chapter 11

Technology and Financial Management

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Case STUDY

Personal E-Finance

Marcella was up early Saturday morning and seated at her computer. She was meeting friends for brunch before they headed to the auto show and then to a concert. She had several tasks to do to get her financial resources organized but was going to make a big effort to get it all done.

Her first stop was her virtual bank web site. She wanted to see if her commission check had been transferred to her bank account via direct deposit. Seeing that it had not and worried that her checking balance was a bit low for some of her weekend spending, she transferred money from a money market account. She had an e-mail message that one of her CDs was up for renewal in 10 days. She checked the renewal interest rate and quickly went to a web site that showed CD rates being paid by banks across the country. She was happy to see that her bank was near the top so she sent a reply to her banker to renew the CD.

Marcella's next stop was her online brokerage account. She checked the performance of her stock portfolio. It wasn't performing as well as she had expected so she sent a question to her online broker and was surprised when she got an immediate response. He was waiting for a plane and had responded to her message using his BlackBerry. She also saw that her automatic trading program had activated a purchase of 100 shares of the tech stock she had been watching. Marcella was glad the order was placed without her having to constantly monitor the market or rely on a broker. The automatic calendar pop-up on her computer screen showed that she needed to make a quarterly contribution to her Roth IRA. She set up an electronic funds transfer from her bank to the mutual fund account to be sent the following Wednesday.

Marcella saw an e-filing reminder from the Internal Revenue Service in her e-mail. She filed her state and federal income taxes last year using e-filing. Since it was so simple and she had received her tax refund quickly she knew she would do it again. She was now doing her own income taxes using a tax preparation software program that linked to financial records she maintained using a personal finance software program.

Her final task was to gather information on new auto models. Marcella was planning to trade her car in the next few months and thought the auto show would be a good chance to look at choices. But before she went, she wanted information on safety, fuel efficiency, and reliability. Later she could get pricing information as well as compare insurance costs before she made a final choice. In fact, Marcella thought she might try an online buying service this time. Why waste time going to a dealer when she could probably get a better deal online?

Think Critically

1. How is Marcella's lifestyle different as a result of using online services and computer technology? Discuss how each of the tasks would be performed differently without the technology.
2. How do the businesses Marcella uses for her financial services benefit from using the Internet to deliver their products and services? What are some problems the businesses might face?

11.1 Financial Information Management

Goals

- Discuss how computers and the Internet are changing the finance industry.
- Describe the parts of a financial information system.

Terms

- electronic document
- electronic record
- electronic information exchange procedures
- financial information system
- electronic spreadsheet
- what-if planning

Changes in Financial Information Management

Finance is an information industry. For the most part, consumers are buying information when they make purchases from businesses in the finance industry. They expect a great deal of information to help them make decisions and manage their financial resources. Savings and investment products marketed by banks, investment businesses, and other financial services companies are selected by consumers based on an understanding of costs, returns, and risks. Insurance products are sold on the basis of protections provided, rates, conditions, and policy terms. To be successful in an information industry, businesses must be able to create, store, access, analyze, update, and transmit information. Customers need to be able to access, understand, analyze, and compare information and, most importantly, use it to make decisions and solve problems.

In the past, most of the information in the finance industry was paper-based. Companies handled large quantities of paper that moved slowly within the company, between businesses, and to and from customers. Businesses and customers relied on large filing systems to hold all of the paperwork and secure storage to protect important papers. Many clerical workers were needed to prepare, process, file, and retrieve the paperwork. Documents were mailed, sent through express delivery, and required security personnel for secure distribution. Days and even weeks were needed to prepare and process complex financial documents.

ELECTRONIC INFORMATION

Today many businesses in the finance industry are shifting to electronic documents and records and electronic information exchange procedures. An **electronic document** (paperless document) is information contained in a computer file prepared for a specific purpose. It can be text, images, graphics, or any combination of those formats. An **electronic record** is a document containing information that is intended to be preserved for a period of time to document an event, activity, or transaction. Electronic documents and records can be created originally in electronic form, meaning

there is no paper document. They can also be developed as electronic "duplicate" versions of documents and records that are first created on paper. **Electronic information exchange procedures** provide a way to share information in electronic forms, including text, graphics, audio, and video. The exchange procedures must maintain the authenticity and accuracy of the information and provide privacy and security.

For many years, businesses and consumers believed they could not replace paper documents and records with paperless alternatives. There was concern that the electronic form could be lost or damaged. Many people were uncomfortable working with electronic documents due to lack of experience. There also were legal restrictions on the use of electronic documents and signatures that prevented the complete replacement of paper records. Today advances in computer technology have created vastly improved quality and speed for developing electronic documents and for copying and scanning paper documents and records into electronic form. Electronic data storage and security procedures are enhanced. People are becoming more experienced and comfortable with using many forms of electronic documents. Laws are now in place to validate the use of electronic documents, records, and signatures for contracts and other legal agreements.

A recent study found that 90 percent of all new business records are either created in electronic form or are scanned and stored electronically. Businesses are moving to electronic records to gain productivity and reduce costs. A study of banking services discovered that the average cost to complete a typical customer transaction face to face with a teller was over one dollar. The cost of ATM and call center transactions was about 25 cents. If the customer completed the transaction using the Internet, the cost was close to a penny.

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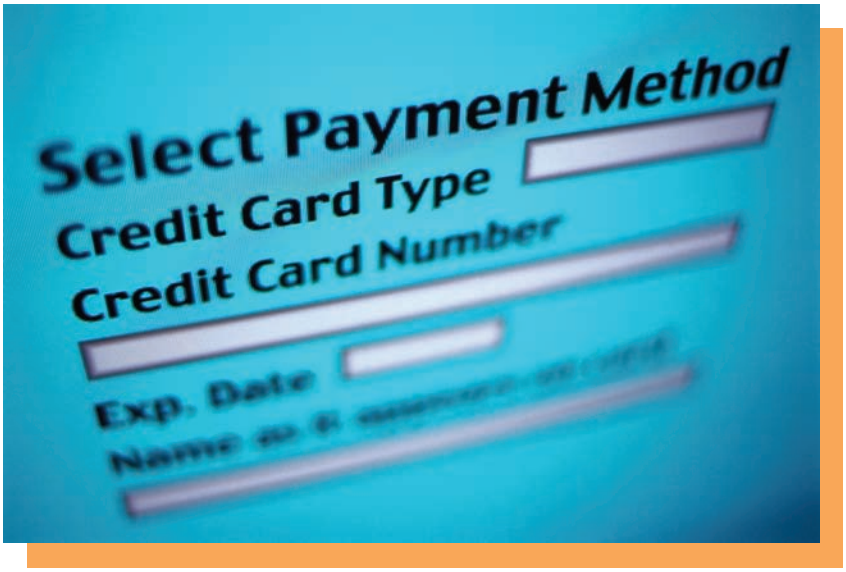
The cost of maintaining paper records can be expensive. Ten hours of the average employee's time each week is spent managing documents, representing about 10 percent of payroll costs. The cost of preparing, copying, storing, and retrieving the documents in just one four-drawer file is between $4,000 and $6,000 a year.

THE USE OF TECHNOLOGY

More important than cost savings for many businesses are changes in consumer expectations. Computers, the Internet, and a variety of emerging electronic tools are now commonplace in businesses and increasingly being used by individuals and families. In the United States, 207 million people use the Internet regularly at home, work, or school. That is 69 percent of the total population of the country and the most users of any country in the world. It also reflects 117 percent growth in the use of the Internet in just six years. The second largest user population is China with 123 million Internet users, which represents only 9 percent of the country's population. Worldwide, there are 1.43 billion Internet users, or about 16 percent of the world population.



Consumers are increasingly comfortable using computers to transact business.

A slightly higher number of U.S. consumers, 219 million, have mobile phones. Currently, about 50 percent of mobile phone users have web-accessible cell phones with multimedia capability. Worldwide, mobile phone usage is exploding. The number of mobile phone users passed 2.5 billion and is expected to reach 3 billion within three years.

