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e-Business & e-Commerce

Objectives

- To explore the advantages and disadvantages to creating an online business.
- To understand how the Internet and World Wide Web are revolutionizing business.
- To introduce the different business models on the Web.
- To discuss the advantages of creating an online business, as well as addressing many of the disadvantages.
- To examine marketing, payment, security and legal issues affecting e-businesses.

O Gold! I still prefer thee unto paper, Which makes bank credit look like a bark of vapour!
Lord Byron

It is an immutable law in business that words are words, explanations are explanations, promises are promises—but only performance is reality.
Harold S. Green

My name is Sherlock Holmes. It is my business to know what other people don't know.
Sir Arthur Conan Boyle

When you stop talking, you've lost your customer.
Estee Lauder

Outline

Summary • Terminology • Self-Review Exercises • Answers to Self-Review Exercises • Exercises • Works Cited

32.1 Introduction

We have recently entered the *Age of Knowledge*. Often you might hear the phrases, "knowledge is power" and "content is king" when discussing business on the Internet. Events in the short course of e-business and e-commerce history have demonstrated that successful e-businesses are those that recognize the needs of their target audiences and match those needs with relevant content. Building an e-business to accomplish this is not limited to seasoned professionals—many successful online ventures have been started by students on college campuses.

The terms e-business and e-commerce, often confused with one another, are in fact different. According to Andrew Bartel, vice president and research leader of e-commerce trends at Giga Information Group, Inc., *e-commerce* involves exchanges among customers, business partners and vendors. For example, a supplier interacts with a manufacturer, customers interact with sales representatives and shipment providers interact with distributors. *E-business* is composed of these same elements, but also includes operations that are handled within the business itself. For example, these include production, development, corporate infrastructure and product management. **[***L. Himelstein and R. Hof, "eBay vs `Amazon.com`,"** *Business Week* **May 1999: 128.***]**

E-business and e-commerce have increased the speed and ease of business transactions, resulting in intense competition. Businesses must adjust to new technologies, integrate newer and faster systems and meet the needs of people around the world. Inventories are no longer kept in preparation for orders; rather, products are prepared specifically for consumers. Good employees are hard to find and even harder to keep. Competing entities must now collaborate to survive, and have realized that customers do not have far to go to buy from the next available vendor.

People can pay their bills, write and cash checks, trade stocks, take out loans, mortgage their homes and manage their assets online. Money as we know it may cease to exist, replaced by more convenient technologies such as smart cards and digital cash. Intelligent programs will take care of the financial and logistical aspects of the interactions between the individuals and corporations that populate the Internet. People will need only a connection, a computer and a digital form of payment to go shopping online. Online monetary transactions are discussed in Section 32.5.

Building and running an e-business, especially one that processes a large number of transactions, requires technical, marketing and advertising expertise. Customers want access to products and services on a *24-by-7 basis* (24 hours-per-day, 7 days-per-week), and moving a business online is the easiest way to provide continuous service. The businesses that provide the most reliable, functional, user-friendly and fastest services will be the ones that succeed. In part, this is done by tracking the consumer's movement through the Internet and combining that data with information provided by the consumer, which could include billing information, interests and hobbies, among other things. *Personalization* makes it easier and more pleasant for many people to surf the Internet and find what they want. We discuss marketing and customer relationship management in Section 32.4.

However, personalization may also be seen as an invasion of privacy. The sale of personal data—names, addresses, purchasing history, credit-card numbers and medical history—for the purposes of targeting advertising is among the privacy issues involving the Internet. These are some of the many questions that must be addressed by consumers, e-businesses and lawmakers alike. We introduce many of these issues in Section 32.7.

The transition from *brick-and-mortar* businesses (businesses that have only a physical presence) to *click-and-mortar* businesses (businesses that have both an online and an offline presence) is happening in all sectors of the economy. It is now possible for businesses to operate effectively without an office, because employees can conduct some communications via phone, voice mail, fax, e-mail and the emerging capabilities of the Internet.

Despite rapid growth and stories of success, businesses and individuals should proceed with caution. While e-business and e-commerce are unstoppable trends that will bring success to many businesses, poor management, ineffective marketing, ill-designed logistics, unrealistic expectations and intense competition have caused many e-business failures.

e-Fact 32.1

During a shakeout period in Fall, 2000, in which a great many e-businesses failed, it is particularly interesting that **dotcomfailures.com**—*a business that keeps track of e-business failures—failed. [***L. Himelstein and R. Hof, "eBay vs Amazon.com," Business Week May 1999: 128.***]*

Financing presents one of the biggest challenges to growing e-businesses. Despite the turmoil generated by the initial scramble to go public, many Internet start-ups are small organizations (fewer than 15 percent have more than 50 employees) struggling to get off the ground. According to studies conducted by *The Industry Standard*, just under half of Internet start-ups have not acquired their first round of financing, and less than 10 percent have gone to their third round. In fact, *The Industry Standard* found that of the 2.5 million e-business entrepreneurs only 600 went public—and this is over the course of 6 years (1994-–2000). **[*** M. Nelson, "Portals to the Products You Need," *PC Novice* 11 May 2000: 24. ***]**

32.2 E-Business Models

There are many benefits of bringing a business to the Internet. An e-business can offer personalization, high-quality customer service and improved *supply-chain management*—the strategic management of distribution channels and the processes that support them. In this section, we explore the different types of businesses operating on the Internet, as well as the technologies needed to build and run an e-commerce Web site.

Although the term "e-commerce" is fairly new, large corporations have been conducting e-commerce for decades, by networking their systems with those of business partners and clients. For example, the banking industry uses *Electronic Funds Transfer* (*EFT*) to transfer money between accounts. Many companies also use a standard communications protocol called *Electronic Data Interchange* (*EDI*), in which business forms, such as purchase orders and invoices, are standardized so that companies can share information with customers, vendors and business partners electronically. Until recently, e-commerce was feasible only for large companies. However, the Internet and the World Wide Web make it possible for small businesses to use EDI as well.

Amazon.com, eBay™, Yahoo! and other e-commerce sites have helped to define industry categories and business models on the Web. Entrepreneurs starting e-businesses and people interested in e-commerce should be aware of the many e-business models. In this section, we review the storefront model, the auction model, dynamic-pricing models, the portal model and other Web-business models. Businesses operating within a particular model can leverage their technologies to differentiate themselves from the competition.

32.2.1 Storefront Model

The *storefront model* is what many people think of when they hear the word "e-business." The storefront model combines transaction processing, security, online payment and information storage to enable merchants to sell their products online. This model is a basic form of e-commerce in which the buyer and the seller interact directly.

To conduct storefront e-commerce, merchants need to organize online catalogs of products, take orders through their Web sites, accept payments securely, send merchandise to customers and manage customer data (such as customer profiles). They must also market their sites to potential customers.

32.2.2 Shopping-Cart Technology

One of the most commonly used e-commerce enablers is the *shopping cart*. This order-processing technology allows customers to accumulate items they wish to buy as they continue to shop (see the **Amazon.com** feature). Supporting the shopping cart is a product catalog, which is hosted on the *merchant server* in the form of a *database*. The merchant server is the data storage and management system employed by the merchant. It is often a system of computers that conduct all of the functions necessary for running a Web site. A database is a part of the merchant server designed to store and report on large amounts of information. For example, a database for an online clothing retailer would typically include such product specifications as item description, size, availability, shipping information, stock level and on-order information. Databases also store customer information such as names, addresses, credit-card data and past purchases. The **Amazon.com** feature explains these technologies and their implementations. For more examples of e-businesses that use shopping-cart technology, visit **www.etoys.com**, **www.eddiebauer.com**® and **www.cdnow.com**.

Case Study: Amazon.com

Perhaps the most widely recognized example of an e-business that uses shopping-cart technology is **Amazon.com**. **[*****"Amazoned," *Computer World* **17 May 1999: 116.***] [*****L. Himelstein and R. Hof, "eBay vs. Amazon.com," *Business Week* **May 1999: 128.*****]** Founded in 1994, the company has rapidly grown to become one of the world's largest online retailers. **Amazon.com** offers millions of products to more than 17 million customers in 160 countries. **Amazon.com** also offers online auctions. In its first few years, **Amazon.com** served as a mail-order book retailer. Its product line has since expanded to include music, videos, DVDs, electronic cards, consumer electronics, hardware, tools, beauty items and toys. **Amazon.com**'s catalog is growing constantly and the site allows you to navigate among millions of products.

Case Study: `Amazon.com` `(Cont.)`

`Amazon.com` uses a database on the *server-side* (the merchant's computer systems) that allows customers on the *client-side* (the customer's computer, handheld device, etc.) to search for products in a variety of ways. This system is an example of a *client/server application*. The `Amazon.com` database consists of product specifications, availability, shipping information, prices, sales histories, reviews and in-depth descriptions. This extensive database makes it possible for `Amazon.com` to cross-reference products. For example, a novel may be listed under various categories, including fiction, best-sellers and recommended titles.

`Amazon.com` personalizes its site to service returning customers. A database keeps a record of all previous transactions, including items purchased, shipping preferences and credit-card information. Upon returning to the site, customers are greeted by name and presented with lists of recommended titles, based on previous purchases. `Amazon.com` searches the customer database for patterns and trends among its clientele. By monitoring such customer data, the company provides personalized service that would otherwise need to be handled by sales representatives.

Buying a product at `Amazon.com` is simple. At the `Amazon.com` home page users can decide on the type of product they would like to purchase. For example, the book *Internet & World Wide Web How to Program*, *Second Edition*, can be found by using the **Search Box** in the top-left corner of the home page. To purchase the item, users simply select **Add to Shopping Cart**, on the top-right corner of the page. The shopping-cart technology processes the information and displays a list of the products in the shopping cart. Users then have the option to change the quantity of each item, remove an item from the shopping cart, check out or continue shopping.

When users are ready to place their orders, they proceed to checkout. First-time visitors will be prompted to fill out a personal-identification form with information including their names, billing addresses, shipping addresses, shipping preferences and credit-card information. They will also be asked to enter a password that will be used to access their account data for all future transactions. Once the information is confirmed, the order can be placed.

Customers returning to `Amazon.com` can use its *1-Click^{SM} system*, which allows the customer to reuse previously entered payment and shipping information to place an order with just one click of the mouse. It is an example of how an intelligently designed database application can make online business transactions faster and easier.

