



Commercializing the Internet

"Show me the money!"

—Cuba Gooding, Jr. "Jerry Maguire"



In this chapter, you will learn how to:

- Define e-commerce, describe the demographics of who is using it, and compare e-commerce to traditional commerce.
- List the technological components required for e-commerce to take place over the Internet securely and define the features of electronic data interchange (EDI) and secure electronic transactions (SET).
- Define the payment models for collecting money when people buy things or when companies transact business online.
- Differentiate the types of e-commerce solutions appropriate for various kinds of large and small businesses.
- Define the concept of an inhouse e-commerce solution, list the stages involved in managing the development of a successful e-commerce project, and define the project management principles of scheduling, budgeting, evaluating risks, preparing contingency plans, preventing scope creep, defining roles, piloting, reporting, and cutover.
- Differentiate the roles that licenses, trademarks, copyrights, and patents play in regulating e-commerce projects on the Internet.
- List the issues involved in trading internationally over the Internet.

HE commercialization of the Internet requires us to revise the old adage that life has only two inevitabilities—death and taxes. E-commerce is fast becoming just as inevitable. When this book went to press, for example, there were already 70 million online customers. By the time you read this, that figure will be well on its way to becoming 700 million and could reach 7 billion by the next millennium. Anyone who plans to be in business during the twenty-first century must come to grips with e-commerce and develop a plan for conducting business online.

Deciding how to architect your e-commerce infrastructure is one of the most important decisions you will ever make. Hundreds of e-commerce service providers present you with options to consider. How can you tell them apart? How do you know which vendors to trust? Should you adopt an instant storefront solution that does everything for you, or should your company undertake to develop a customized in-house e-commerce application? What kinds of customization are possible, and how do you go about managing this kind of project development? How can a multi-tiered application strategy help you streamline this development by taking advantage of business-to-business Web services that are already online? What legal challenges will you encounter related to copyrights, trademarks, and patents?

This chapter prepares you to answer these vital questions by teaching you the underlying technologies that enable e-commerce to happen over the Internet. After studying the basic kinds of e-commerce models businesses are using online, you will understand how these models break down into a series of components. Some of these components are essential for any kind of online business. First, customers must be able to find out what you have for sale. Second, customers must have a way to weigh the relative merits of these products. Third, you need to keep track of what the customers decide to buy. Fourth, you must conduct the financial transaction through which the customer will pay for the purchases. Fifth, you fulfill the order. Sixth, you keep careful records of your users' browsing and buying habits that you can analyze to determine how to improve your business.

Throughout this process, keeping customer information secure is paramount. The last thing you want is to have your customer database hacked. This chapter presents best-practice strategies the computer industry is using to accept online payments and keep electronic transactions secure. A case study, later in this chapter steps you through a turnkey solution offered by the world's largest e-commerce provider.

efining E-Commerce

Electronic commerce (e-commerce) is the integration of digital communications, data management, and security capabilities that allow organizations to exchange information related to the sale of good and services. The three elements of e-commerce are (1) digital communications, which support the transfer of data between the buyer and the seller; (2) data management, whereby the trading partners exchange information through a common digital language; and (3) security, which guarantees the authenticity, integrity, and privacy of the transactions.

In the most common scenario, a shopper browses an online catalog and selects items to purchase. Online stores typically use the metaphor of a **shopping cart**, which is the virtual basket into which the customer places each item selected for purchase. At any time, the customer can review the contents of the shopping cart and add or subtract items from the pending sale. When the customer finishes shopping, another metaphor comes into play: the **checkout**, which is the process of paying for the merchandise and any related shipping costs. During the checkout process, the customer typically selects from a variety of shipping methods, which may include regular mail or various express delivery options, depending on the product.

After the shipping costs have been determined, the final cost is computed, and the customer is presented with a choice of payment options. Once again, traditional metaphors come into play. In the cash model, digital cash or e-cash is a payment method whereby customers pay for the product via tokens drawn from a digital wallet. Like the serial numbers on printed money, these tokens are digital certificates that represent a specified sum of real money drawn from the customer's bank account. To date, however, the digital cash payment method has not gained the popularity hoped for by those who conceived it. The most popular payment option is the credit card, such as the customer's Visa, MasterCard, or American Express card. Using credit cards over the Internet can be risky, however. Unless the vendor is using the best-practice methods of Internet security presented in Chapter 13, it is possible for hackers to sniff the packets as they wind their way over the Internet. Security best practices are also needed to prevent hackers from accessing customer information stored in the vendor's back-office system. Digital cash avoids this risk because, like the printed currency from which this metaphor arose, the serial number cannot be traced back to the individual who paid the money. It is also possible to pay with a **digital check**, which is a token transmitted from your digital checkbook. As with a printed check, the merchant does not get paid until the digital check clears your bank.

Most online vendors do not ship the products until the customer has paid. Because the transactions are occurring online, however, the digital check-clearing or credit card processing occurs very fast. Indeed, credit card processing is an online business to begin with.

Who is Using E-Commerce?

The United States Department of Commerce began to report statistics on e-commerce in the fourth quarter of 1999, when 0.69 percent of retail sales occurred online. Within four years, that percentage nearly tripled to 1.52 percent in the third quarter of 2003. The top applications were nonstore retailers and mail-order houses who conducted 75 percent of their business online and the automotive parts industry, which made 15 percent of its sales online.

According to a poll taken in 2003 by the Direct Marketing Association, there are some demographic differences in terms of the ages at which users shop online. Table 4-1 shows that the highest incidence of online shopping occurs between the ages of 25 and 34, when 61 percent buy products online, while only 14 percent of users over the age of 65 shop online. Look for this elderly percentage to rise as the general population continues to age and the baby boomers enter the 65+ age bracket.

The Different Kinds of E-Commerce

Two models define the basic forms e-commerce can take. The **business-toconsumer (B2C)** model occurs when an end-user buys something from a company's online storefront. This kind of sale normally occurs for single products that are sold at a retail price. The second basic form of e-commerce is the **business-to-business (B2B)** model: transactions that occur when companies conduct business electronically between themselves. B2B sales typically have a high volume in which many products are purchased at once for a wholesale price. These two models can also be combined into a B2B2C situation in which a consumer purchases a product ostensibly in a B2C model; behind the scenes, however, the online retailer uses a B2B transaction to obtain the item from a wholesaler. Hence the acronym, B2B2C.

Age	Percent Who Shop Online
18–24	59%
25–34	61%
<mark>35–44</mark>	57%
<mark>45–54</mark>	<mark>48%</mark>
<mark>55–64</mark>	41%
<mark>65+</mark>	14%
Source: 2003 poll by the Direct Marketing A	ssociation's Shop-at-Home Information Center
TABLE 4-1 Online Shopping Tende	ncies by Age Group 📕

Business-to-Consumer (B2C)

The B2C model is the form of e-commerce that end-users experience when they buy a product online. Figure 4-1 shows the seven steps typically involved in the B2C process. First, the customer visits an online store and browses the products available for sale. After putting the desired products into a virtual shopping cart and selecting a shipping and payment method, the customer places the or-





der. Second, the online store sends the customer an e-mail verification that the order has been received. I recommend that you save e-mails from your online shopping in an e-mail folder. I save my online shopping correspondence, for example, in an e-mail folder called shopping. Chapter 3 contains detailed instructions for creating this kind of an e-mail folder.

Steps 4–6 occur on the merchant side of the B2C model. The online store sends an e-mail message notifying the merchant that your order has been received. If the merchant accepts the order, the store processes the customer's payment. Throughout this process, both the customer and the merchant can use their browsers to view the status of the order. When the product finally ships in step 7, most online stores send an e-mail message notifying the customer of the product's estimated arrival date and linking to tracking tools, such as FedEx or UPS tracking. Many of the steps on the merchant side of the B2C model can be automated. The merchant can set an option, for example, that automatically accepts orders from financially qualified customers.

Business-to-Business (B2B)

The B2B model describes transactions that happen electronically between businesses. Using the Internet as the communications medium, any company in the world can transact business with any other company, provided they recognize each other as online trading partners and provide B2B access to each other's computers. Figure 4-2 illustrates the typical scenario, in which businesses use B2B communications to list products, highlight new products, query inventories, handle potential sales leads, negotiate pricing, place orders, arrange for shipping, and handle customer complaints.



FIGURE 4-2

The Business-to-Business (B2B) model describes the kind of e-commerce in which companies exchange information and buy products and services from online business partners. Businesses that recognize each

other as online trading partners can provide access to one another's computers. Each business's firewall blocks communication from unauthorized sources.

nabling E-Commerce Technologies

The underlying technologies must address three critical elements of e-commerce: communications, security, and data management.

- Communications The communications must use a common digital language that can be understood by the computers involved in the transaction. EDI, SET, and UDDI are three such languages that are achieving widespread adoption. These languages are described in the next part of this chapter.
- Security The security of these communications must follow the necessary safeguards to build the trust consumers need to feel confident in trading online. Secure Socket Layer (SSL) technology ensures that information packets exchanged over the Internet cannot be sniffed by unauthorized parties. Added encryption such as PGP and GNUGP can provide further security. Online business

partners can enforce server- and client-side authentication by using X.509 certificates. Chapter 13 covers these kinds of security measures in detail.

Data management The data exchanged in B2C and B2B transactions must be stored in such a way that e-commerce transactions can be audited and can recover from outages that may occur during power or equipment failures. Chapter 12 covers the relational database technology that makes this possible.

Electronic Data Interchange (EDI)

In 2003, according to the U.S. Department of Commerce, 88.3 percent of all wholesale B2B e-commerce transactions occurred over **electronic data interchange (EDI)**, which is the computerized exchange of business information between trading partners over computer networks. This information can include purchase orders, invoices, shipping schedules, inventory inquiries, claim submissions, or any other kind of information the trading partners need to exchange.

Prior to the invention of the Web, trading partners did their EDI over value-added networks (VANs) that were created by setting up direct links over dedicated communication lines between their computers. Because these VANs tended to be industry specific, different flavors of EDI evolved for specific industries. The heaviest users of EDI were health-related wholesalers of drugs and medical supplies and automotive and commercial equipment suppliers.

