Introduction to Information Systems 5th edition Wallace Solutions Manual

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Instructor's Manual

for

Introduction to Information Systems

Fifth Edition

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Commercial Product Manager: Jenifer Niles
Content Producer: Guneet Gulati

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Wallace: Introduction to Information Systems 5e

The goal of *Introduction to Information Systems* is to provide students and instructors with an authoritative, up-to-date, interactive, and engaging introduction to the MIS field.

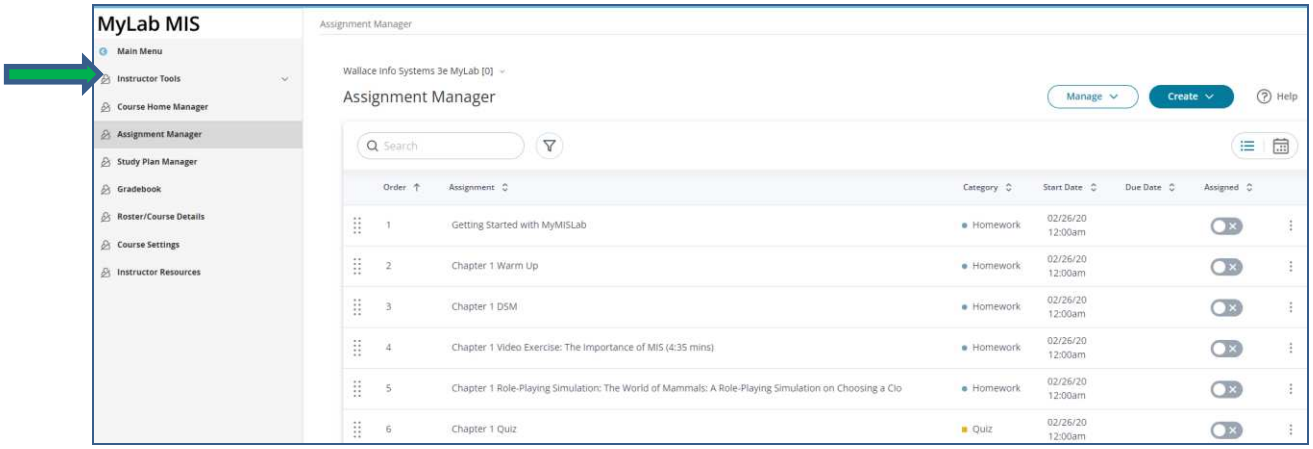
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Select from the following pre-built assignments for your course.

Chapter Warm Up These objective-based questions allow students to prepare for class discussion or review before an assessment.

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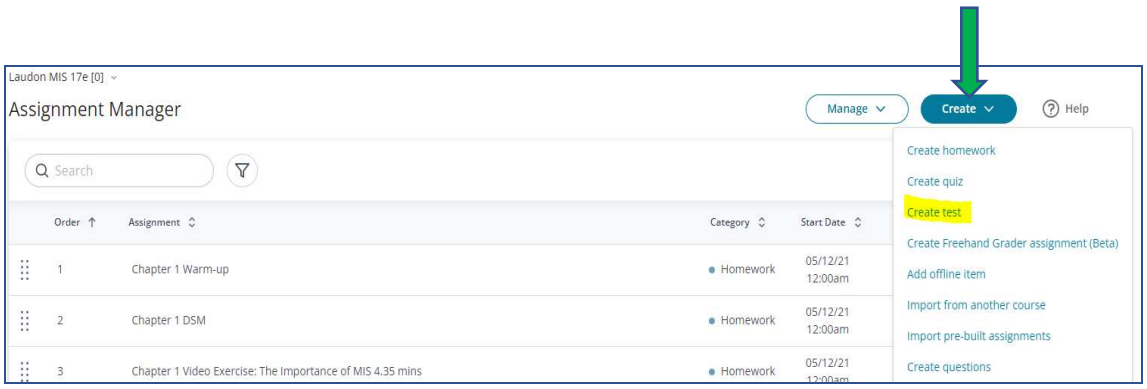
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Interactive Role-Playing Simulations These simulations engage students in lively, realistic, and sometimes tense situations in which they interact with avatars via simulated smartphones, web conferencing, texts, and voicemail to make decisions and solve problems related to each chapter. Students can try the Simulation in the eTextbook and then If you have assigned the simulation, they can perform for a grade in MyLab MIS.

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You can also Create Your Own Tests from the testbank provided in the MyLab. This gives you options to provide new tests from semester to semester as well.



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Chapter 1
Information Systems and *People*

Learning Objectives

1. Describe the main roles that information systems play in organizations.
2. Compare the terms data, information, and knowledge, and describe three characteristics that make information valuable.
3. Describe the four main components of an information system and the role that each component plays.
4. Identify several research areas that are studied in the discipline of management information systems (MIS).
5. Provide examples of how various organizations and their information technology departments depend on information systems knowledge.
6. Explain how information systems present both promises and perils and also pose ethical questions.

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Chapter Outline

1. Information Systems in Action
    a. Managing Operations
    b. Supporting Customer Interactions
    c. Making Decisions
    d. Collaborating on Teams
    e. Gaining Competitive Advantage
    f. Improving Individual Productivity
2. The Nature of Information
    a. Data, Information, Knowledge
    b. What Makes Information Valuable
3. The Components of an Information System
    a. People

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b. Technology
c. Processes
d. Data

4. Information Systems, the Discipline
5. Information Systems throughout the Organization
    a. Information Systems in Business
    b. Information Systems in Nonprofits and Government
    c. Inside the IT Department
    d. Collaborating on Information Systems
    e. Improving your Own Productivity
6. Promises, Perils, and Ethical Issues

Key Terms and Concepts

digital transformation
operations management
customer relationship management (CRM) system
data-driven decision making
business intelligence
social networking sites
competitive advantage
data
information
information system
user-generated content (UGC)
Web 2.0
information technology (IT)
information and communications technology (ICT)
Internet of Things (IoT)
business process
business process management (BPM)
management information systems (MIS)
chief information officer (CIO)
crisis management team

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Answers to Quick Check Questions for Each Learning Objective

1.1. The information managers use to make decisions is called:

a. digital transformation.
b. customer relationship management.
c. business intelligence. ✓
d. operations management.

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1.2. What is are three characteristic that make information valuable?

a. Timeliness, accuracy, and completeness✓
b. Timeliness, distance, and boldness
c. Boldness, fragility, and completeness
d. Transformation, accuracy, and narrow focus

1.3. Identify the four main components of an information system:

a. Computers, smartphones, tablets, and laptops
b. People, processes, technology, and data ✓
c. Websites, online games, browsers, and computation software
d. Data, information, and knowledge

1.4 Which of the following topics is likely to be studied in the discipline of MIS?

a. Cybersecurity
b. IT and ethics
c. Internet of Things
d. All of the above.✓

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1.5. Which of the following is NOT an important role for information systems in organizations?

a. Managing operations
b. Supporting customer interactions
c. Counseling employees about performance problems✓
d. Supporting technology that improves collaboration for teams

1.6. An organization's crisis management team might be called upon to deal with which of the following events?

a. A breach of data from the computer center ✓
b. A rise in sales for certain products.
c. A news story appearing that praised the company's CEO
d. A board meeting that discussed retiring certain products over a period of 3 years.

