Solutions for Systems Analysis and Design 11th Edition by Tilley

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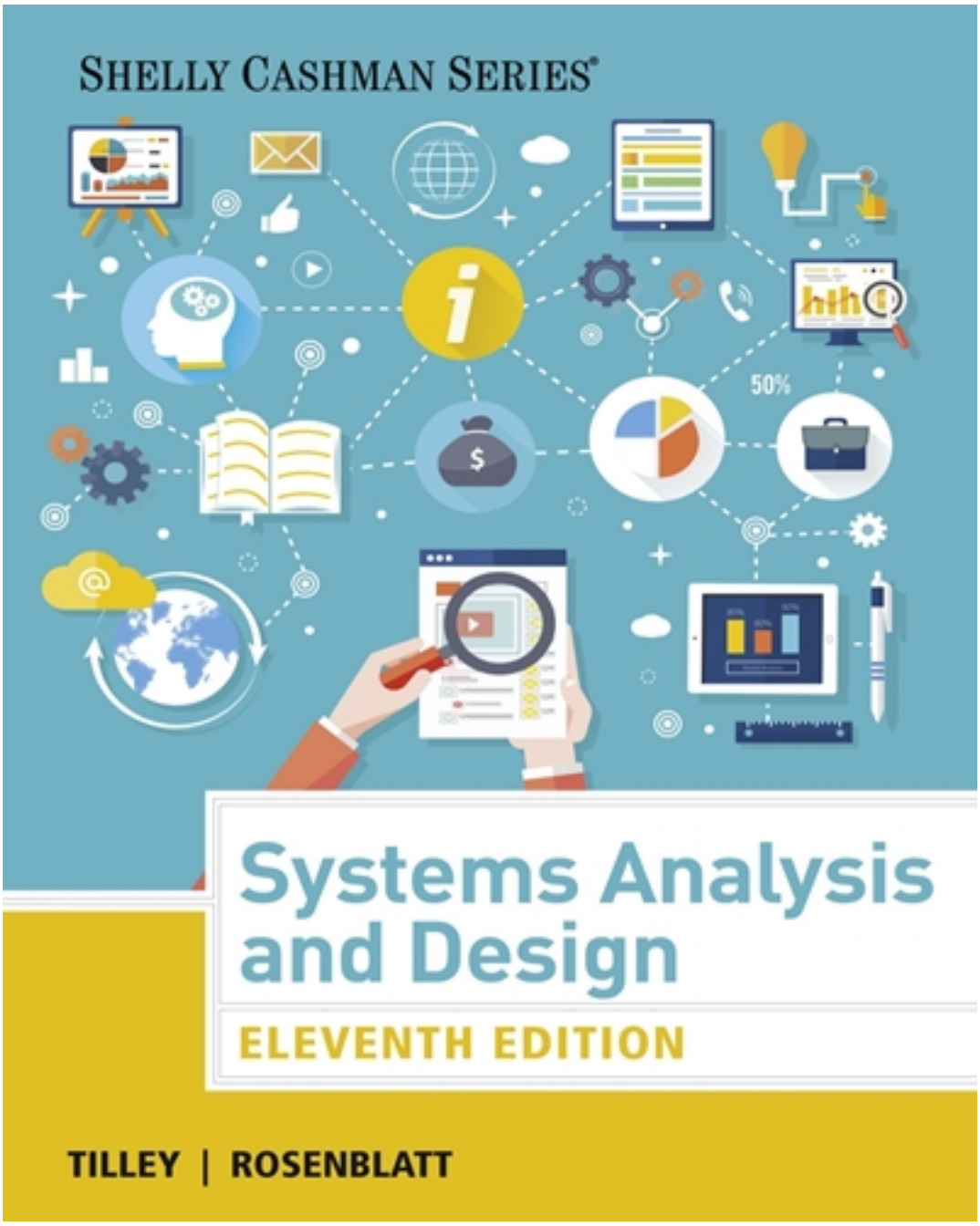


Solutions

Chapter 1 Solutions

Apply Your Knowledge

1 Hi-Volt Components

You are the IT manager at Hi-Voltage Components, a medium-sized firm that makes specialized circuit boards. Hi-Voltage's largest customer, Green Industries, recently installed a computerized purchasing system. If Hi-Voltage connects to the purchasing system, Green Industries will be able to submit purchase orders electronically. Although Hi-Voltage has a computerized accounting system, that system is not capable of handling EDI.

Tasks

1. What options does Hi-Voltage have for developing a system to connect with Green Industries' purchasing system?

   Hi-Voltage has the option to develop a business-to-business transaction processing system to facilitate the electronic data exchange (EDI) that Green Industries recently installed. By developing a new order entry system, Hi-Voltage will improve efficiency and strengthen its bond with Green Industries.

2. What terms or concepts describe the proposed computer-to-computer relationship between Hi-Voltage and Green Industries?

   Electronic data exchange (EDI) is the term used to describe the computer-to-computer transfer of data between Hi-Voltage and Green Industries.

3. Would Hi-Voltage's proposed new system be a transaction processing system? Why or why not?

   Transaction processing (TP) systems process data generated by day-to-day business operations. Hi-Voltage's proposed order entry system will perform online transaction processing.

4. Before Hi-Voltage makes a final decision, should the company consider an ERP system? Why or why not?

   Answers will vary. An ERP strategy depends on the size of the firm and how it integrates its operations and financial data, among other factors.

2 Systems Analyst Salaries

As part of your job search, you decide to find out more about salaries and qualifications for systems analysts in the area where you would like to work. To increase your knowledge, search the Internet to perform the following research:

Tasks

1. Find information about a career as a systems analyst.
   Many sources for IT career information exist on the Web. Online publications such as Occupational Outlook Handbook provide information, resources, and links. If students have trouble getting started, you can suggest http://www.bls.gov.

2. Use the Internet to determine whether the Federal Bureau of Labor Statistics lists salary information for systems analysts in the area where you would like to work. If so, summarize the information you find.
   The Bureau of Labor Statistics maintains salary surveys for a wide range of jobs. For example, systems analysts are included in job code 151051, and computer support staff is included in job code 151041. To review the results of BLS salary surveys, you can visit http://data.bls.gov/oes/search.jsp.

3. Find three online job postings for systems analysts. List the employers, the qualifications, and the salaries, if mentioned.
   The Internet offers numerous sites for job seekers, and students should have no problem locating examples. A good starting point to suggest is http://www.indeed.com/

4. Visit monster.com and search for IT positions. Report your findings
   Answers will vary. You might consider setting up parameters such as salary, location, title, and so on to force students to narrow their search, and see who can find the best job opportunities.

3 NewTech Interview

You have an interview for an IT position with NewTech, a large telecommunications company, and you want to learn more about the firm and its organizational structure. To prepare for the interview, you decide to review your knowledge about corporations, including the following questions:

Tasks

1. What are the four organizational levels in a typical company?
   In the typical organizational model, operational personnel report to lower-level and middle-level managers, who in turn report to top managers. The top managers report to the board of directors that is elected by the company's shareholders.

2. Go online and find three examples of retailers that offer both in-store and Web-based sales. What were the firms? Which one did you like best, and why?
   Students will suggest many examples, including Wal-Mart, Target, Lowes, Apple, and Office Depot, just to name a few. It will be interesting to see how they evaluate the shopping experience. Also, you might consider asking them to pretend they are the CEO of one of these forms, and trying to plan a grand strategy for three to five years from now.

3. What is empowerment? Provide two specific examples.
   In many companies, operational employees need information to handle tasks and make decisions that previously were assigned to supervisors. This trend, called empowerment,

gives employees more responsibility and accountability. Many companies find that empowerment leads to better employee motivation and increased customer satisfaction. Examples might include increasing an employee's authority to resolve a customer issue, allowing lower-level employees to take over short-term operations planning, and allowing them to handle issues usually managed at a higher level.

4. What types of information systems might a large company use? Would the same systems be found in a smaller firm? Why or why not?

Large companies require many different types of information systems. For example, all employees, including top managers, use office systems. Similarly, operational personnel often require information support from what formerly were called management information systems. Now, it is more useful to identify a system by its functions and features, rather than by its users. Today's systems include enterprise computing systems, transaction processing systems, business support systems, knowledge management systems, and user productivity systems. The best answer probably is that a smaller firm might use any or all of these systems, but as scaled-down versions appropriate to size of the firm. This is where scalability would be especially important in order to meet the future needs of a growing business.