When users have finished placing their orders, `Amazon.com` sends a confirmation to them by e-mail. It sends a second e-mail when the order is shipped. A database monitors the status of all shipments. Users can track the status of their purchases until they leave the `Amazon.com` shipping center by selecting the **Your Account** link at the bottom of the page and entering their passwords. This will bring them to an **Account Maintenance** page. Orders can be cancelled at any time before the product is shipped, which usually occurs within 24 to 48 hours of purchase. `Amazon.com` has regional warehouses from which it ships a majority of packages overnight without having to use express delivery services **[***D.K. Berman H. Green, "Cliff-Hanger Christmas," *Business Week e.biz* 23 October 2000: 33.***]**

Case Study: `Amazon.com` `(Cont.)`

`Amazon.com` operates on secure servers that protect personal information. If users feel uncomfortable using their credit cards on the Web, they can initiate their orders through Amazon's Web site using the last five digits of their credit cards and later complete their order by calling Amazon's Customer Service Department to provide the remaining numbers.

32.2.3 Auction Model

The Web offers many kinds of auction sites, as well as sites that search other auction sites to pinpoint the lowest prices on available items. Usually, auction sites act as forums through which Internet users can assume the role of either seller or bidder. As a seller, users are able to post the items they wish to sell, the minimum price they require to sell their items and a deadline to close the auction. Some sites allow users to add features such as a photograph or a description of the item's condition. As bidders, users may search the site for the availability of the item they are seeking, view the current bidding activity and place a bid—usually in designated increments. Some sites allow users to submit a maximum bidding price, and an automated system will continue the bidding. Auction technology is explained in depth in the eBay feature (see the eBay feature).

The *reverse-auction model* allows the buyer to set a price that sellers compete to match, or even beat. One example of a reverse-auction site is **Liquidprice.com**, which processes the buyer's bid within two days. A faster bidding option is available when the seller sets a *reserve price.* A reserve price is the lowest price that the seller will accept. Sellers can set the reserve price higher than the minimum bid. If no bid meets the reserve price, the auction is unsuccessful. If a seller sets a reserve price at **Liquidprice.com**, the seller will receive a series of bids within six hours of the initial posting. However, in this faster option, if a successful bid is made, the buyer and seller must commit.

Auction sites usually require a commission on sales. After an auction has been completed, both the seller and the bidder are notified, and the method of payment and delivery is then worked out between the two parties. Most auction sites do not involve themselves in payment or delivery.

Auctions are also employed by *business-to-business* (B2B) Web sites. In these auctions, the buyers and the sellers are companies. Companies use online auctions to sell excess inventory and gain access to new, price-sensitive customers. Three examples of B2B auction sites

are DoveBid, Inc. (**www.dovebid.com**), WorldCall Exchange (**www.worldcallex-change.com**) and **U-Bid-It.com**.

Case Study: eBay

Online auctions have become an enormously successful method of e-commerce. The leading company in this business is *eBay* (Fig. 32.1) **[***F. Hayes, "Amazoned," *Computer World* 17 May 1999: 116.***]** eBay is one of the most profitable e-businesses. The successful online auction house has its roots in a 50-year-old novelty item—Pez® candy dispensers. Pam Omidyar, an avid collector of Pez® dispensers, came up with the idea of trading them over the Internet. In 1995, she and her husband created a company called AuctionWeb. The company was renamed eBay and has since become the premier online auction house, with as many as 4 million unique auctions in progress and 450,000 new items added each day. **[***L. Himelstein and R. Hof, "eBay vs. Amazon.com," *Business Week e.biz* 23 October 2000: 33.***]**

Fig. 32.1   eBay home page. (These materials have been reproduced by Prentice Hall with the permission of eBay, Inc. COPYRIGHT © EBAY, INC. ALL RIGHTS RESERVED.)

Case Study: eBay (Cont.)

People can buy and sell just about anything on eBay. The company collects a submission fee and a percentage of the sale amount. The submission fee is based on the amount of exposure sellers want their items to receive. A higher fee is required to be among the "featured auctions" in a specific product category, and an even higher fee is required to be listed on the eBay home page under **Featured Items**. Listings are shown on the home page periodically. Another attention-attracting option is to publish the product listing in a boldface font (for an additional charge).

eBay uses a database to manage the millions of auctions it offers. This database evolves dynamically as sellers and buyers enter personal identification and product information. The seller entering a product to be auctioned provides a description of the product, keywords, an initial price, a closing date for the auction and personal information. This data is used to produce the product profile seen by potential buyers (Fig. 32.2).

Fig. 32.2   Placing a bid on eBay. (These materials have been reproduced by Prentice Hall with the permission of eBay, Inc. COPYRIGHT © EBAY, INC. ALL RIGHTS RESERVED.)

Case Study: eBay (Cont.)

The auction process begins when the seller posts a description of the item for sale and fills in the appropriate registration information. The seller must specify a minimum opening bid. If potential buyers feel this price is too high, the item may not receive any bids. In many cases, a *reserve price* is also set. Sellers might set the opening bid lower than the reserve price to generate bidding activity.

If a successful bid is made, the seller and the buyer negotiate the shipping details, warranty and other particulars. eBay serves as a liaison between the parties; it is the interface through which sellers and buyers can conduct business. eBay does not maintain a costly physical inventory or deal with shipping, handling or other services that businesses such as Amazon and other retailers must provide.

The impact of eBay on e-business has been profound. Its founders took a limited-access offline business model and, by using the Internet, were able to bring it to the desktops of consumers worldwide. This business model consistently generates a profit for e-bay. By implementing traditional marketing strategies and keeping the process simple, eBay has offered a successful alternative to storefront-style e-commerce.

There are several other online auction sites, including Yahoo! Auctions (`auctions.yahoo.com`), Amazon Auctions (`www.amazon.com`), FairMarket, Inc. (`www.fairmarket.com`) and Sotheby's (`www.sothebys.com`). If you prefer to see an auction as it happens, visit the demo at `www.ibidlive.com`.

32.2.4 Portal Model

Portal sites give visitors the chance to find almost everything they are looking for in one place. They often offer news, sports and weather information, as well as the ability to search the Web. When most people hear the word "portal," they think of search engines. *Search engines* are *horizontal portals*, or portals that aggregate information on a broad range of topics. Other portals are more specific, offering a great deal of information pertaining to a single area of interest; these portals are called *vertical portals*.

Online shopping is a popular addition to the major portals. Sites such as `Hotbot.com`, `About.com`®, `altavista.com` and `Yahoo.com`® provide users with a shopping page that links them to thousands of sites carrying a variety of products.

Portals linking consumers to online merchants, online shopping malls and auction sites provide several advantages. These portals help users collect information on an item for which they are looking and allow users to browse independently owned storefronts, unlike some online shopping malls. Yahoo! permits users to browse a variety of sites while maintaining the convenience of paying through their Yahoo! account.

32.2.5 Dynamic-Pricing Models

In the past, bargain hunters had to search for deals by visiting numerous local retailers and wholesalers. In this section, we describe in depth the many ways in which creative pricing is used to generate business. Some companies enable customers to name the prices they are willing to pay for travel, homes, automobiles and consumer goods.

Buying in bulk has always driven prices down, and there are now Web sites that allow shoppers to find lower prices by joining with other buyers to purchase products in large quantities. Another pricing strategy used by many e-businesses is to offer products and services for free. By forming strategic partnerships and selling advertising many companies are able to offer their products at a greatly reduced rate, and often for free. Bartering and offering rebates are other ways in which companies are keeping prices down on the Internet.

The Web has also improved the customer's ability to compare pricing among many vendors. Sites like **google.com** and **bottomdollar.com** aggregate pricing information on a wide variety of products sold across the Web.

32.2.6 Name-Your-Price Model

The *name-your-price* business model empowers customers by allowing them to state the price they are willing to pay for products and services. Many of the businesses that offer this service have formed partnerships with leaders of various industries, such as travel, lending, retail, etc. These industry leaders receive the customer's desired price from the business, which acts as an intermediary, and decide whether or not to sell the product or service the customer wants. If the customer's price is not accepted, the customer may offer another price. If it is excepted, the customer is obligated to make the purchase.

Many e-businesses use *intelligent agents* (such as shopping bots) to enhance their Web sites. Intelligent agents are programs that search and arrange large amounts of data and report answers based on that data. Shopping bots are often used to scour data contained within a single database or across the Web to find answers to specific questions.

32.2.7 Comparison-Pricing Model

The *comparison-pricing model* allows customers to poll a variety of merchants and find a desired product or service at the lowest price. Comparison-pricing sites often generate revenue from partnerships with particular merchants. Users need to be careful when using these services because they may not be getting the best prices available on the Web. Some services will promote products based on their partnerships with merchants, rather than on reliable price comparisons.

32.2.8 Demand-Sensitive Pricing Model

The Web enables customers to demand better, faster service at cheaper prices. It also empowers buyers to shop in large groups to obtain group discounts. The concept behind the demand-sensitive-pricing business model is the more people who buy a product in a single purchase, the lower the cost per person becomes. Selling products individually can be expensive because the vendor must price a product so that it covers selling and overhead costs while still generating a profit. When customers buy in bulk, these costs are shared among products, and the profit margin is increased. MobShop^{SM} (**www.mobshop.com**) sells products for the home, electronics, computers and peripherals using the demand-sensitive pricing model. Pricing and products vary between MobShop and similar sites. Therefore, customers should visit several such sites before making a purchase.

32.2.9 Bartering Model

Another popular method of conducting e-business is *bartering*, or offering one item in exchange for another. **Ubarter.com**™ is a site that allows individuals and companies wishing to trade products to post their listings. The initial trader makes an initial offer with the intention of bartering to reach a final agreement with the buyer.

If a business is looking to get rid of an overstocked product, iSolve^{SM} (**www.isolve.com**) can help sell it. Products can be sold directly or on a barter basis. Potential customers send their pricing preferences to the merchant, who evaluates the offer. Deals are often part barter and part cash. Examples of items typically bartered are overstocked inventory items, factory surplus and unneeded assets.

32.3 Building an e-Business

There are numerous ways to approach designing, developing and maintaining an e-business. Some businesses can establish an online presence by using a *turnkey solution* (See the Yahoo! Store case study). A turnkey solution is a pre-packaged e-business. Other options for e-business development include e-business templates that outline the basic structure but allow the design to be determined by the owner. Larger corporations or businesses with substantial funding can outsource the project to an organization offering e-business solution packages. Large corporations can also choose to build the e-business in-house through an application platform.

