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Chapter 3: Business Modeling

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Chapter 3

Business Modeling

While the rest of UML focuses on a system that will be built, *business modeling* instead concentrates on the business around the system. In this chapter, we will examine the business itself, the entities that interact with it, and the workflows within it to truly understand the business environment before designing the system. We can then be sure that the system will work to meet the unique goals of the unique business in which it exists.

We'll begin by introducing the concept of business modeling and then discuss some of the reasons you may want to model your business. Not every project requires business modeling. However, there are many situations where business modeling adds a great deal of value. We'll discuss some of these situations.

We will then get into the specific elements within business modeling. Some of these elements are business actors, business use cases, and business workers. We will discuss each of these and show you how to model them using Rose.

- Introduction to business modeling
- Business modeling concepts
- Reasons for modeling a business
- Working with business use cases, business actors, and business workers

Introduction to Business Modeling

Business modeling is the study of an organization. During the business-modeling process, you examine the organization's structure and look at the roles within the company and how they interrelate. You also examine the organization's workflows, the major processes within the company, how they work, how effective they are, and whether there are any bottlenecks. You'll examine the outside entities, either individuals or other companies, which interact with the business, and look at the implications of that interaction.

In short, you try to understand what is inside and outside the business, and how the inside and outside talk to each other. In UML, you'll document this information in the business model.

Why Model the Business?

There are many reasons to do business modeling. These reasons include gaining an understanding of your organization and its software system, helping in a business process–re-engineering effort, and building a powerful training tool, as explained in the following sections.

Understanding the Organizational Vision

Even if you are not building a software system, you can use business modeling to understand and document what your organization does. This is a wonderful way to develop a vision statement for your organization; the diagrams in business modeling will help you understand what the outside world gains from its relationship with your organization, as well as how your organization goes about accomplishing these goals. The business modeling does not apply only to the organizational level. A particular division within an organization may want to go through the business-modeling process to develop its own division charter or mission statement.

Business Process Re-engineering

Business modeling is also very helpful in a business process–re-engineering effort. One of the chief artifacts of the business-modeling process is the workflow diagram. These diagrams depict how a particular process flows within the organization. It shows the individuals involved in the process, the steps within the process, and the business entities that are involved in the process. A business process–re-engineering team will start by documenting the current process with workflow diagrams. They can then analyze these diagrams to look for inefficiencies or other problems within the workflow. For example, they may discover that a particular document goes from an analyst, to a manager for approval, back to the analyst for additional information, and then back to the manager. The process may be able to be improved by having the analyst fill out all of the required information up front. This is just one example of how workflow diagrams can be analyzed.

The business process–re-engineering team will also use workflow diagrams to analyze possible future workflows. By designing a number of potential processes, the team will be better able to view and discuss the pros and cons of each approach and to select the new process that is most appropriate for the organization.

Training

Whether a new process has just been developed or a new staff member has just joined the team, the results of business modeling can be a powerful training tool. The workflow diagrams illustrate who is involved in the process, what the steps are, and what the artifacts are. Any member of the team can review these diagrams to understand how they fit into the process, what artifacts they are responsible for producing or receiving, and with whom they need to communicate. These simple diagrams can save a great deal of organizational headaches by clearly stating what each person's responsibilities are within a workflow. They help ensure that everyone has a common understanding of the business processes and the roles within them.

Context for a Software Solution

Of course, many of us who are using UML are using it to build software. In this situation, business modeling can help us understand the context of the system we are building. While this may sound

trivial, it can have serious consequences on the success or failure of a software project. If we fail to understand the business, we may make faulty assumptions about what the software should do and how it can best be used by the business community.

The "world around the system" is an important consideration when building software. Over the past several years, as companies were using UML without business modeling, one of the concerns that arose was the inability to understand how the system fit into the organization around it.

Enter business modeling. This solves the hole in the process by giving the team a view of the business itself, the workflows within it, and the way the new system will help automate portions of the workflow.

Do I Need to Do Business Modeling?

Without the help of some gifted psychics, we can't give you a definite answer to that question. However, we can give you some guidelines:

You may need to do business modeling if:

- You and your workgroup are new to the organization.
- The organization has undergone some recent business process re-engineering.
- The organization is planning to go through business process re-engineering.
- You are building software that will be used by a significant portion of the organization.
- There are large and complex workflows within the organization that are not well documented.
- You are a consultant in an organization you have not worked with before.

You may not need to do business modeling if:

- You have a thorough understanding of the organization's structure, goals, business vision, and stakeholders.
- You are building software that will be used by only a small part of the organization, and will not have an effect on the rest of the business.
- The workflows within the organization are fairly straightforward and are well documented.
- There simply isn't time. Let's be realistic; not all projects have the time needed to do a complete business analysis. But be careful! Don't let lack of time be an excuse. Fight for the time if you feel that business modeling would help ensure the success of your project.

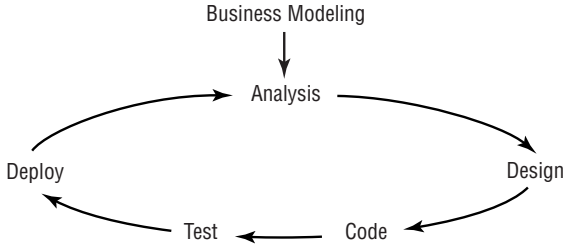
Business Modeling in an Iterative Process

In an iterative process, the team goes through a series of steps multiple times, each time focusing on a different part of the business or system. There are two approaches to business modeling in an iterative environment. First, you can complete all of the business modeling up front, and then iterate through the analysis, design, coding, testing, and deployment steps. Alternatively, you can include the business modeling in the iterations. We'll discuss a few of the pros and cons of each approach, but first let's discuss where business modeling falls in relation to the other steps in the lifecycle.

The typical sequence of steps in developing software is as follows (note that these are not all of the steps in the lifecycle):

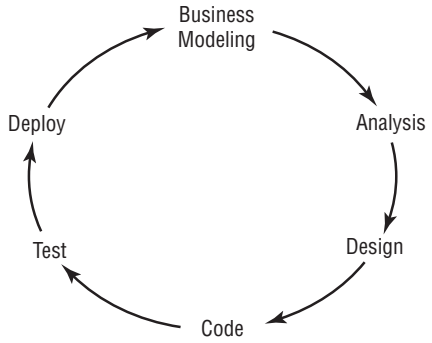
- Business modeling
  - Business Use Case diagrams
  - Activity diagrams (workflows)
  - Analysis-level Class diagrams (business entities)
- System use case modeling
  - Actors
  - Use cases
  - Use Case diagrams
- Analysis
  - Use case flow of events
  - Supplementary specifications
  - Analysis-level Sequence and Collaboration diagrams
  - Analysis-level Class diagrams
- Design
  - Design-level Sequence and Collaboration diagrams
  - Design-level Class diagrams
  - Statechart diagrams (if needed)
  - Component diagrams
  - Deployment diagrams
- Coding
- Testing
- Deployment

As you can see, business modeling is the first step in the process. It is the first step whether you are using an iterative lifecycle or a waterfall approach. The reason for this is that business modeling sets the context for the rest of the project. As you go through the system's design, the business modeling will help you keep in mind why you are building the system in the first place.



Completing the business modeling up front, as opposed to iteratively, gives you the advantage of fully understanding the business process before beginning to scope the system at all. Thus, you can determine from the beginning the areas of the workflow that most need to be automated and the areas in which the system can most effectively help the organization. All of this leads to the ability to build a system that can have a greater positive impact on the company.

The disadvantage to this approach is that, as projects are often time-constrained, it can be unrealistic. Unfortunately, it can lead to the cutting out of business modeling altogether. Your end users or customers may want to get to the system quickly and may not be willing to wait for you to analyze the business first.



Alternatively, you can complete the business modeling in iterations. This has the advantage of letting you study the organization without delaying the building of the software system. You do, of course, run the risk of misunderstanding the company and building a software system that doesn't quite meet its needs. Or, you may discover a previously unknown business process later in the game that has a significant impact on the system. These types of risks can typically be controlled, but they are the downfalls of using this type of approach with business modeling.

Business-Modeling Concepts

In this section, we will discuss some of the fundamental concepts of business modeling. Ideas such as business actors, business workers, and activity diagrams will help us understand the organization itself. In this section, we will cover the following concepts:

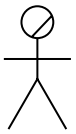
- Business actors
- Business workers
- Business use cases
- Business Use Case diagrams
- Communication relationships between business use cases and business actors
- Business entities
- Activity diagrams

Again, it is important to remember that business modeling does not focus on what will and will not be automated (although that information can be found in the workflows). Instead, it focuses on two areas. First, what are the boundaries of the organization and with whom does it need to communicate? And second, what are the workflows within the organization and how can they be optimized?

Business Actors

A business actor is anyone or anything that is *external* to the organization but interacts with it. For example, a business actor for your organization might be its customers, its creditors, its investors, or its suppliers. Each of these actors has an interest in the actions of the company.

In UML, a business actor is modeled using the following icon:



Although the icon looks like a person, a business actor does not need to be an individual. It could represent a group of people or a company. We model business actors to understand who and what needs to interact with the business and how they interact with the business. When we are re-engineering processes or building new systems, we must always keep in mind that the organization must still meet the needs of these external entities. What good would it be to a grocery store to streamline its processes by getting rid of the cash registers? An extreme example, of course, but the idea is the same: We must keep in mind why the business is there in the first place. Modeling business actors helps with this effort.

