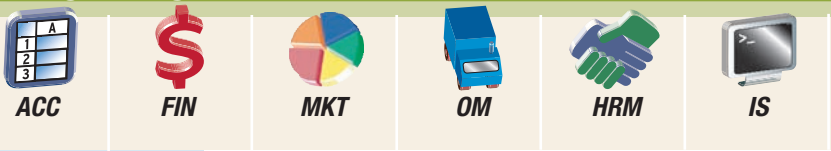
Chapter

7 Mobile Computing and Commerce

Learning Objectives

1. Understand mobile computing technologies.
2. Describe the emergence of the mobile financial services industry.
3. Understand the growing role of mobile computing in shopping, entertainment, gaming, hospitality and travel, and advertising.
4. Describe the growth of location-based services and commerce.
5. Identify the expansion of enterprise handhelds that make use of mobile computing technology.

Integrating *IT*



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QUICK LOOK at Chapter 7, Mobile Computing and Commerce

This section introduces you to the business issues, challenges, and IT solutions in Chapter 7. Topics and issues mentioned in the Quick Look are explained in the chapter.

Mobile computing has changed dramatically since 2008. Portable devices that connect wirelessly to the Internet are lighter, smaller, thinner, and much more powerful. Widely popular smartphones are now capable of performing functions like playing full-length movies that weren't even available on desktop computers a few years ago. Web-enabled computers for navigation and entertainment are available in most luxury vehicles and are becoming an option in mid-priced ones.

New categories of handhelds have emerged and been rapidly adopted, such as e-readers—Amazon's Kindle and Apple's iPad. Wireless hotspots to connect to the Internet are everywhere in urban areas and on transportation lines, and access to high-speed 3G and 4G networks has made interoperability a standard, as you also read in Chapter 1. Consumer and enterprise apps for mobile computing and commerce continue to expand the capabilities of this in-demand technology.

In this chapter, we review the technological foundations for mobile computing and commerce and identify the factors that impact the usability of these tools. You will read how companies are gaining customer loyalty and other competitive benefits from mobile commerce and wireless networks as well as how mobile operating systems (OS) and apps are accelerating the growth of and demand for mobile computing.

Using Mobile Technology to Save Lives


IS


ETHICS

The Institute of Medicine issued a startling report in 2000 about the safety of the nation's healthcare system. According to the report, preventable errors in the healthcare system are the leading cause of death in the United States. The report cited studies suggesting that between 44,000 and 95,000 people die each year as a result of preventable errors made by healthcare providers. Errors specifically attributable to medication occur frequently in American hospitals. In comparison, workplace accidents caused 6,000 deaths nationwide. Even when a medication error doesn't lead to death, the impact can be significant.

Human and Financial Tolls of Poor-Quality Healthcare Information

Another study estimates that medication errors cost the nation over $177 billion a year in direct costs. This doesn't include indirect costs such as lost productivity and the lost wages experienced by the affected patients. To make matters worse, hospitals are not the only place people suffer from medication errors. These problems also exist in nursing homes and long-term-care facilities with considerable frequency. Clearly, the financial cost of this problem is significant at a national

level and an agonizing problem for individuals and families on a personal level.

A Solution: Handheld Mobile Computing and Electronic Records

To address this disturbing problem, experts have recommended IT solutions that rely heavily on mobile computing technology (see Figure 7.1).

A number of studies have identified critical points in the medicine-dispensing process where errors are most likely to occur. These include, (1) the point of prescription, (2) dispensing of medication by pharmacists, and (3) administration of medication by medical personnel or by patient.

Using handheld mobile computing devices, medical personnel can reduce the chance of errors when prescribing medicines (see Figure 7.2). Handhelds can scan barcodes on hospital patient bracelets to correctly identify patients and to retrieve electronic records with information about the patient's condition, drug allergies, and other medications they are taking. The physician can also call up information about the medicine being considered for the patient, identifying any potential dangerous interactions that might occur. Once the doctor determines the proper medication, information can be transmitted directly to the pharmacy, eliminating the chances of error due to unclear handwriting, loss, theft, or fraudulent alteration of the script (see Figure 7.3).

At the pharmacy, electronically received orders are read accurately. Pharmacists scan barcoded medicine bottles prior to dispensing the drugs to make sure they are the same ones ordered by doctors. Dosage levels ordered by the doctor can be checked by the pharmacist for accuracy and appropriateness, providing another check against error. The pharmacist may also have access to patient records in order to check for potential conflicts with existing medicines. In larger pharmacies, the pharmacist may carry a wireless handheld with a scanning tool when looking for containers of prescription drugs. Scanning a large bottle of medication will not only identify the drug but may also tell the pharmacist how many pills or units remain in the bottle to be dispensed.

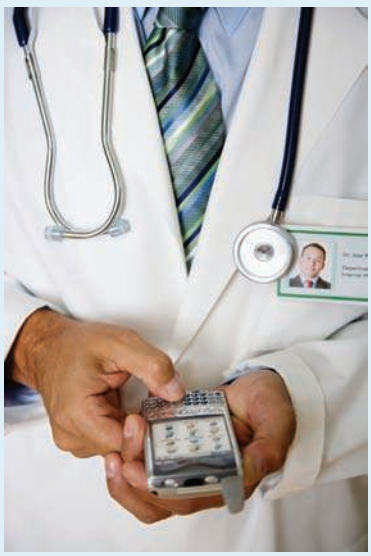

Figure 7.1 Physicians and other medical personnel are adopting mobile technology to treat patients. (*Source: © Corbis Premium RF/Alamy*)

Figure 7.2 Healthcare professionals use laptops, tablet PCs, handhelds, and other mobile computing devices to improve medical services. (*Source: Cultura/Alamy*)

When nursing staff or other medical personnel arrive at the patient's bedside to administer the medicine, a handheld mobile device is again used to scan the patient's barcoded bracelet to confirm identity. Barcodes on the medicine are then scanned to confirm that the drug and dose are consistent with what the physician ordered. Alert systems warn medical personnel if there are any discrepancies between physician's orders and what has been delivered. Once the medication is administered, this information is recorded to prevent additional medication being delivered until the appropriate time.

Medical personnel are increasingly using a wide range of mobile devices for handhelds like the one described above.

Figure 7.3 Handwriting errors can lead to potentially dangerous medical problems. (*Source: Sean Locke/iStockphoto*)

Smartphones, wireless PDAs, tablet PCs, and standard personal computers are common in medical settings. These devices use Wi-Fi and 3G network connections to communicate over the Internet.

Faced with such a significant problem and a solution with such obvious benefits, one would think that electronic prescription systems would be readily embraced by the healthcare industry. Unfortunately, several obstacles are slowing adoption of these mobile computing solutions, including (1) insufficient knowledge of the concept, (2) required start-up financial investment, (3) lack of technology standardization, (4) provider resistance, and (5) regulatory restrictions or indecisiveness (Papshev and Peterson, 2002).

Sources: Compiled from Kohn, Corrigan, and Donaldson (2000), AHRQ (2000), Joia and Magalhães (2009), Papshev and Peterson (2002), Federal Register (2001), Krizner (2008).

For Class Discussion and Debate

The Healthcare Industry is one of the largest industries in most countries and can benefit significantly from on-demand, location-independent, high-quality data. However, many healthcare professionals are unfamiliar with the business, information, and IT solutions or are reluctant to apply them to their field.

1. ***Scenarios for Brainstorming and Discussion:***

a. Cost Benefit Analysis: Papshev and Peterson (2009) identified start-up costs as one reason why healthcare providers are reluctant to adopt electronic prescription systems. Using information in the case above, explain why any investment in these ISs would be a financially sound decision.

b. Resistance by healthcare providers: Some nurses and doctors have resisted the adoption of electronic prescription systems. What are some reasons these professionals might have for not wanting to utilize mobile information systems? What are some ways a hospital administrator might make medical personnel more comfortable with the new mobile computing technology?

2. *Debate:* Until recently, the U.S. Drug Enforcement Agency (DEA) made it very difficult to use electronic prescription systems for controlled substances, such as narcotic drugs. Existing rules required written paper prescriptions for these kinds of drugs. Recently, the DEA changed its stance and created guidelines for using the new information technology. However, many in the pharmaceutical industry feel that the new regulations are still too onerous.

a. One team develops an argument for continued stringent regulations related to the prescription process for these drugs. The other team develops an argument for using electronic prescription systems for these substances.

b. Each side should be prepared to demonstrate how its approach will balance the need of patients and hospitals to reduce medical errors as well as reduce the illegal use and abuse of these controlled substances.

7.1 Mobile Computing Technology

The mobile computing landscape has evolved rapidly over the last two decades. Traditionally, computers were primarily used in fixed locations. They were connected via wires to peripheral devices, other computers, and networks. This lack of mobility significantly constrained the performance of people whose work took place outside of the office, such as salespeople, repair people, students, law enforcement agents, utility workers, and so on.

Wireless technology makes location irrelevant, increasing opportunities for businesses through mobile computing and commerce. In this section you read about the three technological foundations of mobile computing: mobile devices, mobile operating systems and software, and wireless networks.

MOBILE COMPUTING DEVICES

For consumers, the most exciting part of mobile computing is the recent explosion in new computing devices. Powerful smartphones, slate computers, e-readers, and computing devices that we can wear as clothing generate considerable media attention at electronics shows around the world. For some consumers, mobile devices have become fashion statements. For others, the mobile device a person carries can define how sophisticated or cool that person is. Companies with brands like *BlackBerry*, *iPad,* and *Android*

have become experienced at launching sophisticated marketing campaigns designed to build consumer demand and excitement prior to the launch of new products.

Constant innovation in the mobile technology marketplace makes categorization of end-user devices difficult. As capabilities and functionality are added to devices, the differences between PC, e-reader, smartphone, and PDA get blurred. For the discussion below, we will rely on current trends in terminology and categorization but recognize that as mobile hardware evolves, new categories will emerge and traditional categories will become irrelevant.

Laptops, Notebooks, Netbooks, and Tablets. Mobility started when computers became portable. These early devices were only slightly smaller than desktop computers but had external cases that made it somewhat easier to transport them. They were still heavy and bulky. Portable computers evolved into laptop computers. There are currently several variations of this device:

- **Standard laptops** and **desktop replacements.** Perform most of the basic functions of a desktop computer; weigh over 3.6 kg/8 lb.
- **Notebooks.** Smaller, but less powerful than the standards and weigh from 2.7 to 3.6 kg/6 to 8 lb.
- **Netbooks** (*mini-notebook*, *ultra-portable*). Designed for Internet access and cloud computing. Much of their functionality is based on the presumption that users will be able to connect to a network. They have limited RAM, processing power, and storage capabilities and weigh less than 1.8 kg/4 lb.
- **Ultra-thin laptops.** Serve the needs of users who need very light and thin computers. As with notebooks, some processing power and functionality are sacrificed to achieve the size and weight requirements, typically 1.8 to 2.7 kg/4 to 6 lb.
- **Tablet PCs.** Have a tough screen that might also swivel so they can be used like a notebook. When needed, the screen can be folded down flat on the keyboard and used as an electronic tablet. Other tablet PCs are called *slates* because they lack a dedicated keyboard, relying primarily on stylus input. Tablet PCs are popular in healthcare, education, and the hospitality field and weigh 1 to 1.8 kg/2 to 4 lb.