There are many things businesses must consider before beginning an e-business. Building, managing and maintaining a Web site involves advertising, marketing, customer relationship management, accepting online payments, providing and continuously updating content, recognizing cultural differences and legal parameters and providing security features for visitors and the business. We discuss these issues in further detail throughout the chapter. Depending on the degree of sophistication, this can become an expensive venture.

Yahoo! Store

There are many online *store-builder* solutions that allow merchants to set up online storefronts complete with catalogs, shopping carts and order-processing capabilities. These fixed-price options are available to businesses of all sizes, but they are ideal for small businesses that cannot afford custom solutions or do not have secure merchant servers. *Yahoo! Store* is one of the most popular e-commerce store-builder solutions. **[***M Nemzow, *Building Cyberstores* (New York: McGraw-Hill, 1997).***]** Yahoo! Store is available at **store.Yahoo.com**.

Yahoo! Store charges a monthly fee based on the number of items users want to sell. This turnkey solution is designed to simplify the process of creating an online store. All the features needed to set up a complete e-commerce site are included.

Yahoo! Store (Cont.)

To set up a demo store, go to `store.yahoo.com` and click on the **Create a Store** link. Under **I'm a New User**, click on **Sign me up!** Users need to enter the addresses and names for their sites. After clicking **Create** users are presented with the Yahoo! Store Merchant Service Agreement, which must be accepted before a demo store can be built. Setting up a demo store is free, but orders cannot be accepted. After accepting the agreement, Yahoo! Store provides detailed directions to help merchants set up active online storefronts.

Merchants can change the style of their Web sites by clicking on the **Look** button. There are several style templates. **Random** can also be used to change the colors and fonts. Yahoo! Store automatically sets up the shopping cart and secure order forms so customers can purchase products through new Web stores.

To set up a working storefront where orders can be accepted, users must sign on with Yahoo! Store and set up merchant accounts with banks, enabling sites to accept credit-card payments. Generally, merchant banks and credit-card companies charge a small percentage of each transaction as their fee. Online payments are discussed in Section 32.5.

Yahoo! Store e-commerce sites are hosted on Yahoo! secure servers. Yahoo! maintains the servers on a 24-by-7 basis. The site backs up all the information needed to run your store and provides SSL technology to encrypt all credit-card transactions. We discuss SSL in Section 32.6.2.

Yahoo! Store merchants can track sales, see how customers are getting to their sites and use the Yahoo! wallet. E-wallets are discussed in Section 32.5.2. Also, each Yahoo! Store is included in Yahoo! Shopping, allowing customers to access your store through a link at the Yahoo! Web site. **[***<www.yahoo.com>.***]**

32.4 e-Marketing

Competition is intense in the e-business, e-commerce and m-business/m-commerce worlds, and having a solid e-marketing strategy gives a company an advantage. Wireless devices, the Internet and the World Wide Web provide marketers with new tools and added convenience for the development and delivery of marketing campaigns. In this section, we explore various components of a *marketing campaign*, such as marketing research, advertising, promotions and public relations. We also discuss the importance of search engines and how they can be used to increase Web-site traffic.

32.4.1 Branding

A *brand* is typically defined as a name, logo or symbol that helps identify a company's products or services. Customers' experiences can be considered part of a company's brand and include the quality of customers' interactions with a company and its products or services. **[***P. Seybold, "Broad Brand," *The Industry Standard 6* November 2000: 214.***]** Brands should be unique, recognizable and easy to remember. **[***B. Warner and L. Schuchman, "Getting Heard Above the Noise," *The Industry Standard* 27 December 1999 - 3 January 2000: 53.***]** *Brand equity* includes the value of tangible

and intangible items, such as a brand and its monetary value over time, customer perceptions and customer loyalty to a company and its products or services. Businesses that already have a solid brand may find it easier to transfer their brand to the Internet and wireless Web, while Internet-only businesses must strive to develop a brand that customers trust and value.

32.4.2 Marketing Research

Marketing research can help a company develop its *marketing mix,* which includes product or service details and development, effective pricing, promotion and distribution. Marketing research has traditionally consisted of focus groups, interviews, paper and telephone surveys, questionnaires and *secondary research*—findings based on previously collected data. Research can now be performed over the Internet, giving marketers a new, faster method of finding and analyzing industry, customer and competitor information. The Internet also provides a relaxed and anonymous setting to hold focus-group discussions and distribute questionnaires.

It is useful to learn about the demographics of Internet, World Wide Web and wireless device users to target marketing campaigns more effectively. *Demographics* are statistics on the human population, including age, sex, marital status and income. Knowing customers' ages, incomes and locations can help to reveal their buying power. Through research and analysis, marketers gain information about customers' *psychographics*, which can include family lifestyle, cultural background and values.**[***<www.dictio-nary.com/cgi-bin/dict.pl?term=psychographics>.***]**

Through *online focus groups*, current or potential consumers can present their opinions about products, services or ideas. This feedback can be useful when making critical decisions concerning the launch of a new product, service or campaign.

32.4.3 e-Mail Marketing

E-mail marketing campaigns can provide an inexpensive and effective method of targeting potential customers. The marketer should define the *reach*, or the span of people the marketer would like to target, including geographic locations and demographic profiles. The marketer should also determine the level of personalization of the campaign. Personalized *direct e-mail* targets consumers by using their names, offering the right products at the right time and sending special promotions targeted to their interests. *Internet mailing lists* can help target customers through personalized e-mail. *Opt-in e-mail* is sent to people who explicitly choose to receive offers, information and promotions. It is important not to abuse people who have given such permission. For example, marketers should not flood people with e-mails. Excessive e-mailing can decrease the effectiveness of an e-mail campaign. Marketers should avoid sending e-mail to people who have not shown interest in a marketer's products or services. *Spamming*—mass e-mailing to people who have not expressed interest in receiving e-mails from a company—can give that company a poor reputation.

32.4.4 Consumer Tracking

Traffic on Web sites is measured by hits. A hit is recorded for every file transfer from the server to the browser. For example, a Web page containing three images generates four

hits—one for the text and one for each image. Therefore, the number of visitors to a site based on the number of hits is only an estimate. It is nearly impossible with current technology to get an exact count of visitors to a site.

While generating Web-site traffic is important to the success of an e-business, it is not enough. Keeping user profiles, recording visits and analyzing promotional and advertising results are helpful when measuring a marketing campaign's effectiveness. By discovering the *target market*—the group of people toward whom it is most profitable to aim a marketing campaign—a company can focus its campaign and increase the number of visits, responses and purchases. *Log files* (files that consist of data generated by site visits, including each visitor's location, IP address, time of visit and frequency of visits) and *log-file analysis* (organizes and summarizes the information contained in the log files) can be used to monitor consumer information.

Tracking devices are used to monitor consumer behavior. A *Web bug* is a form of tracking device that uses a file embedded in an image on the site. The file allows site owners and third parties to hide consumer behavior information-collecting programs on various parts of a site. *ID cards* are tracking devices that provide the Web site with the numerical address of the PC and browser and information about the consumer's operating system, so that requested information can be sent to the user. *Cookies,* a third type of tracking device, are text files stored by Web sites on an individual's personal computer, that allow a site to track the actions of a visitor. The first time a user visits a Web site, the user's computer may receive a cookie. This cookie is reactivated each time the computer revisits that site. The information collected is intended to be an anonymous account of log-on times, the length of stay at the site, purchases made on the site, the site previously visited and the site visited next. Although the cookie resides on an individual's hard drive, it does not interact with other information stored on the system. Cookies can only be read by the host that sets them on a person's computer.

32.4.5 Advertising

E-business advertising is conducted through traditional channels such as television, movies, newspapers and magazines, as well as online and wireless advertising channels. Many e-businesses advertise during prime-time television, which is the most expensive time to air commercials. Advertising gives e-businesses the opportunity to establish and strengthen branding. Publicizing URLs on all direct mailings, business cards, billboards, print, wireless advertisements and other media helps increase brand awareness and bring more visitors to a site.

E-Fact 32.2

The amount of money spent on e-business commercials during Super Bowl XXXIV totaled approximately $135 million. **[✱✱✱S. Eliot, "Not X's, Not O's, It's the Dot-Coms that Matter. Marketers Suit Up For a Costly Race for Recognition," *The New York Times* 28 January 2000: C1.✱✱✱]**

While newspapers, magazines, television and films all provide effective advertising channels, online and wireless advertising is quickly becoming part of the advertising-world. Online advertising can include placing links and banners on other companies' Web sites and registering a site with search engines and directories. A business can

charge other companies for placing their advertisements on its site, providing the business with additional income.

E-Fact 32.3

By 2003, revenues for online advertising are expected to reach $13.3 billion, according to Jupiter Research. **[*** S. Mulcahy, "On-line Advertising Poised To Explode; Learn Ropes Now,"** *Mass High Tech* **28 February-5 March 2000: 4.***]**

Banner advertising is another means of marketing your site online. Banner ads are similar to the billboards along the side of the highway. Companies such as `Adsmart.net`, `Valueclick.com` and `Doubleclick.com` offer banner-hosting services. Some companies charge based on the number of times a banner ad is viewed on a page. Other companies charge based on the number of click-throughs generated by the banner ad; advertisers only pay when a viewer clicks on the banner ad and goes to that Web site. For more information, visit `www.valueclick.com` and `www.doubleclick.com`.

32.4.6 Search Engines

A *search engine* is a program that scans Web sites and lists relevant sites based on keywords or other search-engine ranking criteria. *Search-engine ranking* is important to bringing new visitors to a site. The method used by search engines to rank a Web site will determine how "high" a site appears on lists of search results. Businesses can customize and register their sites to improve the position in which they appear in search-engine results.

A *meta tag* is an XHTML tag that contains information about a Web page. The tag does not change how a Web page is displayed, but can contain a description of the page, keywords and the page's title. Search engines often use this information when ranking a site.

Some search engines rank sites by sending out a program, called a *spider*, to inspect the site. The spider reads the meta tags, determines the relevance of the Web page's information and keywords and then ranks the site according to that visit's findings. Marketers should examine competitors' sites to see their meta tags and information included in the sites. It is important to have a site appear in the top 10 results, because often people will not look further. For valuable information about keyword selection, visit `www.keywordcount.com` and `www.websearch.about.com/internet/websearch/insub2-m02.htm`.

32.4.7 Affiliate Programs

Affiliate programs have become a dominant and unique form of Internet marketing. An affiliate program is a form of partnership in which a company pays *affiliates* (other companies or individuals) for prespecified actions taken by visitors who *click-through* from an *affiliate site* to a *merchant site*.

