Beginning ASP.NET E-Commerce in C#

From Novice to Professional

Cristian Darie and Karli Watson

Apress®

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

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About the Authors

CRISTIAN DARIE is a software engineer who specializes in project management and web development, currently studying distributed application architectures for his PhD. Cristian has published several technical books with Apress, Packt Publishing, Wrox, and Sitepoint, and he is the manager and the former technical architect of OKazii.ro (`www.okazii.ro`), the largest e-commerce web site in Romania. You can reach Cristian through his personal web site at `www.cristiandarie.ro`.

KARLI WATSON is a technology architect at Boost.net (`www.boost.net`), as well as a freelance IT specialist, author, developer, and consultant. For the most part, he immerses himself in .NET (in particular, C#), and has written numerous books in the field for several publishers. He specializes in communicating complex ideas in a way that is accessible to anyone with a passion to learn, and spends much of his time playing with new technology to find new things to teach people about.

During those (seemingly few) times where he isn't doing the above, Karli will probably be wishing he was hurtling down a mountain on a snowboard. Or possibly trying to get his novel published. Either way, you'll know him by his brightly colored clothes.

About the Technical Reviewer

ANDREI RINEA is a senior .NET developer reaching into the architect league. He works mainly in the web development arena, but his area of expertise goes beyond that. Coming from a desktop application development background, Andrei was able to easily understand the ASP.NET paradigm, and in the end settled on MVC architectures such as Microsoft ASP.NET MVC. Andrei enjoys feedback from readers and is always glad to help you on any questions you may have regarding this book's code. He can be reached via `andrei@rinea.ro` or at his own site at `http://andrei.rinea.ro`.

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Introduction

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:

- *Beginning ASP.NET 3.5 in C# 2008: From Novice to Professional, Second Edition*, by Matthew MacDonald (Apress, 2007)
- *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.

Downloading 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`.

PART 1

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

CHAPTER 1

Starting an E-Commerce Site

During the course of this book, you'll write the code for a full-featured online store. You'll learn how to design and implement the most important features of such a project, which include a product catalog, a shopping cart, and an administrative control panel.

We plan to be very practical and concise in this book, but before moving on to writing some code, it's worth taking a little step back to make sure we're all on the same page regarding the project we're about to implement. In this chapter, we'll discuss the project as a whole and a few of the business aspects to consider before launching such a project:

- Deciding whether to go online
- Considering risks and threats
- Planning the project development

The Balloon Shop

For the purposes of this book, we'll assume that the client for whom we create this site sells themed balloons, and the company already exists as a mail-order company with a good network of customers. The web site we'll create is named BalloonShop, and it will look like that shown in Figure 1-1.

The company is not completely new to the business and wants the site to make it easier and more enjoyable for its existing customers to buy—with the goal that they'll end up buying more.

Tip You can preview the online version of BalloonShop at `http://www.cristiandarie.ro/BalloonShop`. Many thanks go to the Balloon Shop (`http://www.balloon-shop.com/`) for allowing us to use some of their products to populate our virtual BalloonShop store.

