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Welcome to *Beginning ASP.NET E-Commerce in C#: From Novice to Professional*!

This book is a practical, step-by-step ASP.NET and SQL Server tutorial that teaches you real-world development practices. Guiding you through every step of the design and build process, this tutorial will teach you how to create high-quality, full-featured, extensible e-commerce web sites.

Over the course of the book, you will develop the necessary skills to get your business up on the Web and available to a worldwide audience. In each chapter, you will implement and test new features of your e-commerce web site, and you will learn the theoretical foundations required to understand the implementation details. The features are presented in increasing complexity as you advance throughout the book, so that your journey will be as pleasant and painless as possible. By the end of the book, you'll understand the concepts and have the knowledge to create your own powerful web sites.

Owners of previous editions of this book will find that a large part of it has been rewritten and many features have been added, as a result of the developments in the web development scene, and as a result of the extensive feedback we've received from the readers of the previous editions. Now you'll find the book teaches you how to implement search engine optimization, how to implement product attributes, how to use SQL Server's full-text searching, and many other exciting features.

The case study in this book is presented in three phases of development. The first phase focuses on getting the site up and running as quickly as possible, and at a low cost. Although not yet full-featured, at the conclusion of this phase your site will have a fully functional, searchable product catalog, and will be capable of accepting PayPal payments, enabling you to begin generating revenue immediately.

Phase 2 concentrates on increasing revenue by improving the shopping experience. In this phase, you'll learn how to encourage customers to buy more by implementing a dynamic product recommendation mechanism. You'll also implement your own custom shopping cart, replacing that provided by PayPal.

In the third phase, we'll show you how to increase your profit margins by reducing costs through automating and streamlining order processing and administration, and by handling credit card transactions yourself. You'll also learn how to integrate external functionality through web services (with a practical example of integrating Amazon.com products in your site), and improve your customer's shopping experience by adding product review functionality.

We hope you'll enjoy reading our book, and that you'll find it useful and relevant to your development projects!

**Who This Book Is For**

This book is aimed at developers looking for a tutorial approach to building a full e-commerce web site from design to deployment. The book teaches most of the necessary concepts and
guides you through all the implementation steps, but it assumes that you have some basic knowledge of building web sites with ASP.NET and SQL Server. To get this basic knowledge, we recommend one of these books:


- *Build Your Own ASP.NET 3.5 Website Using C# & VB, Third Edition*, by Cristian Darie (Sitepoint, 2008)

**How This Book Is Structured**

This book is divided into three parts consisting of 22 chapters. We cover a wide variety of topics, showing you how to

- Build a product catalog that can be browsed and searched
- Design relational databases, and write SQL Server queries and stored procedures
- Use the SQL Server full-text search feature to implement product searching
- Implement search engine optimization features
- Implement the catalog administration pages that allow adding, modifying, and removing products, categories, and departments
- Create your own shopping basket and checkout mechanism
- Increase sales by implementing product recommendations and product reviews
- Handle payments using PayPal and DataCash
- Implement a customer account system
- Integrate Amazon.com web services to sell Amazon.com items through your web site

The following brief roadmap highlights how we’ll take you from novice to professional regarding each of these topics.

**Part 1: Phase 1 of Development: Getting a Web Store Up and Running, Fast**

The first phase of development, which encompasses the first 12 chapters of the book, focuses on the basics of getting your site up and running quickly.

**Chapter 1: Starting an E-Commerce Site**

In this chapter, we’ll introduce some of the principles of e-commerce in the real world. You’ll see the importance of focusing on short-term revenue and keeping risks down. We’ll look at the three basic ways in which an e-commerce site can make money. We’ll then apply those principles to a three-phase plan that provides a deliverable, usable site at each phase of this book.
Chapter 2: Laying Out the Foundations

The first chapter offered an overview of e-commerce in the real world. Now that you’ve decided to develop a web site, we’ll start to look in more detail at laying down the foundations for its future. We’ll talk about what technologies and tools you’ll use, and even more importantly, how you’ll use them.

