**Learning Objectives**

After completing this chapter, you should understand:

- **U1.** Internal control framework: Objectives and components.
- **U2.** Execution, information systems, asset protection, and performance objectives.
- **U3.** Execution and information system risks associated with events in the acquisition and revenue cycles.
- **U4.** Record and update risks in a general ledger system.
- **U5.** Workflow controls used to reduce risks.

After completing this chapter, you should be able to:

- **P1.** Identify execution risks in acquisition and revenue processes.
- **P2.** Identify risks associated with recording and updating information.
- **P3.** Use narratives and activity diagrams to identify existing controls and opportunities for additional controls.

Chapter 4 builds on the foundations in Chapter 2 and 3 to discuss risks and internal controls. Event analysis, introduced in Chapter 2, helps to identify risks. Activity diagrams, introduced in Chapter 3, are employed to document and evaluate workflow controls. We will continue to discuss internal control issues throughout the text. Read this chapter carefully, as it provides the background for future discussion of internal control.

In this chapter, we discuss key internal control objectives of organizations and the risks of not achieving these objectives. We will explain how one can assess these risks using concepts that were discussed in prior chapters related to transaction cycles, events, activities, and files. Additionally a variety of internal control techniques to address the risks will be considered. The first part of the chapter focuses on internal control objectives and risk assessment. Later, attention is directed to control activities that can be used to mitigate risks.

Throughout the text, an internal control icon is positioned in the margin close to the text where internal control is discussed. Because this entire chapter is about internal control, we place only one icon, to the left of this paragraph, to represent the chapter.

**Internal Control and Accountants’ Roles**

*Internal control* is a process, effected by an entity’s board of directors, management, and other personnel, designed to provide reasonable assurance regarding achievement of objectives in the following categories: effectiveness and efficiency of operations; reliability of financial reporting; and compliance with applicable laws and regulations.

A good understanding of internal control is important to accountants as managers, users, designers, and evaluators of accounting systems.
The responsibility of managers for internal control has been made explicit in the Sarbanes-Oxley Act of 2002 and Standard No. 2 of the Public Company Accounting Oversight Board (PCAOB). Standard No. 2 requires management to prepare a statement describing and assessing the company’s internal control system. Annual reports of public companies must now include (1) a statement that management is responsible for internal controls over financial reporting, (2) a statement identifying the framework used by management to evaluate internal controls, (3) an assessment of internal controls and disclosure of any material weaknesses, and (4) a statement that a public accounting firm has issued an attestation report on management’s assessment of internal control. For the second requirement, a control framework such as the one described later in Key Point 4.1 would be appropriate.

Users must also understand a company’s internal controls so that they can be applied properly. As an example, management policy may require that invoice details should be verified against the packing slip and purchase order. Such a control is effective only if the person responsible for recording invoices understands and performs this verification.

Accountants are also important in their role as designers of internal control procedures that lead to compliance with regulations and company objectives. They must assess the risk of not achieving company and internal control objectives and choose or devise internal controls that can reduce the risks.

In their role as evaluators, internal and external auditors must understand internal control systems. Internal auditors will play an important role in developing management’s report that assesses internal controls, now required by PCAOB Standard No. 2. External auditors need to understand internal controls so that they can prepare an attestation to management’s statement about internal control as required by that standard. Of course, they also need to understand internal controls so that they conduct the audit of a company’s financial statements. Generally accepted auditing standards have long required that auditors obtain a sufficient understanding of internal controls to plan the audit.

Framework for Studying Internal Control: Internal Control Components and Objectives

Components of Internal Control

Key Point 4.1 displays five components of internal control. It is based on a 1992 report, “Internal Control—An Integrated Framework” by the Committee of Sponsoring Organizations (COSO) of the Treadway Commission. Hereafter, we will refer to the report as the COSO Report. This landmark report was used in developing Statement on Auditing Standard (SAS) 94, which governed the auditor’s assessment of internal controls as it relates to information technology. It was also singled out in PCAOB Auditing Standard No. 2, as an example of a framework that would be useful to managers in evaluating internal controls.

1The Sarbanes-Oxley Act resulted in the establishment of the Public Company Accounting Oversight Board (PCOAB), which was empowered to propose auditing standards for publicly traded corporations. The Security and Exchange Commission (SEC) must approve each standard to make it enforceable. The PCOAB created Auditing Standard No. 2, “An Audit of Internal Control Over Financial Reporting Performed in Conjunction With an Audit of Financial Statements.” It was approved by the SEC in Release No. 34-49884, on June 17, 2004.

As indicated in Key Point 4.1, the COSO Report identifies five interrelated components of internal control: (1) control environment, (2) risk assessment, (3) control activities, (4) information and communication, and (5) monitoring. Each component is briefly described in the exhibit. We will emphasize the second, third, and fourth components because they are directly related to the use and design of accounting information systems. The second component, risk assessment, is discussed in the next section of this chapter. You will learn how to systematically identify risks in a business process. The third component, control activities, is addressed later in the chapter. Common internal control techniques that reduce risks such as segregation of duties, prenumbered documents, and many others will be discussed. The fourth component, information and communication, was introduced in Chapter 2 by focusing on information that is recorded about events in a process. Chapter 3 expanded this foundation by introducing activity diagrams that highlight communication between responsible parties in a process.

Key Point 4.1 Internal Control Under COSO Report

The COSO Report identifies five components of internal control that have an impact on an organization’s ability to achieve the internal control objectives.

1. **Control environment** refers to broad factors that set the tone of an organization and affect the control consciousness of its employees. These factors include integrity, ethical values, and management philosophy and operating style. It also includes the way management assigns authority and responsibility, organizes and develops its people, and the attention and direction provided by the board of directors.

2. **Risk assessment** is the identification and analysis of risks that interfere with the accomplishment of internal control objectives.

3. **Control activities** are the policies and procedures developed by the organization to address the risks. Control activities include the following:
   a. **Performance reviews** are activities involving analysis of performance, for example, by comparing actual results with budgets, standards forecasts, and prior-period data.
   b. **Segregation of duties** involves assigning responsibilities for authorizing transactions, executing transactions, recording transactions, and custody of assets to different employees.
   c. **Application controls** apply to individual AIS applications (e.g., order entry and accounts payable).
   d. **General controls** are broader controls that relate to multiple applications. For example, controls that restrict access to a company’s computers, software, and data are general controls. General controls also include controls over the process of developing and maintaining application software.

4. **Information and communication.** The company’s information system is a collection of procedures (automated and manual) and records established to initiate, record, process, and report the events in an entity’s process. Communication involves providing an understanding of individual roles and responsibilities.

5. **Monitoring.** Management should monitor internal controls to make sure that the organization’s controls are functioning as intended.