Now that the Web is enabling all businesses to interact with each other over the Internet, EDI is being standardized across industries. Known as the X12 standards, the EDI protocols are coordinated by the X12 committee that the American National Standards Institute (ANSI) created in 1979. The Internet Engineering Task Force (IETF) has an EDI Internet working group called EDIINT that has created ways for companies to communicate in X12 securely over the Web's hypertext transfer protocol (HTTP).

In 2003, the world's largest retailer, Wal-Mart, adopted the Applicability Statement 2 (AS2) method of implementing the EDI Internet standards. AS2 is a real-time EDI that uses 128-bit encryption with digital signatures, enabling businesses to transact B2B securely over HTTP. Wal-Mart's adoption of AS2 is causing thousands of trading partners to transition their legacy EDI networks over to the new Web EDI standard. By the time you read this, all these trading partners will be using Web EDI to conduct their B2B transactions over HTTP.

These companies are using EDI to accomplish the following three goals:

- Saving cost By standardizing and simplifying the process of electronic data interchange, companies save time and reduce costs. This is especially important at a time when profit margins are small.
- Reducing errors Streamlining the transactions into a common protocol eliminates translation errors.

• Speeding up Thanks to higher efficiency, transactions take less time and business is more efficient.

Secure Electronic Transactions (SET)

Developed by MasterCard and also adopted by Visa, the secure electronic transactions (SET) specification is an open standard for conducting secure payment card transactions over the Internet. Digital certificates create a trust chain that verifies cardholder and merchant validity throughout the transaction. To display the SET Mark on their products, e-commerce vendors must pass SET Compliance Testing, which ensures that the software is following the required security best practices. In addition to using certificates, which enforce server and client side authentication, the SET protocol uses cryptography to prevent unauthorized users from sniffing the confidential information transmitted in packets across the Internet.

Cardholders and merchants obtain their SET certificates from financial institutions, which get them from a Certificate Authority (CA). The certificates are electronic documents that enable an institution to determine whether a given encryption key belongs to the individual or entity that is purporting to own it. The SET environment establishes a hierarchy of CAs that extends all the way to the SET Root CA that is owned and operated by SET Secure Electronic Transaction LLC. Chapter 13 teaches you more about encryption and digital certificates, also referred to as Digital IDs and Electronic Credentials.

Another advantage of SET is that merchants never see the purchaser's credit card number. When it comes time to pay, the merchant directs customers to their financial institutions, which process the credit cards and inform the merchant that the payment succeeded or failed. In addition to handling payments, SET also contains methods for credits, returns, chargebacks, and reversals if a product is not available.

For more information about SET, go to www.setco.org.

XML Web Services

A **Web Service** is a software system that uses an XML protocol to support interoperable machine-to-machine interaction over a network. One of the greatest advantages of a Web Service is that the computers do not need to be programmed in the same language. Applications written in COBOL, for example, can use XML Web Service protocols to communicate with servers programmed in C#, Java, or Visual Basic. Because the communication takes place in XML, the computer does not even need to know what language the other process was written in. Because of this flexibility, all the major players in the IT industry have embraced XML Web Services, which are fast becoming the world's e-commerce infrastructure.

The World Wide Web consortium coordinates the development and standardization of the programmatic interfaces that enable Web Services to communicate with each other. For the latest news, go to www.w3.org and follow the link to Web Services.

Universal Description, Discovery, and Integration (UDDI)

Universal Description, Discovery, and Integration (UDDI) is an online yellow pages directory of Web Services that business computers can use to discover and learn how to use the B2B services offered by various companies over the Internet. UDDI is important because it is a cross-industry effort to address the interoperability problems that are limiting the growth of e-commerce. Figure 4-3 illustrates the four components of UDDI. Stage 1 is a directory service that registers Web Services intended for public consumption. Stage 2 is called discovery and is a process through which a Web Service announces its availability and tells where to find its XML service description. In stage 3, the client obtains this service description, which identifies the methods and protocols the client can use to make requests of the Web Service. In stage 4, the client uses the HTTP wire format to post the XML request and receive the XML response from the Web Service.

Trading partners who want secrecy can run a private UDDI directory that is not visible to unauthorized clients. To learn more about UDDI, go to www.uddicentral.com.

Web Service Description Language (WSDL)

The **Web Service Description Language (WSDL)** is an XML language for identifying the methods in a Web Service, defining how those methods



(3) description, and (4) wire format.

behave, and instructing clients how to interact with the service. The filename extension for documents written in the Web Service Description Language is .wsdl. Every published Web Service has a WSDL file describing what the service does and how to interact with it.

Simple Object Access Protocol (SOAP)

The **Simple Object Access Protocol** (SOAP) is an XML language for exposing the methods and properties of a Web Service to a consumer, which is any Web client authorized to interact with the Web Service. The consumer can be, and often is, another Web Service. Because the SOAP messages can use the Web's HTTP protocol, SOAP can be used anywhere the Web is, which is essentially everywhere. The W3C is in charge of coordinating work on the SOAP language. To learn more about it, go to www.w3.org and follow the link to SOAP.

Microsoft has integrated Web Service development capabilities throughout Visual Studio .NET, which is Microsoft's premier application

Try This!

Exploring Amazon.com's XML Web Services

E-commerce industry leader Amazon.com has integrated XML Web Services throughout its enterprise. Anyone can apply for a free developer's token that identifies who you are when you use that token to access Amazon's Web Services. A Web site developer can, for example, query the Amazon catalog, advertise products for sale, and earn referral fees for sales driven through links to purchase these products from Amazon. Third-party sellers can use Web Services to manage their inventory at the Amazon site and download the latest product information to ensure that these products are competitively priced. There are some exciting demonstrations of Web Services in action at the Amazon site. To peruse these demos, follow these steps:

- 1. Go to www.amazon.com/webservices and read the opening paragraph in which Amazon states its vision for Web Services.
- **2.** Look for a link to click to apply for a developer token. You do not need to click that link unless you are a developer and you really want an Amazon token. You do not need a token for this exercise.
- **3.** Scroll down the page and read about the different ways in which Web developers and businesses can use Amazon Web Services.
- 4. Follow the links to the featured applications. When I did this, one of the featured applications was iPilot.net, where there was a fascinating demonstration showing how you can hang the iPilot scanner on your keychain to take along with you when you go shopping in a traditional store. Whenever you find a product you like, you use the iPilot to scan the product's barcode. Then you beam the scans to your mobile PDA or desktop computer to upload your selections to your live Amazon seller's page, which shows the latest competitive offerings of the products you scanned. If this demo still is online at iPilot.net, follow the link to run the demo, which is fascinating.
- 5. In the Tools section of the Amazon Web Services page, follow the links to explore the various Amazon Web Services tools. Most of these tools are for Web developers. At this point in your studies, you are not expected to download and use any of these tools. Instead, simply read the descriptions of what the various tools do. This will get you started thinking about some of the possibilities Web Services might play in future e-commerce ventures of your own.

development suite. The tools in Visual Studio make SOAP transparent to the developer. Visual Studio automatically creates the SOAP messages needed for your Web Service to communicate over the Internet. My book *Advanced Web Design* contains a step-by-step tutorial in creating Web Services with Visual Studio.

Processing Payments Online

There are three main e-commerce payment models: cash, check, and credit cards. Each of these payment models is based on a metaphor that is very familiar to mass-market consumers. A fourth model called the smart card is emerging in an attempt to bolster security and add functionality to transactions made with cards. The goal of these four models is to enable a merchant to receive payment from a customer in return for some product or service that the merchant has provided. Besides connecting customers to merchants, however, the Internet also makes it possible for people to communicate directly with each other. When customers begin transacting directly with each other, a customer-to-customer (C2C) model emerges that enables online users to bypass the storefronts and pay each other directly for goods or services that people want to sell to each other.

The following sections will discuss the relative merits of these online payment models. We begin with the three primary models, which are cash, check, and credit cards.

Cash Model

The cash model uses the metaphor of a digital wallet residing on the customer's computer. The digital wallet contains digital cash or tokens with which the customer pays for goods and services purchased online. From the vendor's perspective, the primary advantage of the cash model is that the merchant receives instant payment. The main customer advantage is that you can pay for products online without having to provide the vendor with your credit card number.

Formerly known as digicash, the electronic cash model is now called eCash. It is a legal form of online currency that you can pay for by credit card, check, or money order. Sites you can visit to see eCash in action are www.cryptologic.com/ecash and www.ecashdirect.co.uk. For other sites, search Google or Yahoo! for *eCash*.

Check Model

The check model uses the metaphor of a digital checkbook residing on the customer's computer. This checkbook contains digital checks with which the customer can pay for goods and services online. As in the cash model discussed earlier, the main customer advantage is that you do not need to provide the vendor with your credit card number. The vendor, however, does not receive payment instantly, because the check still needs to clear your bank before the vendor gets paid. Because the vendor can cash a digital check electronically, however, checks clear much more quickly online than in a paper-based system.

The digital checkbook model is especially appropriate for paying bills online. If you are still paying your bills via printed checks, do yourself a favor and begin using a digital checkbook service. To learn more, go to www.checkfree.com, a digital checkbook service that powers the online payment services at the U.S. Postal Service, Bank of America, NetBank, Charles Schwab, SouthTrust, SunTrust, U.S. Bank, USAA, and Wells Fargo. A good place to see this technology in action is at www.usps.com/ paymentservices. For other digital checkbook sites, search Google or Yahoo! for *payment service*.

Credit Model

The credit card model is well established both in traditional commerce and on the Web. If you think about it, credit card processing was already electronic from the point at which the sales clerk swiped your card. What e-commerce has done is to enable you to enter your card number by typing it into a Web form instead of swiping your card through a store's card reader.

Every consumer needs to beware of the risk of having your credit card number hacked as part of an unauthorized break-in to a merchant's computer. Every online merchant has the responsibility to employ the bestpractice security methods described in Chapter 13. If the online merchant is using SSL, HTTPS, and the digital certificates in Chapter 13, you can be confident that your credit card number will not get revealed to crackers who may be trying to sniff the packets your computer exchanges with merchants. If a merchant stores your credit card number in a database, however, a cracker could break in and obtain access to your confidential records on the merchant's computer.