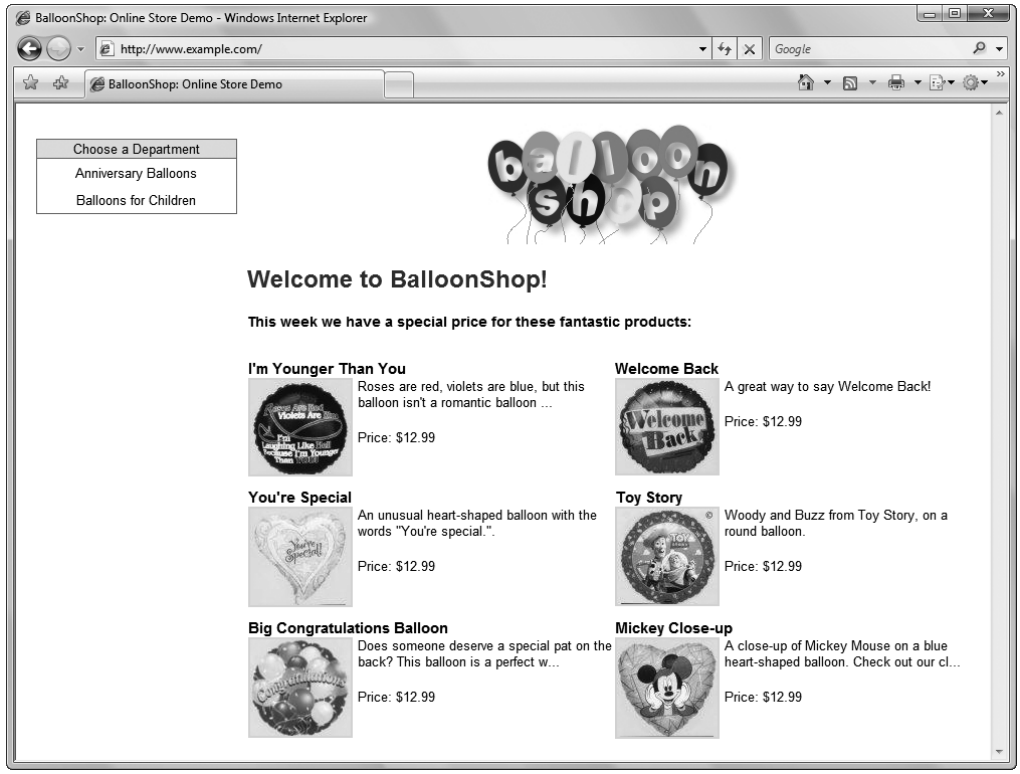

Figure 1-1. *BalloonShop during phase 2 of development*

Deciding Whether to Go Online

Creating and maintaining an e-commerce web site is less expensive than creating and maintaining a brick-and-mortar store, but it still implies a significant financial and time investment. While the risk management strategy is not your primary concern as a developer, understanding the economics of starting such a project will certainly prove helpful sooner or later.

If you want to build an e-commerce site today, you must answer some tough questions. The good news is these questions do have answers, and we're going to have a go at answering them in this chapter:

- So many big e-commerce sites have failed. What can e-commerce possibly offer me in today's tougher environment?
- Most e-commerce companies seemed to need massive investment. How can I produce a site on my limited budget?
- Even successful e-commerce sites expect to take years before they turn a profit. My business can't wait that long. How can I make money now?

Although there are hundreds of possible reasons for an offline business to go online, they tend to fall into the following motivations:

- Getting more customers
- Making customers spend more
- Reducing the costs of fulfilling orders

We'll look at each of these in the following sections.

Getting More Customers

Getting more customers is immediately the most attractive reason. With an e-commerce site, even small businesses can reach customers all over the world. This reason can also be the most dangerous because many people set up e-commerce sites assuming that the site will reach customers immediately. *It won't*.

In the offline world, you need to know a shop exists before you can go into it. This is still true in the world of e-commerce—people must know your site exists before you can hope to get a single order.

Making a web site popular is a much more complex task than it may appear to the uninitiated—and it requires extensive efforts and investment in areas such as web marketing and public relations (PR), search engine optimization (SEO), web analytics, pay-per-click campaigns, usability and accessibility research, customer support, and so on. We'll touch on some of these issues while implementing our virtual store, but we also recommend that you consult additional references if you're interested in deepening your knowledge in any of these fields.

Here are a few books that we recommend you read when you have a bit of spare time:

- *The New Rules of Marketing and PR: How to Use News Releases, Blogs, Podcasting, Viral Marketing and Online Media to Reach Buyers Directly* (Wiley, 2007)
- *Web Design and Marketing Solutions for Business Websites* (friends of ED, 2007)
- *Prioritizing Web Usability* (New Riders Press, 2006)
- *Don't Make Me Think: A Common Sense Approach to Web Usability* (New Riders Press, 2005)
- *Professional Search Engine Optimization with ASP.NET: A Developer's Guide to SEO* (Wrox, 2007)
- Web Analytics: An Hour a Day (Sybex, 2007)
- Designing Interfaces: Patterns for Effective Interaction Design (O'Reilly, 2005)

Admittedly, being a web developer, addressing these issues is not your direct concern, but widening your knowledge on collateral aspects of your day job will certainly not hurt.

