CHAPTER 1

Managing in the Digital World

**CHAPTER OBJECTIVES**

After reading this chapter, you will be able to do the following:

1. Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.
2. Explain what an information system is, contrasting its data, technology, people, and organizational components.
3. Describe the dual nature of information systems in the success and failure of modern organizations.
4. Describe how computer ethics affect the use of information systems and discuss the ethical concerns associated with information privacy and intellectual property.

**Preview**

Today, organizations from Apple to Zappos use information systems to better manage their organizations in the digital world. These organizations use information systems to provide high-quality goods and services, as well as to gain or sustain a competitive advantage over rivals. In addition to helping organizations to be competitive, information systems have contributed to tremendous societal changes. Our objective for this chapter is to help you understand the role of information systems as we continue to move further into the digital world, the role of information systems in current issues faced by societies in the digital world, and the role of IT megatrends in influencing the digital future. We will highlight what information systems are, how they have evolved to become a vital part of modern organizations, and why this understanding is necessary for you to become an effective manager in the digital world. We then conclude by discussing ethical issues associated with the use of information systems.

**CHAPTER OUTLINE**

**PREVIEW**

Managing in the Digital World: Open Innovation

**Information Systems Today**

The Emergence of the Digital World

 Knowledge Workers and the Knowledge Society

 The Digital Divide

Globalization and Societal Issues in the Digital World

 COMING ATTRACTIONS Memory Crystals

 Globalization: Opportunities and Challenges

 Societal Issues in the Digital World

Five IT Megatrends That Shape the Digital Future

WHO’S GOING MOBILE Wearable Technology

GREEN IT CASE The Green Internet of Things

**INFORMATION SYSTEMS DEFINED**

 Data: The Root and Purpose of Information Systems

 Data

 Information

 Knowledge

Hardware, Software, and Telecommunications Networks: The Components of Information Systems

People: The Builders, Managers, and Users of Information Systems

 Careers in Information Systems

 What Makes IS Personnel So Valuable?

 Finding Qualified Personnel

 You—The User

 SECURITY MATTERS Ransomware

Organizations: The Context of Information Systems

 Types of Information Systems

 Organizing the IS Function

 The Spread of Technology in Organizations

 WHEN THINGS GO WRONG Technology Addiction

**The Dual Nature of Information Systems**

Case in Point: An Information System Gone Awry: Outages Outrage Gamers

Case in Point: An Information System That Works: FedEx

Information Systems for Competitive Advantage

 ETHICAL DILEMMA The Social and Environmental Costs of the Newest Gadgets

**IS Ethics**

Information Privacy

Information Property on the Web

E-Mail Privacy

How to Maintain Your Privacy Online

Intellectual Property

The Need for a Code of Ethical Conduct

Responsible Computer Use

Industry Analysis Business Career Outlook

**Key Points Review**

**Key Terms**

**Review Questions**

**Self-Study Questions**

**Problems and Exercises**

**Application Exercise**

**Team Work Exercise**

**End-of-Chapter Cases**

Case 1: Apple

Case 2: Healthcare IS

**TEACHING SUGGESTIONS**

This introductory chapter provides an opportunity for the instructor to familiarize students with the basic definitions and concepts needed to understand IT in its organizational context. In addition to a basic lecture on these terms and concepts, the instructor may wish to consider conducting an extended discussion of the first case (Open Innovation) in order to explore how new technologies are enabling a shift in how innovations that lead to change occur.

Looking at what is an IT/IS career is also a good starting point for this class. Most students will have a misconception of what IT/IS is, including what jobs are available and the salaries for these jobs. It is important that communication skills are emphasized for IT/IS careers. Further, by understanding the IT hierarchy in a typical organization, the students will be able to see who is making the decisions, who is developing the systems, and who is managing the systems.

This chapter also provides an overview of globalization and the opportunities and challenges organizations face when operating in a digital world. Further, it introduces business and information systems strategies organizations use when going global. In addition to a basic lecture on globalization, the instructor may wish to consider conducting an extended discussion of the benefits and drawbacks of globalization. A possible exercise is to have students go through their closets and find out where their clothes have been produced; this can be contrasted with the origin of other consumer goods, such as computers/electronics. This should show the extent of globalization, and should serve as a foundation to discuss how different countries/areas specialize in certain goods/product categories.