Affiliate programs can also increase traffic. Affiliates post links in exchange for referral fees. Many affiliate programs offer a percentage of each sale or a fixed fee for click-throughs that result in sales. For example, `Befree.com` is a fee-based service that helps users set up affiliate programs. For more information, visit `www.befree.com`.

32.4.8 Promotions

Promotions can attract visitors to a site and can influence purchasing. They may also be used to increase brand loyalty through reward programs. Promotions include frequent-flyer miles, point-based rewards, discounts, sweepstakes, free trials, free shipping and e-coupons. Promotions can provide a company with an effective way to establish contact with potential customers, but it is important to make sure that customers are actually becoming loyal to the company and not just to its promotions or rewards program. The costs of the program must also be monitored carefully. **[***J. Black, "Dangle With Care," *Internet World* 15 October 2000: 39. ***]**

32.4.9 Public Relations

Public relations (*PR*) keeps customers and employees current on the latest information about products, services and internal and external issues, such as company promotions and consumer reactions. It includes communicating with consumers and employees through press releases, speeches, special events, presentations and e-mail.

Press releases, which announce current events and other significant news to the press, can be delivered over the Web. PR Web (`www.prweb.com`) allows the submission of press releases for free. Video clips of news appearances, speeches, commercials and advertisements can be effective publicity. Visit `www.prnewswire.com` and `www.businesswire.com` to view lists of recent press releases, including audio and video news.

Crisis management, an aspect of PR, is conducted in response to problems a company is experiencing. For example, many investors and consumers closely follow financial news about Internet companies. When a company is doing well financially, this fact should be made public. However, if the company is doing poorly, the public-relations department must be ready to issue information about what is causing the problem and what will be done to correct it.

32.4.10 Customer Relationship Management (CRM)

Offering customers convenience, personalization and excellent service plays a key role in the success and differentiation of many online businesses. *Customer relationship management (CRM)* focuses on providing and maintaining quality service for customers, by effectively communicating and delivering products, services, information and solutions to address customer problems, wants and needs. It is far less expensive to keep current customers than it is to acquire new ones.

E-Fact 32.4

According to the Boston Consulting Group, the cost of acquiring a new online customer is approximately thirty-four dollars, while using the online channel to market to a current customer costs around seven dollars. **[***B. Thompson, "Keeping Customers is Smart and Profitable," Business Week Special Advertising Section 3 July 2000. ***]**

CRM can include *call handling* (the maintenance of outbound and inbound calls from customers and service representatives), *sales tracking* (the tracking and recording of all sales made) and *transaction support* (the technology and personnel used for conducting business transactions), as well as many other functions. eCRM is the application of CRM to an e-business' strategy and includes the personalization and customization of customers'

experiences and interactions with a Web site, call center or any other method of customer contact with the e-business. The term iCRM (Internet customer relationship management) can be used interchangeably with eCRM for e-business customer relationship management. Business analysts should review all CRM plan details and review data, such as drops in costs or increases in customer complaints, to refine the CRM system.

CRM is essential to the success of an e-business. The relationship between merchants and customers is not always direct. Often transactions are conducted through a series of additional parties. Therefore, it is important to know more about the customers to establish and maintain a relationship, one that will bring them back for repeat purchases.

32.5 Online Payments

Secure electronic funds transfer is crucial to e-commerce. Credit-card transactions, digital cash and e-wallets, smart cards, micropayments and electronic bill presentment and payment are methods for conducting online transactions. Many companies offer products, software and services that enable monetary transactions on the Web.

32.5.1 Credit-Card Payment

Although credit cards are a popular form of payment for online purchases, many people resist the appeal and simplicity of credit-card transactions due to security concerns. Customers fear credit-card fraud by merchants and third parties. Some credit cards, such as the Prodigy Internet® Mastercard® and American Express, have features enabling them to accommodate online and offline payments.

To accept credit-card payments, a merchant must have a *merchant account* with a bank. Traditional merchant accounts accept only *POS (point-of-sale) transactions*, or those that occur when you present your credit card at a store. With the growth in e-commerce, specialized Internet merchant accounts have been established to handle online credit-card transactions. These include *card-not-present* (CNP) transactions. For example, when purchasing on the Web, the card number and expiration dates can be provided, but the merchant does not see the actual card being used in the purchase. A merchant account can be established through either a bank or a third party service.

32.5.2 Digital Cash and e-Wallets

Digital cash is one example of digital currency. It is stored electronically and can be used to make online electronic payments. Digital-cash accounts are similar to traditional bank accounts. Consumers deposit money into their digital-cash accounts to be used in their digital transactions. Digital cash is often used with other payment technologies, such as digital wallets. Aside from alleviating some of the security concerns many people have about online credit-card transactions, digital cash allows people who do not have credit cards to shop online.

To facilitate the credit-card order process, many companies are introducing *electronic wallet* services. *E-wallets* keep track of billing and shipping information so that it can be entered with one click at participating merchants' sites. E-wallets also store e-checks, e-cash and credit-card information for multiple cards.

32.5.3 Micropayments

Merchants must pay a fee for each credit-card transaction that they process; this can become costly when customers purchase inexpensive items. The cost of some items could actually be lower than the standard transaction fees, causing merchants to incur losses. *Micropayments,* or payments that generally do not exceed $10, offer a way for nominally priced products and services (music, pictures, text or video) to be sold over the Web.

e-Fact 32.5

According to Gartner Group, in an ongoing study of online retailers, only a small percentage offered a payment option for items priced under $10. [***M. Solomon, "Micropayments," Computer World 1 May 2000: 62.***]

To offer the option of micropayments, some companies have formed strategic partnerships with utility companies. For instance, a phone bill is essentially an aggregation of micropayments that are charged at the end of a particular period of time to justify the transaction fees.

32.5.4 Smart Cards

Smart cards, cards with computer chips embedded on the faces, are able to hold more information than ordinary credit cards with magnetic strips. Smart-card technology can be used to hold information on health care, transportation, identification, retail, loyalty programs and banking. Smart cards enable information for different purposes to be stored in one location.

There are *contact* and *contactless* smart cards. To read the information on the smart card and update information on the computer chip, contact smart cards need to be placed in a *smart card reader.* A contactless smart card has both a coiled antenna and a computer chip inside, enabling the card to transmit information. The contactless card enables faster information exchange than is possible using a contact smart card. For example, contactless cards are convenient for transportation services, such as an automatic toll payment. A contactless smart card can be placed in a device in a car to charge an account to pay tolls. **[***<www.gemplus.com>.***]**

Smart cards can require the user to have a password, giving the smart card a security advantage over credit cards. Information can be designated as "read only" or as "no access." To address security concerns, the card can have the user's picture on its face for identification purposes.

32.6 Security

Modern computer security addresses the various problems and concerns of protecting electronic communications and maintaining network security. There are four fundamental requirements of a successful, secure transaction: *privacy*, *integrity*, *authentication* and *nonrepudiation*. *The privacy issue is the following*: How do you ensure that the information you transmit over the Internet has not been captured or passed on to a third party without your knowledge? *The integrity issue is the following*: How do you ensure that the information you send or receive has not been compromised or altered? *The authentication issue is the following*: How do the sender and receiver of a message prove their identities to each

other? *The nonrepudiation issue is the following*: How do you legally prove that a message was sent or received? In addition to these requirements, network security addresses the issue of *availability*: How do we ensure that the network and the computer systems to which it connects will stay in operation continuously?

The explosion of e-business and e-commerce is forcing businesses and consumers to focus on Internet, network and wireless security. In the next several sections we will explore Internet security and the technologies and protocols used to secure e-commerce transactions and communications.

32.6.1 Public-Key Cryptography

The channels through which data pass are not secure; therefore, any private information that is being passed through these channels must somehow be protected. To secure information, data can be encrypted. *Cryptography* transforms data by using a *cipher*, or *crypto-system*—a mathematical algorithm for encrypting messages. An algorithm is a computer science term for "procedure." A *key*—a string of digits that acts as a password in the cipher—makes the data incomprehensible to all but the sender and intended receivers. Unencrypted data is known as *plain text*; encrypted data are called *ciphertext*. Only the intended receivers should have the corresponding key to decrypt the ciphertext into plaintext.

In the past, organizations wishing to maintain a secure computing environment used *symmetric cryptography*, also known as *secret-key cryptography*. Secret-key cryptography uses the same secret key to encrypt and decrypt a message. In this case, the sender encrypts a message using the secret key, then sends the encrypted message and the symmetric secret key to the intended recipient. A fundamental problem with secret-key cryptography is that before two people can communicate securely, they must find a secure way to exchange the secret key. The privacy and the integrity of the message could be compromised if the key is intercepted as it is passed between the sender and the receiver over unsecure channels. Also, since both parties in the transaction use the same key to encipher and decipher a message, one cannot authenticate which party created the message.

Public-key cryptography is used mostly for authentication, data integrity and secret-key exchange. Public-key cryptography is asymmetric. It uses two inversely related keys: a *public key* and a *private key*. The private key is kept secret by its owner, while the public key is openly distributed. If the public key is used to encrypt a message, only the corresponding private key can decrypt it, and vice versa (Fig. 32.3). Each party in a transaction has both a public key and a private key. To transmit a message securely, the sender uses the receiver's public key to encrypt the message. The receiver then decrypts the message using his or her unique private key. Assuming that the private key has been kept secret, the message cannot be read by anyone other than the intended receiver; the system ensures the privacy of the message. The defining property of a secure public-key algorithm is that it is computationally infeasible to deduce the private key from the public key. Although the two keys are mathematically related, deriving one from the other would take enormous amounts of computing power and time, enough to discourage attempts to deduce the private key. An outside party cannot participate in communication without the correct keys. The security of the entire process is based on the secrecy of the private keys. Therefore, if a third party does obtain the decryption key, the security of the whole system is compromised. If a system's integrity is compromised, the user can simply change the key, instead of changing the entire encryption or decryption algorithm.
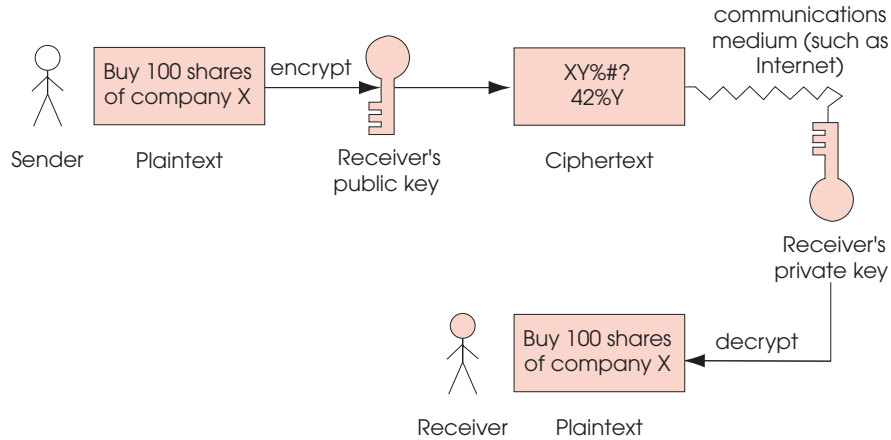
Fig. 32.3   Encrypting and decrypting a message using public-key cryptography.

