Community Experience Distilled

KnockoutJS Web Development

Efficiently work with data, web templates, and custom HTML tags using KnockoutJS

John Farrar

[PACKT] PUBLISHING open source* community experience distilled

KnockoutJS Web Development

Efficiently work with data, web templates, and custom HTML tags using KnockoutJS

John Farrar

[PACKT] PUBLISHING open source community experience distilled

BIRMINGHAM - MUMBAI

KnockoutJS Web Development

Copyright © 2015 Packt Publishing

All rights reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, without the prior written permission of the publisher, except in the case of brief quotations embedded in critical articles or reviews.

Every effort has been made in the preparation of this book to ensure the accuracy of the information presented. However, the information contained in this book is sold without warranty, either express or implied. Neither the author, nor Packt Publishing, and its dealers and distributors will be held liable for any damages caused or alleged to be caused directly or indirectly by this book.

Packt Publishing has endeavored to provide trademark information about all of the companies and products mentioned in this book by the appropriate use of capitals. However, Packt Publishing cannot guarantee the accuracy of this information.

First published: February 2015

Production reference: 1210215

Published by Packt Publishing Ltd.
Livery Place
35 Livery Street
Birmingham B3 2PB, UK.

ISBN 978-1-78216-102-8

www.packtpub.com

Credits

Author
John Farrar

Reviewers
Paul Manzotti
Julia Rechkunova
Tatsuro Shibamura
Cristian Trifan
Saul Wiggin

Commissioning Editor
Mary Nadar

Acquisition Editor
Nikhil Karkal

Content Development Editor
Manasi Pandire

Technical Editor
Prajakta Mhatre

Copy Editors
Puja Lalwani
Vikrant Phadke
Laxmi Subramanian

Project Coordinator
Leena Purkait

Proofreaders
Simran Bhogal
Maria Gould
Paul Hindle
Chris Smith

Indexer
Mariammal Chettiyar

Production Coordinator
Manu Joseph

Cover Work
Manu Joseph

About the Author

John Farrar is a man who has a passion for pragmatic technology. He started working on computers in the late 70s and has watched the trends as closely as he watches the milestones. His work included programming on early computers, repairing military flight simulators in the navy, and working on web technology that helps people get business done. This work included building early commerce solutions for Apple, Brunswick Recreation, and Casio and working for a number of other companies along the letters of the alphabet. He is inspired and passionate about understanding the need before choosing the technology that answers the challenge.

Over the years, John has worked on a couple of books for ColdFusion, multiple open source projects from early Fusebox, community participation with jQuery, and some frameworks he created on his own. He has spoken at about a dozen conferences over the years and worked on supporting local and online users as time has permitted. He has provided technical training from online courses, in person class instructions, and a number of great intern programmers that let him share their entrance into the world of writing software.

I believe no man rises on his own strength and I appreciate the incredible number of friends in the community who give and share time and technology. Every place I have worked and every community that I spent time at has enriched and challenged me. Without you, my technology and understanding would be a fraction of what it is. Thanks for being part of my journey.

About the Reviewers

Paul Manzotti created his first website in 1995, running the newly released CERN httpd on a spare Silicon Graphics machine in the lab he was working in.

A decade of designing websites progressing into mild programming using Microsoft's ASP technology ended with him going back to university to gain an MSc in computer programming.

Then he came out fully armed as a programmer and started using ASP.NET with a lot of heavy JavaScript work; that's what single-page applications (SPA) are all about. And hence, when single-page applications became a thing, he was more than happy to dive into it.

He is a senior developer at Purple Bricks (`https://www.purplebricks.com/`).

Julia Rechkunova is a software engineer who is inspired by web development and design. She has over 4 years of experience and focuses on the quality and usability of web applications. She enjoys working as a frontend developer as well as a backend developer. Modern web technologies and tools are the best instruments that help her build great applications and make the world better. She graduated with a master's degree in computer science, started working as an HTML5 game developer, and then participated in start ups. She has a passion for frontend programming and contributes to open source projects. Currently, she works with technologies such as HTML5, CSS3, JavaScript, Node.js, and other popular frameworks. Julia also likes creating new tools that bring something different to the industry.