Other variations are UMPC (ultra mobile personal computer), smartbook (combines features of a netbook and a smartphone), gaming laptops, and rugged computers designed for industrial settings or for use in challenging climatic conditions.

Figure 7.4 Google's Android phone (shown here) along with Apple's iPhone represent popular innovations in the smartphone market. (*Source: © Hugh Threlfall/Alamy*)

Smartphones. The mobile phone market consists of people who own feature phones and smartphones (see Figure 7.4). Smartphones are mobile phones capable of Internet connectivity and a variety of mobile computing capabilities. Feature phones are more basic devices that offer little if any Internet access or computing capability. As of 2010, there were over 4.6 billion cell phone users globally, or 60.6 percent of the world's population. Cell phone sales to end users totaled over 314 million worldwide in the first quarter of 2010. Smartphone sales totaled 54.3 million units during this same period, a 48.7 percent increase over 2009 figures (Gartner, 2010).

The Nielsen Company (*nielsen.com/*) estimates that smartphones now account for 23% of the U.S. cell phone market, up from 16% almost a year earlier (Kellogg, 2010). While the market trend is definitely toward increased use of smartphones, it should be noted that even feature phones can be used in limited ways for m-commerce.

Other Handheld Devices—PDAs, iPad, E-readers. A number of other handheld devices have emerged recently that make use of mobile networks, LCD screens, and compact processing and data storage technology. Many of these devices have received significant publicity and interest by consumers. **Personal data assistants (PDAs)** have been around for a number of years and have proven popular with the business community. These handheld devices initially focused on organization applications such as calendars, address books, to-do lists, and memo pads. Users frequently

synchronize these applications with applications on their personal computers. While PDAs have proven extremely popular, it is likely that this device category will disappear because many PDA manufacturers are integrating cell phone technology in the devices. Likewise, most smartphones contain applications that effectively turn them into PDAs. The difference between a smartphone with PDA apps and a PDA with cell phone capability is practically zero.

E-readers are devices that look similar to slate tablet computers but are positioned primarily as a way for users to read electronic books. Some of the leading devices have been promoted by book sellers like Amazon (the Kindle) and Barnes and Noble (the Nook). The Apple iPad is expected to present both of these devices with significant competition. The iPad is similar in size and appearance to other e-readers but offers greater functionality. The iPad is yet another illustration of a device that blurs the lines between mobile device categories. It shares similarities with slate tablet PCs, e-readers, and PDAs. All three of the devices discussed above are capable of connecting to online stores through Wi-Fi technology or 3G connections (see below) so that users can purchase books, music, and software applications that will run on the machines.

Wearable Devices. People who work on buildings, electrical poles, or other difficult-to-climb places may be equipped with a special form of mobile wireless computing device called a wearable device. These devices come in a variety of forms, including wrist devices, small screens worn close to the eyes, voice-activated equipment, and keyboards built into gloves or clothing. For an expanded description of these devices and a history of their development, see *en.wikipedia.org/wiki/wearable_computing*. *Glaciercomputer.com*, *kopin.com*, and *Lxe.com* manufacture a variety of wearable computers. Examples can be viewed on their Web sites.

MOBILE COMPUTING SOFTWARE

There are three dominant PC operating systems (OSs): Microsoft Windows, Apple, and Linux. Most laptops and related devices are powered by these OSs. Programmers who write software apps target one or more of these platforms for their programs. Writing apps for handhelds is more difficult because there are more than twice as many systems to write for. Here is a brief summary of the most popular mobile OSs:

- **BlackBerry OS** (RIM). Made by Research in Motion, this is currently the dominant smartphone OS in the United States and number two globally. It powers a variety of BlackBerry-style smartphones manufactured by RIM.
- **iOS** (Apple, Inc.). Formerly called the iPhone OS, this innovative platform is often credited, in part, with spurring growth in the smartphone segment. The iOS is used in Apple's iPhone, iPod Touch, and iPad products. A distinctive feature of these devices is the touch screen. Apple has encouraged third-party development of apps for the iOS, generating further functionality and excitement about these devices.
- **Windows Mobile OS** (Microsoft). This OS by software giant Microsoft was preceded by an earlier version called Pocket PC, which pioneered the use of multiple computing apps in a small handheld. While the Windows Mobile OS holds a respectable market share in the United States, it continues to lose ground globally to other, newer platforms.
- **Android OS** (Google/Open Handset Alliance). This OS is receiving very favorable reaction in the marketplace and is predicted by some to compete fiercely against Apple's popular iOS. Like the Apple product, its use is not limited to smartphones and it can be found in smaller tablet computers, notebooks, and e-readers.
- **Palm OS** (Palm, Inc.). Originally designed to power Palm's PDA devices, this mobile OS has been enhanced for use in smartphones as well as PDAs.
- **Linux OS** (Linux). The iOS, Android, and Palm operating systems described above are all based on modifications of the Linux Kernel (see *wikipedia.org/wiki/Linux_kernel*). Other manufacturers like Motorola and Samsung have used Linux to power their mobile phone devices.
- **Symbian OS** (Symbian Foundation). While this open-source software platform enjoys only a fractional market share in the United States, globally it is the

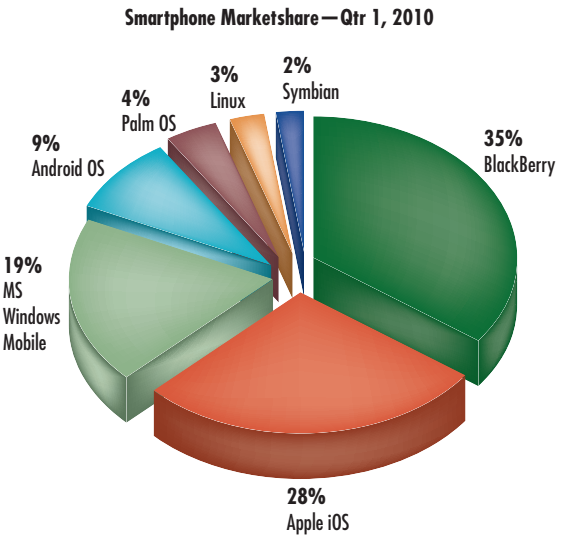

Figure 7.5 Smartphone operating system market share in the United States. (*Source: Adapted from The Nielsen Company*)

dominant smartphone OS and runs mainly on phones manufactured by Nokia. The fourth generation of this OS became available in 2011.

Consumers expect to access Web sites from their smartphones and other devices and are frustrated by companies that do not have Web sites developed for this OS and purpose. This presents special challenges for business and Web site programmers because now they must design Web sites for access from the various mobile browsers. If a company is unable to develop mobile sites for all available devices, then knowing the relative market share of mobile OSs will help target the most dominant platforms. Figures 7.5 and 7.6 illustrate the relative share of these platforms in the United States and worldwide.

WIRELESS NETWORK GROWTH

As you read in Chapter 4, mobile devices must be able to connect with high-speed wireless networks. The mobile computing and commerce environment relies on two basic approaches to Internet connectivity: short-range wireless technologies such as Wi-Fi and longer-range telecommunications technologies such as 3G and 4G networks such as WiMAX. Most laptops today rely on Wi-Fi technology that requires being in range of a network access point. Cell phones communicate over a 3G network. However, it is possible for laptops and other mobile devices to connect with 3G networks using peripheral devices.

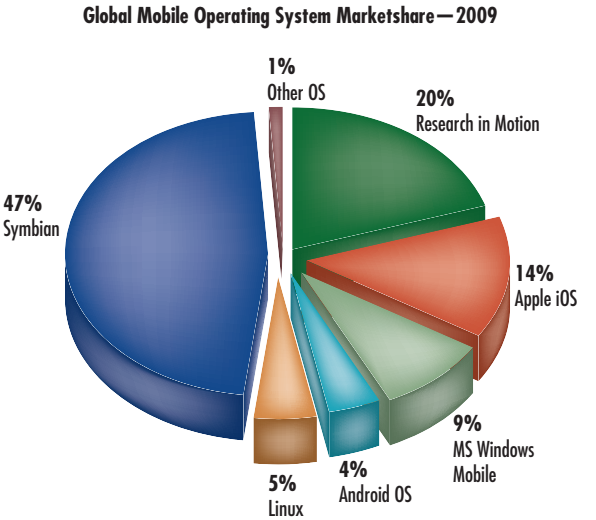

Figure 7.6 Global smartphone OS market shares. (*Source: Adapted from Gartner, 2010.*)

TABLE 7.1 Wi-Fi Locations and Applications

- iWire has a searchable registry of 317,585 free and for-purchase Wi-Fi locations in 144 countries at *v4.jiwire.com/search-hotspot-locations.htm*
- Most major airports today offer complimentary or fee-based wireless access to the Internet. Lufthansa offers in-flight Wi-Fi service on its long-haul fleet. The hotspots on the planes are connected to the Internet via satellites. American Airlines, Alaska Airlines, JetBlue, and Virgin America offer connection to the Web to fliers as of 2008.
- McDonald's offers free Wi-Fi hotspots in more than 11,500 restaurants, and the number is increasing daily. Local service providers provide high-quality wireless service.
- Using a wireless ticketing system, Universal Studios in Hollywood is shortening the waiting lines for tickets at its front gate. The ticket sellers, armed with Wi-Fi–enabled devices and belt mounted printers sell tickets and provide information to guests.
- Several mining companies in Europe installed hundreds of Wi-Fi hotspots in their coal mines. Information from drills and trucks, such as their positions and the weight of their loads, is transmitted wirelessly to the control center. It increases both productivity and safety.

Wireless Local Area Networks and Wi-Fi. Wireless local area networks have been making their way to the wireless forefront (see Table 7.1). A wireless LAN (WLAN) is like a wired LAN without cables. WLANs transmit and receive data over the airwaves from a short distance in what is known as Wi-Fi, which is short for Wireless Fidelity. Wi-Fi technology is described in Chapter 4.

The growth of Wi-Fi networks globally is one of the factors fueling the growth of mobile computing. As the number of access points or ***hotspots*** grows, use of mobile devices becomes easier, more convenient, and more reliable, increasing the attractiveness of the technology to end users. Across the world, businesses—especially restaurants and hotels—and municipalities are increasingly offering access to Wi-Fi as a free benefit. Business and residential users are rapidly expanding their Wi-Fi networks. Manufacturers of Wi-Fi equipment reported double-digit growth in 2010 from the previous year, a further indication that Wi-Fi network coverage will continue to expand.