Having access to high-speed Internet connections increases the likelihood that businesses and consumers will use their computers for business services. Currently 50 million high-speed (broadband) connections serve U.S. businesses and consumers. The number of connections is increasing by about 33 percent each year. Most of those connections are residential, with 43 million high-speed Internet connections in American homes. The types of high-speed service are nearly evenly divided between cable (cable television) modem service and DSL (telephone line) connections.

With Internet access, both home-based and mobile, consumers are increasing their use of financial services provided via the Internet. Figure 11-1 illustrates some of that use.

FIGURE 11-1

Internet Access to Financial Services in the U.S.

Online Financial Service	Percent of Consumers with Internet Access
Use a banking web site	43%
Pay bills	38%
Obtain financial information; e.g., stock quotes, interest rates	44%
Buy and sell stocks	12%
Obtain auto insurance quotes	7%
Invest in a mutual fund	11%
Shop for a home mortgage	10%

Most financial services businesses are adapting to the online environment. Online trading accounted for over 40 percent of all stock trades on both the New York Stock Exchange and NASDAQ by the early 2000s. The average assets of Internet-only banks are over three times greater than that of traditional banks—$3.5 billion to $1 billion. Two-thirds of U.S. banks currently accept online payments or are implementing the technology to do so. Businesses are spending about $5 billion a year on equipment and procedures to support mobile commerce from cell phones and other wireless devices. Overall, businesses report that currently about 15 percent of all interactions with consumers and 20 percent of all interactions with suppliers occur online. The most productive companies report online interaction rates with consumers as high as 80 percent.

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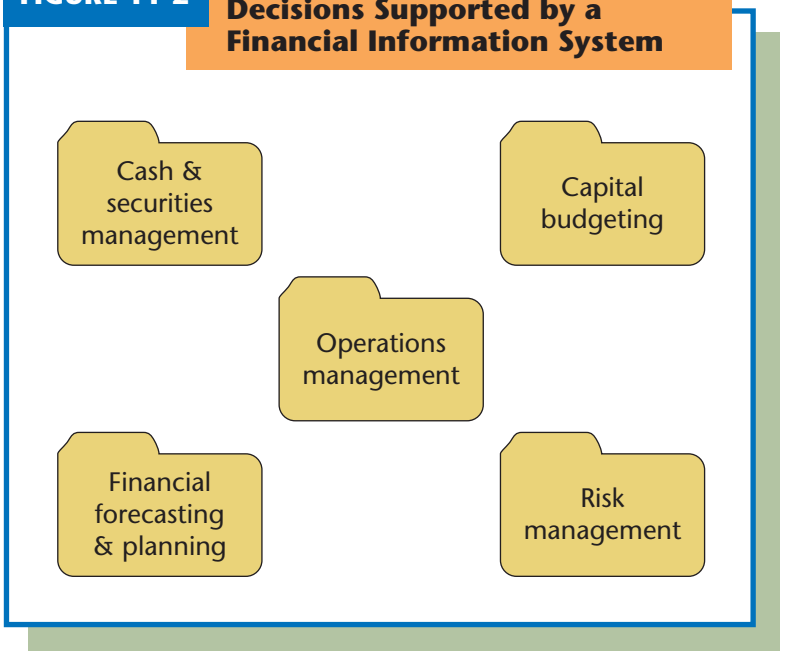
What advantages do electronic documents offer to businesses compared to paper documents?

Financial Information Systems

Effective information systems are essential for companies, especially those that provide financial services. The need for information is steadily increasing, the forms in which information is developed, stored, and transmitted are expanding, the speed required to access information constantly accelerates, and the concern for privacy and security is growing. An *information system* is a structured set of processes, people, and equipment for converting data into information. It integrates hardware, software, information, data, applications, communications, and the people who generate, record, and use the information.

Financial information is a key part of information systems in every company. Within financial services companies a specialized information system is required. A **financial information system** supports managers in the financing of a business and the allocation and control of financial resources. The main financial decisions supported by the specialized information system are shown in Figure 11-2.

FIGURE 11-2 **Decisions Supported by a Financial Information System**



MANAGING FINANCIAL INFORMATION

A financial information system is used to (1) gather, (2) organize, (3) store, (4) analyze, and (5) report financial data. The activities are managed through a system of data collection procedures, computer technology, software, and electronic information exchange procedures. The system allows an organization to obtain financial information and use that information in decision-making.

Several factors provide the basis for financial planning and management. Figure 11-3 describes the information that should be included in a financial information system and the basic financial goals managers attempt to achieve by the analysis of that information. Notice that the categories of financial factors match information included in a company's financial statements. Other key financial planning and performance data included in

financial information systems are sales, inventory, operating expenses, personnel and payroll costs, insurance expenses, tax liabilities, and profitability. In addition to the company's financial performance data, the financial information system should also collect, analyze and report external information including economic and competitive data, information about investment alternatives, and data on risks that the company faces.

FIGURE 11-3

Information Needs and Goals in Financial Management

Financial Factor	Information Needed	Management Goal
Cash flow	Cash inflows and outflows; cash needs; cash balances; cash investment options and results	Efficiency in use of cash; minimum cash balance; maximum return on cash investments
Accounts receivable	Total receivables; history of total receivables and of each account; account aging	Minimize receivables in relation to sales and inventory; minimize overdue and uncollectible accounts
Accounts payable	Total payables; history of payables; ratio of payables to related performance variables; cost of credit	Optimize cost of credit in relation to purchase needs and cash investments
Capital assets	Value, age, life, and depreciation of each asset; projected asset needs and costs; net present value; rate of return on each capital asset	Optimize asset value and resource use; maintain effective asset mix in relation to company strategy
Long-term liabilities	Type, amount, cost, and term of liabilities; payment histories	Optimize long-term debt to total capital
Stockholder's equity	Classifications and total/per share values of stock; profit or loss; dividend payments; retained earnings; stock actions (splits, purchases, new issues)	Maximize stockholder value and return; optimum use of retained earnings

MAKING DECISIONS

Financial management involves analyzing a company's financial performance, identifying ways to use financial resources as efficiently as possible, and developing strategies to use current resources to improve the financial position of the company. Specifically, financial management activities include

- Matching available resources to the activities planned by the organization
- Identifying additional sources of financing to meet deficiencies or to finance new initiatives

- Monitoring the effectiveness of current resource use
- Identifying ways to reduce and recover expenses
- Studying past resource usage to determine future budget requirements, project cash needs, and forecast financial growth
- Managing and investing company assets to make them profitable
- Developing long-term financial plans to meet future resource requirements and maximize financial returns
- Forecasting, controlling, and attempting to prevent major risks

Before the availability of computerized information systems and decision tools, analyzing financial data was a time-consuming and complex task. Today, the primary tool for financial analysis is the electronic spreadsheet. An **electronic spreadsheet** is a software program that organizes and presents data in columns and rows and allows analysis using integrated mathematical formulas. The spreadsheet makes it possible for managers to complete what-if planning. With **what-if planning**, alternatives for financial decisions are considered by applying assumptions to the financial data in an electronic spreadsheet. The spreadsheet automatically computes the effects of the assumptions on financial performance.

teamwork

Identify a type of business with which all team members are familiar. As a team, brainstorm a list of the types of information that business uses in its day-to-day operations. Divide the list into information that would be a part of a financial information system and information that would be a part of the larger company information system.

SHARING INFORMATION

An important function of a financial information system is to provide access to appropriate information for stockholders, managers, employees, business partners, and customers. Information must be accessible at the time and in the form required by each type of user. The system needs to provide access to the information each group needs but restrict access to confidential and private information.

DIGITAL VISION

Information must be accessible at the right time and in the right format for each type of user.

The ability to collaborate in the analysis of financial information and decision-making is another important requirement of information systems. Today, companies need to be connected around the world. Computer networks must provide that access in business offices and allow for mobile access as well. Computerized information systems provide worldwide access in multiple languages and various currencies and recognize the legal requirements and tax laws of each of the countries in which a business operates.

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List several types of decisions managers make with information available in a financial information system.

technology topics

Overcoming Virtual Communication Limitations

One of the objections many people have to participating in online virtual meetings is the lack of the types of feedback they are used to receiving in face-to-face communications. Body language, facial expressions, and visual evidence of interest or boredom provide useful information to both leaders and participants.

