# Chapter 1 Solutions

**Apply Your Knowledge ri al] e**

**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.*

1. 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.*

1. 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.*

1. 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.*

1. 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*](http://data.bls.gov/oes/search.jsp)*.*

1. 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/*](http://www.indeed.com/)

1. 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.*

1. 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.*

1. 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.*

1. 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.*

1. 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.*

1. 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.*

1. 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 s**

**Chapter Case: Hudson Kayak Adventures** s

**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.

1. 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:*



1. 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.

1. 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.** s

**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*

1. 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*

1. 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.*

1. 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** c

**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*

1. 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* |

1. 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 |
| 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 |
| 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 until they can see examples of features and functions. | 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 |

**CASE Tool Workshop s**

**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.*

1. 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.*