Chapter 3: Starting the BalloonShop Project

In this chapter, you’ll prepare the groundwork for developing the BalloonShop project—the e-commerce web site you’ll be creating throughout the book. You’ll be guided through installing and configuring the necessary software on your development machine, including Visual Web Developer 2008 and SQL Server 2008. You’ll also write a bit of code for the foundations of your project, and you’ll create the SQL Server database that will store the web site’s data.

Chapter 4: Creating the Product Catalog: Part 1

After learning about three-tier architecture and implementing a bit of your web site’s main page, it’s time to continue your work by starting to create the BalloonShop product catalog. Because the product catalog is composed of many components, you’ll create it over two chapters. In Chapter 4, you’ll create the first database table, create the first stored procedure, implement generic data access code, learn how to handle errors and email their details to the administrator, and finally use data gathered from the database to compose dynamic content for your visitor.

Chapter 5: Creating the Product Catalog: Part 2

In Chapter 4, you’ll create a selectable list of departments for BalloonShop. However, a product catalog is much more than a list of departments. In Chapter 5, you’ll add the rest of the product catalog features, creating category pages, product lists, and product details pages. While designing the data structure that supports these features, you’ll learn how to implement relationships between data tables, and how to use parameterized SQL Server stored procedures.

Chapter 6: Product Attributes

Many online stores allow shoppers to customize the products they buy. For example, when selling balloons (as BalloonShop does), it’s recommended to let your customer choose the color of the balloon. In this chapter, you’ll implement the product attributes feature in BalloonShop.

Chapter 7: Search Engine Optimization

Search engine optimization, or simply SEO, refers to the practices employed to increase the number of visitors a web site receives from organic (unpaid) search engine result pages. Today, the search engine is the most important tool people use to find information and products on the Internet. Needless to say, having your e-commerce web site rank well for the relevant keywords will help drive visitors to your site and increase the chances that visitors will buy from you and not the competition! In this chapter, we’ll update BalloonShop so that its core architecture will be search engine–friendly, which will help marketers in their efforts.
Chapter 8: Searching the Catalog

In the preceding chapters, you will have implemented a functional product catalog for BalloonShop. However, the site still lacks the all-important search feature. The goal in this chapter is to allow the visitor to search the site for products by entering one or more keywords. You’ll learn how to implement search result rankings, and how to browse through the search results page by page. You’ll see how easy it is to add new functionality to a working site by integrating the new components into the existing architecture.

Chapter 9: Improving Performance

Why walk when you can run? No, we won’t talk about sports cars in this chapter. Instead, we’ll analyze a few possibilities to improve the performance of the BalloonShop project.

Chapter 10: Receiving Payments Using PayPal

Your e-commerce web site needs a way to receive payments from customers. The preferred solution for established companies is to open a merchant account, but many small businesses choose to start with a solution that’s simpler to implement, where they don’t have to process credit card or payment information themselves.

A number of companies and web sites exist to help individuals or small businesses that don’t have the resources to process credit card and wire transactions, and can be used to process the payment between companies and their customers. In this chapter, we’ll demonstrate some of the functionality provided by one such company, PayPal.

Chapter 11: Catalog Administration: Departments and Categories

The final detail to take care of before launching a web site is to create its administrative interface. Although this is a part visitors will never see, it’s still key to delivering a quality web site to your client. In this chapter and the following one, you’ll implement a catalog administration page. This chapter deals specifically with administering departments and categories.

Chapter 12: Catalog Administration: Products

This chapter completes the catalog administration features by implementing product management features. Once this chapter is complete, your site administrators will be able to create products, assign products to new departments or categories, and so on.

Part 2: Phase 2 of Development: Selling More and Increasing Profits

In Part 2, you enter the second phase of development, where you start improving and adding new features to the already existing, fully functional e-commerce site.

Chapter 13: Creating Your Own Shopping Cart

With this chapter, you’ll implement the custom shopping cart, which stores its data in the local database. This provides you with more flexibility than the PayPal shopping basket, over which you have limited control and that you can’t save into your database for further processing and analysis.
Chapter 14: Accepting and Processing Customer Orders

The good news is that the brand new shopping cart implemented in Chapter 13 looks good and is fully functional. The bad news is that it doesn’t allow the visitor to place an order yet, making it totally useless in the context of a production system. As you have probably already guessed, you’ll deal with that problem in Chapter 14, in two separate stages. In the first part of the chapter, you’ll implement the client-side part of the order-placing mechanism. In the second part of the chapter, you’ll implement a simple order administration page where the site administrator can view and handle pending orders.

