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# Backbone.js Essentials

Build amazing high-performance web applications  
using Backbone.js

**Jeremy Walker**

**[PACKT]** open source\*  
PUBLISHING community experience distilled



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BIRMINGHAM - MUMBAI



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In his free time, Jeremy enjoys reading, playing old computer games, and answering questions on Stack Overflow. If the weather is nice, he can often be found hiking or just lying on the beach in neighboring Santa Cruz. Jeremy is also the author of two programming libraries: Underscore Grease and BackSupport, and he is an active proponent of all things Backbone-related.



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He has also worked on the following books:

- Backbone Blueprints (<http://k33g.github.io/2014/07/29/BBBLUEPRINT.html>)
- Node.js Blueprints (<http://k33g.github.io/2014/07/22/NODEJSBLUEPRINT.html>)
- Backbone Patterns & Best Practices (<http://k33g.github.io/2014/02/28/BBPRACTICES.html>)
- Mastering Grunt

**Peter deHaan** likes Grunt a lot and thinks it's the best thing to happen to Node.js since npm. You can follow his Grunt npm-twitter-bot feed at [@gruntweekly](https://twitter.com/gruntweekly).



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- *Cake PHP 1.3 Application Cookbook*
- *Drupal 7 Business Solutions*
- *Drupal 7 Webforms Cookbook*

Manning books:

- *Fast Asp.net*
- *The Responsive Web* (Published 10/30/2014)
- *Clojure in Action, 2nd edition, 2nd Review now ()*
- *F# Deep Dives* (December 2014)

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I would like to thank my girlfriend Dawn for putting up with the long evenings

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He has developed front-end web applications using Javascript libraries and frameworks such as OpenLayers and Backbone. He has also developed a lot of back-end web services with Spring and Hibernate.

At work, he advocates software quality and clean code practices. After 4 years as a GIS engineer at Worldline, he moved to the position of Quality and Tests Support Engineer in the same company. He provides support to his colleagues with respect to software testing and good programming practices.

He is also a great partisan of the open source philosophy and likes to contribute to such projects.



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# Table of Contents

<b>Preface</b>	<b>vii</b>
<b>Chapter 1: Building a Single-Page Site Using Backbone</b>	<b>1</b>
What is Backbone?	1
Why choose Backbone?	2
A Brief History of Web Development	2
Benefits of Backbone and single-page applications	4
Full User Interface Asset Control	4
Simpler Data Management and Event Triggers	5
Enhanced performance	5
Backbone and Its Competitors	6
Summary	7
<b>Chapter 2: Object-Oriented JavaScript with Backbone Classes</b>	<b>9</b>
JavaScript's class system	9
The new keyword	10
Prototypal inheritance	11
Extending Backbone classes	14
Applying parent methods	15
Introducing Underscore	17
More Underscore	19
Each, Map, and Reduce	19
Extend and defaults	21
Pluck and invoke	22
Further reading	23
Summary	23
<b>Chapter 3: Accessing Server Data with Models</b>	<b>25</b>
The purpose of Models	25
Attributes, options, and properties	26



<b>Getters and setters</b>	<b>28</b>
<b>Listening for events</b>	<b>30</b>
<b>Available events</b>	<b>31</b>
Custom events	32
<b>Server-side actions</b>	<b>32</b>
Storing URLs on the client	34
Identification	34
Fetching data from the server	36
Saving data to the server	37
Validation	39
<b>Return of Underscore</b>	<b>40</b>
<b>Summary</b>	<b>41</b>
<b>Chapter 4: Organizing Models with Collections</b>	<b>43</b>
<b>Working with Collections</b>	<b>43</b>
<b>Collections and Models</b>	<b>44</b>
<b>Adding to and resetting Collections</b>	<b>45</b>
<b>Indexing</b>	<b>46</b>
<b>Sorting</b>	<b>47</b>
<b>Events</b>	<b>48</b>
<b>Server-side actions</b>	<b>49</b>
<b>Underscore methods</b>	<b>49</b>
<b>Previously mentioned methods</b>	<b>51</b>
<b>Testing methods</b>	<b>51</b>
<b>Extraction methods</b>	<b>52</b>
<b>Ordering methods</b>	<b>53</b>
<b>Summary</b>	<b>54</b>
<b>Chapter 5: Adding and Modifying Elements with Views</b>	<b>55</b>
<b>Views are the core of Backbone-powered sites</b>	<b>55</b>
Instantiating Views	56
Rendering view content	57
Connecting Views to Models and Collections	58
Accessing a View's el element	58
A brief aside on \$Variable names	59
<b>Handling events</b>	<b>59</b>
<b>Rendering strategies</b>	<b>61</b>
Simple templating	61
Advanced templating	62
Logic-based	63
The combined approach	64



