

Apply Your Knowledge

This section contains four mini-cases. Each case describes a situation, explains your role, and requires you to apply what you learned in the chapter.

Globe Consulting

You are a senior systems analyst at Globe Consulting, a growing IT consulting firm. You are leading the development team for a major client. You need to explain data and process modeling to your two newly hired junior analysts (Michelle and Aidan) before meeting with the client tomorrow afternoon.

Tasks

1. Describe the rules for creating DFDs.
2. What are the data flow and process combinations that must be avoided when creating a DFD?
3. Explain what a diagram 0 is and how it is used.
4. Ask Michelle and Aidan to review the order system context diagram on page 188, and compare it with the order system diagram 0 DFD on page 192. Then ask them to answer the following questions: (a) How many external entities are shown in each diagram? (b) In each diagram, how many data flows connect to the external entities? (c) How many processes are identified in the diagram 0 DFD? (d) Could the data store have been shown in the context diagram? Why or why not?

2 Kitchen Gadgets

Kitchen Gadgets sells a line of high-quality kitchen utensils and gadgets. When customers place orders on the company's Web site or through electronic data interchange (EDI), the system checks to see if the items are in stock, issues a status message to the customer, and generates a shipping order to the warehouse, which fills the order. When the order is shipped, the customer is billed. The system also produces various reports.

Tasks

1. List four elements used in DFDs, draw the symbols, and explain how they are used.
2. Draw a context diagram for the order system.
3. Draw a diagram 0 DFD for the order system.
4. Explain the importance of leveling and balancing.

3 Big State University

The Big State University course catalog reads as follows: “To enroll in MIS 260, which is an advanced course, a student must complete two prerequisites: MIS 120 and MIS 222. A student who completes either one of these prerequisites and obtains the instructor’s permission, however, will be allowed to take MIS 260.”

Tasks

1. Create a decision table that describes the Big State University course catalog regarding eligibility for MIS 260. Show all possible rules.
2. Simplify the table you just created. Describe the results.
3. Draw a simplified decision tree to represent the Big State University catalog. Describe the results.
4. Why might you use a decision tree rather than a decision table?

4 Fresh-Mart Grocery

Fresh-Mart Grocery is a regional grocery chain that is developing an information system to monitor inventory levels, product sales, and merchandise turnover. As products are sold in stores, they need to be replaced by shipments from the distribution centers. The IT manager wants you to document a process called BALANCE that determines whether extra product inventory is needed in a particular store. The BALANCE process is to be used in a just-in-time inventory system that automatically orders products and routes them to various stores for sale. A store manager can override the automatic BALANCE process if he or she so desires to get more product into a store.

Tasks

1. Create a decision table that describes the movement of inventory.
2. Draw a decision tree that describes the merchandise inventory management process.
3. Name four attributes that you can use to define a data flow in the grocery inventory information system.
4. Name four attributes that you can use to define a data store in the grocery inventory information system.

Case Studies

Each chapter includes a Chapter Case, a Continuing Case, a Capstone Case, and an Online Case Simulation. You can learn more about the Online Case Simulation in the MIS CourseMate Features section.

Chapter Case: College Driver Insurance

College Driver Insurance offers discounted auto insurance to college students.

Background

The company uses several factors to set discounts, as follows:

- A student who has taken a safe driver course earns a 5% discount.
- A student with a clean record (no tickets or accidents in the last three years) earns a 5% discount.
- A student who is 23 or older earns a 5% discount.
- A student who meets all three conditions (has taken a safe driver course *and* has a clean record *and* is 23) earns an additional bonus discount of 5%.

Tasks

1. Create a decision table that describes the discount rules.
2. Simplify the table you just created. Describe the results.
3. Draw a simplified decision tree that shows the discount rules.
4. What are the pros and cons of using a decision table versus a decision tree?

Continuing Case: Personal Trainer, Inc.

Personal Trainer, Inc. owns and operates fitness centers in a dozen Midwestern cities. The centers have done well, and the company is planning an international expansion by opening a new “supercenter” in the Toronto area. Personal Trainer’s president, Cassia Umi, hired an IT consultant, Susan Park, to help develop an information system for the new facility. During the project, Susan will work closely with Gray Lewis, who will manage the new operation.

Background

Susan Park has completed a preliminary investigation and performed the fact-finding tasks that were described in Chapters 2 and 4. Now, she will use the results to develop a logical model of the proposed information system.

Tasks

Before you perform the following tasks, you should review the information provided in Chapters 2 and 4 of the case.