Tatsuro Shibamura is a Microsoft MVP of ASP.NET/IIS. He develops applications that use the Azure websites and ASP.NET MVC architecture in Japan. He has mainly used Knockout.js as a client-side technology. Thanks to that, it has received the advice to Akira Inoue's Microsoft Japan.

Cristian Trifan is a full-time developer based in Cluj-Napoca, Romania. He started developing ERP desktop applications in .NET about 10 years ago but switched to web development as he felt more attracted to Node.js and single page applications. As a pragmatic perfectionist, he's constantly seeking to improve himself. Apart from his job, he's also a contributor to the Knockout-Validation library.

He is currently working at Acunetix, building the frontend for their Online Vulnerability Scanner. It is a single page application that provides security scanning services to users who need to protect their web applications and perimeter networks. Its strong focus is on simplicity and usability while maintaining a high level of security in the system.

Saul Wiggin completed a PhD in transformation optics and metamaterials from the Department for Electronic Engineering and Computer Science at Queen Mary University of London. His thesis was on applications for transformation optics to engineering electromagnetic waves and optics. He worked with the QUEST platform grant. He presented his research at international conferences: META12 in Paris and EUCAP 2014 in Orlando Florida. His square Luneberg Lens was patented by BAE systems. Prior to this, he completed his master's at the University of Manchester in physics, where his final year project involved astrophysical simulations of Masers around late-type stars using Fortran and IDL, and he discovered evidence for the existence of a radio photosphere near to the stellar surface. His supervisors were Professor Clive Parini FRS, Professor Ian Youngs (DSTL), and Dr. Malcom Grey at the centre for astrophysics at the University of Manchester. He was funded partly by the EPRSC and partly by DSTL. He has written books on parallel programming in Haskell and worked on the open source project Ropensci, which led to a package being distributed on cran.

www.PacktPub.com

Support files, eBooks, discount offers, and more

For support files and downloads related to your book, please visit `www.PacktPub.com`.

Did you know that Packt offers eBook versions of every book published, with PDF and ePub files available? You can upgrade to the eBook version at `www.PacktPub.com` and as a print book customer, you are entitled to a discount on the eBook copy. Get in touch with us at `service@packtpub.com` for more details.

At `www.PacktPub.com`, you can also read a collection of free technical articles, sign up for a range of free newsletters and receive exclusive discounts and offers on Packt books and eBooks.

`https://www2.packtpub.com/books/subscription/packtlib`

Do you need instant solutions to your IT questions? PacktLib is Packt's online digital book library. Here, you can search, access, and read Packt's entire library of books.

Why subscribe?

- Fully searchable across every book published by Packt
- Copy and paste, print, and bookmark content
- On demand and accessible via a web browser

Free access for Packt account holders

If you have an account with Packt at `www.PacktPub.com`, you can use this to access PacktLib today and view 9 entirely free books. Simply use your login credentials for immediate access.

Table of Contents

Preface **1**

Chapter 1: Getting Started with KnockoutJS **5**

Installing KnockoutJS **5**
Looking at MVVM **6**
Binding DOM elements using Knockout **7**
Binding text 8
Binding HTML 9
Binding CSS 10
Binding numbers 10
Managing visibility 11
Multibound control 12
Power development using browser developer tools **13**
The Knockout debugger 15
Shortcuts 16
The DOM inspection 17
The AJAX inspection 17
The resource inspection 17
The device emulation 17
Using internal functions with Knockout **18**
Preventing hidden features 20
Automating calculations with Knockout **20**
Subtotal calculation 22
Tax time 23
Final total 25
Working with non-Knockout functions **26**
Summary **27**