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Solutions to Chapter Review Questions

1-1. What are the six primary roles that information systems play in organizations? How are information systems used in each context? What does digital transformation mean?

Information systems play critical roles in (1) managing operations, (2) supporting customer interactions, (3) making decisions, (4) collaborating on teams, (5) gaining competitive advantage, and (6) improving individual productivity.

In operations management, information systems are used to manage assets and inventories; track employee payroll, taxes, benefits, and timesheets; process transactions; track accounts payable and accounts receivable; procure goods and services; and pay suppliers. Information systems that support customer interactions include customer relationship management systems, web-based front offices, online self-service applications, modern point-of-sale systems and self-service checkouts. Information systems support data-driven decision making by using both internal organizational data and external data from partners, suppliers and public sources. Smart managers use aggregated data to identify trends and patterns rather than rely on gut instincts.

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Collaboration and teamwork have considerable support from information systems such as web applications that enable virtual meeting spaces and social networking sites. Microsoft's SharePoint is an example of information technology that supports project teams with document management, shared calendars, and communication features. The innovative use of an information system can provide a competitive advantage until competitors jump on the bandwagon. Consider how Apple's iPhone got the jump on smartphone competitors with Siri, the intelligent personal assistant. The selection of information systems and technology to improve personal productivity ranges from use of email and smartphones to word processing programs and contact databases. The challenge for most people is to pick easy-to-use software and devices that integrate with existing applications.

Digital transformation is how organizations develop new business models by integrating digital technologies into all aspects of the business, including relationships with customers, suppliers, and partners.

1-2. How is data different from information? How is information different from knowledge? What are examples of each?

Data refers to individual facts or pieces of information, and information refers to data or facts that are assembled and analyzed to add meaning and usefulness. A patient's temperature reading is one piece of data; however, when combined with other pieces of data in a patient records information system, it becomes

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information that is useful for diagnostic purposes. Aggregated with data from other patients, it can be further refined and analyzed to become knowledge of a flu outbreak that is even more useful.

1-3. What are the three characteristics that make information valuable? Why is each a critical attribute of information?

The three characteristics that make information valuable are timeliness, accuracy, and completeness. Timeliness is a critical attribute for certain kinds of information, such as stock prices. Accuracy is a critical attribute for some information, such as a patient's temperature reading. On the other hand, extreme accuracy may not be necessary for certain kinds of information, such as a competitor's price for a rival product. Completeness is a critical attribute for some information, such as a patient's list of current medications. In the context of a marketing survey, complete information adds value as a means to avoid bias or spin.

1-4. What are the four components of an information system? Describe each component. What are the five functions that these components provide?

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The four components of an information system are (1) people, (2) technology, (3) processes, and (4) data. People interact with information systems in various roles such as systems analysis and developers, managers, users, customers, contributors, and sometimes roadblocks. Information technology includes hardware, software, and telecommunications equipment. Business processes are activities designed to achieve a task, such as automatically generating form letters to students. Data are individual facts or pieces of information. These four components are used to (1) collect, (2) process, (3) manage, (4) analyze, and (5) distribute information.

1-5. How are information systems important to managers in a variety of functional business units? What are examples of ways that information systems are important to the success of a marketing department, a human resources department, and a small business owner?

Information systems are important to business managers because they support the company's business activities throughout every functional department. Information systems are used to streamline processes, reduce costs, increase revenue, or launch that "killer app." A marketing manager who knows how to analyze big data from multiple sources will make much smarter decisions about how to spend the marketing budget most effectively. A talent development professional who has experience launching effective e-learning modules will reach more employees for far less money compared with the trainer who hands

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out three-ring binders in face-to-face classes. The online learning programs can also be easily updated, while information in the binders grows stale quickly. Self-employed consultants with knowledge of information systems can launch websites, build social networks, and maximize profits from online ads—all for very little money.

1-6. What are the functional areas that are common to most information technology departments?

Common functional areas in an information systems department include help desk, systems administration, data center operations, enterprise systems and applications, and telecommunications and network services.

1-7. What is the role of the chief information officer?

The chief information officer (CIO) heads the IT department and is responsible for managing and maintaining information systems and ensuring they support the organization's strategic goals. The CIO might report directly to the CEO or the vice president of finance and administration.

1-8. What are some of the perils of information systems? What are some of the ethical questions associated with the use of information systems?

The perils of information systems include the increased risk of privacy breaches and amplification effects that result from interconnected systems. A number of ethical questions are associated with the use of information systems: Who is responsible for the damage caused by a privacy breach? Who is responsible when false, damaging, or illegal videos are shared on the internet? Is it unethical to broadcast an email message received by mistake?

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Solutions to Projects and Discussion Questions

1-9. As customers, students, patients, taxpayers, and citizens, we are surrounded by information systems that support customer interactions. Identify and describe two such systems that you have used. Briefly describe the types of customer interactions you have experienced with these systems and compare what you found to be important features of each one. Are there features or functions that you would change or add to either system?

Answers will vary, as the object of this question is to prompt the student to consider features of an information system. An example is a student registration system that allows students to browse class offerings, review course descriptions and required textbooks, and register for classes.

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1-10. Web conferencing has been available for many years. In this market space, products from Adobe, Cisco, Citrix, IBM, and Microsoft compete with lower-cost or free web-conferencing applications from Zoom, AnyMeeting, and others. What are some of the advantages of using a virtual meeting space? Are there disadvantages? Search the web to learn more about online meeting rooms and prepare a five-minute presentation of your findings.

The benefits of virtual meetings include saved time and money, increased productivity, increased meeting participation, and the ability to record meetings for presentation at a later date. On the other hand, virtual meeting participants may be less likely to build strong, personal relationships, and they may be more likely to experience distractions and engage in multitasking (e.g., checking email) during the meeting. Acquiring the necessary technology and training in the use of that technology are additional drawbacks of virtual meetings.

1-11. Information systems play a very large role in decision making, and many would argue that you can always use more information to make better decisions. But sometimes digging deeply for more information leads to troubling ethical dilemmas. Visit 23andme.com, the website of a company that offers to read your DNA from saliva for a flat fee and provide reports about disease risk factors, ancestral lineage, and more. If you learn of a significant health risk, should you tell siblings who chose not to investigate their own DNA? Should you tell your significant other? List factors you should take into account when making decisions about whether to obtain information like this and how to use it.

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Answers to this question will vary based on the student's perspective and experience. Potential factors that students may identify are the physical and psychological health of their friends and family, their own physical and psychological health, and potential impact to past and future relationships.

1-12. One way to be more productive and manage time efficiently, is to use the calendar feature offered by many email systems, such as Microsoft Outlook or Gmail. Create a calendar for the semester that shows class times as well as test dates and project due dates. If you have a smartphone, you may be able to sync your calendar to an app, so you always have it handy. Which reminder option did you select for class times? Which reminder option did you select for project due dates? Briefly describe several benefits of using the calendar feature.