4 Rainbow's End Interview

Your NewTech interview seemed to go well, but you did not get the job. During the meeting, the interviewer mentioned that NewTech uses structured analysis and relies heavily on modeling, prototyping, and CASE tools. Thinking back, you realize that you did not fully understand those terms. As you prepare for an interview with Rainbow's End, a large retail chain, you decide to review some IT terms and concepts. You want to be ready for the following questions:

Tasks

1. What are the main differences between structured analysis, O-O, and agile development methods? Which method do you think is best, and why?

While structured analysis regards processes and data as separate components, object-oriented (O-O) analysis combines data and the processes that act on the data into things called objects. O-O analysis uses object models to represent data, behavior, and by what means objects affect other objects. By describing the objects (data) and methods (processes) needed to support a business operation, a system developer can design reusable components for faster system implementation and decreased development cost. Many analysts believe that, compared with structured analysis, O-O methods are more flexible, efficient, and realistic in today's dynamic business environment.

As noted in the suggested answer to Review Question 9, agile development methods have attracted a wide following and an entire community of users. Agile methods typically use a spiral model, which represents a series of iterations, or revisions, which are based on user feedback. Proponents of the spiral model believe that this approach reduces risks and speeds up software development. Analysts should recognize that agile methods have advantages and disadvantages.

By their nature, agile methods allow developers to be much more flexible and responsive, but can be riskier than more traditional methods. For example, without a

detailed set of system requirements, certain features requested by some users might not be consistent with the company's larger game plan. Other potential disadvantages of adaptive methods can include weak documentation, blurred lines of accountability, and too little emphasis on the larger business picture. Also, unless properly implemented, a long series of iterations might actually add to project cost and development time.

2. What is a CASE tool and why is it important? What are two CASE tool examples?

Computer-aided systems engineering (CASE) is a technique that uses powerful programs, called CASE tools, to help systems analysts develop and maintain information systems. CASE tools provide an overall framework for systems development and support a wide variety of design methodologies, including structured analysis and object-oriented analysis. CASE tools can boost IT productivity and improve the quality of the finished product. For example, developers use CASE tools to maintain design integrity, manage a complex project, and generate a wide variety of business, process, and data models. Many CASE tools can be used to build prototypes and generate code modules that speed up implementation. Two popular CASE tool examples are Visible Analyst, and IBM's Rational software.

3. What is business process modeling and how is it done?

A business process model (BPM) graphically displays one or more business processes that systems developers can analyze, test, and modify. A systems analyst can describe and simplify an information system by using a set of business, data, object, network, and process models. Modeling involves various techniques, such as data flow diagrams, entity-relationship diagrams, use cases, and unified modeling language.

4. What is prototyping and why is it important? What industries are likely to use prototyping?

Prototyping involves the creation of an early working version of the information system or its components. A prototype can serve as an initial model that is used as a benchmark to evaluate the completed system, or the prototype itself can develop into the final version of the system. Either way, prototyping speeds up the development process significantly. Prototyping tests system concepts and provides an opportunity to examine input, output, and user interfaces before final decisions are made.

Case Studies

Chapter Case: Hudson Kayak Adventures

Tasks

1. Develop a business profile for Hudson Kayak Adventures. Create a separate section for each of the following: HKA's business activities, organization, resources, customers, and potential for Web-based marketing.

In the textbook, students learn that a business profile defines a company's overall functions, processes, organization, products, services, customers, suppliers, competitors, constraints, and future direction. The first step is to create an outline using the facts presented in the background statement. A sample answer follows:

Business Activities
HKA has three main business functions: kayak rentals, instruction, and guided tours.

Processes
To support its business functions, HKA performs various business processes. Based on the background statement, a partial list might include entering reservations, displaying kayak availability, creating schedules, billing, updating the HKA Web site, updating kayak fleet data, and maintaining an inventory of accessory and safety equipment.

Organization
The organization chart includes Steve and Linda Lane, and Janet Jacobs, a local college student. Linda handles most of the computer work at this time.

Products
At this time, HKA does not sell products. Linda would like to offer a selection of books and videos about kayaking and eco-tourism.

Services
HKA offers kayak rentals, instruction, and guided tours. If the business expands, HKA might consider other services, such as kayak repair and maintenance, kayak sales and brokerage, expansion of the HKA Web site to share more information about kayaking, and Elderhostel tours.

Customers
HKA's business is split evenly between customers with reservations and walk-in customers. These two groups may have different profiles and might respond differently to marketing and pricing policies. Also, HKA offers three different services (rentals, instruction, and guided tours) that appeal to different customers. With better information, HKA will better understand the needs of its customers and gauge the potential of promotions, special discounts, and so on.

Suppliers
The background information does not mention HKA's suppliers. Students can assume that HKA deals with wholesale sources for kayaks and marine equipment.

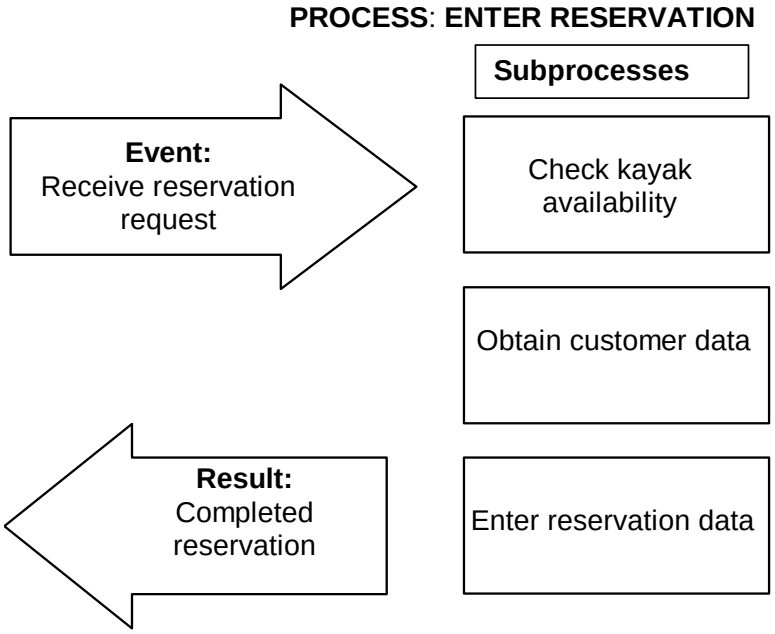
Competitors
No other Kayak rental firms operate within 20 miles of HKA's location.

Constraints
Steve and Linda have been too busy to update the system, and it seems clear that outside assistance will be required. Nothing is known about budget or time constraints, and these would have to be discussed in an initial meeting.

Future Direction
HKA appears to be doing well after two years in business. The Lanes would like to see the business grow, and they realize that they need more information in order to plan for the future. A business support system with decision support features would enable the Lanes to examine potential business opportunities by creating business models and using what-if analysis.

2. List HKA's main functions and business processes. Draw a model of an HKA kayak rental, including possible events and results.

A business model graphically represents business functions that consist of business processes. Students can use Figure 1-8 as a sample, but there are many ways to develop a graphical model, including CASE tools, drawing programs, and freehand. The main objective is to show the events, subprocesses, and results. Answers to this assignment will vary depending on the process selected. An example follows:



3. What types of information systems does HKA use? Do these systems support its current and future business objectives? Why or why not? What would you recommend?

The notebook entries represent a manual type of transaction processing system, and the transaction data is managed by the Access database. Together with the visible display of kayak availability, these systems provide some business support, but they lack decision support and what-if capability.

Linda Lane also uses an inexpensive accounting system, which is a user productivity tool. The Lanes would like more information about scheduling, rental patterns, customer profiles, advertising effectiveness, and future business opportunities. Additionally, Linda is considering new business functions, such as adding books and videos. Clearly, the HKA's information systems do not support the firm's current business activities and will be unable to support future objectives.

4. From an object-oriented viewpoint, HKA treats kayaks as a class. Based on the background information provided, what are some properties of kayak objects?

Students should understand that an object is a member of a class, which is a collection of similar objects, and that objects have characteristics called properties. Because an object can represent a person, thing, or event, a reservation can be represented as an object. The properties of a kayak object might include an ID number stamped into the hull by the manufacturer, an HKA "stock" number, model number, cost, year purchased, length, single or double, sit-on-top or sit-in, color, and similar characteristics.

Continuing Case: Personal Trainer, Inc.

Tasks

1. Use the background information to develop a business profile for Personal Trainer. Be sure to indicate where more information will be needed.