People responsible for planning and managing virtual communications need to respond to those concerns to make team members and meeting participants comfortable. The use of web cams is a simple and inexpensive way for people to see and hear other participants rather than just viewing text and graphics. Older camera technology restricted participant views to only one person at a time or just the speaker's face on the computer screen. Newer group meeting software and better placement of cameras make it possible for all team participants, local meeting groups, and full images of people to be seen on a computer screen. Participants can click around among people and locations on their own computers to get the visual image they want.

There are other useful virtual communication tools that increase involvement and feedback. One helpful tool is *emoticons* (small symbols used to convey feelings and emotions in a text message). Some emoticons useful for giving group feedback are "Applause," "Let's take a break," or "I don't understand." Voting tools allow leaders to poll participants to determine areas of agreement or disagreement. A hand-raising icon allows a participant to seek recognition in order to ask a question or provide input.

Think Critically

1. Do you believe that with experience virtual teams and meetings can be as effective as or more effective than traditional face-to-face experiences? Why or why not?
2. In your view, what effect if any does a person's age, gender, or culture have on comfort with virtual teams and meetings? What other factors might affect a person's motivation and effectiveness in virtual groups?

11.1 Lesson Assessment

UNDERSTAND CONCEPTS

Determine the best answer for each of the following questions.

1. Which of the following statements about electronic documents and records is correct?
   a. businesses are required to make paper backups of both
   b. electronic documents are intended to be preserved for a period of time while electronic records are not
   c. few businesses are currently using electronic documents or records
   d. none of the statements are correct
2. The reasons businesses and consumers believed they could not replace paper documents and records with paperless alternatives include all of the following except
   a. concern that the electronic form may be lost or damaged
   b. lack of comfort in working with electronic documents
   c. legal restrictions on the use of electronic documents and signatures
   d. all of the statements are correct
3. **True or False?** Access to high-speed Internet connections increases the likelihood that consumers will use computers for business services.
4. A ____?____ supports financial managers in the financing of a business and the allocation and control of financial resources.
5. ____?____ planning applies assumptions to the financial data in an electronic spreadsheet.
   a. what-if
   b. what-was
   c. if-then
   d. profit-loss

MAKE ACADEMIC CONNECTIONS

6. **Math** If a bank processes 180,225 transactions in a month, what will it cost if all transactions are (a) paper-based at a cost of $1.09 per transaction, (b) completed through ATMs and call centers at a cost of $0.27, and (c) completed by consumers using the Internet at $0.02? How much can the bank save if it changes the way transactions are completed from 100 percent paper based to 50 percent paper-based, 35 percent through ATMs and call centers, and 15 percent Internet?
7. **Technology** Use an electronic spreadsheet to show the 5-year return on a $150,000 investment with interest compounded annually at the following interest rates: 4 percent, 5.5 percent, 6 percent.
8. **Communication** You have been hired as a customer service manager for a small local bank. It has been a part of the community for over 70 years and the customers are mostly middle-aged and older. The bank does not yet have a web site or use Internet technology. You want to attract younger customers and believe technology will appeal to them. Write a one-page memo to the bank president giving your rationale for introducing the technology and your recommendations for the first steps the bank could take.

11.2 Technology in Finance

Goals

- Describe factors businesses consider when making technology decisions
- Discuss how technology is changing the financial industry

Terms

- adoption curve
- cost-benefit analysis

A Focus on Technology

The environment is changing dramatically for almost all businesses in the finance industry. A new focus on technology is required. Financial services are delivered globally, providing new opportunities but at the same time creating new competitors. The speed of financial transactions is becoming instantaneous. Customers expect more choices and higher levels of customer service. At the same time they are able to access more information on which to base their decisions and can compare the prices and features of products and services.

Most businesses do not feel they have a choice about whether to increase the use of technology. They see evidence of the success many businesses have had in attracting customers through technology and the potential cost savings they might realize. At the same time they are challenged by the many types of technology, the effects that changes may have on current and new customers as well as on the company's employees, and the high initial costs of the changeover.

MAKING TECHNOLOGY DECISIONS

When businesses plan to adopt new technology, they make three decisions.

1. What types of technology will benefit the business?
2. How will technology be used in the business? Will it replace a current process, duplicate and provide an alternative to a current process, or will it offer a new process, product, or service?
3. What will be the timeline for implementing the technology?

Type The type of technology can be directed at consumers or at business processes. A consumer technology improves the customer experience. It may offer more convenient, timelier, or faster access. Technology can make it easier for customers to gather and analyze information and make comparisons of the business' products and services with its competitor's. It can provide improvements to existing products and services or even brand new choices the business could not offer without the technology.

Technology can also be used to improve the way business processes are completed. That can mean improvements in quality and efficiency and

often savings in the cost of completing business activities. Another benefit of technology is that the business process may be performed in different locations by more people to allow easier business expansion or more effective use of business resources.

Use One of the greatest challenges to businesses when considering new technology is the effect it will have on existing products, services, and processes. For example, when banks began using ATMs it didn't mean that bank tellers could be replaced. While the increased use of ATMs frequently resulted in the need for fewer tellers, many customers still want personalized service at times but the convenience of ATMs at other times. Other customers will never use ATMs if they can avoid it. So ATM technology in effect duplicates existing services. Insurance companies that provide web sites where customers can obtain information and complete applications or file claims almost always still need agents and customer service personnel to work directly with customers. Some of the personnel may now devote a portion of their time to Internet business, but the company cannot eliminate traditional service methods. As new technology is considered, the business must evaluate how it will affect existing operations immediately and in the long run.

Some technologies actually introduce new products, services, and processes that create new business opportunities. In those instances, the company must decide if the new business will replace older or more traditional products, if it will compete with existing products and services and likely reduce the revenues they generate, or if it adds to the business and will require additional resources since the existing products and services must still be maintained.

Timing When will new technology be introduced and how long will it take to be fully implemented? The introduction of new technology and its acceptance by consumers follows a common set of stages that can be shown in an adoption curve. An **adoption curve** represents the stages in which an innovation is accepted by individuals and businesses. Figure 11-4 on the next page shows an adoption curve with five typical responses to an innovation.

Innovators are the small percentage of consumers or businesspeople who are risk takers and want to be the first to try something new. They are willing to pay more and put up with early problems in order to be the first to obtain the innovation.

Early adopters are viewed as opinion leaders and are quick to adopt an innovation after they have seen its use and value. They will take a bit more time to gather information and consider risks and benefits than innovators, but will make a decision quickly when they determine that the innovation offers benefits.

The *early majority* is one of the two largest groups of adopters. They are more cautious than the first two groups, but they want to be seen by others as accepting and using innovation. They respect and follow the lead of early adopters but are more value conscious and not as willing to take a risk.

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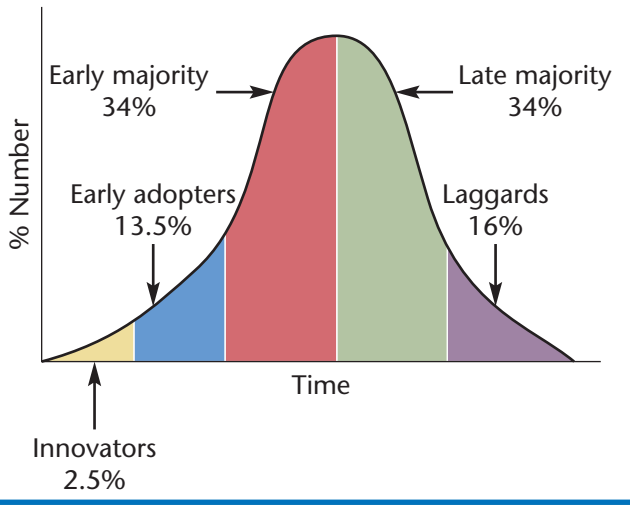
The *late majority* is the other large group of innovation users. By the time they made a decision, the product is no longer considered an innovation and is widely used. This group is cautious and conservative. They want clear evidence of the effectiveness of an innovation. They will wait until it is thoroughly tested and proven and the cost has dropped.