When discussing globalization, the focus could be on the effects of globalization on the individual student. Many students will voice that globalization may negatively influence their career outlooks; in such cases, the instructor should stress that all industries are affected by globalization (not only IS/IT jobs, but also jobs in accounting, human resources, and so on). Further, the instructor should highlight that only certain job types are being outsourced, and that there is still (and will be) high demand for well-trained IS employees who possess a well-balanced skill set.

A discussion can be led regarding “The Dual Nature of Information Systems” by looking at two examples in the textbook as follows:

1. *Case in Point: An Information System Gone Awry: Outages Outrage Gamers*

This is a good example of how susceptible programs can be to system outages. Numerous outages plagued Sony’s PlayStation Plus including outages of 23 days in 2011, Christmas Day in 2014 when a denial-of-service attack caused the program to be unavailable, and an outage early in 2016.

1. *Case in Point: An Information System That Works: FedEx*

This case examines how FedEx has created unique competitive advantage in its industry by implementing superior and flexible information technology. FedEx is one of the exemplary companies in demonstrating how to create competitive advantage with information technology/systems. On average, FedEx reengineers and improves the performance twice a year and now manages to deliver a quarter of all daily packages handled within one business day. These and other information systems have positioned FedEx as the global leader in express transportation.

**ANSWERS TO REVIEW QUESTIONS**

* 1. Describe the major challenges societies face.

**Answer:**

Major challenges are as follows:

* The digital divide is a major ethical challenge facing society today when you consider the strong linkage between computer literacy and a person’s ability to compete in the digital world.
* People in rural communities, the elderly, people with disabilities, and minorities lag behind national averages for Internet access and computer literacy.
* A wider gap exists in the developing countries where infrastructure and financial resources are lacking.

LO: 1— Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Reflective Thinking Skills, Ethical Understanding and Reasoning Abilities

* 1. Define the term *knowledge worker*. Who coined the term?

**Answer:**

Peter Drucker first used the term in 1959. It is generally taken to refer to workers who use, create, modify, and/or synthesize knowledge as a fundamental part of their jobs.

LO: 1— Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Reflective Thinking Skills

* 1. Name your two favorite mobile devices. For each device, discuss how it has influenced your

 work or personal life.

**Answer:**

Answers may vary.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Reflective Thinking Skills

* 1. Describe how cloud computing can improve your personal productivity.

**Answer:**

The ability to access data and files from anywhere with connectivity to the Internet, including

e-mails, files, notes, and the like, from different devices, including mobile devices, further enhances portability and mobility.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Use of Information Technology

1-5. List and describe several opportunities and challenges brought about by globalization.

**Answer:**

Opportunities include:

* It has opened up many opportunities for organizations, brought about by falling transportation and telecommunication costs.
* Lower shipping costs.
* Moving cultures closer together.
* Streaming of media content from other countries at low costs.
* The creation of new markets from the rapid rise of a new middle class in developing countries.
* The tremendous decrease in communication costs has increased the use of outsourcing.

Challenges include:

* Governmental challenges related to differences in political systems, regulatory environments, laws, standards, or individual freedoms.
* Geoeconomic challenges include differences in infrastructure, demographics, welfare, or workers’ expertise.
* Organizations face cultural challenges, such as dealing with differences in languages, beliefs, attitudes, religions, or life focus but also different viewpoints regarding intellectual property.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Reflective Thinking Skills, Dynamics of the Global Economy

* 1. Compare and contrast how the digital divide manifests in different parts of the world.

 **Answer:**

In the U.S. the digital divide is rapidly shrinking, although those people in rural communities, the elderly, people with disabilities, and minorities lag behind national averages for Internet access and computer literacy. Outside the United States and other developed countries, the gap gets even wider and the obstacles get much more difficult to overcome, particularly in the developing countries where infrastructure and financial resources are lacking. For example, most developing countries are lacking modern informational resources such as affordable Internet access or efficient electronic payment methods like credit cards.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Analytic Skills, Multicultural and Diversity Understanding

* 1. Define and contrast data, information, and knowledge.