According to Gray Lewis, who will manage the new facility at the new "supercenter," Personal Trainer will offer exercise equipment, a health food store, a pool, a snack bar, sporting goods, child care, child-fitness programs, a teen center, and a computer cafe. Each of these activities represents a major business function, which in turn includes various business processes. Examples of business processes might include the following:

- *Add new member*
- *Create fitness class*
- *Schedule fitness instructor*
- *Register member in class*
- *Sell health food products*
- *Sell sporting goods*
- *Design training program for member*
- *Enter member charges*
- *Prepare monthly bills*
- *Apply member payments*

2. Each new supercenter service represents a business function, which is composed of one or more business processes. Using the background information and the conversation between Susan and Gray, list the business functions and the processes with each function.

Based on his comments, Gray seems a bit skeptical. Although he knows that Cassia wants more information support for the new operation, he states that he is not so sure. Sometimes managers like Gray are reluctant to embrace major changes in IT management. A further clue is his statement about not wanting to "reinvent the wheel."

In response to his comments, Susan offers a specific approach, which Gray seems to accept. Students should recognize that an IT professional must work effectively with various levels within the organization in order to gain trust, confidence and management support. Also, Susan must be courteous and discreet — she is an outside consultant, not Gray's boss. But Gray knows that she was brought in by Cassia, who is Gray's boss. The relationship between managers and the IT team is critical to a project's success, and it would appear that Susan is trying hard to get off on the right foot in her meeting with Gray.

Each service would require one or more processes, and it is OK for students to use their imagination in providing that part of the answer. Examples of business functions might include the following:

- *Customer management*
- *Fitness classes*
- *Exercise equipment*
- *Pool*
- *Snack bar*
- *Sporting goods sales*
- *Child fitness service*
- *Yoga*
- *Zumba*
- *Dance*

3. Based on what you know, should Personal Trainer consider any of the following systems: ERP, transaction processing, business support, knowledge management, or user productivity? Why or why not?

With a dozen or more fitness centers, Personal Trainer might be ready for a company-wide approach to managing its IT resources. Enterprise computing and ERP systems allow a company to integrate its primary functions (such as production, sales, services, inventory control, and accounting) to improve efficiency, reduce costs, and help managers make key decisions. Enterprise computing also improves data security and reliability by imposing a company-wide framework for data access and storage.

Personal Trainer will certainly use transaction processing in its day-to-day operations, and the firm could benefit significantly from using a business support system to help mangers make key decisions. For example, based on data generated by the TP system, a business support system might help Gray to identify fast-moving services and products, and use that information to plan future staffing and marketing decisions.

Personal Trainer might not be large enough to benefit from a knowledge management system, but the company certainly can use user productivity systems to empower its employees, reduce expenses, and serve its customers better.

4. What opportunities might Personal Trainer have for Web-based B2C transactions in the future? What about B2B?

From the meeting discussion, it is clear that Cassia wants members to have online access to their fitness programs. Internet access would be an example of B2C commerce, which would give Personal Trainer the ability to sign up new members, provide online class registration, and explore new markets for its services. Personal Trainer also could examine opportunities for B2B commerce in its dealings with the suppliers of products or services that it purchases. By opening up B2B links with its suppliers, Personal Trainer might achieve better inventory management and reduce its internal purchasing and communications costs.

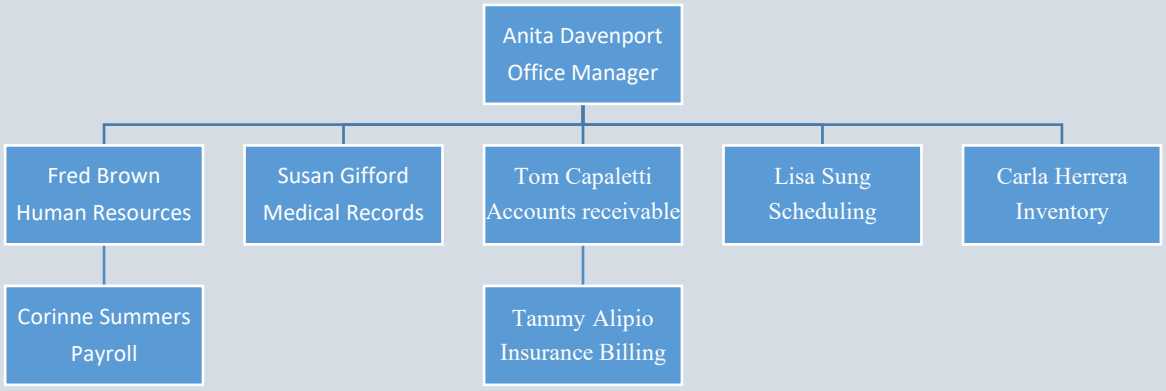
Capstone Case: New Century Health Clinic

Tasks

1. Use the background information to create a business profile for New Century, and indicate areas where more information will be needed. The profile should include an organization chart of the office staff. You can create the chart using Microsoft Word or a similar program, or you can draw it by hand. In Word 2010, click the Insert tab on the Ribbon, then Smart Art, then Organization Chart.

Answers will vary but should include components of a business profile including an overview of a company's mission, functions, organization, products, services, customers, suppliers, competitors, constraints, and future direction.

A sample organization chart is shown in the following figure. The job titles are not important, but it is necessary to identify the functions. Your students will want to refer to this chart in later chapters. Systems analysts must draw critical facts from a written summary, and creating an organization chart requires students to practice their analytical



2. Identify six business processes that New Century performs, and explain who has primary responsibility for each process. Also describe what data is required and what information is generated by each process.

Business Process	***Person Responsible***	***Data***
Prepare office payroll	*Corinne Summers*	*Employment hours, benefits, pay check data*
Handle tax reporting	*Fred Brown*	*Tax reports and payments*
Handle Employment Paperwork	*Fred Brown*	*New employee paperwork and training records*
Handle profit distribution	*Fred Brown*	*Track partner ownership, performance, and payments*
Maintain patient medical records	*Susan Gifford*	*Patient information and treatment records.*
Handle insurance reporting billing	*Tammy Alipio*	*Insurance information and billing data for patient visits.*
Handle accounting	*Tom Capaletti*	*Accounts receivable and payable.*
Manage appointment book	*Lisa Sung*	*Calendar and exchange information*
Make patient reminder calls	*Lisa Sung*	*Call record data*
Prepare daily appointment list	*Lisa Sung*	*Calendar data*
Order office and clinic supplies	*Carla Herrera*	*Inventory data*
Organize office and clinic supplies	*Carla Herrera*	*Inventory data*

3. Based on what you know at this point, is it likely that you will recommend a transaction processing system, a business support system, or a user productivity system? What about an ERP system? Explain your reasons.

The clinic could utilize a transaction processing system to track each charge, payment, and insurance claim. This system would reduce administrative costs, speed up insurance reimbursement, and provide controls and reports. A business support system could be used to analyze provider workloads, turnaround time for claims and payments, and forecast future staffing needs. A user productivity system would increase office efficiency and improve patient satisfaction.

New Century must develop computerized information systems for all critical operations as soon as possible. The first step is to identify New Century's current procedures, which are typical of many small- and medium-size companies. These include managing customer

(patient) records, accounts receivable (patient and insurance billing), accounts payable; scheduling production or services; and handling inventory, payroll, and human resources.

Because New Century deals with many insurance companies, there probably are opportunities to exchange claim information and payment status using EDI. Also, New Century can consider vertical and horizontal packages that would support the clinic's information management needs. The following table shows some possible systems that might be considered, along with potential benefits.