Business Workers

A business worker is a role *within* the organization. Notice that business workers are roles, not positions. A single person may play many roles but hold only one position. The benefit of being role-based rather than position-based is that positions tend to change over time, while roles remain fairly constant.

In UML, a business worker is modeled using the following icon:

We model business workers to understand the roles within the business and how these roles interact. By describing each business worker, we can understand what the responsibilities of that role include, what skills are required for that role, and other details. At a minimum, think about the following for a business worker:

- What are the worker's responsibilities?
- What skills does the worker need to carry out those responsibilities?

- With what other workers does it interact?
- In what workflows does it participate?
- What are the worker's responsibilities within each workflow?

Business Use Cases

A business use case is a group of related workflows within the organization that provide value to the business actors. In other words, the business use cases tell the reader what the organization *does*. More specifically, they tell someone what the organization does that provides value to the businesses and individuals that interact with it. The set of all business use cases for an organization should completely describe what the business does.

Examples of business use cases for a retail store might include "Restock Inventory," "Price Products," "Sell Products," "Refund Money," or "Deliver Products." For an e-business, they might include "Register New User," "Create/Modify Order," "Fill Order," "Restock Inventory," or "Cancel Order." An investment house might have "Buy Stock" and "Sell Stock," among others.

A company does not even have to be highly automated to use business modeling. A cattle rancher might have business use cases like "Buy Cattle," "Sell Cattle," "Bottle Milk," or "Replenish Feed."

In UML, we use the following icon for business use cases:

The business use cases are typically named in the format "<verb><noun>," as in "Price Products." This is a good standard to follow for several reasons. It keeps the business use cases consistent, even if multiple analysts are defining them. Also, it makes the use cases easier for the end user to understand. "Price" alone doesn't tell the user much about the business, nor would "Products." Finally, and perhaps most importantly, it keeps the focus on what the business is *doing*—what it's accomplishing—not just what entities it uses.

Of course, even "Price Products" doesn't tell us much without some details. For each business use case, you will want to create some type of report that lets people know specifically what goes on within the use case. Does a clerk use historical prices to set the current price? Do they use surveys to determine what the customers are willing to pay? Do they do an in-depth study of the prices of each product in Egypt and Turkey and then average the two? Or do they just make up product prices as they go along? We won't know for sure unless the specific workflow is documented somewhere.

The workflow can be documented in a couple of ways. The simplest in some situations is just to create a numbered, step-by-step list of what happens as the use case progresses:

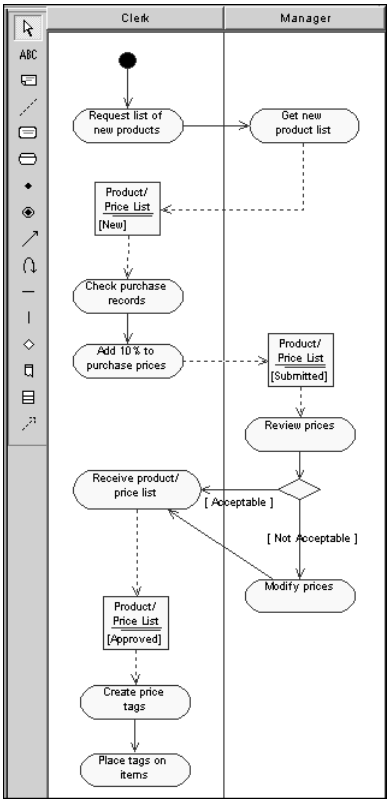
1. The clerk talks to the manager to obtain a list of all new products to be priced.
2. The clerk checks the store's purchase records to see how much the store paid for each new item.
3. The clerk adds 10% to the purchase price to find the item's price.
4. The clerk gives the new prices to the manager for approval.

5. If the manager does not approve, the clerk and manager decide upon new prices.
6. The clerk creates price tags for each new item.
7. The clerk places price tags on each new item.

The problem with this approach is that if there is a lot of conditional logic, it can confuse the reader. In the simple example above, the condition is fairly straightforward. Unfortunately, though, the real business world isn't always so simple. A business worker may perform some actions if condition A occurs, others if condition B occurs, and still others if condition C occurs. In this situation, it might be more beneficial to use an activity diagram.

An activity diagram shows in graphical form what the steps are in a workflow, the sequence of the steps, and who is responsible for performing each step. A sample activity diagram for the workflow described above would look like Figure 3.1.

FIGURE 3.1
Activity diagram



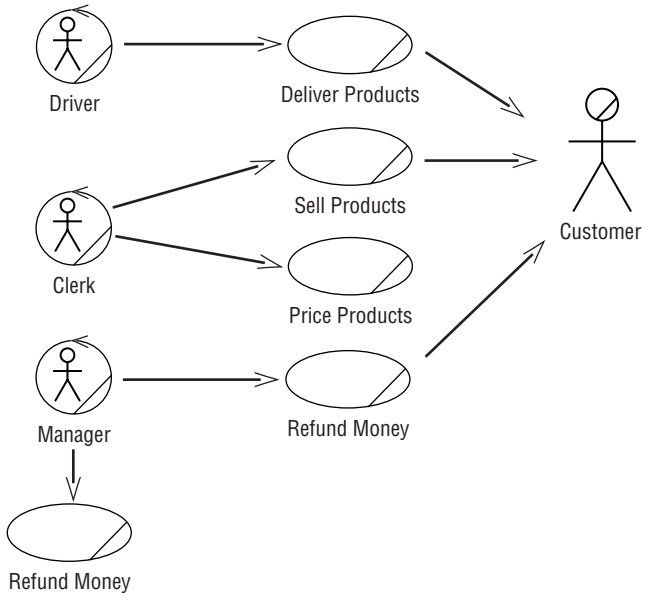
We'll discuss activity diagrams, including the different symbols that appear on the diagram, later in this chapter. For now, just look at the message the diagram is conveying. As before, we can see what the steps are in pricing products, but the graphical representation helps in making these steps easier to read and understand. The difference is even more striking with large and complex workflows.

Business Use Case Diagrams

A Business Use Case diagram shows you the business use cases, business actors, and business workers for an organization and the interactions between them. It gives you a complete model of what the company does, who is inside the company, and who is outside the company. It gives you the scope of the organization, so you can see what it encompasses and where its borders are.

An example of a Business Use Case diagram is shown in Figure 3.2.

FIGURE 3.2
Business Use Case diagram



This diagram is simple by design. It is intended to quickly convey high-level information about the business without getting into all the details or confusing the reader with too much notation. If you have a large number of business use cases, simply create multiple diagrams with each containing a subset of the use cases.

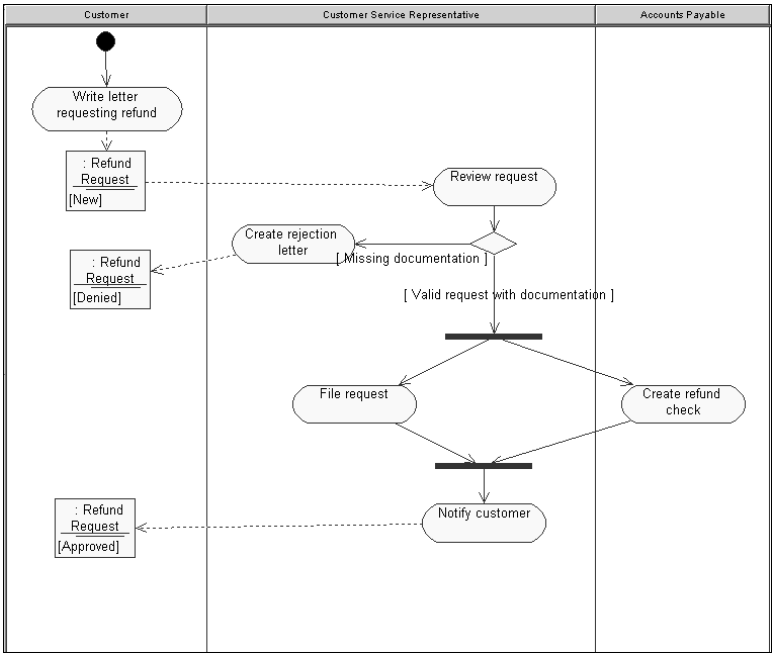
An arrow from a business actor or a business worker to a use case suggests that the actor or worker initiates the use case. In this example, the clerk begins the process of pricing products. An arrow from a business use case to a business actor suggests that the organization initiates communication with the business actor. In this example, while the Deliver Products workflow is occurring, the organization (in this case, the driver) communicates with the customer.

Activity Diagrams

An activity diagram is a way to model the workflow of a use case in graphical form. The diagram shows the steps in the workflow, the decision points in the workflow, who is responsible for completing each step, and the objects that are affected by the workflow.

An example of an activity diagram is shown in Figure 3.3. In this example, a customer has received a defective product and is asking for a refund.

