS 2 Apps with the WatchKit SDK

This PDF file contains pages extracted from *Developing for Apple Watch, Second Edition*, published by the Pragmatic Bookshelf. For more information or to purchase a paperback or PDF copy, please visit http://www.pragprog.com.

Note: This extract contains some colored text (particularly in code listing). This is available only in online versions of the books. The printed versions are black and white. Pagination might vary between the online and printed versions; the content is otherwise identical.

The Pragmatic Bookshelf

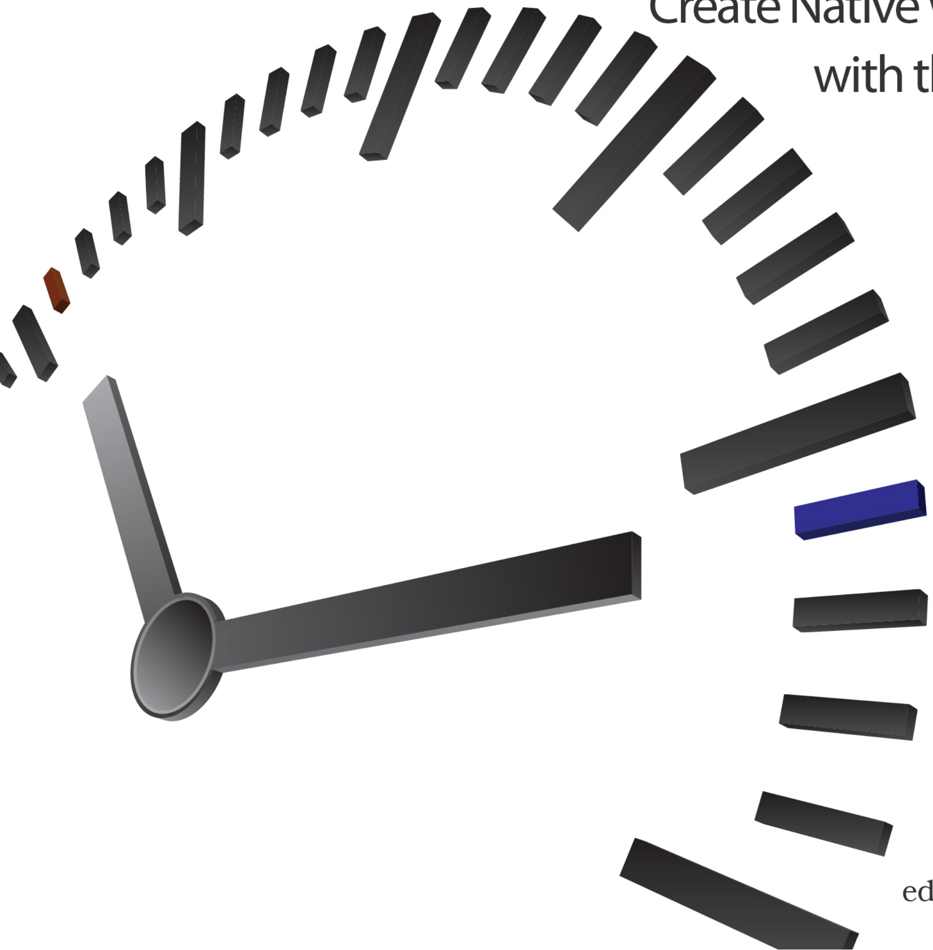
Dallas, Texas • Raleigh, North Carolina

The Pragmatic Programmers

Second Edition

Developing for Apple Watch

Create Native watchOS 2 Apps with the WatchKit SDK



Jeff Kelley

edited by Rebecca Gulick

Developing for Apple Watch, Second Edition

Create Native watchOS 2 Apps with the WatchKit SDK

Jeff Kelley

The Pragmatic Bookshelf

Dallas, Texas • Raleigh, North Carolina

Pragmatic Bookshelf

Every precaution was taken in the preparation of this book. However, the publisher assumes no responsibility for errors or omissions, or for damages that may result from the use of information (including program listings) contained herein.

Our Pragmatic courses, workshops, and other products can help you and your team create better software and have more fun. For more information, as well as the latest Pragmatic titles, please visit us at *https://pragprog.com*.

The team that produced this book includes:

Rebecca Gulick (editor)
Potomac Indexing, LLC (index)
Linda Recktenwald (copyedit)
Gilson Graphics (layout)
Janet Furlow (producer)

For customer support, please contact *support@pragprog.com*.

For international rights, please contact *rights@pragprog.com*.

Printed in the United States of America.
ISBN-13: 978-1-68050-133-9
Encoded using the finest acid-free high-entropy binary digits.
Book version: P1.0—May 2016

Preface

Apple Watch has inspired a brand-new platform, watchOS, for iOS developers—that's you!—to take advantage of. You're now competing not only for your users' iPhone screens but also for space on their wrists. For the first time, you can make an iOS app that your users will actually *wear*. As intimate as that is, you want to make sure you can deliver the best experience possible so your app will stay on those wrists. This book will help you make an app that not only stays on your users' wrists, but that they use every single time they look at their watch.

What's in This Book?

This book guides you through the process of creating an Apple Watch app. You'll learn about the kinds of apps you can make for the device, features available to you, and development paradigms you'll use as a watch app developer. By the end of this book, you'll be able to create engaging, full-featured apps for the watch that also interface with their companion iPhone apps, joining forces to create amazing experiences for your users. Here's a quick rundown of what you'll learn in each chapter:

Chapter 1: An Overview of Apple Watch In this chapter you'll learn the basics of the watch: what it can do, what apps on it are like, and how to decide which features of your iPhone app to bring along to your watch app.