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Answers will vary, as the object of this question is to require students to work with software that enhances productivity. At a minimum, students should be able to list several benefits of the Outlook or Gmail calendar features, which include the ability to mark items such as appointments, meetings, or all-day events, and to specify items as recurring or one-time events. The scheduling option is used to invite others to a meeting. Reminders can be set anywhere from 15 minutes up to five days prior to an appointment.

1-13. Netflix has grown to more than millions of customers who can stream movies and TV episodes to any internet-connected device or request DVDs by mail. Describe Netflix in terms of (1) the types of information technology it uses and (2) its customer-facing business processes.

Answers supplied by students will vary, but generally should be drawn from chapter information contained in Section 1.3: The Components of an Information System. Answers should include brief statements relating to people, technology, processes, and data.

1-14. Consider the information that is maintained by a bank. In addition to customer records, the bank maintains records on accounts and loans. Figure 1-20 and Figure 1-21 (below) are two examples of database tables for a regional bank. How might this data be aggregated and analyzed to create information and knowledge?

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Figure 1-20

Customers table

CustomerID	Name	Address	City	State	Zip
100001	Don Baker	1215 E. New York	Aurora	IL	60504
100002	Yuxiang Jiang	1230 Douglas Road	Oswego	IL	60543
100003	Emily Brown	632 Fox Valley Road	Aurora	IL	60504
100004	Mario Sanchez	24 E. Ogden	Naperville	IL	60563

Figure 1-21

Accounts table

CustomerID	AccountNumber	AccountType	DateOpened	Balance
100001	4875940	Checking	10/19/1971	2500.00
100001	1660375	Savings	08/10/1973	1200.00

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100002	1783032	Savings	05/15/1987	500.00
100002	4793289	Checking	05/15/1987	3200.00
100003	6213690	Checking	02/14/1996	6700.00
100004	1890571	Savings	10/16/2007	5300.00
100004	8390126	Checking	12/02/2008	2700.00

Answers will vary but the student should be able to provide several examples. For instance, the student may discuss how customer data may be aggregated with account data to create information such as a table showing customers in zip code 60504 having a savings account, and how customer data and account data may be aggregated and analyzed to create higher-level knowledge, such as which customers may be prospects for a CD savings account or a consumer loan.

1-15. Parking is a problem at many universities across the United States. Is it a problem on your campus? Describe the business process to acquire a parking pass at your school. Can you get a parking pass online? Can you get one in person? How does your process compare with that of an organization that uses a paper form to apply for a parking permit? How can that organization use an information system to improve this business process? Can you think of a business process at your college or university that can be improved with an information system?

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Answers will vary depending on the business process evaluated. Students should be able to provide a comprehensive description of the process they use to acquire a parking pass and a comparison to the process used at a smaller school. They may identify a process they have experienced that can be improved or eliminated with the help of information systems.

1-16. A typical information technology department is composed of common functional areas, and each requires skills and competencies unique to that area. Scan the web or visit an online job search site such as careerbuilder.com or monster.com to learn more about the IT functional areas described in Figure 1-15. Select two functional areas and compare job postings for each. In a brief report, contrast the differences in education, experience, and technical certification that are required for each job.

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Answers will vary depending on the websites accessed. Job titles generally should be drawn from information contained in Figure 1-16. Students may identify network and security certifications such as CCNA (Cisco Certified Network Associate), CCNP (Cisco Certified Network Professional), and CompTIA's A+, Network+, and Security+ certifications.

1-17. In 2020, a hacker attacked electronic files at a media law firm, and a great deal of sensitive information was stolen. The victims included well-known celebrities such as Madonna, Lady Gaga, Bruce Springsteen, and Drake, among others. Work in a small group with classmates to consider the severity of this leak of private information. In this case, should the severity of the breach measured by the number of affected individuals or by the high-profile status of some of the subscribers? What criteria are best for judging the severity of a data leak? Prepare a brief summary of your group discussion.

Answers will vary but students should weigh the factors that they consider important in judging the scope of the damage and defend their criteria. The extent of harm done directly and indirectly should be considered, whether or not high-profile individuals are involved.

1-18. Information systems are fundamental to the success of every functional business unit within an organization, from marketing to manufacturing to finance. Work in a small group with classmates to share your career choice and discuss how information systems support processes within your field. Can you name types of software applications that are used in your chosen career?

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Answers will vary depending on students' career choices. Students should discuss how information systems support processes within a given field in the context of the different roles information systems play in different organizations. Accounting majors may identify QuickBooks or NetSuite accounting programs. Marketing majors may identify email marketing or internet marketing software programs. Information technology majors may identify project management software programs.

Solutions to Application Exercises

1-19. Excel Application: Staff Planning Spreadsheet

Precision Products specializes in custom-manufactured metal parts. The production manager has asked you to create an Excel spreadsheet to help manage operations. The company needs a way to calculate staffing requirements (number of employees) based on different levels of production. The five manufacturing operations are fabrication, welding, machining, assembly, and packaging. One unit of production requires 1.5 hours for fabrication, 2.25 hours for welding, 0.7 hours for machining, 3.2 hours for assembly, and 0.5 hours for packaging. Download the Excel file *Ch01Ex01* (Figure 1.22) and then calculate the

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weekly staffing required, at 40 hours per week, for production levels of 200, 300, 400, and 500 units. How does the total required for each level of production change if Precision Products operates a 45-hour production schedule?

In the file Excel Ch01Ex01, students should go to the cell containing 40 (Weekly Requirement) hours and change it to 45; the formula would then recalculate the Total Requirement amount. Refer to the Ch01Ex01_Solution file.

Figure 1.22

Managing operations at Precision Products using Excel.

	A	B	C	D	E	F	G	H	I
1			HOURS REQUIRED						
2			Units	Fabrication	Welding	Machining	Assembly	Packaging	Total Hours
3		Weekly Production	1	1.5	2.25	0.7	3.2	0.5	
4			200						
5			300						
6			400						
7			500						
8									
9		Weekly Requirement							Total Requirement
10	Hours	40	200						
11			300						
12			400						
13			500						

1-20. Access Application: Information Systems in Business

Seconds Later, a clothing consignment shop, is fast becoming a favorite place to shop. The owner has asked you to create an Access database to help manage inventory. Download and import the information provided in the spreadsheet *Ch01Ex02* to create a database with two tables (Consignors and Items). The owner wants you to add a calculated field to the Items table that shows the net selling price after paying the commission to the consignors. Start with two reports: an Inventory Report and a Consignor Report. The Inventory Report summarizes the inventory by item type. This report will include the number of items and the total selling price for each item type plus the total sales value of each inventory type. It will also include the total potential commission that the consignors will earn if the owner sells all items. The Consignor Report will list the total number of items and the total selling