Laggards are very resistant to change and very conservative in their purchase behavior. They do not trust innovation and will avoid spending money on products and services they have not used in the past until they have little other choice. They do not view themselves as a part of the group and may even take pride in being different.

FIGURE 11-4 **The Stages of the Adoption Curve**



After decisions about the type, use, and timing of technology adoption have been analyzed, the final step is to complete a standard cost-benefit analysis. A **cost-benefit analysis** compares the total expected costs with the total expected benefits of one or more choices in order to choose the most profitable option. When completing a cost-benefit analysis of a technology choice, the actual monetary value of both the cost of purchasing and implementing the technology and the financial benefits from its implementation must be calculated. The costs to purchase and implement new technology are relatively easy to determine, although the continuing cost of its use over a period of years may be more difficult. The people responsible for the cost-benefit analysis will have to estimate how successful the new technology will be and how quickly and widely it will be used.

It is often much more difficult to determine the monetary value of the benefit of the technology. Increases in sales and revenues can be estimated but must be matched to any possible decreases from existing products, services, and technologies. Will the technology increase the number of new customers? The new technology might actually result in the loss of some customers who don't like it. Will it increase the average amount current customers spend? It might simply spread the current amount customers spend across the old and new technologies.

An important part of cost-benefit analysis is determining opportunity costs. An *opportunity cost* for a technology decision is the cost of adopting

teamwork

Discuss with your team how the adoption curve is demonstrated by people in your school, family, and neighborhood by the purchase and use of new technology products. Discuss whether you can see examples of the adoption curve in how businesses in your community begin to use new technology.

the technology compared to what the same amount of money could have earned if it was used for the next best alternative. For example, a brokerage firm could compare the cost of investing in web-based software so customers can make stock purchases online versus the cost of hiring and training more stockbrokers and customer service personnel to provide personalized customer service.

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What are the differences among the five groups identified in the adoption curve?

Technology Applications in the Finance Industry

All parts of the financial services industry are affected by technology. Every category of financial services is expanding the types of products and services offered. Financial services businesses such as banks, stockbrokers, investment companies, and insurance companies compete with each other offering similar savings, investment, and insurance products. There is a smaller number of larger businesses as competitors merge and small businesses are driven from the market by competition. Customers demand higher levels of service and personalized attention no matter how they contact the business. They want convenient access to financial services at any time and any place through traditional as well as mobile and electronic services. Companies must use technology to provide employees and customers with quick access to information and fast service, but with attention to both accuracy and security.

TECHNOLOGY AND BANKING

New banking technology provides consistent service no matter what method of contact customers choose. The concept of branch banking is expanding to provide banking and financial services through traditional branch offices, but also through staffed banking centers in supermarkets, discount stores, and other businesses. The number of ATMs is expanding as are the types of financial transactions that can be completed through the automated technology. Banking services and financial resources are accessed with smart cards that can be used at many types of retail businesses as well as stand-alone financial services kiosks. The kiosks offer easy-to-use touch screen technology with audio, text, graphics, and video and often the capability to talk directly to a customer service representative when help is needed.

Early bank web sites primarily provided information. Now customers can complete most banking transactions online, such as account management, bill paying, loan applications, and accessing customer service and financial advice through direct personal contact with bank personnel. Mobile banking using cell phones is the newest form of customer service technology. It is expected that interactive television may provide personalized banking services at home in the future.

Banks are implementing sophisticated technology and improving internal processes that collect, store, and provide instantaneous access to customer and product information for use by employees and customers in any location using any type of technology. The technology used to support those processes must be accurate, efficient, and secure, and it must greatly reduce the per-transaction cost to keep the business competitive and profitable. Converting most paper-based transactions to electronic transactions will be an important part of reducing costs and increasing accuracy. Electronic data will increase security issues facing both the banks and their customers.

TECHNOLOGY AND INVESTING

Investing in stocks and mutual funds has traditionally been done by direct contact with a stockbroker who then placed orders via telephone or computer to the trading floor. Beginning in 1971, the NASDAQ exchange removed the floor trading component and made trading on its exchange entirely computer-based. The growth of personal computers and the Internet opened electronic trading to individual investors who could place orders through an account with an online stockbroker. It also provided the individual investor with a growing and easily accessible amount of information that was previously available primarily through direct contact with a stockbroker.

Gen Yers spend about 12 hours online every week. That compares to 9 hours for Gen Xers and 6 for Boomers. They are also active social users of the Internet. For example, they are 50 percent more likely than Gen Xers to send instant messages, twice as likely to read blogs, and three times as likely to use social networking sites.

The early growth of online investing was initially accomplished through specialized electronic brokerage firms such as Ameritrade and E*Trade. They offered limited investor information and support, but placed investor orders at greatly discounted prices compared to full-service brokers. Over time, traditional full-service brokers recognized the importance of offering online trading for their customers, while specialized electronic brokers recognized that their customers wanted more information and investment advice. Many of the electronic brokerage companies have now merged with full-service brokers. The products and services they offer have expanded into a variety of savings, investment, money management, retirement, and insurance products.

Most investors with Internet access now use the Internet for a number of investment services. They expect to be able to access investment information that is understandable and current. They want immediate access to stock quotes. Most importantly, they want their buy and sell orders to be placed instantaneously so the price doesn't change between the time the order is placed and the transaction is completed. As with other financial services businesses, each customer has unique needs and expectations for information, services, and access to technology. Most investment firms continue to offer the services of investment advisors and brokers who can be contacted personally via telephone or computer, or even in person. They also offer technology services that allow investors to complete most investment activities without the help of a company employee.

Many companies have entered the investment services market to provide information to consumers and businesses. Some of the information services are available free and supported by advertising, while others charge a fee to customers. Most of the companies provide information in multiple formats including e-mail updates, cell phone alerts, special reports, charts, graphs, and the streaming of current stock price and market information. The technology allows customers to customize the type of information they

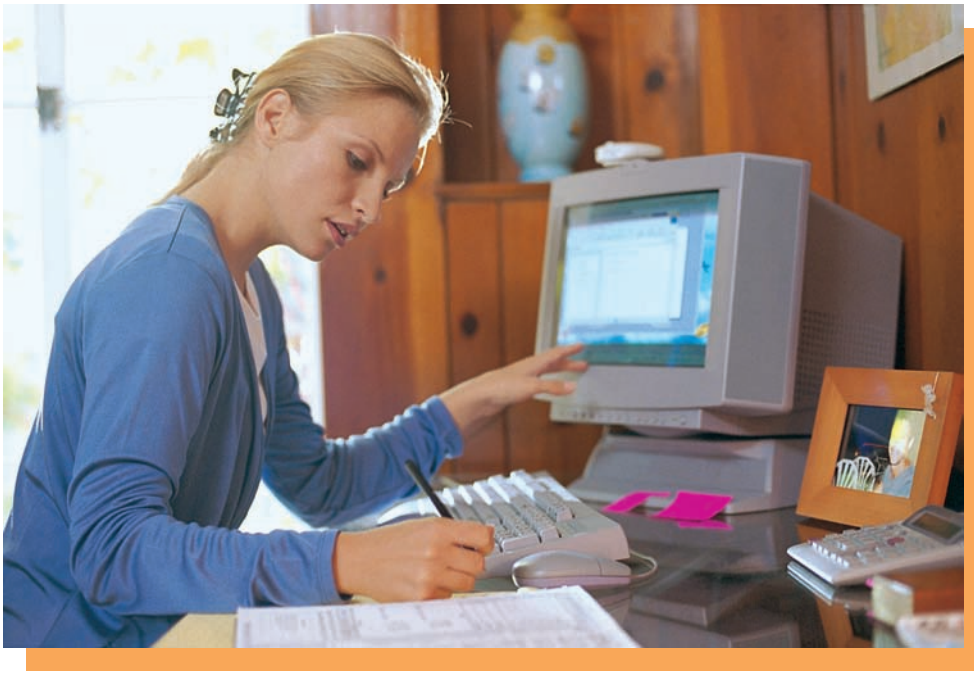
want and the form in which they receive it. The volume of information, the customization capabilities, and the need to provide immediate information requires sophisticated technology.

Other investment services are also becoming increasingly computer-based. Information on available bond offerings and the purchase of new bond issues as well as bond trading can be completed via computer. The federal government now sells treasury securities through computer-based auctions and the securities themselves are now paperless.