Such a break-in occurred at America Online during the summer of 2000, for example, when more than 500 screen names were hacked, along with their owner's names, addresses, and the credit card number under which their AOL account was opened. Since then, AOL has taken steps to minimize or eliminate the possibility of such a hack from recurring. In February 2003, however, cardcops.com reported that a hacker broke into a DPI database containing around eight million Visa, MasterCard, and American Express credit card numbers. DPI is one of the companies that process credit card transactions. All three of these credit card companies notified their customers that they would automatically be credited for any unauthorized purchases. The FBI launched an investigation, and you can bet that DPI shored up this vulnerability. Anyone who understands the nature of computers, however, knows that weaknesses must still exist out there somewhere. That is why consumers need to keep a careful watch on their credit card statements and report suspicious activity promptly.

To reduce the cracker's payoff for hacking into credit card databases, some banks offer single-use credit card numbers whereby the customer has a different credit card number for each purchase. To learn more about this, search Google or Yahoo! for *single-use credit card*.

Smart Card Model

A smart card is a credit-card sized plastic card with an embedded computer chip and memory that can store digital information. Because the computer chip can handle digitally signed and encrypted transactions whenever the card is used, the smart card enables the cardholder to take advantage of the best-practice security measures you will be studying in Chapter 13. Moreover, the smart card typically has about 4 megabytes of storage, which is more than a hundred times as much as the magnetic strip on a credit card. Another advantage of the smart card is that its computer chip can handle currency conversions when purchases involve international transactions.

The Smart Card Alliance is on the Web at www.smartcardalliance.org. MasterCard, Visa, IBM, and Bank of America serve on the Alliance's leadership council, and several branches of the U.S. government belong to the Alliance. The Federal Aviation Administration, the General Services Administration, and several transit authorities belong as well. Electronic passports and next-generation phone services are among the applications that are emerging for smart cards.

One of the key partners on the smart card leadership council is Oberthur Systems, the world leader and number-one supplier for Visa and MasterCard payment cards. Oberthur has created a megabyte Subscriber Identity Module (SIM) card for mobile phones, thereby setting the stage for third-generation (3G) mobile phones to become e-commerce clients. Although SIM cards are an essential component of all mobile phones, previous SIM cards have not contained enough memory to serve as mobile smart cards. Look for the megabyte SIM to power the convergence of e-commerce with mobile phones. For more on this and other emerging smart card applications, go to www.smartcardalliance.org or search Google or Yahoo! for *smart card*.

Person-to-Person Payment Model

In 1998, a company called PayPal started a person-to-person payment model that enables any individual or business with an e-mail address to send and receive payments online. This model became so popular at the eBay auction site that eBay acquired PayPal in 2002. When customers use PayPal to buy and sell products from each other, a **customer-to-customer** (C2C) form of e-commerce emerges. PayPal's popularity led to its winning the Webby People's Voice Award for Best Finance Site in 2003. When this book went to press in 2004, PayPal had 35 million account members worldwide. In addition to enabling eBay buyers and sellers to transact business directly with each other, PayPal has become popular as a payment method for online retailers and offline businesses, which need only an e-mail address to participate.

PayPal enables you to pay money to anyone who has an e-mail account, even if they do not have a PayPal account. The buyer, however, must have a PayPal account. To get a PayPal account, you go to www.paypal.com and fill out a form to register. As part of the registration process, you choose whether to pay for purchases via credit card, debit from a bank account, or stored balance.

PayPal makes its money by charging sellers a percentage of the transaction as a processing fee. The charge for most purchases is either 2.2 percent plus thirty cents to 2.9 percent plus thirty cents per transaction, depending on volume. There is also a micro-payment processing fee that enables high-volume online digital music companies to sell downloads at a charge of 2.5 percent plus nine cents for each transaction.

The HTML coding needed to put a PayPal payment button at a Web site is relatively straightforward. One of the step-by-step exercises in Chapter 7 walks you through the process of creating a PayPal "Buy Now" button.

hoosing an E-Commerce Solution

There are two basic ways to go about setting up an e-commerce site. You can either develop your own or you can use an **instant storefront**, which is a preprogrammed e-commerce system into which you enter your catalog of products and begin conducting business online. The advantage of the instant storefront is its timeliness. Because the instant storefront is preprogrammed, everything is already set up for you. If a problem arises in the back-end processing at an instant storefront, the responsibility for fixing that problem vests in your instant storefront provider. If you develop your own e-commerce solution, on the other hand, the problem is yours to fix. Depending on your technical skills, this may be an advantage in that you might be able to fix the problem sooner than the instant storefront provider. On the other hand, if the glitch causes your customers to lose large sums of money, you may wish you had never decided to roll your own solution.

Instant Storefronts

Instant storefront solutions come in two kinds, namely, online and offline. In an online instant storefront solution, you do all your development online. In an offline solution, you develop the storefront on your PC and upload it for delivery on the Web. Many instant storefront vendors offer both online and offline solutions.

Searching Google for the keyword "storefront" brings up dozens of sponsored instant storefront solutions. The slogans hype the instant storefront advantages. The following are some typical catchphrases:

- In just 5 minutes you'll be selling online www.shoppingcartsplus.com
- Anyone can create an ecommerce Storefront in minutes using the Storefront Wizard—www.storefront.com
- Everything you need to sell online, only \$19.95 per month www.ThriftEstore.com
- Low cost ecommerce shopping cart, no programming www.aacard.com

- We charge, you deliver—www.kagi.com
- Putting e-commerce in your control—www.digibuy.com

These claims are mostly true. If you select a good instant storefront solution, you can be selling products online very quickly and easily, although five minutes may be a stretch. Anyone who is considering the adoption of an e-commerce solution will spend more than five minutes analyzing the relative costs and features of the various systems.

If you have a very small business and you want a quick solution, it is a no-brainer to go with one of the industry leaders such as Microsoft bCentral, Amazon, or Yahoo! These companies offer instant storefront solutions that are backed by some of the largest companies in the industry. You can rest assured that by adopting one of the frontrunners, you will have the industry's best practices working for you in the background. If you shop around, on the other hand, you may be able to find a less wellknown storefront that costs you less and still offers the reliability and security your business requires. Just beware that if problems arise, an industry leader may be quicker to solve them than smaller outfits.

Auctions

Industry leader eBay has made it as easy as 1–2–3 to buy goods at an online auction over the Internet. In step 1, you search or browse for the item you are looking for. In step 2, you buy the item or place a bid. A "buy it now" option lets you purchase the item instantly. If you place a bid, on the other hand, eBay bids for you, up to the limit you specified. In step 3, you pay for the item when eBay sends you an e-mail message explaining how to pay the seller. Most sellers accept PayPal, which is free for buyers. Many sellers also accept payment by check or money order.

There are many online auctions besides eBay, such as auctions.yahoo .com, creativeauction.com, and auctionaddict.com. For more, see internetauctionlist.com or search Google or Yahoo! for *auctions*.

Case Study: Microsoft bCentral Commerce Manager

I own a small business called Serfsoft Corporation, which markets an eLearning solution called Serf. When customers began asking for a way to purchase products online, I decided to add a storefront page to the serfsoft.com Web site. Time was of the essence, because any time spent fussing with e-commerce details would be time taken away from developing Serf and writing books. To provide customers with a secure storefront, I wanted to go with an industry leader that is employing best practices on the Internet.

I developed the serfsoft.com Web site with Microsoft FrontPage, which is the Web authoring program in Microsoft Office. While considering the various instant storefront alternatives, I discovered the Microsoft bCentral e-commerce add-in, which adds to FrontPage a toolbar for creating an instant storefront. Deciding to use bCentral became a no-brainer, **note** By using Serf as the example in this case study, I am not attempting to interest you in buying the Serf product. Rather, the purpose is to provide a working example of what it is like to set up an instant storefront.

note SKU stands for **stockkeeping unit**, which is a unique alphanumeric code you assign to each because (1) it could snap right into the existing site and (2) it is backed by Microsoft, the world's largest developer of e-commerce solutions.

This case study takes you on a guided tour of the steps I went through in adding a bCentral instant storefront to the Serfsoft site. You can visit the storefront by going to www.serfsoft.com and following the link to the online store. Feel free to browse the product catalog and put items into your shopping cart. As long as you do not click the Purchase button, you will not be committed to buying anything. Thus, you can follow along at the site as you read the following case study, which shows you what it is like to create an instant storefront.

Setting Up a bCentral E-Commerce Account

Microsoft bCentral's e-commerce product is called Commerce Manager. When I got my Commerce Manager account, bCentral was charging an annual fee of \$249 or a monthly fee of \$24.95 beginning with a 30-day free trial. I chose the annual fee, which saves \$50 per year as compared to the monthly cost. If you would like to try bCentral before committing to spending anything, on the other hand, you can step through this case study and choose the 30-day free trial option.

To get a bCentral E-commerce account, you go to www.bCentral.com and follow the link to E-commerce. Figure 4-4 shows how you click the option to sign up for either the monthly or the annual plan. You are then guided through a series of screens that prompt you for information required to set up your account. Later on, if any of this information changes, you can edit your settings via the controls on the Commerce Manager menu.

Creating a Product

You keep your product catalog online at the bCentral Web site. To add a product to the catalog, you log on to your bCentral account, choose Commerce Manager, click Product Catalog, and choose the option to add a new product. Figure 4-5 shows how the Add Single Product screen consists of sections that let you enter the standard product information, set shipping charges, upload product images, define the product's details, and add product options. When you fill in the standard product information, be sure to include the product's name, summary, SKU, and price.

Every product in your catalog must belong to a department. By default, products are entered in the top-level department. If you click to change or edit the department, a special window opens for managing your departments. At my storefront, for example, I have two departments, one for nonprofit academic customers and one for businesses.

When you click to add an image, a Select Images window opens to help you select or upload an image to depict this product in your catalog. You should provide an image for each product.

If your product has special options that the customer needs to choose for example, the color or size of the desired product—click the link to *Add*



product options. This causes a special window to open where you can add options.

When you finish filling out the Add Single Product form, click Save to enter this item into your catalog. If you ever need to change this information, choose the View/Manage Products option in the Products section of the Commerce Manager.