FIGURE 3.3
Activity diagram



We can read the diagram as follows: The customer begins the process by writing a letter asking for a refund. The customer service representative reviews the letter. If the required documentation is missing, the customer service representative writes a rejection notice and sends it to the customer, who now has a request that has been denied. If the documentation is present, the customer service representative files the request at the same time as the accounts payable clerk writes a check. Once these two steps are completed, the customer service representative notifies the customer, who now has a request that has been approved.

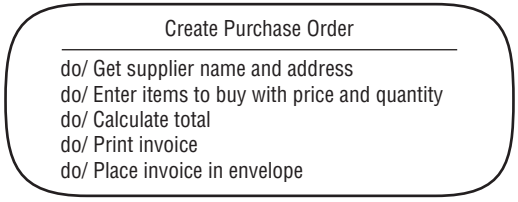
Let's examine the notation in this diagram. The first piece is the start state, which is the solid dot in the upper-left portion of the diagram. This symbol lets you know where the process begins.

The rounded rectangles in the diagram are known as activities. An activity is simply a step in the workflow. It is a task that a business worker performs. Notice that the diagram is divided into three vertical sections, known as swimlanes. Along the top of the swimlanes, we can see the role that performs all of the activities in the swimlane.

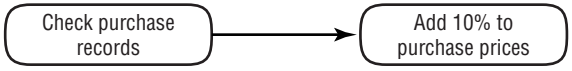
Within an activity, you can list the actions that occur for that activity. Actions are simply steps within the activity. For example, if you have an activity called "create purchase order," the actions that make up that step might include: "get the supplier's name and address," "enter the item(s) to be ordered with price and quantity," "calculate the total," and "print the purchase order." These are steps that are too small to be shown as their own activities on a high-level business activity diagram but that add information about the process.

There are four types of actions:

- Those that occur when you enter an activity. These are marked with the word *entry*.
- Those that occur while an activity is occurring. These are the steps within the activity. These are marked with the word *do*.
- Those that occur when you leave an activity. These are marked with the word *exit*.
- Those that occur when a specific event happens. These are marked with the word *event*.



The arrows connecting the activities are known as transitions. A transition lets you know which activity is performed once the current activity has completed.



In this example, as soon as the clerk finishes checking the purchase prices of the items, he or she begins the process of adding 10% to those prices.

We can place guard conditions on the transitions to show when the transition occurs. Guard conditions are placed in square brackets. In this example, the activity "create rejection letter" is only performed if the guard condition "missing documentation" is true.

The horizontal bars are called synchronizations. They let you know that two or more activities occur simultaneously. The upper synchronization shows a fork in which the control of the workflow is split into two branches. Once those activities are complete, another synchronization, called a join, occurs. After the join, the workflow again has only one thread of control. Synchronization bars may be either horizontal or vertical. In the example shown previously in Figure 3.3, the customer service representative files the request at the same time the accounts payable clerk creates a refund check. Only after those two activities have completed does the customer service representative notify the customer.

Finally, the square symbols represent objects. These objects are affected by the workflow, and change state as the workflow goes along. In this example, a request could be new, denied, or accepted. Dashed lines are used to show which activities affect the state of an object. For example, the creation of a rejection letter sets the state of the request to "denied."

Business Entities

A business entity is an object that the organization uses to conduct its business or produces during the course of its business. A business entity is, as its name implies, an entity that the business uses. Entities include the things that the business workers deal with day to day. Examples might be sales order, account, shipping box, contract, small blue thumbtack—whatever is relevant to the business.

Look at that last statement carefully. You want to list the major items the business deals with, but without getting carried away. If you are in the business of producing thumbtacks, a small blue thumbtack might actually be a valid business entity. If not, it probably isn't worth worrying about. Ask questions like:

What products does the company produce?

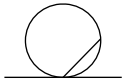
What services does the company provide?

What items does the company purchase to do its work?

What are the items it delivers to/receives from its customers?

What items are passed from business worker to business worker for processing?

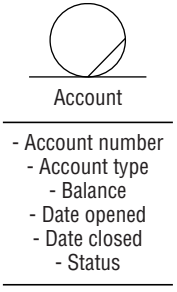
Another trick is to look at the nouns in the names of the business use cases you've defined. For the most part, each noun is a business entity. We use the following icon for a business entity:



You can refine the business entities by adding attributes. An attribute is a piece of information that describes the entity. For example, an entity called account might have attributes such as account number, account type (checking or savings), balance, date opened, date closed, and status.

WARNING *It can be very easy to get carried away with attribute modeling. Remember that the purpose here is to elaborate on the business. You don't want to start designing a database yet! Include only those attributes that will help someone more fully understand the business.*

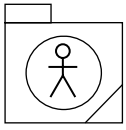
If you have defined attributes for the entity, they are displayed below the entity name, as shown here:



Organization Unit

An organization unit is simply a collection of business workers, business entities, or other business-modeling elements. It is a mechanism that can be used to organize the business model.

Many companies are organized into divisions, groups, or units. Each of these can be modeled as an organization unit. The organization unit will contain all of the business workers within that division, group, or unit. In UML, the following icon is used to represent an organization unit:



Where Do I Start?

To begin, define the boundaries of your business-modeling effort. Are you modeling the entire organization or just one division? Which workflows within the business are relevant to your current project? It might be nice to analyze all the business workflows, but that could be quite an undertaking.

Once you have a clear definition of the scope of the project, it's very important to assemble the right team. You will need individuals with business knowledge, as well as individuals with business-modeling knowledge. In general, the people on the team do not need to be technical at all, and in fact it is sometimes better if they are not. Technical teams might dive too quickly into the solution space—the system design.

Some of the important roles to consider include the following:

Team lead This person should have both business knowledge and modeling knowledge. He or she will be responsible for coordinating the efforts of the other members of the team and for keeping discussions focused.

Business representative(s) These people are representatives from different parts of the organization to be modeled. They should be very familiar with the workflows of the business, including the current problems and benefits of those workflows. They should be able to see both their workflows in detail and the organization at a high level.

Business process re-engineer(s) These individuals should be familiar with current workflows, and they should have an eye for finding efficiency problems and coming up with creative solutions. Ideally, they would have been involved in business process–re-engineering efforts in the past. They should be inquisitive but not belligerent, be excellent communicators (both written and verbal), and have the ability to decompose problems into manageable pieces. This is an optional role, used for business process–re-engineering efforts.

Business modeler(s) or business process analyst(s) This role is very similar to that of a business process re-engineer, but in this case the business processes will not change. In this role, you need someone who understands the business workflows, who communicates extremely well, and has good analysis skills.

Management representative(s) Someone must have the authority to decide what pieces of the business will be covered by the business-modeling effort. This person can also help the team understand the workflows from a manager's perspective.

Identifying the Business Actors

After the team has been assembled, begin identifying the business actors, business use cases, and business workers. This can be done in any order. To find the business actors, look at the scope of the project you are undertaking and ask yourself what lies outside that scope. If you are modeling the entire business and you ask what lies outside the business boundaries, your answer would be a whole world of people, companies, and other entities! You should therefore narrow the focus a little—for example, what lies *just* outside the business? In other words, who or what communicates with the business? These are your business actors.

It can be very helpful to hold brainstorming sessions to find some initial business actors. You can also review the project vision statement if one exists, the organization's marketing and other public relations materials, business goals, and business vision. Each of these might help you determine the outside entities that are important to the business.

Let's look at the example of an airline. Looking at the marketing materials for a particular airline, we find two types: those trying to win new customers, and those trying to win new employees. We can therefore identify two business actors: customers and potential employees (actual employees are business workers, because they lie within the scope of the organization). Reviewing some public relations materials, we find that they largely focus on the needs and concerns of the shareholders, so we add another business actor called shareholder. Knowing that this is an airline, there are certain federal regulations they must adhere to. The Federal Aviation Administration (FAA) is concerned with whether these rules are followed, so it is an actor as well. The airline buys its planes and many of its parts from a large plane manufacturer, which also is an actor. It buys the meals and drinks for its passengers from an outside catering company. These are just a few examples, but there are frequently a number of business actors for an organization, especially a large organization. Figure 3.4 shows examples of some of the business actors for an airline.