 **Answer:**

*Data* are raw symbols, such as words and numbers. Data have no meaning in and of themselves, and are of little value until processed.

*Information* is a representation of reality, and can help to answer questions about who, what, where, and when.

*Knowledge* is the ability to understand information, form opinions, and make decisions or predictions based on the information.

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Analytic Skills

* 1. Describe three or four types of jobs and career opportunities in information systems and in related

 fields.

**Answer:**

There are a large number of different career opportunities. Likely to be mentioned are some from the following list.

|  |  |  |
| --- | --- | --- |
| **IS Activity** | **Job Title** | **Job Description** |
| Develop | Systems Analyst | Analyze business requirements and select information systems that meet those needs. |
|   | Software Developer | Code, test, debug, and install programs. |
|   | Systems Consultant | Provide IS knowledge to external clients. |
| Maintain | IS Auditor | Audit information systems and operating procedures for compliance with internal and external standards. |
|   | Database Administrator | Manage database and database management software use. |
|   | Webmaster | Manage the firm’s Web site. |
|  | IS Manager | Manage existing information system. |
|   | IS Security Manager | Manage security measures and disaster recovery. |
|  Manage | Chief Information Officer (CIO) | Highest-ranking IS manager; oversee strategic planning and IS use throughout the firm. |
|   | Chief Digital Officer(CDO) | Executive focused on converting traditional "analog" businesses to digital; oversee operations in rapidly changing digital sectors like mobile apps and social media. |
| Study | University Professor | Teach undergraduate and graduate students; study the use of information systems in organizations and society. |
|   | Government Scientist | Perform research and development of information systems for homeland security, intelligence, and other related applications. |

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Reflective Thinking Skills

* 1. List and define four of the systems knowledge and/or skills core competencies.

**Answer:**

|  |
| --- |
| **Systems Knowledge and Skills** |
| Systems integration | Connectivity, compatibility, integrating subsystems and systems |
| Development methodologies | Steps in systems analysis and design, systems development life cycle, alternative development methodologies |
| Critical thinking | Challenging one’s and others’ assumptions and ideas |
| Problem solving | Information gathering and synthesis, problem identification, solution formulation, comparison, and choice |

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Use of Information Technology

* 1. List and define five types of information systems used in organizations.

**Answer:**

There are many types of information systems used in organizations. Likely to be mentioned are some from the following list.

| **Type of Systems**  | **Purpose**  | **Sample Application**  |
| --- | --- | --- |
| Transaction processing system  | Process day-to-day business event data at the operational level of the organization. | Grocery store checkout cash register with connection to network; student registration system |
| Management information system  | Produce detailed information to help manage a firm or a part of a firm. | Inventory management and planning system; student enrollment management |
| Decision support system  | Provide analysis tools and access to databases in order to support quantitative decision making. | Product demand forecasting system; loan and investment analysis |
| Intelligent system  | Emulate or enhance human capabilities. | Automated system for analyzing bank loan applications; self-driving car |
| Business intelligence system | Analyze Big Data to better understand various aspects of a business. | Online analytical processing (OLAP) system  |
| Office automation system (personal productivity software)  | Support a wide range of predefined day-to-day work activities of individuals and small groups. | Word processor, spreadsheet, presentation software, e-mail client |
| Collaboration system  | Enable people to communicate, collaborate, and coordinate with each another. | Electronic mail system with automated, shared calendar |
| Knowledge management system  | Enable the generation, storage, sharing, and management of knowledge assets. | Knowledge portal for finding answers to common questions |
| Social software | Facilitates collaboration and knowledge sharing. | Social network, connecting colleagues and friends |
| Geographical information system  | Create, store, analyze, and manage geographically referenced data. | Site selection for new shopping mall |
| Functional area information system | Support the activities within a specific functional area of a firm. | Planning system for personnel training and work assignments |
| Customer relationship management system | Support interaction between a firm and its customers. | Sales force automation, lead generation |
| Enterprise resource planning system | Support and integrate all facets of the business, including planning, manufacturing, sales, marketing, and so on. | Financial, operations, and human resource management |
| Supply chain management system | Support the coordination of suppliers, product or service production, and distribution  | Procurement planning  |
| Electronic commerce system  | Enable customers to buy goods and services from a firm’s web site  | Amazon.com, eBay.com, Nordstrom.com |
| Mobile app | Perform a particular, well-defined function, typically on a mobile device | Instagram, Snapchat, WhatsApp, Facebook app |

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Use of Information Technology

* 1. Discuss the issues surrounding information privacy, and how you can protect yourself.

