COMPANION WEB SITE!

**Microsoft** 

# ASP.NET

fast&easy web development

**Look** up tasks and features

**Learn** them quickly

Apply what you learn now



NITIN PANDEY with NIIT

# Microsoft ASP.NET

# fast&easy web development

Nitin Pandey

with NIIT



A DIVISION OF PRIMA PUBLISHING

© 2002 by Premier Press, Inc. All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage or retrieval system without written permission from Premier Press, except for the inclusion of brief quotations in a review.

Premier

The Premier Press logo, top edge printing, related trade dress, and Fast & Easy are trademarks of Premier Press, Inc. and may not be used without written permission. All other trademarks are the property of their respective owners.

Publisher: Stacy L. Hiquet

Associate Marketing Manager: Heather Buzzingham

Managing Editor: Sandy Doell
Acquisitions Editor: Stacy L. Hiquet
Project Editor: Cathleen D. Snyder

**Project Editor:** Cathleen D. Snyder **Editorial Assistant:** Margaret Bauer

Interior Layout: Marian Hartsough Associates

Cover Design: Mike Tanamachi Indexer: Sharon Hilgenberg Proofreader: Lorraine Gunter

Microsoft, Windows, Internet Explorer, the .NET logo, Visual Basic, Visual C++, Visual C#, and Windows NT are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries.

*Important:* Premier Press cannot provide software support. Please contact the appropriate software manufacturer's technical support line or Web site for assistance.

Premier Press and the author have attempted throughout this book to distinguish proprietary trademarks from descriptive terms by following the capitalization style used by the manufacturer.

Information contained in this book has been obtained by Premier Press from sources believed to be reliable. However, because of the possibility of human or mechanical error by our sources, Premier Press, or others, the Publisher does not guarantee the accuracy, adequacy, or completeness of any information and is not responsible for any errors or omissions or the results obtained from use of such information. Readers should be particularly aware of the fact that the Internet is an ever-changing entity. Some facts may have changed since this book went to press.

ISBN: 1-931841-46-2

Library of Congress Catalog Card Number: 2001099842

Printed in the United States of America

01 02 03 04 05 BH 10 9 8 7 6 5 4 3 2 1

## Acknowledgments

My parents and my brother and sisters have been a strong support to me through the long hours that went into completing this book. They helped me bring out the best in the book. My heartfelt gratitude goes to my parents for their support.

My project manager, Anita Sastry, has worked tirelessly, reviewing and giving her valuable input to the book. Without her support, the book would not have become what it is.

Thank you, Cathleen Snyder, for editing the book so well. Your valuable input has made this a wonderful book that reads very well.

I would also like to thank Stacy Hiquet for making this book happen in the first place! You provided active support in all development stages of the book.

My special thanks also go out to Sai Kishore, Kuljit Kaur, Surbhi Malhotra, Ambika Trehan, Geetanjali Arora, Yesh Singhal, and Ashok Appu for their support and input for some important chapters of the book.

### **About NIIT**

**NIIT** is a Global IT Solutions Corporation with a presence in 38 countries. With its unique business model and technology creation capabilities, NIIT delivers Software and Learning Solutions to more than 1000 clients around the world.

The success of NIIT's training solutions lies in its unique approach to education. NIIT's Knowledge Solutions Business conceives, researches, and develops all of the course material. A rigorous instructional design methodology is followed to create engaging and compelling course content. NIIT has one of the largest learning-material development facilities in the world, with more than 5000 person-years of experience.

NIIT trains over 200,000 executives and learners each year in Information Technology areas, using Stand-up training, video-aided instruction, computer-based training (CBT) and Internet-based training (IBT). NIIT has been featured in the Guinness Book of World Records for the largest number of learners trained in one year!

NIIT has developed over 10,000 hours of instructor-led training (ILT) and over 3000 hours of Internet-based training and computer-based training. IDC ranked NIIT among the Top 15 IT training providers globally for the year 2000. Through the innovative use of training methods and its commitment to research and development, NIIT has been in the forefront of computer education and training for the past 20 years.

Quality has been the prime focus at NIIT. Most of the processes are ISO-9001 certified. NIIT was the 12<sup>th</sup> company in the world to be assessed at Level 5 of SEI-CMM. NIIT's Content (Learning Material) Development facility is the first in the world to be assessed at this highest maturity level. NIIT has strategic partnerships with companies such as Computer Associates, IBM, Microsoft, Oracle, and Sun Microsystems.