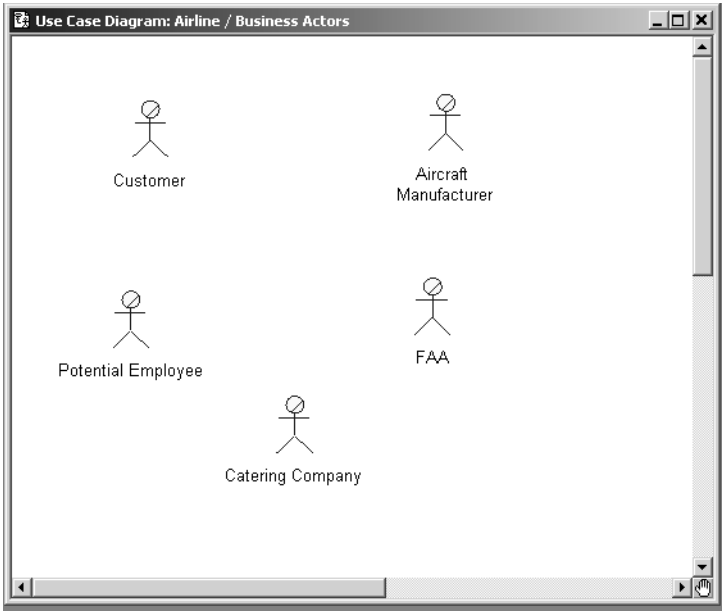


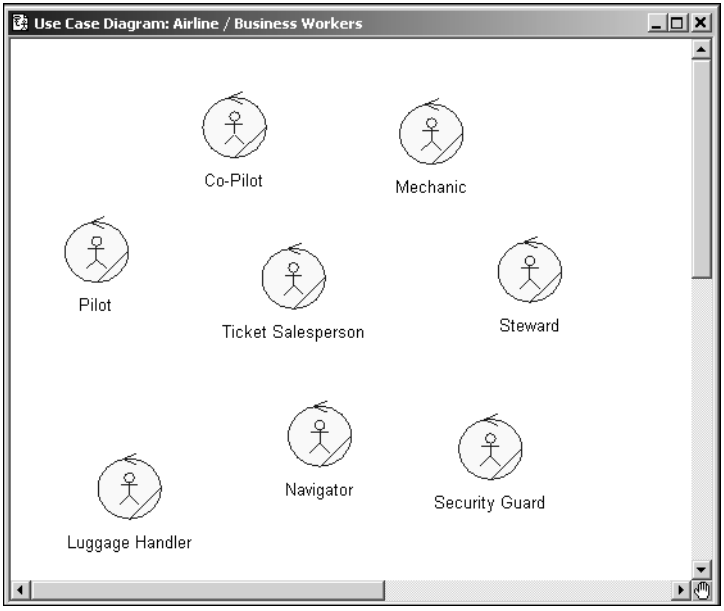
FIGURE 3.4
Business actors for an airline

Identifying the Business Workers

To identify business workers, again look first at the scope of your project. If you are modeling the entire business, an organizational chart is a good place to start. Consider each *role* within the chart rather than each *position* to define the business workers. Remember that a single person may fill multiple roles. Once you have listed the business workers, begin detailing them. Document their responsibilities within the organization, their required skills, and their interactions with other business workers and with business actors.

In the airline example, the business workers are all of the different roles within the company. If we were modeling the entire organization, business workers would include, among others, pilots, co-pilots, navigators, stewards and stewardesses, mechanics, ticket sales staff, luggage handlers, and security guards. Figure 3.5 shows some of the business workers for an airline.

FIGURE 3.5
Business workers for an airline



Identifying the Business Use Cases

To identify business use cases, you can start with the vision or mission statement for the organization. These should say, at a high level, what the business accomplishes that is of value to the outside world. An airline's main service is flying a customer from one city to another, so let's begin with that idea.

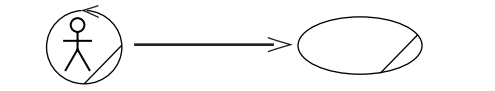
You then ask what needs to happen in order to transport that customer from Los Angeles to New York. First, the airline needs to have a mechanism for the customer to purchase a ticket. It then must check in the customer and their luggage; load the aircraft with fuel, luggage, and people; perform a safety check on the plane flying from L.A. to New York; land; and unload the aircraft. Some business use cases might include "Issue Ticket," "Check In Passengers," "Check In Luggage," "Perform Safety Check," "Load Aircraft," "Land Aircraft," and "Unload Aircraft." Of course, these represent only the

core workflow of the business. If you are modeling the entire organization, you will need to think also about sales, marketing, accounting, and the other areas of the business.

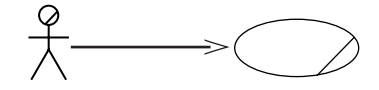
Other ways to find business use cases might include brainstorming sessions, reviews of the organization's processes and procedures, interviews with customers and other stakeholders, or your own business knowledge. Be patient if this is time-consuming; this process is a little bit of art and a little bit of science.

Showing the Interactions

The next step is to draw one or more Business Use Case diagrams that show the interactions between the business workers, business actors, and business use cases. An arrow from a business worker to a business use case suggests that the worker initiates the process represented by the use case. In the following example, the safety coordinator initiates the process of performing a pre-flight safety check:



An arrow from a business actor to a business use case suggests that the actor initiates the process. For example, a customer may initiate the "Issue Airline Ticket" process:



If you have a large number of business use cases, actors, and workers, you may want to group them into organizational units. This can help organize the model and make it easier for the reader to understand. If you take this approach, create a separate Business Use Case diagram for each organization unit.

An example of a Use Case diagram for an airline is shown in Figure 3.6.

Once the initial Use Case diagrams have been constructed, distribute them for feedback and finally for approval.

Documenting the Details

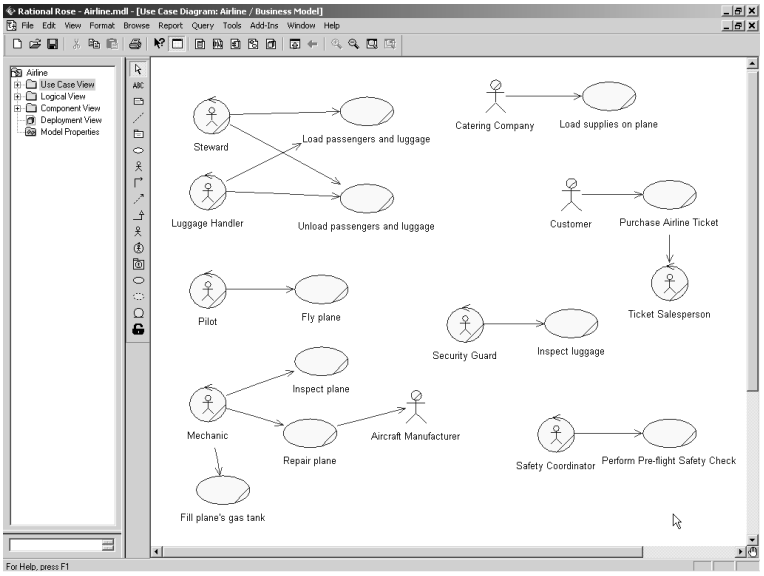
This process will give you a high-level view of what is inside and outside the organization. What it will not do yet is give you any of the workflow details behind any of the use cases. Therefore, the next step in the process is to dive into those details.

For each business use case, document the workflow through the use case. As we discussed above, the workflow could be documented using numbered steps, flowcharts, or activity diagrams. Remember to document the primary flow, which is the normal course of events, and any alternate flows. If it is a complex process or there are many alternate flows, an activity diagram may be the best way to document the workflow.

If you are working with the Rational Unified Process, another artifact to create is a business use case report, which includes details about the use case such as the description, goals, workflow, relationships, and special requirements.

After these details have been documented for all business use cases, you have a great picture of the organization. The use cases tell you what the organization does. The workflows give you the details of how each use case is accomplished. The actors tell you what is outside the organization that interacts with it. The business workers tell you the roles within the organization. The organization units tell you how the company is structured. The business use case reports give you additional information about each use case. Finally, the Business Use Case diagrams tell you what the relationships are between all of those elements.

FIGURE 3.6
Business Use Case Diagram for an airline



Next, let's take a look at how to model these UML concepts in Rational Rose.

Creating Business Use Case Diagrams

Business Use Case diagrams are created in the Use Case view within Rose. After they are created, they will appear in the browser hierarchy under Use Case view. A Business Use Case diagram will show some or all of the business actors, business workers, and business use cases in the model and the relationships between them. You can place a specific business actor, worker, or use case on as many Use Case diagrams as you'd like.

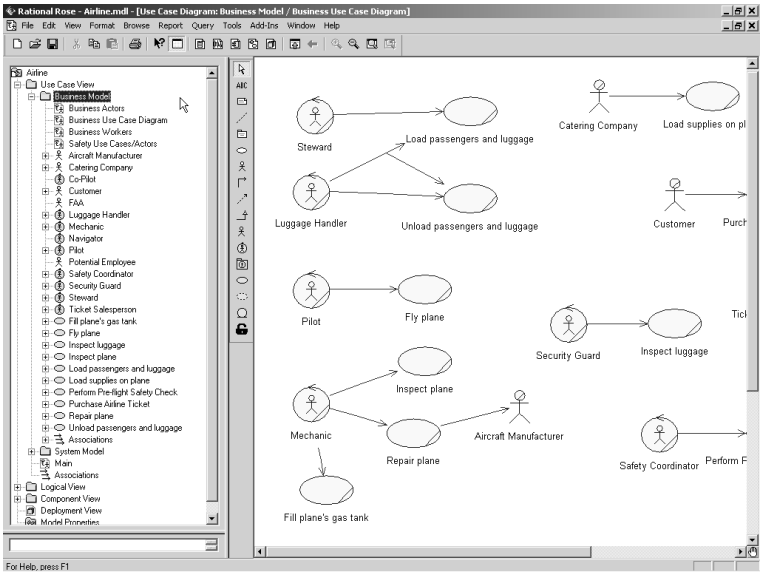
Although you can create Business Use Case diagrams directly under the Use Case view, keep in mind that your system use cases, system actors, and System Use Case diagrams will also be placed in the Use Case view. It can be helpful to begin by creating a separate area for the business modeling. This is accomplished by adding a package, which will contain all of your business use cases, business actors, and other business-modeling elements. Of course, you can create packages within this package to further organize your business model.