Chapter 2: Using Arrays, Nesting, and Grids 29
Conditional binding 29
Introduction to arrays in Knockout 31
Working with array collections 33
Removing the last item 37
Sorting time 38
The simpleGrid plugin 41
Running the code 42
Final sort 47
Summary 49
Chapter 3: Giving Forms the Knockout Touch 51
Event binding 51
The binding markup 52
The binding checkbox with visibility 54
Modifier keys 55
Default actions 56
Preventing bubbling 57
The textInput binding 57
Dynamic focus 58
Radio and checkbox binding 62
Enhanced event integration 65
Select binding 66
Selecting elements with the object collections 68
Listing the management Knockout style 70
The uniqueName binding 72
Grid forms 72
Summary 75
Chapter 4: Coding – AJAX, Binding Properties, Mapping, and Utilities 77
JSON done Knockout style 78
Mapping – first look 81
Connecting with AJAX remotely 82
Unmapping your data 85
Merging mapped data 87
Mapping options 88
Utility functions 88
ko.utils.arrayFilter() 88
ko.utils.arrayFirst() 90
ko.utils.arrayMap() 91
ko.utils.arrayGetDistinctValues () 92

ko.utils.arrayForEach() 93
ko.utils.compareArrays() 94
Purifying our computations 95
Coding documents for computed observables 97
Form 1 97
Form 2 98
Form 3 98
Form 4 99
Using a computed observable 99
Using the computed context 99
Summary 100
Chapter 5: The Joy of Templates 101
Native templates 101
Enhanced collection handling 107
Render event handling 112
Third-party template options 114
Modified template handling with Underscore 116
Live updates and the subscribe method in Knockout 117
Awesome template options 121
Summary 124
Chapter 6: Packaged Elegance 127
Introduction to components 127
Dynamic component selection 130
Bring Your Own Tags (BYOT) 131
Enhancing attribute handling 131
Building your own libraries 133
Bootstrap component example 136
Understanding the AMD approach 138
Component-based SPAs 141
Best development strategies 142
Getting real 142
Coding time 144
Adding navigation 147
Adding pages 148
Time for some custom style 149
Bonus item 154
Building cross-page interaction 154
What next? 157
Summary 157
Index 159

Preface

Good tools make the Internet responsive and interactive and put its control in the hands of developers. The Knockout library is well-known because it is a pair of boxing gloves that work well in the ring! What jQuery did for JavaScript years ago, Knockout is doing for smart data management with the browser elements. With this library, you will find another way to enjoy building web technology, while building sites that end users will enjoy just as much. If you know the basics of JavaScript and HTML, this book will soon make you a champion.

What this book covers

Chapter 1, *Getting Started with KnockoutJS*, teaches you what Knockout is and why it is different. This chapter gets you coding and opens the door to a simpler and more powerful way of building web pages.

Chapter 2, *Using Arrays, Nesting, and Grids*, continues opening your mind to less code with more power. There is special coverage on dynamic sorting of data collections that will put power coding in the hands of newer developers.

Chapter 3, *Giving Forms the Knockout Touch*, demonstrates the use of Knockout to make our web forms easier and fun to build. This covers both simple and grid-based forms.

Chapter 4, *Coding – AJAX, Binding Properties, Mapping, and Utilities*, proves that Knockout is not just a stand-alone solution. It is a technology that connects and simplifies our interaction, and it has a number of awesome plugins that will make you eager to use it in your projects.

Chapter 5, *The Joy of Templates*, covers native templates, enhanced collection handling, render events, third-party templates, and a few more template options.

Chapter 6, *Packaged Elegance*, takes you into the future of web development. This chapter covers present-day use of custom components in all popular browsers. We will use this opportunity to cover another way of building a simplified and powerful SPA, single-page applications, and solutions.

What you need for this book

First, you will need a computer with a web server. The examples will run on any common server, so a special server-side language is not required. You will need a text editor, and if you want to use the exercise files, you will need to be able to decompress a ZIP file. There is a built-in provision for this in most modern computers. Finally, you will need a browser to view your work.