**Internal Control Objectives**

Different stakeholders (stockholders, managers, customers, and employees) may be concerned with different objectives. Stockholders may be primarily concerned with objectives related to share value. The marketing manager may be most interested in objectives related to market share, sales, and customer satisfaction. Internal control objectives indicated in the COSO Report include the following:
Effectiveness and efficiency of operations
Reliability of financial reporting
Compliance with applicable laws and regulations
Safeguarding assets (This objective was included in the report, although not at the place where the other three were listed.)

As you can see, the first three objectives are included in the definition of internal control discussed earlier. For purposes of organizing this text, we classify internal control objectives as the four types of objectives in Key Point 4.2. Each of the four objectives (execution, information system, asset protection, and performance) is discussed in more detail next:

**Execution Objectives.** In the revenue cycle, execution refers to the delivery of goods or services and the collecting and handling of cash. Accordingly, execution would include activities in which the company is releasing inventory and/or using other resources (e.g., labor and equipment) for providing services and handling the resulting cash. Thus, the two execution objectives for the revenue cycle are (1) to ensure proper delivery of goods and services and (2) to ensure proper collection and handling of cash. The way in which goods or services are delivered and cash is handled can vary considerably across organizations. However, the two execution objectives generally apply to the revenue process of any business. The notion of execution objectives is central to our approach to risk assessment, which includes a generic list of risks for any organization's revenue cycle expressed in terms of the two execution objectives. For example, generic risks related to the delivery of goods/services include delivering the wrong goods/services, delivering the wrong quantity, or delivering to the wrong customer. A list of the generic risks for the revenue cycle is provided later in this chapter in Key Point 4.3. We then customize the generic risks based on the nature of the specific organizational process.

Similarly, in the acquisition cycle, execution refers to the actual receiving of goods or services and the payment and handling of cash. Therefore, the two execution objectives for the acquisition cycle are (1) to ensure proper receiving of goods and services and (2) to ensure proper payment and handling of cash. Our approach for identifying execution risks in the acquisition cycle is the same as that for the revenue cycle.

**Information System Objectives.** Information system objectives focus on recording, updating, and reporting accounting information. Event data should be recorded properly on source documents and in transaction files. Master file data about customers, suppliers, employees, and products/services should be updated as needed. Finally, timely and useful reports should be provided to employees/managers. Information systems objectives are also important for ensuring effective execution of transactions. For example, data about supplier invoices must be captured accurately and in a timely fashion in order for the subsequent cash payment process to be effective.

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3The four objectives in Key Point 4.2 are related to the objectives set forth in the COSO Report although there is no one-for-one correspondence. The COSO objective of effectiveness of operations is the principal objective discussed in this chapter, and is included in Key Point 4.2 as execution, information system, and performance objectives. The COSO objective of reliable financial reporting is included in the information objective. Controls for achieving reliability are discussed in this chapter somewhat, but are further explained in Chapters 8 through 11, particularly in the sections where the events in acquisition and revenue cycles are tied to the general ledger. The objective of compliance is not considered in this text because it would require much discussion about laws, regulations, generally accepted accounting principles, and generally accepted auditing standards, subjects which are better left to financial accounting and auditing texts.
Asset Protection Objectives. Our primary focus will be on the execution and information system objectives. These objectives are appropriate in this text because they are especially relevant to the function of an accounting information system and are consistent with our focus on events and processes. However, we will also address the objective of safeguarding assets because theft or loss of assets is a risk that accountants are expected to help control and because accounting information can play a major role in safeguarding assets.

Performance Objectives. Performance objectives focus on achieving favorable performance of an organization, person, department, product, or service. Recall that execution objectives emphasize the proper execution of key revenue and acquisition cycle operations. Even when these objectives are achieved, performance objectives may not be met. For example, orders, shipments, and billing may be done properly, but sales targets may not be met. To address this concern, sales goals may be established for salespeople, and their actual performance could be measured against the goal. As another example, the percentage of uncollectible accounts may be too large despite the facts that customers are approved according to management policies and sales are made only to authorized customers. Along with execution objectives, performance objectives are established to ensure effective operations. Later in the chapter, you will see that reports generated from an AIS also play an important role in reviewing performance. An example would be reports that compare results of operations with prior-period data, standards, and budgets. Thus, performance objectives are related to the information system objectives of timely and useful reports.

Risk Assessment

As indicated in Key Point 4.1, an important component in internal control is the assessment of risks that threaten the achievement of a company’s objectives. Internal control objectives and related risks are displayed in Key Point 4.2. We begin the next section by discussing execution risks in the revenue cycle.

<table>
<thead>
<tr>
<th>Objectives:</th>
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<tbody>
<tr>
<td><strong>Objective type</strong></td>
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<tr>
<td>Execution</td>
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<tr>
<td>Information system</td>
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<tr>
<td>Asset protection</td>
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<td>Performance</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Risks:</th>
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<tbody>
<tr>
<td><strong>Risk type</strong></td>
</tr>
<tr>
<td>Execution</td>
</tr>
<tr>
<td>Information system</td>
</tr>
<tr>
<td>Asset protection</td>
</tr>
<tr>
<td>Performance</td>
</tr>
</tbody>
</table>
ASSESSMENT OF EXECUTION RISKS: REVENUE CYCLE

This section provides guidance for identifying execution risks in the revenue cycle. Execution risks involve the risks of not properly executing transactions. The top part of Key Point 4.3 lists the generic revenue cycle risks for any organization. These generic risks serve as the starting point for risk assessment. The second part lists steps that you can follow for customizing these risks to a specific revenue process.

Key Point 4.3 Guidelines for Assessing Execution Risks in a Revenue Cycle

Generic execution risks for each of the two revenue cycle transactions are as follows:

1. Delivering goods and services:
   - Unauthorized sale or service permitted
   - Authorized sale or service did not occur, occurred late, or was duplicated unintentionally
   - Wrong type of product or service
   - Wrong quantity or quality
   - Wrong customer or address

2. Collecting cash:
   - Cash not collected or collected late
   - Wrong amount of cash collected

Five steps are useful in understanding and assessing execution risks:

Step 1. Achieve an understanding of the organization’s processes.
Step 2. Identify the goods or services provided and cash received that are at risk.
Step 3. Restate each generic risk to describe the execution risk more precisely for the particular process under study. Exclude any risks that are irrelevant or obviously immaterial.
Step 4. Assess the significance of the remaining risks.
Step 5. For significant risks, identify factors that contribute to the risk. The events in the process can be used to systematically identify these factors.

Example: ELERBE’s Revenue Cycle

We will now apply the five steps in Key Point 4.3 to ELERBE’s revenue cycle as an example.

**Step 1: Achieve an understanding of the organization’s processes.** We have already documented ELERBE’s revenue cycle in Chapters 2 and 3. The narrative in Example 4.1, Part A, is taken from Chapter 3.