TECHNOLOGY AND INSURANCE

The insurance industry has been one of the last categories of financial services to accept and implement consumer-oriented technology. Companies have internal systems and procedures to maintain their own records. That technology only recently has begun to extend to accepting, processing, and updating applications and adjusting claims. Recent surveys indicate that only 31 percent of insurance companies allow customers to access quotes on their web sites and only 7 percent enable their customers to make simple applications or basic changes to existing policies online. Even insurance agents and adjusters often don't have online access to much of the information they need or are unable to enter policy and claims information online. Insurance companies claim that policies must be personalized and underwriting is too complex to allow it to be managed by people without specialized knowledge and training.

Several small insurance companies led by auto insurers have been implementing a number of web-based consumer services, including comparing insurance rates and applying for basic coverage. That has spurred larger companies to increase their web presence to compete. Another focus of online customer service is providing current customers with access to policy information and the ability to make basic changes such as address or beneficiary. Some companies have added online billing and payment processes. One of the innovations being implemented by companies that offer multiple types of insurance is to consolidate policy information and billing of several types of insurance so customers can access, review, and pay for all policies in one place and at one time if they choose.



DIGITAL VISION

Financial customers expect to receive current, correct, and understandable information online.

Technology services are being developed to allow agents, adjusters, and other personnel to easily access company records and input new data from any location. The technology can be used on wireless computers, PDAs, cell phones, and other mobile computing devices. Insurance agents can gather and submit information from the customer's home or business. An adjuster can access a specialized form to be used on site to assess and document damage, determine the amount the insurance company will pay, and even process a partial or full payment for the customer immediately.

THE EFFECT OF TECHNOLOGY ON CONSUMERS

As consumers gain more access to and experience with technology, their preferences for interacting with businesses often change. Figure 11-5 illustrates consumer views of some common types of technology.

FIGURE 11-5

Consumer Use of Technology

Type of Technology	Currently Use or Would Use if Available
Gas pump payments	79%
ATMs	75%
Debit/credit keypads at checkout	66%
Self-service grocery checkouts	55%
Automated financial/banking services	49%
Automated ticket purchases	48%

In addition, research shows that

- Consumers currently make 33 percent of their in-store payments with cash, 14 percent with a paper check, 19 percent with a credit card, and 23 percent with a debit card. Debit cards are the fastest growing as well as the most widely used form of electronic payment, while the use of cash and checks are declining.
- For online payments, consumers choose credit cards for 55 percent of purchases, debit cards for 25 percent, and checks and money orders for 6 percent.
- When paying monthly bills, checks are still the preferred choice of 49 percent of consumers. Automatic bill pay where payments are transferred from a bank account is used by 21 percent, and 24 percent use a credit or debit card for an online payment.
- Four web sites that combine money-management content with financial services ranked among the 20 most popular consumer sites for business information: AOL Money & Finance, MSN Money, Yahoo! Finance, and CNN Money.
- Internet users who have used an e-commerce or financial management site are more trusting of online banking sites, automatic bill pay sites, credit history sites, and others.
- Internet users who have bought items online are more likely to say they have a lot of trust in online security.

checkpoint

Provide an example of the use of technology in banking, investment, and insurance businesses.

finance around the world

Informal Currency Traders

As you are walking the streets of Addis, Ethiopia, you need to exchange some U.S. dollars for birr. You can go to a bank and get 8.5 birr per dollar or you can do business with a street trader and get 10 per dollar. What should you do?

When traveling, most of your currency exchanges will be done through banks, currency exchange bureaus, and travel agencies. Exchange services often are also available at hotels, airports, railway stations, and small shops. In many countries, another alternative exists—the black market currency exchange, also referred to as informal currency traders.

In some major towns In Ethiopia, there are black market money exchange kiosks. Often, they use a legitimate business enterprise, such as selling food items, as a cover for their currency exchange activities. In general, it is illegal for a person to participate in foreign exchange transactions except in banks, major hotels, and travel agencies.

In Zambia, black market foreign exchange dealers offer better rates for several currencies, including the U.S. dollar, the British pound, the South African rand, and the Botswana pula. It is not uncommon to see individuals offering bundles of Zimbabwean banknotes for sale on the roadside near the Zambia border with Zimbabwe. You might also find freelance currency traders in the marketplaces of larger towns and cities.

Many opportunities exist in Peru to exchange currencies in settings other than banks and other formal financial institutions. Individuals on street corners in large cities change money, mostly involving transactions between U.S. dollars and Peruvian sol.

Informal currency trading is not always possible, especially in countries where strong government controls exist. In Tunisia, you are not allowed to import or export dinars. Transactions outside the formal financial system are forbidden. Violation can result in heavy penalties. A similar situation exists in Morocco, where no currency trading of the dirham outside of banks is allowed. In Thailand, a person must have a license issued by the Bank of Thailand to be authorized to do currency exchange.

Think Critically

1. What are benefits and concerns associated with informal currency traders?
2. Conduct a web search to obtain additional information about currency exchange activities for travelers.

11.2 Lesson Assessment

UNDERSTAND CONCEPTS

Determine the best answer for each of the following questions.

1. Which of the following is not one of the decisions businesses make about the adoption of technology?
   a. type
   b. competition
   c. use
   d. timing
2. An ____?____ curve represents the stages for an innovation to be accepted by individuals and businesses.
3. ____?____ are very resistant to change and very conservative in their purchase behavior.
   a. innovators
   b. early adopters
   c. late adopters
   d. laggards
4. **True or False?** Mobile banking through the use of cell phones is the newest form of customer service technology.
5. When making online payments, the most common form of payment used by consumers is
   a. cash
   b. paper check
   c. credit card
   d. debit card

MAKE ACADEMIC CONNECTIONS

6. **Technology** Prepare a computer presentation of at least three slides describing how technology is changing the way consumers purchase and use financial services.
7. **Debate** Form two teams and prepare for a debate on the topic "The major factor businesses should consider when adopting technology is cost-benefit analysis rather than consumer preferences."
8. **Communication** Write a one-page persuasive paper convincing an insurance company it should allow its agents and customers to complete most of their transactions using the Internet.
9. **Math** In 2006 there were 219.4 million wireless subscribers in the U.S., each of whom paid an average monthly bill of $51. Use that information to calculate the total revenues collected in one month and for the full year by the wireless service providers.
10. **Sociology** The amount of Internet use and type of online activities varies based on people's age, gender, income level, and race/ethnicity. Use the Internet to collect information on those differences. Prepare three tables or charts that present your findings. For each chart or table, develop a conclusion about the meaning of the information to financial services businesses.

11.3 Information Privacy and Security

Goals

- Describe important responsibilities of companies in protecting business and customer information
- Identify specific risks to customer information privacy and security

Terms

- data integrity
- information privacy
- information security
- identity theft
- account hijacking
- phishing
- pharming
- pretexting

Business Responsibility for Private Information

Data security has become an important issue for both businesses and consumers. As more and more personal information is collected, stored electronically, and shared among employees and between businesses, the risks of lost or stolen data increases. According to the Privacy Rights Clearinghouse, in a recent two-year period companies and institutions of every type and size have collectively mishandled nearly 94 million private records. Examples of the data security problems include the following.

- Personal data on more than 26 million U.S. veterans was missing after the burglary of a computer disk from the home of a computer analyst working for the Department of Veterans Affairs.
- Two laptop computers with personal information on about 31,000 Navy recruiters and their prospective recruits were stolen from a local recruitment office in New Jersey.
- Chase Card Services notified 2.6 million current and former Circuit City credit card holders that computer tapes containing their personal information had been inadvertently tossed in the trash.
- The names, addresses, and credit and debit card numbers of some 243,000 customers of Hotels.com were on a laptop that was stolen from an employee of Ernst & Young who was auditing the company's records.
- ChoicePoint, which provides consumer data services to insurance companies and other businesses, was duped by thieves who set up fraudulent accounts with the company by posing as collection agencies that were looking to run background checks on potential customers. Over 100,000 records were stolen.
- CardSystems' computers were breached when a script was installed on its servers by company insiders or hackers that periodically looked for specific file types. Three files containing information for 263,000

teamwork

You have just received a notice from your credit card company that your account information has been stolen. Discuss with team members how you would feel about the business upon receiving the news and what you believe individual consumers can do to protect their personal information.

accounts were removed from the computers. CardSystems processed credit card data for both MasterCard and Visa.