Digital signatures, the electronic equivalent of written signatures, were developed to be used in public-key cryptography to solve the problems of authentication and integrity. A digital signature authenticates the sender's identity, and, like a written signature, they are difficult to forge. To create a digital signature, a sender first takes the original plaintext message and runs it through a *hash function*, which is a mathematical calculation that gives the message a *hash value*. For example, you could take the plaintext message "Buy 100 shares of company X," run it through a hash function and get a hash value of 42. The hash function could be as simple as adding up all the 1s in a message, although it is usually more complex. The hash value is also known as a *message digest*. The chance that two different messages will have the same message digest is statistically insignificant. *Collision* occurs when multiple messages have the same hash value. It is computationally infeasible to compute a message from its hash value or to find two messages with the same hash value.

Next, the sender uses the sender's private key to encrypt the message digest. This step creates a digital signature and authenticates the sender, since only the owner of that private key could encrypt the message. The original message, encrypted with the receiver's public key, the digital signature and the hash function are sent to the receiver. The receiver uses the sender's public key to decipher the original digital signature and reveal the message digest. The receiver then uses his or her own private key to decipher the original message. Finally, the receiver applies the hash function to the original message. If the hash value of the original message matches the message digest included in the signature, there is *message integrity*; the message has not been altered in transmission.

One problem with public-key cryptography is that anyone with a set of keys could potentially assume another party's identity. For example, say a customer wants to place an order with an online merchant. How does the customer know that the Web site indeed belongs to that merchant and not to a third party that posted a site and is masquerading as a merchant to steal credit-card information? *Public Key Infrastructure* (*PKI*) integrates public-key cryptography with *digital certificates* and *certificate authorities* to authenticate parties in a transaction. *Wireless PKI* (*WPKI*) is a security protocol specifically for wireless

transmissions. Like regular PKI, WPKI authenticates the users with digital certificates and encrypts messages using public-key cryptography. It also ensures nonrepudiation.

A digital certificate is a digital document issued by a *certification authority (CA)*. A digital certificate includes the name of the subject (the company or individual being certified), the subject's public key, a serial number, an expiration date, the signature of the trusted certification authority and any other relevant information. A CA is a financial institution or other trusted third party, such as *VeriSign*. The CA takes responsibility for authentication, so it must check information carefully before issuing a digital certificate. Once issued, the digital certificates are publicly available and are held by the certification authority in *certificate repositories*. VeriSign, Inc., is a leading certificate authority. For more information about VeriSign, visit **www.verisign.com**

Many people still consider e-commerce unsecure. However, transactions using PKI and digital certificates are more secure than exchanging private information over phone lines, through the mail or even than paying by credit card in person. The key algorithms used in most secure online transactions are nearly impossible to compromise. By some estimates, the key algorithms used in public-key cryptography are so secure that even millions of today's computers working in parallel could not break the codes in a century.

The most commonly used public-key algorithm is *RSA*, an encryption system developed in 1977 by MIT professors Ron Rivest, Adi Shamir and Leonard Adleman. Today, their encryption and authentication technologies are used by most Fortune 1000 companies and leading e-commerce businesses. With the emergence of the Internet and the World Wide Web, their security work has become even more significant and plays a crucial role in e-commerce transactions. Their encryption products are built into hundreds of millions of copies of the most popular Internet applications, including Web browsers, commerce servers and e-mail systems. Most secure e-commerce transactions and communications on the Internet use RSA products. For more information about RSA, cryptography and security, visit **www.rsasecurity.com**. Other organizations, such as Microsoft, offer products to ensure security (see the Microsoft Authenticode feature).

Microsoft Authenticode: Authenticating Software

How do you know that the software you ordered online is safe and has not been altered? How can you be sure that you are not downloading a computer virus that could wipe out your computer? Do you trust the source of the software? With the emergence of e-commerce, software companies are offering their products online, so that customers can download software directly onto their computers. Security technology is used to ensure that the downloaded software is trustworthy and has not been altered. *Microsoft Authenticode*, combined with VeriSign digital certificates (or *digital IDs*), authenticates the publisher of the software and detects whether the software has been altered. Authenticode is a security feature built into Microsoft Internet Explorer.

Microsoft Authenticode: Authenticating Software (Cont.)

To use Microsoft Authenticode technology, each software publisher must obtain a digital certificate specifically designed for the purpose of publishing software; such certificates may be obtained through certificate authorities, such as VeriSign. To obtain a certificate, a software publisher must provide its public key and identification information and sign an agreement that it will not distribute harmful software. This requirement gives customers legal recourse if any downloaded software from certified publishers causes harm.

Microsoft Authenticode uses digital-signature technology to sign software (Section 32.6). The signed software and the publisher's digital certificate provide proof that the software is safe and has not been altered.

When a customer attempts to download a file, a dialog appears on the screen displaying the digital certificate and the name of the certificate authority. Links to the publisher and the certificate authority are provided so that customers can learn more about each party before they agree to download the software. If Microsoft Authenticode determines that the software has been compromised, the transaction is terminated. To learn more about Microsoft Authenticode, visit the following sites:

msdn.microsoft.com/workshop/security/authcode/signfaq.asp
msdn.microsoft.com/workshop/security/authcode/authwp.asp

32.6.2 Secure Sockets Layer (SSL)

The *Secure Sockets Layer* (*SSL*) protocol, developed by Netscape Communications, is a non-proprietary protocol commonly used to secure communication between two computers on the Internet and the Web. **[***S. Abbot, "The Debate for Secure E-Commerce,"** *Performance Computing* **February 1999 37-42.***] [***T. Wilson, "E-Biz Bucks Lost Under the SSL Train,"** *Internet Week* **24 May 1999: 1,3.***]** SSL is built into many Web browsers, including Netscape Communicator and Microsoft Internet Explorer, as well as numerous other software products. Currently, most e-businesses use SSL for secure online transactions, although SSL is not designed specifically for securing transactions.

In a standard correspondence over the Internet, a sender's message is passed to a *socket*, which receives and transmits information from a network. The socket then interprets the message through *Transmission Control Protocol/Internet Protocol* (*TCP/IP*). TCP/IP is the standard set of protocols used for communication between computerson the Internet. Most Internet transmissions are sent as sets of individual message pieces, called *packets*. At the sending side, the packets of one message are numbered sequentially, and error-control information is attached to each packet. IP is primarily responsible for routing packets to avoid traffic jams, so each packet might travel a different route over the Internet. The destination of a packet is determined by the *IP address*—an assigned address used to identify a computer on a network, similar to the address of a house in a neighborhood. At the receiving end, the TCP makes sure that all of the packets have arrived, puts them in sequential order and determines if the packets have arrived without alteration. If the packets have been altered or any data has been lost, TCP requests retransmission. When all of the data is successfully tranmitted, the message is passed to the socket at the receiver end. The

socket translates the message back into a form that can be read by the receiver's application. **[***H. Gilbert, "Introduction to TCP/IP," 2 February 1995 <http:// www.yale.edu/pclt/COMM/TCPIP.HTM>.***]** In a transaction using SSL, the sockets are secured using public-key cryptography.

SSL implements public-key technology using the RSA algorithm and digital certificates to authenticate the server in a transaction and to protect private information as it passes from one party to another over the Internet. SSL transactions do not require client authentication; many servers consider a valid credit card number to be sufficient for authentication in secure purchases. To begin, a client sends a message to a server. The server responds and sends its digital certificate to the client for authentication. Using public-key cryptography to communicate securely, the client and server negotiate *session keys* to continue the transaction. Session keys are symmetric secret keys that are used for the duration of that transaction. Once the keys are established, the communication proceeds between the client and the server by using the session keys and digital certificates. Encrypted data is passed through TCP/IP, just as regular packets travel over the Internet. However, before sending a message with TCP/IP, the SSL protocol breaks the information into blocks, compresses it and encrypts it. Conversely, after the data reaches the receiver through TCP/IP, the SSL protocol decrypts the packets, then decompresses and assembles the data. These extra processes provide an extra layer of security between TCP/IP and applications. SSL is primarily used to secure *point-to-point connections*—transmissions of data from one computer to another. **[***RSA Laboratories, "Security Protocols Overview," <ftp.rsa.com/pub/pdfs/protocols.pdf>, RSA Data Security, Inc., 1999.***]**The Transport Layer Security (TLS) protocol, designed by the Internet Engineering Task Force, is similar to, and compatible with, SSL. For more information on TLS visit **www.ietf.org/rfc/rfc2246.txt**.

Although SSL protects information as it is passed over the Internet, it does not protect private information, such as credit-card numbers, once the information is stored on the merchant's server. When a merchant receives credit-card information with an order, the information is often decrypted and stored on the merchant's server until the order is placed. If the server is not secure and the data is not encrypted, an unauthorized party can access the information. Hardware devices, such as *peripheral component interconnect (PCI) cards* designed for use in SSL transactions, can be installed on Web servers to process SSL transactions, thus reducing processing time and power and leaving the server free to perform other tasks. **[***M. Bull, "Ensuring End-to-End Security with SSL,"** *Network World* **15 May 2000: 63.***]**For more information about the SSL protocol, check out the Netscape SSL tutorial at **developer.netscape.com/tech/security/ssl/ protocol.html** and the Netscape Security Center site at **www.netscape.com/ security/index.html**.