**Answer:**

Information privacy issues include:

* Information Property on the Web—We receive unwanted solicitations from credit card companies, department stores, magazines, or charitable organizations all the time. Of course we often wonder how we got on another mailing list. When survey data becomes mixed with transaction data it can be more problematic because we don’t know the limits data collectors have gone to analyze our behavior.
* E-mail Privacy—We send and receive numerous e-mails every day. If sent through a company e-mail system the organization has the right to monitor every e-mail, as it is unprotected. E-mail at work should be appropriate and based on their company’s policy and their own ethical standards.
* Maintaining Privacy Online—Companies operating in the online world are not required by law to respect your privacy. Fair information practices include:
	+ Notice/Awareness. Data practices are usually detailed in an organization’s data privacy statement.
	+ Choice/Consent. Providing options about what will be done with the data gathered.
	+ Access/Participation. Providing customers with means to access data collected about them, check for accuracy, and request correction of inaccuracies.
	+ Integrity/Security. Ensuring integrity of the data as well as implementing controls against unauthorized use.
	+ Enforcement/Redress. Providing means to enforce these practices, and/or for customers to receive remedies.

Some steps for protecting yourself include:

* Choose websites that are monitored by independent organizations.
* Avoid having “cookies” left on your machine.
* Visit websites anonymously.
* Use caution when requesting confirmation of an e-mail.
* Beware what you post or say online.

LO: 4—Describe how computer ethics affect the use of information systems and discuss the ethical concerns associated with information privacy and intellectual property.

AACSB: Analytic Skills

1.12 Following the guidelines of the Computer Ethics Institute, what behaviors are considered unethical computer use?

**Answer:**

* Using a computer to harm others
* Interfering with other people’s computer work
* Snooping in other people’s files
* Using a computer to steal
* Using a computer to bear false witness
* Copying or using proprietary software without paying for it
* Using other people’s computer resources without authorization or compensation
* Appropriating other people’s intellectual output

LO: 4—Describe how computer ethics affect the use of information systems and discuss the ethical concerns associated with information privacy and intellectual property.

AACSB: Ethical Understanding and Reasoning Abilities

**NOTE**: Self-Study questions and answers 1-13 through 1-21 can be found in the text.

**ANSWERS TO PROBLEMS AND EXERCISES**

* 1. Match the following terms with the appropriate definitions:

 \_\_b\_\_ **Information** \_\_c\_\_ **Globalization**

 \_\_e\_\_ **Internet of Things**  \_\_g\_\_ **Outsourcing**

 \_\_f\_\_ **Information systems** \_\_i\_\_ **Digital divide**

 \_\_h\_\_ **Information privacy** \_\_j\_\_ **Intellectual property**

 \_\_d\_\_ **Computer fluency** \_\_a\_\_ **Computer ethics**

* 1. Of the several information systems listed in the chapter, how many do you have experience with?

 What systems would you like to work with? What types of systems do you encounter at the

 university you are attending? The Web is also a good source for additional information.

**Answer:**

Answers will vary.

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Use of Information Technology

* 1. Identify someone who works within the field of information systems as an IS instructor,

 professor, or practitioner (e.g., as a systems analyst or systems manager). Find out why this

 individual got into this field and what this person likes and dislikes about working within the field

 of information systems.

**Answer:**

Answers will vary.

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Communication Abilities

* 1. As a small group, conduct a search on the Web for job placement services. Pick at least four of

 these services and find as many IS job titles as you can. You may want to try monster.com or

 careerbuilder.com. How many did you find? Were any of them different from those presented in

 this chapter? Could you determine the responsibilities of these positions based on the information

 given to you?

**Answer:**

Answers will vary, but some of the services that students might find would include Headhunters and Manpower in addition to the ones mentioned in the question.