- Blue Cross and Blue Shield inadvertently printed customer Social Security numbers on mailing labels. Also, a contractor e-mailed a data file containing personal information on employees and vendors to his home computer in violation of company policy.

Each of the companies when informing the public of the lost information claimed that they had specific security procedures in place that were designed to protect the data. In each case either the procedures were violated or security systems were breached. The lost data created problems for the individuals whose personal information was compromised and for the companies responsible for the resulting damages and financial losses.

MAINTAINING DATA INTEGRITY

Businesses require customers to provide personal information in order to establish accounts, approve credit, and offer customer services. Customers submit the information to businesses with the belief that it will be protected and not misused. Very large databases of customer information are regularly used by many employees to complete a variety of business activities. Data may be shared with business partners and vendors that have been contracted to provide specific services. As a part of providing effective and efficient customer service, customers may be given access to the data in order to manage their own accounts and update information. Each part of the information management process involves security risks where data may be lost, stolen, damaged, or altered.

Developing effective information management systems is a significant challenge for today's businesses. An information management system must have the capability to handle large amounts of information while complying

IMAGE SOURCE

Businesses must provide assurance to online consumers that their personal information will be protected and not misused.

with company policies and legal requirements. The system needs to provide access to data in multiple ways from hundreds of locations while maintaining data integrity. **Data integrity** means that information has not been altered or destroyed in an unauthorized manner. The protection includes making sure data can be recovered and restored if the original information is damaged or destroyed as a result of error, equipment failure, or disaster. Both hardware and software must be up to date and reliable. Information management policies and procedures need to address data confidentiality and privacy safeguards. Transactions cannot be completed without proper authorization and procedures to check the accuracy of data when it is entered, analyzed, and used.

LEGAL RESPONSIBILITIES OF FINANCIAL BUSINESSES

Financial businesses are legally required to protect the privacy of consumer information they collect. **Information privacy** is the right of an individual to be secure from unauthorized disclosure of information. The Financial Services Modernization Act of 1999 requires companies to give consumers privacy notices that explain the institutions' information-sharing practices. In turn, consumers have the right to limit some sharing of their information. The law applies to companies that offer financial products or services to individuals such as loans, financial or investment advice, and insurance.

Consumers that are not regular customers of a business are entitled to receive a privacy notice only if the company shares the consumers' information with other companies. Customers must receive a notice every year for as long as the customer relationship lasts. The privacy notice must be a clear statement of the company's privacy practices including what information the company collects, with whom it shares the information, and how it protects or safeguards the information. Consumers have the right to say no to having their information shared with certain third parties. Companies must make it easy for the customer to refuse information sharing. Companies are able to share data with other companies that provide data management services or when legally required to release the information.

Information security is another important issue facing companies as they increase their use of technology. **Information security** is the protection of information from unauthorized accidental or intentional access, modification, destruction, or disclosure while being transmitted or stored. In 2002, The Federal Trade Commission (FTC) issued the Safeguards Rule, which requires financial institutions to have measures in place to keep customer information secure. The Safeguards Rule requires companies to develop a written information security plan that must

- Designate one or more employees to coordinate its information security program
- Realistically identify and assess the risks to customer information in each area of company operation, design and implement a safeguards program, and regularly monitor and test it
- Require service providers to maintain security safeguards and oversee their handling of customer information

Not all privacy rules and procedures result from laws. The Direct Marketing Association (DMA) developed and adopted online privacy guidelines

Fingerprint readers used with personal computers offer an alternative to entering a password. First, you record your fingerprint on the fingerprint reader that is integrated into the computer or keyboard. The first time you are required to enter a password. You touch the reader, type your user id and password, and touch the reader again to confirm your identity. After that, whenever you want access you just touch the fingerprint reader and you're in.

for businesses and organizations to follow. The five guidelines for protecting consumer information privacy are

1. The right of consumers to receive notice of policies
2. The right of consumers to choose not to allow information sharing
3. The right to access and correct personal information
4. The right to expect information to be secured and protected
5. The right to redress if policies are violated

The DMA guidelines have been accepted by many businesses even though the businesses are not legally required to follow them. A recent survey found that most business web sites post a privacy policy, although many of the policies do not include all five of the consumer rights stated in the DMA guidelines.

INFORMATION SECURITY PROCEDURES

The Federal Trade Commission has issued a list of procedures businesses should follow to increase the security of their information systems and to protect business and consumer information. The most important steps they identify are

- Make sure all employees understand the importance of information security
- Review information security policies and procedures with all personnel
- Check backgrounds of employees who handle sensitive information
- Verify employee qualifications for the use of information technology
- Classify sensitive information and restrict access to such information
- Remove access and information when an employee leaves or a customer account is closed
- Employ firewalls to protect personally identifiable information

DIGITAL VISION

Conducting employee background checks on new hires is one aspect of information security procedures.

- Use current virus protection and security programs and update them regularly
- Respond to security alerts released by software vendors
- Require users to regularly change passwords and use complex passwords
- Use authentication measures to verify personnel and consumer use of personally identifiable information and monitor access
- Routinely test vulnerabilities to hardware, software, and data entry and storage
- Develop procedures to identify and stop potential security breaches
- Recognize and study all attempted intrusions and unusual data requests
- Have a recovery/backup plan and a secondary site to maintain data in case of a security breach or natural disaster
- Destroy or shred data when it is no longer needed and eradicate data from equipment prior to disposal
- Be careful about sharing networks with business partners and vendors
- Develop decoys and monitor company and vendor data management procedures

checkpoint

What law requires financial businesses to protect the privacy of consumer information they collect?

Consumer Privacy and Security

Today business procedures and technology provide greater and easier access to information than ever before. You can conduct business over the Internet with companies from your local community or around the world at any time of the day. But that access comes at a price. The number of U.S. adult victims of identity fraud was 8.9 million in 2006. The total amount lost by consumers to fraud was $56.6 billion or an average of $6,383 per victim. In addition to the losses suffered, victims reported it took them about 40 hours of personal time to resolve the problems.

Consumers are concerned about the security risks of using computers. The most active users report the greatest concern, even though their concern doesn't reduce their use. According to information reported in the Online Fraud Report, two-thirds of consumers who conduct online financial transactions are extremely or very concerned about giving their personal or financial information to a fake web site and having hackers steal financial information from their computer. In another study, while 87 percent of consumers polled said they were confident they could recognize fraudulent e-mails, when tested, 61 percent were unable to identify which e-mails were legitimate and which were not. The study also presented images of sample web sites and asked consumers whether they could identify whether a site

was secure or not. Sixty-seven percent could not identify a secure web site. Seventy-four percent of Americans don't believe using only an ID and password to log in is very safe.

TYPES OF ONLINE SECURITY RISKS

Online fraud steals consumer identities and personal information and hijacks customer financial accounts. **Identity theft** occurs when someone uses your personal information without your permission to commit fraud or other crimes. A great deal of personal data is available online, although most of it is not accessible in one location. By obtaining one or two pieces of personal information such as a Social Security, account, or driver's license number, identity thieves are able to obtain additional information from other sites. **Account hijacking** is obtaining access to another person's financial accounts through fraud and then stealing the funds. Account hijacking is the fastest growing form of consumer financial crime in the U.S., with $2.4 billion stolen from 2 million people in one year. Account hijackers are now attacking investment accounts maintained by online brokerage firms as well as more traditional financial accounts in banks.

Online fraud occurs in several ways. **Phishing** involves creating e-mails with legitimate-looking addresses and web sites designed to look like familiar businesses, financial institutions, and government agencies to deceive Internet users into disclosing their personal information. Pharming is more sophisticated than phishing. **Pharming** attacks a legitimate business' server to redirect traffic from that site to another web site. Consumers who believe they are submitting information to the legitimate business are actually sending it to the illegitimate site. **Pretexting** is the practice of obtaining personal information through illegal contacts with organizations that maintain consumer databases. The criminal poses as a legitimate business or official to secure access to the organization's computer files or to purchase available information from the database. The information is then used for identify theft or other types of fraud.

