Beginning ASP.NET 3.5 in VB 2008

**From Novice to Professional,
Second Edition**

Matthew MacDonald

Beginning ASP.NET 3.5 in VB 2008: From Novice to Professional, Second Edition

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ISBN-13 (pbk): 978-1-59059-892-4

ISBN-10 (pbk): 1-59059-892-X

Printed and bound in the United States of America 9 8 7 6 5 4 3 2 1

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Distributed to the book trade worldwide by Springer-Verlag New York, Inc., 233 Spring Street, 6th Floor, New York, NY 10013. Phone 1-800-SPRINGER, fax 201-348-4505, e-mail orders-ny@springer-sbm.com, or visit <http://www.springeronline.com>.

For information on translations, please contact Apress directly at 2855 Telegraph Avenue, Suite 600, Berkeley, CA 94705. Phone 510-549-5930, fax 510-549-5939, e-mail info@apress.com, or visit <http://www.apress.com>.

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*For my wonderful family,
Faria and Maya*

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About the Author

MATTHEW MACDONALD is an author, educator, and Microsoft MVP. He's a regular contributor to programming journals and the author of more than a dozen books about .NET programming, including *Pro ASP.NET 3.5 in C# 2008* (Apress, 2007), *Pro WPF: Windows Presentation Foundation in .NET 3.0* (Apress, 2007), and *Pro .NET 2.0 Windows Forms and Custom Controls in VB 2005* (Apress, 2006). He lives in Toronto with his wife and daughter.

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■ **ANDY OLSEN** is a freelance developer and consultant based in the UK. Andy has been working with .NET since Beta 1 days and has coauthored and reviewed several books for Apress, covering C#, Visual Basic, ASP.NET, and other topics. Andy is a keen football and rugby fan and enjoys running and skiing (badly). Andy lives by the seaside in Swansea with his wife Jayne and children Emily and Thomas, who have just discovered the thrills of surfing and look much cooler than he ever will!

Acknowledgments

No author could complete a book without a small army of helpful individuals. I'm deeply indebted to the whole Apress team, including Laura Esterman, who helped everything move swiftly and smoothly; Liz Welch, who performed the copy edit; Andy Olsen, who performed a thorough technical review; and many other individuals who worked behind the scenes indexing pages, drawing figures, and proofreading the final copy. I also owe a special thanks to Gary Cornell, who always offers invaluable advice about projects and the publishing world.

I'd also like to thank those who were involved with previous editions of this book. This includes Emma Acker and Jane Brownlow at Osborne McGraw-Hill and previous tech reviewers Ronald Landers, Gavin Smyth, Tim Vercruysse, and Julian Skinner. I also owe a hearty thanks to all the readers who caught errors and took the time to report problems and ask good questions, including Rick Falck, who submitted detailed comments for virtually every chapter. Keep sending in the feedback—it helps make better books!

Finally, I'd never write *any* book without the support of my wife and these special individuals: Nora, Razia, Paul, and Hamid. Thanks, everyone!

Introduction

ASP.NET is Microsoft's platform for developing web applications. Using ASP.NET, you can create e-commerce shops, data-driven portal sites, and just about anything else you can find on the Internet. Best of all, you don't need to paste together a jumble of HTML and script code in order to program the Web. Instead, you can create full-scale web applications using nothing but code and a design tool such as Visual Studio 2008.

The cost of all this innovation is the learning curve. To master ASP.NET, you need to learn how to use an advanced design tool (Visual Studio), a toolkit of objects (the .NET Framework), and an object-oriented programming language (such as Visual Basic 2008). Taken together, these topics provide more than enough to overwhelm any first-time web developer.

Beginning ASP.NET 3.5 in VB 2008 assumes you want to master ASP.NET, starting from the basics. Using this book, you'll build your knowledge until you understand the concepts, techniques, and best practices for writing sophisticated web applications. The journey is long, but it's also satisfying. At the end of the day, you'll find that ASP.NET allows you to tackle challenges that are simply out of reach on many other platforms.

About This Book

This book explores ASP.NET, which is a core part of Microsoft's .NET Framework. The .NET Framework is not a single application—it's actually a collection of technologies bundled into one marketing term. The .NET Framework includes languages such as C# 2008 and VB 2008, an engine for hosting programmable web pages and web services (ASP.NET), a model for interacting with databases (ADO.NET), and a class library stocked with tools for everything from reading files to validating a password. To master ASP.NET, you need to learn about each of these ingredients.