Who this book is for

This book is for web developers or web designers who work with HTML and wants to gain knowledge while making things simple. This will show you how to automate, with some simple markup, the interaction between your data and the visual side of the browser. If you are looking to get the best experience with cleaner and more sustainable code, this book will serve you well.

Conventions

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

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 will need to use the `push` method of our bound array collection to add this."

A block of code is set as follows:

```
<button data-bind="click: sort('name')">Sort By Name</button>
<button data-bind="click: sort('item')">Sort By Item</button>
```

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

```
this.orderVM = new ko.simpleGrid.viewModel({
data: this.orders,
columns: [
```

```
{ headerText: "Customer", rowText: "name"},
{ headerText: "Item", rowText: "item"},
{ headerText: "Count", rowText: "qty"}
],
pageSize: 3
});
```

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

```
> pagedOrderModel.orders()
```

New terms and **important words** are shown in bold. Words that you see on the screen, for example, in menus or dialog boxes, appear in the text like this: "Click on the **Add Staff** button."

Warnings or important notes appear in a box like this.

Tips and tricks appear like this.

Reader feedback

Feedback from our readers is always welcome. Let us know what you think about this book—what you liked or disliked. Reader feedback is important for us as it helps us develop titles that you will really get the most out of.

To send us general feedback, simply e-mail `feedback@packtpub.com`, and mention the book's title in the subject of your message.

If there is a topic that you have expertise in and you are interested in either writing or contributing to a book, see our author guide at `www.packtpub.com/authors`.

Customer support

Now that you are the proud owner of a Packt book, we have a number of things to help you to get the most from your purchase.

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.

Errata

Although we have taken every care to ensure the accuracy of our content, mistakes do happen. If you find a mistake in one of our books—maybe a mistake in the text or the code—we would be grateful if you could report this to us. By doing so, you can save other readers from frustration and help us improve subsequent versions of this book. If you find any errata, please report them by visiting `http://www.packtpub.com/submit-errata`, selecting your book, clicking on the **Errata Submission Form** link, and entering the details of your errata. Once your errata are verified, your submission will be accepted and the errata will be uploaded to our website or added to any list of existing errata under the Errata section of that title.

To view the previously submitted errata, go to `https://www.packtpub.com/books/content/support` and enter the name of the book in the search field. The required information will appear under the **Errata** section.

Piracy

Piracy of copyrighted material on the Internet is an ongoing problem across all media. At Packt, we take the protection of our copyright and licenses very seriously. If you come across any illegal copies of our works in any form on the Internet, please provide us with the location address or website name immediately so that we can pursue a remedy.

Please contact us at `copyright@packtpub.com` with a link to the suspected pirated material.

We appreciate your help in protecting our authors and our ability to bring you valuable content.

Questions

If you have a problem with any aspect of this book, you can contact us at `questions@packtpub.com`, and we will do our best to address the problem.

1
Getting Started with KnockoutJS

Welcome to the power and wonder of the world of KnockoutJS. In this chapter, we will start down the road to win with AJAX HTML applications AJAX HTML applications. This chapter will focus on:

- Installing KnockoutJS
- Understanding what MVVM means
- Binding elements with the Knockout library
- Accelerating and simplifying coding using developer tools in modern browsers
- Creating functions for consumption with Knockout
- Automating the computing of values directly with Knockout
- Working with functions outside of Knockout

Installing KnockoutJS

First, make sure you have a working website set up on a server. It can be as simple as plain old HTML if you only want to learn those features or any of the productive web platforms out there (ASP.NET, ColdFusion/Railo, NodeJS, PHP, Python, Ruby, and so on); just make sure the service is running before installing Knockout. However, there is one exception. If you are using Knockout for an HTML application like PhoneGap or something along those lines, then you do not need a web server for internal functionality.