

Beginning ASP.NET 2.0

Chris Hart, John Kauffman, Dave Sussman, and Chris Ullman



Wiley Publishing, Inc.

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Chris Ullman: All my love to my wife Kate and the boys.

About the Authors

Chris Hart

Chris works full-time as a developer at Trinity Expert Systems Plc, based in Coventry (UK), where she's worked on several major .NET, SharePoint, and CMS applications. She enjoys having a job where she gets to learn and play with new technologies on a regular basis, often working on-site with customers. She's been using .NET since the pre-Alpha days, and yet still enjoys the fun of working with beta software.

Chris lives in Birmingham (UK, not Alabama) with her extremely understanding husband James, as she tries to fit writing alongside her hectic job and her attempts at gardening. She collects computers in much the same way as some old ladies collect cats.

Chris Hart contributed Chapters 3–5 and 11 and Appendix C to this book.

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In his spare time, John is an avid sailor and youth sailing coach. He also enjoys jazz music and drumming. In addition to technical material, he manages to read the *New Yorker* magazine from cover-to-cover each week.

John Kauffman contributed Chapters 1, 2, 7, and 8 and Appendix D to this book.

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Dave Sussman contributed Chapters 6, 9, 14, and 15 and Appendix E to this book.

Chris Ullman

Chris Ullman is a freelance web developer and technical author who has spent many years stewing in ASP/ASP.NET, like a teabag left too long in the pot. Coming from a Computer Science background, he started initially as a UNIX/Linux guru, who gravitated toward MS technologies during the summer of ASP (1997). He cut his teeth on Wrox Press ASP guides, and since then he has written on more than 20 books, most notably as lead author for Wrox's bestselling Beginning ASP/ASP.NET 1.x series, and has contributed chapters to books on PHP, ColdFusion, JavaScript, Web Services, C#, XML, and other Internet-related technologies too esoteric to mention, now swallowed up in the quicksands of the dot.com boom.

Quitting Wrox as a full-time employee in August 2001, he branched out into VB.NET/C# programming and ASP.NET development and started his own business, CUASP Consulting Ltd, in April 2003. He maintains a variety of sites from www.cuasp.co.uk, his "work" site, to www.atomicwise.com, a selection of his writings on music and art. The birth of his twins, Jay and Luca, in February 2005 took chaos to a new level. He now divides his time between protecting the twins from their over-affectionate three-year-old brother Nye, composing electronic sounds on bits of dilapidated old keyboards for his music project, Open E, and tutoring his cats in the art of peaceful coexistence, and not violently mugging each other on the stairs.

Chris Ullman contributed Chapters 10, 12, 13, and 16 and Appendix B to this book.

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Chris Ullman

Thanks to everyone on the author team (Dave, Chris, and John) for being available for my Messenger and e-mail queries, thanks to Dan for being an honest reviewer and always ready with good advice, and thanks to Jim and Brian for being patient on the chapters—I got there eventually!

Introduction

Many different technologies are available today for developing complex web sites and web applications, and with so many to choose from, it's great that there's one technology in particular that stands out from the crowd and is such a joy to use. ASP.NET 2.0 is a fantastic technology that enables you to develop web sites and applications with very little hassle. Developing web applications was never this easy, yet even though it may appear simple, there is real power and depth to this technology that enables it to host even the most complex applications available today.

With every new release from Microsoft comes a new way of thinking, new technologies designed to make your life easier, and the best-ever programming experience; ASP.NET 2.0 is no exception to this rule. Whether you have developed web applications before, or if you are completely new to the world of web development, there's a lot to learn about this particular version of the technology.

Built on top of version 2.0 of the .NET Framework, ASP.NET 2.0 extends on the functionality first seen in ASP.NET 1.0 and 1.1. At its core, you have a *control-based, event-driven* architecture, which means that you have the ability to add small blocks of code to a page, and see dynamic results with minimal effort, and you can react to user input to provide a smooth and intuitive user experience.

The biggest change since the previous edition of ASP.NET is in the amount of code you have to write—the ASP.NET team aimed for a 70% reduction in the amount of code you write, and having spent time myself working with ASP.NET 2.0 in the field, even if this claim does sound somewhat large, the reduction in time spent with fingers on keys is very noticeable. The mundane and repetitive tasks that you would have previously had to complete have been simplified. For example, providing user login functionality to a site is now a very swift process—adding a few controls to a page and setting up some user accounts is pretty much all you need to do to get basic user login functionality implemented on a site, and personalizing the user experience is just a step away from there!