32.6.3 WTLS

Wireless Transport Layer Security (*WTLS*) is the security protocol for the *Wireless Application Protocol* (*WAP*). WAP is a standard for wireless communications on mobile phones and other wireless devices. WTLS secures connections between wireless devices and application servers. It provides wireless technology with data integrity, privacy, authentication and denial-of-service security. **[***"Wireless Application Protocol White Paper,"** *WAP Forum* **June 2000.***]** WTLS encrypts data sent between a WAP-enabled wireless

device and a WAP *gateway* where messages are transferred from the wireless network to a wired network. At the gateway, data is decrypted from WTLS and then encrypted into SSL. For a few milliseconds the data is not encrypted and therefore it is unsecure. This brief lapse in security is called the *WAP gap*. Despite the fact that this system is unsecure, it is extremely difficult to exploit the WAP gap in practice. To date, no attack on the WAP gap has successfully caused the compromise of any secure data.

32.6.4 IPSec and Virtual Private Networks (VPN)

Organizations are taking advantage of the existing infrastructure of the Internet—the publicly available wires—to create *Virtual Private Networks* (*VPNs*), linking multiple networks, wireless users, customers and other remote users. A VPN is created by establishing a secure tunnel between multiple networks. *IPSec* (*Internet Protocol Security*) is one of the technologies used to secure the tunnel through which the data passes. **[***S. Burnett and S. Paine, *RSA Security's Official Guide to Cryptography* (Berkeley, CA: Osborne/ McGraw-Hill, 2001) 210.***]**

IPSec uses public-key and symmetric key cryptography to ensure authentication of the users, data integrity and confidentiality. An IP packet is encrypted, then sent inside a regular IP packet. The receiver discards the outer IP packet, then decrypts the inner IP packet. **[***D. Naik, *Internet Standards and Protocols* (Redmond, WA: Microsoft Press, 1998) 79–80.***]** For more information about IPSec, visit the *IPSec Developers Forum* at `www.ip-sec.com`. Also, check out the Web site for the *IPSec Working Group* of the IETF at `www.ietf.org/html.charters/ipsec-charter.html`.

32.6.5 Security Attacks

Recent cyberattacks on e-businesses have made the front pages of newspapers worldwide. *Denial-of-service attacks* (*DoS*), *viruses* and *worms* have cost companies billions of dollars.

Typically, a denial-of-service attack occurs when a network or server is flooded with data packets. This action greatly increases the traffic on the network, overwhelming the servers and making it impossible for legitimate users to download information. *Distributed denial-of-service attacks* occur when an unauthorized user gains illegitimate use of a network of computers (usually by installing viruses on the computers) and then uses the power of the computers working simultaneously to attack. These attacks cause networked computers to crash or disconnect from the network, making services unavailable for legitimate users.

Viruses are computer programs—often sent as attachments or disguised as audio clips, video clips and games—that attach to, or overwrite other programs to replicate themselves. Viruses can corrupt files or even wipe out a hard drive. Viruses are spread over a network simply by sharing "infected" files embedded in e-mail attachments, documents or programs. A worm is similar to a virus, except that it can spread and infect files on its own over a network; worms do not need to be attached to another program to spread. One of the most famous viruses to date is the *ILOVEYOU virus* that hit in May 2000. The virus cost organizations and individuals billions of dollars. Viruses and worms are not just limited to computers. In June 2000, a worm named *Timofonica* that was propagated through e-mail quickly made its way

into the cellular phone network in Spain, sending prank calls and leaving text messages on the phones.

Who is responsible for viruses and denial-of-service attacks? Most often the responsible parties are referred to as *hackers* or crackers. Hackers and crackers are usually skilled programmers. According to some, hackers break into systems just for the thrill of it, without causing any harm to the compromised systems; crackers have malicious intent. Either way, hackers and crackers break the law by accessing or damaging private information and computers. Many vendors offer antivirus utilities that help protect computers against viruses and other threats. For more information, visit McAfee at **www.mcafee.com** and Symantec at **www.symantec.com**.

32.6.6 Network Security

The goal of network security is to allow authorized users access to information and services, while preventing unauthorized users from gaining access to, and possibly corrupting, the network. A basic tool in network security is the *firewall*. The firewall protects a *local area network* (*LAN*) from intruders outside the network. For example, most companies have internal networks that allow employees to share files and access company information. Each LAN can be connected to the Internet through a gateway, which usually includes a firewall. A firewall acts as a safety barrier for data flowing into and out of the LAN. Firewalls can prohibit all data flow not expressly allowed, or can allow all data flow that is not expressly prohibited. The choice between these two models is up to the network security administrator and should be based on the need for security versus the need for functionality. Personal firewalls may also be used to protect a single PC.

What happens if a hacker gets inside your firewall? How do you know if an intruder has penetrated the firewall. Also, how do you know if unauthorized employees are accessing restricted applications? *Intrusion detection systems* monitor networks and application *log files*—files containing information on files, including who accessed them and when—so if an intruder makes it into the network or an unauthorized application, the system detects the intrusion, halts the session and sets off an alarm to notify the system administrator. [***O. Azim and P. Kolwalkar, "Network Intrusion Monitoring," *Advisor.com*/*Security* March/April 2001: 16-19.***]

32.7 Legal Issues

The Internet has posed significant challenges to the legal structure in the United States. Copyright infringement has confronted file-sharing technology, and privacy continues to be challenged by personalization mechanisms. In this section, we investigate the differences between our physical environment consisting of temporal and geographic boundaries, and *cyberspace*, the realm of digital transmission not limited by geography. We also explore defamation, copyright and pornography as they relate to the Internet.

32.7.1 Privacy

In the United States, an individual's right to privacy is not explicitly guaranteed by the Constitution, but protection from government intrusion is implicitly guaranteed through the First, Fourth, Ninth and Fourteenth Amendments. Of these four amendments, the Fourth

Amendment provides U.S. citizens with the greatest assurance of privacy, as it protects them from illegal search and seizure by the government:

> *The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrant shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the person or things to be seized.*

Many Internet companies collect users' personal information as the users navigate through a site. While privacy advocates argue that these efforts violate individuals' privacy rights, online marketers and advertisers disagree; they suggest that, by recording the likes and dislikes of online consumers, online companies can better serve their users. For example, if a user visits an online travel site and purchases a ticket from Boston to Philadelphia, the travel site might record this transaction. In the future, when a ticket goes on sale for the same flight, the Web site can notify the user.

Online privacy affects the workplace as well. Many businesses monitor employee activities on corporate and communications equipment. One of the newest surveillance technologies, *keystroke cops*, creates tension between employers and employees. **[***M.J. McCarthy, "Thinking Out Loud: You Assumed Erase Wiped Out That Rant Against the Boss.? Nope,"** *The Wall Street Journal* **7 March 2000.***]** The surveillance software is loaded onto the hard drive of an employee's computer, or it can be sent to an unsuspecting employee as an e-mail attachment. Once activated, the software registers each keystroke before it appears on the screen. The issue is most often one of company time and company equipment versus the employee's right of self expression. Situations may involve employees who neglect responsibilities to write personal e-mails, surf the Web or conduct online tirades against management in chat rooms.

32.7.2 Defamation

Defamation is the act of injuring another's reputation, honor or good name through false written or oral communication. **[***Webster's New World College Dictionary (USA: McMillan, 1999).***]** It is often difficult to win a defamation suit because the First Amendment strongly protects the freedom of *anonymous speech* (speech by an unknown person or a person whose identity has been withheld).

Defamation consists of two parts, *slander and libel*. Slander is spoken defamation, whereas libelous statements are written or spoken in a context in which they have longevity and pervasiveness that exceed slander. For example, broadcasting is considered libelous even though it is spoken.

To prove defamation, a plaintiff's (the person bringing the argument to court) case must meet five requirements: (1) The statement must have been published, spoken or broadcast; (2) There must be identification of the individual(s) through name or reasonable association; (3) The statement must, in fact, be defamatory; (4) There must be fault (for public persons, the statement must have been made in *actual malice*, or with the intention of causing harm; for private persons, the statement needs only to have been *negligent*, or published, spoken or broadcast when known to be false); and (5) There must be evidence of injury or *actual loss*. **[***<www.abbottlaw.com>.***]**

32.7.3 Sexually Explicit Speech

As determined in *Miller v. California (1973)*, the *Miller Test* identifies the criteria used to distinguish between obscenity and pornography. In the United States, pornography is protected by the First Amendment. To be determined obscene by the Miller Test, material has to (1) appeal to the prurient interest, according to contemporary community standards, and (2) when taken as a whole, lack serious literary, artistic, political or scientific value. **[***Miller vs. California, 413 U.S. 15 at 24-25 (1973).***]**

The Internet, with its lack of geographic boundaries, challenges the Miller Test. As we have discussed, the Test is dependent on contemporary community standards. In cyberspace, communities exist independently of geographic boundaries.

The Internet has characteristics similar to those of broadcast media and print media; yet there are problems with applying traditional regulations to publishing on the Web. Broadcasting is considered highly pervasive. The Internet resembles broadcasting in its ability to reach a broad audience with little or no warning. **[***FCC vs. Pacifica Foundation 438 U.S. 726 (1978).***]** The regulation of printed media focuses on the audience and less on the content of the material. Defined as *non-content-related means* (an effort to control the audience rather than the material), print restrictions allow an adult to purchase and view pornographic material, but limit an adolescent's ability to obtain that material. The Internet can mimic non-content related means by requiring users to provide identification before entering specific sites.

32.7.4 Copyright and Patents

Copyright, according to the U.S. Copyright Office, is the protection given to the author of an original piece, including "literary, dramatic, musical, artistic and certain other intellectual works," whether the work has been published or not. For example, copyright protection is provided for literature, music, sculpture and architecture. Copyright protects only the expression or form of an idea, and not the idea itself.

Copyright protection provides incentives to the creators of original material by guaranteeing them credit for their work for a given amount of time. Currently, copyright protection is guaranteed for the life of the author plus 70 years. Concerns have been raised regarding the level of protection of intellectual property offered through traditional law because of the ease with which material can be reproduced on the Internet, and because *digital copies* are perfect duplicates of the original,.

Patents, which grant the creator sole rights to the use of a new discovery, present another issue: There are opponents to the duration of patents. Given the growth rate of the Internet, some argue that the 20-year duration of patents discourages continuous software development and improvement.

In 1998, the federal regulations governing the distribution of patents increased the scope of patented discoveries to include "methods of doing business." **[***L. Lessig, "Patent Problems,"** *The Industry Standard* **31 January 2000: 47.***]** To be granted a patent for a method of doing business, the idea must be new and not obvious to a skilled person.