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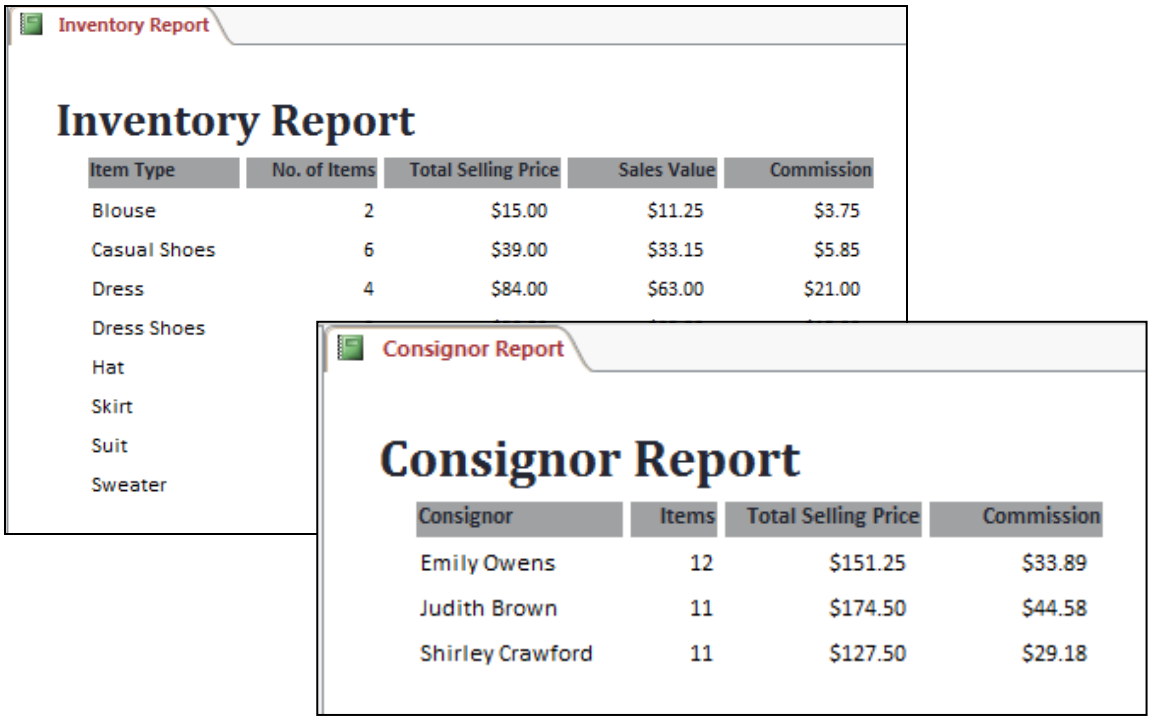
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price and commission for each consignor. What other reports could you make with this data that would be useful to the owner?

Students should produce an Access database with two tables by importing data from the Excel file named Ch01Ex02. In Access, you can create table fields that calculate values. In the older Access 2007, calculated fields are created in a query. Students should create queries to produce the Inventory Report and the Consignor Report, using the Property sheet caption field to name the columns and the format function to show values as currency. Refer to the Ch01Ex02_Solution file.



Inventory Report

Inventory Report

Item Type	No. of Items	Total Selling Price	Sales Value	Commission
Blouse	2	$15.00	$11.25	$3.75
Casual Shoes	6	$39.00	$33.15	$5.85
Dress	4	$84.00	$63.00	$21.00
Dress Shoes				
Hat				
Skirt				
Suit				
Sweater				

Consignor Report

Consignor Report

Consignor	Items	Total Selling Price	Commission
Emily Owens	12	$151.25	$33.89
Judith Brown	11	$174.50	$44.58
Shirley Crawford	11	$127.50	$29.18

Solutions to Case Study Questions

Case 1—Trading at the Speed of Light: Nasdaq's Information Challenges

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1-21. How has Nasdaq's business benefited from the use of information systems?

The purpose of the first two questions for this case is to have students consider how information systems (IS) can transform an organization. Nasdaq is a technology company that would not be possible without IS. IS enabled Nasdaq to enter the trading market even after the NYSE was well established, to offer customers a full range of trading services even as a relatively new organization, and to achieve an advantage in speed compared with other exchanges. Further, IS are a source of revenue growth for Nasdaq, as Nasdaq has sold its technology to other countries and the IT department directly supports Nasdaq's new business strategies.

1-22. What risks do information systems pose for Nasdaq's business?

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The purpose of this question is to have students give a balanced consideration to the risks of IS as well as the benefits of IS. The benefits of IS were addressed in the previous question, and this question addresses risks. One risk is that IS lowers the cost of doing business for all firms in an industry, which is likely to lead to lower prices. Nasdaq must manage this risk by finding ways to remain profitable even in an environment of lower prices. A second risk is that IS can contribute to high market volatility, which could lead to a loss of investor confidence and cause instability for the entire industry. For example, to help manage this risk, Nasdaq strengthened the guardrails around trading that will prevent high frequency traders from moving stock shares too quickly if prices go outside previously set price "bands."

1-23. This chapter discusses the value of information. What types of information are handled through Nasdaq systems, what are the key characteristics of this information, and how do Nasdaq customers use this information to create value?

The purpose of this question is to have students focus on the "information" aspect of IS. The most critical components of information handled through Nasdaq systems are the security name, price, seller, buyer, and time of the trade. One interesting characteristic is that this information is constantly changing. For example, from one moment to the next, the price of a security will change and the seller willing to sell the security at that price will change. Nasdaq customers create value based on access to timely information, as a customer may want to buy at a certain price, sell at a certain price, or transact on an exchange with a certain level of commission.

1-24. What does the example of Goldman Sachs paying to locate its server in the

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Nasdaq data center say about the relationship between information systems and physical operations?

The purpose of this question is to help students understand the relationship between technical considerations and physical operations. This theme will surface in several cases throughout the textbook. Given the importance of timeliness to Nasdaq customers (see third question in this case study), even with high-speed IS there is a small benefit in response time based on server location and the distance the information must travel to confirm trades. Trades are conducted within nanoseconds so any delays due to physical distance might be costly. Goldman Sachs is willing to pay a premium for server location, which represents yet another IS revenue source for Nasdaq. As Nasdaq moves its servers to the cloud, traders like Goldman Sachs can move their servers to the cloud provider's data center. Even in automated operations, students will need to understand where physical location may still make a difference for firms, workers, and customers.

Case 2—Breaking News: Twitter's Growing Role in Emergencies and Disaster Communications

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1-25. What are the potential benefits of Twitter and other social media for emergency and disaster communications?

The purpose of the first two questions for this case is to have students consider how IS can transform a public service. Although emergency and disaster communications have developed through the years based on existing technologies (such as an air horn for a tornado watch, or the Federal Emergency Alert System [EAS] through television and radio), new technologies such as Twitter and social media offer potential benefits for these communications. For example, social media enable emergency and disaster communications to originate from multiple locations at the same time (while an air horn or a news reporter operates from only one location at a time). Social media also enable emergency and disaster communications to be constantly updated in real time.

1-26. What are the potential risks of using Twitter and other social media for emergency and disaster communications?

The purpose of this question is to have students give a balanced consideration to the risks of IS as well as the benefits of IS. The benefits of IS were addressed in the previous question for this case study above, and this question addresses risks. One risk is that the IT and

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telecommunications infrastructure on which social media operates could be overloaded or cease to operate in a disaster. For example, on September 11, 2001, many mobile phone circuits in large cities were overloaded by excessive demand. To manage this risk, providers would need to look at the robustness of their infrastructure in the face of peak demand, and the flexibility of infrastructure to reroute traffic if some nodes are damaged. A second risk is that because various individual citizens are preparing updates, the updates may vary in depth and accuracy. Management of this risk will be discussed in the next question.