Other render considerations	65
Child views	65
Repeatable versus one-time renders	66
Return value – this or this.\$el	67
<b>Summary</b>	<b>68</b>
<b>Chapter 6: Creating Client-side Pages with Routers</b>	<b>69</b>
<b>Backbone routers enable single-page applications</b>	<b>69</b>
<b>How Routers work</b>	<b>70</b>
<b>Backbone.history</b>	<b>71</b>
<b>Differences between routes and pages</b>	<b>71</b>
<b>Creating a new Router</b>	<b>72</b>
<b>Creating routes</b>	<b>72</b>
<b>Route styles</b>	<b>74</b>
<b>A note about routing conflicts</b>	<b>77</b>
<b>Trailing slashes</b>	<b>77</b>
<b>Redirects</b>	<b>78</b>
<b>404s and other errors</b>	<b>79</b>
<b>Routing events</b>	<b>79</b>
<b>Multiple routers</b>	<b>80</b>
<b>Page views</b>	<b>81</b>
<b>Summary</b>	<b>83</b>
<b>Chapter 7: Fitting Square Pegs in Round Holes – Advanced Backbone Techniques</b>	<b>85</b>
<b>Taking it up a notch</b>	<b>85</b>
<b>Methods in place of properties</b>	<b>86</b>
Collection.model as a factory method	87
<b>Overriding a class constructor</b>	<b>87</b>
<b>Class mixins</b>	<b>88</b>
<b>Publish/subscribe</b>	<b>91</b>
<b>Wrapping widgets of other libraries</b>	<b>93</b>
<b>Summary</b>	<b>95</b>
<b>Chapter 8: Scaling Up – Ensuring Performance in Complex Applications</b>	<b>97</b>
<b>Backbone and performance</b>	<b>97</b>
<b>Causes of performance issues</b>	<b>98</b>
<b>CPU-related performance issues</b>	<b>99</b>
<b>Event delegation</b>	<b>99</b>
<b>Bandwidth-related performance issues</b>	<b>100</b>
Downloading excessively large files	101
Downloading excessive number of files	101



<b>Memory-related performance issues</b>	<b>103</b>
<b>Summary</b>	<b>105</b>
<b>Chapter 9: What Was I Thinking? Documenting Backbone Code</b>	<b>107</b>
<b>Backbone and documentation</b>	<b>107</b>
<b>Documentation approaches</b>	<b>108</b>
<b>The non-documentation approach</b>	<b>108</b>
Benefits of non-documentation for other approaches	111
<b>The simple documentation approach</b>	<b>111</b>
<b>The robust documentation approach</b>	<b>112</b>
JSDoc	113
Docco	116
<b>Summary</b>	<b>118</b>
<b>Chapter 10: Keeping the Bugs Out – How to Test a Backbone Application</b>	<b>119</b>
<b>Testing in JavaScript?</b>	<b>119</b>
<b>Which library to use</b>	<b>120</b>
<b>Getting started with Mocha</b>	<b>121</b>
TDD versus BDD: What's the difference?	122
Describe, beforeEach, and it	124
Running our test	125
<b>Introducing mocks</b>	<b>126</b>
<b>Selenium</b>	<b>128</b>
<b>Summary</b>	<b>130</b>
<b>Chapter 11: (Not) Re-Inventing the Wheel – Utilizing Third-Party Libraries</b>	<b>131</b>
<b>The Backbone ecosystem</b>	<b>131</b>
<b>Dependency management with RequireJS</b>	<b>132</b>
<b>External dependency management with Bower</b>	<b>134</b>
<b>Paginating with Backbone Paginator</b>	<b>135</b>
<b>Rendering tables with Backgrid.js</b>	<b>136</b>
<b>Templating with Handlebars</b>	<b>137</b>
<b>Automating tasks with Grunt</b>	<b>139</b>
<b>New syntax with CoffeeScript</b>	<b>140</b>
<b>Making life easier with BackSupport</b>	<b>141</b>
<b>Summary</b>	<b>142</b>



<b>Chapter 12: Summary and Further Reading</b>	<b>143</b>
<b>Putting it all together</b>	<b>143</b>
<b>What's Syapse?</b>	<b>144</b>
The 10,000-foot view	145
The View layer	145
The Data layer	146
The Support layer	147
<b>Building your own Syapse</b>	<b>148</b>
<b>Further reading</b>	<b>148</b>
<b>Summary</b>	<b>150</b>
<b>Index</b>	<b>151</b>

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# Preface

We JavaScript developers live in exciting times. Every month we're presented with an incredible new browser feature, open source library, or software methodology that promises to vastly improve on whatever came before it. And then, just as soon as one new technology arrives, another almost inevitably follows it, promising still further innovation.