Choosing a Marketplace

A marketplace is a virtual trading area in which products are listed for sale. After you create your product catalog at bCentral, you need to select at least one marketplace in which your products will be listed. One of the options is to make your FrontPage Web site a marketplace. I chose this option because my business's Web site is a FrontPage site. There are other marketplaces, however, where you can list your products without needing to host your own Web site. These include the Product Gallery, the MSN



Marketplace, the bCentral marketplace, and the eBay auctions. Figure 4-6 shows how I chose to list my products in these marketplaces.

Installing the FrontPage E-Commerce Wizard

Remember that I chose bCentral because of the E-Commerce Wizard that can create automatically at a FrontPage Web site a product catalog that customers can browse to buy products online. To download this wizard, you go to www.bcentral.com and search for FrontPage Wizard. This brings up a link to the bCentral Commerce Manager Add-In for FrontPage customers. I followed the onscreen instructions to download and install this add-in.

🗿 Commerce Manager - Products & Images - Microsoft Internet Explorer <u>File Edit View Favorites Tools</u> Help (bCentral Sign Out_{net} Products & Services News & Resources **My Business** Help ▼ My Products 🗆 Commerce Manager Products & Images Account Overview Overview Products Images Orders Manage Products Add Single Product Download Product Data Upload Multiple Products Manage Depts. Reports **Current view: All products** Products & Images Marketplaces Settings Learning Center go Search: Name SKU Picture Buy more products Academic Annual Serf License SAEL \checkmark \checkmark \checkmark \checkmark view Student Ticket SAST ~ \checkmark ~ \checkmark view Commercial SACL \checkmark \checkmark \checkmark Annual Serf License view \checkmark SCST Student Ticket \checkmark \checkmark \checkmark \checkmark view Delete About bCentral | Customer Service | Terms of Service | Advertise | Privacy Statement | Help Copyright© 2003 Microsoft Corporation All Rights Reserved

FIGURE 4-6

At Microsoft bCentral, the Manage Products page lets you select the products you want to list in various marketplaces. I chose to list all my products in the gallery, FrontPage, MSN, and bCentral marketplaces. A nice feature of the gallery is that it creates an instant

storefront to which you can send customers even if your company does not have a Web site.

Running the Wizard

The simplest and most rewarding part of the bCentral process is running the wizard. To run the wizard, you click the E-commerce icon on the E-commerce toolbar pictured in Figure 4-7. When the wizard runs, it prompts you to log on to bCentral. Automatically, the wizard takes a look around and prompts you to do anything you may not have done yet at your bCentral account. If you have not yet listed your products in a marketplace, for example, you will be prompted to do so.

Last but not least, the wizard asks you to

select the departments you want in your FrontPage catalog. Figure 4-8 shows that I chose not to select the top level, because all my products are in either the academic or commercial departments. When you click Next, the





to insert lists, fields, images, and links to any product in the

company's bCentral account. Clicking the Wizard icon at the end of the toolbar creates the FrontPage catalog pages and synchronizes them with any updates the business may have made in its bCentral account.

	Academic List - N	icrosoft Internet Explorer <u>a</u> vorites <u>T</u> ools <u>H</u> elp		
The sustained -	Go back to: <u>Cataloc</u> Sorf. Academic License	Annual Serf License Annual Serf license for a non-profit educational organization. More	View Cart \$300.00	View Cart lets customers review their selections and check out or continue shopping.
clicks More to get more detail and see a larger image of the product.	Andreit Student Tuker	Student Ticket Admits one student into one course. More	\$3.00 ADD TO CART	When the customer clicks Add to Cart, a — bCentral screen handles the transaction.

FIGURE 4-8 A catalog page created by the E-Commerce Wizard. You can stylize these catalog pages by using a FrontPage theme to create a common look and feel for your company's pages. If you visit the online store at www.serfsoft.com, for example, you will see that I used the same theme in FrontPage and at bCentral to give the storefront a seamless fit with the company pages.

wizard generates the templates and creates the pages for your catalog. Then the wizard provides a button users can click to view the catalog. Any time you make a change to your products at bCentral, you simply run the wizard again, and the wizard automatically updates everything for you. This truly is a turnkey process that enables a small business to have a world-class e-commerce storefront with a minimum of effort.

Payment Settings

Last, but certainly not least, I set up my bCentral Commerce Manager account to accept and process credit card payments online. There are several ways of doing this. You will want to familiarize yourself with the options before deciding which one to choose. Figure 4-9 shows that I chose to set up a Cardservice Nanomerchant account to process Visa and MasterCard payments online. I chose this option because my business is small, and the Nanomerchant account has no monthly fee. If the business grows, on the other hand, I will switch to a monthly plan, which has a lower service fee per purchase than the free Nanomerchant account.

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FIGURE 4-9 The bCentral Commerce Manager payment settings. I decided to accept payments online via Visa and MasterCard. You can also configure bCentral to accept person-to-person payments via PayPal, as well as cash, checks, and money orders.

eveloping an In-House E-Commerce System

If your company needs or wants to customize its online business operations to work in ways that the turnkey solutions are not programmed to handle, you may wish to consider developing an in-house e-commerce system. The Internet's open standards make it technologically possible to create virtually any kind of a system you can imagine. If you need to set up a way for other businesses to conduct online transactions with your company, for example, you could create a Web Service that would provide authorized businesses with methods for making these transactions over the Internet. If you want to create a customized storefront at which consumers can buy your products directly, you can program your own product catalog and shopping cart and implement the payment models you want to offer your customers when they check out. One of the advantages of programming your own storefront is that you do not need to pay commissions to a third party to front the store for you. If you have a large sales volume, avoiding these commissions can potentially save you a lot of money. On the other hand, developing your own e-commerce solution is a lot of responsibility. You need to create a team to do this development, because the task is larger than one person can handle alone. This team needs to include (1) a Web designer to create the look and feel of the Web forms through which customers will interact with your storefront, (2) a database designer to create the relational database that will keep track of your customers and their interactions with your site, (3) one or more application programmers to develop the software consisting of the business objects that power your site, and (4) a security officer to ensure that everyone on the team is following best-practice methods of preventing unauthorized access to the company's information all the way from customer to storefront as well as from business to business.

Because of the continually evolving nature of the Internet, the work of this team will be ongoing. The security officer needs to keep up with best practices and make sure your network stays protected from the latest security vulnerabilities and attacks. You need more than one programmer to understand your application's code so that if one person should happen to become ill or otherwise unavailable, another programmer can step in to create new features that may be needed and implement new security measures that may be required.

ADDIE Software Development Cycle

For an in-house e-commerce project to succeed, it is essential for the team to understand that software development projects follow a cycle of **analy-sis, design, development, implementation, and evaluation**. These five stages are easy to remember because of the acronym they form: ADDIE.

Stage 1: Analysis

The wise developer begins by conducting a thorough analysis of the company's business and customer needs. Writing down the goals of the project is a very good place to start. Follow this by articulating each goal's subgoals. This process of organizing a project into goals and sub-goals is called **task analysis**.

Stage 2: Design

Informed by the task analysis completed in stage 1, the design phase plans the work to be done. Useful design tools include storyboards and flow diagrams. A **storyboard** consists of a series of sketches that depict what will appear on each screen of the application. At the bottom of each sketch, you specify in writing any features that are not obvious in the sketch. The flow diagram depicts the logical order in which customers will work their way through the screens depicted in the storyboard. It is important to standardize the look and feel of the icons and buttons the customer will use to navigate through the application. If the user interface is not intuitive, customers will become frustrated and leave your site without buying anything.

Stage 3: Development

Artists create the icons, button shapes, banners, logos, and other kinds of graphics that will appear on the screens designed in the previous stage. Application programmers write the computer code, or scripts, that power the solution by bringing these screens to life. Large projects divide this application programming into tiers. Database programmers create the data tier, Web designers create the user interface tier, and application programmers create the business tier, which receives requests from customers and handles interactions with the data tier. Projects developed in such a manner are said to have a multi-tiered application design.

Stage 4: Implementation

Putting the software into production is often the most exciting part of a project, because this is when you learn how well your design works in practice. It is wise to pilot a new application with a small number of users before rolling out the project into large-scale production. Large projects often use two testing phases called alpha and beta testing. Alpha testing is done in-house by people close to the project, such as your fellow employees. Beta testing happens with a small group of real users to test your software before releasing it.

Stage 5: Evaluation

At the fifth stage, you conduct an evaluation to assess how well the project met its goals, how customers feel about the solution you provided, and what improvements are needed. Site statistics come in handy during this stage. Analyzing logs of customer activity can enable you to determine who bought what under different kinds of conditions. Smart companies base enhancements on strategic information that can be mined by studying customer activity at your site.

ADDIE as a Model for Continuous Improvement

You must avoid the temptation to think of these five stages as a serial process in which a project progresses in order from stage 1 through stage 5, when the project is complete. Software is never finished. As long as people are using your software, you will find yourself going back in to work on new features and troubleshoot problems. Especially on the Internet, where new capabilities are continually being invented, you will find yourself wanting to take advantage of the new features and to make sure you are following the latest security best-practices to thwart crackers.



Figure 4-10 illustrates how this kind of feedback loop transforms the five-step ADDIE process into a model of continuous improvement. If the designers notice a logical flaw in the task analysis, for example, the company can save a lot of time and effort by correcting that flaw before proceeding to the more expensive development stage. Likewise, if the developers notice a problem in the design, they can ask the designers to fix it to avoid the costly need for reprogramming a faulty design. At the end of the process, the cycle repeats as the evaluation informs the analysis of what the company should work on next.

Project Management Fundamentals

Software development projects are complex. Without good management, projects can run into delays and cost overruns that will not make you very popular with your employer. Printed below is a list of project management principles designed to help you avoid things that can go wrong in any project. At the end of this chapter, three labs put these principles into practice by providing you with a framework for planning the project, allocating resources, and establishing a project review cycle.