System	***Type***	***Use***	***Benefit***
Accounts receivable	*Vertical or horizontal*	*Track money owed the clinic for goods sold/services rendered; send monthly bills/statements to patients and insurance companies; automatically generate reminder statements*	*Identify overdue accounts and credit risks; provide faster, more accurate billing; improve customer service; increase cash flow by reducing the time between goods sold/services rendered and payment*
Accounts payable	*Vertical or horizontal*	*Send checks to suppliers; generate a purchases journal*	*Increase clinic's control over purchasing; minimize manual data entry; improve cash flow; increase profitability; provide more effective management of current liabilities*
Inventory	*Vertical or horizontal*	*Track inventories of office and clinic supplies*	*Obtain real-time inventory data; better inventory management*
Payroll	*Horizontal*	*Generate employee checks and federal and state tax forms; manage profit distribution to partners*	*Monitor and control pay to individual employees; determine cost of completing jobs; allow for electronic funds transfer (direct deposit) into employee bank accounts*
Voice mail	*Horizontal*	*Internal and external messaging*	*Allow customers to contact office after hours; faster, more effective internal messaging*
Fax	*Horizontal*	*Transmit forms to insurance companies; order office and clinic supplies*	*Faster transmission and ordering speeds insurance claim processing/order fulfillment*

System	*Type*	*Use*	*Benefit*
Word processing	*Horizontal*	*Create letters, memos, faxes, agendas, newsletters; do business mailings*	*More professional-looking documents via formatting features and templates; easier editing*
Scheduling; automated calendars	*Vertical or horizontal*	*Managing and tracking schedules; printing daily appointment lists*	*Minimize scheduling conflicts; provide efficient service, while maximizing appointment times*
Database management	*Horizontal*	*Managing and providing access to customer records (patients, employers, and insurance firms)*	*Increase access to records; provide better organization in a single repository; allow for querying and filtering of records; reduce paper flow*
Spreadsheets	*Horizontal*	*Plan and/or track costs, budgets, profits*	*Increase clinic's control over costs, budgets, profits; improve cash flow; increase profitability; provide more effective management of assets and liabilities*
Intranet	*Horizontal*	*Share data across the entire clinic (e.g., forms, policies, procedures; patient data; announcements)*	*Increase access to corporate and customer (patient) information; reduce paper flow*
Web-based	*Internet*	*Order office and clinic supplies online; place prescription orders for patients; send/check status of deliveries; create Web page to market the clinic, inform prospective patients, and answer frequently asked questions*	*Better customer service; reduce paper; less expensive ordering; real-time tracking data for orders*
E-mail	*Internet*	*Send reminder e-mails to patients; communicate with employers, insurance firms*	*More efficient, less expensive than long-distance calls*

System	*Type*	*Use*	*Benefit*
EDI	*Internet*	*Track claim data and reimbursement status*	*Reduce administrative costs, speed up insurance reimbursement, and provide controls and reports*

4. Describe the systems development method you plan to use, and explain the pros and cons of using this method.
Answers will vary but students should describe why the method was chosen, and compare the strengths and weaknesses of other methods.

	Structured analysis	***Object-oriented (O-O) analysis***	***Agile methods***
Modeling Tools	*Data flow diagrams (DFDs) and process descriptions, which are described in Chapter 5. Also, business process modeling, which is explained in Part B of the Systems Analyst's Toolkit.*	*Various object-oriented diagrams depict system actors, methods, and messages, which are described in Chapter 6. Also, business process modeling, which is explained in Part B of the Systems Analyst's Toolkit.*	*Tools that enhance communication, such as collaborative software, brainstorming, and whiteboards. Business process modeling, which is explained in Part B of the Systems Analyst's Toolkit, works well with agile methods.*
Strengths	*Traditional method, which has been very popular over time. Relies heavily on written documentation. Frequent phase iteration can provide flexibility comparable with other methods. Well-suited to project management tools and techniques.*	*Integrates easily with object-oriented programming languages. Code is modular and reusable, which can reduce cost and development time. Easy to maintain and expand as new objects can be cloned using inherited properties.*	*Very flexible and efficient in dealing with change. Stresses team interaction and reflects a set of community-based values. Frequent deliverables constantly validate the project and reduce risk.*
Weaknesses	*Changes can be costly, especially in later phases. Requirements are defined early, and can change during development. Users might not be able to describe their needs*	*Somewhat newer method might be less familiar to development team members. Interaction of objects and classes can be complex in larger systems.*	*Team members need a high level of technical and communications skills. Lack of structure and documentation can introduce risk factors. Overall project might*

	until they can see examples of features and functions.		

CASE Tool Workshop

Background

Suppose you are a part-time student assistant in the computer lab at your school. Janet Jacobs, the IT department chair, recently announced that a CASE tool will be installed on the lab network. Her decision was welcomed by many IT faculty members, who think it is important for students to learn about CASE tools and how use them to complete assignments in MIS courses.

You have been asked to evaluate various CASE tools, and submit the results. Your initial tasks will be to provide an overview of the Visible Analyst® CASE tool, or a similar tool.

Tasks:

1. Describe the user interface. Is it attractive and easy to use? Why or why not?
   A CASE tool interface is like any other application interface; some features are excellent, some are not. Students should be able to evaluate the interface and suggest what needs to be improved.

2. How do you open an existing project? How do you create a new project?
   *In Visible Analyst, you use the menu at upper left and click **File-Select Project**, and then click one of the listed projects. To create a new project, you would use the same menu and click **File-New Project**, and then follow the menu prompts.*

Chapter 1: Introduction to Systems Analysis and Design

Chapter 1 – Introduction to Systems Analysis and Design: Chapter 1 provides an introduction to systems analysis and design by describing the role of information technology in today's dynamic business environment.

Questions

1. What is information technology and why is it important? Suggest three fictitious headlines that might be added to Figure 1-1.

   Information technology (IT) is a combination of hardware and software products and services that companies use to manage, access, communicate, and share information. Your students should be able to suggest many interesting headlines. You might want to hold a class contest and reward the most creative headline writers.

2. Why would a systems analyst have to act as a translator? What groups might be involved?

   To succeed, analysts often must act as translators. For example, when they describe business processes to programmers, they must speak a language that programmers will understand clearly. Typically, the analyst builds a series of models, diagrams, decision tables, and uses other descriptive tools and techniques. Similarly, when communicating with managers, the analyst often must translate complex technical issues into words and images that nontechnical people can grasp. To do this, the analyst uses various presentation skills, models, and communication methods.

3. Write a business profile for a large business in your town. You can use your imagination to supply details you might not know.

   A business profile is an overview that defines a company's overall functions, processes, organization, products, services, customers, suppliers, competitors, constraints, and future direction. Students should be able to identify a large local firm, supply the basic information, and fill in the details.

4. What strategies are Wal-Mart and Lowes using to gain more online customers?

   Most successful brick-and-mortar firms, such as Lowe's, Costco, Target, and Wal-Mart, have expanded their Web-based marketing channels to increase sales and serve customers better. This strategy combines the convenience of online shopping and the alternative of hands-on purchasing for those who prefer that option.

5. Identify the main components of an information system. What is a mission-critical system?

   An information system has five main components: hardware, software, data, processes, and people. A mission-critical system is one that is vital to a company's operations. An order processing system, for example, is mission-critical because the company cannot do business without it.

6. Compare enterprise computing systems to transaction processing systems. Provide three examples of each type of system.

Enterprise computing systems support company-wide data management requirements. Airline reservations, asset management, and credit card billing systems are examples of enterprise computing systems. Transaction processing (TP) systems process data generated by day-to-day business operations. Examples of TP systems include customer billing, accounts receivable, and warranty claim processing.

7. What are the four organizational levels common to many businesses? Which level typically requires data that supports long-term strategic planning and the overall business enterprise? What level of worker might rely heavily on transaction processing systems?

Four organizational levels are operational personnel, lower management, middle management, and top management. Top managers need summary-level information; one-time, what-if information; and external information to support the strategic planning process. Operational personnel are the main users of transaction processing systems.

8. Describe three systems development tools and three development methods.

Systems analysts use modeling, prototyping, and computer-aided systems engineering (CASE) tools. Modeling produces a graphical representation of a concept or process, whereas prototyping involves the creation of an early working model of the information or its components. A systems analyst uses CASE tools to perform various systems development tasks.

Three popular system development methods are structured analysis, which is a traditional method that still is widely used, object-oriented analysis (O-O), which is a more recent approach that many analysts prefer, and agile methods, also called adaptive methods, which include the latest trends in software development.

9. What are the phases of the SDLC waterfall model? Who was Barry Boehm, and what did he have to say about spiral models?

The SDLC waterfall model consists of five phases: systems planning, systems analysis, systems design, systems implementation, and systems operation and support. During the systems planning phase, you identify the nature and scope of the problems discovered in the systems request and conduct a preliminary investigation. The purpose of the systems analysis phase is to learn exactly what takes place in the current system, determine and fully document in detail what should take place, and make recommendations to management on the alternative solutions and their costs. The purpose of the systems design phase is to determine how to construct the information system to best satisfy the documented requirements. Systems implementation is the phase during which the information system actually is constructed.

Spiral models initially were suggested in the 1990s by Barry Boehm, a noted software engineering professor. He stated that each iteration, or phase, of the model must have a specific goal that is accepted, rejected, or changed by the user, or client. The spiral model produces feedback and enhancements, which enable the team to reach the overall project goal. Spiral model activities include planning, risk analysis, engineering, and evaluation. The repeated iterations produce a series

of prototypes, which evolve into the finished system. Notice that these phases resemble SDLC tasks, which also can be iterative.