**Example 4.1** ELERBE, Inc.: Revenue Process

**PART A. Narrative**

**Event 1: Accept customer order.** Bookstore managers send an order with details of all books (ISBN, author, title, publication year, quantities). The order entry clerk enters the order data into the computer. The computer system checks to see if the order is from an existing customer. If the order is from a new customer, the clerk creates a customer record in the Customer File in the computer system. Then, the system checks whether inventory is available. The order details are recorded in the Order File by ELERBE’s computer system. The computer system also updates the quantity allocated for orders in the Inventory File. The clerk prints two copies of the sales order. The clerk sends one copy of the sales order to the warehouse (picking ticket). The second copy serves as a packing slip and is sent to the Shipping Department.

**Event 2: Pick goods.** A warehouse employee uses the picking ticket to locate all the products. In addition to the products and quantities, the picking ticket identifies warehouse locations to make it easy for the warehouse employees to assemble the orders. The employee picks the goods from the warehouse for shipping, packs the goods in a package, notes the actual amounts packed on the
Identifying Risks and Controls in Business Processes

Chapter 4

Step 2: Identify the goods or services provided and cash received that are at risk. ELERBE provides CD-ROMs and Internet products to bookstores and collects cash from bookstores.

Step 3: Restate each generic risk to describe the execution risk more precisely for the particular process under study. Exclude any risks that are irrelevant or obviously immaterial. Example 4.1, Part B, presents the execution risks for ELERBE’s revenue process.

Note that the terms on the left side of Example 4.1, Part B are generic, but the terms on the right side have been customized to suit the revenue cycle of ELERBE.

Step 4: Assess the significance of the remaining risks. Now that the types of errors that can occur in the revenue cycle have been identified, one should consider the likelihood of the error and the magnitude of the losses or opportunity costs associated with those errors. For example, shipping goods to the wrong address would be a serious problem. However, under the current system, shipment to an incorrect address may be highly unlikely. Suppose, however, that orders are never shipped or shipped very late and the probability of delayed or missed shipments is significant. Significant lost sales and a poor reputation will result. Shipping the wrong product is costly because shipping costs will have to be incurred again for the correction.
**Step 5:** For significant risks, identify factors that contribute to the risk. The events in the process can be used to systematically identify these factors. The narrative in Example 4.1, Part A was annotated to show ELERBE’s events. A review of these events is helpful in identifying possible causes of risk. As an example, consider the risk that the wrong product could have been shipped. Points in the revenue cycle that can cause such an error are as follows:

1. Take order event. The order could have been taken incorrectly.
2. Pick goods event. The warehouse employee could have picked the wrong goods.
3. Ship goods event. The shipping clerk may be packing several orders at the same time and sometimes include wrong products in the shipment.

**Devising controls to mitigate risks.** Once the possible causes of risks have been considered, the evaluator needs to decide what control activities could be implemented to mitigate the risks. Later in this chapter, we will consider such control activities.

To gain experience in identifying risks, complete the requirements of Focus on Problem Solving exercise 4.a in the end-of-chapter section. Note that we have summarized events using a table (as in Chapter 2) rather than an annotated narrative (as in Chapter 3). You can use either approach to show events.

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**Assessment of Execution Risks: Acquisition Cycle**

In the previous section we provided guidelines for assessing execution risks in the revenue cycle. In this section we consider execution risks in the acquisition cycle. Key Point 4.4 summarizes the generic risks associated with the acquisition cycle and the steps for assessing risks for a specific acquisition process.

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**Key Point 4.4  Guidelines for Assessing Execution Risks in an Acquisition Cycle**

<table>
<thead>
<tr>
<th>Generic execution risks for each of the two acquisition cycle transactions are as follows:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Receiving goods and services:</td>
</tr>
<tr>
<td>• Unauthorized goods/services received</td>
</tr>
<tr>
<td>• Expected receipt of goods/services did not occur, occurred late, or was duplicated unintentionally</td>
</tr>
<tr>
<td>• Wrong type of product or service received</td>
</tr>
<tr>
<td>• Wrong quantity or quality</td>
</tr>
<tr>
<td>• Wrong supplier</td>
</tr>
<tr>
<td>2. Making payment:</td>
</tr>
<tr>
<td>• Unauthorized payment</td>
</tr>
<tr>
<td>• Cash not paid, paid late, or duplicate payment.</td>
</tr>
<tr>
<td>• Wrong amount paid</td>
</tr>
<tr>
<td>• Wrong supplier paid</td>
</tr>
</tbody>
</table>

Five steps are useful in understanding and assessing execution risks:

**Step 1.** Achieve an understanding of the organization’s processes.

**Step 2.** Identify the goods or services provided and cash received that are at risk.

**Step 3.** Restate each generic risk to describe the execution risk more precisely for the particular process under study. Exclude any risks that are irrelevant or obviously immaterial.

**Step 4.** Assess the significance of the remaining risks.

**Step 5.** For significant risks, identify factors that contribute to the risk. The events in the process can be used to systematically identify these factors.
We provide several examples for identifying different types of risks. However, these risks have a similar pattern. Complete the requirements of Focus on Problem Solving exercise 4.b in the end-of-chapter section to recognize the similarities and differences between Key Point 4.4 and 4.3 (acquisition and revenue cycle risks). Making such comparisons will help you remember these generic risks and use them in future problems.

Example: ELERBE’s Payroll Process

We will now apply the guidelines in Key Point 4.4 to ELERBE’s payroll process to identify its risks.

Step 1: Achieve an understanding of the organization’s processes. Assume that the following narrative in Example 4.2 Part A has been developed based on a review of ELERBE’s payroll process.

Step 2: Identify the goods or services received and cash that are at risk. In the narrative, service is received from employees, and cash is paid to employees.

Step 3: Restate each generic risk to describe the execution risk more precisely for the particular process under study. Exclude any risks that are irrelevant or obviously immaterial. Example 4.2 Part B shows the generic risks adapted to ELERBE’s payroll system.

Step 4: Assess the significance of the remaining risks. Once risks have been identified, one should consider the significance of the losses and opportunity costs associated with the risks. If an employee did a particular job incorrectly, this behavior can result in

---

### Example 4.2  ELERBE, Inc.: Payroll Process

#### Part A. Narrative

**Event 1: Assign tasks.** Supervisor assigns tasks to employees.

**Event 2: Perform assigned duties.** Based on supervisor’s instructions, employees perform their assigned duties.

**Event 3: Record arrival time.** As employees begin work, they “clock-in” by entering a password in an electronic time keeper that records the time of arrival.

**Event 4: Record departure time.** As employees leave work, they “clock-out” using the same device.

**Event 5: Prepare payroll.** On Monday mornings, the payroll clerk obtains a printed report from the electronic time keeper showing the sign-in and sign-out times for each employee during the past week. The clerk computes the hours worked for the week for each employee, separating regular and overtime hours, and enters the information in payroll application software. The clerk uses the system to print a payroll report showing a row for each employee, with employee identification, hours worked, wages earned, and deductions.

**Event 6: Approve payroll.** The clerk gives the payroll report to the controller who approves the payroll determination.