- Scheduling The schedule establishes a targeted completion date for each milestone to be accomplished on the way to completing the project. Make the schedule as detailed as you can. Under each milestone, list the subtasks and identify who will accomplish them. At the end of this chapter, Lab Project 4-1 illustrates how you can lay out these tasks on a timeline that enables you to visualize the project's workflow.
- **Budgeting** The budget allocates resources for accomplishing the project's goals. To avoid cost overruns, make sure the budget contains a realistic estimate of what it will take to accomplish the tasks on the project schedule.
- Evaluating risks Make a list of all the risks your project is taking. Alongside each risk, write a paragraph explaining its impact on the project as a whole.
- Contingency planning If something goes wrong or fails to be accomplished, having a contingency plan can save you valuable time in correcting the situation. Hold a brainstorming session with your coworkers and make a list of everything you think could go wrong. For each pitfall, write a paragraph explaining how you plan to cope if it happens.
- Preventing scope creep During the software development process, new ideas will arise. Programmers may suggest ideas for additional features, or your employer may want the software to

meet new business needs that were not articulated in project planning. Broadening the purpose of the software during project development is called scope creep. You need to minimize this to keep the project from slipping its schedule. A well-defined project plan is the best defense against scope creep.

- Defining roles Most software is developed by teams consisting of one or more Web designers, artists, programmers, and database developers. Define the roles of your project's personnel and assign to each task the team member(s) playing the role(s) needed to accomplish it.
- Piloting Testing the software and making sure it works properly is important before turning it over to production. Make sure you test the software with people who were not part of the development team to see if it works with users who were not privy to the design. Test the software under heavy loads, with different browsers, and at different connection speeds. Click all the links and make sure there are no dead ends. You want to find and fix any problems before production cutover.
- Reporting Every member of the development team should keep logs and report regularly regarding progress toward accomplishing assigned tasks. It is especially important to report any problems that may jeopardize the schedule by causing tasks to take longer than expected.

So important is project management that the International Organization for Standardization (ISO) developed quality management standards known as the ISO 9000 family. ISO 9000 defines the vocabulary and fundamentals of quality management systems. ISO 9001 lists the certification requirements. ISO 9004 presents guidelines for performance improvements. Companies that follow these quality management standards can apply to be ISO 9001 certified. Registration procedures are online at www.iso.org.

Regulating Copyrights, Licenses, Patents, and Trademarks

Anyone who conducts business online must become educated about regulatory issues related to software licensing, intellectual property rights, patented inventions, and trademarks for two reasons. First, you want your online business practices to be ethical. Second, you want to avoid costly lawsuits that may arise if you violate the rights of another company or individual.

You need to realize that in a courtroom, ignorance is no defense. Everyone conducting business online has the responsibility to learn about these laws and observe them both in spirit and in practice. Just as the Internet is a work in progress, so are the legal interpretations that are emerging as new laws are enacted and tested in the courts. In the following sections, this product in your catalog.

note This chapter is not intended as a substitute for legal advice. You should consult a lawyer or a campus book introduces you to legal principles involving copyrights, fair use, licensing, trademarks, and patents. Equally as important are the links provided in each section to lead you to further information. Every company, no matter how large or small, should identify someone to monitor these sites and review your business practices on an ongoing basis to make sure you do not violate a statute or infringe the rights of another.

Copyright

Article I, section 8 of the United States Constitution grants Congress the power "to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." Congress used this power to pass the Copyright Act of 1976, which defines and allocates rights associated with "original works of authorship fixed in any tangible medium of expression, now known or later developed, or otherwise communicated, either directly or with the aid of a machine or device" (U.S. Constitution, 17 § 102). This means that all the downloadable elements presented in Chapter 2 of this book-including illustrations, text, movies, video clips, documentaries, animations, music, and software-are protected by copyright. There are stiff penalties for copyright offenders. If a company is sued for civil copyright infringement, for example, the penalty ranges up to \$100,000 per software title. If the company is charged with a criminal violation, the fine goes up to \$250,000, plus up to five years in prison. The stakes are high because the Software & Information Industry Association (SIIA) reports that its members lose more than \$12 billion annually due to software piracy. That is why the SIIA sues organizations that pirate commercial software or circumvent copyright protection, resulting in millions of dollars in fines. Whenever you plan to publish a Web page on the Internet, you must make sure you have the right to use every object in it. To learn about recent actions taken against copyright infringers, go to www.siia.org.

Although Web pages, like any other form of writing, are considered to be copyrighted by default, you should register a copyright for your Web pages to be fully protected. To copyright a Web page, include the following copyright notice on the page, replacing xx by the current year:

Copyright © 20xx by your_name_goes_here. All rights reserved.

Although this notice legally suffices to protect your copyright, it is also a good idea to register the copyright with the U.S. Copyright Office. If someone infringes your copyright and you take legal action to defend it, copyright registration can help your case. To register a copyright, follow these steps:

I. Go to the U.S. Copyright Office Web page at www.copyright.gov. In the section on how to register a work, choose Literary Works.

- **2.** Read the instructions for registering a literary work. The instructions tell you that computer programs and databases are considered to be literary works for copyright purposes.
- **3.** Find the link for downloading either the long or the short version of Form TX, and download the form you need.
- **4.** Complete the application form and make a copy to retain in your files.
- **5.** Mail the application along with a printout of the work and the \$30 registration fee to the Library of Congress, Copyright Office, 101 Independence Ave., S.E., Washington, D.C. 20559-6000.

If you want a receipt, have the Post Office mail your application as "return receipt requested." It will take several weeks for the Library of Congress to process your application and send you the registration number. For more information, follow the link to Copyright Basics at www.copyright.gov.

Fair Use

Fair use is described in the Fair Use section of the U.S. Copyright Law that allows the use of copyrighted works in reporting news, conducting research, and teaching. The law states:

Notwithstanding the provisions of section 106 [which grants authors exclusive rights], the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include:

- I. the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
- **2.** the nature of the copyrighted work;
- **3.** the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
- **4.** the effect of the use upon the potential market for or value of the copyrighted work.

If you feel that these four tests are vague, you are correct, in that the law goes on to state that "although the courts have considered and ruled upon the fair use doctrine over and over again, no real definition of the concept has ever emerged. Indeed, since the doctrine is an equitable rule of reason, no generally applicable definition is possible, and each case raising the question must be decided on its own facts." If you are an educator who is teaching in a classroom, you may be able to claim Fair Use. To help educational institutions interpret the Fair Use law with regard to multimedia and the Internet, the CCUMC (Consortium of College and University Media Centers) spearheaded the creation of the Fair Use Guidelines for Educational Multimedia. You can read these guidelines online by following the link to Fair Use and Multimedia at fairuse.stanford.edu.

If you are creating an e-commerce site, on the other hand, you will rarely qualify for Fair Use because you will fail the first test, which asks whether the use is of a commercial nature.

World Intellectual Property Organization (WIPO) Treaties

Because the Web is worldwide, any company conducting business online must consider the international ramifications of its e-commerce activities. As described at www.wipo.org, the **World Intellectual Property Organization (WIPO)** is in charge of administering 23 treaties comprising an international Intellectual Property (IP) system. When this book went to press, 179 countries belonged to WIPO, including the United States, which is a major stakeholder in this attempt to protect intellectual property rights throughout the world. To resolve conflicts, there is a WIPO Arbitration and Mediation Center. If someone in a WIPO member country infringes the copyright of someone in another member country, WIPO provides a mechanism for that infringement to be prosecuted in both countries. For the latest on WIPO, go to www.wipo.org.

Digital Millennium Copyright Act (DMCA)

In 1998, the **Digital Millennium Copyright Act (DMCA)** was enacted into law in the United States. One of the primary purposes of this complex act was to bring the United States into conformance with the World Intellectual Property Organization (WIPO) treaties. The DMCA includes the following:

- New rules prohibiting the circumvention of Technological Protection Measures (TPM), with stiff penalties for infringers
- Prohibition of the removal from a copyrighted work of information related to ownership, copyright, and licensing
- Limitation of liability of Online Service Providers if someone using their service infringes a copyright
- Promoting distance education over digital networks while maintaining an appropriate balance between the rights of copyright holders and the needs of teachers and students making fair use of copyrighted works

TEACH Act

In late 2002, the Technology Education and Copyright Harmonization (TEACH) Act was signed into law. This act extends the concept of Fair Use beyond the classroom to "anytime, anywhere" distance learning courses, permits educational institutions to use "reasonable and limited" portions of audiovisual works and sound recordings in distance learning courses without needing to request permission, and permits educators in certain instances to digitize and make Fair Use of works that are not already available in digital form. The TEACH Act also clarifies a point that has been in dispute since the passage of the DMCA, namely, that the temporary "buffer" copies created on networked file servers to transmit content over the Web also are covered under the exemption.

While extending the concept of educational Fair Use to digitally transmitted works, the TEACH Act also requires the transmitting institution to ensure that the performance can be received only by students who are enrolled in the course. To learn more, search Google or Yahoo! for the TEACH Act and the TEACH Act primer.

Licensing

A license is a permission to use a good or service provided by a third party who owns the good or provides the service. Many people have the mistaken impression that when you buy a computer application, you are buying a copy of the software. What you buy is not the software itself; rather, you purchase a license to use the software. This is why you need to read carefully the license to any software your company is using. Before you purchase additional software, be sure to study carefully the terms of the license. There are three main kinds of software licenses: single-user licenses, site licenses, and open source licenses.

Single-User Licenses

Most licenses are single-user, meaning that the individual who purchases the license thereby acquires the right to use the software. Many single-user licenses give an individual the right to use the software on more than one machine, such as on a desktop computer and on a laptop, so long as only that one person is using the software.

Site Licenses

Schools and companies often buy a **site license**, which permits the software to be used on multiple computers located in the workplace. Many site licenses exclude employees from taking the software home to use on personal computers. Before you take software from school to home or from office to home, read the license to make sure this is permitted.

Open Source Licenses

So-called **open source** licenses, on the other hand, make freely available to the public the source code from which the computer software is compiled. As described by the Open Source Initiative at www.opensource.org, the basic idea behind open source software is as follows:

When programmers can read, redistribute, and modify the source code for a piece of software, the software evolves. People improve it, people adapt it, people fix bugs. And this can happen at a speed that, if one is used to the slow pace of conventional software development, seems astonishing (source: www.opensource.org, January 2, 2004).

