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SECOND EDITION



# Professional WordPress<sup>®</sup>

*Design and Development*

Brad Williams, David Damstra, Hal Stern



# PROFESSIONAL WORDPRESS®: DESIGN AND DEVELOPMENT, SECOND EDITION

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PROFESSIONAL

**WordPress®**



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**WordPress®**

DESIGN AND DEVELOPMENT

**Second Edition**

Brad Williams  
David Damstra  
Hal Stern



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*For my wife, my partner, my best friend April Williams. You'll never know how much you mean to me. Thank you for putting up with my nerdy ways and always supporting me.*

—BRAD WILLIAMS

*For my loving wife Holly, my children - Jack, Justin and Jonah. Thanks for your love and support.*

—DAVID DAMSTRA

*For Toby, whose patience grows with each project.*

—HAL STERN

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—BRAD WILLIAMS

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# INTRODUCTION

**DEAR READER,** Thank you for picking up this book. WordPress is the most popular self-hosted website software in use today. It is available as an open source project, licensed under the GPL, and is built largely on top of the MySQL database and PHP programming language. Any server environment that supports that simple combination can run WordPress, making it remarkably portable as well as simple to install and operate. You don't need to be a systems administrator, developer, HTML expert, or design aesthete to use WordPress.

On the other hand, because WordPress has been developed using a powerful set of Internet standard platforms, it can be extended and tailored for a wide variety of applications. WordPress is the publishing mechanism underneath thousands of individual blog voices and the engine that powers high-volume, high-profile sites such as CNN's websites and blogs. It was designed for anyone comfortable navigating a browser, but is accessible to web designers and developers as well. Given this range of applications and capabilities, it can prove hard to know where to start if you want to make use of the power of WordPress for your specific purposes. Should you first study the database models and relationships of content and metadata, or the presentation mechanics that generate the HTML output?

This book was designed for readers to develop a knowledge of WordPress from the inside out, focusing on the internal structure and flow of the core code as well as the data model on which that code operates. Knowing how something works often makes you more adept at working with it, extending it, or fixing it when it breaks. Just as a race car driver benefits from a fundamental knowledge of combustion engines, aerodynamics, and the mechanics of automobile suspension, someone driving WordPress through its full dynamic range will be significantly more adept once acquainted with the underlying software physics.

## WHO THIS BOOK IS FOR

It was the dichotomy between the almost trivial effort required to create a WordPress-based website and publish a "first post" to the world and the much more detailed, broad understanding required to effect mass customization that led us to write this book. Many books on the market provide guidance to beginning bloggers by walking you through the typical functions of creating, configuring, and caring for your WordPress site. Our goal was to bridge the gap between an expert PHP developer who is comfortable reading the WordPress Codex in lieu of a manual and the casual WordPress user creating a public persona integrated with social networking sites and advertising services, with a tailored look and feel.

In short, we hope to appeal to a range of developers, from the person looking to fine-tune a WordPress theme to a more advanced developer with a plugin concept or who is using WordPress in a large enterprise integrated into a content management system. We do this by exploring WordPress from the inside out. Our goal for this book is to describe the basic operation of a function, and

then offer guidance and examples that highlight how to take it apart and reassemble that function to fit a number of needs. WordPress users who are not hardened PHP developers may want to skim through the developer-centric section, whereas coders looking for specific patterns to implement new WordPress functionality can start in the middle and work toward the end.

## WHAT THIS BOOK COVERS

This book is divided into three major sections: Chapters 1 through 4 are an overview of the WordPress system, its major functional elements, and a top-level description of what happens when a WordPress-generated web page is displayed. Chapters 5 through 9 build on this foundation and dive into the core of WordPress, describing internal code flow and data structures. This middle section is strongly developer-oriented, and describes how to extend WordPress through plugins and customize it via themes. The last section, Chapters 10 through 16, combines a developer view of user experience and optimization with the deployer requirements for performance, security, and enterprise integration.

## HOW THIS BOOK IS STRUCTURED

The following is a detailed chapter-by-chapter overview of what you can expect to find in this book.

**Chapter 1, “First Post,”** contains a brief summary of the history of the WordPress software core, explores some popular hosting options, why community matters in a content-centric world, and concludes with the basics of do-it-yourself WordPress installation and debugging.

**Chapter 2, “Code Overview,”** starts with the mechanics of downloading the WordPress distribution and describes its basic contents and filesystem layout. A top-to-bottom code flow walks you from an index or specific post URL, through the process of selecting posts, assembling content, and generating the displayed HTML. This chapter is a map for the more detailed code tours in the developer-focused section.