10. Review the IBM history. Describe three distinct phases the company has gone through in reaction to changing mark conditions.

IBM's history truly is remarkable. IBM is a 100-year old globe-spanning company with several hundred thousand employees. It has succeeded in part by constantly adapting to its changing business environment. For example, while it was once known primarily as a hardware company, today IBM makes a significant part of its revenue from software and services. It also invests in its people and tries to hire the best talent available. It has more patents and more Noble Prize winners than any other IT company in history.

Discussion Topics

1. Some experts believe that the growth in e-commerce will cause states and local governments to lose tax revenue, unless Internet transactions are subject to sales tax. What is one argument that supports this view, and one that opposes it?

*This issue has sparked strong differences of opinion among national and state leaders, consumer advocacy groups, and trade associations whose members offer online sales and services. Those who believe that Internet transactions should not be taxed often point to other sales channels, such as mail order firms that conduct no physical operations within a state or locality, and therefore do not collect sales tax. Should the Internet be treated differently? Opponents of a tax-free Internet often cite the impact on local and state government, and suggest that **all** channels should operate on a level playing field. You might ask your students to research and debate this issue. Also, you might follow this topic as news occurs during the course.*

2. Are top managers likely to be more effective if they have IT experience? Why or why not?

Some possible arguments for a "Yes" answer:

1) Information technology (IT) management has a broad understanding of the information processing of the company instead of the narrower view held by managers from other areas of the company.
2) IT management deals with all functional company areas so members of IT management know and interrelate with the people who lead and who work in these areas. Because they provide needed services to these areas, IT management personnel have the support of the key personnel from these areas.
3) Information systems development and maintenance is complex and requires extraordinary management skills to operate successfully. These same skills are necessary in top-level management positions.
4) Computer technology dominates many companies today. Today's technology leaders should be tomorrow's business leaders.

Some possible arguments for a "No" answer:

1) *IT management is more comfortable dealing with computers and with procedures, and less comfortable dealing with people. Top-level management positions require a strong interest in people and strong skills in dealing with people.*
2) *Whether a firm is product-oriented or service-oriented, it must make a profit to survive. Future company leaders should, therefore, come from the production, service, or financial areas, because these areas are the most important to a company. Possibly, in Internet-dependent firms, the best choice would be an IT manager — but only if he or she had extraordinary business skills apart from technical ability.*
3) *It is unwise to restrict prospects for top-level management positions to one specific area of the company. Competent leaders are apt to rise from many different departments.*
4) *People who have worked in several different functional areas are better rounded than those restricted to just one area. So, unless the IT manager has worked outside the IT department, he or she essentially is a specialist and is at a disadvantage compared to someone with more general knowledge and skills.*

3. Should the IT director report to the company president, or somewhere else? Does it matter?

No clear organizational pattern exists. Perhaps the strongest case for having the IT department report to the president is that information technology is a vital corporate asset, and should not be "owned" by a particular department or function. IT can have a huge impact on profitability, and deserves equal attention from the top executive.

However, not everyone agrees with this view, and many would argue that IT should report to the chief financial officer, because financial functions require the most IT support. Also, the operation of the IT department represents a large expense for most companies, and the chief financial officer probably is in the best position to monitor and control this expense.

4. Will online transactions eventually replace person-to-person contact? Why or why not?

IT professionals agree that computer technology is changing the way companies do business. Many brick-and-mortar firms are launching large-scale B2B and B2C ventures that profoundly will affect traditional business practices and operations. Few observers think that IT will replace person-to-person contact totally, although many clerical and administrative functions will become automated. The real question is how these changes will affect people in an information-oriented society. Many observers feel that the implications of huge quantities of information and 24/7 access can cut in both directions.

Reasonable people differ on these issues, and you might want to propose a debate among your students. For additional background and viewpoints about the impact of computer technology on traditional person-to-person interaction, students can perform research on the Internet and compare the views of technology-based publications such as InfoWorld, to mainstream business publications such as Fortune, Forbes, and the Harvard Business Review, among others.

5. The BYOD movement has serious implications for IT professionals, such as managing applications on user devices and security implications. Do you think BYOD is a net positive or a net negative for the enterprise? Explain your answer.

Systems analysts need to know about the role of apps and the effect of the "bring your own device" (BYOD) movement in the enterprise.

BYOD can negatively affect the enterprise by introducing security risks, by increasing incompatibilities among employee devices, and by reducing productivity as employees are forced to maintain and update the software on their devices themselves.

BYOD can positively affect the enterprise by lowering capital costs for employee equipment, by off-loading tasks from the IT support department and therefore letting them focus on more high-level concerns, and by increasing productivity as employees use devices they are familiar with from outside usage.

Projects

1. Contact four people at your school who use information systems. List their positions, the systems they use, and the business functions they perform.

Students can perform this task as individuals or work in teams. It might be interesting to compare and discuss the various ways in which the departments manage information.

2. Research newspaper, business magazine articles, or the Web to find IT companies whose stock is traded publicly. Choose a company and pretend to buy $5,000 of its stock. Why did you choose that company? What is the current price per share? Report each week to your class.

To perform the task, students will need a basic understanding of the stock market. Sites such as Yahoo! offer financial information and analysis links and resources. If students need fundamental information about investing in stocks, you might direct them to the material at www.free-financial-advice.net/stock-market.html. Industry leader Vanguard also offers free online information about investing at www.vanguard.com. Also, many school and community libraries can assist students in learning about financial terms and concepts, including stock market investments.

3. Visit at least three Web sites to learn more about agile system development and spiral models. Prepare a list of the sites you visited and a summary of the results.

Many sites describe and discuss agile methods. Students should have no trouble finding material on agile methods and spiral models and preparing a summary of the results. Several sites are shown in the text, and a simple search will produce a list of many more.

4. Explore the Critical Thinking Community Web site at criticalthinking.org. Identify three important topics currently being discussed, and describe your findings.

You might encourage students to explore beyond the suggested link, and challenge them to identify additional resources and issues. Also consider asking them to examine their own approach to learning, and whether they would consider themselves to be critical thinkers.

5. Read about the corporate culture of three leading IT companies, such as that from Google shown in Figure 1-27. Compare each statement of values and describe the type of employee you think each company is looking for.

It would be insightful for examine a traditional company, such as IBM, which has an established but dynamic corporate culture that has withstood the test of time. Newer companies such as Facebook are also quite large, but their culture originates in a different space than that of IBM. The culture of a Silicon Valley startup is different yet again, and the type of employee they seek may have different professional goals – particularly if they are at the start of their career.

Systems Analysis and Design
Eleventh Edition

Phase 1: Systems Planning

A Guide to the Instructor's Manual:
We designed the Instructor's Manual to supplement and enhance your teaching experience with classroom activities and a cohesive chapter summary.

This document is organized chronologically, using the same main heading in **red** that you see in the textbook. Under each heading you will find (in order): Lecture Notes that summarize the section, Figures and Boxes found in the section, if any, Teaching Tips, and Classroom Activities. Pay special attention to teaching tips and activities geared toward quizzing your students and enhancing their critical thinking skills.

In addition to the Instructor's Manual, the Instructor Companion Site also contains PowerPoint Presentations, Solutions to Exercises, Figures, Test Banks, and other materials to aid you as an instructor.

1: Phase 1: Systems Planning

LECTURE NOTES

- Use the Gantt chart as a starting point for a discussion about systems development.
- Inform that systems planning is the first of five phases in the systems development life cycle.
- Indicate that the systems planning phase explains how systems projects get started, how to evaluate a project proposal to determine its feasibility, and how to use project management tools and techniques.
- Discuss the deliverable for the systems planning phase.

FIGURES: Gantt chart on Page 1

CLASSROOM ACTIVITIES

1. Group Activity: Ask students if they have ever used Gantt charts, and ask them to explain when they have used them. Also ask for examples of other task sets that might lend themselves to Gantt charts (planning a vacation, buying and installing a new kitchen faucet, etc.)