#### **About the Author**

**NITIN PANDEY** works as a Consultant with NIIT. In his two years of work experience at NIIT, he has authored several books, which include *Commerce Server 2000 Configuration and Administration*, *Visual Studio .NET for Dummies*, and *C# Professional Projects*.

At NIIT, Nitin has been a SME (Subject Matter Expert) for seminars and WBTs developed for Microsoft. He has also actively worked on all languages of the .NET Framework, Visual Studio .NET, and .NET Enterprise Servers.

When he is not at work, Nitin enjoys reading and playing volleyball.

#### Introduction

ASP (Active Server Pages) has long been used as a Web programming language for creating dynamic Web sites. ASP.NET is the next version of ASP 3.0, and it simplifies the development of ASP applications for the Internet. ASP.NET forms an important component of Microsoft's .NET initiative.

With the release of Visual Studio .NET, creating ASP.NET applications has become very simple. Visual Studio .NET provides all of the necessary tools and support for creating ASP.NET applications. The easy-to-use interface of Visual Studio .NET coupled with the power of ASP.NET makes programming Web applications an easy and interesting experience.

ASP.NET Fast & Easy Web Development equips you with the necessary skills to create ASP.NET applications. The characteristic visual emphasis of the book introduces ASP, Visual Basic .NET, and ADO.NET concepts to novice developers. These concepts help you get started with ASP.NET. Thereafter, the book delves into the advanced features of ASP.NET, which include validating user input; developing user controls and composite controls; reading XML data; creating XML Web services; managing, retrieving, formatting, and displaying data using ADO.NET data objects; and creating and implementing Web services.

#### Who Should Read This Book

Readers who are proficient in HTML and have some experience in Web programming can best utilize this book. You will probably benefit more from the book if you have worked on a scripting language before. After reading this book, you will be

proficient in ASP.NET and able to create high-performance dynamic Web sites. If this is your expectation, then this book is certainly for you!

Although the book builds from very elementary concepts, it delves into fairly advanced topics that provide valuable information to both novice and expert developers. If you have already programmed in one or more of the .NET languages, you might want to skip the first five chapters of the book, which lay the foundation for novice developers.

#### Added Advice to Make You a Pro

To benefit as much as possible from this book, you should download the code for the sample application that is available at http://www.premierpressbooks.com/downloads.asp. The sample application runs through all of the important chapters of the book, with each chapter building on the application in some way. Therefore, as you read the book, you will have a professional application ready to use.

After you read this book, your next objective should be to create an application that is similar to (or even more advanced than) the application developed in this book. This will give you adequate hands-on practice in creating ASP.NET applications. You should also regularly visit some of the useful Web sites on ASP.NET that I have listed in Appendix D, "Online Resources for ASP.NET." These Web sites provide the latest information on the developments in ASP.NET.

#### Conventions Used in This Book

In the book, you will find several special elements that will make using this book easier.

- Tips give you helpful information or shortcuts to accomplish a goal more quickly or easily.
- Notes provide you with additional information or background about a given topic.
- Cautions warn you of potential pitfalls or glitches in an application or procedure.

## Contents at a Glance

	Introduction
Chapter 1	Introducing the .NET Initiative
Chapter 2	Installing and Configuring Visual Studio .NET
Chapter 3	Exploring the New Features of ASP.NET
Chapter 4	Visual Basic .NET Basics
Chapter 5	Beginning with a Simple ASP.NET Application
Chapter 6	Adding Server Controls to a Web Form
Chapter 7	Accepting Information Using Web Forms
Chapter 8	SQL Server Basics
Chapter 9	Getting Started with ADO.NET
Chapter 10	Managing Data for ASP.NET Applications
Chapter 11	Displaying Data Using Data Binding Server Controls181
Chapter 12	Creating a User Control in ASP.NET
Chapter 13	Creating a Composite Control in ASP.NET
Chapter 14	Getting Started with ASP.NET Web Services

Chapter 15	Building ASP.NET Web Services
Chapter 16	Building Mobile Web Applications
Chapter 17	Managing State in ASP.NET Applications
Chapter 18	Caching in ASP.NET Applications
Chapter 19	Tracing ASP.NET Applications
Chapter 20	Debugging ASP.NET Applications
Chapter 21	Handling Exceptions in ASP.NET Applications
Chapter 22	Securing ASP.NET Applications
Chapter 23	Deploying ASP.NET Applications
Appendix A	Keyboard Shortcuts in Visual Studio .NET
Appendix B	Developing ASP.NET Applications in Visual C#
Appendix C	Migrating from ASP 3.0 to ASP.NET
Appendix D	Online Resources for ASP.NET
	Indov 204
	Index