**Chapter 3, “Working with WordPress Locally,”** covers the many benefits to working with WordPress on your local computer. This chapter also reviews the various setups for local development on a Microsoft Windows or Apple OSX computer. Finally you’ll cover how to deploy your local changes to a remote server using various deployment methods.

**Chapter 4, “Tour of the Core,”** examines the essential PHP functions comprising the basic WordPress engine. It serves as an introduction to the developer-focused middle section of the book and also lays the foundation for the deployment-, integration-, and experience-focused chapters in the last section. This chapter also covers using the core as a reference guide, and why it is best not to hack the core code to achieve desired customizations.

**Chapter 5, “The Loop,”** is the basis for the developer-centric core of this book. The WordPress main loop drives the functions of creating and storing content in the MySQL database, as well as extracting appropriate chunks of it to be sorted, decorated, and nested under banners or next to sidebars, in



both cases generating something a web browser consumes. This chapter disassembles those processes of creating, saving, and publishing a new post as well as displaying content that has been stored in the WordPress MySQL databases. The underlying database functions and the management of content metadata are covered in more detail to complete a thorough view of WordPress' internal operation.

**Chapter 6, "Data Management,"** is the MySQL-based counterpart to Chapter 5. The core functions create, update, and manipulate entries in multiple MySQL database tables, and this chapter covers the database schema, data and metadata taxonomies used, and the basic relations that exist between WordPress elements. It also includes an overview of the basic query functions used to select and extract content from MySQL, forming a basis for extensions and custom code that needs to be able to examine the individual data underlying a WordPress site.

**Chapter 7, "Custom Post Types, Custom Taxonomies, and Metadata,"** explores the different types of content and associated data in WordPress. You'll cover how to register and work with custom post types for creating custom content in WordPress. Custom taxonomies are also dissected, diving into the various setups with examples. Finally you'll cover post metadata, and the proper ways to store arbitrary data against posts in WordPress.

**Chapter 8, "Plugin Development,"** starts with the basic plugin architecture and then explores the hook, action, and filter interfaces that integrate new functionality around the WordPress core. This chapter demonstrates the interposition of functions into the page composition or content management streams and how to save plugin data. Examples of building a plugin using a simple framework outline the necessary functionality of any plugin. This chapter also covers creation of widgets, simpler-to-use plugins that typically add decoration, additional images, or content to a sidebar; many plugins also have a widget for easier management. Publishing a plugin to the WordPress repository and pitfalls of plugin conflict round out the discussion of WordPress' functional extensions.

**Chapter 9, "Theme Development,"** is the display and rendering counterpart to Chapter 8. Plugins add new features and functions to the core, whereas themes, CSS and page templates change the way that content is shown to readers. Starting with a basic theme, this chapter covers writing a theme, building custom page templates, menu management, widget areas, post formats, theme installation, and how thematic elements are used by the functions described in previous chapters. This chapter ends the deep developer-focused middle section of the book.

**Chapter 10, "Multisite,"** explores the popular Multisite feature of WordPress. You'll learn the advantages of running your own Multisite network, how to properly install Multisite, working in a network, creating sites and users, managing themes and plugins, and even domain mapping. The last part of the chapter explores coding for Multisite and the various functions and methods available for use.

**Chapter 11, "Content Aggregation,"** looks at WordPress from a services point of view. If a website represents your public persona or online presence, it has to pull content from a variety of tools and content sources. This chapter delves into web services interfaces, WordPress APIs, feeds into and out of WordPress, and making WordPress entries show up in Facebook pages.

**Chapter 12**, “Crafting the User Experience,” looks at a WordPress installation from the perspective of a regular or potential reader. Usability, testing, and the ease of finding information within a WordPress website form the basics, with added emphasis on web standards for metadata and search engine optimization so content can be found through an appropriate Google search. Whereas Chapter 11 covers pulling external content into your WordPress instance, this chapter shows how to get your content to show up elsewhere on the Web. Alternatives for adding search functionality, one of WordPress’ weaknesses, are discussed, along with content accessibility and delivery to mobile devices.

**Chapter 13**, “Statistics, Scalability, Security, and Spam,” deals with good and bad popularity. Keeping a WordPress installation safe from inevitable comment spammers as well as malicious attackers is a key part of configuration and management, and this chapter covers the more popular security and anti-spam plugins and features. Traffic analysis tools indicate how well certain content types, functions, ad campaigns, promotions, or links are driving readership and how this informs traffic management.

**Chapter 14**, “WordPress as a Content Management System,” goes beyond blogging to examples of WordPress as a system for managing the life cycle, integration, and distribution of networked content.