32.8 XML and e-Commerce

XHTML is a markup language used for publishing information on the Web. Content developers use a fixed set of XHTML tags to describe the elements of online documents, such as headers, paragraphs, bold-face text, italicized text, etc.

XML (Extensible Markup Language) is not actually a markup language like XHTML. Rather, it allows users to create customized tags unique to specific applications, so that users are not limited to using XHTML's fixed set of publishing-industry-specific tags. For example, developers can make industry-specific (or even organization-specific) tags to categorize data more effectively within their communities. Some industries have already developed standardized XML tags for publishing documents online. For example, MathML (Math Markup Language) is a standardized XML-based language for marking up mathematical formulas in documents, and CML (Chemical Markup Language) is a standardized XML-based language for marking up the molecular structure of chemicals.

The ability to customize tags will allow business data to be used worldwide. For example, businesses could create XML tags specifically for invoices, electronic funds transfers or purchase orders. They could standardize tags for prices, the parties in the transaction, etc. XML will be used to define business transactions. To be used effectively, an industry's customized tags must be standardized across that industry.

Once tags are standardized, the browser must be able to recognize them. Either the tags can be built into the browser, or plug-ins could be downloaded. A customized XML tag could actually be used as a command for a browser to download the plug-in for the corresponding set of standardized tags.

The impact of XML on e-commerce is profound. XML gives online merchants a better means of tracking product information. By using standardized tags for data, bots and search engines are able to find products faster online.

Many industries are using XML to improve EDI. The health care industry, for example, uses XML to share patient information (even CAT scans) among health care-oriented applications. This helps doctors access information and make decisions faster, which can improve the care patients receive. **[***R. Kwon, "Delivering Medical Records Securely,"** *Internet World* **10 August 1998: 23.***]**

The *Health Level Seven (HL7)* organization's *Application Protocol for Electronic Data Exchange in Healthcare Environments* uses XML. This standard enables health care-oriented applications to exchange data electronically by specifying the layout and order of information. Patient names, addresses, insurance providers, etc. are tagged so that they can be shared electronically among applications. Once a patient's identification information is entered, that information can be shared over the hospital's intranet with the labs and the accounting department, thus eliminating the need to re-enter the same data. HL7 is a nonprofit, *American National Standards Institute (ANSI)—accredited Standards Developing Organization* that focuses on clinical and administrative data. For more information on HL7, visit their Web site at `www.HL7.org`. The ANSI Web site is `www.ansi.org`.

The XML *Metadata Interchange Format (XMI)* is a standard that combines XML with *Unified Modeling Language (UML)*. Software developers use UML to design object-oriented systems. XMI allows developers using object technology to tag design data. XMI tags allow developers to exchange design data over the Internet and interact with multiple vendors using a variety of tools and applications. Thus, with XMI people worldwide can

collaborate on the designs of object-oriented software systems. For more information about XMI, visit **www-4.ibm.com/software/ad/features/xmi.html**.

Some software companies sell their products over the Web. The *Open Software Description Format (OSD)* is an XML specification that enables the distribution of software over the Internet. Using OSD, developers tag the structure of an application and its files. The tags describe each component of the software and its relationship to the other components in the application. The ability to download software from the Web means vendors can save the time, resources and money previously required for creating boxed products and shipping them to customers.

32.9 Internet and World Wide Web Resources

Storefront Model

barnesandnoble.com
One of the first brick-and-mortar companies to make a large-scale commitment to the Web, Barnes & Noble sells books, e-books, CDs and software on their Web site using the shopping cart technology.

Moviefone.com
Moviefone enhances its offline efforts by allowing people to buy advance tickets to movies from its Web site. Visitors can also view movie trailers, read cast interviews and get the latest movie reviews.

Auction Model

eBay.com
This site is one of the most well known and successful auction sites on the Web. The site gives people the chance to sell their items on the Internet and buy items at a reduced cost.

auctiontalk.com
This site is an auction portal, providing links to other auctions and specific products being auctioned at various sites online.

Portal Model

google.com
Google is an advanced search engine that rank search results based on the true popularity of the Web site. The more people that follow a link to a particular site, the higher the site will appear in a search.

yahoo.com
Yahoo is a full scale portal allowing people to search the Web using a traditional search engine, by browsing specific categories. Yahoo! also offers games, e-business solutions and free e-mail.

Name-Your-Price Model

priceline.com
The originator and patent holder of the name-your-price model, **Priceline.com** gives customers the ability to name their price for travel arrangements and scores of other products and services.

ticketsnow.com
Finding low-priced tickets to concerts and theater is often difficult. This site gives people the ability to bid for a lower price on their tickets.

Comparison-Pricing Model

www.google.com
`Google.com` uses the comparison pricing model to sell products through its Web site. The site also hosts newsgroups on a broad range of topics.

www.pricewatch.com
People interested in building a computer or upgrading their current system will find the lowest prices on computer equipment on this price comparison Web site.

Demand-Sensitive Pricing Model

www.mobshop.com
A competitor of Mercata, Mobshop also lowers prices as group buying increases.

www.shop2gether.com
This site gives visitors a chance to buy products at a lower price buy buying with a group.

Bartering Model

www.ubarter.com
This site facilitates B2B transactions by allowing members to trade assets through the `ubarter.com` Web site.

www.allbusiness.com/barter
This site allows business to sell virtually any product in return for Trade dollars. These Trade dollars can be used to purchase other products on the Web site.

Free Turnkey Solutions

www.websiteforfree.com
The free portion of the site's services include home-page design, the ability to make site corrections and use of the site's educational resources.

www.freemerchant.com
This site provides a free turnkey solution for building an online store and offers hosting, store-building capabilities and a shopping-cart model at no cost to the user.

Credit–Card Payment

www.cybercash.com
CyberCash enables e-merchants to accept credit-card payments online. The company also offer an e-wallet technology and an online bill-paying service.

www.trintech.com
Trintech offers a secure credit-card payment system that enables simultaneous purchases from multiple stores. This is used in virtual shopping malls.

E-Wallets

www.visa.com/pd/ewallet/main.html
Visa offers various e-wallets for use with Visa credit cards. These wallets are backed by a specific financial institution that issues the Visa card.

www.infogate.com
Infogate's product is a personalized desktop toolbar that offers easy access to news, sports, finance, travel and shopping. It includes an e-wallet feature for use at affiliate Internet stores.

Checking Account Payment

www.debit-it.com
This site allows merchants to draw against the balance in their checking account as a valid form of payment over the Internet.

Digital Cash

www.ecash.net
eCash offers digital cash services for both online purchases and peer-to-peer payment.

www.flooz.com
Flooz is a form of digital cash that is used as a gift currency. Customers buy Flooz currency with their credit cards and then establish gift accounts. The recipient can then spend the Flooz account at participating stores.

Smart Cards

www.visa.com/nt/chip/info.html
This page contains information on the forthcoming smart card being offered by Visa, which will contain a digital-cash application and e-wallet services.

www.americanexpress.com
American Express offers the Blue smart card (personal and corporate) and related services through its Web site.

Micropayments

www.hut.fi/~jkytojok/micropayments
This is a paper on electronic-payment systems with a focus on micropayments.

www.echarge.com
eCharge partners with AT&T to provide micropayment services billed to the user's phone bill.

Online Privacy

www.cdt.org
The *Center for Democracy and Technology* has expertise in the legal and technological development of the Web. Its mission is protecting privacy and free speech.

www.eff.org
The *Electronic Frontier Foundation* is a nonprofit organization concerned with privacy and the freedom of expression in the digital age.

Search-Engine Information

www.webdeveloper.com/html/html_metatags.html
The Webdeveloper provides a tutorial on **META** tags.

www.tiac.net/users/seeker/searchenginesub.html
This site offers direct links to the registration portions of many search engines.

General Internet Marketing Information

www.eMarketer.com
eMarketer aggregates content on Internet marketing, including news, statistics, profiles and reviews.

`www.channelseven.com`

Channelseven is a news and information site that helps marketing and advertising professionals keep up-to-date with the Web.

Complete CRM Solutions

`www.peoplesoft.com`

PeopleSoft® created the *Vantive Enterprise* and the *Web-based Vantive eBusiness application suites* to fulfill companies' customer relationship management needs. The modules of the solution can be used separately or together and include *Vantive Quality, Vantive Support, Vantive Sales, Vantive Field Service* and *Vantive HelpDesk*.

`www.pegasystems.com`

Pegasystem offers a full range of CRM solutions for service, marketing and sales, using various channels of contact with consumers.

Security Resource Sites

`www.securitysearch.net`

This is a comprehensive resource for computer security. The site has thousands of links to products, security companies, tools and more. The site also offers a free weekly newsletter with information about vulnerabilities.

`theory.lcs.mit.edu/~rivest/crypto-security.html`

The *Ronald L. Rivest: Cryptography and Security* site has an extensive list of links to security resources, including newsgroups, government agencies, FAQs, tutorials and more.

Government Sites for Computer Security

`www.usdoj.gov/criminal/cybercrime/compcrime.html`

Visit this site for information about the U. S. government's efforts against cybercrime or to read about recently prosecuted cases

`cs-www.ncsl.nist.gov`

The *Computer Security Resource Clearing House* is a resource for network administrators and others concerned with security. This site has links to incident-reporting centers, information about security standards, events, publications and other resources.

Internet Security Vendors

`www.rsasecurity.com`

RSA is one of the leaders in electronic security. Visit its site for more information about its current products and tools, which are used by companies worldwide.

`www.ca.com/protection`

Computer Associates is a vendor of Internet security software. It has various software packages to help companies set up a firewall, scan files for viruses and protect against viruses.

Public-key Cryptography

`www.entrust.com`

Entrust produces effective security software products using Public Key Infrastructure (PKI).

`www.cse.dnd.ca`

The Communication Security Establishment has a short tutorial on Public Key Infrastructure (PKI) that defines PKI, public-key cryptography and digital signatures.

Digital Signatures

www.ietf.org/html.charters/xmldsig-charter.html
The *XML Digital Signatures* site was created by a group working to develop digital signatures using XML. You can view the group's goals and drafts of their work.

www.elock.com
E-Lock Technologies is a vendor of digital-signature products used in Public Key Infrastructure. This site has an FAQs list covering cryptography, keys, certificates and signatures.

Digital Certificates

www.verisign.com
VeriSign creates digital IDs for individuals, small businesses and large corporations. Check out its Web site for product information, news and downloads.

www.silanis.com/index.htm
Silanis Technology is a vendor of digital-certificate software.