This book covers all these topics from the ground up. As a result, you'll find yourself learning many techniques that will interest any .NET developer, even those who create Windows applications. For example, you'll learn about component-based programming, you'll discover structured error handling, and you'll see how to access files, XML, and relational databases. You'll also learn the key topics you need for web programming, such as state management, web controls, and caching. By the end of this book, you'll be ready to create your own rich web applications and make them available over the Internet.

Note This book has a single goal: to be as relentlessly practical as possible. I take special care not to leave you hanging in the places where other ASP.NET books abandon their readers. For example, when encountering a new technology, you'll learn not only how it works but also why (and when) you should use it. I also highlight common questions and best practices with tip boxes and sidebars at every step of the way. Finally, if a topic is covered in this book, it's covered *right*. This means you won't learn how to perform a task without learning about potential drawbacks and the problems you might run into—and how you can safeguard yourself with real-world code.

Who Should Read This Book

This book is aimed at anyone who wants to create dynamic websites with ASP.NET. Ideally, you'll have experience with a previous version of a programming language such as Visual Basic 6 or Java. If not, you should be familiar with basic programming concepts (loops, conditional structures, arrays, and so on), whether you've learned them in C, Pascal, Turing, or a completely different programming language. This is the only requirement for reading this book.

Understanding HTML and XHTML (the markup languages used to write web pages) will help you, but it's not required. ASP.NET works at a higher level, allowing you to deal with full-featured web controls instead of raw web page markup. However, you'll get a quick overview of XHTML fundamentals in Chapter 4, and you'll learn about CSS, the Cascading Style Sheet standard, in Chapter 13.

This book will also appeal to programmers who have some experience with Visual Basic and .NET but haven't worked with ASP.NET in the past. However, if you've used a previous version of ASP.NET, you'll probably be more interested in a faster-paced book such as *Pro ASP.NET 3.5 in VB 2008* (Apress, 2007) instead.

Note This book begins with the fundamentals: VB syntax, the basics of object-oriented programming, and the philosophy of the .NET Framework. If you haven't worked with VB before, you can spend a little more time with the syntax review in Chapter 2 to pick up everything you need to know. If you aren't familiar with the ideas of object-oriented programming, Chapter 3 fills in the blanks with a quick, but comprehensive, review of the subject. The rest of the book builds on this foundation, from ASP.NET basics to advanced examples that show the techniques you'll use in real-world web applications.

What You Need to Use This Book

The main prerequisite for this book is a computer with Visual Studio 2008. You can use the scaled-down Visual Studio Web Developer 2008 Express Edition (available at <http://msdn.microsoft.com/vstudio/express>) with a few minor limitations. Most significantly, you can't use Visual Studio Web Developer to create separate components, a technique discussed in Chapter 23. However, you can get around this limitation by using *two* express editions—Visual Studio Web Developer Express Edition to create your websites and Visual Basic 2008

Express Edition to create your components. Even if you don't use this trick, you'll still be able to run all the sample code for this book.

To develop ASP.NET web pages, you need Windows XP, Windows Vista, Windows Server 2003, or Windows Server 2008. To *use* an ASP.NET web page (in other words, to surf to it over the Internet), you simply need a web browser. ASP.NET fully supports Internet Explorer, Firefox, Opera, Safari, Netscape, and any other browser that respects the HTML standard on virtually any operating system. There are a few features that won't work with extremely old browsers (such as the ASP.NET AJAX techniques you'll learn about in Chapter 25), and you'll consider these limitations when they crop up. You'll also notice that this book features a variety of screen captures—some taken in Windows XP and others in Windows Vista. This should make perfect sense. After all, your choice of operating system (and the operating system of the people who are browsing your website) won't change how your web pages work.

If you plan to host websites on your computer, you'll also need to use IIS (Internet Information Services), the web hosting software that's part of the Windows operating system. You might also use IIS if you want to test deployment strategies. You'll learn how to use and configure IIS in Chapter 9.

Finally, this book includes several examples that use SQL Server. You can use any version of SQL Server to try these examples, including SQL Server 2005 Express Edition, which is included with some versions of Visual Studio (and freely downloadable at <http://msdn.microsoft.com/sql/express>). If you use other relational database engines, the same concepts will apply; you will just need to modify the example code.

Code Samples

To master ASP.NET, you need to experiment with it. One of the best ways to learn ASP.NET is to try the code samples for this book, examine them, and dive in with your own modifications. To obtain the sample code, surf to <http://www.prosetech.com> or the publisher's website at <http://www.apress.com>. You'll also find some links to additional resources and any updates or errata that affect the book.