Systems Analysis and Design
Eleventh Edition

Chapter 1: Introduction to Systems Analysis and Design

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Key Terms
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2: Learning Objectives

Students will have mastered the material in Chapter One when they can:

- Describe the impact of information technology
- Define systems analysis and design and the role of a systems analyst
- Define an information system and describe its components
- Explain how to use business profiles and models
- Explain Internet business strategies and relationships, including B2C and B2B
- Identify various types of information systems and explain who uses them
- Distinguish among structured analysis, object-oriented analysis, and agile methods
- Explain the waterfall model, and how it has evolved
- Discuss the role of the information technology department and the systems analysts who work there

3: Introduction

LECTURE NOTES

- Use Figure 1-1 as a starting point for a discussion about how information technology affects the society
- Discuss the benefits of using information by an organization
- Discuss the importance of information technology in a global economy

FIGURE: 1-1

3: What Is Information Technology

LECTURE NOTES

- Define information technology (IT)
- Discuss the role of information technology in an organization's success
- Use Figure 1-2 to discuss how technology has evolved over the years
- Use Figure 1-3 to illustrate job opportunities available in IT
- Define an information system
- Provide an overview of systems analysis and design
- Discuss the role of systems analysts

FIGURES: 1-2, 1-3

TEACHING TIPS

Explain the way in which information systems are used. In business, clerks, sales representatives, accountants, supervisors, managers, executives, and customers all use information systems, either directly or indirectly. Information systems support daily, short-term, and long-term activities.

Talk over the history of information technology and how it has evolved. From Herman Hollerith and IBM to tablets and smartphones, generate excitement about the endless possibilities of IT in the 21st century.

CLASSROOM ACTIVITIES

1. Quick Quiz: Assign Question 1 on page 39.

2. Quick Quiz: Assign Question 10 on page 39.

2. Critical Thinking: What characteristics would make an individual a strong systems analyst?

5: Case in Point 1.1: Cloud Nine Financial Advisors

Cloud Nine provides its clients with a monthly newsletter that offers recommendations about stocks to buy or sell. Doug Layton, Cloud Nine's president, has asked your opinion on whether dot-com stocks might be good investments for the future. He specifically mentioned Google, eBay, Amazon.com, and Yahoo!, but he said you could suggest other companies. Doug wants you to do some Internet research to learn more about these web-based companies and their future prospects. You can use a search engine,

or start by visiting the websites of publications such as *Forbes*, *Fortune Magazine*, *Business Week*, or *The Wall Street Journal*, among others.

***Comments**: Encourage students to share the results of their research. Some students understand the stock market, but many others do not. This would be a good opportunity to explain the basics of investing. In recent years, compared to other sectors, IT industry stocks have been significantly more volatile, and the hope of higher rewards is balanced by the prospect of higher risks. Google and Yahoo! are excellent examples of new stock offerings that exceeded all expectations. No one can know which companies will be the winners. The main point of this case is to encourage students to understand more about the business aspects of the IT industry, and to decide whether they want to invest in this area.*

5: Information System Components

LECTURE NOTES

- Define system and mission-critical system
- Explain in what way data is different from information
- Use Figure 1-5 to identify the key components of an information system
- Define hardware
- Define server farm using Figure 1-6
- Discuss Moore's Law
- Define software, and show that system software is different from application software
- Describe enterprise applications by providing examples such as order processing systems, payroll systems, and company communication networks
- Differentiate between a horizontal system and a vertical system
- Define legacy systems
- Redefine data using a typical payroll system as an example
- Describe processes
- Define stakeholders and users (end users)

FIGURES: 1-4, 1-5, 1-6, 1-7

TEACHING TIPS

Using Figure 1-7, illustrate a payroll system that stores data in related tables.

Elucidate the prediction of Gordon Moore, a cofounder of Intel, and update that this prediction was valid for 50 years.

Explain that system software manages the hardware components of a system. It also controls the flow of data, provides data security, and manages network operations. Offer examples of system software, which include: Windows, UNIX, Mac OS X, and Linux (operating systems); personal firewalls (security software); and file viewers, file compression utilities, disk scanners, and screen savers (utility programs).

CLASSROOM ACTIVITIES

1. Class Discussion: Ask students for examples of mission-critical systems.

2. Class Discussion: Challenge students to give examples of data and information. Encourage them to explain why they classified each example as they did.

3. Class Discussion: Ask students to suggest processes that might be used to perform a simple operation, such as selling an item in a grocery store.

4. Critical Thinking: Which is more widely available and less expensive: horizontal or vertical systems? Why?

5. Quick Quiz: Assign Question 5 on page 39

8: Business Today

LECTURE NOTES

- Define ecommerce (electronic commerce)
- Discuss the use of an app
- Describe B2C ecommerce, and point out the types of companies that participate in B2C ecommerce
- Discuss how B2C ecommerce is changing traditional business models
- Describe B2B ecommerce, and point out the advantages of B2B ecommerce
- Describe electronic data interchange (EDI)
- Differentiate between B2C (business-to-consumer) ecommerce and B2B (business-to-business) ecommerce
- Define supply chain

TEACHING TIPS

Mention that B2C ecommerce involves the sale of products or services to the general public. In addition to allowing customers to compare and buy products, some B2C websites offer access to product reviews, chat rooms, and other product-related information.

Explain that B2B ecommerce consists of the sale and exchange of products and services between businesses.

CLASSROOM ACTIVITIES

1. Class Discussion: Ask students to describe their B2C experiences. What types of services or products (such as travel, hobbies, electronic products, and so on) did they purchase? How satisfied were they with the transaction? Why?

2. Critical Thinking: Assign Discussion Topic 1 on page 39.

3. Critical Thinking: Assign Discussion Topic 4 on page 39.

4. Quick Quiz: Assign Question 4 on page 39.

5. Projects to Assign: Assign Project 2 on page 39.

10: Modeling Business Operations

LECTURE NOTES

- Define business profile
- Define business process

- Define business process model (BPM)
- Describe business process modeling notation (BPMN)

FIGURES: 1-8, 1-9

TEACHING TIPS
Discuss the use of business process models (BPM) in providing visual representations of business processes using Figure 1-8.

Use Figure 1-9 to illustrate a business process modeling notation (BPMN).

CLASSROOM ACTIVITIES
1. Class Discussion: Ask students for examples of business processes for registration of classes at their university.

2. Quick Quiz: Assign Question 3 on page 39.

10: Business Information Systems

LECTURE NOTES
- Specify the four types of system definitions
- Define enterprise computing
- Discuss the main objective of enterprise computing
- Define enterprise resource planning (ERP), and discuss its advantages and disadvantages
- Use Figure 1-10 to show an example of an ERP solution that can boost productivity
- Describe transaction processing (TP) systems, and use Figure 1-11 to show the tasks processed by a TP system
- Discuss business support systems and management information systems (MIS)
- Discuss radio frequency identification (RFID) technology with the help of Figure 1-12
- Discuss the important feature of business support systems
- Characterize the knowledge base and inference rules that make up knowledge management systems
- Use Figure 1-13 to explain a knowledge management system
- Give examples of user productivity systems
- Define groupware
- Discuss the need for systems integration

FIGURES: 1-10, 1-11, 1-12, 1-13

TEACHING TIPS
Enterprise Resource Planning (ERP) systems are used by most organizations today to increase efficiencies and maximize effectiveness of operations.

Explain the reason for ERP systems to be considered essential for integrating business processes, improving data security, and helping managers make key decisions. For example, a truck manufacturer can use ERP to forecast customer demand for his trucks at several locations. Mention several of the key

vendors of ERP systems and discuss how an understanding of these systems is required in most organizations.

Explain that management information systems evolved from transaction processing systems as a way to organize information for managers. Management information systems can produce detailed reports that list transactions, summary reports that consolidate data, or exception reports that identify data outside of normal conditions.

CLASSROOM ACTIVITIES
1. Group Activity: Ask students if they have ever used a website that uses a knowledge base and to list their experiences with such websites.

2. Quick Quiz: Assign Question 6 on page 39.

14: What Information Do Users Need?

LECTURE NOTES
- Use Figure 1-14 to describe a typical organizational model
- Point out why a systems analyst must understand a company's organizational model
- Describe strategic plans
- Discuss middle managers and knowledge workers
- Describe the roles of supervisors or team leaders.
- Define operational employees, and describe the empowerment trend

FIGURE: 1-14

TEACHING TIPS
Organizational levels affect not only the type of information needed; it also defines the presentation of information. A night shift supervisor can be given raw columns of data. A report for a top manager, however, often requires an artistic title page, a summary page, and several pages of graphical presentations complete with footnotes.

Point out how the information required by middle managers is different from the information required by top managers. While top managers make strategic decisions, some say that middle managers make tactical decisions, determining specific programs and plans to meet stated objectives. As businesses expand and new companies grow, middle managers are in increasing demand.

Explain that supervisors make operational decisions that involve a company's day-to-day activities. These decisions should be consistent with and support the decisions made by middle management. Top managers often have far less computer experience than middle managers and supervisors.

CLASSROOM ACTIVITIES
1. Projects to Assign: Assign Project 1 on page 39.