Wi-Fi is used to support business and compliance requirements. By now we're aware of the terrible mining accidents that occur from time to time in various parts of the world. After the Sago mine disaster in West Virginia in January 2006, the U.S. Congress passed the Mine Improvement and New Emergency Response (MINER) Act, which requires underground coal mining firms to upgrade procedures, equipment, and technology. These companies must provide two-way communications between underground and surface personnel and an electronic tracking system that allows surface personnel to determine the location of any persons trapped underground. The solution is to use Wi-Fi to monitor underground conditions.

3G and 4G Networks. 3G and 4G networks have evolved from telecommunications technology. Earlier forms of these networks were used primarily for voice communications, but now data transmission constitutes a major portion of the information flowing over these networks. These technologies allow greater ubiquity than Wi-Fi, and coverage is widespread, access is very good throughout most metropolitan areas and, depending on the carrier, may be strong across the country. The historical trade-off between the telecommunications networks and Wi-Fi has been coverage versus speed. Wi-Fi was faster but required users to be near an open network access point. With 3G networks, a user could be traveling down the road in an automobile and reasonably expect to access the network, but at speeds slower than Wi-Fi. With 4G technologies, the telecommunications networks are becoming faster, approaching speeds offered by Wi-Fi.

The Future of Wireless Networking. It remains to be seen how the global wireless network system will evolve. For the foreseeable future, telecommunications and

Wi-Fi technologies will coexist. With the growth of free or public Wi-Fi access points, many users are likely to view this technology as an adequate, low-cost approach to certain types of mobile computing. While access to a telecommunications network is only available through a paid subscription, other users may see the cost as well worth the benefit of constant connectivity. It is simply too early to tell whether one or the other of these technologies will eventually become dominant or whether market forces and user behavior will continue to support a dual approach. One thing is certain—because both technologies are expanding geographically, along with increases in speed and functionality, overall mobile computing is projected to grow dramatically in the near future.

Review Questions

1. What are the three technological foundations of mobile computing?
2. List some of the reasons why it can be difficult to categorize mobile computing devices.
3. What factors have led to the recent growth of the smartphone market?
4. From an end-user perspective, what are the basic trade-offs between Wi-Fi and telecommunications technology (e.g., 3G and 4G)?

7.2 Mobile Financial Services (MFS)

Mobile banking is generally defined as carrying out banking transactions and other related activities via mobile devices. The services offered include bill payments and money transfers, account administration and checkbook requests, balance inquiries and statements of account, interest and exchange rates, and so on.

Banks and other financial institutions let customers use mobile devices for a wide range of services. The most common of these mobile banking services are the following (Mobile Marketing Association, 2009):

- Account alerts, security alerts, and reminders
- Account balances, updates, and history
- Customer service via mobile
- Branch or ATM location information
- Bill paying (e.g., utility bills), delivery of online payments by secure agents and mobile phone client apps
- Funds transfers
- Transaction verification
- Mortgage alerts

People access these financial services using a combination of mobile media channels including Short Message Service (SMS), mobile Web browsers, and customized smartphone apps. Mobile banking is a natural extension of online banking services, which have been growing in popularity over the last decade.

Short Codes. Many m-commerce transactions utilize SMS texts in conjunction with **short codes.** This is true of financial services as well. A short code works like a telephone number, except that it is only five or six characters long and easier to remember. For example, mobile banking customers of PNC Bank can send an SMS text message to short code 762265 to retrieve account information. In the body of the text, they might include messages such as BAL for account balance or LAST CHK1 to retrieve information about recent transactions.

Businesses lease short codes from the Common Short Code Association (CSCA) for $500 to $1,000 a month. The lower price is for randomly assigned codes, companies that want a specific short code pay a higher monthly rate. Once a company has leased its short code, it can begin using it in promotions and interactivity with customers.

One example of nonbanking short-code use is voting on the popular television show *American Idol*. Each contestant is assigned a specific short code, and viewers are encouraged to send text messages indicating which performer they like the best. The annual *MTV Movie Awards* also uses short-code voting, which allows viewers to pick the winning entry in certain prize categories. For a related example, see the Starbucks business case at the end of this chapter. On some telecommunications networks, ringtones are sold using short codes and SMS texts.

MOBILE BANKING AND STOCK TRADING

Throughout Europe, the United States, and Asia, an increasing percentage of banks offer mobile access to financial and account information. In 2009, ABI Research evaluated 29 U.S. banks on accessibility of their mobile banking services. Six of the banks received top marks: BB&T, Eastern Bank, Fifth Third Bank, Northeast Bank, USAA, and Wells Fargo. Bank of America and Chase also received positive evaluations (ABI Research, 2009).

In Sweden, Merita Bank has pioneered many services, and The Royal Bank of Scotland offers mobile payment services. Banamex, one of Mexico's largest banks, is a strong provider of wireless services to customers. Many banks in Japan allow for all banking transactions to be done via cell phone. Experts predict that growth in the mobile banking services sector could reach between 894 million and 1.5 billion customers globally by 2015. The Asia-Pacific region is expected to emerge as the predominant market for mobile banking services. (Berg Insight, 2010; Global Industry Analysts, 2010).

As the wireless transmission speeds improve, the rate of mobile banking services is increasing. The same holds true for other mobile insurance and stock market trades (see Figure 7.7).

Security Issues. At present, the benefits associated with mobile banking seem to outweigh potential security threats. However, as the number of people who engage in mobile banking increases, the likelihood that criminals will target mobile financial activity is sure to grow as well. What kinds of threats exist to mobile banking? Table 7.2 lists several mobile banking risks.

MOBILE ELECTRONIC PAYMENT SYSTEMS

According to the Mobile Marketing Association (2010), about one in five U.S. adults is now using **mobile commerce.** As interest in mobile commerce grows, there is a greater demand for innovative payment systems that make transactions from smartphones and other mobile devices convenient, safe, and secure. A number of businesses have attempted to meet this demand with a variety of approaches. There are two basic types of transactions of interest: the online purchase of goods and services

Figure 7.7 Mobile banking, stock trading, and payment services have increased in recent years. (*Source: Daniel Heighton/Alamy*)

TABLE 7.2 Mobile Banking Security Risks

Cloning. Duplicating the electronic serial number (ESM) of one phone and using it in a second phone—the clone. This allows the perpetrator to have calls and other transactions billed to the original phone.
Phishing. Using a fraudulent communication, such as an e-mail, to trick the receiver into divulging critical information such as account numbers, passwords, or other identifying information.
Smishing. Similar to phishing, but the fraudulent communication comes in the form of an SMS message.
Vishing. Again, similar to phishing, but the fraudulent communication comes in the form of a voice or voice-mail message encouraging the victim to divulge secure information.
Lost or stolen phone. Lost or stolen cell phones can be used to conduct financial transactions without the owner's permission.

Sources: Compiled from Howard (2009), Mobile Marketing Association (2009), and McGee (2008).

using a mobile device (e.g., ordering a book from *Amazon.com*) and using a handheld to pay for goods and services in a traditional brick-and-mortar retail store. Here are examples of recent innovations approaches:

Charge to phone bills with SMS confirmation (see *Boku.com*). Using this approach, mobile users text a message to a short-code number specified by the payee. The amount of the charge is then added to the payer's phone bill, and the telecom carrier remits this amount to the payee. Telecom companies may deduct a service charge from the amount paid.

Near- field communications (see *Blingnation.com*). Another approach to mobile payment uses a small microchip containing account information that users attach to their mobile device. The mobile user simply passes or taps the phone on a merchant terminal and payment is transferred. Users receive an SMS text message confirmation. A variation on this approach involves the use of a smart card in the user's mobile phone.

Payment by credit card via phone number and SMS (see *Zong.com* and *Paypal.com*). Mobile buyers create an account at a company like *zong.com*. This account links a mobile phone number with a credit card. When shopping online, the buyer clicks a payment button and enters his or her telephone number, which is easier to remember than a credit card number. An SMS text is sent to the buyer asking for payment confirmation. When confirmed, a charge is made to the buyer's credit card.

Credit card + Web form. Using a mobile Web browser, buyers make online purchases by entering their credit card number and other identifying information just as they would if they were using a personal computer. This process can be cumbersome, given the smaller screen and keyboards on mobile devices, but it is an option.

Transfer funds from payment account using SMS (see *obopay.com* and *paypal.com*). Using this approach, the user creates an account at a company like *obopay.com* and transfers money into it from a bank or credit card account. Using a mobile phone and SMS, the user can then transfer money to anyone else with a mobile phone number. The receiver must create an account at the payment company in order to retrieve the funds.

Mobile phone card reader (see *square.com*). This novel approach requires mobile phone users to use a small card reader that plugs into the audio input jack of most mobile devices. The card reader, which resembles a small cube, allows those with accounts at *square.com* to make or receive credit card payments without a merchant account.

2D tags (see *Cimbal.com*). This payment system uses QR or 2D tags to identify the merchant or payee. The buyer scans the merchant's tag using a special smartphone app and then approves the fund transfer when it shows up on the device.

Person-to-person transfers are also possible, since the app can generate custom QR tags that individuals can scan from one another's mobile devices.

"Bumping" iPhones with payment applications (see *bumptechnologies.com*). Using an iPhone app called bump, two individuals can transfer money to each other simply by tapping their phones together.

Phone displays barcode that retailers scan (see *Facecash.com*). When it comes time for buyers to pay for goods and services, they present their mobile device, which displays their photograph for identification purposes and a barcode linked to a payment account that they've established with *facecash.com*. The merchant scans the barcode with a reader and completes the transaction.

Almost all of the payment systems described above are illustrated by videos on *YouTube.com*. Interested readers are encouraged to view these video resources for a more complete explanation of how they work.

Wireless payment systems transform mobile phones into secure, self-contained purchasing tools capable of instantly authorizing payments over the cellular network. Many of the above systems bypass traditional credit card companies or banks, decreasing transaction costs for merchants. In addition, the payment of small sums, called **micropayments,** is less problematic since many of the systems are specifically designed to accommodate smaller transactions. The ability to make micropayments allows individuals to use their mobile devices to do things like purchase a beverage from a vending machine or make a payment to a municipal parking meter. Many cities in Europe, and a growing number in the United States that have adopted mobile phone payment systems for parking, have reported dramatic increases in revenue because of the reduction in loss due to theft, broken meters, and the reduced expense associated with collecting cash from traditional meters.