**Chapter 15**, “WordPress in the Enterprise,” tackles issues of scale and integration. WordPress may address deficiencies in “enterprise scale” content management tools, and building on the mechanisms covered in Chapter 12, this chapter shows how to use WordPress with a variety of enterprise facilities ranging from identity management to Microsoft ASP.NET services.

**Chapter 16**, “WordPress Developer Community,” is an introduction to contributing to the WordPress ecosystem by working on the core, submitting plugins or themes, adding to the documentation canon, and assisting other developers. An overview of WordPress sister projects such as bbPress for forums is provided along with a brief summary of other developer resources and a glossary of WordPress-context sensitive terms.

## WHAT YOU NEED TO USE THIS BOOK

You’ll need at least a rudimentary understanding of HTML and some knowledge of cascading style sheets (CSS) to make use of the theme and user experience sections of the book. Experience in writing and debugging PHP code is a prerequisite for more advanced developer sections, although if you’re just going to make changes based on the samples in this book, you can use the code as a template and learn on the fly. A basic knowledge of databases, especially the syntax and semantics of MySQL, is in order to make the most out of the chapter on data management as well as develop plugins that need to save data.

It’s helpful to have an interactive development environment in which to view PHP code, or PHP code sprinkled through HTML pages. Choosing a set of developer tools often borders on religion and deep personal preference (and we know plenty of coders who believe that `vi` constitutes a development environment). Some of the more user-friendly tools will make walking through the WordPress code easier if you want to see how functions used in the examples appear in the core.

Most important, if you want to use the code samples and examples in this book, you'll need a WordPress website in which to install them. Chapter 1 covers some basic WordPress hosting options as well as the simple mechanics of downloading the components, and installing WordPress on a desktop or test machine for debugging and closer inspection.

Finally, some people might argue that to really take advantage of WordPress you need to be able to write, but that ignores the basic beauty of the WordPress platform: it takes the power of the printing press to an individual level. This book isn't about what you say (or might say); it's about how you're going to get those ideas onto the web and how the world will see them and interact with your blog.

The source code for the samples is available for download from the Wrox website at:

[www.wrox.com/remtitle.cgi?isbn=9781118442272](http://www.wrox.com/remtitle.cgi?isbn=9781118442272)

## CONVENTIONS

To help you get the most from the text and keep track of what's happening, we've used a number of conventions throughout the book.

**WARNING** *Boxes like this one hold important, not-to-be forgotten information that is directly relevant to the surrounding text.*

**NOTE** *Notes indicate notes, tips, hints, tricks, or and asides to the current discussion.*

As for styles in the text:

- We *italicize* new terms and important words when we introduce them.
- We show file names, URLs, and code within the text like so: `persistence.properties`.
- We present code in two different ways:

We use a monofont type with no highlighting for most code examples.

We use bold to emphasize code that's particularly important in the present context.

## SOURCE CODE

As you work through the examples in this book, you may choose either to type in all the code manually, or to use the source code files that accompany the book. All the source code used in this book is available for download at [www.wrox.com](http://www.wrox.com). Specifically for this book, the code download is on the Download Code tab at:

[www.wrox.com/remtitle.cgi?isbn=9781118442272](http://www.wrox.com/remtitle.cgi?isbn=9781118442272)

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**NOTE** *Because many books have similar titles, you may find it easiest to search by ISBN, which is 978-1-118-44227-2.*

At the beginning of each chapter for which there is downloadable code, we've provided a reminder of the URL at which you can find the code files. Throughout each chapter, you'll also find references to the code file names in listing titles or the text.

Most of the code on [www.wrox.com](http://www.wrox.com) is compressed in a .ZIP, .RAR archive, or similar archive format appropriate to the platform. Once you download the code, just decompress it with your preferred compression tool.

## ERRATA

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At <http://p2p.wrox.com>, you will find a number of different forums that will help you, not only as you read this book, but also as you develop your own applications. To join the forums, just follow these steps:

1. Go to <http://p2p.wrox.com> and click the Register link.
2. Read the terms of use and click Agree.
3. Complete the required information to join, as well as any optional information you wish to provide, and click Submit.
4. You will receive an e-mail with information describing how to verify your account and complete the joining process.

**NOTE** *You can read messages in the forums without joining P2P, but in order to post your own messages, you must join the forum.*

Once you join, you can post new messages and respond to messages other users post. You can read messages at any time on the web. If you would like to have new messages from a particular forum e-mailed to you, click the Subscribe to this Forum icon by the forum name in the forum listing.

For more information about how to use the Wrox P2P, be sure to read the P2P FAQs for answers to questions about how the forum software works, as well as many common questions specific to P2P and Wrox books. To read the FAQs, click the FAQ link on any P2P page.