Chapter 2: WatchKit Extension Overview A WatchKit extension is where your watch app code will live, and this chapter covers what WatchKit extensions are, how they relate to iPhone apps, and how to test them on real devices.

Chapter 3: WatchKit User Interfaces This chapter dives into the various user-interface (UI) elements available to you on Apple Watch. You'll learn what they are, how to use them, and the layout system that positions them onscreen. You'll also start *TapALap*, the example app we'll create together.

Chapter 4: Organizing Your UI with Groups Expanding on your understanding of the UI layout system that began in Chapter 3, this chapter shows you *groups*, a way to achieve even more complicated and appealing designs in your app.

Chapter 5: Delivering Dynamic Content with Tables This chapter introduces you to *tables*—interface objects you can use to display lists of content to your users. You'll learn how to create them, how to fill them with data, and how to respond to user interaction with them.

Chapter 6: Navigating Between Interfaces You'll compose your watch apps with many screens of content; therefore, a successful app needs to transition from one screen to another. This chapter shows you how, why, and when to move your app to new screens.

Chapter 7: WatchKit Extension Lifecycle At the heart of any watchOS 2 app is the WatchKit extension. In this chapter you'll learn about the proper care and feeding for a WatchKit extension to unlock powerful functionality and become a best-in-class watch app.

Chapter 8: Communicating with WatchConnectivity No app these days is complete without networking, so this chapter shows you how to send and receive data from outside your watch app. Whether you're talking to a server on the Internet or just to your companion iPhone app, you'll learn how to extend your app's reach beyond the wrist.

Chapter 9: Creating Complications with ClockKit Building a watch app that users launch is cool. You know what's cooler? Building an app that shows up on their watch face every time they so much as *look* at their watch. The extra features on the watch face are called *complications*, and this chapter will teach you how to make your own.

Chapter 10: Extending Complications with Time Travel Complications are a deep topic, so this chapter picks up where the previous one left off to cover time travel—showing information about the past and future—in your complications, as well as animations between them!

Chapter 11: Getting Personal with Sensor Data and HealthKit The Apple Watch includes a host of onboard sensors, and this chapter will teach you how to take advantage of them. We'll also use HealthKit to activate the heart rate monitor and use it to track a workout!

Chapter 12: Unlocking Watch App Performance The most useful watch app in the world with the cleanest, most amazing user interface is useless if it can't load before the watch screen deactivates. This chapter will show you all kinds of tips and tricks to maximize the performance of your app.

Chapter 13: Being a Good Watch App Citizen If there's one thing Apple Watch customers appreciate, it's attention to detail. This chapter will show you how to make a watch app that respects all users' physical and mental abilities, speaks to them in their native language, and uses the units of measure they're comfortable with. By doing that, you'll have achieved the final bit of spit and polish for an amazing watchOS app experience.

Who's This Book For?

Making an Apple Watch app, at least for now, means making an iPhone app to contain it. This book assumes some familiarity with making iPhone apps; you should know the basic concepts behind object-oriented programming and be able to follow along with code written in Swift for iOS. Many of the concepts in WatchKit are brand new to even the most experienced iOS developer, so don't worry; I'll explain the code we're writing as we go along.

If you've never made an iOS app before and want to make an amazing iPhone app to go along with your amazing Apple Watch app, the Pragmatic Bookshelf has your back with *iOS 9 SDK Development*.[1] If you're just starting out, I highly recommend reading that book in addition to this one; many of the skills you learn in one will transfer to the other.

The Code in This Book

The code in this book is 100% Swift. While it's still a young language, Swift is clearly the direction in which Apple wants to move, so rather than trying to do both Swift and Objective-C and succeeding at neither, I elected to do this all in one language. The aforementioned book is *also* in Swift, so it serves as a great introduction to iOS in general and Swift specifically.

Now, Swift is a language that's always changing, so it's possible that things will break as new versions of Xcode come out. Fortunately, as a registered Pragmatic Bookshelf customer, you're in luck! I'll be keeping the book up to date and you'll be notified whenever we release an update. As of this writing, the current version of Xcode is 7.2.1, targeting iOS 9.2 and watchOS 2.1. If that seems hilariously old to you, then it's pretty likely that the syntax of Swift has changed. Xcode has some support for bringing things forward into new versions, so try using it to help. If you get stuck, let us know on the book's forum or errata page. More on those next.

[1] https://pragprog.com/book/adios3/ios-9-sdk-development

Although a later chapter in this book will discuss localization and internationalization for watchOS apps, the majority of the content in this book is in English with units of measure and formatting to American norms. Readers in other countries may need to enter slightly different values in some cases—for instance, entering “0,35” instead of “0.35” for a value in Xcode.

Online Resources

The book’s website has links to an interactive discussion forum as well as a place to submit errata for the book.[2] You’ll also find links to download the source code for the sample app you’ll be working on as you read this book. If you’re reading this in ebook form, you’ll notice a box above code excerpts that you can click or tap to download the code directly.

Now that we’ve gotten these things out of the way, your tour through Apple Watch development can begin. Let’s start by discussing the device itself, its capabilities and limitations, and what kind of apps you’ll want to make for the watch.

[2] https://www.pragprog.com/titles/jkwatch2