Mobile (wireless) wallets are yet another payment system. An *e-wallet* is a piece of software that stores an online shopper's credit card numbers and other personal information so that the shopper does not have to reenter that information for every online purchase. While mobile e-wallets, called **m-wallets,** have been around for a few years, adoption of these apps has been limited because users perceive them to be of limited value. Companies that promote m-wallets are attempting to make them more attractive by expanding their functionality beyond simple payment systems. Their goal is to make the m-wallet an attractive replacement for a person's physical wallet. New m-wallets will be capable of storing not only credit card information but also driver's license, passport, and healthcare information (Swartz, 2010). Furthermore, many of the new m-wallet products are server-side apps. This means that crucial information in a user's wallet is not stored on the mobile device. Instead, the information is stored on secure servers and accessed, when needed, by mobile phones or other devices. This increases the safety and security of critical information by minimizing the risk associated with lost or stolen mobile devices. Makers of m-wallet apps hope that these changes will spur wide-scale adoption of m-wallets.

Review Questions

1. What are the two kinds of basic transactions requiring mobile payment systems?
2. What are short codes and how are they used to conduct transactions?
3. Why have e-wallets not been widely adopted and what are makers of m-wallets doing to make their apps more attractive?
4. What are the most common security risks associated with mobile banking?
5. Describe some of the mobile payment systems.

7.3 Mobile Shopping, Entertainment, and Advertising

Mobile commerce B2C apps are expanding in several areas—retail shopping for products and services, mobile entertainment, mobile gaming, travel and hospitality services, and sales of digitized content (e.g., music, news, videos, movies, or games).

SHOPPING FROM WIRELESS DEVICES

An increasing number of online vendors allow customers to shop from handheld devices. For example, customers use smartphones to shop at sites like *target.com*, *amazon.com*, and *buy.com.* Customers use handhelds to perform quick searches, compare prices, use a shopping cart, order, pay, and view the status of their order. Specialized devices like Amazon's e-reader Kindle allow users to purchase and download books from the store. Using Apple's iPod touch, users can purchase and download music from iTunes. Many national restaurant chains offer consumers the ability to search menus, order, and pay for food via their mobile devices.

Figure 7.8 QR codes linked to specific goods and services are used by mobile phone users to retrieve product information. (*Source: © jeremy suttonhibbert/ Alamy*)

Handheld users can also participate in online auctions. For example, eBay offers mobile apps for a variety of smartphones. They also use a voice-based service called Unwired Buyer that can contact bidders minutes before their auction is going to close to let them know the status of their bid. eBay subsidiary PayPal allows users to pay for their merchandise by phone. Consumers are increasingly using their phones to get product and price information while shopping in traditional stores. *Pricegrabber.com*, *slifter.com*, and *froogle.com* are just some of the price-comparison sites that allow people to search for product information from their mobile phones. Experts are now advising retailers to take these savvy shoppers into consideration when developing their mobile strategy. The ability to identify in-store mobile shoppers and to deliver meaningful information and value through price-matching offers or other incentives is vitally important.

Mobile commerce in Japan is growing exponentially and now represents the largest volume of m-commerce sales in the world. Over 60 million Japanese are making purchases with cell phones, for example, buying their train tickets while riding the train. Mobile shopping is popular with busy single parents, executives, and teenagers, who are doing over 80 percent of their EC shopping from cell phones.

In Japan, most food products are tagged with QR codes, allowing consumers to quickly find information about the goods they are shopping for (see Figure 7.8). According to the Daiwa Institute of Research, impulse shopping accounts for most of the purchases that are done on mobile phones, but only if the users are on flat-fee-based service.

MOBILE ENTERTAINMENT

Mobile entertainment is expanding on wireless devices. Most notable are music, movies, videos, games, adult entertainment, sports, and gambling apps.

Sports enthusiasts enjoy a large number of apps and services on their mobile devices. Apps exist to check game scores; track news updates about specific athletes, teams, or sports; participate in fantasy team contests like fantasy football; and participate in sports-oriented social networking services. Numerous sports-related games like mobile golf and sports trivia apps are widely available. There are even handhelds designed to provide tips and information for improving your own athletic performance. An app that analyzes a person's golf swing and provides advice for improving performance is available for the iPhone.

ESPN's Sport Center, in partnership with Sanyo, offers a cell phone that comes preloaded with several sports-related apps. You can get quick access to news of your favorite teams. Video clips of up to 30 seconds are available, and so is a built-in camera. To occupy the owner during waiting time, sports-trivia questions are installed on the phone. Sports-related alerts are sent to the phone via text message.

Industry analysts are predicting that recent improvements in mobile computing device hardware will lead to an even bigger increase in the number of people who watch video clips, movies, and television programs on their mobile devices. The screen size of devices like Apple's iPad makes watching videos more appealing than on a smartphone. However, the number of people viewing videos on smartphones seems to be increasing as well. Companies like *theChanner.com* and FLO TV, among others, offer television programs to mobile device users. Fox Mobile recently introduced a mobile app that will allow smartphone users to view television content from its Web site *Hulu.com.*

IT at Work 7.1

Mobile Godiva

Belgian Godiva Chocolatier is recognized worldwide as the leader in fine chocolates. From its famous truffles and shell-molded chocolate pieces to its European-style biscuits, gourmet coffees, and hot cocoa, Godiva Chocolatier has been dedicated to excellence and innovation in the tradition for 80 years.

When it came time to continuing the tradition of innovation and excellence in the mobile channel, Godiva launched the Godiva Mobile initiative. Godiva Mobile was designed as a way to purchase goods and build intimate customer relationships. A device-resident app, Godiva Mobile includes Godiva's best-selling products and can integrate with other applications on a BlackBerry smartphone, including the address book and mapping applications. Consumers purchase products by simply scrolling and clicking.

Godiva Mobile includes:

- Quick access to Godiva Chocolatier's most popular products
- The ability to complete a shopping transaction in less than 30 seconds
- Rich product descriptions and full-color images
- Address book integration, allowing users to ship with just a few clicks
- A "One-Touch Store-Locator" that uses GPS or cell towers to automatically identify stores close to the user's location
- Secure transactions and password-protected buying

Discussion Questions: Why is Mobile Godiva a good application for Godiva? In your answer, consider the fact that Godiva chocolates and other products are usually bought as a gift rather than for oneself.

The iTunes Store continues to be a leader in making digital music, movies, and podcasts available to consumers for a fee. Mobile users can also access music from digital streaming sites like *Pandora.com* and *Grooveshark.com*. Both of these services offer free streaming music. Users can upgrade their accounts by paying a subscription fee, which then limits the amount of advertising that occurs during their listening.

While still relatively small, the mobile gambling industry is expected to grow substantially in the next few years. Some predict this type of mobile commerce could generate as much as $20 billion in the near future. Primary growth of this market is expected to take place in Japan and other Asian countries.

Many handhelds exist to enhance home-based entertainment activities. The Food Network has an app with tips and recipes for fine dining and entertaining. *Mobilewinelist.com* offers a way to inventory your wine collection, rate wines, and share information about wine with other enthusiasts through your mobile device. Mobatech is the maker of a mobile bartending app with numerous recipes for cocktails and party drinks. Mobile Godiva is discussed in *IT at Work 7.1*

MOBILE GAMES

With smartphones, the potential audience for mobile games is substantially larger than the market for other platforms, PlayStation and X-box included. Nearly half (45 percent) of smartphone users play games and spend an average of $41 on gaming handhelds. Experts expect that this market will continue to grow as network speeds increase and mobile devices become more powerful, adding increased richness to the gaming experience. In Japan, where millions of commuters "kill time" during long train rides, cell phone games have become a cultural phenomenon. Now mobile games are very popular in many countries.

In July 2001, Ericsson, Motorola, Nokia, and Siemens established the Mobile Games Interoperability Forum (MGIF) (*openmobilealliance.org*) to define a range of technical standards that will make it possible to deploy mobile games across multigame servers and wireless networks, as well as across different mobile devices.

HOTEL SERVICES AND TRAVEL GO WIRELESS

A number of hotels now offer their guests in-room wireless or wireline (wired) high-speed Internet connections. Some of these same hotels offer Wi-Fi Internet access in public areas like the lobby and in meeting rooms. One of these is Marriott, which manages about 3,000 hotels worldwide. Most other large hotel chains (e.g., Best Western), as well as small hotels, offer Internet connections.

Airports and other transit centers are increasingly offering Wi-Fi access to the Internet to accommodate travelers. Major airlines are exploring the ability to offer broadband Internet access during flights to users of laptops and other computing devices. Some rail services also provide in-transit Internet access to travelers.

In addition to providing guests with Internet access via Wi-Fi access points, a small number of hotels are exploring use of mobile Web sites for guests to check in, book spa or restaurant reservations, and order room service. Other technologies are being developed that would allow guests to open their hotel room door using SMS text messages or by passing their NFC (near field communications) enabled phone next to the door lock.

MOBILE SOCIAL NETWORKING

Mobile social networking is social networking in which two or more individuals converse and connect with one another using smartphones or other mobile devices. Much like Web-based social networking, mobile social networking occurs in virtual communities. All of the most popular social networking sites now offer apps that allow users to access their social network accounts from a smartphone or other mobile device. Some experts predict that mobile social media will be one of the most popular consumer applications and, along with gaming apps, will be a driving force in the growth of the mobile market.

OTHER MOBILE COMPUTING SERVICES FOR CONSUMERS

Many other mobile computing services exist for consumers in a variety of categories. Examples include information services for news, city events, weather, and sports reports; online language translations; information about tourist attractions (e.g., hours, prices); and emergency services. Many other services are available to cell phones with Internet access. For example, Skype offers its voice, text, and video service for free.

TARGETED ADVERTISING

The growth of mobile computing and m-commerce is attractive to advertisers. Smartphones enabled with GPS capabilities can convey information about a user's location to advertisers. This information can be used, along with user preferences or surfing habits, to send user-specific advertising messages to mobile devices. Advertising can also be location-sensitive, providing information about stores, malls, and restaurants close to a potential buyer. SMS messages and short paging messages can be used to deliver this type of advertising to cell phones and pagers, respectively. Many companies are capitalizing on targeted advertising. See *IT at Work 7.2* for an illustration.

As more wireless bandwidth becomes available, content-rich advertising involving audio, pictures, and video clips will be generated for individual users with specific needs. The obvious challenge for advertisers will be to use this information to communicate with users in ways they find helpful and not annoying.

MOBILE PORTAL

A mobile portal is a customer channel, optimized for mobility, that aggregates and provides content and services for mobile users. These portals offer services similar to those of desktop portals such as AOL, Yahoo!, and MSN. Many companies host mobile portals today, as shown in Table 7.3.

IT at Work 7.2

Wireless Marketing and Advertising in Action

MKT

Industry analysts expect advertising in the mobile channel to heat up. Increasing numbers of smartphones, better browsers, enhanced GPS capabilities, and better ways of measuring advertising effectiveness are all factors powering this growth. The following are a few examples of wireless advertising in action.