1-27. What types of education would be necessary at the user level to make Twitter and other social media more effective for emergency and disaster communications?

The purpose of this question is to have students consider the value chain in social media. As social media begins to play a role in functions (such as public safety) that were previously handled by firms, students need to understand how the related value chains may be impacted. The key objectives of educating citizens on the use of social media in emergencies would be to reduce variability and increase quality and timeliness of communications. Accordingly, it would be useful to educate citizens on basic principles (such as syntax) of using social media for emergency communications. It is also important to remind citizens to issue genuine communications, and to prioritize urgent communications during an emergency or disaster.

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1-28. What would need to happen on the part of aid organizations and traditional media for Twitter and other social media to be effective in emergency and disaster communications?

The purpose of this question is for students to continue the discussion from the third question for this case study and consider the value chain implications of using social media for emergency and disaster communications. Although citizens may originate the communications, aid organizations and traditional media would still need to monitor the communications, integrate the communications, and prioritize the communications so that appropriate action can be taken. Aid organizations also need to coordinate directly with each other to ensure that they do not duplicate efforts in the response, and that they allocate resources efficiently to address all important areas in a timely manner.

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Solutions to E-Project Questions

E-Project 1—Analyzing the May 6 "Flash Crash" with Excel Charts

1-29. Download the Ch01_AAPL Excel file, which contains the high, low, and closing prices for Apple Computers between May 3 and May 14. (AAPL is the ticker symbol for Apple.) Open the file to see how the data are arranged in columns, with the first row showing the column headers. Refer to the Ch01_AAPL_Solution file.

a) What was the closing price for Apple on May 6?

On May 6, the closing price for Apple stock was $60.75 per share.

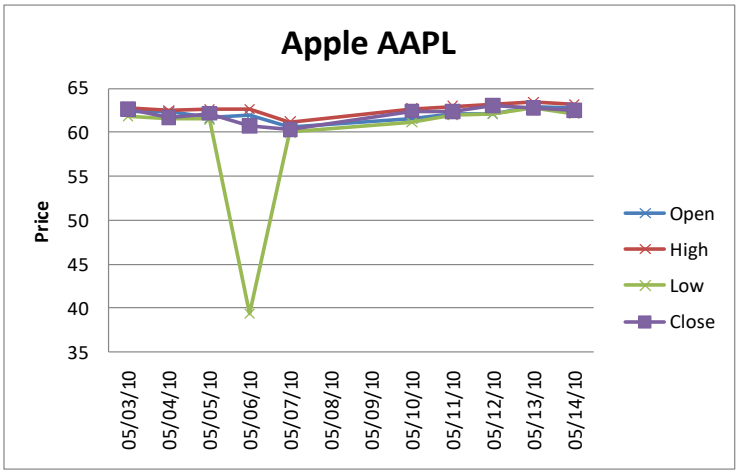
b) What was the volume of trading for this stock on May 6?

On May 6, there were 28,560,400 shares of Apple stock traded.

1-30. Create a line graph from the AAPL data, in which the dates are on the *x*-axis (horizontal), and the stock prices are on the vertical *y*-axis. Include the opening price, high, low, and closing price on the graph. Add a title to the top of your chart.

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The line graph would appear as follows:



1-31. Download Expedia stock prices (ticker symbol EXPE) for the same time period (May 3–May 14, 2010) from http://finance.yahoo.com. (Click on "Historical

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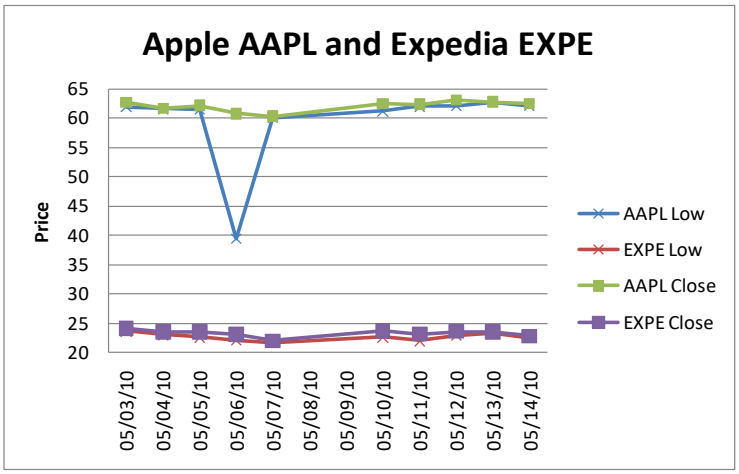
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Data", under the current chart and prices.)

a) Create a line graph to compare the *low* and *closing prices* for Apple stock and Expedia stock. You do not need to include open and high prices on this graph.

The line graph would appear as follows:



b) How do you compare the activity on those two stocks?

Apple experienced a significant intraday price decline (low stock price) on May 6 during the "flash crash," while Expedia did not experience a significant decline that day.

E-Project 2—Gathering, Visualizing, and Evaluating Reports from Twitter and Other Sources During a Disaster

Download the Excel file called "Ch01_OilSpill," which contains sample reports, and answer the following questions (also refer to the Ch01_OilSpill_Solution file.**:**

1-32. First, select columns B through F and reformat them with word wrap so you

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can easily see the actual comments people sent in.

	A	B	C	D	E	F	G	H	I	J
1	TOTAL NOT VERIFIED									791
2	#	INCIDENT TITLE	INCIDENT DATE	LOCATION	DESCRIPTION	CATEGORY	LATITUDE	LONGITUDE	APPROVED	VERIFIED
3	9	Oily bird	4/30/2010 5:05	Fort Jackson, LA	Oily bird found in Fort Jackson in Plaquemines Parish	Birds,	29.35778	-89.455	YES	YES
4	85	2nd bird recovering after being found in Gulf oil	5/4/2010 14:20	FORT JACKSON, la	FORT JACKSON, La. -- A second bird has been found in the Gulf of Mexico oil slick and is recovering at a bird rescue center in Louisiana. National Wildlife Federation president and CEO Larry Schweiger said Tuesday that a brown pelican was being cared for along with a northern gannet that was found several days ago. The brown pelican is Louisiana's state bird. Schweiger says there's no way to know how many birds have been oiled because the slick is so big and offshore. Schweiger says both were in an isolated recovery area to let them preen and get back to flying condition. He says he doesn't know just where or when the pelican was found.	Birds,	29.35778	-89.455	YES	YES
	154	2 dead gannets found	5/7/2010 14:49	Grand Gosier Island	Louisiana Wildlife and Fisheries enforcement agents announced Thursday that they found two dead gannets, possibly killed by oil from the spill, while patrolling closed fishing grounds Wednesday near Grand Gosier	Birds,	29.54438	-89.069208	YES	YES

Using word wrap the spreadsheet should now appear consistent with the sample of title and first two lines of data below:

1-33. Suppose you have a friend who lives in Bay Champagne. First sort the table by LOCATION and scroll down to Bay Champagne. How many reports do you find using this strategy? Why would this approach be limited in terms of its ability to find all the events that may have affected your friend?