STEPS TO REDUCE SECURITY RISKS

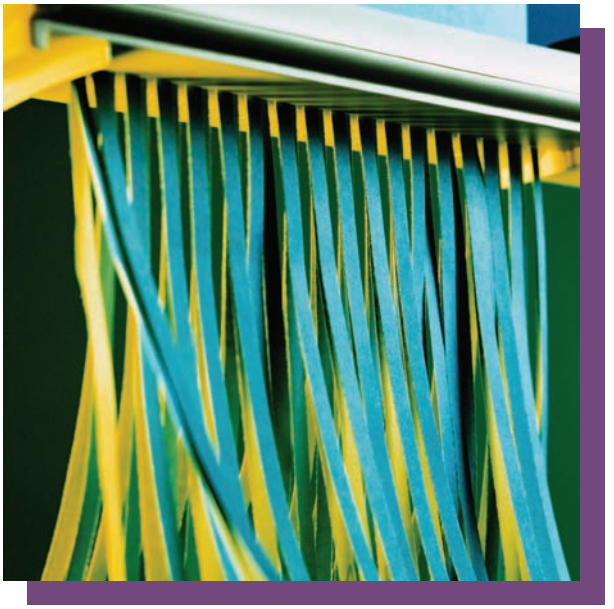
Consumers express concern about online security risks and many take steps to protect their personal information and reduce the chance they will be a victim of Internet crime. Figure 11-6 shows some methods consumers use to prevent identify theft.

FIGURE 11-6

Consumer Actions to Protect Their Identity

Method	Percentage
Review bank/credit card statements for fraud	88%
Shred/destroy credit card receipts/other financial papers	77%
Check credit reports	64%
Never give out Social Security number	51%

The National Cyber Security Alliance recommends the following actions to protect yourself from Internet crime.



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One method of protecting against identity theft is to shred receipts and statements.

- If you receive a request for personal information through an e-mail, online form, or application, make sure you know who it is from and how the information will be used.
- If you get an unknown e-mail or pop-up message, do not open the message, reply, or click on a link in the message. Delete the e-mail message. Use pop-up blocking software whenever possible.
- If you believe there is a legitimate need to supply personal information to a company with whom you have an account or have placed an order, contact that company directly in a way you know to be genuine. You may want to supply the information the first time through the mail or via a telephone call you place to the company.
- Never send personal information via e-mail even if you originate the message. E-mail is not a secure transmission method.
- When making an online purchase, never provide personal information or a credit or debit account number through a company's web site unless you are certain about the company's integrity and you have checked for indicators that the site is secure. Unfortunately, no indicator is foolproof since scammers are able to forge security icons.
- Even though it takes time and is not always easy to do, read company privacy policies posted on their web site. Determine what personal information the company collects, how the information is used, and whether it is shared or sold to other businesses. Find out whether you have the right to review your personal information as well as what security measures the company uses to protect your information. If you don't see a privacy policy or it is difficult to understand, think about finding another business to use.

checkpoint

What is the difference between identity theft and account hijacking?

finance in your life

Using Online Financial Tools

As a consumer you will make many financial decisions in your lifetime. Some financial calculations are quite complex. There are many Internet web sites and online resources that provide financial tools and software to help you with financial planning and decision-making. Here are a few of the most popular and helpful.

Financial Calculators

http://money.aol.com/calculators
A large number of calculators for specific financial tasks including autos, budgeting, college planning, savings, stocks, and retirement.

Financial Planning Tools

http://www.finance.cch.com/tools/tools.asp
Forms and tools to help you organize and manage your personal finances including an insurance policy inventory, self-employment tax planning, life expectancy tables, and a mortgage planning worksheet.

Interest Rate Finder

http://bankrate.com
Searches for and presents the best current rates for various types of loans, investments, credit cards, and insurance policies.

Virtual Spreadsheet

http://spreadsheets.google.com
An online spreadsheet template for budget preparation, financial analysis, and what-if comparisons. Spreadsheets can be created and saved online as well as shared with others for collaborative work. (This site requires that you create a Google account with a password.)

Social Security Benefits Calculator

http://www.ssa.gov/retire2/AnypiaApplet.html
Allows you to calculate your estimated lifetime Social Security benefits based on current wages and benefit rates.

Financial Planning WebQuest

http://www.sbzinak.com/webquest
A comprehensive WebQuest activity where you to set up a budget for the lifestyle you choose. It includes decisions on a house, automobile, other personal expenses, and a job that will provide adequate income to meet your income requirements.

Think Critically

1. Why is it important to keep financial records and make careful financial calculations as a part of financial planning?
2. In addition to the tools listed above, what other types of financial planning do you believe consumers should complete? Use the Internet to see if you can locate online tools and software to help with each type of planning.

11.3 Lesson Assessment

UNDERSTAND CONCEPTS

Determine the best answer for each of the following questions.

1. The total number of private records that have been mishandled by businesses in one year is nearly
   a. 10 million
   b. 50 million
   c. 100 million
   d. 1 billion
2. **True or False?** Businesses cannot require consumers to provide personal information in order to do business with them.
3. Data ____?____ means that information has not been altered or destroyed in an unauthorized manner.
4. ____?____ is the protection of information from unauthorized accidental or intentional access, modification, destruction, or disclosure while being transmitted or stored.
   a. information security
   b. information management
   c. hijacking
   d. a privacy policy
5. ____?____ theft occurs when someone uses your personal information without your permission to commit fraud or other crimes.

MAKE ACADEMIC CONNECTIONS

6. **Technology** Use the Internet to identify a new technology product that is being developed to provide greater security for protecting personal information. Based upon your research about the product, prepare a one-page magazine advertisement promoting the new product to prospective customers.
7. **Critical Thinking** Use the Internet or locate an article in a magazine that describes a situation where a business lost a large amount of personal consumer data. Analyze the reasons it occurred. Make several recommendations to the company of security procedures they should follow to prevent the problem from occurring again.
8. **Communication** Schedule an interview with an information technology specialist from your school or a local large business. You can conduct the interview by telephone or via e-mail if the person agrees. Ask the person about the procedures the organization follows to protect the information it collects and maintains electronically. Based on information in the chapter, write a two-page report analyzing the effectiveness of the organization's security procedures.
9. **Visual Art** Prepare a chart that can be posted in your home or in another location where family or friends use a computer to access the Internet. The chart should provide tips and reminders of how to use the Internet safely.

Summary

11.1 FINANCIAL INFORMATION MANAGEMENT

1. Finance is an information industry. Consumers buy information when they purchase financial products. They expect a great deal of timely and accurate information to help them make purchasing decisions and manage their financial resources.
2. Within financial services companies a specialized financial information system is required. The system allows an organization to obtain needed financial information and use that information in decision-making.

11.2 TECHNOLOGY IN FINANCE

3. When businesses plan for the adoption of technology, they make decisions about the types of technology to adopt, how the technology will be used, and the timeline for implementing the technology. Final decisions are made using a cost/benefit analysis.
4. All parts of the financial services industry are affected by technology. Large customer databases and more product information demand that companies use technology to provide quick access to information and faster services with accuracy and security.

11.3 INFORMATION PRIVACY AND SECURITY

5. As more personal information is collected, stored on computers, and shared, the risks of lost or stolen data increase. Financial businesses are legally required to protect the privacy of the consumer information they collect.
6. Online fraud is used to steal consumer identities and personal information and to hijack customer financial accounts. Online fraud occurs through phishing, pharming, and pretexting.

Develop Your Business Language

Match the terms listed with the definitions. Some terms will not be used.