Foursquare.com is one of the latest entries in the growing field of mobile advertising. Structured as a kind of mobile social media game, users "check in" from their phones when they visit retail stores and restaurants. They can provide information and ratings based on their reaction to these outlets. This information is shared with advertisers and their friends who are also part of the Foursquare network. Over time, Foursquare develops a profile of users based on the kinds of businesses they frequent and can use this information to better target consumers with advertising messages. Foursquare reinforces member use of the service by awarding *badges* to members for various types and levels of usage. Members who are the most frequent shopper at a particular location are awarded the title of *Mayor* and may receive special attention and discounts from the retailer. Foursquare provides advertisers with information about target customers that they usually don't have: location. This helps advertisers deliver timely messages that can be more relevant and meaningful to consumers, increasing the chances that the ads will be acted on.

Augmented reality (AR) apps are a special technology that will become more commonplace in the future. Augmented reality involves computer-generated graphic images being superimposed on pictures of real things (e.g., people, rooms, buildings, roads, etc.). This technology is used by advertisers in several ways. For instance, a mobile phone user might point his or her phone camera at an office building and activate an AR app that generates the logos of all food service outlets (e.g. Starbucks, Subway, McDonald's) inside the building. Furniture retailer IKEA offers shoppers an AR app that allows them to project images of its products onto pictures of the rooms in their homes so they can "visualize" how the products will look there. Industry experts expect that AR advertising will grow as smartphone users become more familiar with the concept. You can watch a fascinating video of an iPhone handheld developed by Yellow Pages at *youtube.com/watch?v=tOw8X78VTwg/*.

Hoping to become the king of location-based Web domains, Go2Online (*go2.com*) helps mobile travelers find everything from lodging to Jiffy Lube stations. Partnering with Sprint, Nextel, Verizon, and Boost, Go2 makes its services available on every Web-enabled phone, Palm i705, and BlackBerry RIM pager in America. Entering "JiffyLube" or any of hundreds of other brand names into the Go2 system will bring up the nearest location where one can find that product or service.

Sources: Compiled from Moore (2010) and Whitfield (2010).

Discussion Questions:

1. What benefit do advertisers derive from knowing a customer's location?

2. What are some similarities between Foursquare.com and other social networking services?

3. What privacy concerns do you think are important for users of location-based services like Foursquare.com to consider?

4. How might augmented reality apps be more effective than traditional directory services?

The services provided by mobile portals include news, sports, e-mail, entertainment, and travel information; restaurants and event information; leisure-related services (e.g., games, TV and movie listings); community services; and stock trading. A sizable percentage of the portals also provide downloads and messaging; music-related services; and health, dating, and job information. Mobile portals frequently charge for their services. For example, you may be asked to pay 50 cents to get a weather report over your mobile phone. Alternatively, you may pay a monthly fee for the portal service and get the report free anytime you want it. In Japan, for example, i-mode generates revenue mainly from subscription fees.

TABLE 7.3 Mobile Portals

Name	Address
iGoogle	*google.com/m/ig*
Yahoo Mobile	*m.yahoo.com*
MSN	*mobile.msn.com*
Windows Live	*mobile.live.com*
AOL	*wap.aol.com/portal/*
Redcliff (India)	*mobile.rediff.com*
Nokia Here and Now	*nokia.mobi/hereandnow/*

VOICE PORTALS

A **voice portal** is a Web site that can be accessed by voice. Voice portals are not really Web sites in the normal sense because they are not accessed through a browser.

In addition to providing information, some sites provide true interaction. *iPing.com* is a reminder and notification service that allows users to enter information via the Web and receive reminder calls. In addition, *iPing.com* can call a group of people to notify them of a meeting or conference call. *Tellme.com* and *quack.com* also offer voice-based services.

Voice portals are used extensively by airlines, for example, enabling customers to make reservations, find flight status, and more. Many other organizations use voice portals to replace or supplement help desks. The advantage to the company is cost reduction. Users can save time, since they do not have to wait for help.

A benefit for Internet marketers is that voice portals can help businesses find new customers. Several of these sites are supported by ads; thus, the customer-profile data they have available helps them deliver targeted advertising. For instance, a department-store chain with an existing brand image can use short audio commercials on these sites to deliver a message related to the topic of the call.

Review Questions

1. Describe how shoppers use mobile devices to enhance their shopping experience.
2. How is targeted advertising done wirelessly?
3. Describe a mobile portal.
4. What is a voice portal?
5. List types of mobile entertainment available to consumers.
6. How are hotels using mobile computing technology to increase guest satisfaction?

7.4 Location-Based Services and Commerce

Location-based commerce (l-commerce) refers to the delivery of advertisements, products, or services to customers whose locations are known at a given time [also known as location-based services (LBSs)]. Location-based services are beneficial to consumers and businesses alike. From a consumer's viewpoint, l-commerce offers safety. For instance, you can connect to an emergency service with a mobile device and have the service pinpoint your exact location. (See *IT at Work 7.3.*) The services offer convenience because you can locate what is near you without having to consult a directory, pay phone, or map. The services offer increased productivity because you can decrease your travel time by determining points of interest in close proximity. From a business supplier's point of view, l-commerce offers an opportunity to sell more. (See *IT at Work 7.3*)

The basic l-commerce services revolve around five key concepts:

1. **Location.** Determining the basic position of a person or a thing (e.g., bus, car, or boat) at any given time
2. **Navigation.** Plotting a route from one location to another
3. **Tracking.** Monitoring the movement of a person or a thing (e.g., a vehicle or package) along the route
4. **Mapping.** Creating digital maps of specific geographic locations
5. **Timing.** Determining the precise time at a specific location

L-COMMERCE TECHNOLOGIES

Providing location-based services requires the following location-based and network technologies, shown in Figure 7.10:

- **Position-determining equipment (PDE).** This equipment identifies the location of the mobile device either through GPS or by locating the nearest base station. The position information is sent to the mobile positioning center.
- **Mobile positioning center (MPC).** The MPC is a server that manages the location information sent from the PDE.

IT at Work 7.3

The Highway 91 Project

SVR

Route 91 is a major eight-lane, east-west highway near Los Angeles. Traffic is especially heavy during rush hours. California Private Transportation Company (CPT) built six express toll lanes along a 10-mile stretch in the median of the existing Highway 91. The express lane system has only one entrance and one exit, and it is totally operated with EC technologies. The system (see Figure 7.9) works as follows.

Only prepaid subscribers can drive on the road. Subscribers receive an automatic vehicle identification (AVI) device that is placed on the rearview mirror of the car. The device, which uses RFID technology, is about the size of a thick credit card and includes a microchip, an antenna, and a battery. A large sign over the tollway tells drivers the current fee for cruising the express lanes. In a recent year it varied from $0.50 in slow traffic hours to $3.25 during rush hours.

Sensors in the pavement let the tollway computer know that a car has entered; the car does not need to slow or stop. The AVI makes radio contact with a transceiver installed above the lane. The transceiver relays the car's identity through fiber-optic lines to the control center, where a computer calculates the fee for that day's trip. The system accesses the driver's account and the fare is automatically deducted from the driver's prepaid account. A monthly statement is sent to the subscriber's home.

Surveillance cameras record the license numbers of cars without AVIs. These cars can be stopped by police at the exit or fined by mail. Video cameras along the tollway also enable managers to keep tabs on traffic, for example, sending a tow truck to help a stranded car. Also, through knowledge of the traffic volume, pricing decisions can be made. Raising the price as traffic increases ensures that the tollway will not be jammed. In similar systems, nonsubscribers are allowed to enter via special gates, where they pay cash.

The system saves commuters between 40 and 90 minutes each day, so it is in high demand. An interesting extension of the system is the use of the same AVIs for other purposes. For example, they can be used in paid parking lots. Someday you may even be recognized when you enter the drive-through lane of McDonald's and a voice asks you, "Mr. Smart, do you want your usual meal today?"

Figure 7.9 Highway 91 Project. (*Source: UPI Photo/NewsCom*)

Sources: 91expresslanes.com and *en.wikipedia.org/wiki/91_Express_Lanes.*

Discussion Questions: What is the role of the wireless component of this system? What are the advantages of the system to commuters? If a large percent of drivers use the express lanes, what happens?

- **Location-based technology.** This technology consists of groups of servers that combine the position information with geographic- and location-specific content to provide an l-commerce service. For instance, location-based technology could present a list of addresses of nearby restaurants based on the position of the caller, local street maps, and a directory of businesses. It is provided via the content center via the Internet.
- **Geographic content.** Geographic content consists of digitized streets, road maps, addresses, routes, landmarks, land usage, zip codes, and the like. This information must be delivered in compressed form for fast distribution over wireless networks.
- **Location-specific content.** Location-specific content is used in conjunction with the geographic content to provide the location of particular services. Yellow Pages directories showing the location of specific businesses and services are examples of this type of content.

Figure 7.10 also shows how these technologies are used in conjunction with one another to deliver location-based services that are managed via the service center. Underlying these technologies are global positioning and geographical information systems.

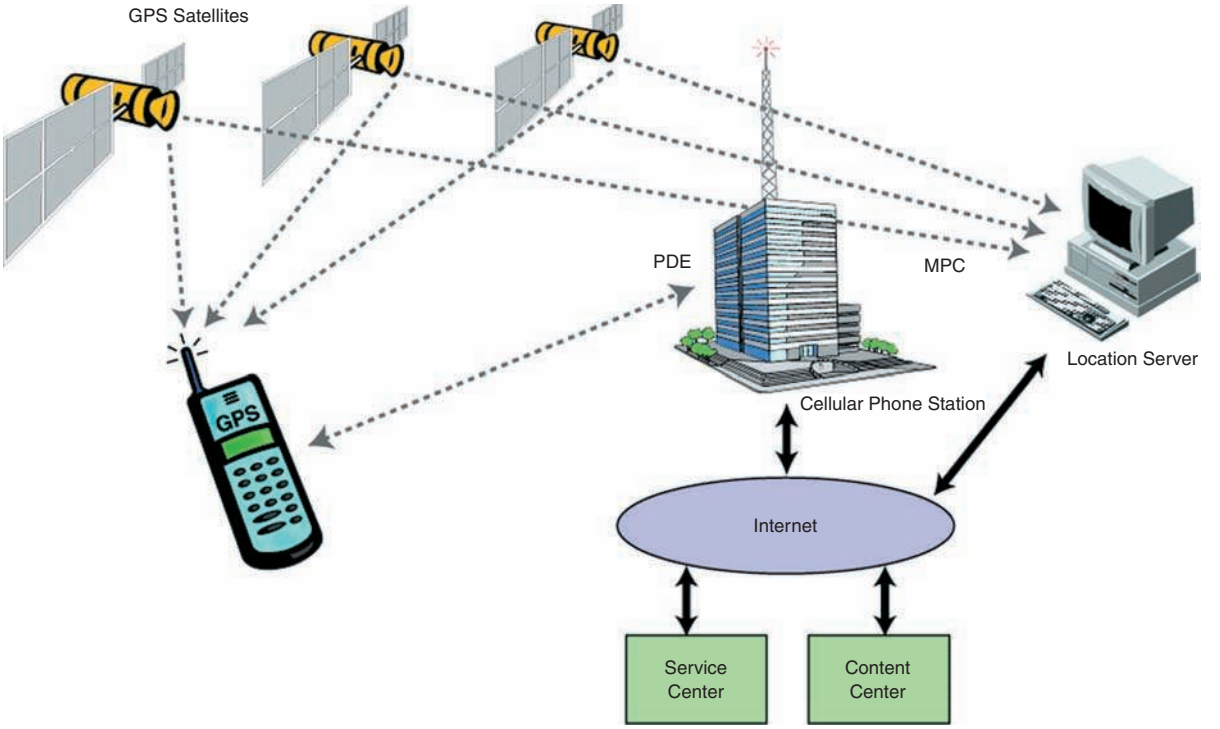

Figure 7.10 Smartphone with GPS in location-based commerce.