Now add the new development environment designed for building ASP.NET 2.0 applications, Visual Web Developer (available on its own, or as part of Visual Studio 2005), and you will find building dynamic, feature-rich applications to be a fast, smooth process.

Visual Web Developer is a new innovation from Microsoft, and was developed mostly in response to developer demand. Previous editions of Visual Studio .NET were not great when it came to web programming, and you'd often find your code had been "fixed" for you behind the scenes because your HTML came out looking very different than the way it went in originally! Visual Web Developer has a fantastic HTML editing environment, and a really smooth and intuitive interface for developing complex ASP.NET applications. Best of all, it's a low-cost product, which makes it accessible to a wide audience who may not be able to afford the complete Visual Studio package.

Who This Book Is For

This book teaches you how to program web applications in ASP.NET 2.0 that can display data stored in a database, provide a personalized user experience to your users, and even offer shopping functionality.

Introduction

All of these sorts of web applications can be developed using ASP.NET 2.0, so if these are the sorts of applications that you are interested in developing, then this is a great place to start!

This book is for anyone new to web programming, or who has a small amount of knowledge of web programming concepts. Maybe you want to start a career as a web developer? Or perhaps you just want to learn how to use some cool server-side technology to put together some sites in your spare time? In either case, this book teaches you what you need to know, and gives you a good feel for how the technology works, how to use the Visual Web Developer environment to speed up your development, and to give you total control over the development process.

The early chapters in this book ease you into the world of ASP.NET development, and if you already have some knowledge of programming, you will find these early chapters a swift and pleasant read. Note, though, that ASP.NET 2.0 has a lot of neat tricks and tools at its disposal, and we'll be introducing these throughout the book. As with other Wrox *Beginning* books, you should find that the concepts discussed in one chapter are then used and extended in other chapters.

What This Book Covers

This book teaches you ASP.NET 2.0, with the help of the Visual Web Developer IDE (Integrated Development Environment). Working through this book, you will learn how to develop powerful data-driven web applications, and even to expose functionality using web services. Here's how the book shapes up over the next 16 chapters.

Chapter 1: An Introduction to ASP.NET 2.0 and the Wrox United Application

This chapter provides an overview of ASP.NET 2.0 and the Visual Web Developer environment, and gives you a chance to create and run a simple page. You'll also learn about the Wrox United sample web site, which is used in examples throughout the book to demonstrate different aspects of ASP.NET 2.0.

Chapter 2: Site Design

Now that you've gained some familiarity with creating simple pages, this chapter discusses the concept of site design, and introduces the concept of a Master page, which can be used to provide a consistent look for all pages on a site. It also introduces `Web.config` and `Global.asax`—two important ASP.NET files that control the behavior of a site, and the concept of a site map, for defining a site page hierarchy.

Chapter 3: Page Design

This chapter starts by providing a quick crash-course (or a refresher course as the case may be) in HTML and XHTML development, and introduces the crucial concept of server controls. The chapter continues by demonstrating several of the built-in server controls in action to provide navigation functionality on a site.

Chapter 4: Membership and Identity

One of the big new features of ASP.NET 2.0 is the addition of the `Login` server controls, so this chapter introduces these controls, alongside discussions of how to create user accounts, how to configure roles, and how to enable login functionality on a site.

Chapter 5: Styling with Themes

Once the functionality of a site has been developed, it's important to make a site look and feel the right way. This chapter introduces CSS style sheets, and integrates them into the discussion of ASP.NET's Theme functionality, making it simple to keep your functionality and your site styling cleanly separated—great for future maintainability!

Chapter 6: Events and Code

Reacting to events involves writing code, so this chapter talks about server-side coding concepts and how web servers work. It walks you through the basics of HTTP so that you will gain an understanding of the *postback*, and how you can write code to handle postback events.

Chapter 7: Reading Data

Developing a site will almost always involve reading data stored in a database, and displaying that data on the screen, so this chapter talks about how you can use ASP.NET controls (such as the `GridView`, `DataLists`, and `DetailsView` controls) to connect to a database and display data. This chapter also discusses reading data stored in an XML file.

Chapter 8: Writing Data

The storing and updating of data is the next topic to be covered in this book, and in this chapter, you'll learn some useful techniques for safely updating the data stored in the database using parameters and referring to data using keys that uniquely identify items in a database.