The most famous example of open source software is the Linux operating system, which Microsoft's competitors are touting as an alternative to Windows. Before you consider adopting Linux, however, beware that few things in life are truly free. Open source programmers make a lot of money consulting for companies who adopt the "free" software but later find out that to make it work properly, you need support and advice, which the programmers will happily provide you for a fee. Microsoft's competitors make billions of dollars each year in Linux-related consulting services. By making you aware of this, I am not necessarily recommending against Linux, which may be a good choice if your company is prepared to pay for supporting it. What I am cautioning, however, is that you need to understand the full ramifications of the licensing. To read the open source licenses, go to www.opensource.org/licenses.

Patents

The U.S. Patent and Trademark Office defines the term **patent** as the granting to an inventor of a property right for an invention to exclude others from making, using, offering for sale, or selling the invention in the United States or "importing" the invention into the United States. The purpose of the patent is to provide the inventor an opportunity to profit from the invention for a reasonable period of time (i.e., 20 years) before the patent expires. It is the responsibility of the inventor to enforce the patent infringement suits can range into the tens of millions of dollars. Therefore, companies need to be careful not to infringe the patents of others. In a patent suit, ignorance is no defense. All patents are online, and you can search them at www.uspto.gov.

What causes problems in the computer industry is when a company applies to patent an invention for which there is prior art, meaning that the so-called "invention" pre-existed. There have been several cases in which computer companies have fooled the patent office into granting patents for technology that pre-existed. When these cheaters began suing other companies for infringing, there was such an industry-wide outcry that the patent office overturned the patents. The danger is that in less high-profile cases, it may cost a company less to pay for the right to use the mistakenly issued patent than to undergo the lengthy legal proceeding needed to overturn the patent.

Compton's Multimedia Search Patent

One of the most blatant cases of patent abuse occurred when Compton's announced at the 1993 Fall COMDEX convention that they had been awarded a patent that would require all multimedia developers to pay them royalties. As Compton's CEO Stanley Frank said, "We helped kick start this industry. We now ask to be compensated for our investments. We will do whatever it takes to defend our patent."

The Compton's patent is very broad. It covers any type of computercontrolled database system that allows a user to search for mixed media that includes text with graphics, sound, or animation. Compton's did not limit their claims to CD-ROM products; they also claimed rights to any type of database involving interactive TV or the Internet. Thus, the patent includes the searching of product catalogs that contain text and graphics advertising products for e-commerce purposes.

The title of the Compton's patent is "multimedia search system using a plurality of entry path means which indicate interrelatedness of information." It claims:

A computer search system for retrieving information, comprising: means for storing interrelated textual information and graphical information;

means for interrelating said textual and graphical information; a plurality of entry path means for searching said stored interrelated textual and graphical information, said entry path means comprising: textual search entry path means for searching said textual information and for retrigence interrelated graphical information

information and for retrieving interrelated graphical information to said searched text;

graphics entry path means for searching said graphical information and for retrieving interrelated textual information to said searched graphical information;

selecting means for providing a menu of said plurality of entry path means for selection;

processing means for executing inquiries provided by a user in order to search said textual and graphical information through said selected entry path means;

indicating means for indicating a pathway that accesses information related in one of said entry path means to information accessible in another one of said entry path means;

accessing means for providing access to said related information in said another entry path means; and

output means for receiving search results from said processing means and said related information from said accessing means and for providing said search results and received information to such user.

Compton's demanded that all multimedia developers pay back royalties of 1 percent of net receipts from sales before June 30, 1994, and 3 percent thereafter. To say the least, developers reacted negatively to Compton's demands. Some suggested that users should burn all Compton's CD-ROMs and refuse to purchase future titles from any company that would try to force such a Machiavellian proviso on the multimedia industry. As a result of public hearings held by the U.S. Patent and Trademark Office to review its handling of software patents, the Compton's patent was rescinded, and the patent office initiated reforms that include publicizing patent applications, hiring software specialists as examiners, revamping the examiner bonus program so it does not encourage superficial review, and requiring more information about patent applications before decisions are made. In fairness to the government, industry leaders such as Compton's (who know better) should stop trying to profit from patenting prior art; instead, they should concentrate on improving their products and moving the industry forward.

Unisys GIF Patent

Unisys owns the patent on the compression scheme used in the GIF file format, which is one of the most popular image formats in the world. In 1994, Unisys decided to begin charging developers a licensing fee for using the GIF file format. This resulted in a backlash of harsh opposition from developers and users who felt Unisys had acted unfairly, and Unisys backed down. Toward the end of the twentieth century, Unisys began to try again to charge for the use of GIF images. Unisys asked all Webmasters to pay \$5,000 if their Web site uses one or more GIF images created by a program that is not licensed by Unisys to use GIF images.

By trying a second time to make users pay for something they thought was free, Unisys caused another uproar among GIF users and developers who, instead of paying the \$5,000 fee, have begun converting their graphics to the PNG format. PNG stands for Portable Network Graphics. It's a format created largely in response to the Unisys patent fiasco. The World Wide Web consortium's PNG Web site at www.w3.org/Graphics/PNG refers to the format as "a patent-free replacement for GIF."

Happily, the U.S. version of the GIF patent expired on June 20, 2003. Unisys continues to warn developers, however, that the patent continues in some other countries. For this reason, the "Burn All GIFs" Web site at burnallgifs.org continues to urge developers to refrain from using GIFs. The recommended alternative is PNG, which is the graphics format I used when making the screen captures that illustrate this book.

Eolas '906 Patent

In 2003, Microsoft was ordered to pay \$520 million for allegedly infringing U.S. patent number 5,838,906 issued to the University of California, which formed a company named Eolas to handle the licensing. The socalled Eolas '906 patent covers the technology used by browsers to launch automatically the appropriate applet or plug-in to display embedded content, such as a Flash animation, within a hypermedia document. When Eolas won the \$520 million settlement against Microsoft, the World Wide Web Consortium (W3C) asked for a review of the patent. The W3C provided evidence that the Eolas patent was based on prior art and therefore should be overturned. The W3C further pointed out that enforcing this patent could cause "substantial economic and technical damage to the operation of the World Wide Web." As this book goes to press, the U.S. Patent and Trademark Office is reevaluating the Eolas '906 patent. By the time you read this, I hope the patent will be overturned. For the latest, go to the Eolas FAQ at www.w3.org/2003/09/public-faq.html. If that link does not work, go to www.w3.org and search for Eolas. To read the patent itself, go to www.uspto.gov and search for patent number 5,838,906.

I believe that the actions taken in these kinds of patent cases by Compton's, Unisys, and Eolas are unethical and self-defeating. In the Compton's and Eolas examples, technologists were taking advantage of the U.S. Patent and Trademark Office by obtaining patents for prior art of which the patent office was unaware. Unisys, on the other hand, appears to have waited until its GIF technology spread throughout the world before enforcing the patent in an attempt to cash in on its widespread adoption. In all three cases, I believe that the technologists working within these companies knew this kind of activity was unethical. Corporations need to be more honest and up-front if the patent system is to function as intended. The purpose of the patent system is to give an inventor an honest period of time in which to profit from an invention. High-tech companies are not acting in the best interests of the Internet when they abuse the patent system to rip people off.

<mark>Tra</mark>demarks

The U.S. Patent and Trademark Office defines the term **trademark** as a word, phrase, symbol, or design, or a combination of words, phrases, symbols, or designs, that identifies and distinguishes the source of the goods of one party from those of others. The word Microsoft, for example, is a registered trademark of Microsoft Corporation. In the United States, you register trademarks via the Trademark Electronic Application System (TEAS) at www.uspto.gov/teas. If you want international protection for your trademark, follow the special instructions WIPO provides for the worldwide protection for trademarks. Any company that registers a trademark in a WIPO country's official trademark office has worldwide protection for that mark among all the other WIPO nations.

rading Internationally

By definition, the Web is worldwide. Even if you do not plan to trade with customers outside the country when you begin your e-commerce activities, it may be just a matter of time before you begin trading internationally. To prepare, you need to be able to handle multiple currencies, overseas shipping, and language differences.

Multiple Currencies

If a customer purchases a product in a country that differs from that of the merchant, the customer may need to pay in a foreign currency. Depending on how your online business handles its transaction processing, you may need to use a currency converter. Most of the major turnkey systems, such as Microsoft bCentral, handle the currency conversion for you. If an international customer pays with MasterCard or Visa, for example, the credit card company handles the currency conversion by charging the customer the appropriate amount in the local currency and depositing to your bank account the converted sum in your currency. If you have developed your own in-house system, on the other hand, you may need to use a currency converter to calculate the cash conversions.

International Currency Converter

Try This!

There is an international currency calculator at www.bankrate.com. Imagine that you are in charge of an in-house e-commerce site that does not normally conduct business outside the United States. Someone from Germany wants to pay for one of your products in Euros instead of in the dollars to which you are accustomed. In U.S. dollars, the product costs \$129.99. To find out how much the product costs in Euros, follow these steps:

- **1.** Go to www.bankrate.com and follow the link to Calculators. On the Calculators page, choose the Currency calculator, and follow the link to get the currency converter onscreen.
- **2.** Notice that there are two menus onscreen. You use the menu on the left to set the currency from which you want to convert. Set that menu to U.S. dollars.
- **3.** You use the menu on the right to set the currency into which you want to calculate the conversion. Set the menu on the right to EUR for Euro.
- **4.** In the blank where you enter the amount to be converted, type **129.99**. Leave the date field set to the current date.
- 5. Click the Convert Now button to perform the calculation.
- 6. For other currency converters, search Google or Yahoo! for currency converter.

Shipping Overseas

When you sell products in other countries, you need to be careful not to violate any customs regulations. Some products are outlawed in certain countries. The U.S. government, for example, forbids the sale of cryptology software to certain countries and terrorist organizations.

You will probably need to charge more for shipping overseas than for distributing products within your country's borders. You need to tell

customers what the shipping will cost and build that cost in when the customer pays for the product. Otherwise, the customer may refuse the delivery of your product if you later add on a shipping charge that seems too high. To reduce the high cost of shipping products internationally, large vendors maintain overseas warehouses from which products can be shipped locally in countries with which they do a lot of business. Small companies, on the other hand, usually cannot afford the cost and overhead of maintaining multiple warehouses.

FedEx can ship your products to more than 213 countries. For a demonstration, go to www.fedex.com. Another premier worldwide shipping company is DHL, which you can find at www.dhl.com. For other companies that ship overseas, search Google or Yahoo! for *international shipping*.