Global Positioning System (GPS). A **Global Positioning System** (**GPS**) is a wireless system that uses satellites to determine where the GPS device is located anywhere on earth. GPS equipment has been used extensively for navigation by commercial airlines and ships and for locating trucks and buses.

GPS is supported by 24 U.S. government satellites, plus 3 backup satellites, that are shared worldwide. Each satellite orbits the earth once every 12 hours on a precise path, at an altitude of 10,900 miles. At any point in time, the exact position of each satellite is known, because the satellite broadcasts its position and a time signal from its onboard atomic clock, which is accurate to one-billionth of a second. Receivers also have accurate clocks that are synchronized with those of the satellites.

GPS handsets can be stand-alone units or can be plugged into or embedded in a mobile device. They calculate the position of the handsets or send the information to be calculated centrally. Knowing the speed of the satellite signals, 186,272 miles per second, engineers can find the location of any receiving station—its latitude and longitude—to within 50 feet by *triangulation*, using the distance from a GPS to *three* satellites to make the computation. GPS software then computes the latitude and longitude of the receiver. This process is called **geocoding.** (See *IT at Work 7.4.*)

Geographic Information System (GIS). The location provided by GPS is expressed in terms of latitude and longitude. To make that information useful to businesses and consumers, it is necessary in many cases to relate those measures to a certain place or address. This is done by inserting the latitude and longitude onto a digital map, which is known as a **geographic information system** (**GIS**). The GIS data visualization technology integrates GPS data onto digitized map displays. Companies such as *mapinfo.com* provide the GIS core spatial technology, maps, and other data content needed in order to power location-based GIS/GPS services.

IT at Work 7.4

NextBus: Superb Customer Service

Service Problem. Buses in certain parts of San Francisco have difficulty keeping up with the posted schedule, especially in rush hours. Generally, buses are scheduled to arrive every 20 minutes, but at times, passengers may have to wait 30 to 40 minutes. The schedules become meaningless, and passengers are unhappy because they waste time.

Solution. San Francisco bus riders carrying a smartphone or similar device can quickly find out when a bus is likely to arrive at a particular bus stop. The system tracks public transportation buses in real time. Knowing where each bus is and factoring in traffic patterns and weather reports, NextBus (*nextbus.com*) dynamically calculates the estimated arrival time of the bus to each bus stop on the route. The arrival times are also displayed on the Internet and on a public screen at each bus stop.

The NextBus system has been used successfully in several other cities around the United States, in Finland, and in several other countries. Figure 7.11 shows how the NextBus system works. The core of the NextBus system is a GPS satellite that can tell the NextBus information center where a bus is at any given time. Based on a bus's location, the scheduled arrival time at each stop can be calculated in real time. Users can access the information from their cell phones or PCs anytime, anywhere. NextBus schedules are also posted in real time on passengers' shelters at bus stops and public displays.

NextBus is an ad-free customer service, but in the near future advertising may be added. As the system knows exactly where you are when you request information and how much time you have until your next bus, it could send you to the nearest Starbucks for a cup of coffee, giving you an electronic discount coupon for a cup of coffee as you wait.

Sources: Compiled from *en.wikipedia.org/wiki/NextBus* and *nextbus.com*.

Discussion Questions: How can NextBus generate revenues? Who might be good sponsors of the service?

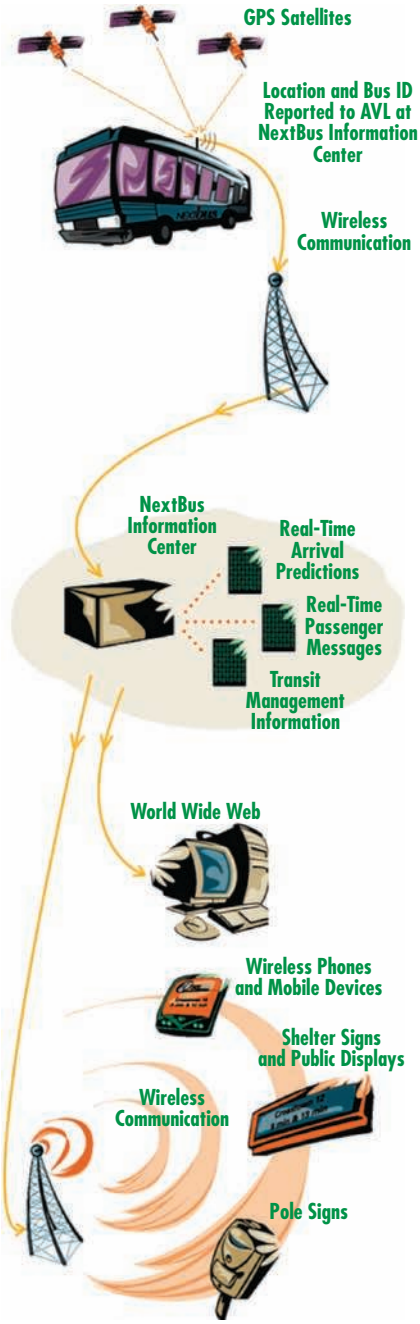

Figure 7.11 NextBus operational model. (*Source: nextbus.com/corporate/works/index.htm, 2008. Used with permission of NextBus Information Systems.*)

Review Questions

1. Define location-based services.
2. How does location-based EC work? Provide an example.
3. Describe GPS. What is it used for?
4. Describe GIS and its advantages.
5. Describe some location-based applications, particularly advertising.

7.5 Mobile Enterprise Applications

More organizations are looking to create a full range of mobile apps—from back-office to consumer-centric apps. Leading organizations are building a marketing and sales strategy that is built on connecting with customers via mobile devices. These connections extend beyond Facebook and Twitter to include the ability to be aware of mobile coupons, advertisements, or product offerings, and then engage with companies via their mobile devices.

The limitations that come from two-inch or four-inch smartphone screens are being eliminated by the iPad and other mobile tablets—and expanding the possibilities of mobile computing and mobile enterprise applications.

Whether the apps are for internal or external users, organizations need to develop plans to manage apps and keep them updated. Greater adoption of mobile apps will change the way that organizations deal with both internal and external customer service and support. However, few organizations have yet developed a plan for mobile customer service and support.

The next section looks at how mobile devices and technologies can be used *within, outside*, and *between* organizations.

MOBILE APPS

Many companies offer innovative mobile and wireless apps in the enterprise. In this section, you will read about examples of how organizations are deploying mobile solutions to conduct business. Mobile apps include the following:

- Supporting salespeople while they are waiting on customers
- Supporting field employees doing repairs or maintenance on corporate premises or for clients
- Supporting executives, managers, or other employees when they are traveling or otherwise not at the corporate site
- Supporting employees while they do work inside the enterprise at places where there is no easy access to desktop computers, for example, in a warehouse, at outdoor facilities, or in large retail stores.
- Supporting employees driving trucks while they are on the road.

Investments in mobile enterprise apps are made to provide employees with communication and collaboration tools as well as access to data, information, and people inside the organization.

Mobile POS (Point of Sale). Traditional POS technology involves a computerized cash register connected to a server via a wired local area network (LAN). These stations are fixed, requiring customers to bring their merchandise to a specific location in the store, where they wait in line for their turn to check out. Long lines frustrate customers. Some studies show that at least one in ten customers will abandon a long line, leaving the store without completing a purchase.

Mobile POS stations can be set up as needed by using handhelds, scanners, and printers. During periods of high volume, employees can set up temporary mobile checkout stations capable of scanning merchandise barcodes, processing credit card payments, and printing receipts. Employees can even walk through a fixed-station line offering to expedite checkout for those customers paying with credit card.

Inventory Management. Inventory management and tracking represent a significant expense for retailers. Using barcodes and handhelds or wearable wrist devices, retailers can record when merchandise enters the store, where it is stored, and when it is moved to the floor. Delivery drivers use mobile devices to enter invoices and other shipping data into the store's database at the point of delivery, making billing and accounting easier. As merchandise is sold, inventory levels are updated, triggering replacement orders and reducing the chances of stock-out situations. The benefits are a reduction in lost sales due to missing or unavailable merchandise and theft.

If a customer asks an employee to help find a particular product, the employee can check its location from a handheld device or order it and arrange for drop-shipping directly to the customer's home. Immediate response reduces the probability that the customer will purchase the product from another business.

Finally, the cumbersome process of changing prices on in-store merchandise is made easier using mobile devices. Employees can walk the aisles of a store, scanning merchandise and checking the posted price against the price in the store's UPC (Universal Product Code) database. If the employee finds a discrepancy, he or she can use the device to print a new price tag.

Customer Service. Because wireless devices can be quickly set up or moved throughout a store, retailers can position mobile price-check devices in convenient locations for customers to verify prices or retrieve product information by simply scanning the UPC code on a product. These devices can be moved without incurring the costs of rewiring the units. Wireless self-help kiosks can be positioned in each department, allowing customers to identify the location of products and obtain other information to facilitate their purchase. Stores can program the devices to identify inventory levels of a product at nearby locations in the chain if necessary. Some devices have a voice-activated feature allowing customers to request assistance from store employees carrying handheld devices capable of voice communications. This prevents customers from having to search for someone to help when they need assistance—or leaving because they can't get help.

Job Dispatch. Mobile devices are becoming an integral part of groupware and workflow handhelds. For example, nonvoice mobile services can be used to assist in dispatch functions—to assign jobs to mobile employees, along with detailed information about the tasks.