LO: 2— Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Use of Information Technology

* 1. Visit Walmart China ([www.wal-martchina.com/english/index.htm](http://www.wal-martchina.com/english/index.htm)). Compare and contrast

 [www.walmart.com](http://www.walmart.com) with Walmart China’s site. What is the focus of Walmart China’s Web site?

Discuss how the focus differs from www.walmart.com. What are possible reasons for the differences?

**Answer:**

In China, Walmart primarily operates stores of the Walmart Supercenter and Sam’s Club brands. Both Walmart China and Walmart USA procure a wide selection of their goods from China; so whereas in the United States many of the products sold are imported, Walmart China has strong ties with the local business communities.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Multicultural and Diversity Understanding, Dynamics of the Global Economy

* 1. What are potential costs and benefits of using your own devices in the workplace? How can

 organizations balance costs and benefits?

**Answer:**

When new technologies arrive it is usually consumers who will try them first, followed by organizations. A potential benefit to the organization is the ability of the employee to communicate quickly in areas such as customer relationship management and enterprise resource planning. One concern of organizations is the security of data when using multiple technologies. Some benefits include increased productivity, higher retention rates of talented employees, and higher customer satisfaction.

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Use of Information Technology

* 1. What is the impact of mobility and social networks on your personal life? On the Web, find

 statistics about these topics. How does your own behavior compare to the statistics you found?

**Answer:**

Answers will vary, but students will probably mention networking through Facebook and Google+, with the ability to use portable devices such as cell phones and iPads to accomplish this.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Reflective Thinking Skills

* 1. As a small group, brainstorm what different types of data make up “Big Data” for a company like

 Amazon.com. What data are easiest/hardest to analyze? What data are least/most important?

 Justify your answers.

**Answer:**

Answers will vary.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Analytic Skills

1-30. Compare and contrast the data privacy statements of three different e-commerce Web sites. What are the similarities and differences? Which business would you be least/most willing to do business with? Why?

**Answer:**

Answers will vary.

LO: 4—Describe how computer ethics affect the use of information systems and discuss the ethical concerns associated with information privacy and intellectual property.

AACSB: Analytic Skills

1-31. Societies face a variety of challenges. Provide a short report that discusses one of the challenges mentioned in the chapter, and describe five ways in which information systems can help address these challenges.

**Answer:**

Answers will vary.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Dynamics of the Global Economy, Multicultural and Diversity Understanding

* 1. The Electronic Frontier Foundation ([www.eff.org](http://www.eff.org)) has a mission of protecting rights and

 promoting freedom in the “electronic frontier.” The organization provides additional advice on

 how to protect your online privacy. Review its suggestions, and provide a summary of what you

 can do to protect yourself.

**Answer:**

Answers will vary. This is a large and complex site. Student answers will vary depending on site contents and lead articles at the time of access. The purpose of this site is to “Defend Your Rights in the Digital World,” as the EFF slogan indicates.

LO: 4—Describe how computer ethics affect the use of information systems and discuss the ethical concerns associated with information privacy and intellectual property.

AACSB: Reflective Thinking Skills

* 1. Find your school’s guidelines for ethical computer use and answer the following

 questions: Are there limitations as to the type of Web sites and material that can be viewed (e.g.,

 pornography)? Are students allowed to change the programs on the hard drives of the lab

computers or download software for their own use? Are there rules governing personal use of computers and e-mail?

**Answer:**

Answers will vary widely. Some schools have general guidelines, others are quite specific, whereas still others lack such guidelines entirely.

LO: 4—Describe how computer ethics impact the use of information systems and discuss the ethical concerns associated with information privacy and intellectual property.

AACSB: Ethical Understanding and Reasoning Abilities

**ANSWERS TO Application exercises**

The Solution Files to accompany these exercises are available within the Instructor Resource Center. The Student Files to accompany these exercises are available for download at: [www.pearsonhighered.com/valacich](http://www.pearsonhighered.com/valacich). Please refer to the Data File Guide for file names.