Eight reports were found. This search strategy is limited for at least two reasons. First, a user may miscount the number of rows when data is sorted. Second, it is possible that Bay Champagne may be mistyped for other entries (for example, “Champagne Bay”) and may not show next to the other eight Bay Champagne entries in the spreadsheet.

1-34. For crisis management, timeliness is important, but so is accuracy. How many reports in this sample were not verified (NO in the Verified column)? You can use Excel’s countif function to determine the number of NOs and YESes. What is the percentage of total reports that have not been verified?

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The verified column indicates that 791 out of 2464 reports (32.1 percent) have not been verified.

1-35. Sort the file by CATEGORY then by LOCATION. Take a look at the reports that are categorized as Health Effects in Grand Isle. Why do you think many of these reports are not verified?

Many reports of Health Effects in Grand Isle involve internal symptoms (such as coughing or difficulty breathing) that may be more difficult to verify during a reporting visit. This may be partly because the symptom may not manifest during the reporting visit, and partly because the report data collection involved verbal interviews rather than medical examinations.

Chapter 2
Information Systems and *Strategy*

Learning Objectives

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1. Describe Porter's five competitive forces that shape industry competition.
2. Explain how disruptive innovations, government policies, and other factors affect how the competitive forces operate.
3. Identify the components of the value chain and explain its extended version.
4. Describe how information systems apply to competitive strategies for business.
5. Explain how information systems apply to strategy for nonprofit organizations and governments.
6. Explain how information systems are deployed to run, grow, or transform the business.

Chapter Outline

1. Porter's Five Competitive Forces
    a. Threat of New Entrants

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   b. Power of Buyers
   c. Power of Suppliers
   d. Threat of Substitutes
   e. Rivalry among Existing Competitors
2. Factors that Affect How the Five Forces Operate
   a. Disruptive Technology and Innovations
   b. Government Policies and Actions
   c. Complementary Services and Products in the Ecosystem
   d. Environmental Events and Wildcards
3. The Value Chain and Strategic Thinking
   a. Extending the Value Chain: From Suppliers to the Firm to Customers
   b. Benchmarking Components of the Value Chain
   c. IT Benchmarks
4. Competitive Strategies in Business
   a. The Role of Information Systems in Strategy
   b. Information Systems: Run, Grow, and Transform the Business
5. Information Strategies and Nonprofit Organizations
   a. Fund-Raising
   b. Volunteering
   c. Information Strategies and Government
6. Does IT Matter?
   a. Spending on Running, Growing, and Transforming
   b. *Leveling UP!:* A Strategic Analysis

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Key Terms and Concepts

threat of new entrants
network effects
switching costs
power of buyers
power of suppliers
threat of substitutes
rivalry among existing competitors
disruptive innovation
sustaining technologies
creative destruction
ecosystem
value chain model
primary activities
support activities
benchmark
low-cost leadership strategy
product differentiation strategy
focused niche strategy
strategic enabler
e-government

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Answers to Quick Check Questions for Each Learning Objective

2.1. A startup with little funding that competes effectively with existing businesses would be an example of

a. the threat of new entrants.✓
b. the power of buyers.
c. network effects.
d. the threat of substitutes.

2.2. An example of a disruptive innovation is

a. a 10% increase in a TV's screen resolution.
b. an improved gaming interface that allows users to customize more characteristics of their avatars.
c. the internet. ✓
d. a hard drive with more capacity.

2.3. In the value chain, primary activities include

a. technology support.
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b. human resources.
c. administration and management.
d. making the product or service. ✓

2.4. A company that strives to offer highly differentiated product to a particular market niche would be applying the

a. focused niche strategy. ✓
b. low cost leadership strategy.
c. product differentiation strategy.
d. a strategy enabler.

2.5. Most US counties allow pet owners to apply for licenses via online applications. This is an example of

a. low cost leadership.
b. e-government. ✓
c. network effects.
d. switching costs.

2.6. As described in the text, strategies to reduce IT spending should be applied mainly to

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a. employee benefits.
b. costs for growing the business.
c. the IT costs of running the business, because these do not usually provide competitive advantage. ✓
d. costs for transforming the business and creating new business models.

Solutions to Chapter Review Questions

2-1. What are the five competitive forces that shape industry competition? How are these forces interrelated?

The five forces that influence industry competition are (1) threat of new entrants, (2) power of buyers, (3) power of suppliers, (4) threat of substitutes, and (5) rivalry among existing competitors. The five forces determine industry structure and how profitable companies in the industry will be. The five interrelated forces are "internal" to the industry.

2-2. How do disruptive innovations, government policies, complementary products and services, and environmental events affect how the competitive forces operate?

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Disruptive innovations, government policies, complementary products and services, and environmental are "external" forces that affect how the five forces operate. For example, certain innovations can flood through an industry like a tidal wave, changing everything in their path, forcing every company to either make changes or sink.

2-3. What are the components of the value chain? Which components comprise the primary activities? Which components comprise the support activities? What is the extended value chain?

The primary activities of a value chain are: (1) bring in raw resources; (2) make the product or service; (3) market the product or service; (4) deliver the product or service; and (5) provide customer support. The support activities are: (1) administration and management; (2) human resources; (3) technology support; and (4) procurement. The extended value chain links the company's value chain with the value chains of its suppliers and its customers.

2-4. How do managers use benchmarks to analyze the value chain and IT spending?

Organizations use the value chain model to compare their performance to industry benchmarks and identify areas that should be targeted for improvement. For

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example, an organization may compare its budget allocation to each value chain activity to industry benchmarks (i.e., average expenditures in its industry). IT benchmarks include average IT spending by industry and amount spent on IT per employee.

2-5. How do information systems apply to competitive strategies for business?

All of the competitive strategies leverage information systems to achieve success. Low-cost leaders must automate as much as possible using information systems to reduce costs in many different ways depending on the industry. Organizations with a differentiated product or service often rely on innovations in IT to implement their strategy.

2-6. How are information systems used to run, grow, and transform a business?

Information systems are used to run a business by supporting productivity throughout the organization, in every component of the value chain, helping to streamline processes in administration and management and improve customer loyalty. As a strategic enabler, IT can be used to grow and transform a business by facilitating a new business model or introducing disruptive innovations.

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2-7. How do information systems apply to competitive strategies for nonprofit organizations?

Nonprofit organizations can apply information systems to their competitive strategy in two critical areas: fund-raising and volunteer management. Specialized information systems assist nonprofits in managing donations and online fund-raising as well as building relationships with volunteers.

2-8. How do governments use information systems to improve services and fund research?

Governments use information systems to improve services in varied ways depending on the specialized requirements and responsibilities of the agency providing the service. For example, the military uses real-time systems to support military personnel and material distribution; the Department of Natural Resources needs easy ways for people to report poachers who damage forests or hunt illegally, and the agency offers online tools for that; the US Internal Revenue Service must have information systems to support e-filing and to process millions of tax returns. Government funding is critical to certain kinds of research projects that private investors might avoid for various reasons including risk and uncertainty. For example, the internet was developed by the Defense Advanced Research

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Projects Agency. Currently, green sources of energy and the smart electricity grid are receiving significant funding from governments.

Solutions to Projects and Discussion Questions

2-9. Although many people think electronic book readers are expensive, there is a massive global demand for the devices, and the trend is likely to continue for some time. Search the web to learn more about how digital technology has disrupted the book publishing industry, and prepare a five-minute presentation of your findings.