A dispatching handheld for wireless devices allows improved response with reduced resources, real-time tracking of work orders, increased dispatcher efficiency, and a reduction in administrative work. For example, Michigan CAT (*michigancat.com*), a large vendor of used heavy machinery equipment, offers an interesting solution. Michigan CAT's system uses Cloudberry from Air-Trak (*airtraksoftware.com*), which supports both cellular and satellite networks. It entails a hybrid approach to the use of a GPS tracking and messaging system that enables information and forms generated by Caterpillar's database (DBS) and Service Technician Workbench (STW) software to be transmitted wirelessly between the field operations staff and service vehicles equipped with a laptop. Data gathered from the field can be easily integrated into a back-end system. A simple extraction program was created to move data, service reports, and time sheets from one program to the other, eliminating duplicate keying of the same information into separate systems. Other dispatchers can access the information to add comments or notes. The system's benefits include increased productivity; reduced staff time; timely parts ordering; faster invoicing; and secure, precise service information with seamless integration between the company's systems.

Mobile App Failure. However, not all mobile apps are successful. An example is the U.S. Census Bureau's mobile snafu. For the 2010 Census, the government allocated $3 billion for handhelds to improve interviewers' performance in the field. Unfortunately, due to poor program management, a poor contract estimate, and hardware and software delays, the program had to be delayed until the 2020 Census. The cost of manual data taking and programming increased the cost of the project by $2.2–3 billion.

CUSTOMER SUPPORT AND MOBILE CRM

Mobile access extends the reach of customer relationship management (CRM)—both inside and outside the company—to both employees and business partners on a 24/7 basis, to any place where recipients are located.

In the large software suites, such as Siebel's CRM (an Oracle company), the two CRM functions that have attracted the most interest are *sales force automation* and *field service.* For instance, a salesperson might be on a sales call and need to know the recent billing history for a particular customer. Or a field service representative on a service call might need to know the current availability of various parts in order to fix a piece of machinery. It is in these sorts of situations that real-time mobile access to customer and partner data is invaluable. Two popular offerings are Salesforce.com's App Exchange Mobile (*salesforce.com/)* and Oracle's CRM On Demand (*oracle.com/crmondemand/index.html*).

MOBILE SUPPLY CHAIN MANAGEMENT (MSCM)

Mobile computing solutions are also being applied to B2B and supply chain relationships. Such solutions enable organizations to respond faster to supply chain disruptions by proactively adjusting plans or by shifting resources related to critical supply chain events as they occur. Furthermore, mobile computing may have strategic implications regarding supply chains by improving efficiency, reducing delays, and improving supplier and customer relationships.

With the increased interest in collaborative commerce comes the opportunity to use wireless communication to collaborate along the supply chain. There is no longer any need to call a partner company and ask someone to find certain employees who work with your company. Instead, you can contact these employees directly or access ordering systems using mobile devices. For this to take place, interorganizational information systems integration is needed.

By enabling sales force employees to type orders or queries directly into ERP (Enterprise Resource Planning) systems while at a client's site, companies can reduce clerical mistakes and improve supply chain operations. If salespeople can check production schedules and inventory levels and access product configuration and availability as well as capacity available for production, they can obtain quantities and real-time delivery dates. Thus, companies empower their sales force to make more competitive and realistic offers to customers. Today's ERP systems tie into broader supply chain management solutions that extend visibility across multiple tiers in the supply chain. Mobile supply chain management empowers the workforce to leverage these broader systems through inventory management and ATP/CTP functionality that extend across multiple supply chain partners and take into account logistics considerations.

For example, sales teams at Adidas America use BlackBerry's Enterprise Solution and PDAs to check inventory levels from anywhere in real time. This enables better customer service and increases sales productivity. For details, see *na.blackberry.com/eng/ataglance/get_the_facts/rapid_roi.pdf*.

Review Questions

1. Describe mobile apps used inside organizations.
2. Describe wireless sales force apps.
3. Describe mobile CRM.
4. Describe how mobile computing is used to improve supply chain management.

Key Terms

Android OS *194*
augmented reality *204*
Blackberry OS *194*
E-readers *194*
geocoding *207*
geographic information system (GIS) *207*
Global Positioning System (GPS) *207*
hotspot *196*
iOS *194*
Linux OS *194*
location-based commerce (l-commerce) *205*
micropayments *200*
mobile commerce *198*
mobile banking *197*
mobile electronic payment system *198*
mobile social networking *203*
mobile supply chain management (MSCM) *211*
m-wallets *200*
Palm OS *194*
personal data assistant (PDA) *193*
short codes *197*
Symbian OS *194*
voice portal *205*
Windows Mobile OS *194*

Chapter Highlights and Insights

(Numbers refer to Learning Objectives)

1 Mobile commuting and commerce are based on a foundation of mobile devices, mobile software (operating systems and handhelds), and wireless networks.

1 Mobile computing devices include laptop computers, handheld devices like smartphones and PDAs, e-readers and slate computers, as well as wearable computers.

1 A wide variety of mobile operating systems exist to power smartphones and other mobile devices. This presents a challenge for mobile Web site and handheld programmers.

1 Wireless networks based on Wi-Fi and telecommunications technology (e.g., 3G and 4G) have expanded considerably in the last few years, offering wide-scale coverage for mobile users.

2 People are increasingly using mobile devices, specifically smartphones, to perform financial transactions, including banking, credit card transactions, and stock purchases.

2 Numerous mobile electronic payment systems have been developed. It remains to be seen which one(s) will be accepted by merchants and consumers.

2 People access financial services using a combination of mobile media channels including Short Message Service (SMS) text and short code, mobile Web browsers, and customized smartphone apps.

3 Mobile retail shopping has grown considerably in recent years. Japanese consumers have embraced mobile commerce more than any other group, but American interest in mobile retail is growing.

3 Shoppers are increasingly using their mobile devices to find product and price information while shopping in traditional stores.

3 Smartphones and other mobile devices are becoming a key channel for entertainment such as music, movies, and games.

3 Hotels and others in the hospitality and travel industry are expanding their use of mobile apps to provide greater service and convenience to travelers.

3 Mobile social networking is expected to grow dramatically over the next decade, and experts predict it will be a primary driver of mobile computing technology.

3 Advertising through the mobile channel is attractive to businesses because it allows them to send targeted messages to prospective customers. In some cases, these messages may be based on a user's location, which can be determined using GPS technology.

3 A mobile portal is a customer channel, optimized for mobility, that aggregates and provides content and services for mobile users.

4 Location-based commerce or services refers to the delivery of advertisements, products, information, or services to customers whose locations are known at a given time.

4 An increasing number of handhelds are evident in several industries, particularly in transportation. These handhelds relate mainly to customer service, advertising/marketing, and operations.

5 Many organizations are using mobile computing technology to improve their operations, automate their sales force, and improve employee communications and interactions. These uses are referred to as mobile enterprise apps.

5 Retailers are increasingly using mobile technology to improve operations in their stores and to provide enhanced customer service and inventory management.

5 Mobile supply chain management (MSCM) refers to the use of mobile computing technology to manage the flow of goods from the point of manufacture to the end user.

5 Mobile computing technologies allow different business organizations in a supply chain to communicate and share information in order to improve the efficiency of the whole distribution system.

5 CRM (customer relationship management) systems are increasingly being enhanced with mobile technology to improve the ability of businesses and their partners to provide greater service and value to end users.

Questions for Discussion

1. Explain how mobile computing technology is being used to enhance the safety and effectiveness of the healthcare industry.
2. Describe some of the latest advances in mobile computing devices. What trends do you see in the development of this equipment? Speculate on how future devices might look or function.
3. Based on how other industries have developed over time, what do you predict will occur in the area of mobile device operating systems? (Hint: How does this market compare to the operating system market for personal computers?)
4. Describe some of the key developments in wireless network technology that have taken place in the last few years.
5. How are people using mobile devices to conduct banking and other financial services?
6. Evaluate the various mobile electronic payment processes described in the chapter. Which ones do you think are likely to emerge as the dominant method for mobile payment? Explain your answer.
7. What are some of the risks for consumers related to mobile banking and other financial transactions that take place using mobile devices?
8. What are the key benefits of using a mobile wallet? Do you think new improvements to this handheld will make it more attractive to end users?
9. How has mobile computing changed the retail shopping behavior of consumers?

10. What can stores do to utilize mobile technology to make shopping in traditional stores more attractive?
11. Describe the mobile entertainment market and ways people can use their mobile devices to have fun.
12. Why is mobile social networking expected to grow dramatically in the next few years?
13. How is mobile computing creating an attractive opportunity for advertisers? Will consumers be receptive to this type of communication? Why or why not?
14. List some location-based services and explain their value to mobile device users.
15. How do businesses, governments, and other organizations use mobile computing to enhance their productivity, efficiency, and profitability?

Exercises and Projects

1. Conduct research on the relative advantages/disadvantages of Apple's iOS versus the Android OS, developed by Google and the Open Handset Alliance. Based on your research, predict which system will become most popular with mobile device users.
2. Take a poll of your classmates and friends to see how many are using feature phones versus smartphones. Briefly interview a handful of people in each group to identify their reasons for owning the kind of phone they do. Summarize your findings in a brief report.
3. Investigate how your college or university is using mobile computing technology. (Note: you may have to speak to several different people.) Specific areas you should examine include admissions, instructional uses, operations, and information services. Conduct research to see how other campuses employ mobile technology. Prepare a brief report comparing your campus with others.
4. Prepare a brief report comparing Apple's iPad with various copy-cat products that are on the market (e.g., the Apad, the LifePad, the iPed). How do these products compare with the iPad? Do they represent a competitive threat to Apple's new slate computer?
5. Conduct research on the way telecommunications companies are charging for mobile access to the Internet. Identify providers that offer fixed or flat rate pricing versus those that charge based on usage.

Group Assignments and Projects

1. When patient medical records are stored electronically, it is easier for patients, doctors, and other healthcare providers to access medical information during treatment. Unfortunately, it also increases the possibility that unauthorized individuals may be able to gain access to sensitive information. Each team brainstorms the potential benefits associated with electronic medical records (EMR). Then, create a list of the potential risks associated with this approach. Finally, discuss the potential trade-offs associated with moving to the kind of mobile computing handheld discussed in the opening case. Compare the teams' answers.
2. Along with other students, sign up for an account at *foursquare.com.* Make connections with your group members on the service. Use Foursquare for a week or two, checking into the retail locations you visit. At the conclusion of this experience, meet with your group and compare reactions. Was it fun? Did the group gain valuable information from one another? Was the experience compelling enough that you'll want to maintain your account?
3. *Yelp.com* is a social networking directory service. It helps people find local businesses based on location, ratings, and recommendations from friends. With other students from your class, sign up for an account on Yelp and download its mobile handheld. Connect with your classmates (and other friends) on the Yelp service. Use Yelp for two weeks and then prepare a presentation with your group on the advantages and disadvantages of this new service.
4. Have each member of your group contact their bank to identify what mobile banking services, if any, are offered. Create a table that lists the mobile banking services offered by each bank. Finally, discuss among yourselves how receptive you all are to the idea of banking on your mobile devices. Identify the reasons why people want to engage in mobile banking and reasons why they are reluctant.