Chapter 9: Code

This chapter teaches you the fundamental programming concepts that you will need to understand if you are to become a fully fledged .NET developer. It starts by taking you through basic variables and data types, before looking at collections, statements, operators, branches, and loops. Then it introduces some object orientation and talks about classes, properties, methods, and simple class design principles.

Chapter 10: Componentization

Having learned all about the principles of code in the previous chapter, this chapter takes those building blocks and talks about creating pages with separate code files, and about how to design applications with logic stored in different classes or files. This chapter also introduces the concept of user controls, which are great for storing pieces of code that can be reused across pages on a site.

Chapter 11: Roles and Profiles

Following on from simple user accounts and roles as introduced in Chapter 4, this chapter builds on the concept of site design, and changing the appearance of a site depending on which user is accessing the site. This chapter also looks at storing user profiles and populating profiles in code, as well as switching the theme used on a site according to user preferences.

Chapter 12: Web Services

At this stage in the book, you'll have gained sufficient experience with ASP.NET 2.0 and coding that you should now be ready to enter the world of web services. First, you'll learn how to consume a third-party web service, and use that functionality on a page. Next, you'll get the chance to build your own web services, and you'll learn about proxies and WSDL.

Chapter 13: E-Commerce

Adding e-commerce functionality to a site can be a bit tricky, so this chapter walks you through the e-commerce facilities built into the Wrox United sample application, looking at how to implement a product catalog, and build a shopping cart system that links in to user's profiles.

Chapter 14: Performance

You may find your rather lovely web applications may crawl to a halt if you haven't quite tweaked them the right way to make them perform well under heavy loading, so this chapter talks about many of the different ways you can enhance the performance of an application. This includes concepts such as disposing of objects, using stored procedures, and making efficient use of caching.

Chapter 15: Dealing with Errors

Errors happen whenever you develop any application, so this chapter talks you through some of the most common ways to handle errors, how to trap exceptions, and how to present custom error pages to users of your site. After all, they don't need to know that your database server collapsed, but they would like to know, if the site is down, that faults will be rectified shortly. You can then use some of the excellent debugging and tracing functionality available in ASP.NET.

Chapter 16: Deployment, Builds, and Finishing Up

The final chapter of the book talks you through the ideal way to deploy a finished web application to a live server. The application used as an example is the Wrox United application, which you can publish using both the Visual Web Developer tools and what's known as XCOPY deployment. This chapter also looks at testing the deployment and looking out for common deployment problems. The final part of the chapter reviews the different parts of the Wrox United application, and recaps where each part of the application was discussed in the book. Finally, we'll give you some pointers as to where you can head next to further your ASP.NET development career!

How This Book Is Structured

This book takes time to explain concepts step-by-step, using worked examples and detailed explanations, to tell the story of how to develop ASP.NET applications. Each chapter assumes knowledge developed in previous chapters, so you will likely find a front-to-back study approach works best to understand the concepts explained. Four authors worked on this book as a team, and we all worked quite closely together (with some great editorial support), to give you a steady and complete tutorial of the basics of developing ASP.NET applications.

What You Need to Use This Book

To gain the most from this book, you should have the following software installed on your system:

- A minimum of Windows XP Home Edition as your operating system
- Microsoft Visual Web Developer
- Microsoft SQL Server 2005 Express Edition

Because Visual Web Developer includes the .NET Framework and ASP.NET 2.0, these three pieces of software are all you will need to develop ASP.NET applications.

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.

Try It Out

The *Try It Out* is an exercise you should work through, following the text in the book.

1. They usually consist of a set of steps.
2. Each step has a number.
3. Follow the steps through with your copy of the code.

How It Works

After each *Try It Out*, the code you've typed will be explained in detail.

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

Tips, hints, tricks, and asides to the current discussion are offset and placed in italics like this.

Introduction

As for styles in the text:

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

In code examples we highlight new and important code with a gray background. The gray highlighting is not used for code that's less important in the present context, or has been shown before.

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 of the source code used in this book is available for download at <http://www.wrox.com>. Once at the site, simply locate the book's title (either by using the Search box or by using one of the title lists) and click the Download Code link on the book's detail page to obtain all the source code for the book.

Because many books have similar titles, you may find it easiest to search by ISBN; for this book the ISBN is 0-7645-8850-8.

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Errata

We make every effort to ensure that there are no errors in the text or in the code. However, no one is perfect, and mistakes do occur. If you find an error in one of our books, like a spelling mistake or faulty piece of code, we would be very grateful for your feedback. By sending in errata you may save another reader hours of frustration and at the same time you will be helping us provide even higher-quality information.

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