**Event 7: Print checks.** The payroll clerk prints the checks.

**Event 8: Signs checks.** The payroll clerk gives the checks to the controller who signs them.

**Event 9: Distribute checks.** Employees pick up their checks from the controller’s secretary.

(continued)
Example 4.2 Concluded

**Part B. Applying the Generic Acquisition Cycle Risks to ELERBE’s Payroll Process**

<table>
<thead>
<tr>
<th>Generic execution risks</th>
<th>ELERBE’s execution risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving goods and services:</td>
<td>Receiving employee services:</td>
</tr>
<tr>
<td>Unauthorized service received</td>
<td>Employee provided unauthorized service (e.g., performed a duty not permitted).</td>
</tr>
<tr>
<td>Expected receipt did not occur, occurred late, or was duplicated unintentionally</td>
<td>Employee did not report for work or reported late. Unintentional duplication is unlikely.</td>
</tr>
<tr>
<td>Wrong type of product or service received</td>
<td>Employee did not do the job correctly.</td>
</tr>
<tr>
<td>Wrong quantity or quality</td>
<td>Employee provided incorrect amount of service, provided poor service, or was granted a wage rate that was inappropriate.</td>
</tr>
<tr>
<td>Wrong supplier</td>
<td>Wrong (e.g., unqualified) employee provided the service.</td>
</tr>
<tr>
<td><strong>Cash payment</strong></td>
<td><strong>Cash payment</strong></td>
</tr>
<tr>
<td>Unauthorized payment</td>
<td>An unauthorized payment was made to an employee.</td>
</tr>
<tr>
<td>A paycheck was prepared for an employee no longer working at the company.</td>
<td></td>
</tr>
<tr>
<td>Cash not paid or paid late</td>
<td>An employee was not paid or paid late.</td>
</tr>
<tr>
<td>Wrong amount paid</td>
<td>An employee was paid the wrong amount. The wrong amount was withheld, thus violating government requirements.</td>
</tr>
<tr>
<td>Wrong supplier paid</td>
<td>Wrong employee was paid.</td>
</tr>
</tbody>
</table>

wasted labor costs and perhaps scheduling problems that could affect other operations. Although the error of paying an employee who no longer works at a company might seem unlikely, it is not as unusual as one might think. In large organizations, an employee could leave the company without the Payroll Department knowing it. In such a case, the person who distributes the checks could keep the one for the ex-employee and cash it at a bank.

Paying an employee more than the appropriate amount could result in a loss of cash; paying too little could result in an unhappy employee. Errors could also result in failing to correctly withhold the amount of taxes, leading to penalties from the government.

**Step 5: For significant risks, identify factors that contribute to the risk.** Identifying the events in a process, as done in Chapter 2, can be helpful in this step. Example 4.2, Part A identified the individual events in the payroll process, using the techniques described in Chapter 2. We now review these events and consider where the causes of the identified risks are likely to occur. For example, if an employee did not do the job correctly, it could be because the supervisor gave unclear instructions (Assign tasks event) or because the employee did not follow instructions (Perform assigned duties event). If an employee was paid the wrong amount, that might have occurred because the hours were recorded incorrectly (Record arrival time or Record departure time events), because the payroll was computed incorrectly (Prepare payroll event), or because an error was made in writing the check (Print checks event).

**Implementing Controls.** After the potential causes of risks have been determined, appropriate internal controls should be implemented. Again, internal control activities will be discussed later in this chapter.
ASSESSMENT OF INFORMATION SYSTEMS RISKS

The previous section focused on execution risks in a company's processes. In this section, we focus on information systems risks, or the risk of errors in a company's information system through the improper recording, updating, or reporting of data. Because information systems keep track of a company's transactions, they are not independent of execution risks. Even though execution risks and information system risks are not independent, we find that the guidelines for identifying such risks are different enough to warrant separate treatment. In this section, we focus on the risk that data in an information system are incorrect or not up-to-date. We organize information systems risks into two categories: (1) recording risks and (2) update risks. In this chapter we focus on risks related to transactions. There are also information system risks in the file maintenance process. We defer discussion of file maintenance until Chapter 9.

Recording Risks

Recall that we define recording as entering data about an event in a source document or a transaction file. Recording risks represent risks that event information is not captured accurately in an organization's information system. Errors in recording can cause substantial losses. For example, if a sales record has the wrong customer identification, the proper customer will not get billed, and the company may not be paid for the sale. The same problem occurs when a sale is not recorded at all. Having two records for the same sale in the database could result in double-billing. Incorrect pricing information can result in reduced collections. Recording events late can cause opportunity losses. For example, if credit sales are recorded late, then bills will be sent late, and payments will be received later than necessary. In the acquisition cycle, recording errors can result in overpaying bills or loss of credit from failure to pay.

Updating Risks

Update risks are risks that summary fields in master records are not properly updated. Update failures can be costly. For example, orders may be rejected because the quantity of inventory was reported as zero, when inventory was really available. A failure to update the cash balance can result in checks written with nonsufficient funds. Errors in updates can also reduce the effectiveness of controls over the general ledger balances for assets and liabilities. For example, the accounts receivable total in the general ledger should equal the sum of the balance due figures in customer master records. The balance in the general ledger for inventory should agree with the sum of the balances taken from the individual inventory master records. Thus, whenever a customer's balance due is updated, the general ledger account, Accounts Receivable, must be updated immediately or at least scheduled for update.

This section explains how you can systematically identify and document recording and update risks in an AIS. Key Point 4.5 provides guidelines for identifying recording risks. Guidelines for identifying updating risks will be given later in Key Point 4.6 on page 117.

4 The process of recording and updating information can be seen as both a risk and a control. There is the risk that information will be recorded incorrectly, perhaps resulting in transaction errors and incorrect financial statements. But information, when correct, can also be viewed as a control because recorded information is used to control transactions.
Key Point 4.5 Guidelines for Identifying Recording Risks

Generic recording risks for both revenue and acquisition cycles are as follows:

- Event recorded that never occurred
- Event not recorded, recorded late, or unintended duplication of recording
- Wrong type of product or service recorded
- Wrong quantity or price recorded
- Wrong external or internal agent recorded
- Wrong recording of other data, such as dates, general ledger accounts, or other details

In Chapters 9–11, we will extend this list to consider wrong recording of other data items stored in event records (e.g., dates and credit items).

Three steps are useful in identifying recording risks:

**Step 1.** Achieve an understanding of the process under study. Identify the events as discussed in Chapter 2.

**Step 2.** Review the events, and identify instances where data are recorded in a source document or in a transaction file. Be aware that sometimes there is no recording of data during an event.

**Step 3.** For each event where data are recorded in a source document or transaction record, consider the preceding generic recording risks. Restate each generic risk to describe the recording risk more precisely for the particular event under consideration. Exclude any recording risks that are irrelevant or immaterial.

Focus on Problem Solving

Complete the requirements in Focus on Problem Solving exercise 4.c in the end-of-chapter section to compare the transaction and recording risks. Again, recognizing the similarities will help you learn the different risks described in this chapter.