Amid this ever-changing landscape of new technologies only a very few libraries manage to stay not just relevant but essential over a long period of time, despite having newer challengers. For many web programmers jQuery was the first such library, but in recent years another library has proven itself to be similarly indispensable. That library is Backbone.

Backbone offers developers a wide range of foundational pieces from which they can build any manner of web application. From its simple yet flexible class system, to its event-based and AJAX-simplifying data containers, to its DOM manipulation and single-page user-facing components, Backbone provides everything needed to form the underlying framework of a site.

However, at first Backbone's incredible power and flexibility can be intimidating. When faced with over a hundred different methods spread across four base classes it can be challenging for a new Backbone developer to determine which ones to use and when. In addition, while Backbone is very "opinionated" about its core functions, it takes a deliberately agnostic approach to just about everything else. This allows developers to choose the perfect approach for their application, but at the same time all those choices can be daunting to someone unfamiliar with Backbone.

In this book we offer two things, both drawn from years of experience using Backbone to create and maintain a real-world web-based application. First, we will provide you with an understanding of all of Backbone's essentials. By the time you complete this book, you will have learned everything you need to create powerful and maintainable web applications using Backbone.



But at the same time, in addition to just explaining Backbone itself, we'll also explain the wider, "meta" level of Backbone programming. From advice on how to implement important details of your classes, to examinations of how Backbone can be made even more powerful when connected to the larger JavaScript ecosystem, we have endeavored to not only show how to use Backbone, but how to use it well.

Welcome to Backbone Essentials.

## What this book covers

*Chapter 1, Building a Single-Page Site Using Backbone*, introduces Backbone and explains why it is such a popular choice of framework

*Chapter 2, Object-Oriented JavaScript with Backbone Classes*, details Backbone's class system, a significant improvement over JavaScript's native system

*Chapter 3, Accessing Server Data with Models*, begins our exploration of Backbone's data management, event listening, and AJAX capabilities with Backbone's Model class

*Chapter 4, Organizing Models with Collections*, continues our exploration of Backbone's data management capabilities, only this time using multiple data sets with the Collection class

*Chapter 5, Adding and Modifying Elements with Views*, examines Backbone's DOM rendering and event-handling View class

*Chapter 6, Creating Client-side Pages with Routers*, introduces the heart of Backbone's single-page architecture, the Router class

*Chapter 7, Fitting Square Pegs in Round Holes – Advanced Backbone Techniques*, explores advanced Backbone patterns for solving tricky problems

*Chapter 8, Scaling Up – Ensuring Performance in Complex Applications*, looks at the causes of performance issues in Backbone applications, and how to prevent them

*Chapter 9, What Was I Thinking? Documenting Backbone Code*, considers different strategies for documenting your application, including JSDoc and Docco

*Chapter 10, Keeping the Bugs Out – How to Test a Backbone Application*, recommends best practices for testing a Backbone application, with examples from the Mocha and Sinon libraries



*Chapter 11, (Not) Re-Inventing the Wheel – Utilizing Third-Party Libraries*, previews a variety of 3rd party libraries, some Backbone-specific and some not, which can benefit a Backbone application

*Chapter 12, Summary and Further Reading*, looks back on the topics previously discussed and considers their application in the real world

## What you need for this book

As a web-based technology book, Backbone Essentials requires very little, only some form of text editor and web browser. Backbone itself is compatible with almost all browsers, including Internet Explorer 7 and up, though a modern web browser is recommended. Similarly, while you *can* write Backbone code using a plain text editor, we recommend instead using a modern IDE such as Sublime, Eclipse, or WebStorm, as it can provide many useful features to aid development.

Of course to use Backbone you'll need to download (and include in your HTML) the library itself, which can be found at <http://www.backbonejs.com>. In addition, you'll also need to download Backbone's two dependencies: jQuery (<http://www.jquery.com>) and Underscore (<http://www.underscorejs.org/>). Technically only Underscore is required, but you'll want jQuery also to be able to take advantage of Backbone's View class.

Once you have an editor, browser, and all three libraries downloaded and included in your HTML, you're ready to get started using Backbone.

## Who this book is for

This book is geared towards readers with a basic understanding of JavaScript and HTML and at least some familiarity with the jQuery library. While this book does not require any formal computer science knowledge, it does employ industry terms such as "reference" or "inheritance system" which may be unfamiliar to readers without at least some programming background.

If you are unfamiliar with jQuery, we recommend that you first read Packt's excellent *Learning jQuery*, by Jonathan Chaffer, before starting this book. If you are completely new to web development, you would be better served by first familiarizing yourself with JavaScript through one of the many excellent free tutorials available on the web.