Chapter 15: Product Recommendations

One of the most important advantages of an Internet store, compared to a brick-and-mortar location, is the capability to customize the web site for each visitor based on his or her preferences or preferences based on data gathered from similar visitors. If your web site knows how to suggest additional products to your visitors in a clever way, they might end up buying more than initially planned. You have undoubtedly already seen this strategy in action on many successful e-commerce sites, and there is a reason for that—it increases profits. In this chapter, you’ll implement a simple but efficient dynamic product recommendation system in your BalloonShop web store.

Part 3: Phase 3 of Development: Advanced E-Commerce

In the first two stages of development, you’ll have built a basic (but functional) site, and you’ll have hooked it into PayPal for taking payments and confirming orders. In the third section of the book, you’ll take things a little further. By cutting PayPal out of the ordering process, you can gain better control as well as reduce overhead. This isn’t as complicated as you might think, but you must be careful to do things right.

Chapter 16: Creating Customer Accounts

Chapter 16 lays the groundwork by implementing a customer account system, as well as looking into the security aspects of exchanging and storing customer and credit card details.

Chapter 17: Storing Customer Orders

In Chapter 16, we added customer account management capabilities, and we’re keeping track of customer addresses and credit card information, which are stored in a secure way. However, we’re not currently using this information in our order tracking system, which was created in phase 2 of development. We currently don’t associate an order with the account of the customer that placed that order.

In this chapter, we’ll make the modifications required for customers to place orders that are associated with their user profiles. The main modification here is that the customer associated with an order will be identified by a new piece of information in the orders table, and much of the rest of the modifications will be made to use this information.

These changes will allow us to track into our database the orders placed by a particular customer, and represent a base for implementing the order pipeline and credit card transactions in the following chapters.
Chapter 18: Implementing the Order Pipeline, Part 1

Order pipeline functionality is an extremely useful capability for an e-commerce site. Order pipeline functions let us keep track of orders at every stage in the process and provide auditing information that we can refer to later or if something goes wrong during the order processing. We can do all this without relying on a third-party accounting system, which can also reduce costs.

Implementing the order pipeline is the first step we’re making for creating a professional order management system. In this and the next chapter, we’ll build our own order-processing pipeline that deals with credit card authorization, stock checking, shipping, email notification, and so on. We’ll leave the credit card–processing specifics for Chapter 20, but in this chapter, we’ll show you where this process fits into the picture.

Chapter 19: Implementing the Order Pipeline, Part 2

In this chapter, you’ll add the required pipeline sections so that you can process orders from start to finish, although you won’t be adding full credit card transaction functionality until the next chapter. We’ll also look at the web administration of orders by modifying the order admin pages added earlier in the book to take into account the new order-processing system.

Chapter 20: Credit Card Transactions

The last thing you need to do before launching the e-commerce site is enable credit card processing. In this chapter, we’ll look at how you can build this into the pipeline you created in Chapters 18 and 19 by using the DataCash service. By the end of this chapter, BalloonShop will be a fully functioning, secure, and usable e-commerce application.

Chapter 21: Product Reviews

At this point, you have a complete and functional e-commerce web site. However, this doesn’t stop you from adding even more features to it, making it more useful and pleasant for visitors. By adding a product reviews system to your web site, you increase the chances that visitors will get back to your site, either to write a review for a product they bought, or to see what other people think about that product.

Chapter 22: Integrating Amazon Web Services

So far in this book, you’ve learned how to integrate external functionality provided by PayPal and DataCash to process payments from your customers. In this chapter, you’ll learn new possibilities for integrating features from external sources through web services. Knowing how to interact with third-party web services can offer you an important advantage over your competitors. In Chapter 22, you’ll learn how to use Amazon.com functionality from and through web services.

Download the Code

The code for this book can be downloaded in ZIP file format from the Source Code section of the Apress web site. You can also find the code, errata, and other resources related to the book on Cristian Darie’s web site, at www.cristiandarie.ro/asp35-sql-server-ecommerce.