To create a Business Model package (optional):

1. Right-click the Use Case View entry in the browser.
2. Select New ➢ Package.
3. Enter the name of the new package, such as Business Model.

An example of a model that was organized using this method is shown in Figure 3.7. The Business Model package contains all business use cases, business workers, business actors, and Business Activity diagrams, while the System Model package contains all of the technical details for the system itself.

FIGURE 3.7
Business Model package



To create a new Business Use Case diagram:

1. Right-click the Business Model package in the Use Case view in the browser. If you did not create a business-modeling package within the Use Case view, right-click the Use Case View entry.
2. Select New ➢ Use Case Diagram from the shortcut menu.
3. With the new diagram selected, type in the name of your new diagram.
4. Double-click the name of the new diagram in the browser to open it.

To open an existing Business Use Case diagram:

1. Locate the Business Use Case diagram in the Use Case view in the browser.
2. Double-click the Business Use Case diagram's name to open it.

OR

1. Select Browse ➢ Use Case Diagram.
2. In the Package list box, select the package that contains the diagram you want to open.
3. In the Use Case Diagrams list box, select the diagram you want to open.
4. Press OK.

Deleting Business Use Case Diagrams

If you need to delete a Business Use Case diagram, you can do so in the browser. The business use cases, business actors, and other model elements on the diagram will not be deleted from the model. To delete a diagram, simply right-click it in the browser and select the Delete option from the shortcut menu.

WARNING *Rose does not allow you to undo a deletion of a diagram or to delete the Use Case diagram called Main.*

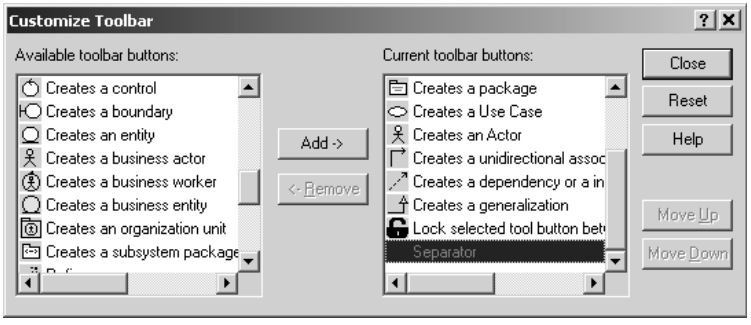
The Use Case Diagram Toolbar

When creating a Business Use Case diagram, the toolbar that will display shows the icons that are typically used for a System Use Case diagram. We will need to customize the toolbar to include the business-modeling icons.

To customize the Use Case toolbar:

1. Right-click the Use Case toolbar and select the Customize option. The window displayed in Figure 3.8 will appear.

FIGURE 3.8
Customizing the Use Case toolbar



2. Find the business-modeling toolbar buttons in the Available Toolbar Buttons list box and press the Add key to add them to the toolbar.

Table 3.1 lists the business-modeling icons that are available to add to the Use Case Diagram toolbar. Note that there are other icons available on the toolbar. Table 3.1, however, lists only the business-modeling icons. We will discuss the other icons in Chapter 4, "Use Cases and Actors."

NOTE *In Rose, all of the business-modeling icons will be displayed in yellow.*

TABLE 3.1: BUSINESS-MODELING ICONS IN THE USE CASE DIAGRAM TOOLBAR

ICON	BUTTON	PURPOSE
	Business Actor	Adds a new business actor, who is external to the organization
	Business Worker	Adds a new business worker, who is internal to the organization
	Organization Unit	Adds a new organization unit, which is used to group business workers and other business-modeling elements
	Business Use Case	Adds a new business use case
	Business Use Case Realization	Adds a new business use case realization
	Business Entity	Adds a new business entity

Adding Business Use Cases

To add a business use case, first create or open a Use Case diagram and then add the new business use case to the diagram. When you create the business use case with this method, it is automatically added to the browser.

To add a new business use case:

1. Select the Business Use Case button from the toolbar.
2. Click anywhere inside the Use Case diagram. The new use case will be named NewUseCase by default.
3. With the new use case selected, type in the name of the new use case.
4. Note that the new use case has been automatically added to the browser under the Use Case view.

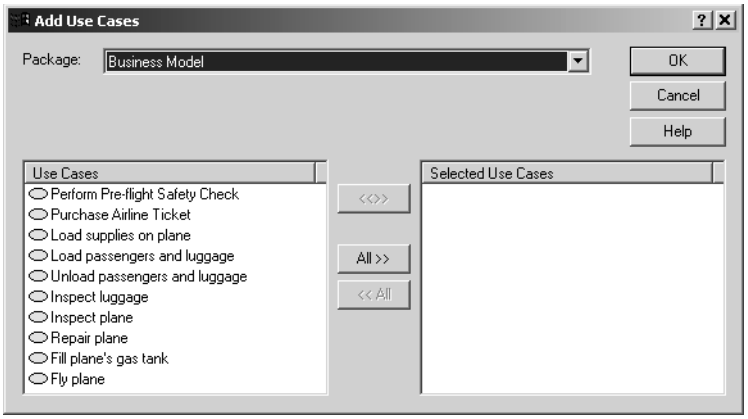
To add an existing business use case to a Use Case diagram:

1. Drag the business use case from the browser to the open Use Case diagram and drop it anywhere in the diagram.

   OR

   Select Query ➢ Add Use Cases. A dialog box will display, as in Figure 3.9, which will allow you to select and add existing use cases.
2. In the Package drop-down list box, select the package that contains the business use case(s) you want to add.
3. Move the business use case(s) you want to add from the Use Cases list box to the Selected Use Cases list box.
4. Press OK to add the business use cases to the diagram.

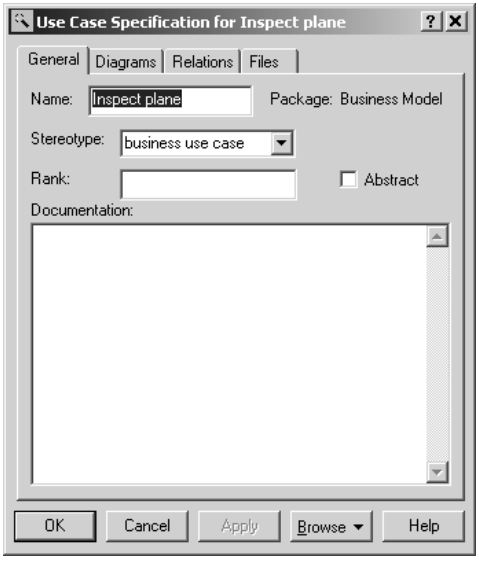
FIGURE 3.9
Adding existing business use cases to a Use Case diagram



Business Use Case Specifications

In Rose, you can specify the name, priority, and other details for each business use case through the use case specification window, shown in Figure 3.10.

FIGURE 3.10
Use case specification window



In the following sections, we'll take a look at each of the specifications available on the tabs of this window. But first, you should know the methods to use for viewing the specifications.

To open the business use case specifications:

1. Right-click the business use case on a Use Case diagram.
2. Select Open Specification from the shortcut menu.

OR

1. Right-click the use case in the browser.
2. Select Open Specification from the shortcut menu.

OR

1. Select the use case on a Use Case diagram.
2. Select Browse ➢ Specification.

OR

1. Select the use case on a Use Case diagram.
2. Press Ctrl+B.

Assigning a Priority to a Business Use Case

To help you manage the project, you may want to prioritize the business use cases. You could use the priority, for example, to determine in what order the business use cases will be analyzed and documented. The Rose specifications window provides a field called Rank, which can be used to prioritize the business use cases. It does not set up a numbering scheme for you, but you can use letters, numbers, or any other way of prioritizing the use cases.

To assign a priority to a business use case:

1. Right-click the business use case in the browser or on the Use Case diagram.
2. Select Open Specification from the shortcut menu.
3. On the General tab, enter the priority in the Rank field.

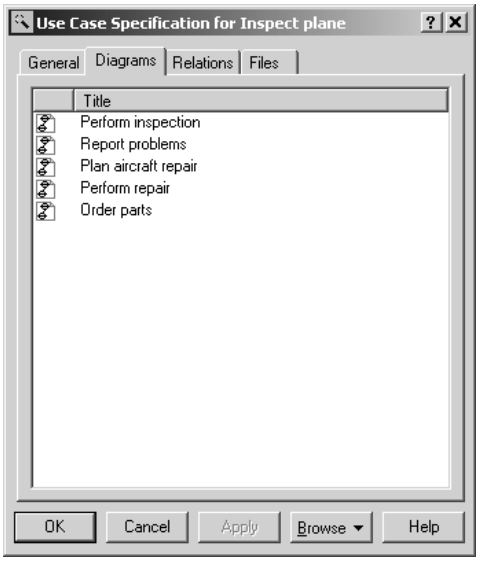
Viewing Diagrams for a Business Use Case

As you analyze a business use case, you may create a number of activity diagrams to document the workflow. Using the specification window or the browser, you can see a list of all of the diagrams for this particular business use case. Note that this list does not show you on which diagrams the use case resides; instead it shows you which diagrams contain some details for the use case.