2. Quick Quiz: Assign Question 7 on page 39.

3. Critical Thinking: Assign Discussion Topic 2 on page 39.

15: Systems Development Tools

LECTURE NOTES

- List various systems development tools, and point out that systems analysts should be familiar with each of these
- Define modeling
- Discuss the concept of business model
- Define prototyping and prototype
- Point out the disadvantage of prototyping
- Define computer-aided systems engineering (CASE) (also called computer-aided software engineering) and CASE tools
- Use Figure 1-16 to show a CASE tool

FIGURES: 1-15, 1-16

TEACHING TIPS

Use Figure 1-15 to explain the dragging and dropping of various symbols and connecting them to show a business process using the charting tool Microsoft Visio.

Explain that a prototype allows users to work with a system before it is completed to make sure it meets their needs. Prototypes and test data commonly are used to see how a complex system will work before committing large amounts of time and money. Prototyping is rarely used in small businesses.

Explain that CASE tools increase the efficiency of systems development. CASE tools can exist independently or be integrated together. CASE technology allows programmers to retrieve commonly used algorithms from a central repository and combines them together to form modules. CASE tools can be used to design a program in a condensed form of English and then automatically generate code in a programming language. One disadvantage of CASE tools is that they can take a long time to learn them.

CLASSROOM ACTIVITIES

1. Class Discussion: Ask students if a kind of prototyping could be used before deciding on a personal course of action (such as whether or not to take a part-time job).

17: Systems Development Methods

LECTURE NOTES

- List the different systems development methods
- Using Figure 1-17, introduce and differentiate structured analysis, object-oriented (O-O) analysis, and agile (or adaptive) methods
- Define structured analysis and systems development life cycle (SDLC)
- Clarify the reason for structured analysis being called a predictive approach and a process-centered technique
- Describe the concept of business rules, and use Figure 1-18 to illustrate a process model
- Discuss data flow diagrams (DFD)

- Point out that the SDLC describes activities and functions employed in all systems development, regardless of the approach used
- Introduce waterfall model, and define deliverable
- List the steps in the SDLC model
- Describe the systems planning phase
- Explain the concept of systems request
- Discuss preliminary investigation
- Outline feasibility study and explain its importance
- Describe the purpose of systems analysis phase along with the first step of the phase and its deliverable
- Describe the purpose of systems design phase
- Define system design specification
- Describe the systems implementation phase, and discuss systems evaluation
- Describe the systems support and security phase, and define scalable design
- Describe objects
- Define class and properties
- Use Figure 1-20 to show how an object inherits properties from its class
- Define methods with respect to O-O analysis
- Discuss the role of a message in O-O analysis
- Use Figure 1-21 to depict how planning, analysis, and design tasks interact continuously to generate prototypes that can be tested in a typical O-O development model
- Discuss iterative development
- Define spiral model
- Discuss the advantages and disadvantages of agile methods
- Describe joint application development (JAD) and rapid application development (RAD)

FIGURES: 1-17, 1-18, 1-19, 1-20, 1-21, 1-22

TEACHING TIPS

Point out that the SDLC is formalized in many organizations, with detailed instructions outlining reporting requirements, specific tasks that must occur in each phase, and individual responsibilities. The goal of structured analysis and the SDLC is to create a system with the desired capabilities, within budget, and on time.

Point out how perceived problems can be different from actual problems. Benefits of a new system can be intangible, such as greater customer satisfaction, or tangible, such as reduced expenses. A compelling benefit can be the cost of *not* acting; a bank's installation of an ATM may not yield positive cash benefit, but consider the impact that not installing an ATM would have on business.

Explain that during systems analysis, the current system is studied by developers, user's requirements (requirements modeling) are determined, and a solution (systems requirement document) is recommended. The time spent on this phase of the SDLC usually is quite short when compared with the rest of the project.

Mention that some experts feel an impartial third party who has not been actively involved in the design of the system should do the systems evaluation. Users and systems analysts may have a tendency

to test only what has been designed; a third party is more likely to discover a procedure or type of data that has been overlooked.

During the systems support and security phase, explain that a systems analyst reviews the system, identifies errors, identifies enhancements, monitors system performance, and protects the system. When systems implementation is complete, the key issue is whether the system performs as advertised. Experienced systems analysts find that the worst situation occurs when management or users have changed their expectations, and these changes are not reflected in the new system. The best insurance against this problem is frequent communication between and feedback from all participants throughout the SDLC. Point out that information systems development is a continuing process.

Students may need help differentiating between JAD and RAD. A JAD session is a lengthy, structured, group work meeting in which users and IT professionals discuss an aspect of a systems development project. The goal is to obtain group agreement on an issue. RAD is the concept of developing software during the system development process. Prototyping is a common RAD technique.

CLASSROOM ACTIVITIES

1. Projects to Assign: Assign Project 3 on page 39.

2. Quick Quiz: Assign Questions 8 and 9 on page 39.

3. Critical Thinking: Agile methods are quickly becoming a preferred development approach. Ask students to compare and contrast the agile approach with the structured and object-oriented analysis methods.

24: The Information Technology Department

LECTURE NOTES

- Discuss information technology (IT) department
- Use Figure 1-23 to discuss a typical IT organization in a company that has networked PCs, enterprise-wide databases, centralized processing, and web-based operations
- Describe technical support
- Describe the application development group, listing the members of a development team and characterizing a popular model for information systems development
- Discuss systems support and security; point out the responsibilities of the systems support and security group
- Define help desk, and clarify the role of user support specialists
- Outline database administration, and discuss the importance of continuous attention and technical support for mission-critical database applications
- Define network administration and point out the responsibilities of network administration
- Define web support, and point out the tasks performed by web support specialists
- Discuss the responsibilities of a quality assurance (QA) team

FIGURE: 1-23

TEACHING TIPS

A help desk specialist is an entryway into the information technology (IT) field. Almost all organizations provide their employees with some type of help desk assistance. Within most companies, this job is one of the least technical. Some of the job requirements may include the following:
1) Solve procedural and software questions both in person and over the telephone
2) Develop and maintain help desk operations manuals
3) Assist in training new help desk personnel

The type of questions one might encounter as a help desk specialist depends on the setting. In most instances, a help desk specialist must be informed about major software packages in use. Entry-level positions primarily answer calls from people with questions. Other positions, however, provide additional assistance and assume further responsibilities, often demanding greater knowledge and problem-solving skills that can serve as a springboard to more advanced positions in the IT field.

CLASSROOM ACTIVITIES
1. Critical Thinking: Assign Discussion Topic 3 on page 39.

25: Case in Point 1.2: Global Hotels and Momma's Motels

Suppose you work in the IT department of Global Hotels, a multinational hotel chain. Global Hotels runs several specialized business support systems, including a guest reservations system that was developed in-house to meet the requirements of a large company with worldwide operations. Guests can make one-stop online reservations by visiting Global's website, which has links to all major travel industry sites.

Global Hotels just acquired Momma's, a regional chain of 20 motels in western Canada. Momma's uses a vertical reservations package suitable for small- to medium-sized businesses and a generic accounting and finance package. Should Momma's use Global Hotels' information systems or continue with its own? In your answer, consider issues such as business profiles, business processes, system interactivity, EDI, ecommerce, and the characteristics of both information systems. What additional information would be helpful to you in making a recommendation?

Comments: *The answer depends on the corporate culture and IT policies at both companies and the organizational relationship between them. Clearly, there is quite a difference between Global Hotels and Momma's. Students can discuss how that difference would affect information needs of smaller versus larger firms.*

To make a decision about the SDLC process, Global must determine whether Momma's can handle local IT needs with its current systems development approach. If so, it might be best to leave this process alone. On the other hand, Momma's might have to develop and install certain corporate-wide systems to interface with the Global Hotels financial and accounting systems. In this case, Global probably would send IT people to guide Momma's in applying Global's standard SDLC process. In a diversified corporation, the main objective is to select a development strategy that supports the business needs of both the parent and the subsidiary business unit.

With regard to Momma's future approach, students should be able to see how issues such as business profiles, business processes, system interactivity, EDI, ecommerce, and the characteristics of both information systems might affect the decision. If the objective is tighter integration between the two business units, then Momma's might benefit from EDI and strategies. On the other hand, there might be a downside to adopting Global's systems development approach just because it is a larger, more sophisticated business. Going back to the question about what additional information would be helpful in making a recommendation, students should suggest more data on corporate culture, IT policies at both companies, the organizational relationship between them, and strategic plans.

26: Case in Point 1.3: What Should Lisa Do?