**Example: Angelo’s Diner**

We will apply the three guidelines in Key Point 4.5 to develop a list of recording risks in the revenue cycle of Angelo’s Diner. Review the description of the revenue cycle at Angelo’s Diner shown in Example 4.3.

**Example 4.3 Revenue Cycle for Angelo’s Diner**

**Part A. Narrative**

The customer arrives and sits at a table or at the counter. If a table is not available, the customer waits in the waiting area until one is available. When the customer has taken a seat and is ready to order, he calls the server. The server records the customer’s order on a prenumbered sales ticket. The server gives the sales order to the kitchen staff. The kitchen staff prepares the meal using the information on the sales ticket. When the meal is ready, it is placed on the shelf between the kitchen and dining area. The server picks up the meal and the sales ticket and serves the food. While the customer is eating, the server enters the prices on the sales ticket and leaves it at the customer’s table.

The customer gives the cash and the completed sales ticket to the cashier. The cashier enters the code of each item. The register uses the price lookup tables stored in the register to display the price. After all the items have been entered, the register displays the total. The register stores the information about sales of various items during the day. The cashier collects the cash and gives the customer the appropriate amount of change. At the end of each shift, the cashier closes the register and prints the sales summary. The clerk gives the cashier the sales summary to the manager. The manager checks that all prenumbered sales tickets issued during the day have been collected. The manager then computes the total dollar amount of these tickets. Next, the manager counts the cash receipts and compares this amount with the total shown on the sales summary and the total of the sales tickets.
### Example 4.3
Concluded

#### Part B. Events Recorded in AIS for Angelo's Diner

<table>
<thead>
<tr>
<th>Event</th>
<th>Recording</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Take order</td>
<td>The server records the customer’s order on a prenumbered sales ticket.</td>
</tr>
<tr>
<td>2. Prepare food</td>
<td>Sales ticket information is read by the cook. No additional information is created.</td>
</tr>
<tr>
<td>3. Serve food</td>
<td>Sales ticket information is used by server to determine where to deliver the cooked meal. The prices are recorded on the sales ticket.</td>
</tr>
<tr>
<td>4. Collect cash</td>
<td>The cashier enters the code of each item. The register displays the price. After all the items have been entered, the register displays the total. The register stores the information about sales of various items during the day.</td>
</tr>
<tr>
<td>5. Close register</td>
<td>This event uses data from prior events.</td>
</tr>
<tr>
<td>6. Reconcile cash</td>
<td>This event uses data from prior events.</td>
</tr>
</tbody>
</table>

#### Part C. Recording Risks During the Take Order Event

<table>
<thead>
<tr>
<th>Generic recording risks</th>
<th>Angelo's Diner’s recording risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event recorded that never occurred</td>
<td>Not likely in this situation.</td>
</tr>
<tr>
<td>Event not recorded, recorded late, or unintended duplication of recording</td>
<td>Server does not record order, relying on memory. Server recorded order late, relying on memory of what customer said. Unintended duplication is unlikely in this situation.</td>
</tr>
<tr>
<td>Wrong type of product or service recorded</td>
<td>Server recorded incorrect menu selections on sales ticket.</td>
</tr>
<tr>
<td>Wrong quantity or price recorded</td>
<td>Server recorded wrong quantity of a menu item.</td>
</tr>
<tr>
<td>Wrong external or internal agent recorded</td>
<td>Server failed to record own name on the sales ticket. External agent is not applicable because customer name is not to be recorded.</td>
</tr>
</tbody>
</table>

#### Part D. Recording Risks During the Collect Cash Event

<table>
<thead>
<tr>
<th>Generic recording risk</th>
<th>Angelo's Diner’s recording risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event recorded that never occurred</td>
<td>Not likely in this situation.</td>
</tr>
<tr>
<td>Event not recorded, recorded late, or unintended duplication of recording</td>
<td>Cashier fails to record a sale. Sale was recorded late. For example, after closing the cash register, a customer’s payment was seen on a table. It is unlikely that a cashier will record the same sale twice.</td>
</tr>
<tr>
<td>Wrong type of product or service recorded</td>
<td>Wrong product code entered.</td>
</tr>
<tr>
<td>Wrong quantity or price recorded</td>
<td>Cashier recorded incorrect quantity.</td>
</tr>
<tr>
<td>Wrong external or internal agent recorded</td>
<td>External and internal agents are not applicable. Customers and servers are not recorded in this small business.</td>
</tr>
</tbody>
</table>
Step 1: Achieve an understanding of the process under study. Identify the events as discussed in Chapter 2. This was done in Chapter 2 for Angelo’s Diner. The events identified were as follows:

1. Take order
2. Prepare food
3. Serve food
4. Collect cash
5. Close register
6. Reconcile cash

Step 2: Review the events and identify instances where data are recorded on a source document or in a transaction file. Many events do not result in new data (e.g., inquiries and reports). Example 4.3, Part B highlights the recording activities in the six events identified in Step 1.

Only Events 1, 3 and 4 include recording activities. We will focus on events 1 and 4 in identifying and analyzing recording risks because Event 3 involves recording one data item only. We now move to Step 3.

Step 3: For each event where data are recorded in a source document or transaction record, consider the preceding generic recording risks. Restate each generic risk to describe the recording risk more precisely for the particular event under consideration. Exclude any recording risks that are irrelevant or immaterial. The risks for the “Take order” event are restated in Example 4.3, Part C, and the risks for the “Collect cash” event are restated in Example 4.3, Part D. Refer to Key Point 4.5 on page 114 for the list of risks.

Once the recording risks have been identified, one should consider the amount of losses or opportunity costs that could result from the risks. For example, recording a customer order incorrectly could result in a requirement to cook a new meal, thus wasting the food that was used in the first meal. In addition, the error could result in an unhappy customer who tells others about the bad experience.

The evaluator should think about what caused the errors associated with the various risks. For example, orders could be recorded incorrectly because of a poorly organized or out-of-date menu, a misunderstanding by the customer, or a poorly trained server.

Visualizing Recording Risks in a Computerized Information System

In the Angelo’s Diner case, an electronic cash register was used, but there was no discussion of a true computer system with transaction and master files (although the price list stored in the cash register had some of the attributes of a master file). On the other hand, the information system described for ELERBE’s revenue cycle played a more active role. Master files were maintained for customers and products, and transaction files were used to record events. In the next section, we illustrate how the recording risks indicated in Key Point 4.5 can be applied to a computerized information system.

As seen from Panels A and B in Example 4.4 on page 118, ELERBE’s database has three orders (0100011, 0100012, and 0100013). Assume that (1) all three orders were shipped in the second week in May; (2) they were shipped completely and correctly; and (3) no other shipments were made. The recording of the shipments is displayed in Panels C and D (Shipment and Shipment_Details files). Several errors were made in recording the shipments. The errors are identified by the words in script next to the records in Panels C and D, using the risk terminology in Key Point 4.5. The errors are easy to find in this case, because we know that the information in Panels A and B is correct, that all orders were completely shipped, and that no other shipments were made.