#### Contents

	Introduction
Chapter 1	Introducing the .NET Initiative
	Products and Technologies in the .NET Initiative
	.NET Enterprise Servers
	.NET Framework
	Visual Studio .NET
	Applications Created in ASP.NET
	ASP.NET Web Applications12
	ASP.NET Web Services
	Implementing the .NET Initiative
Chapter 2	Installing and Configuring Visual Studio .NET 15
	Installing Visual Studio .NET
	Hardware and Software Requirements16
	Installing Windows Update Components17
	Visual Studio .NET Installation
	Checking for Product Upgrades23
	Configuring Visual Studio .NET24
	Visual Studio .NET Windows
	Customizing Visual Studio .NET

Chapter 3	Exploring the New Features of ASP.NET33
-	Getting Started with ASP.NET
	Understanding the ASP.NET Application Architecture 34
	Examine the Features of ASP.NET
	Advantages of ASP.NET
	Introducing Web Forms
	Understanding the Page Class
	Understanding Page Directives
	Understanding Postbacks and Round Trips
	Understanding Cookies43
	Understanding Query Strings43
Chapter 4	Visual Basic .NET Basics
	An Introduction to Visual Basic .NET
	Using Variable and Data Types
	Declaring Variables
	Initializing Variables
	Using the Option Explicit Statement
	Working with Arrays
	Declaring an Array
	Initializing an Array
	Working with Multi-Dimensional Arrays53
	Understanding Dynamic Arrays
	Working with Decision Structures
	Using IfThenElse Statements
	Using SelectCase Statements
	Looping Constructs60
	Understanding WhileEnd While Statements60
	Understanding DoLoop Statements 61
	Understanding ForNext Statements 62
	Understanding For EachNext Statements 63

Chapter 5	Beginning with a Simple ASP.NET Application 65
	Creating ASP.NET Web Application Projects
	Creating a New Project66
	Renaming a Web Form
	Changing the Class Associated with a Web Form 70
	Adding a New Form
	Designing Forms
	Selecting a Layout for a Form74
	Adding Controls to a Form76
	Responding to User Interaction
	Redirecting a User to Another Web Form 80
	Executing the Application82
Chapter 6	Adding Server Controls to a Web Form 85
	Using ASP.NET Server Controls
	Working with the Label Control
	Working with the DropDownList Control90
	Working with the Button Control
	Working with the Panel Control
	Working with the RadioButtonList Control
	Working with the Calendar Control
	Working with the AdRotator Control
	Coding the Functionality of a Web Form
	Coding the Load Event of a Form
	Hiding and Displaying Panels on a Form
Chapter 7	Accepting Information Using Web Forms 105
	Designing Forms to Accept Information106
	Understanding Form Structure
	Adding Server Controls to a Form
	Adding HTML Controls to the Form

	Validating Information on a Form	113
	Understanding Validation Controls in ASP.NET	113
	Adding Validation Controls to a Form	115
	Coding the Validation Logic	118
	Running the Form	120
Chapter 8	SQL Server Basics	123
-	Creating Databases and Tables	124
	Creating a Database	124
	Creating a Table	126
	Managing Data	132
	Inserting Data	132
	Updating Data	135
	Deleting Data	137
	Retrieving Data	138
	Retrieving Data Using the SELECT Query	138
	Retrieving Data Using a Conditional Query	139
	Understanding Stored Procedures	140
	Creating a Stored Procedure	140
	Executing a Stored Procedure	142
Chapter 9	Getting Started with ADO.NET	143
	Understanding the Features of ADO.NET	144
	Non-Dependency on a Persistent Connection	144
	Data Commands	145
	Datasets	145
	Support for XML	146
	Understanding the ADO.NET Architecture	147
	Datasets	148
	The .NET Data Provider	148
	Configuring a Data Adapter	154
	Introducing the Data Adapter Configuration Wizard	154
	Running the Wizard	154

Chapter 10	Managing Data for ASP.NET Applications 1	161
	Adding Data to SQL Server Databases	162
	Designing a Database Table	162
	Designing a Form to Accept Information	165
	Inserting Records into the Database Table	165
	Retrieving Data from SQL Server Databases	174
	Designing the Form to Display Data	175
	Displaying Data on a Form	176
	Running the Application	179
Chapter 11	Displaying Data Using Data Binding Server Controls	121
	Using the DataGrid Control	
	Displaying Data in a DataGrid Control	
	Customizing a DataGrid Control	
	Using the Repeater Control	
	Displaying Data in a Repeater Control	
	Customizing the Repeater Control	
	Using the DataList Control	
	Designing the DataList Control	
	Implementing the Programming Logic	
Chapter 12	Creating a User Control in ASP.NET	201
Salahara Araba ang pangananan	Converting a Web Form into a User Control	
	Removing HTML Tags	
	Renaming Web Form Files	204
	Changing Page Directives	205
	Adding a User Control to a Web Form	206
	Instantiating the Control	206
	Testing the Application	207
Chapter 13	Creating a Composite Control in ASP.NET	209
	Creating a Composite Control	210
	Creating a Class Library Project	210