**ANSWERS TO TEAM WORK EXERCISE**

**Net Stats: Worldwide Internet Usage**

In March 2016, there were almost 3.3 billion people worldwide who had access to the Internet at home (i.e., Internet users). Since its inception, the number of users has seen tremendous growth, from only around 14 million users in 1993 to 1 billion users in 2005, 2 billion users in 2010, and 3 billion users in 2014. Having grown exponentially in the early years, the growth in user numbers has slowed to less than 10 percent per year, as worldwide Internet penetration has surpassed 35 percent. In 2016, almost 10 percent of the world’s Internet users were located in the United States, with an Internet penetration of 84 percent. However, other countries are catching up. In 2013, China, with an Internet penetration of 46 percent (and much room to grow), accounted for over 23 percent of worldwide Internet users; similarly, only 16 percent of India’s population had access to the Internet, accounting for 7 percent of worldwide Internet users (Table 1.8).

1-36. Search the Web for the most up-to-date statistics.

**Answer:**

Answers will vary.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Analytic Skills

1-37. As a team, interpret these numbers. What is striking/important about these statistics?

**Answer:**

Answers will vary.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Analytic Skills

1-38. As a team, discuss how these numbers will look in 5 years and 10 years. What will the changes mean for globalization? What issues/opportunities do you see arising?

**Answer:**

Answers will vary.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Analytic Skills

1-39. Using your spreadsheet software of choice, create a graph/figure most effectively visualizing the statistics/changes you consider most important.

**Answer:**

Answers will vary.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Analytic Skills

**ANSWERS TO OPENING CASE—MANAGING IN THE DIGITAL WORLD: Open Innovation**

1. How do the five IT megatrends fuel open innovation?

**Answer:**

The five IT megatrends that fuel open innovation are:

1. Mobile—With the move toward mobile devices, most adults in developed countries have a mobile phone, and typically, people have their mobile phones within their reach 24/7. Compare that with the access to your laptop or PC. In the developing world, mobile devices are frequently seen leapfrogging traditional PCs; owing to the lack of stable, reliable power or landline telephone infrastructure, mobile devices are often the primary means of accessing the Internet.
2. Social Media-- The rise of social media is largely based on the network effect, the notion that the value of a network (or tool or application based on a network) increases with the number of other users. In other words, if a network has few users, it has little or no value. Today organizations use social media to encourage employee collaboration or to connect with their customers. In addition, companies can harness the power of the crowd by using social media to get people to participate in innovation and other activities. With the rise of social media, we have witnessed a shift in roles, where users are not mere consumers of information but have become important creators and contributors.
3. The Internet of Things-- A third megatrend is the Internet of Things, a network of a broad range of physical objects that can automatically share data over the Internet. Such objects (or “things”) can range from an automobile tire equipped with a pressure sensor to a smart meter enabling remote monitoring of energy consumption, to a cow with an injectable ID chip. Fueled by advances in chips and wireless radios and decreasing costs of sensors (devices that can detect and respond to changes in the physical environment), in the not-too-distant future everything that can generate useful information will be equipped with sensors and wireless radios. In other words, anything that can generate data or uses data can be connected, accessed, or controlled via the Internet (sometimes referred to as “pervasive computing”). With the ability to connect “things” such as sensors, meters, signals, motors, actuators, or cameras, the potential for gathering useful data is almost limitless.
4. Cloud Computing-- Whereas traditionally each user would install a number of different applications for various tasks—from creating documents to listening to music—as well as store documents, pictures, and other data on his or her computer, web technologies enable using the Internet as the platform for applications and data. Now, much of the functionality previously offered by applications installed on each individual computer is offered by applications “in the cloud,” accessed via a web browser. Increasingly, not only the applications but also the data reside in the cloud, to be accessed at anytime from anywhere.
5. Big Data-- Big Data are typically described as extremely large and complex datasets, which are characterized as being of high volume, variety (i.e., many different types of data), and velocity (i.e., the data are being collected and analyzed at ever-increasing rates). Following the old adage that information is power, organizations are continuously seeking to get the right information to make the best business decisions. Yet organizations are generating and collecting ever more data from internal and external sources. The rise of social media has further increased the amount of unstructured data available to organizations; insights gained from analyzing Big Data can not only contribute to business success but can also help to address some of the tremendous challenges society faces.