Making Customers Spend More

Assuming your brick-and-mortar store already has customers, you probably wish that they bought more. What stops them? If the customers don't want any more of a certain product, there's not a lot that e-commerce can do, but chances are there are other reasons, too:

- Getting to the shop/placing an order by mail is a hassle.
- Some of the things you sell can be bought from more convenient places.
- You're mostly open while your customers are at work.
- Buying some products just doesn't occur to your customers.

An e-commerce site can fix those problems. In many cases, people with Internet access will find placing an order online far easier than any other method—meaning that when the temptation to buy strikes, it will be much easier for them to give in. Of course, the convenience of being online also means that people are more likely to choose your site over other local suppliers.

Because your site is online 24 hours a day, rather than the usual 9 to 5, your customers can shop at your store outside of their working hours. Having an online store brings a double blessing to you if your customers work in offices because they can indulge in retail therapy directly from their desks.

Skillful e-commerce design can encourage your customers to buy things they wouldn't usually think of. You can easily update your site to suggest items of particular seasonal interest or to announce interesting new products.

Many of the large e-commerce sites encourage shoppers to buy useful accessories along with the main product or to buy a more expensive alternative to the one they're considering. Others give special offers to regular shoppers or suggest impulse purchases during checkout. You'll learn how to use some of these methods in later chapters, and by the end of the book, you'll have a good idea of how to add more features for yourself.

Finally, it's much easier to learn about your customers via e-commerce than in face-to-face shops, or even through mail order. Even if you just gather email addresses, you can use these to send out updates and news. More sophisticated sites can automatically analyze a customer's buying habits to suggest other products the customer might like to buy.

Another related benefit of e-commerce is that you can allow people to browse without buying at no real cost to you. In fact, getting people to visit the site as often as possible can be valuable. You should consider building features into the site that are designed purely to make people visit regularly; for example, you might include community features such as forums or free content related to the products you're selling. Although we won't cover these features explicitly, by the end of the book you will have learned enough to easily add them for yourself.

Reducing the Costs of Fulfilling Orders

A well-built e-commerce site will be much cheaper to run than a comparable offline business. Under conventional business models, a staff member must feed an order into the company's order-processing system. With e-commerce, the customer can do this for you—the gateway between the site and the order processing can be seamless.

Of course, after your e-commerce site is up and running, the cost of actually taking orders gets close to zero—you don't need to pay for checkout staff, assistants, security guards, or rent in a busy shopping mall.

If you have a sound business idea, and you execute the site well, you can receive these benefits without a massive investment. It's important to always focus on the almighty dollar: Will your site, or any particular feature of it, help you get more customers, get customers to spend more, or reduce the costs and therefore increase your profit margins?

Now it's time to introduce the site we'll be using as the example in this book, and see just how all these principles relate to your own shop.

Making Money

In this book, we're going to build an online balloon shop. On all the e-commerce sites we've worked on, there's been a great deal of tension between wanting to produce an amazing site that everybody will love and needing to create a site with a limited budget that will make money. Usually, we're on the trigger-happy, really-amazing-site side, but we're always grateful that our ambitions are reined in by the actual business demands. If you're designing and building the site for yourself and you are the client, then you have a challenge: keeping your view realistic while maintaining your enthusiasm for the project.

This book shows you a logical way to build an e-commerce site that delivers what it needs to be profitable. However, when designing your own site, you need to think carefully about exactly who your customers are, what they need, how they want to place orders, and what they are most likely to buy. Most important of all, you need to think about how they will come to your site in the first place. You should consider the following points before you start to visualize or design the site, and certainly before you start programming:

- *Getting customers*: How will you get visitors to the site in the first place?
- *Offering products*: What will you offer, and how will you expect customers to buy? Will they buy in bulk? Will they make a lot of repeat orders? Will they know what they want before they visit, or will they want to be inspired? These factors will influence how you arrange your catalog and searching, as well as what order process you use. A shopping basket is great if people want to browse. If people know exactly what they want, then they may prefer something more like an order form.
- *Processing orders*: How will you turn a customer order into a parcel ready for mailing? How will you ship the products (for example, FedEx, UPS, or DHL)? Your main consideration here is finding an efficient way to process payments and deliver orders to whoever manages your stocks or warehouse. You must give your customers confidence in your ability to protect their data and deliver their purchases on time.
- *Servicing customers*: Will customers require additional help with products that they buy from you? Do you need to offer warranties, service contracts, or other support services?
- *Bringing customers back*: How will you entice customers back to the site? Are they likely to only visit the site to make a purchase, or will there be e-window shoppers? Are your products consumables, and can you predict when your customers will need something new?