Lisa Jameson has two job offers. One is from Pembroke Boats, a boat manufacturer that employs 200 people in a small Ohio town. Pembroke does not have an IT department and wants her to create one. The job position is called information coordinator, but she would be the only IT person.

The other offer, which pays about $7,500 more annually, is from Albemarle Express, a nationwide trucking firm located in Detroit. At Albemarle Express, Lisa would be a programmer-analyst, with the promise that if she does well in her position, she eventually will move into a systems analyst position and work on new systems development. Lisa has heard a rumor that another company might acquire Albemarle Express, but that rumor has occurred before and nothing has ever happened. What should Lisa do, and why?

***Comments**: Encourage students to identify the key issues that Lisa should consider. These include working for a small firm rather than a large corporation, living in a small town instead of a big city, being on her own versus being a member of a large IT department, getting involved in a startup situation versus working with established systems. Also to be considered are salary issues, job security questions, and the possible impact of future mergers or downsizing. In the end, Lisa must decide what is important to her as an individual.*

26: The Systems Analyst

LECTURE NOTES

- Discuss the roles and responsibilities of a systems analyst
- Point out the skills (including critical thinking skills) and educational background a systems analyst must posses
- Use Figure 1-24 to show that the IEEE computer society is one of the leading computing organizations offering systems analysts a wide array of information, news, training, support communities, and more
- Discuss the importance of strong oral and written communication skills to be possessed by systems analysts
- Discuss the importance of critical thinking skills and use Figure 1-25 to show the website for The Critical Thinking Community that provides encouragement and resource for critical thinkers
- Point out the need for certification and use Figure 1-26 to show that employers like to hire people who can think logically and effectively
- Point out the strong demand for systems analysts, noting the horizon of opportunities available for systems analysts
- Discuss how the responsibilities of a systems analyst vary depending on an employer's size, with many analysts working as consultants
- List job titles that may involve responsibilities of a systems analyst

- Point out the importance of company organization when evaluating prospective employers
- Describe the role of a systems analyst based on company size
- Discuss the importance of considering salary, location, and future growth
- Define corporate culture and use Figure 1-27 to show the attractive corporate culture of Google

FIGURES: 1-24, 1-25, 1-26, 1-27

TEACHING TIPS

Systems analysts are the liaison between users and IT professionals. They convert user requests into technical specifications. To be effective, a systems analyst must:
1) have state-of-the-art technical knowledge
2) be familiar with business operations
3) have excellent communications and interpersonal skills

The primary focus of this work is to design and develop new hardware and software systems and to incorporate new technologies. A successful systems analyst must be willing to embrace new technologies and be prepared for continual learning. Typically, systems analysts are more involved in design issues than in day-to-day coding. Systems analyst is a somewhat arbitrary title, however, as companies have varying definitions for the role.

Explain that duties of the systems analyst can vary. In small- and medium-sized businesses, the systems analyst also may be a programmer. The role of the systems analyst is critical. The systems analyst must understand the business' and the users' needs, as well as the technical aspects of system and program development.

Emphasize the importance of interpersonal skills in the work of the systems analyst. Despite the importance of the relationship between IT professionals, such as the systems analyst, and users, such as business managers, the bond can be contentious.

Minimum educational requirement for systems analysts is a bachelor's degree, but many people opt for a master's degree. Point out the opportunities available on the Internet to update technical knowledge and skills.

Benefits of certification include:
1) Proof of professional achievement
2) Enhancement of job opportunities
3) Opportunity for advancement

Explain that certifications are developed by a sponsoring organization, which include computer equipment and software vendors, independent training companies, and professional organizations.

CLASSROOM ACTIVITIES

1. Class Discussion: Ask students to think through other ways in which systems analysts can maintain their skills.

2. Projects to Assign: Assign Project 4 on page 39.

3. Projects to Assign: Assign Project 5 on page 39.

4. Quick Quiz: Assign Question 2 on page 39

31: Case in Point 1.4: Just-in-Time Airfreight, Inc.

Suppose you are the IT director at Just-in-Time Airfreight, and you have received authorization to hire another systems analyst. This will be an entry-level position, and the person will assist senior systems analysts on various projects involving the reservations and the human resources systems. Using the information in this chapter, draft an ad that would appear in *The Wall Street Journal*, local newspapers, and online. You can get some ideas by visiting monster.com, or a similar site. In your ad, be sure to list desired skills, experience, and educational requirements.

***COMMENTS**: Answers will vary. The main objective is to get students to think about real-world it opportunities. While four-year degrees are required, many companies will accept equivalent training, experience, or certification credentials. Encourage students to do a job search first, and then try to write a suitable ad.*

31: Trends in Information Technology

LECTURE NOTES

- List the key trends that disrupt information technology
- Discuss bring your own device movement (BYOD)
- Discuss cloud computing
- Discuss product-oriented and service-oriented firms

TEACHING TIPS

Explain that bring your own device movement (BYOD) allows employees to bring their own devices to access an organization's data and perform operations. If any problem occurs in these devices, the IT department will not be in charge.

CLASSROOM ACTIVITIES

1. Critical Thinking: Assign Discussion Topic 5 on page 39.

32: A Question of Ethics

You are enjoying your job as a summer intern in the IT department of a local company. At lunch yesterday, several people were discussing ethical issues. You learned that some of them belong to IT organizations that have ethical codes to guide members and set professional standards. For example, Ann, your supervisor, belongs to the Association for Computing Machinery (ACM), which has over 100,000 members from more than 100 countries and a website at acm.org. Ann said that the ACM code of ethics is important to her, and would definitely influence her views. On the other hand, Jack, a senior programmer, believes that his own personal standards would be sufficient to guide him if ethical questions were to arise.

Because you are excited about your career as an IT professional, you decide to visit ACM's website to examine the code of ethics and make up your own mind. After you do so, would you tend to agree more with Ann or with Jack?

Comments: *Ann's position makes more sense. She is not saying that she would follow the ACM guidance in all cases—only that the ACM code would influence her. She can still rely on her personal standards if she wishes to do so. Jack, on the other hand, won't have the benefit of broad-based community standards that have been accepted by many thousands of members. His own moral compass might be fine, but it certainly would not hurt to have valuable input from others.*

Key Terms

- adaptive methods (17)
- agile methods (17)
- app (9)
- application software (7)
- B2B (business-to-business) (9)
- B2C (business-to-consumer) (9)
- bring your own device (BYOD) (31)
- business model (16)
- business process (10)
- business process model (BPM) (10)
- business process modeling notation (BPMN) (10)
- business profile (10)
- business rules (19)
- business support systems (12)
- CASE tool (17)
- certification (28)
- class (21)
- computer-aided software engineering (CASE) (17)
- computer-aided systems engineering (CASE) (17)
- corporate culture (30)
- critical thinking skills (28)
- data (5)
- data flow diagram (DFD) (19)
- deliverable (19)
- ecommerce (electronic commerce) (8)
- electronic data interchange (EDI) (9)
- empowerment (15)
- enterprise application (7)
- enterprise computing (11)
- enterprise resource planning (ERP) (11)
- feasibility study (20)
- groupware (13)
- hardware (6)
- help desk (25)
- horizontal system (7)
- inference rule (13)
- information (5)
- information system (4)
- information technology (IT)
- iterative (22)
- joint application development (JAD) (24)
- knowledge base (13)
- legacy systems (7)
- management information systems (MIS) (12)
- mission-critical system (5)
- modeling (16)
- Moore's Law (6)
- objects (21)
- object-oriented (O-O) analysis (17)
- preliminary investigation (20)
- processes (7)
- product-oriented (31)
- properties (21)
- prototype (16)
- radio frequency identification (RFID) (12)
- rapid application development (RAD) (24)
- requirements modeling (20)
- scalable (21)
- server farm (6)
- service-oriented (31)
- software (6)
- spiral model (23)
- stakeholders (7)
- strategic plans (14)
- structured analysis (17)
- supply chain (10)
- system (5)
- system design specification (21)
- system requirements document (20)
- system software (6)
- systems analysis and design (4)
- systems analysis phase (20)
- systems analyst (4)
- systems design phase (20)
- systems development life cycle (SDLC) (18)
- systems implementation phase (21)
- systems planning phase (20)
- systems request (20)
- systems support and security phase (21)
- technical support (24)
- transaction processing (TP) systems (11)
- user productivity system (13)
- users (7)
- vertical system (7)
- waterfall model (19)

End of Chapter Material

- **Chapter Exercises:** The Chapter Exercises include questions, discussion topics, and projects that reinforce concepts and provide opportunities to practice skills.

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