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Use of Information Technology

1. What are the primary information systems components that enable open innovation?

**Answer:**

1. People
2. Hardware
3. Software
4. Telecommunications networks
5. Data

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Use of Information Technology

1. What intellectual property issues arise from engaging in open innovation?

**Answer:**

1. Information privacy
2. Intellectual property
3. Need for a code of ethical conduct

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Use of Information Technology

**ANSWERS TO ETHICAL DILEMMA The Social and Environmental Costs of the Newest Gadgets**

1. If you were in Tim Cook’s shoes, what would you do?

**Answer:**

Answers may vary with some advocating for better working conditions with the outsourcer balanced by a small extension of the roll out time for new products.

LO: 4—Describe how computer ethics affect the use of information systems and discuss the ethical concerns associated with information privacy and intellectual property.

AACSB: Ethical Understanding and Reasoning Abilities, Reflective Thinking Skills

1. As a consumer, what are your ethical dilemmas associated with the ever-increasing desire for new gadgets?

**Answer:**

Answers will vary.

LO: 4—Describe how computer ethics affect the use of information systems and discuss the ethical concerns associated with information privacy and intellectual property.

AACSB: Ethical Understanding and Reasoning Abilities, Reflective Thinking Skills

**ANSWERS TO END-OF-CHAPTER CASES**

**Case 1*:* Apple**

1-40. Given the pace at which technology is converging (e.g., phones, music players, cameras, and so on), what do you think will be Apple’s next revolutionary innovation?

**Answer:**

Answers will vary, although many of Apple’s products should be clearly within the consumer electronics domain. Possible topics could include a new iPhone, a revamped Apple TV, Apple HD 1080 Glasses, electronic pets, and a new gaming console.

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Reflective Thinking Skills

1-41. How have Apple’s products influenced the way we work and socialize?

**Answer:**

Apple is now a stable consumer electronics business with a variety of successful products. Apple’s diverse line of products serving many different markets, from personal and social to the businesses storing data “in the cloud,” is changing the way in which users work and play.

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Reflective Thinking Skills

1-42. What are the ethical concerns associated with storing and analyzing user data?

**Answer:**

The biggest concern is keeping data private. When data are personal, organizations have to protect that data from both accidental and intended disclosure. This requires very strict control over who can access the data. Employees who are in charge of sensitive data must be screened and expected to act ethically. Several organizations are now hiring people for positions such as chief data officer, chief safety officer, or chief privacy officer to address the ethical concerns of storing data.

LO: 4—Describe how computer ethics affect the use of information systems and discuss the ethical concerns associated with information privacy and intellectual property.

AACSB: Ethical Understanding and Reasoning Abilities

**Case 2: Healthcare IS**

1-43. Have you encountered EHRs? How have they improved or detracted from your healthcare experience?

**Answer:**

Answers will vary.

LO: 2—Explain what an information system is, contrasting its data, technology, people, and organizational components.

AACSB: Reflective Thinking Skills

1-44. How should patient privacy be balanced against social needs? For example, should pilots be required to disclose their mental health information to their employers?

**Answer:**

Information should be disclosed when there could be a perceived safety risk, such as with a pilot. In all cases the patient privacy should be conditional on their direct influence on others, pertaining to their safety and welfare.

LO: 4—Describe how computer ethics affect the use of information systems and discuss the ethical concerns associated with information privacy and intellectual property.

AACSB: Reflective Thinking Skills, Ethical Understanding and Reasoning Abilities

1-45. What opportunities and challenges lay ahead as health records become increasingly integrated into our mobile devices and the Internet of Things?

**Answer:**

Answers will vary,

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Reflective Thinking Skills

**MyMISLab Assisted Graded Writing Activities**

 1-46. How do the five megatrends influence how people work and interact?

**Answer:**

Visit MyMISLab for suggested answers.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future.

AACSB: Reflective Thinking Skill

1-47. Describe and contrast the economic, cultural, and technological changes occurring in the

 digital world.

**Answer:**

Visit MyMISLab for suggested answers.

LO: 1—Describe the characteristics of the digital world, contemporary societal issues of the digital world, and IT megatrends shaping the digital future

AACSB: Analytic Skills, Ethical Understanding and Reasoning Abilities

View the video, Decision Simulation, Learning Catalytics questions, and Dynamic Study Modules in MyMISLab for this chapter to help students engage with the concepts explored in this chapter.