	Renaming the Module Files and the Class	
	Coding the Functionality of the Control	212
	Adding the Composite Control to a Web Form	217
	Creating a Reference to the Control	217
	Instantiating the Control	219
	Testing the Control	221
Chapter 14	Getting Started with ASP.NET Web Services	225
	Defining Web Services	226
	Understanding the Architecture of Web Services	227
	Understanding the Workings of Web Services	228
	Web Service Technologies	229
	Creating Web Services in the .NET Framework	233
	Understanding Default Files Created for Web Services	235
's	Understanding the Default Code Generated	
	for Web Services	237
	Testing Web Services	238
	testing web services	200
Chapter 15	Building ASP.NET Web Services	
Chapter 15	_	241
Chapter 15	Building ASP.NET Web Services	<b>241</b>
Chapter 15	Building ASP.NET Web Services	241 242
Chapter 15	Building ASP.NET Web Services	241 242 242
Chapter 15	Building ASP.NET Web Services	241 242 242 243
Chapter 15	Building ASP.NET Web Services	241 242 243 243 247
Chapter 15	Building ASP.NET Web Services.  Creating a Web Service.  Creating an ASP.NET Web Service Project.  Adding Web Methods to the Web Service.  Testing the Web Service.  Accessing a Web Service.	241 242 243 245 247
Chapter 15	Building ASP.NET Web Services	241 242 243 245 247 249
Chapter 15	Building ASP.NET Web Services.  Creating a Web Service.  Creating an ASP.NET Web Service Project.  Adding Web Methods to the Web Service.  Testing the Web Service.  Accessing a Web Service.  Adding a Web Reference  Implementing the Web Service.  Testing the Output of a Web Service.	241 242 243 245 247 247 249
	Building ASP.NET Web Services.  Creating a Web Service.  Creating an ASP.NET Web Service Project.  Adding Web Methods to the Web Service.  Testing the Web Service.  Accessing a Web Service.  Adding a Web Reference  Implementing the Web Service.  Testing the Output of a Web Service.	241 242 243 245 247 247 250
	Building ASP.NET Web Services.  Creating a Web Service.  Creating an ASP.NET Web Service Project.  Adding Web Methods to the Web Service.  Testing the Web Service.  Accessing a Web Service.  Adding a Web Reference.  Implementing the Web Service.  Testing the Output of a Web Service.  Building Mobile Web Applications.	241 242 243 245 247 247 249 250 251
	Building ASP.NET Web Services.  Creating a Web Service.  Creating an ASP.NET Web Service Project.  Adding Web Methods to the Web Service.  Testing the Web Service.  Accessing a Web Service.  Adding a Web Reference  Implementing the Web Service.  Testing the Output of a Web Service.  Building Mobile Web Applications.  Overview of Mobile Web Applications.	241 242 243 245 247 247 250 251 252

	Creating a Mobile Web Application	25/
	Adding a Mobile Web Form to a Project	258
	Designing Forms for a Mobile Application	259
	Writing the Code for the Form	262
	Testing a Mobile Application	263
Chapter 17	Managing State in ASP.NET Applications	265
	Implementing Client-Side State Management	266
	Using Cookies	266
	Using Query Strings	267
	Using Hidden Fields	267
	Implementing Server-Side State Management	268
	Implementing Session State Management	268
	Implementing Application State Management	271
Chapter 18	Caching in ASP.NET Applications	273
	Implementing Page-Output Caching	274
	Implementing Page-Fragment Caching	276
	Implementing Page-Data Caching	277
	Adding Items to the Cache	277
	Creating Cache Dependencies	279
	Caching in Web Services	280
Chapter 19	Tracing ASP.NET Applications	281
	Enabling Page-Level Tracing	282
	Generating Trace Output	282
	Adding Custom Data to Trace Output	287
	Enabling Application-Level Tracing	289
	Configuring the Trace Service	289
	Changing Properties of the Trace Output	291
Chapter 20	Debugging ASP.NET Applications	293
-	Debugging Tools in Visual Studio .NET	294
	Using the Breakpoints Window	294