To ensure your understanding of Example 4.4, answer the questions in Focus on Problem Solving exercise 4.d in the end-of-chapter section. To gain experience in identifying recording risks, complete the requirements in Focus on Problem Solving exercise 4.e in the end-of-chapter section.
Identifying Update Risks

In the previous section, guidance was provided for identifying recording risks. In this section, we provide guidance for identifying update risks. Key Point 4.6 provides steps for identifying update risks.

**Key Point 4.6** Guidelines for Identifying Update Risks

Update risks are risks of an error in updating summary data in master files (in a computer system) or subsidiary ledgers (in a manual system).

Generic updating risks are as follows:

- Update of master record omitted or unintended duplication of update
- Update of master record occurred at the wrong time*
- Summary field updated by wrong amount
- Wrong master record updated**

Three steps are useful in identifying update risks:

1. **Step 1.** Identify recording risks as indicated in Key Point 4.5. This step is necessary because errors in recording information in transaction files can result in using inaccurate information to update summary fields.

2. **Step 2.** Identify the events that include update activity. Identify the summary fields in master files that are updated. Types of master files that could be updated as a result of transactions include (a) inventory, (b) services, and (c) agents.

3. **Step 3.** For each event where a master file is updated, consider the preceding generic update risks. Restate each generic risk to describe the update risk more precisely for the particular event under consideration. Exclude any update risks that are irrelevant or immaterial.

*If updates are not immediate but are scheduled, it is important that updates occur according to schedule and that users are aware of the schedule.

**Errors in updating general ledger accounts can also occur, but discussion is deferred until later in this chapter.

Example: ELERBE’s Revenue Cycle

No update activity is necessary for Angelo’s Diner so we will not use that case to illustrate update risks. However, instances of master file updates occur in ELERBE’s system. We will use the three steps in Key Point 4.6 to identify update risks in ELERBE’s revenue cycle files.
### Example 4.4

Tables in ELERBE’s Revenue Cycle with Errors

#### Panel A: Order File

<table>
<thead>
<tr>
<th>Order#</th>
<th>Order_Date</th>
<th>Customer#</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100011</td>
<td>05/11/2006</td>
<td>3451</td>
</tr>
<tr>
<td>0100012</td>
<td>05/15/2006</td>
<td>3451</td>
</tr>
<tr>
<td>0100013</td>
<td>05/16/2006</td>
<td>3450</td>
</tr>
</tbody>
</table>

Order Date = date the order was received by ELERBE, Inc.

#### Panel B: Order_Detail File

<table>
<thead>
<tr>
<th>Order#</th>
<th>ISBN</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100011</td>
<td>0-256-12596-7</td>
<td>200</td>
</tr>
<tr>
<td>0100011</td>
<td>0-146-18976-4</td>
<td>150</td>
</tr>
<tr>
<td>0100012</td>
<td>0-135-22456-7</td>
<td>50</td>
</tr>
<tr>
<td>0100012</td>
<td>0-146-18976-4</td>
<td>75</td>
</tr>
<tr>
<td>0100012</td>
<td>0-145-21687-7</td>
<td>40</td>
</tr>
<tr>
<td>0100013</td>
<td>0-146-18976-4</td>
<td>35</td>
</tr>
<tr>
<td>0100013</td>
<td>0-256-12596-7</td>
<td>100</td>
</tr>
</tbody>
</table>

ISBN = number identifying the book; Quantity = quantity ordered.

#### Panel C: Shipment File

<table>
<thead>
<tr>
<th>Order#</th>
<th>Ship_Date</th>
<th>Customer#</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100011</td>
<td>05/11/2006</td>
<td></td>
</tr>
<tr>
<td>0100012</td>
<td>05/15/2006</td>
<td>3451</td>
</tr>
<tr>
<td>0100012</td>
<td>05/15/2006</td>
<td>3451</td>
</tr>
<tr>
<td>0100012</td>
<td>05/20/2006</td>
<td>3453</td>
</tr>
</tbody>
</table>

Ship Date = date the order was received by ELERBE, Inc.

#### Panel D: Shipment_Detail File

<table>
<thead>
<tr>
<th>Order#</th>
<th>ISBN</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100011</td>
<td>0-256-12596-7</td>
<td>78.35</td>
<td>200</td>
</tr>
<tr>
<td>0100012</td>
<td>0-145-21687-7</td>
<td>80.00</td>
<td>100</td>
</tr>
<tr>
<td>0100012</td>
<td>0-135-22456-7</td>
<td>68.00</td>
<td>50</td>
</tr>
<tr>
<td>0100012</td>
<td>0-146-18976-4</td>
<td>70.00</td>
<td>75</td>
</tr>
<tr>
<td>0100012</td>
<td>0-145-21687-7</td>
<td>72.00</td>
<td>40</td>
</tr>
<tr>
<td>0100012</td>
<td>0-135-22456-7</td>
<td>68.00</td>
<td>50</td>
</tr>
<tr>
<td>0100012</td>
<td>0-146-18976-4</td>
<td>70.00</td>
<td>75</td>
</tr>
<tr>
<td>0100015</td>
<td>0-256-12596-7</td>
<td>78.35</td>
<td>40</td>
</tr>
</tbody>
</table>

ISBN = number identifying the book; Quantity = quantity shipped; Errors are in italics.
**Step 1:** Identify recording risks as indicated in Key Point 4.5. This step is necessary because errors in recording information in transaction files can result in using inaccurate information to update summary fields.

Assume that this step has already been done in the same way that recording risks were identified for Angelo’s Diner. (See page 115.)

**Step 2:** Identify the events that include update activity. A description of three of the events in ELERBE’s revenue process is shown in Example 4.1. Identify the summary fields in master files that are updated. Types of master files that could be updated as a result of transactions include (a) inventory, (b) services, and (c) agent.

The results of this step are shown in Example 4.5, Part A.

**Example 4.5**

ELERBE, Inc.