Language Issues

Fortunately for U.S. businesses, English is the most universal language in the world. If you are marketing products to well-educated people, chances are they can read your site if the pages are written in English. If, on the other hand, you are selling mass market products that you want everyone in the world to buy, you need to create alternate language versions of your Web site so people who do not know English can browse your site and understand how to buy your products online.

When you create Web pages intended for international consumption, you should use the Unicode option for character encoding. Unicode was invented to solve the problem of displaying international characters correctly. In the Unicode standard, every character in the world has a unique code; hence the term, Unicode. The Web authoring tutorial in Part Two of this book shows you how to select Unicode for your Web pages.

You need to beware of the temptation to use automatic translation software to create international versions of your Web pages. If you search Google or Yahoo! for translation software, you will find several sites where you can enter the text of a Web page in English and have the page automatically translated into a variety of foreign languages. The field of artificial intelligence, however, has not progressed to the point at which automatic translation software can translate Web pages with 100 percent accuracy. Especially when you are conducting business online, you need your pages to be accurate. If you should happen to use an automatic translator, therefore, make sure someone who truly understands the foreign language checks to make sure your translated page says what you intend to convey.

Chapter 4 Review

Chapter Summary

After reading this chapter and completing the stepby-step tutorials and Try This! exercises, you should understand the following facts about the Internet:

Defining E-Commerce

- E-commerce is the use of the Internet to conduct the sale of goods and services online.
- The highest incidence of online shopping occurs between the ages of 25 to 34, when 61 percent buy products online, while only 14 percent of users over the age of 65 shop online. This elderly percentage will rise when the baby boomers enter the 65+ age bracket.
- There are two models that define the basic forms e-commerce can take. The business-to-consumer (B2C) model occurs when an end-user buys something from a company's online storefront. The business-to-business (B2B) model describes transactions that occur when companies conduct business electronically between themselves.

Enabling E-Commerce Technologies

- There are three critical elements of e-commerce that the underlying technologies must address: communications, security, and data management. The communications must use a common digital language that can be understood by the computers involved in the transaction. The security of these communications must follow the necessary safeguards to build the trust consumers need to feel confident in trading online. The data exchanged in B2C and B2B transactions must be stored in such a way that e-commerce transactions can be audited and can recover from outages that may occur during power or equipment failures.
- Electronic data interchange (EDI) is the computerized exchange of business information between trading partners over computer networks. This information can include purchase orders, invoices, shipping schedules, inventory inquiries, claim submissions, or any other kind of information that the trading partners need to exchange.

- Developed by MasterCard and also adopted by Visa, the Secure Electronic Transactions (SET) specification is an open standard for conducting secure payment card transactions over the Internet. Digital certificates create a trust chain that verifies cardholder and merchant validity throughout the transaction.
- A Web Service is a software system that uses an XML protocol to support interoperable machineto-machine interaction over a network. Through this XML protocol, the Web Service exposes methods whereby a business process running on a primary company's computer can interact with processes running on a business partner's computer over the Internet.
- Universal Description, Discovery, and Integration (UDDI) is an online yellow pages directory of Web Services that business computers can use to discover and learn how to use the B2B services offered by various companies over the Internet.

Processing Payments Online

- There are three main e-commerce payment models: cash, check, and credit cards. A fourth model called the smart card is emerging in an attempt to bolster security and add functionality to transactions made with cards.
- The cash model uses the metaphor of a digital wallet residing on the user's computer. The digital wallet contains digital cash or tokens with which the user pays for goods and services purchased online.
- The check model uses the metaphor of a digital checkbook residing on the user's computer. This checkbook contains digital checks with which the user can pay for goods and services online. The digital checkbook model is especially appropriate for paying bills online.
- The credit card model is well established both in traditional commerce and on the Web. Credit card processing has always been electronic from the point at which the sales clerk swiped your

card. What e-commerce has done is to enable you to enter your card number by typing it into a Web form, instead of swiping your card through a store's card reader.

- A smart card is a credit-card sized plastic card with an embedded computer chip and memory that can store more than a hundred times as much digital information as the magnetic strip on a credit card. Because the chip can handle digitally signed and encrypted transactions, the smart card enables the cardholder to take advantage of the Internet's best-practice security measures.
- In 1998, a company called PayPal started a person-to-person payment model that enables any individual or business with an e-mail address to send and receive payments online. When customers use PayPal to buy and sell products from each other, a customer-to-customer (C2C) form of e-commerce emerges.

Choosing an E-Commerce Solution

- There are two kinds of instant storefront solutions: online and offline. In an online instant storefront solution, you do all your development online. In an offline solution, you develop the storefront on your PC and upload it for delivery on the Web.
- The advantage of the instant storefront is its timeliness. Because the instant storefront is preprogrammed, everything is already set up for you.
- The disadvantage of the instant storefront is flexibility. If you want to be able to customize totally the look and feel of your e-commerce screens, you should consider developing your own in-house storefront.

Developing an In-House E-Commerce System

- One of the advantages of programming your own storefront is that you do not need to pay commissions to a third party to front the store for you. If you have a large sales volume, avoiding these commissions can potentially save you a lot of money.
- On the other hand, developing your own e-commerce solution is a lot of responsibility. You will need to create a team to do this development, because the task is larger than one person can handle alone.

- For an in-house e-commerce project to succeed, it is essential for the team to understand that software development projects follow a cycle of analysis, design, development, implementation, and evaluation. These five stages are easy to remember because of the acronym they form: ADDIE.
- You must avoid the temptation to think of these five stages as a serial process in which a project progresses in order from stage 1 through stage 5, when the project is complete. Software is never finished. As long as people are using your software, you will find yourself going back in to work on new features and troubleshoot problems.

Regulating Copyrights, Licenses, Patents, and Trademarks

- Computer programs and databases are considered to be literary works for copyright purposes. To register such a copyright in the United States, you use form TX, which you can download from www.copyright.gov.
- Fair Use is a section of the U.S. Copyright Law that allows the use of copyrighted works in reporting news, conducting research, and teaching. Due to their commercial nature, however, Web pages at an e-commerce site do not qualify for Fair Use. Make sure you have written permission to use anything at your Web site that you do not already own.
- The World Intellectual Property Organization (WIPO) administers 23 treaties comprising an international Intellectual Property (IP) system among 179 member countries. The United States belongs to WIPO. One of the purposes of the Digital Millennium Copyright Act (DMCA) was to bring the United States into conformance with the WIPO treaties.
- A license is a permission to use a good or a service provided by a third party who owns the good or provides the service. Many people have the mistaken impression that when you buy a computer application, you are buying a copy of the software. What you buy is not the software itself; rather, you purchase a license to use the software.
- There are three main kinds of software licenses: single-user licenses, site licenses, and open source

licenses. Most licenses are single-user, meaning that the individual who purchases the license thereby acquires the right to use the software. Schools and companies often buy a site license, which permits the software to be used on multiple computers located in the workplace.

- Open source licenses make freely available to the public the source code from which the computer software is compiled. The most famous example of open source software is the Linux operating system.
- A patent is a property right granted to an inventor for the purpose of excluding others from making, using, offering for sale, or selling the invention to provide the inventor an opportunity to profit from the invention for a reasonable period of time (i.e., 20 years) before the patent expires.
- A trademark is a word, phrase, symbol, or design, or a combination of words, phrases, symbols, or designs, that identifies and distinguishes the source of the goods of one party from those of others.

Trading Internationally

 If a customer purchases a product in a country that differs from that of the merchant, the customer may need to pay in a foreign currency. Depending on how your online business handles its transaction processing, you may need to use a currency converter to inform the buyer how much the purchase will cost in the customer's currency.

- When you sell products in other countries, you probably need to charge more for shipping than when you distribute products within your country's borders. You need to tell the customer what shipping will cost and build that cost in when the customer pays for the product.
- When you sell products in other countries, you need to be careful not to violate any customs regulations. Some products are outlawed in certain countries.
- Because English is the most universal language in the world, well-educated people will be able to read your site if the pages are written in English. If you are selling mass-market products that you want everyone in the world to buy, however, you will need to create alternate language versions of your Web site so people who do not know English can browse your site and understand how to buy your products online.
- Unicode is a character encoding scheme invented for the Internet to create a unique code for every character in all the different languages used throughout the world.

Key Terms

analysis, design, development, implementation, and evaluation (ADDIE) (22) business-to-business (B2B) (4) business-to-consumer (B2C) (4) checkout (3) customer-to-customer (C2C) (13) digital cash (3) digital cash (3) digital check (3) Digital Millennium Copyright Act (DMCA) (28) digital wallet (3) fair use (27) e-commerce (3) electronic data interchange (EDI) (7) instant storefront (14) license (29) open source (30) patent (30) secure electronic transactions (SET) (8) shopping cart (3) site license (29) smart card (13) Simple Object Access Protocol (SOAP) (10) stock-keeping unit (SKU) (16) storyboard (22) task analysis (22) trademark (33) Universal Description, Discovery, and Integration (UDDI) (9) Web Service (8) Web Service Description Language (WSDL) (9) World Intellectual Property Organization (WIPO) (28)

Key Terms Quiz

- is a payment method whereby customers pay for the product via tokens drawn from their digital wallet.
- 2. The _____ model occurs when an end-user buys something from a company's online storefront.
- The _____ model occurs when companies conduct business electronically between themselves.
- **4.** _______ is the computerized exchange of business information between trading partners over computer networks.
- Developed by MasterCard and also adopted by Visa, the ______ specification is an open standard for conducting secure payment card transactions over the Internet.
- **6.** A(n) _______ is a computer application that uses an XML protocol to expose methods whereby a business process running on a primary company's computer can

Multiple-Choice Quiz

- 1. In a seemingly B2C situation, when a retailer obtains a product from a wholesaler behind the scenes, what kind of an e-commerce model emerges?
 - a. B2B
 - **b.** B2C
 - **c.** B2B2C
 - d. C2C2B
- **2.** What is not one of the three critical elements that underlying e-commerce technologies must address?
 - a. Communications
 - b. Data management
 - c. Project management
 - d. Security
- **3.** Health-related wholesalers of drugs and medical supplies, automotive, and commercial equipment suppliers have historically been the heaviest users of
 - a. ASCII
 - b. EDI

interact with processes running on a business partner's computer over the Internet.

