Community Experience Distilled

Backbone.js Patterns and Best Practices

A one-stop guide to best practices and design patterns when building applications using Backbone.js

Swarnendu De

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BIRMINGHAM - MUMBAI

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Dedicated to my parents.

All the good that happened in my life happened because of your example, guidance, and love!

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Preface

Though Backbone.js provides a structure for JavaScript applications, developers need to take care of most of the design patterns and best practices themselves. Over the years, my JavaScript development team and I worked on multiple Backbone.js applications ranging from simple to extremely complex. We experienced different types of problems related to layout management, project architecture, modular development, and so on. Before I started writing this book, I spent a significant amount of time trying to figure out solutions for all the common problems associated with the development of Backbone.js applications. In this book, I have documented all my findings in detail.

Whether you are an intermediate- or advanced-level Backbone.js developer, this book will guide you through the best practices and patterns to handle different issues with each Backbone component. Whether this is by using your own solution or an existing Backbone plugin, you will get a clear idea of the best way to resolve any problem.

Instead of developing a single application spanning all the chapters, a simple and complete example on each topic is provided separately throughout this book. This is because it would be quite difficult to implement all the tips and patterns given in this book in a single application. Moreover, we preferred to provide immediate and compact solutions to problems, instead of including all the problems and solutions in a single large application. Within a short span, this book tries to cover all the important points you may need for the development of your Backbone.js application.

What this book covers

Chapter 1, *Reducing Boilerplate with Plugin Development*, starts with the basics of why reusing your code is important, and how we can achieve that by creating custom Backbone.js widgets and mixins.

Chapter 2, *Working with Views*, discusses the different points related to view rendering and layout management. Starting from partial updating of views, functionality of nested views or subviews for different processes of JavaScript template management and best practices, this chapter covers most of the problems a developer may face while working with views. We conclude by writing about the Marionette custom views and the Layout Manager plugin for complex app layout management.

Chapter 3, *Working with Models*, talks about different patterns while working with Backbone models, including data validation, model serialization to fetch data, and saving data to the server. We also analyze the relational data model for one-to-many and many-to-many relationships using Backbone's relational plugin.

Chapter 4, *Working with Collections*, covers a number of common problems that developers face while using Backbone collections. We explain how to apply basic and multiple sorting, how to apply filtering to a collection, and how to manage a collection while a mixed set of data is passed from the server.

Chapter 5, *Routing Best Practices and Subrouting*, covers a number of best practices you should follow while working with routers. We also discuss the benefits of using multiple routers or subrouters for complex and large-level applications.

Chapter 6, *Working with Events, Sync, and Storage*, begins by describing the importance of custom events to enhance an application's modularity and reusability. We also discuss using an application-level event manager to work as a centralized PubSub system, and the use of the `Backbone.sync()` method to create different data-persistent strategies.

Chapter 7, *Organizing Backbone Applications – Structure, Optimize, and Deploy*, is one of the most important chapters that a developer will find very useful if they are developing a complex Backbone application. It talks about the application directory structure, organizing and managing files with RequireJS, and the different architectural patterns that every JavaScript developer should follow to develop large-scale application architectures.

Chapter 8, *Unit Test, Stub, Spy, and Mock Your App*, talks about the benefits of unit testing your JavaScript application, and introduces you to the QUnit and SinonJS test frameworks.

Appendix A, *Books, Tutorials, and References*, lists a number of useful Backbone.js resources that you may find helpful.

Appendix B, *Precompiling Templates on the Server Side*, describes the benefits of precompiling JavaScript templates at server side with examples.

Appendix C, *Organizing Templates with AMD and Require.js*, discusses the process of storing and organizing JavaScript templates with the RequireJS, text!, and tpl! plugins.

What you need for this book

Most of the code in this book can be opened in a simple text editor (Notepad++ or Sublime Text). To run the code, you can use any web browser. For some code, you may need a local server (Apache or IIS) to be set up. For Node.js-related functionality, you need to set up a Node.js server.

Who this book is for

This book is for any developers who has a basic knowledge of Backbone.js and is looking for solutions to common Backbone.js problems, looking to enforce reusability in their code by removing boilerplate and developing custom plugins and extensions, and hoping to use the most effective patterns to develop large-scale web application architecture.

This book is not a general introduction to Backbone.js or JavaScript design patterns. There are lots of books, tutorials, and screencasts available that cover a general introduction in great detail. While this book will discuss the basics of the Backbone.js components in each chapter, the main priority will be to provide you with the concepts of developing a robust, high quality, and flexible code base.

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 can include other contexts through the use of the `include` directive."

A block of code is set as follows:

```
var MainView = Backbone.View.extend({
  el : '#main',
  render : function(){
    this.$el.html(new BaseView().render().el);
  }
});
```

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

```
var BaseView = Backbone.View.extend({
  template : '<h1><%= name %></h1>',
  render : function(){
    var html = _.template(this.template, {
      name : 'Swarnendu De'
    });
    this.$el.html(html);
    return this;
  }
});
```

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: "clicking on the **Next** button moves you to the next screen".

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Tips and tricks appear like this.

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1
Reducing Boilerplate with Plugin Development

> *"When working on a web application that involves a lot of JavaScript, one of the first things you learn is to stop tying your data to the DOM. It's all too easy to create JavaScript applications that end up as tangled piles of jQuery selectors and callbacks, all trying frantically to keep data in sync between the HTML UI, your JavaScript logic, and the database on your server. For rich client-side applications, a more structured approach is often helpful."*

The previous excerpt from `http://backbonejs.org` precisely specifies the problem that Backbone.js solves. Backbone.js provides a way to simplify the JavaScript application structure, which was clearly a nightmare, even a few years ago. Today, we have moved a long way from tightly coupled jQuery-based applications to heavy frontend applications, and a major portion of the application logic now relies on the UI part. This means organizing the application structure is now one of the most significant aspects of application development, and should take care of the reusability, modularity, and testability of the components of an application.

Being an extremely lightweight library, Backbone.js, along with the utility library Underscore.js, provides a set of tools that help to organize your code and makes it easier to develop single-page web applications. Backbone delivers a minimalistic solution to separate the concerns of your application; features include RESTful operations, persistent strategies, models, views with logic, event-driven component communication, templating, and routing facilities. Its simplistic nature, excellent documentation, and a large community of developers make it easy to learn how to use this library.

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