<table>
<thead>
<tr>
<th>Event</th>
<th>Master File updated</th>
<th>Name of summary field and update required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respond to customer inquiries</td>
<td>No update</td>
<td></td>
</tr>
<tr>
<td>Take order</td>
<td>Inventory</td>
<td>Quantity_Allocated field increased to show commitment to existing orders</td>
</tr>
<tr>
<td>Pick goods</td>
<td>No update</td>
<td></td>
</tr>
<tr>
<td>Ship goods</td>
<td>Inventory</td>
<td>Quantity_Allocated reduced (to release allocation); Quantity_On_Hand reduced</td>
</tr>
<tr>
<td>Bill customer</td>
<td>Customer</td>
<td>Balance_Due increased</td>
</tr>
<tr>
<td>Collect cash</td>
<td>Customer</td>
<td>Balance_Due reduced</td>
</tr>
<tr>
<td>Deposit checks</td>
<td>No update</td>
<td></td>
</tr>
</tbody>
</table>

**Part B.** Update Risks in ELERBE’s Shipping Event

<table>
<thead>
<tr>
<th>Generic update risks</th>
<th>Update risks in ELERBE’s shipping event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update of master record omitted or unintended duplication of update</td>
<td>The Quantity_On_Hand and the Quantity_Allocated fields in the inventory are not updated or are updated twice by accident.</td>
</tr>
<tr>
<td>Update of master record occurred at the wrong time</td>
<td>The update of the two summary fields in the inventory record occurred late (perhaps resulting in customers being told that goods were on hand when they were not).</td>
</tr>
<tr>
<td>Summary field updated by wrong amount</td>
<td>The Quantity_On_Hand or Quantity_Allocated were not reduced by the correct amounts.</td>
</tr>
<tr>
<td>Wrong master record updated</td>
<td>The wrong inventory record was updated.</td>
</tr>
</tbody>
</table>
### Recording and Updating in the General Ledger System

For the most part, we have devoted our attention to the recording and updating of information necessary to carry out functions in the acquisition and revenue transaction cycles. Little attention has been given to recording and updating information for the purpose of financial reporting, something that is accomplished through the general ledger system. Some events have direct financial accounting significance and some do not. Read Example 4.6, Part A to see this distinction as it applies to ELERBE Inc.

As you can see from Example 4.6, Part A, three events require updating of general ledger accounts. It is necessary to record such events as they occur in a way that facilitates the subsequent necessary updates of the general ledger. General ledger account fields can be added to transaction and master files.

Example 4.6, Part B illustrates the use of general ledger account fields. They are essentially the same ELERBE files presented in prior parts of this book except that fields for general ledger accounts and a General Ledger Master File have been added.

While discussing recording risks, we assumed that all three orders were shipped but recorded incorrectly (Example 4.4). In Example 4.6, Part B, we assume that the shipment information was correctly recorded. We also assume that inventory has already been updated. A Cost field has also been added to the Inventory File.

### Example 4.6 ELERBE, Inc.

#### Part A. Financial Accounting Significance of Events in the Revenue Cycle

<table>
<thead>
<tr>
<th>Event</th>
<th>Any impact on general ledger balances?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respond to customer inquiries</td>
<td>No.</td>
</tr>
<tr>
<td>Take order</td>
<td>No.</td>
</tr>
<tr>
<td>Pick goods</td>
<td>No.</td>
</tr>
<tr>
<td>Ship goods</td>
<td>Yes. Record decrease in inventory and increase in cost of goods sold.</td>
</tr>
<tr>
<td>Bill customer</td>
<td>Yes. Record increase in accounts receivable and increase in sales.</td>
</tr>
<tr>
<td>Collect cash</td>
<td>Yes. Record increase in cash and decrease in accounts receivable.</td>
</tr>
<tr>
<td>Deposit checks</td>
<td>No.</td>
</tr>
</tbody>
</table>

#### Part B. Sample ELERBE Files with General Ledger Fields and Files Added

#### Panel A: Inventory File

<table>
<thead>
<tr>
<th>ISBN</th>
<th>Author</th>
<th>Title</th>
<th>Default_price</th>
<th>Cost</th>
<th>Quantity_On_Hand</th>
<th>Quantity_Allocated</th>
<th>G/L_Invt</th>
<th>G/L_COGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-256-12596-7</td>
<td>Barnes</td>
<td>Introduction to Business</td>
<td>$78.35</td>
<td>$52.00</td>
<td>3,700</td>
<td>0</td>
<td>2030</td>
<td>6030</td>
</tr>
<tr>
<td>0-135-22456-7</td>
<td>Cromwell</td>
<td>Management Info. Systems</td>
<td>$68.00</td>
<td>$45.00</td>
<td>4,950</td>
<td>0</td>
<td>2040</td>
<td>6040</td>
</tr>
<tr>
<td>0-146-18976-4</td>
<td>Johnson</td>
<td>Principles of Accounting</td>
<td>$70.00</td>
<td>$48.00</td>
<td>7,740</td>
<td>0</td>
<td>2030</td>
<td>6030</td>
</tr>
<tr>
<td>0-145-21687-7</td>
<td>Platt</td>
<td>Introduction to E-commerce</td>
<td>$72.00</td>
<td>$50.00</td>
<td>4,960</td>
<td>0</td>
<td>2040</td>
<td>6040</td>
</tr>
</tbody>
</table>

G/L_Invt = general ledger account number for inventory; 2030 = business products; 2040 = technology products; G/L_COGS = general ledger account number for cost of goods sold; 6030 = business products; 6040 = technology products
Example 4.6  Concluded

To understand how general ledger information can be updated using the files in Example 4.6, Part B, consider the general ledger effects of the shipment of Order# 0100011. The following journal entry could be added to the general ledger system:

Cost of Goods Sold—Business Products (6030) 10,400*
Cost of Goods Sold—Technology Products (6040) 7,200**

The dollar amounts in the calculations came from the Shipment_Detail File (quantity) and the Inventory File (cost). The correct cost of goods sold account to debit and the correct inventory account to credit were taken from the Inventory File for the particular products sold. Note that it is not actually necessary for someone to make the journal entry. The system could make the journal entry automatically. All of the needed information is already stored in the Inventory and Shipment_Detail files. In that sense, recording the preceding journal entry would be redundant in this computer system. This is true only because care was taken to store the correct general ledger accounts in the Inventory_Master File.

### Panel B: Shipments File

<table>
<thead>
<tr>
<th>Order#</th>
<th>Ship Date</th>
<th>Customer#</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100011</td>
<td>05/11/2006</td>
<td>3451</td>
</tr>
<tr>
<td>0100012</td>
<td>05/15/2006</td>
<td>3451</td>
</tr>
</tbody>
</table>

### Panel C: Shipment_Detail File

<table>
<thead>
<tr>
<th>Order#</th>
<th>ISBN</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100011</td>
<td>0-256-12596-7</td>
<td>$78.35</td>
<td>200</td>
</tr>
<tr>
<td>0100011</td>
<td>0-146-18976-4</td>
<td>$70.00</td>
<td>150</td>
</tr>
<tr>
<td>0100012</td>
<td>0-135-22456-7</td>
<td>$68.00</td>
<td>50</td>
</tr>
<tr>
<td>0100012</td>
<td>0-146-18976-4</td>
<td>$70.00</td>
<td>75</td>
</tr>
<tr>
<td>0100012</td>
<td>0-145-21887-7</td>
<td>$72.00</td>
<td>40</td>
</tr>
<tr>
<td>0100013</td>
<td>0-146-18976-4</td>
<td>$70.00</td>
<td>35</td>
</tr>
<tr>
<td>0100013</td>
<td>0-256-12596-7</td>
<td>$78.35</td>
<td>100</td>
</tr>
</tbody>
</table>