1. Prepare a context diagram for the new system.
2. Prepare a diagram 0 DFD for the new system.
3. Write a brief memo that explains at least five attributes that you can use to define a process in the order system.
4. Write a brief memo that explains at least five attributes that you can use to define an entity in the order system.

Capstone Case: New Century Wellness Group

New Century Wellness Group offers a holistic approach to healthcare with an emphasis on preventive medicine as well as traditional medical care. In your role as an IT consultant, you will help New Century develop a new information system.

Background

You began the systems analysis phase by conducting interviews, reviewing existing reports, and observing office operations. (Your instructor may provide you with a sample set of interview summaries.)

The New Century medical team performs services and medical procedures, which are coded according to the American Medical Association's Current Procedure Terminology (CPT). CPT codes consist of five numeric digits and a two-digit suffix, and most insurance payers require the codes to be included with billing information.

The new system must be able to handle the new ICD-10 procedure coding system, which will be required by the Centers for Medicare & Medicaid Services (CMS) beginning October 1, 2014. ICD-10 codes consist of seven alphanumeric characters, which can be electronically transmitted and received. New Century's information system must interface with 25 California health insurance providers. The new system represents an opportunity for significant cost saving for New Century, and more convenience for patients, who will be able to go online to update medical information, schedule appointments, and request medical records.

During your fact-finding, you learned that the clinic requires various reports, as follows:

- Daily appointment list for each provider. The list shows all scheduled appointment times, patient names, and services to be performed, including the procedure code and description.
- Daily report call list, which shows the patients who are to be reminded of their next day's appointments. The call list includes the patient name, telephone number, appointment time, and provider name.
- Weekly provider report that lists each of the providers and the weekly charges generated, plus a month-to-date (MTD) and a year-to-date (YTD) summary as well as profit distribution data for the partners.
- Monthly patient statement, which includes the statement date, head of household name and address, previous month's balance, total household charges MTD, total payments MTD, and the current balance. The bottom section of the statement shows activity for the month in date order. For each service performed, a line shows the patient's name, the service date, the procedure code and description, and the charge. The statement also shows the date and amount of all payments and insurance claims. When an insurance payment is received, the source and amount are noted on the form. If the claim is denied or only partially paid, a code is used to explain the reason. A running balance appears at the far right of each activity line.
- Weekly Insurance Company Report.
- Monthly Claim Status Summary.

In addition to these reports, the office staff would like automated e-mail and text messaging capability for sending reminders to patients when it is time to schedule an appointment. Data also needs to be maintained on employers who participate in employee wellness programs. This information can be used for marketing purposes throughout the year. Finally, the new system needs to track employee schedules, attendance, vacation time, and paid time off.

Now you are ready to organize the facts and prepare a system requirements document that represents a logical model of the proposed system. Your tools will include DFDs, a data dictionary, and process descriptions.

Capstone Case: New Century Wellness Group**Tasks**

1. Prepare a context diagram for New Century's information system.
2. Prepare a diagram 0 DFD for New Century. Be sure to show numbered processes for handling appointment processing, payment and insurance processing, report processing, and records maintenance. Also, prepare lower-level DFDs for each numbered process.
3. Prepare a list of data stores and data flows needed for the system. Under each data store, list the data elements required.
4. Prepare a data dictionary entry and process description for one of the system's functional primitives.

CASE Tool Workshop

Systems analysts use CASE tools to help them plan, build, and maintain information systems. To learn more about CASE tools, turn to Part B of the Toolkit that follows Chapter 12. You can complete these tasks with the Visible Analyst® CASE tool, which is available with this textbook, or a similar tool.

Background

You decided to start a mobile auto detailing service that will visit customers at their homes or businesses, and use traditional, high-quality hand washing and waxing methods. In addition to retail customers, several auto dealers have expressed interest in your services, and you are eager to get started. You plan to hire college students as technicians, train and supply them, and offer them a share of the profits as an incentive.

Your friend, who is an IT major, offered to help you set up an information system by customizing several Microsoft Office applications to meet your needs. She suggested that you prepare an initial context diagram and a DFD diagram 0, and not to be too concerned about the details — just the main entities, data flows, and data stores. Thinking it over, you know that you will have employees, retail customers, auto dealer accounts, one or more suppliers, and your local bank, where you plan to set up a business checking account to handle the business. You also plan to keep track of customers, employee information, profit-sharing data, and an operations log, among other things.

Tasks

1. Create a context diagram from the new business. It is okay to use your imagination with respect to data flows that you envision.
2. Create a diagram 0 that includes at least three processes and two data stores that would be typical in a small business of this kind. You can use your imagination with respect to the processes and data stores that might be needed.