To view the diagrams for a business use case:

1. Right-click the business use case in the browser or on a Use Case diagram.
2. Select Open Specification from the shortcut menu.
3. The diagrams will be listed on the Diagrams tab of the specification window, as shown in Figure 3.11. In this example, the use case has five activity diagrams.

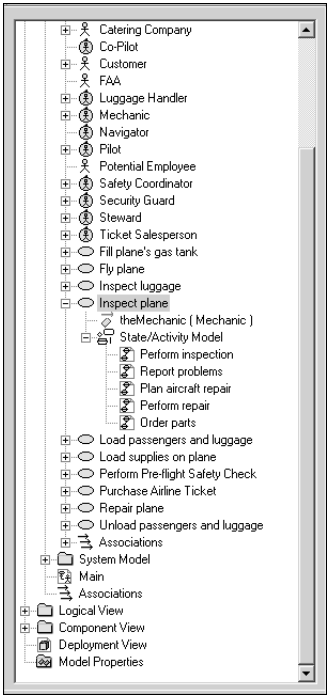
FIGURE 3.11
Diagrams tab of a use case specification window



OR

Look through the browser. The diagrams for the use case will appear underneath the business use case in the browser, as shown in Figure 3.12.

FIGURE 3.12
Diagrams for a use case



To open a diagram for a use case:

Double-click the diagram name on the Diagrams tab of the use case specification window.

OR

Right-click the diagram name on the Diagrams tab of the use case specification window and select Open Diagram from the shortcut menu.

OR

Double-click the diagram in the browser.

To add a diagram to a use case:

1. Right-click anywhere inside the Diagrams tab of the use case specification window.
2. From the shortcut menu, select the type of diagram (Use Case, Sequence, Collaboration, Statechart, Activity, or Class) you want to add.
3. Enter the name of the new diagram.

OR

1. Right-click the use case in the browser.
2. Select New ➢ (Collaboration Diagram, Sequence Diagram, Class Diagram, Use Case Diagram, Statechart Diagram, Activity Diagram) from the shortcut menu.
3. Enter the name of the new diagram.

To delete a diagram for a use case:

1. Right-click the diagram name on the Diagrams tab of the use case specification window.
2. Select Delete from the shortcut menu.

OR

1. Right-click the diagram name in the browser.
2. Select Delete from the shortcut menu.

Viewing Relationships for a Business Use Case

A relationship is a link between the business use case and a business actor or worker. It shows which business actor or worker initiates the business use case. As with diagrams, you can view the relationships for a particular business use case either through the specifications window or directly in the Rose browser. In the specifications window, the relationships are listed in the Relations tab, as shown in Figure 3.13.

To view the relationships for a use case:

1. Right-click the use case in the browser or on a Use Case diagram.
2. Select Open Specification from the shortcut menu.

3. The relationships will be listed on the Relations tab. The actor or worker who initiates the use case (or who is a client of the use case's functionality) will be listed in the Client column. The business use case itself (which supplies the functionality) is listed in the Supplier column.

FIGURE 3.13
Relations tab of a use case specification window

OR

1. Select the use case on a Use Case diagram.
2. Select Report ➢ Show Usage.

OR

Simply look at the hierarchy in the browser. The relationships for the business use case will be in the treeview below the use case itself.

To view the relationship specifications:

1. Double-click the relationship in the list.
2. The relationship specification window will appear. See the section "Working with Relationships" later in this chapter for a detailed description of relationship specifications.

OR

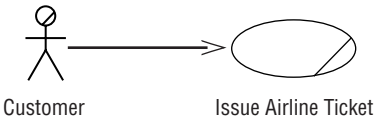
1. Right-click the relationship in the list.
2. Select Specification from the shortcut menu.
3. The relationship specification window will appear. See the section "Working with Relationships" later in this chapter for a detailed description of relationship specifications.

To delete a relationship:

1. Right-click the relationship in the list.
2. Select Delete from the shortcut menu.

Working with Business Actors

As you now know, a business actor is anyone or anything outside the business that interacts with it. Once you identify the business actors for your organization, the next step is to add them to the Rose model and create relationships between the business actors and business use cases.



Adding Business Actors

Like business use cases, business actors are added to the Rose model by adding them to a Use Case diagram. The first step in the process is to create or open a Use Case diagram. Once you have, you can add business actors using the toolbar.

To add a business actor to a Use Case diagram:

1. Select the Business Actor button from the toolbar (the yellow actor icon is a business actor).
2. Click anywhere inside the Use Case diagram. The new business actor will be named NewClass by default.
3. With the new actor selected, type in its name. Note that the new business actor has been automatically added to the browser under the Use Case view.

Adding Actor Specifications

Details about the business actor, such as the name, relationships, and attributes, are controlled through the business actor specifications window, shown in Figure 3.14.

As you work with classes later in this book, you may note that the actor specification window and the class specification window are very similar. This is because Rose treats an actor as a specialized form of a class. The actor specification window includes the same fields as the class specification window, but some of these fields are disabled for actors.

To open the business actor specifications:

1. Right-click the business actor on the Use Case diagram.
2. Select Open Specification from the shortcut menu.

OR

1. Right-click the actor in the browser.
2. Select Open Specification from the shortcut menu.

OR

1. Select the actor on the Use Case diagram.
2. Select Browse Specification.

OR

1. Select the actor on the Use Case diagram.
2. Press Ctrl+B.

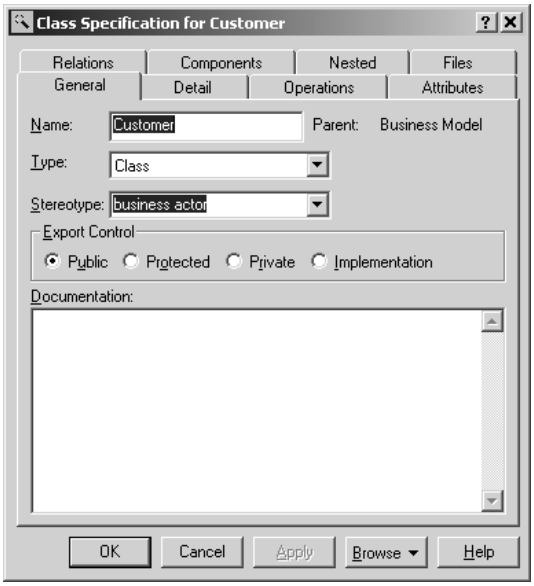


FIGURE 3.14
Business actor specification window

Assigning an Actor Stereotype

A stereotype is a way to categorize model elements in UML. Stereotypes are used when you have many different types of one element. For example, Visual Basic has a number of different types of classes: interface, form, control, collection, and so on. Each of these is represented in UML as a different stereotype.

The same concept applies to business actors. You may have several different types of business actors: those from supplier companies, those from government agencies, those from customer companies, and so on. If you would like, you can create your own stereotypes to categorize your business actors. You assign a stereotype to a business actor in the specifications window.

To assign a business actor stereotype:

1. Right-click the business actor in the browser or on a Use Case diagram.
2. Select Open Specification from the shortcut menu.
3. In the Stereotype field, enter the business actor stereotype.

WARNING *If you change the stereotype of a business actor, Rose will no longer display the actor using the UML actor symbol. It will display it as a box instead. This won't affect the rest of your model, but may make the Use Case diagram harder to understand.*

Setting Business Actor Multiplicity

Multiplicity refers to the number of instances you expect to have for a particular business actor. For example, you may expect to have 300,000 people play the role of customer. You can capture this information in the specifications window.

Rose provides you with several multiplicity options:

Multiplicity	Meaning
0..0	Zero
0..1	Zero or one
0..n	Zero or more
1..1	Exactly one
1..n	One or more
n (default)	Many

Or, you can enter your own multiplicity, using one of the following formats:

Format	Meaning	Example
<number>	Exactly <number>	3
<number 1>..<number 2>	Between <number 1> and <number 2>	3..7
<number>..n	<number> or more	3..n
<number 1>,<number 2>	<number 1> or <number 2>	3, 7
<number 1>, <number 2>..<number 3>	Exactly <number 1> or between <number 2> and <number 3>	3, 7–9
<number 1>..<number 2>, <number 3>..<number 4>	Between <number 1> and <number 2> or between <number 3> and <number 4>	3–5, 7–10

To set business actor multiplicity:

1. Right-click the business actor in the browser or on a Use Case diagram.
2. Select Open Specification from the shortcut menu.
3. Select the Detail tab.
4. Select from the Multiplicity drop-down list box, or type in the business actor's multiplicity using one of the formats listed above.

Viewing Relationships for a Business Actor

As with business use cases, you can view all of the relationships for a business actor either by using the Relations tab in the specification window or by going through the browser.

To view the relationships for a business actor:

1. Right-click the business actor in the browser or on a Use Case diagram.
2. Select Open Specification from the shortcut menu. The relationships will be listed on the Relations tab.

OR

Look at the browser window. All of the business actor's relationships will be listed under it in the treeview.

To view the relationship specifications:

1. Double-click the relationship in the list.
2. The relationship specification window will appear. See the upcoming section "Working with Relationships" for a detailed description of relationship specifications.

OR

1. Right-click the relationship in the list.
2. Select Specification from the shortcut menu.
3. The relationship specification window will appear. See the upcoming section "Working with Relationships" for a detailed description of relationship specifications.