Answers will vary. At a minimum, students should be able to list several effects of digital technology on book publishing such as a decrease in sales of non-digital books and new options for self-publishing books and make them available on Kindle and iBooks and other websites.

2-10. The value that attracts millions of customers to McDonald's every day comes from capabilities that are based in its value chain. Briefly describe McDonald's value chain and discuss how information systems facilitate each component in the chain. Can you think of a way that information technology could improve a visit to McDonald's?

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Answers will vary but should include an example of at least one information system that is used in each component of the value chain and one improvement using information technology.

2-11. Information technology enables nonprofit organizations to reach out to constituents 24 hours a day, 7 days a week. Visit www.redcross.org and note the various ways this charity is using its website to communicate with volunteers, donors, and people who need assistance. Compare the Red Cross site to your university's alumni association website. Prepare a brief summary of your findings that includes a list of specific services provided on each site. How does each website support the organization's strategic goals?

Answers will vary depending on the services made available by their local alumni association. Because the content of www.redcross.org may change, expected results will vary but should include services such as these: Get Assistance, Volunteer, Take a Class, and Give Blood.

2-12. Government agencies and corporations have similar information needs. Identify and briefly discuss specific examples of information systems typically used by a law enforcement agency such as a state or local police

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department. Which of these systems are used to "run" the business? Which are used to fulfill the agency's mission?

Answers will vary but should include an example of an information system used to manage operations such as human resource scheduling, payroll, or accounts payable. The mission of a state or local police department includes safeguarding the lives and property of the people it serves. Examples of systems to fulfill the agency's mission may include systems to manage criminal history records, arrest warrants, stolen vehicles and property, fingerprint identification, sex-offender registration, and concealed handgun licenses.

2-13. What are the three basic strategies that companies adopt to compete? Describe how information systems support each strategy. What is a "hybrid" strategy? Describe a company, product, or service that adopts each of these four competitive strategies.

The three basic strategies are (1) low-cost leadership, (2) product differentiation, and (3) focused niche. The low-cost leadership strategy relies on information systems that automate and streamline processes and eliminate costly human labor. The product differentiation strategy requires systems that add special features or unique add-ons for which customers are willing to pay more. The focused niche strategy relies on special features for a particular market niche such as a business or government segment. A hybrid model incorporates aspects of several strategies. An example of a hybrid strategy is providing the best value for the lowest price. Answers will vary regarding names of companies, products, or services that adopt each of these competitive strategies. This question draws on the student's ability to understand the four strategies and their knowledge of companies, products, and services.

2-14. The US federal government collects trillions in taxes each year, including individual income taxes, social security/ social insurance taxes, and corporate taxes. Visit www.irs.gov and describe how this website enhances services to the public. What types of services are available to individuals? To businesses? To charities and nonprofit organizations? What kind of "tax information for students" does this site provide? Prepare a five-minute presentation of your findings.

The list of services provided at www.irs.gov could be extensive. For example, services provided to individuals include assistance with finding a "free file" provider, transmitting a tax return electronically, and checking on the status of a tax return. Services provided to businesses include electronic submission of tax returns, links to compliance and enforcement information, and taxpayer advocate services. Services provided to charities

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and nonprofit organizations are similar to those provided to businesses. Services provided to students include links to an interactive tax education program and information on education credits and student loan interest. Student lists will vary and should include specific services for each category of client.

2-15. Why are IT resources described as a commodity? How do IT resources "matter" in terms of the different roles they play in an organization? Which component of an information system is most critical to success in growing and transforming the business? Why?

A commodity is a product for which quality is the same no matter who produces it. Examples are milk and paper. The price of a commodity fluctuates depending on supply and demand. Nicholas Carr suggests that IT resources have become so commonplace that their strategic importance has diminished, and they have become an infrastructure commodity, much like electricity. Information technology resources that are used to run the business generally fall into the commodity category where price competition is fierce. Consequently, organizations can avoid wasteful spending for these systems and get the best value for the lowest cost. On the other hand, information systems that are used to grow and transform an organization include the "people" component. Although many technologies are commodities, the ability to extract their value requires human imagination. Innovative business practices, new products and services, and changed processes come from talented people who know how to leverage information technology.

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2-16. According to the Computer History Museum (www.computerhistory.org), the Kenbak Corporation sold the first personal computer in 1971. Since then, several billion PCs have been sold under various brand names. Work in a small group with classmates to analyze and describe the personal computer industry using the five competitive forces model.

Students should be able to provide a brief analysis that describes competitive rivalry as high due to little differentiation in PCs, supplier power that comes from the lack of substitutes for their input product and the cost associated with changing suppliers, and buyer power that comes from customer price sensitivity and the low cost of switching to another PC. The threat of substitutes is relatively high because it is easy for customers to switch to alternate products such as laptops, notebooks, and netbooks. The threat of a new entrant in this industry is relatively low due to barriers to entry such as acquiring necessary inputs from key suppliers.

2-17. Work in a small group with classmates to discuss how information technology plays a role in the competitive environment of your college or university. How do you describe the competition to attract and retain students? How do you describe the threat of substitutes in higher education? How does the threat of substitutes affect supplier power in education?

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Answers will vary. At a minimum, students should provide a list of ways that IT is used by their college or university to attract and retain students and discuss the competitive environment of their school. The threat of substitutes in higher education includes programs provided by community colleges and technical schools, as well as online degree programs offered by traditional and virtual universities. As students have more choices, supplier power for institutions of higher education is reduced.

Solutions to Application Exercises

2-18. Excel Application: IT Benchmarks

Jay's Bikes is a family-owned and -operated business that stocks a wide range of bikes designed to fit the needs of professional riders, your child's first bike, and everything in between. The business has 12 full-time employees. Download the Excel file *Ch02Ex01* (Figure 2.21) to calculate average IT spending so that it can be compared with the retail industry average. Recall that average IT spending in the retail industry is about 2 percent of revenue. How do the company's IT expenditures compare with the industry average? How much would the company need to change spending in order to match the retail industry average?

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Students should use formulas to calculate Jay's average IT spending as a percent of revenue and his average IT spending per employee, then use Goal Seek to determine how much he needs to change IT expenditures to match the industry benchmark of 2 percent of revenue. To answer the question, "How much would Jay need to change spending in order to match the retail industry average?," students should use a formulas to calculate (a) the difference between Jay's current IT spending as a percent of revenue and the target spending as a percent of revenue and (b) the difference between Jay's current IT spending per employee and the target spending per employee. Refer to Ch02Ex01_Solution file.