- 7. ______ is an XML language for exposing the methods and properties of a Web Service to a consumer, which is any Web client authorized to interact with the Web Service.
- **8.** A(n) _______ is a preprogrammed e-commerce system into which you enter your catalog of products and begin conducting business online.
- **9.** International copyright treaties are administered by the ______.
- 10. A(n) ______ is the granting to an inventor of a property right for an invention to exclude others from making, using, offering for sale, or selling the invention in the United States, or "importing" the invention into the United States.

- c. SET
- d. Unicode
- **4.** One of the most important advantages of SET is that merchants never see the customer's
 - a. Street address
 - b. Credit card number
 - c. E-mail address
 - d. Phone number
- 5. What is the name for the XML language that is used to identify the methods in a Web Service, define how those methods behave, and instruct clients how to interact with the service?
 - a. HTTP
 - b. SOAP
 - c. UDDI
 - d. WSDL
- **6.** Which company won a Webby for establishing the person-to-person model of e-commerce on the Internet?
 - a. American Express
 - b. bCentral

- c. MasterCard
- d. PayPal
- 7. Microsoft's e-commerce company is called
 - a. bCentral
 - b. FrontPage
 - c. MarketPlace
 - d. Serfsoft
- **8.** The process of organizing a project into goals and sub-goals is called
 - a. Flow charting
 - b. Resource allocation
 - c. Storyboarding
 - d. Task analysis

- **9.** If you want to secure your right of ownership over a Web page that you have created, you should apply for a
 - a. Copyright
 - b. License
 - c. Patent
 - d. Trademark
- **10.** What kind of license permits commercial software to be used on multiple computers located in the workplace?
 - a. Open source
 - b. Patent
 - c. Single-user
 - d. Site

Essay Quiz

- 1. Search Google for an instant storefront. What are the top three sponsored sites that Google brings up? Go to one of these instant storefront sites and peruse the services it offers. Compare these services to the features offered by Microsoft bCentral, which was illustrated in this chapter's case study. Name the instant storefront vendor you visited, and give at least two or three examples of ways in which its claimed features either exceed or fail to match the capabilities of bCentral.
- 2. When this book went to press in 2004, the World Intellectual Property Organization (WIPO) was overseeing 23 treaties that govern worldwide intellectual property rights in 179 countries belonging to WIPO. Go to www.wipo.org and find out whether any new treaties have been enacted. How many treaties is WIPO currently administering? How many nations currently belong to WIPO?
- **3.** As you learned in the patent section of this chapter, the Eolas '906 patent threatens the future of the Web by attempting to steal the technology used by browsers to launch automatically the appropriate applet or plug-in to display embedded content, such as a Flash animation, on a Web page. Go to www.w3.org/2003/09/public-faq.html and find out the latest news regarding this patent. If that link does not work, go to www.w3.org and search for Eolas. Have the courts and/or the patent office decided whether to uphold or overturn the patent? If not, what is the latest estimate about when a decision is expected?

Lab Projects

Under a grant from the National Science Foundation, the National Workforce Center for Emerging Technologies (NWCET) has created a framework identifying key activities that successful project managers employ to develop in-house solutions. The following lab projects take you through a series of situations designed to give you practice performing these key activities. If you are considering whether to become a project manager, perusing these labs will give you a good idea of the kinds of things managers do. Completing these labs will enable you to assemble a portfolio of project plans demonstrating that you have the technical knowledge and employability skills that companies look for when recruiting a project manager.

Lab Project 4-1: Project Planning Fundamentals

Imagine that you have been hired by a medium-sized chain of retail hobby shops that sell O-gauge model trains in traditional brick-and-mortar storefronts. These hobby shops do not sell anything online, but they are beginning to have a hard time competing with other hobby shops that have online storefronts. The problem is that many people who come into the store to handle the products and seek advice end up buying the trains online from electronic storefronts that sell the same products at discounted prices. You have been hired to solve this dilemma by creating an online store through which your employer can sell the trains online as well as in the chain of traditional stores. Your first assignment is to develop a project plan that defines the scope of work to be done, estimates how long it will take, and informs your new employer of the steps you will be taking to accomplish your objective. In creating such a plan, you should address the following issues:

- Define the scope of the project. At the outset of any project, you should write a goal statement that explains the project's contribution to your company's overall business needs. To ensure that the goal statement is comprehensive, make a list of the criteria you will use to determine whether the outcome of the project will meet customer needs. Then estimate the size of the project and document the e-commerce standards, regulations, and laws you will follow as you develop the solution.
- Identify stakeholders, decision makers, and escalation procedures. Every project has risks. You need to state what those risks will be and identify the people who will be notified if a problem arises. Explain how problems that are not solved promptly will escalate up through the company's hierarchy to be resolved by higher authorities.
- Develop a detailed task list. In any project, it is important to identify the tasks that need to be accomplished. As you make this list, document any special aspects the developers will need to be aware of.
- *Estimate time requirements*. Estimate how much time it will take to accomplish each task identified in the previous step. Be realistic. Avoid the temptation to please management by making time estimates you cannot realistically meet.
- Develop the initial project management flow chart. Some of the items on your task list can be worked on simultaneously; others will need to wait until previous steps have been completed. Create a flowchart that diagrams the simultaneous versus the sequential aspects of the project you envision. On this chart, identify the project milestones, approval points, and go/no-go decision points at which you will decide whether sequential tasks have been completed well enough to proceed to the next step. To avoid project delays, note any tasks requiring long lead times.

Use a word processor to write up your project plan. Feel free to use spreadsheet software to create your task list and add up the time estimates for each phase of your project. If your company has Microsoft Project or some other brand of project management software, you may use it as you see fit. Figure 4-11 shows how Microsoft Project enables you to create a task list, organize the tasks into phases, and schedule the tasks. (To learn more about Microsoft Project, go to www.microsoft.com/office/project.) Do not worry if you do not have this kind of project management software right now, however, because you can also create your chart with a word processor. If your instructor has asked you to hand in the recommendation, make sure you put your name at the top; then save it on disk or follow the other instructions you may have been given for submitting this assignment.



FIGURE 4-11

Microsoft Project is the project management program in Microsoft Office. The project guide illustrated in the left pane steps you through the process of creating the task list in the middle pane, organizing the tasks into phases, and scheduling the tasks, as shown on the right.

Lab Project 4-2: Securing Resources for Project Development

Imagine that your employer was intrigued by the project plan you created in Lab Project 4-1. To determine whether to move forward, your employer wants to know how much it will cost for you to proceed with project development. In creating a cost estimate, you will need to take the following issues into account:

- Identify required resources and budget. To convince your employer to fund items in your budget, you need to document them in a budget explanation that provides the rationale for the resources you recommend. The better you support your budget requests with relevant data, the more chance you will have of getting your project approved.
- *Evaluate project requirements.* You need to explain any overlap that may exist among the resources you are requesting. Otherwise, your employer may think you are requesting more funding than you need to complete the project.
- Identify and evaluate risks. You may get different advice from customers than you get from your superiors and fellow employees. You need to take these conflicting viewpoints into account when you write your budget explanation. Your employer will feel more confident about approving your budget if the risk identification is complete and considers the impact on the whole system.

- Prepare a contingency plan. According to Murphy's Law, if anything can go wrong, it will. Although I hope Murphy's Law will not apply to your project, your resource allocation plan must specify alternate methods of completing any tasks that could become troublesome. A special trait of successful managers is their ability to foresee things that can go wrong and have alternate plans ready in case of a failure.
- Identify interdependencies. To control costs, every member of your project team needs to be aware of any interdependencies related to their work on the project. The project will fall behind schedule if things get out of phase because members of the team did not realize the interdependent nature of their tasks and subtasks.

Use a word processor to write up your cost estimate. Feel free to use spreadsheet software to create your list of required resources and total the costs for each phase of your project. If your company has Microsoft Project or some other brand of project management software, you may use it as you see fit. If your instructor has asked you to hand in this cost estimate, make sure you put your name at the top; then save it on disk or follow the other instructions you may have been given for submitting this assignment.

• Lab Project 4-3: Establishing the Project Review Cycle

Imagine that your employer is pleased by the cost estimate you created in Lab Project 4-2. Although money is tight, your employer feels that moving forward with this project is going to be a strategic investment in your company's future. Before allocating the money, however, your employer wants to know how you will ensure that the beginning phases of the project will be done correctly before you proceed to subsequent phases that depend on earlier work. To answer this concern, you need to establish a project review cycle that will make your employer feel confident that you can manage effectively the project staging and ensure that each task meets its objective before spending money on dependent tasks. To create a project review cycle, you need to take the following issues into account:

- Identify and track critical milestones. You need to establish a method for tracking the progress toward achieving the project's critical milestones. If you have Microsoft Project or its equivalent, you can use your project management software to do the tracking. Otherwise, you can use a spreadsheet or word processor to create a grid on which to track critical milestones.
- Participate in the project phase review. You should schedule meetings for appropriate members of the team to review the phases of the project for which they are responsible or upon which they are dependent. Include these project review meetings in the project's master schedule.
- Secure needed resources. You will have a greater chance of getting your project approved if your employer feels confident that the people, equipment, supplies, and services will be available when your project needs them. In your project review cycle, therefore, include appropriate checkpoints for making sure these resources are available on schedule.
- Manage the change control process. Implementing e-commerce will cause many changes in how the company operates. Make the necessary parties aware of the impact of these changes, and build checkpoints into the review cycle to make sure the required changes are documented and implemented in the company's operating procedures.
- Report the project status. To bring problems promptly to the attention of your employer, the project review mechanism needs to keep an updated report on the project's status. This report should include an explanation of lessons learned in the event that something goes wrong and the project needs to be modified. It is hoped that the report will be mainly positive, stating the extent to which each task and subtask met its goals.

Use a word processor to write up your project review cycle. If your company has Microsoft Project or some other brand of project management software, you may use it as you see fit. If your instructor has asked you to hand in this project review cycle, make sure you put your name at the top; then save it on disk or follow the other instructions you may have been given for submitting this assignment.