To delete a relationship:

1. Right-click the relationship in the list.
2. Select Delete from the shortcut menu.

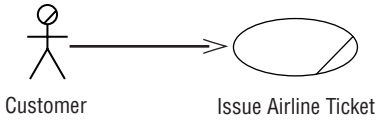
Working with Relationships

In business modeling, there are two types of relationships that are used: association relationships and generalization relationships. Association relationships are links between business actors and business

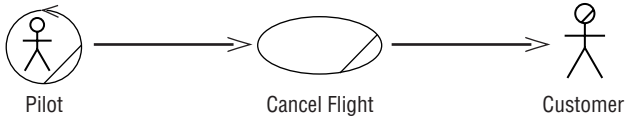
use cases or between business workers and business use cases. Generalization relationships show an inheritance structure among business-modeling elements. In this section, we will discuss these two types of relationships and how to model them in Rose.

Association Relationship

An association relationship is a relationship between a business actor or business worker and a business use case. It indicates that a particular business actor or business worker initiates the functionality provided by the use case. The relationship is shown as an arrow:



The direction of the arrow indicates who initiates the communication. In the example above, the customer initiates the Issue Airline Ticket transaction. In the following example, after the pilot initiates the "Cancel Flight" business use case, the organization initiates communication with the customer.



We can see from the direction of the arrows that the pilot begins the process and that during the cancellation of the flight, the organization is responsible for notifying the customer.

To add a communicates relationship:

1. Select the Unidirectional Association toolbar button.
2. Drag the mouse from the business actor or business worker to the business use case (or from the business use case to the business actor or worker if the organization initiates the communication).
3. Rose will draw a relationship between the business use case and the business actor or worker.

To delete a communicates relationship:

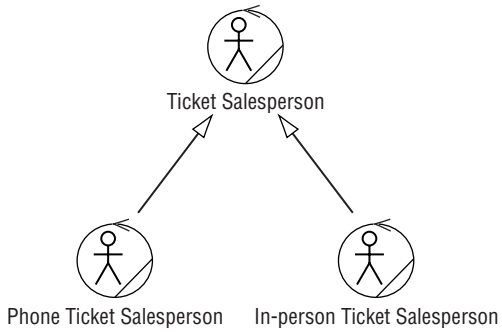
1. Select the relationship on the Use Case diagram.
2. Select Edit ➢ Delete from Model, or press Ctrl+D.

Generalization Relationship

A generalization relationship is used when there are two or more business actors, business workers, or business use cases that are very similar. As an example, there may be two different groups of people selling airline tickets: phone representatives and staff who work at the airport counter for in-person sales. For the most part, these two groups of people do the same job, but there are some differences in their responsibilities.

In UML, you can model this situation through a generalization relationship. We create a generic business worker called ticket salesperson, and then create two more business workers, one for each type of salesperson. You can see this example modeled in Figure 3.15.

FIGURE 3.15
Generalization relationship



In a generalization relationship, the arrow points from the specific actor to the generic actor. Someone reading this diagram would say that there are two types of ticket salespeople: phone salesperson and counter salesperson.

The generic actor may actually be an *abstract* actor. An abstract actor is one that is never directly instantiated. In this example, no one ever plays the role of a ticket salesperson; they are always either a phone salesperson or a counter salesperson. The ticket salesperson actor is just there to hold the commonality between phone and counter salespeople. Because no one ever directly plays that role, ticket salesperson is an abstract business actor. Phone salesperson and counter salesperson, on the other hand, are examples of *concrete* business actors because people do directly play those roles.

A fairly recent evolution of UML is in generalization relationships between use cases. You can use this type of relationship when you have two or more use cases that are very similar but that still have some differences. First, you create an abstract use case, much the same as we did for business actors. This abstract use case holds the elements that are common between the other business use cases. You then inherit the other business use cases from the abstract business use case with a generalization relationship.

To add a generalization relationship:

1. Add the business actors, business workers, or business use cases to the Use Case diagram.
2. Select the Generalization button from the toolbar.
3. Drag from the concrete business actor, worker, or use case to the abstract business actor, worker, or use case.
4. Open the specification window for the abstract business actor, worker, or use case.
5. Select the Detail tab.
6. Check the Abstract check box.

To delete a generalization relationship:

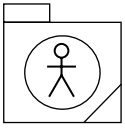
1. Select the relationship on the Use Case diagram.
2. Select Edit ➢ Delete from Model, or press Ctrl+D.

WARNING *Be careful of using too many generalization relationships. Unless the reader is familiar with generalizations, they may make the diagram very difficult to understand.*

Working with Organization Units

As we discussed above, an organization unit is a UML construct used to group business actors, business workers, and business use cases together. Typically, a UML organization unit corresponds to a division or group within the organization. We might have organization units called Sales, Finance, Manufacturing, and Human Resources for those divisions within the company. Each organization unit would hold the business actors, workers, and use cases appropriate for that division. It can also be helpful to create a Use Case diagram specific to that organization unit, which shows only the business actors, workers, and use cases for that unit.

As you know from earlier in this chapter, an organization unit is represented by the following symbol:



Adding Organization Units

In Rose, you can add organization units through a Use Case diagram. Once the units have been created, you can create new business actors, workers, or use cases inside them, or move existing business actors, workers, or use cases into the new unit. You can create as many organization units as you need, and create organization units within organization units to further organize the business model.

To add an organization unit:

1. Open a Use Case diagram.
2. Use the Organization Unit toolbar button to add a new unit. It will be named NewPackage by default, and will be automatically added to the browser.
3. Type in the name of the new organization unit.

To move an item into an organization unit, go to the browser and drag and drop the item from its existing location to the new organization unit.

Deleting Organization Units

Organization units can be deleted from the model using either the browser or a Use Case diagram. When you delete an organization unit, all business actors, business workers, business use cases, activity diagrams, and all other model elements within it will also be deleted from the model.

To remove an organization unit from a diagram without deleting it from the model:

1. Select the organization unit on a Use Case diagram.
2. Press the Delete key.
3. Note that the unit has been removed from the Use Case diagram, but it still exists in the browser and on other Use Case diagrams.

To delete an organization unit from the model:

1. Right-click the unit in the browser.
2. Select Delete from the shortcut menu.

OR

1. Select the organization on a Use Case diagram.
2. Select Edit ➢ Delete from Model, or press Ctrl+D.

WARNING *When you delete an organization unit from the model, all business use cases, business actors, and other items in the unit will also be deleted from the model.*

Activity Diagrams

In Rose, you can use an activity diagram to model the workflow through a particular business use case. The main elements on an activity diagram are:

- *Swimlanes,* which show who is responsible for performing the tasks on the diagram.
- *Activities,* which are steps in the workflow.
- *Actions,* which are steps within an activity. Actions may occur when entering the activity, exiting the activity, while inside the activity, or upon a specific event.
- *Business objects,* which are entities affected by the workflow.
- *Transitions,* which show how the workflow moves from one activity to another.
- *Decision points,* which show where a decision needs to be made during the workflow.
- *Synchronizations,* which show when two or more steps in the workflow occur simultaneously.
- *The start state,* which shows where the workflow begins.
- *The end state,* which shows where the workflow ends.

In this section, we'll take a look at how to model these different parts of the activity diagram using Rose.

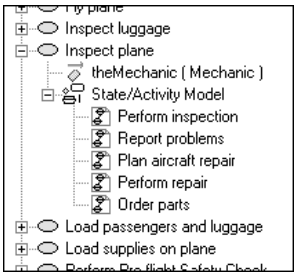
Adding an Activity Diagram

You can create as many activity diagrams as you need for a particular business use case. The activity diagrams for a business use case will appear in the State/Activity Model area under the business use case in the browser.

To add an activity diagram:

1. Right-click the business use case in the browser.
2. Select New ➢ Activity Diagram from the menu.
3. Rose will create an entry in the browser called State/Activity Model under the business use case, as shown in Figure 3.16. The new activity diagram will appear under the State/Activity Model entry.

FIGURE 3.16
Adding an activity diagram



4. Name the new activity diagram.
5. Double-click the diagram to open it.

Adding Details to an Activity Diagram

Once the diagram has been created, the next step is to add the swimlanes, activities, and other details to it. This is accomplished using the Activity Diagram toolbar. Table 3.2 lists the icons available on the Activity Diagram toolbar and the purpose of each.

TABLE 3.2: ICONS ON THE ACTIVITY DIAGRAM TOOLBAR

ICON	BUTTON	PURPOSE
	Selection Tool	Returns the cursor to an arrow to select a toolbar button
	Text Box	Adds a text box to the diagram
	Note	Adds a note to the diagram

Continued on next page

TABLE 3.2: ICONS ON THE ACTIVITY DIAGRAM TOOLBAR *(continued)*

ICON	BUTTON	PURPOSE
	Anchor Note to Item	Connects a note to an item in the diagram
	State	Adds a state to the diagram
	Activity	Adds an activity to the diagram
	Start State	Adds a start state to the diagram
	End State	Adds an end state to the diagram
	State Transition	Transitions from one activity or state to another
	Transition to Self	Transitions to the current activity or state
	Horizontal Synchronization	Shows where two or more activities occur simultaneously
	Vertical Synchronization	Shows where two or more activities occur simultaneously
	Decision	Shows decision points in the workflow
	Swimlane	Shows who is responsible for completing activities
	Object	Shows an object that is affected by the workflow
	Object Flow	Shows what activities change the state of the object

To add a swimlane to the diagram:

1. Select the Swimlane toolbar button.
2. Click inside the diagram. A new swimlane will appear, and will be titled NewSwimlane by default, as shown in Figure 3.17.
3. Name the new swimlane, using the name of a business worker or organization unit.