Internet Exercises

1. Visit ME, a news site for the mobile entertainment industry (*mobile-ent.biz/)*. Select an entertainment category and study recent developments in that area. Prepare a report summarizing the current status of and predicting future developments in the category.
2. Using *YouTube.com* or any other video-sharing site, watch examples of augmented reality handhelds and promotional campaigns. Write a brief report describing your reaction to this new technology and predict whether it will become more commonplace in the future.
3. If you have a smartphone and an appropriate mobile network access plan, download apps for *Pandora.com* and *Grooveshark.com*. Use these two services for a few

days to listen to music. Prepare a presentation that compares the services, listing the strengths and weaknesses of each. (Caution: These services use a lot of bandwidth, so you should check with your cell phone carrier prior to using these handhelds to make sure you won't incur unexpected expenses on your phone bill.)

4. If you have a smartphone, download one or more comparison shopping apps (e.g., Citishopper, Shopsavvy, or Sidebar). Visit a local mall or retail store and practice using the handhelds. Prepare a report or presentation about your experience, noting the strengths and weaknesses of each handheld. Explain whether or not you think you will continue using one of the apps.
5. If you have a Facebook account, download the Facebook mobile app and use it for approximately one week. Prepare a report describing how your mobile experience on the social networking site compares with your experience using a personal computer. Do you think you could use the mobile handheld as your primary interface with Facebook? Why or why not?

BUSINESS CASE

Starbucks Coffee to Go Mobile Commerce

Most consumer brands have taken a "wait and see" attitude toward mobile commerce while other brands see it as a source of competitive advantage and are moving quickly into this space. Starbucks (*starbucks.com/*), the global coffee-beverage retailer, has engaged in several mobile commerce initiatives.

Text "Venti" in Mexico for Perks

In Mexico, Starbucks used in-store signs to encourage on-site customers to text the word "Venti" to short code 80080 in order to receive offers for discounts and drink upgrades (see Fig. 7.12). This mobile commerce campaign also included the distribution of postcards in malls, universities, and other public areas that encouraged cell phone users to text "Starbucks" to the same short code. Consumers who responded via text received instructions for downloading a 2D barcode to their phones. (You read about 2D codes in Chapter 1.)

Figure 7.12 Starbucks Venti coffee. (*Source: © Exotic eye/Alamy*)

When consumers visited a Starbucks store, the baristas would scan the code on their phones to determine which offer the customer was eligible to receive. To keep customers coming back and the campaign interesting, Starbucks continually modified the offer—for instance, offering a 2-for-1 drink special or a free upgrade on the size of a customer's drink order.

Redemption of these 2D barcode coupons was approximately 60 percent, more than double the effectiveness of other types of coupon promotions. This clearly demonstrated the effectiveness of the mobile campaign. Mobile commerce enabled Starbucks to differentiate between new and existing customers and alternate their offers accordingly.

Figure 7.13 A Starbuck's branch in the Polanco district of Mexico City. (*Source: © Keith Dannemiller/Alamy*)

Building Loyalty, Traffic, and a Mobile Edge

Starbucks also has an app that allows iPhone users to turn their device into a Starbucks loyalty card. Users register the card, track their balance, and pay for their orders at over 1,000 Target and Starbucks stores. A second iPhone app helps users locate nearby stores based on their location.

In another mobile initiative, Starbucks builds loyalty and traffic in its stores using the Foursquare social app. Foursquare customers who visit and check in to Starbucks locations frequently can earn a *Barista badge* on the social networking service. For a limited time, Foursquare members who earned

the status of *Mayor* at particular store locations qualified for discounted beverages during the promotion.

Starbucks coordinated with MTV in a promotion for its Frappuccino drinks. During the *MTV Movie Awards*, viewers were encouraged to text a vote for their favorite movie to short code 66333. Viewers then received a *thank you* along with a promotional message from Starbucks. This cross-promotion with MTV demonstrates how mobile commerce can be used in interactive promotions in which consumers choose to participate in two-way communications with businesses.

Controlling Mobile Commerce

While Starbucks initiatives in mobile commerce have created lots of attention (which is a great marketing benefit), some critics think the effort falls short. Schuman (2009) notes that the apps allow users to select favorite store locations and beverage preferences, but there isn't anything the customer can do with that information. Schuman blames this shortcoming on Starbucks' fear of customers uploading information that might interfere with its POS (point of sale) system. Others have suggested that this is a common problem for companies that are testing the waters with mobile commerce. They develop nice-looking apps that don't really do anything of value for end users. But in this case, they get discounts at Starbucks, which customers apparently appreciate.

Sources: Compiled from Butcher (2009), Roldan (2010), Tsirulnik (2010a, 2010b), Van Grove (2010) and Schuman (2009).

Questions

1. What advantages do mobile coupons have for businesses over traditional methods of coupon promotions?
2. What advantages do mobile coupons have for consumers compared to traditional coupons?
3. How does Starbucks use mobile promotions to engage its customers?
4. Why do you think Starbucks partnered with MTV for its Frappuccino promotion? What benefits were there to both companies?
5. How can Starbucks take mobile commerce to the next level? What more can it do to engage the mobile consumer?

NONPROFIT CASE

Mobile Charity via Cell Phones

Since 2008, many charities have employed a novel approach to raising money in response to natural disasters and other emergencies. M-donations involve the use of mobile devices, usually cell phones, to make contributions to charitable organizations and disaster relief efforts. Mobile donations have played an important role in raising money to address the growing needs of people affected by events like Hurricane Katrina, the 2010 earthquakes in Haiti and Chile, and the devastation caused by British Petroleum's (BP) Gulf Coast oil spill. Other charity and not-for-profit organizations have developed integrated fund-raising campaigns that make use of M-donations as an ongoing giving channel.

Micropayments and Microdonations

Most mobile donations are made using SMS text messaging. In one approach, the giver sends a simple predetermined message to a short code specified in an advertisement or public announcement. A second text message is required to confirm the transaction. The donation, usually $5 or $10, is then added to the user's mobile phone bill. A variation on this approach involves users sending a SMS text message to a short-code number. In response, they are sent a link to a mobile Internet site that allows them to specify an amount they'd like to give. As with the previous method, the amount is then added to the giver's monthly phone bill. At the end of the month, the phone company sends a payment to the charity for all the donations it has received.

Some experts have speculated that the microdonation format, combined with the use of familiar mobile technology, makes this kind of philanthropy particularly appealing to a new generation of givers. Young people are comfortable with cell phones, and mobile technology makes it easy for them to respond to appeals by charities, particularly when the cause is compelling. The mobile donation process encourages spontaneous giving, since it is less cumbersome than donation methods that involve sending paper checks or submitting credit card numbers on a Web page.

In order for an organization to solicit charitable donations via mobile devices in the United States, there are guidelines it must follow. Organizations must be organized under Section 501(c)3 of the U.S. tax code and recognized by the Internal Revenue Service as a not-for-profit organization. The Mobile Giving Foundation (MGF) and *mGiving.com* provide verification services for the telecommunications companies that collect the donations, ensuring that only legitimate organizations collect money using this method.

Mobile Donation Campaigns

Mobile donations to assist victims of Hurricane Katrina in 2005 amounted to only $250,000. Just a few years later, there was much greater interest in mobile giving. As of February 2010, the Red Cross had raised over $31 million for victims of the Haiti earthquake through mobile donations. The organization has used these funds along with donations received through traditional channels to provide food, water, shelter, and medical services to earthquake victims.

Successful campaigns typically integrate other media—print ads, television, radio, and social media (e.g. Twitter and Facebook). Capital Area United Way, located in Baton Rouge, Louisiana, used traditional media and distributed pamphlets prior to a LSU football game. During the first timeout of the game, a message was shown on the stadium Jumbotron

asking the 90,000 fans to send a text message "LSU" to short code 864833 to donate $5 to Capital Area United Way, resulting in over $9,000 in donations (*mGive.com*, 2009). Other charities have partnered with celebrities who announce mobile giving opportunities during concerts or shows.

While the dramatic nature of disasters caused by hurricanes, earthquakes, or environmental devastation are more likely to make the news headlines, many charities not involved with disaster relief are exploring ways to generate funding from mobile philanthropy. For example, the National Public Radio program *This American Life* has raised over $140,000 from listeners who donated using their mobile devices.

Many of the organizations that offer to partner with not-for-profit organizations by providing technological support for mobile giving say that 100 percent of the donations are passed on to the charity. However, this doesn't mean that the mobile donation process is free. While most, if not all, donations are conveyed to the charitable organization, the partner organizations charge charities a number of fees associated with running a mobile donation campaign. Many charge setup fees ranging from $350 to $500, monthly fees that can range from several hundred dollars to thousands of dollars, and almost all charge some type of transaction fee. A typical transaction fee amounts to $0.35 per transaction plus 3 percent of the donation.

Sources: Compiled from Strom (2010), Green (2010), Heatwole (2010), *mGive.com* (2009), and Fisher-Thompson (2010).

Questions

1. What changes in the behavior of mobile device users has led to the increase in mobile donations from Hurricane Katrina in 2005 to the Haitian earthquake in 2010?
2. Why do some people find it easier to make mobile donations compared with traditional methods of giving?
3. Do you think it is reasonable for organizations that facilitate mobile giving to charge setup fees and transaction fees to charitable organizations? Are the fees discussed in the case reasonable? Explain your answer.
4. Why is it important for charitable organizations to integrate their mobile giving campaigns with traditional and social media communications?

ANALYSIS USING SPREADSHEETS

Estimating the Financial Benefits of Increased Customer Loyalty

Customer loyalty is a bond between a targeted customer and an organization whereby the customer consistently spends a significant amount of money on the supplier's goods or services. Loyal customers add value to a supplier's bottom line by one or more of the following:

- Generating new sales by referring other customers
- Paying a price premium
- Buying a broader mix of goods and services
- Reducing the company's selling and servicing costs

Enhancing loyalty in target customers can lead to sustainable and profitable sales growth. Starbucks' mobile commerce strategy, as you read in the Business Case, is aimed at increasing customer loyalty.

You are tasked with completing the analysis using spreadsheet software. Create a spreadsheet with the data shown in Figure 7.14. Then use formulas or functions to calculate the blue-shaded cells. The results represent the NPV and ROI of the mobile commerce campaigns.

Estimating Financial Benefits of Increased Customer Loyalty

		Year 1	Year 2	Year 3	Total	Present Value (PV)
(a)	Benefit	$ 803,300	$ 722,970	$ 650,673		
(b)	Cost	317,060	301,207	286,147		
(a) – (b)	Net Cash Flow					
	Net Present Value (NPV)					
	ROI					

Figure 7.14 Spreadsheet for estimating financial benefits of increased customer loyalty.

Resources on the Book's Web Site

More resources and study tools are located on the Student Web Site and on WileyPLUS. You'll find additional chapter materials and useful Web links. In addition, self-quizzes that provide individualized feedback are available for each chapter.

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