

## 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:

### Osceola Auto Parts

Osceola Auto Parts is an independent auto parts dealer that sells auto parts, runs tests on customers' cars, and delivers parts and tools to mechanic shops around town.

#### Tasks

1. Identify possible actors and use cases involved in Osceola's business functions.
2. Create a use case diagram for Osceola's operations.
3. Select one of the use cases and create a class diagram.
4. Create a sequence diagram for the use case you selected.

### 2 Area Transit Authority

The Area Transit Authority (ATA) is a rural public transportation company. ATA operates a fleet of 25 buses that serve approximately 1,000 riders each day. The bus operation involves 10 regular routes, plus routes for special events. The ATA employs 20 full-time drivers and 10 to 15 part-time drivers. A dispatcher coordinates the staffing and routes and relays messages to drivers regarding traffic information and special passenger pick-up arrangements.

#### Tasks

1. Identify possible actors and use cases involved in ATA's bus operations.
2. Create a use case diagram for the bus system.
3. Create a sequence diagram for the use case you selected.
4. Create a state transition diagram that describes typical passenger states and how they change based on specific actions and events.

### 3 Oakwood Community College Registration

Oakwood Community College has a student registration process similar to the one at your school. The administration asked you, as IT director, to develop a new system that would be more user-friendly. Your first task is to create an object-oriented model of the current system. You can use your school's registration process as the basis for the model.

#### Tasks

1. List possible objects in the registration system, including their attributes and methods.
2. Identify possible use cases and actors.
3. Create a use case diagram that shows how students register.
4. Create a state transition diagram that describes typical student states and how they change based on specific actions and events.

### 4 Oakwood Community College Library

The library staff at Oakwood Community College works hard to satisfy students and faculty. One of library's main goals is to use new technology whenever possible to enhance service and efficiency. The collection is updated constantly, and faculty members often request new books to support current courses and research needs. Students and faculty can visit the library to use on-site resources, including some materials that cannot be checked out. In addition, the library maintains extensive online resources. The head librarian wants you to develop an object-oriented model for a new library information system that would be user-friendly and cost-effective. You can use your schools library as a model, and you are free to use your imagination.

#### Tasks

1. List possible objects in the library operation, including their attributes and methods.
2. Identify possible use cases and actors.
3. Select one of the use cases and create a sequence diagram.
4. Create an object relationship diagram that provides an overview of the system, including how books are requested by faculty and checked out to students.

## 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: Campus Bikes

Campus Bikes is a popular bicycle shop located near a major university. The business has grown and the owner, Mark Turner, wants to install an up-to-date computer system to handle all business functions.

#### Background

Campus Bikes sells several brands of new bikes, including everything from high-end racing models to beach cruisers. In addition to sales of new bikes and accessories, Mark's service department is always busy. The staff includes Mark himself, a bookkeeper, two part-time sales reps, a full-time mechanic, and several part-time service helpers who assemble bikes.

Before opening the shop three years ago, Mark worked for many years in his father's auto dealership, Turner Motors, and he learned all about the automobile business. In the bike shop, he runs a similar operation, but on a much smaller scale. For example, sales orders are recorded on pre-printed forms, and service requests are written up just as they would be in an auto service department.

Mark's customers find him fair and reasonable. He likes to say that the main difference between his business and a big-box retailer is that he knows his customers and will do whatever it takes to keep them happy.

You work at the college as a lab assistant in the computer information department. You earned a computer science degree at a two-year school, and you recently decided to work toward your four-degree. The computer lab manager, Jill, often suggests that local businesses contact you for help in troubleshooting IT issues.

This morning, you received a call from Mark, who wants to hire you as a consultant to help plan a system for Campus Bikes. You learned that Jill had referred him, and you are excited to have this opportunity. It probably didn't hurt that both you and Jill had bought bikes from Mark, and already knew him. After spending several weekends talking with Mark and the staff, you are ready to start. You decide to use an object-oriented approach that will be easy to understand.

#### Tasks

1. List possible objects in the new bike shop system, including their attributes and methods.
2. Identify at least three possible use cases and actors.
3. Create a use case diagram that shows how service requests are handled.
4. Create a state transition diagram that describes typical customer states and how they change based on specific actions and events.

### 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.

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**Continuing Case: Personal Trainer, Inc.****Background**

Working as an IT consultant for Personal Trainer, Susan Park used data and process modeling tools to create a logical model of the proposed information system. Now she wants to build an object-oriented view of the system using O-O tools and techniques. Before you perform the following tasks, you should review the information and background in Chapters 1 and 2, and the fact-finding summary of the case provided in Chapter 4.

**Tasks**

1. Identify possible actors and use cases involved in Personal Trainer's operations.
2. Create an object relationship diagram for the Personal Trainer information system.
3. Create a use case diagram for the system.
4. Select one of the use cases and create a sequence diagram and a state transition diagram.

**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 at New Century by completing a series of interviews, reviewing existing reports, and observing office operations. Then, in Chapter 5, you acquired more information and developed a set of DFDs, process descriptions, and a data dictionary.

The next step in the SDLC is to perform an object-oriented analysis of the new system. Before you begin, go back and review the organization chart and processes list from Chapter 1, and the diagrams data store list from Chapter 5. Then complete the following tasks.

**Tasks**

1. Identify possible use cases and actors, and create a use case diagram for the New Century Wellness Group system.
2. Select one of the use cases and create a class diagram.
3. Create a sequence diagram for the use case that you selected.
4. Create a state transition diagram that describes typical patient states and how they change based on specific actions and events.

## 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

In the previous chapter, you created a data and process model for a new business venture. You plan to operate a mobile auto detailing service that will visit customers at their homes or businesses, and offer traditional, high-quality hand washing and waxing. In addition to retail customers, several auto dealers have expressed interest in your services, and you are eager to get started. You will 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. In addition to the data and process model you created, she recommended that you prepare an object model. She suggested that you focus on the main actors and events, and that it was OK to use your imagination.

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. You also plan to keep track of customers, employee information, profit-sharing data, and an operations log.

### Tasks

1. List possible objects in the new business, including their attributes and methods, and create a use case diagram that shows how an on-site service request would be handled.
2. Create a sequence diagram that models the on-site service request mentioned in Task 1.