To add a start state to the diagram:

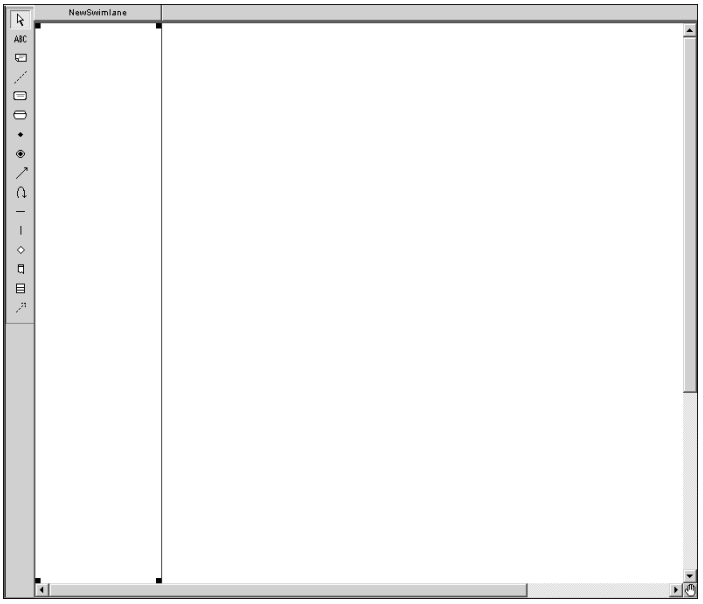
1. Select the Start State toolbar button.
2. Click inside the diagram within the swimlane for the worker or unit who will start the workflow.

To add activities to the diagram:

1. Select the Activity toolbar button.

2. Click inside the diagram within the swimlane for the worker or unit who is responsible for performing the activity.
3. Name the new activity.

FIGURE 3.17
Swimlane in an activity diagram



To add actions to the activities:

1. Right-click the activity.
2. Select the Open Specification option. The activity specification window will appear.
3. Select the Actions tab.
4. Right-click inside the tab and select Insert. The default action type, called Entry, will appear in the Type column, as shown in Figure 3.18.
5. Double-click the new action. The action specification window will appear.
6. In the When drop-down list box, select the appropriate option:
   - On Entry for actions that occur when entering the activity
   - On Exit for actions that occur when leaving the activity
   - Do for actions that occur within the activity
   - On Event for actions that occur when a specific event happens
7. Enter the action's name, as shown in Figure 3.19.

FIGURE 3.18
Adding actions to an activity

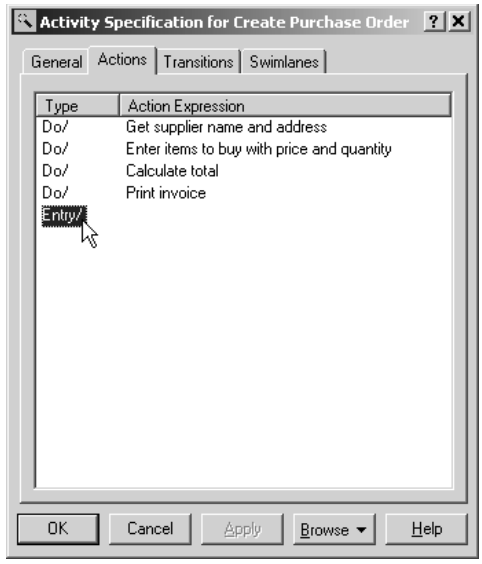
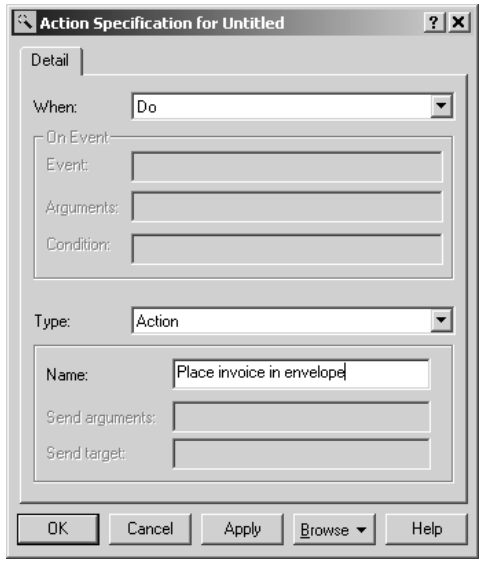


FIGURE 3.19
Action specification window



8. If the action was on an event, enter the event that triggers the action, any arguments to the event, and any guard conditions. A guard condition must be true for the action to occur.
9. Click OK to close the action specification.
10. Click OK to close the activity specification.

To add a business object:

1. Select the Object toolbar button.

NOTE *The Object button does not appear by default when you install Rose. You may need to customize the toolbar to see it.*

2. Click inside the diagram within the swimlane for the worker or unit responsible for performing the activity that will affect the object.
3. Name the new object.

To draw transitions between activities:

1. Select the State Transition toolbar button.
2. Drag and drop from one activity to another.

To set a condition on the transition:

1. Right-click the transition.
2. Select the Open Specification option.
3. Select the Detail tab.
4. Type the condition in the Guard Condition field. When the condition is displayed on the diagram, it will be surrounded by square brackets to indicate that it is a guard condition, as shown in Figure 3.20. You can also type the guard condition directly on the transition by enclosing it in square brackets.

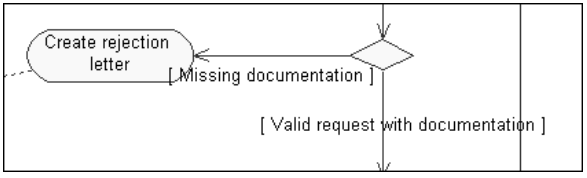


FIGURE 3.20
Guard conditions on transitions

To add a decision point:

1. Select the Decision toolbar button.
2. Click inside the diagram to place the decision.
3. Draw two or more transitions from the decision, one for each decision possibility.

To add a synchronization:

1. Select the Horizontal or Vertical Synchronization toolbar button.
2. Click inside the diagram to place the synchronization.

3. Draw two or more transitions from the synchronization, one to each activity that will occur simultaneously, as shown in Figure 3.21.

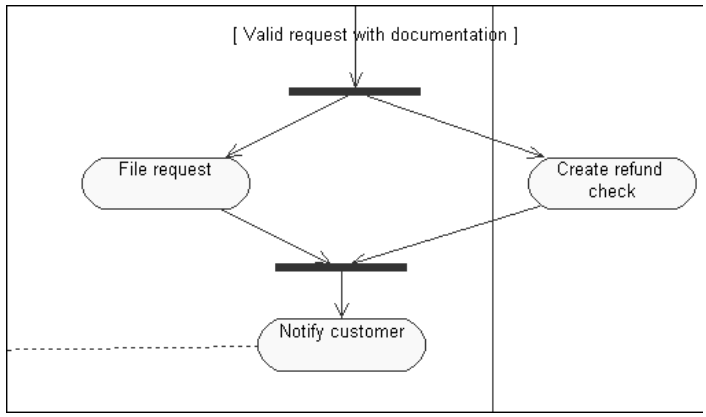


FIGURE 3.21
Synchronization in an activity diagram

To show which activities affect a business object:

1. Select the Object Flow toolbar button.
2. Drag and drop from the activity that changes the state of the object to the object itself. A dashed arrow will appear between the two. Figure 3.22 shows an example of how creating a rejection letter sets the state of the request object to Denied.

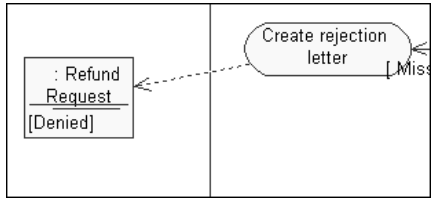


FIGURE 3.22
Object flow in an activity diagram

Summary

In this chapter we discussed business modeling. We began by examining why we would want to do business modeling in the first place. It is not right for all projects, but there are many times when business modeling can add a great deal of value to a project. We then moved on to discuss some of the fundamental elements of business modeling, including business actors, business use cases, business workers, and organization units, and how you would find some of these things in your organization.

From there, we moved into a discussion of the details of a business use case. You model the flow through a use case either by using text or via an activity diagram. Activity diagrams have the advantage of clarity and ease of use, especially when considering a workflow that is large and complex. We

examined the different pieces of an activity diagram, including swimlanes, activities, actions, objects, transitions, and synchronizations.

Once we examined the business-modeling ideas, we moved on to how these items can be modeled using Rational Rose. We walked through the Rose toolbars and specification windows to examine the details of the elements that can be added to a Rose model.

In the next chapter, we'll begin the process of system modeling. Business modeling isn't as concerned with what is automated by a particular system. System modeling, in contrast, is focused on the implementation of a particular software project. Business modeling helps us set the context for the system model.