SSL

www.netscape.com/security/index.html
The Netscape Security Center is an extensive resource for Internet and Web security. You will find news, tutorials, products and services on this site.

www.openssl.org
The *Open SSL Project* provides a free, open source toolkit for SSL.

Firewalls

www.interhack.net/pubs/fwfaq
This site provides an extensive list of FAQs on firewalls.

www.thegild.com/firewall
The *Firewall Product Overview* site has an extensive list of firewall products, with links to each vendor's site.

IPSec and VPNs

www.ietf.org/html.charters/ipsec-charter.html
The IPSec Working Group of the Internet Engineering Task Force (IETF) is a resource for technical information related to the IPSec protocol.

www.ip-sec.com
The IPSec Developers Forum allows vendors and users to test the interoperability of different IPSec products. The site includes technical documents related to the IPSec protocol.

Wireless Security

www.radicchio.cc
Radicchio is a non-profit organization dedicated to the development and promotion of standards and technologies for secure mobile business.

www.mwif.org
The *Mobile Wireless Internet Forum (MWIF)* aims to develop a standard for wireless technology and the mobile Internet. The site provides press releases detailing MWIF advancements.

SUMMARY

- E-commerce involves exchanges among customers, business partners and vendors. E-business is composed of these same elements, but also includes operations that are handled within the business itself.

- The transition from brick-and-mortar businesses to click-and-mortar businesses is happening in all sectors of the economy.

- The banking industry uses Electronic Funds Transfer (EFT) to transfer money between accounts.

- Electronic Data Interchange (EDI) standardizes business forms, such as purchase orders and invoices so that companies can share information with customers, vendors and business partners electronically.

- The storefront model combines transaction processing, security, online payment and information storage to enable merchants to sell their products online.

- Shopping cart technology allows customers to accumulate items they wish to buy as they continue to shop. A widely recognized example of an e-business that uses shopping-cart technology is **Amazon.com**.

- Auction sites allow users to pinpoint the lowest prices on available items.

- The reverse-auction model allows the buyer to set a price that sellers compete to match, or even beat. A reserve price is the lowest price that the seller will accept.

- Portal sites give visitors the chance to find what they are looking for in one place. Search engines are horizontal portals, or portals that aggregate information on a broad range of topics. Other portals are more specific, offering information pertaining to a single area of interest; these portals are called vertical portals.

- The name-your-price business model allows customers to state the price they are willing to pay for products and services.

- Intelligent agents are programs that search and arrange large amounts of data and report answers based on that data.

- The comparison-pricing model allows customers to poll a variety of merchants and find a desired product or service at the lowest price.

- The demand-sensitive-pricing business model follows the idea that the more people who buy a product in a single purchase, the lower the cost per person becomes.

- A popular method of conducting e-business is bartering, or offering one item in exchange for another.

- Some businesses establish an online presence by using a turnkey solution (a pre-packaged e-business). Other options include e-business templates that outline the basic structure, but allow the design to be determined by the owner.

- Components of a marketing campaign include marketing research, advertising, promotions and public relations.

- A brand is a name, logo or symbol that helps identify a company's products or services.

- Spamming is mass e-mailing people who have not expressed interest in receiving e-mails from a company. Spamming can give a company a poor reputation.

- Traffic on Web sites is measured by hits. A hit is recorded for every file transfer from the server to the browser. While generating Web-site traffic is important to the success of an e-business, keeping user profiles, recording visits and analyzing promotional and advertising results are also helpful in measuring a marketing campaign's effectiveness.

- The target market is the group of people toward whom it is most profitable to aim a marketing campaign. Tracking devices, such as Web bugs, ID cards and cookies, are used to monitor consumer behavior.
- A search engine is a program that scans Web sites and lists relevant sites based on keywords or other search-engine ranking criteria. Some search engines rank sites by sending out a program, called a spider, to inspect the site.
- An affiliate program is a form of partnership in which a company pays affiliates (other companies or individuals) for prespecified actions taken by visitors who click-through from an affiliate site to a merchant site.
- Promotions can attract visitors to a site and can influence purchasing.
- Public relations (PR) keeps customers and employees current on the latest information about products, services and internal and external issues, such as company promotions and consumer reactions.
- Customer relationship management (CRM) focuses on providing and maintaining quality service for customers.
- Digital cash is one example of digital currency. It is stored electronically and can be used to make online electronic payments.
- E-wallets keep track of billing and shipping information so that it can be entered with one click at participating merchants' sites.
- Smart cards are able to store more information than ordinary credit cards. Smart cards can require the user to have a password, giving the smart card a security advantage over credit cards.
- There are four fundamental requirements of a successful, secure transaction: privacy, integrity, authentication and non-repudiation.
- Public-key cryptography uses two inversely related keys: a public key and a private key. The most commonly used public-key algorithm is RSA.
- The Secure Sockets Layer (SSL) protocol is commonly used to secure communication on the Internet and the Web. SSL uses public-key technology and digital certificates to authenticate the server in a transaction and to protect private information as it passes from one party to another over the Internet.
- Defamation is the act of injuring another's reputation, honor or good name through false written or oral communication. Defamation consists of two parts, slander and libel. Slander is spoken defamation, whereas libelous statements are written or spoken in a context in which they have longevity and pervasiveness that exceed slander.
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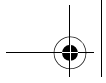
TERMINOLOGY

24-by-7
actual loss
actual malice
affiliate program
asymmetric keys

authentication
business-to-business (B2B)
certificate repositories
certificate authority
ciphertext
client/server application
collision
comparison pricing model
contact smart card
contactless smart card
contemporary community standards
cookie
copyright
cracker
cryptography
cryptosystem
customer relationship management (CRM)
decryption key
demand-sensitive pricing
digital cash
digital certificate
digital signature
digital wallet
distributed denial-of-service
dynamic pricing
e-business
e-commerce
Electronic Data Interchange (EDI)
Electronic Funds Transfer (EFT)
encipher
encryption
firewall
gateway
hacker
hash function
hash value
horizontal portal
ID cards
integrity
intelligent agent
IP address
IPSec (Internet Protocol Security)
key algorithms
libel
log files
merchant account
merchant server
message digest
message integrity
meta tag
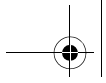
Metadata Interchange Format (XMI)
method of doing business
Miller Test
negligent
non-content-related means
non-repudiation
Open Software Description Format (OSD)
opt-in
patents
plaintext
pornography
portal
private key
psychographics
public key
public-key algorithm
public-key cryptography
Public-key Infrastructure (PKI)
reach
reliability
reverse auction
search engine
secondary research
secret key
secret-key cryptography
secure sockets layer (SSL)
shopping bot
shopping cart
slander
smart card
smart card reader
storefront
storefront model
supply chain management
symmetric cryptography
symmetric secret key
TCP/IP
turnkey solution
Unified Modeling Language (UML)
user profile
vertical portal
Virtual Private Network (VPN)
WAP gap
Web bug
wireless PKI (WPKI)
wireless qpplication protocol (WAP)
wireless transport layer security (WTLS)
worm

SELF-REVIEW EXERCISES

32.1   State whether each of the following is *true* or *false*. If *false*, explain why.

    k) To conduct electronic commerce, a company must implement storefront technology.

    l) Electronic Data Interchange (EDI) is the system that uses standardized electronic forms to facilitate transactions between businesses and their customers, suppliers and distributors.

    m) In public-key technology, the same key is used to both encrypt and decrypt a message.

    n) Secure Sockets Layer protects data stored on the merchant server.

    o) Secure Electronic Transaction is another name for Secure Sockets Layer.

    p) A shopping bot is a shopping cart that allows you to buy items from different stores, all at the same time.

    q) XML allows developers to create unique tags to define specialized data.

32.2   Fill in the blanks in each of the following statements.

    a) Customers are able to store products they wish to purchase in a _____ while they continue to browse the online catalog.

    b) Public Key Encryption uses two types of keys, the _____ and the _____.

    c) _____ learn more about a customer over time.

    d) The type of cryptography in which the message sender and receiver both hold an identical key is called _____.

    e) A customer can store purchase information and multiple credit cards in an electronic purchasing and storage device called a _____.

ANSWERS TO SELF-REVIEW EXERCISES

32.1   a) False. Companies have many options when it comes to the design of their e-business. A storefront is a popular method, but it is not the only method. b) True. c) False. Separate, inversely related public and private keys are used. d) False. Secure Sockets Layer is an Internet security protocol, which secures the transfer of information in electronic communication. It does not protect data stored on a merchant server. e) False. Secure Electronic Transaction is a security protocol designed by Visa and MasterCard as a more secure alternative to Secure Sockets Layer. f) False. A shopping bot can be used to search multiple Web sites for the best available prices and availability. g) True.

32.2   a) Shopping cart. b) Public key, private key. c) Intelligent agents. d) Secret-key encryption. e) Electronic wallet.

EXERCISES

32.3   State whether each of the following is *true* or *false*. If *false*, explain why.

    a) A search engine pays companies for prespecified actions taken by visitors who click through from an affiliate site.

    b) CRM attracts visitors to a site and uses private-key encryption.

    c) Smart cards can store more information than credit cards.

    d) RSA is a method of preventing slander and libel on the Web.

    e) The Open Software Description Format (OSD) allows software to be distributed over the Internet.

32.4   Fill in the blanks in each of the following statements.

    a) _____ is stored electronically and can be used to make online electronic payments.

    b) The _____ model allows customers to poll a variety of merchants and find a desired product or service at the lowest price.

    c) The _____ model combines transaction processing, security, online payment and information storage to enable merchants to sell their products online.

    d) There are four fundamental requirements of a successful, secure transaction: _____, _____, _____ and _____.

    e) The _____ identifies the criteria used to distinguish between obscenity and pornography.

32.5 Define the following.
    a) cryptography
    b) public key
    c) SSL
    d) auction
    e) personalization
    f) E-wallet
    g) shopping bot
    h) intelligent agent
    i) private key
    j) XML
    k) cookies

32.6 Make a spreadsheet containing a column for each of the following business models: store-front model, auction model, name-your-price-model and B2B exchange model. In each column, list three e-businesses that operate in the corresponding model. Visit the Web site of each of the companies you have selected. Answer the following questions:
    a) Do the companies operate with more than one of the defined business models (e.g., store-front and auction)? If, so which models do they implement?
    b) Are the companies Internet-only companies, or brick-and-mortar businesses?
    c) How do the companies generate revenue?

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