■ **Note** Previous editions of this book tackled *web services*, a feature that allows you to create code routines that can be called by other applications over the Internet. Web services are more interesting when considering rich client development (because they allow you to give web features to ordinary desktop applications), and they're in the process of being replaced by a new technology known as WCF (Windows Communication Foundation). For those reasons, web services aren't covered in this book. However, if you want to branch out and explore the web service world, you can download the web service chapters from the previous edition of this book from the book's download page. The information in these chapters still applies to ASP.NET 3.5, because the web service feature hasn't changed.

Chapter Overview

This book is divided into six parts. Unless you've already had experience with the .NET Framework, the most productive way to read this book is in order from start to finish. Chapters later in the book sometimes incorporate features that were introduced earlier in order to create more well-rounded and realistic examples. On the other hand, if you're already familiar with the .NET platform, VB, and object-oriented programming, you'll make short work of the first part of this book.

Part 1: Introducing .NET

You could start coding an ASP.NET application right away by following the examples in the second part of this book. But to really master ASP.NET, you need to understand a few fundamental concepts about the .NET Framework.

Chapter 1 sorts through the Microsoft jargon and explains what the .NET Framework really does and why you need it. Chapter 2 introduces you to VB 2008 with a comprehensive language tour. Finally, Chapter 3 explains the basics of modern object-oriented programming.

Part 2: Developing ASP.NET Applications

The second part of this book delves into the heart of ASP.NET programming and introduces its new event-based model. In Chapter 4, you'll take a look around the Visual Studio design environment and learn a few fundamentals about web forms, events, and XHTML. In Chapters 5 and 6, you learn how to program a web page's user interface through a layer of objects called *server controls*.

Next, you'll explore a few more essentials of ASP.NET programming. Chapter 7 describes different strategies for state management. Chapter 8 presents different techniques for handling errors. Finally, Chapter 9 walks you through the steps for deploying your application to a web server. Taken together, these chapters contain all the core concepts you need to design web pages and create a basic ASP.NET website.

Part 3: Building Better Web Forms

The third part of this book explores several topics that can help you transform ordinary web pages into polished web applications. In Chapter 10 you'll learn to use the validation controls to catch invalid data before the user submits it. In Chapter 11 you'll move on to consider some of ASP.NET's more exotic controls, such as the Calendar and Wizard. In Chapter 12, you'll learn how to build your own reusable blocks of web page user interface and draw custom graphics on the fly. Finally, Chapter 13 shows how you can standardize the appearance of an entire website with themes and master pages, and Chapter 14 shows you how to add navigation to a website.

Part 4: Working with Data

Almost all software needs to work with data, and web applications are no exception. In Chapter 15, you begin exploring the world of data by considering ADO.NET—Microsoft's .NET-powered technology for interacting with relational databases. Chapters 16 and 17 explain how to use data binding and the advanced ASP.NET data controls to create web pages that integrate attractive, customizable data displays with automatic support for paging, sorting, and editing.

Chapter 18 moves out of the database world and considers how to interact with files. Chapter 19 broadens the picture even further and describes how ASP.NET applications can use the XML support that's built into the .NET Framework.

Part 5: Website Security

Every public website needs to deal with security—making sure that sensitive data cannot be accessed by the wrong users. In Chapter 20, you'll start out learning how ASP.NET provides different authentication systems for dealing with users. You can write your own custom logic to verify user names and passwords, or you can use existing Windows account information. In Chapter 21, you'll learn about the membership model, which extends the authentication system with prebuilt security controls and handy objects that automate common tasks. If you want, you can even get ASP.NET to create and manage a database with user information automatically. Finally, Chapter 21 deals with another add-on—the profiles model that lets you store information for each user automatically, without writing any database code.

Part 6: Advanced ASP.NET

This part includes the advanced topics you can use to take your web applications that extra step. Chapter 23 covers how you can create reusable components for ASP.NET applications. Chapter 24 demonstrates how careful use of caching can boost the performance of almost any web application. Finally Chapter 25 introduces ASP.NET AJAX, one of the hottest new topics in web development. Using ASP.NET AJAX, you can build web pages that feel more responsive and add rich features that are usually limited to desktop applications, like text autocompletion and drag-and-drop.

Feedback

This book has the ambitious goal of being the best tutorial and reference for ASP.NET. Toward that end, your comments and suggestions are extremely helpful. You can send complaints, adulation, and everything in between directly to apress@prosetech.com. I can't solve your ASP.NET problems or critique your code, but I do benefit from information about what this book did right and wrong (and what it may have done in an utterly confusing way). You can also send comments about the website support for this book.