1. The practice of obtaining personal information under false pretenses
2. The right of an individual to be secure from unauthorized disclosure of information
3. Attacks a legitimate business' server to redirect traffic from that site to another web site
4. Represents the stages for an innovation to be accepted by individuals and businesses
5. Information contained in a computer file prepared for a specific purpose
6. Obtaining access to another person's accounts through fraud and then stealing the funds
7. Alternatives for financial decisions are considered by applying assumptions to the financial data in an electronic spreadsheet
8. The protection of information from unauthorized accidental or intentional access, modification, destruction, or disclosure while being transmitted or stored
9. Compares the total expected costs with the total expected benefits of one or more choices in order to choose the most profitable option

a. account hijacking
b. adoption curve
c. cost-benefit analysis
d. data integrity
e. electronic document
f. electronic information exchange procedure
g. electronic record
h. electronic spreadsheet
i. financial information system
j. identity theft
k. information privacy
l. information security
m. pharming
n. phishing
o. pretexting
p. what-if planning

Review Concepts

10. Which of the following statements is *not* true about electronic documents in business?
    a. most new business records today are either created in electronic form or are duplicated and stored electronically
    b. the cost of electronic transactions is actually just about the same as the cost of paper-based transactions
    c. laws now allow the use of electronic signatures for contracts
    d. all of the statements are true
11. Which category of financial service businesses has been one of the last to accept and implement consumer-oriented technology?
    a. banking
    b. investments
    c. consumer finance
    d. insurance
12. Which of the following is not a legal requirement of financial businesses regarding the use of consumer information they collect?
    a. they must give consumers privacy notices
    b. they cannot share customer data they have collected with business partners
    c. they must develop, monitor, and test information safeguards
    d. all of the above are legal requirements of business

Think Critically

13. What is meant by the statement, "Finance is an information industry"? Why does that make technology an important part of offering products and services to customers? Why does that put pressure on businesses to maintain effective, secure, and up-to-date technology?
14. A car insurance company is considering a new process where customers can notify the company of an accident and track the claims process by cell phone. Explain how they can use the stages of the adoption curve to decide how to implement the new technology.
15. The number of data security problems in the U.S. has actually declined in the past few years, but the total cost to businesses and consumers has increased. Why do you believe both of those changes have happened at the same time?
16. Identify and justify the three most important things consumers can do to protect personal information when they use the Internet.

Business Financial Calculations

17. A company is developing a new smart card technology that allows customers to maintain all financial and investment account information on one card that they can use at ATMs. The company estimates the total number of possible users of the technology to be 58 million. If 3 percent of the consumers are innovators, 10 percent early adopters, 36 percent early majority, 32 percent late majority, and the remainder laggards, how many users are in each of the adoption categories?
18. Consumers currently make 33 percent of in-store payments with cash, 14 percent by check, 19 percent with a credit card, and 23 percent with a debit card. If a store has $589,200 of sales, what was the amount paid using each method? Prepare a pie chart to illustrate the percentage breakdown of payment methods.
19. Research by Celent Communications compared the total amount of fraud in the U.S. with the amount of online fraud. Their findings were:

Year	Total Fraud (in millions)	Online Fraud Rates
2003	$2,373.2	2.5%
2004	$2,664.9	2.4%
2005	$2,745.4	2.2%
2006	$3,028.8	2.0%
2007	$3,212.7	2.0%

Calculate the dollar amount of online fraud for each year and the total cost of fraud and online fraud over the five-year period. Using those totals, what was the average online fraud rate for the entire time?

Analyze Cases

Use the case from the beginning of the chapter, Personal E-Finance, to answer the following questions.

20. Identify the different financial institutions, services, and technologies Marcella used while completing her work on Saturday morning.
21. Marcella's father questioned her when she told him she was using an online bank. He said he would want to be able to walk into a bank and talk to a real person. He also liked the security his bank provided for his deposits. How should Marcella respond to her father's concerns?
22. Describe some other financial activities Marcella probably completes and how technology could help her complete those activities.
23. Discuss the security risks Marcella faced during her work session. What do you believe the businesses Marcella used should do to make sure her identity and finances are protected? What security precautions would you recommend to Marcella for her activities?

Portfolio Activity

COLLECT an example of hardware, software, and methods businesses and consumers can use to protect privacy and increase security. The example could be an ad, written article, product, or other type of example.

CREATE a visual to illustrate a business environment or an individual's computer work area demonstrating the use of security procedures. Use photos, other pictures, or drawings to show the security applications.

CONNECT your visual to other items already in your class portfolio or relate it to an important concept you have learned in another class. Make the connection by preparing a one-minute presentation on how poor security procedures can harm both individuals and businesses.

Stock Market Activity

Technology continually affects business operations. The use of computerized information, production, and distribution systems can increase an organization's efficiency. Effective technology management is vital to compete successfully in most industries.

Use Internet and library resources to research the company you have been studying (or select a different company).

1. List examples of the use of technology by this company. Describe situations in which the organization's operations and information systems have been enhanced with the use of computers.
2. Obtain information on potential technology that may affect this type of company in the future.
3. Identify potential influences of technology on the recent financial performance and stock value of the company.

Planning a Career in Information Security

As people increase their computer use and connect to the Internet with a number of technologies, they increase their awareness of the risks they face in those activities. Businesses also are focused on security as they expand their use of information technology and work to deliver more services to more customers using the Internet. Information security specialists plan, coordinate, and implement the organization's plans to protect business and customer hardware, software, and data. They develop security plans, educate employees and customers about computer security, develop and maintain security software, monitor computer networks for security breaches, and respond to cyber attacks, security breaches, and a wide variety of information integrity issues.

Employment Outlook

- The number of jobs and types of jobs in information security are growing rapidly as technology applications are improved and expanded to more and more employees and customers.
- Security professionals work as a part of information technology staffs in all types of businesses including finance, engineering, healthcare, education, government, and law enforcement.

Job Titles

- Security risk analyst
- Manager of information security
- Data recovery specialist
- Software security developer
- Technology access manager
- Security architect

Needed Skills

- Minimum of a bachelor's degree in computer science, mathematics, or business information systems
- Specialized preparation in computer programming, software development, and network management
- Excellent analytical and problem-solving skills, ability to work as a team member and leader, effective written and oral communications skills with technical and non-technical audiences

What's It Like to Work as an Information Security Specialist?

Jessica is an entry-level security specialist working in Internet security for her company. She spends well over half of her time most days monitoring the company's web site and evaluating use by employees, customers, and others. She looks for problems that might slow or bring down the web site and unusual activity that might present a security risk. She also is responsible for reviewing and responding to technical questions, complaints, and problems that are submitted via e-mail. The problems range from the amount and type of spam received by customers to forms and procedures that don't work and problems with account access and passwords. Once a week she participates in a team meeting to review the latest security threats, hardware and software issues, and plans for new technology.

What about you? What appeals to you about the career area of information security? What types of jobs in this career area do you currently find most interesting?

GRAPHIC DESIGN PROMOTION EVENT

The Graphic Design Promotion Event requires participants to demonstrate the ability to create a computer-aided graphic design for promotional purposes.

You must produce a three-fold professional brochure. The theme of your Graphic Design Promotion (brochure) is Identity Theft—Protecting Yourself from Being the Next Statistic. Your Graphic Design Promotion must provide the consumer with strategies to protect financial security and privacy.

Dimensions of your original work must be 8 ½" by 11" or less. The product may be black and white or color and printed on white or colored paper. The graphic design should not be professionally or commercially produced. All graphics must be computer generated. Public domain and contestant-prepared graphics may be used for this project. No copyrighted items may be used. No photographs, text, registered trademarks, or names may be used without permission. All state and federal copyright laws must be respected. Although a work may be freely accessible on the Internet and contain no statement of copyright, copyright law provides that such works are protected.

Each participant will have no more than ten (10) minutes for the judges' question and answer session. The participant will be asked questions about how the graphic was developed and produced.

Performance Indicators Evaluated

- Use principles of design, layout, and typography in graphic design.
- Demonstrate knowledge of graphic design and rules for layout.
- Demonstrate effective use of color, lines, text, graphics, shapes, etc.
- Generate a promotional flyer for marketing purposes.
- Use appropriate artwork and design techniques for a given theme.
- Apply technical skills to manipulate graphics, artwork, and images.

Go to the BPA web site for more detailed information.

Think Critically

1. Why is a brochure about protecting against identity theft a good idea?
2. What is a good source for this topic?
3. Why is it important to use current identity theft statistics in the brochure?
4. Where is a good place to distribute identity theft brochures for consumers?

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