After you've answered these questions, you can start designing your site, knowing that you're designing for your customers—not just doing what seems like a good idea. Determining the answers to these questions also helps ensure that your design covers all the important areas, without massive omissions that will be a nightmare to fix later.

The example presented in this book takes a deliberate generic approach to show you the most common e-commerce techniques. To really lift yourself above the competition, however, you don't need fancy features or Flash movies—you just need to understand, attract, and serve your customers better than anybody else. Think about this before you launch into designing and building the site itself.

Considering the Risks and Threats

All this might make it sound as if your e-commerce business can't possibly fail. Well, it's time to take a cold shower and realize that even the best-laid plans often go wrong. Some risks are particularly relevant to e-commerce companies, such as

- Hacking and identity theft
- Credit card scams
- Hardware failures
- Unreliable shipping services
- Software errors
- Changing laws

You can't get rid of these risks, but you can try to understand them and defend yourself from them. The software developed in this book goes some way toward meeting these issues, but many of the risks have little to do with the site itself.

An important way to defend your site from many risks is to keep backups. You already know backups are important; however, if you're anything like us, when it gets to the end of the day, saving five minutes and going home earlier seems even more important. When you have a live web site, this simply isn't an option. Coding with security in mind is also essential. In this book, you'll learn how to protect yourself by implementing a good error-handling strategy and validating user input. Using SSL (Secure Sockets Layer) connections is vital for securing sensible pages, such as the ones that contain credit card data, and we'll cover this as well.

We haven't talked much about the legal side of e-commerce in this book because we're programmers, not lawyers. However, if you're setting up an e-commerce site that goes much beyond an online garage sale, you'll need to look into these issues before putting your business online.

While we're on the subject of risks and threats, one issue that can really damage your e-commerce site is unreliable order fulfillment. An essential part of the processes is getting the products delivered. To do this, you need a good logistics network set up before launching your shop. If your store doesn't deliver the goods, customers won't come back or refer their friends.

Designing for Business

Building an e-commerce site requires a significant investment. If you design the site in phases, you can reduce the initial investment, and therefore cut your losses if the idea proves unsuccessful. You can use the results from an early phase to assess whether it's worthwhile to add extra features, and even use revenue from the site to fund future development. If nothing else, planning to build the site in phases means that you can get your site online and receive orders much earlier than if you build every possible feature into the first release.

Even after you've completed your initial planned phases, things may not end there. Whenever you plan a large software project, it's important to design in a way that makes unplanned future growth easy. In Chapter 2, where we'll start dealing with the technical details of building e-commerce sites, you'll learn how to design the web site architecture to allow for long-term development flexibility and scalability.

If you're building sites for clients, they will like to think their options are open. Planning the site, or any other software, in phases will help your clients feel comfortable doing business with you. They will be able to see that you are getting the job done, and they can decide to end the project at the end of any phase if they feel—for whatever reason—that they don't want to continue to invest in development.

Knowing the Client

As specified earlier, the client already exists as a mail-order company and has a good network of customers. The company is not completely new to the business and wants the site to make it easier and more enjoyable for its existing customers to buy—with the goal that they'll end up buying more.

Additional business requirements to take into consideration are

- The company is unlikely to get massive orders initially, so you should keep the initial cost of building the web site down as much as possible.
- The company is accustomed to manually processing mail orders, so manually processing orders emailed by a third-party payment processor such as PayPal will not introduce many new problems.
- The company doesn't want to invest all of its money in a massive e-commerce site only to find that people actually prefer mail order after all! Or, after phase 1, the company might realize that the site already meets its needs and there's no reason to expand it further. Either way, you hope that offering a lower initial cost gives your bid the edge. (It might also mean you can get away with a higher total price.)
- Because this company is already a mail-order business, it probably already has a merchant account and can process credit cards. Thus, moving away from PayPal and implementing a custom credit card–processing mechanism as soon as possible would be best for this company so it can benefit from the preferential card-processing rates.

To best address the business requirements of our client, we come up with a plan that consists of three large development and deployment cycles. The first stage will focus on getting the web store up and running as fast as possible. Only the essential features will be included.