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	A	B	C
1	Revenue	Apparel & shoes	$ 1,250,000
2		Bike accessories	$ 550,000
3		New bikes	$ 2,650,000
4		Used bikes	$ 18,500
5		Bike repairs	$ 33,000
6			
7	IT Expenditures	Hardware	$ 15,000
8		Software updates	$ 18,000
9		Software licenses	$ 4,500
10		Software support	$ 4,500
11		Employee training	$ 5,000
12		Web site development	$ 5,000
13		Internet access	$ 1,200

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2-19. Access Application: Telethon Call Reports

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The volunteer coordinator of the Downtown Emergency Shelter has asked you to use the information provided in Figure 2-22 to create an Access database. (You can download the Excel file called *Ch02Ex02* and import the data into your database.) The coordinator will use the database to manage donor records and help the shelter prepare for an upcoming Phonathon fundraising event. During the Phonathon, volunteers will call previous donors to ask for donations to this year's fund. Your instructions are to create two tables (donors and volunteers) and prepare a Phonathon Call Report for each volunteer. The shelter manager wants you to add three fields to the donor table: this year's contribution, a calculated field that shows the average contribution per employee, and a calculated field that shows a target contribution that is 5 percent higher than last year's contribution. The report should list the volunteer's name and number, as well as the following donor information: donor number, donor name, company name, phone number, contribution amount from the prior year, number of employees, average contribution per employee, and target contribution for this year. Although address information will not be included on the report, that information will be used to send receipts to the donors at the conclusion of this year's fund-raising event.

Students should produce an Access database with two tables by importing data from the Excel file named Ch02Ex02. Students should create a query to produce the Phonathon Call Report. The query includes two calculated fields: average contribution per employee and target contribution per employee for the current year. Set the format for both fields to currency in the Property sheet. Refer to Ch02Ex01_Solution file.

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Bob's Phonathon Call Report

Bob's Phonathon Call Report

Volunteer Number	First Name	Co Name	Donor No	Phone No	Employees	2015 Contribution	Average Per Employee	Target Per Employee
H042	Robert	Alternate Health Spa	M697	312-341-9979	3	$878.65	$292.88	$307.53
		Carol's Beauty Shop	C456	312-044-2956	17	$2,365.00	$139.12	$146.07
		Green City Grocers	E105	630-123-4598	32	$6,234.45	$194.83	$204.57
		Hollywood Pet Care	Q349	630-234-3484	9	$563.00	$62.56	$65.68
		Mia's Nail Salon	L345	630-345-0080	12	$2,644.25	$220.35	$231.37
		Perfect Cleaners	S493	312-451-0080	11	$2,651.00	$241.00	$253.05
J234	Bob	All Right Auto Repair	A234	630-345-3333	21	$3,209.00	$152.81	$160.45
		Al's Music Shop	A226	630-555-5554	8	$945.50	$118.19	$124.10
		Do It Rental	D256	630-876-3476	19	$3,465.00	$182.37	$191.49
		Haney Enterprises	HJ376	630-345-3767	36	$9,345.00	$259.58	$272.56
		The Book Nook	W098	630-345-5656	26	$5,234.00	$201.31	$211.37
		The Butcher Shop	D345	312-456-0080	5	$928.00	$185.60	$194.88
M173	Sara	Day & Night Gym	U602	630-434-5555	32	$2,535.00	$79.22	$83.18
		Downtown Bikes	A657	630-186-7689	12	$1,248.00	$104.00	$109.20
		Edies Ice Cream Shop	E456	312-345-7890	24	$5,237.76	$218.24	$229.15
		Nelson's Gallery	W456	630-345-8235	3	$2,766.00	$922.00	$968.10
		Say It With Flowers	A754	312-972-3456	14	$2,500.00	$178.57	$187.50
		The Barbeque Pit	F234	312-555-5445	18	$2,926.74	$162.60	$170.73
		The Little Card Shop	T706	312-455-8876	8	$1,834.00	$229.25	$240.71

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Solutions to Case Study Questions

Case 1— Can GameStop Survive with Its Brick-and-Mortar Stores?

2-20. Perform a five forces analysis of the online gaming industry. What are the implications of the five forces analysis for GameStop?

The purpose of this question is to have students apply a framework from the chapter to the case. A five forces analysis provides an idea of whether or not an industry would be attractive to enter. In the online gaming industry, entry barriers are reasonably low (implies that industry is not attractive), because all that is required to enter the industry are developers to program a game and a website to publish the game. There are numerous available substitutes (implies that industry is not attractive), as online gaming is only one of many forms of entertainment. Internal rivalry is increasing (implies that industry is not attractive) with multiple providers

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of online gaming. Buyer power is low (implies that industry is attractive) because buyers are individual consumers, and no consumer wields undue market power. There is some supplier power (implies that industry is moderately attractive), because there may be a limit to the number of talented developers available for hire. This five forces analysis suggests that the online gaming industry has low to moderate attractiveness. It is not necessary for students to arrive at this suggested answer, instead it is more important for students to get experience in performing and drawing implications from a five forces analysis.

2-21. What role have information systems played in the five forces you identified?

Building from the five forces analysis in the previous question, IS plays a key role in at least three of the five forces. For example, one reason that barriers to entry are low is because online distribution reduces the barriers to entry. A game publisher does not require physical logistics to distribute games to retail locations; the publisher can simply distribute directly to consumers via the internet. One reason that substitutes for online gaming are high is that the target demographic can use online social media (another form of entertainment) at no cost. One reason that internal rivalry is increasing is because existing retailers (such as GameStop) are adding online channels. It is not necessary for students to develop this precise analysis, instead it is more important for students to understand the relationship between IS and strategy.

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2-22. How has GameStop used information systems to compete more effectively?

The five forces analysis performed in questions 1 and 2 relate with GameStop's evaluation of the industry and GameStop's response to the industry. The purpose of this question is to have students understand how firms can incorporate IS as part of their strategy. GameStop acquired an online gaming company to embrace online gaming as a substitute for offline gaming and to enter that segment of the industry. Firms can use IS as a tool to implement their strategies.

2-23. What other strategic actions will GameStop need to take to protect its business?

The purpose of this question is to have students understand that IS are only one component of strategy, and that organizations need to integrate IS

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together with other components to successfully execute a strategy. For this case, in addition to acquiring the online gaming company, GameStop will need to integrate operations of the online gaming company with its brick-and-mortar operations, to take advantage of GameStop's physical footprint. Offering opportunities to earn PowerUP reward points is an example of how the company can attract more in-store customers. The company might also conduct gaming tournaments that further integrate its online presence with in-store events. GameStop management will need to think through whether the firm will compete more based on low price (in which case it might increase its focus on online gaming) or quality service (in which case it might maintain focus on the brick-and-mortar stores and personnel). Company management also needs to be alert to the suddent and dramatic effects that social media can have on their business and reputation.

Case 2— The Battle over Net Neutrality

2-24. What are the strategic interests of carriers? What are the strategic interests of websites?

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The purpose of this case is to give students the opportunity to think through strategic considerations at the industry level, as opposed to the firm level as in the GameStop case. In this case, the strategic interests of carriers such as Verizon and AT&T are not necessarily aligned with the strategic interests of websites such as YouTube and Facebook. Carriers argue that they have invested substantial financial resources to build internet capacity and want to protect their ability to generate additional revenues from their investments. On the other hand, websites argue that their success depends on a direct connection to the customer and the ability to offer the customer an exceptional user experience.

2-25. How do the interests of carriers differ from the interests of websites? What are the implications for websites from a value chain perspective?

The purpose of this question is to help students further understand the relationship between IS and strategy at the industry level. Building from the first question for this case, one way for carriers to protect their investments and generate additional revenues would be to have users pay for enhanced internet connectivity. Another way for carriers to generate

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