### Panel D: General_Ledger_Master File

<table>
<thead>
<tr>
<th>G/L_Account#</th>
<th>Name_of_Account</th>
<th>Type</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2030</td>
<td>Inventory—Business Products</td>
<td>Current asset</td>
<td>$ 873,400</td>
</tr>
<tr>
<td>2040</td>
<td>Inventory—Technology Products</td>
<td>Current asset</td>
<td>$ 700,000</td>
</tr>
<tr>
<td>6030</td>
<td>Cost of Goods Sold—Business Products</td>
<td>Expense</td>
<td>$1,400,560</td>
</tr>
<tr>
<td>6040</td>
<td>Cost of Goods Sold—Technology Products</td>
<td>Expense</td>
<td>$1,350,518</td>
</tr>
</tbody>
</table>

* $52.00 × 200
**$48.00 × 150
The General Ledger File stores reference and summary data about the general ledger accounts. The update of the summary data (Balance field) is straightforward. The balance in the account, Cost of Goods Sold—Business Products, would be increased by $10,400, and the balance in the account, Inventory—Business Products, would be reduced by $10,400. As you probably know, the process of updating a general ledger account is sometimes referred to as “posting.” For practice, do the exercise in Focus on Problem Solving exercise 4.g in the end-of-chapter section.

Risks in Recording and Updating Information in a General Ledger System

For the general ledger system, the recording and updating risks are similar to the risks already outlined in Key Points 4.5 and 4.6. One risk is that the wrong general ledger account will be recorded and that the amounts of the debit or credit could be wrong. There is also the risk that the general ledger master record might not be updated at all, updated late, or updated twice. In addition, the wrong general ledger master record could have been updated, and the update process may have an error resulting in an updated balance that is incorrect.

The policy for updating general ledger accounts should be well understood. In many cases, general ledger balances are not updated as soon as the transaction occurs. Instead, an update is made after a batch of transactions has accumulated. This approach has internal control advantages that we will discuss in Chapter 8 in some detail and in Chapters 9 through 11 concerning the revenue and acquisition cycles. When the batch process is used, general ledger account balances are temporarily out of date. Employees need to know when updates are made to ledger balances so that they are not relying on information that has not yet been updated.

Controlling Risks

Once significant risks of losses or errors have been identified, the evaluator must consider ways to control the risks. In many cases, a company will turn to its accountants, external auditors, or internal auditors to evaluate existing controls and suggest additional controls where warranted. In the next section, we present some of the techniques that are used to control risks.

Control Activities

In the beginning of this chapter, the components of internal control, as identified in the COSO Report and PCAOB Standard No. 2, were summarized in Key Point 4.1 on page 105. Prior to this point, the discussion centered on risk assessment. In this section we address the third component of internal controls in Key Point 4.1, control activities, in more detail.

Control activities are the policies and procedures developed by the organization to address the risks to the achievements of the organization’s objectives. These activities can be manual or automated and may be implemented at various levels of the organization. Key Point 4.7 describes four types of controls: workflow controls, input controls, general controls, and performance reviews. Our categories of control activities are different from the categories in the COSO Report (and control activities were not detailed in PCAOB Standard No. 2) to better fit our coverage in various chapters of the text. However, we discuss many of the same activities enumerated in the report. As we cover additional controls in later chapters, we will use Key Point 4.7 to reinforce the relationships among various controls. Among the controls in Key Point 4.7, significant attention is given to workflow controls in this chapter; input controls are discussed in detail in Chapter 7; and Chapter 13 is almost entirely devoted to general controls.
In this text, we organize controls into the following four categories:

- **Workflow controls** are used to control a process as it moves from one event to the next. Workflow controls exploit linkages between events and focus on responsibilities for events, the sequence of events, and the flow of information between events in a business process.

- **Input controls** are used to control the input of data into computer systems.

- **General controls** are broader controls that apply to multiple processes. These broader controls should be in place for the workflow and input controls to be effective.

- **Performance reviews** are activities involving analysis of performance including the comparison of actual results with budgets, forecasts, standards, and prior-period data.

Control activities of each type discussed in this text are described here:

**Workflow controls**

- Segregation of duties.
- Use of information from prior events to control activities.
- Required sequence of events.
- Follow-up on events.
- Prenumbered documents.
- Recording of internal agent(s) accountable for an event in a process.
- Limitation of access to assets and information.
- Reconciliation of records with physical evidence of assets.

**Input controls**

- Drop-down or look-up menus that provide a list of possible values to enter.
- Record-checking to determine whether data entered was consistent with data entered in a related table.
- Confirmation of data that was entered by a user by displaying related data from another table.
- Referential integrity controls to ensure that event records are related to the correct master file records.
- Format checks to limit data entered to text, numbers, and date.
- Validation rules to limit the data that can be entered to certain values.
- Use of defaults from data entered in prior sessions.
- Restriction against leaving a field blank.
- Establish a field as a primary key.
- Computer-generated values entered in records.
- Batch control totals taken before data entry compared to printouts after data entry.
- Review of edit report for errors before posting.
- Exception reports that list cases where defaults were overridden or where unusual values were entered.

**General controls**

General controls are organized into the following four categories:

- Information Systems (IS) Planning
- Organizing the Information Technology (IT) Function

(continued)
Workflow Controls

1. Segregation of Duties

Segregation of duties among internal agents is a core concept in designing internal control activities. Typically, for fraud to occur, employees need access to assets as well as the ability to conceal the fraud in the organization’s records. For example, the cashier at Angelo’s Diner could take the cash and conceal it by discarding the sales ticket. To prevent such problems, organizations make an effort to segregate (a) authorization of events, (b) execution of events, (c) recording of event data, and (d) custody of resources associated with the event. Authorization activities refer to any activities performed to check whether an event should be allowed to happen.

The overview activity diagram is best suited to understanding and documenting segregation of duties. Review the overview activity diagram in Example 4.7 for Angelo’s Diner and note the following:

- **Separation between server and kitchen staff.** The server authorizes the removal of ingredients by preparing a sales ticket and giving it to the kitchen staff. The kitchen staff executes the cooking of the meal and has custody of the assets (ingredients used in cooking). Although a separation of duties occurs between authorization and execution, in this case, no separation takes place between custody of assets and execution (removing ingredients). If a substantial risk of loss of ingredients were at issue, someone in the company could be given the custody of the ingredients and only release them to the kitchen staff if a sales ticket supports the removal. This situation is probably uncommon in diners because the cost of the additional employee probably exceeds the amount of benefit from the control.

- **Separation between server and cashier.** The server adds prices to the sales ticket (recording function), and the cashier takes custody of the cash. The cashier also records the sale in the cash register, but the risk of the cashier removing cash and not ringing up the sale is reduced because the completed sales tickets will indicate the expected cash from sales.

2. Use of Information About Prior Events to Control Activities

Information about prior events can come from documents or computer records. First, we consider information from documents.
Information from documents. Example 4.8 shows this control for Angelo’s Diner. The sales ticket prepared during the “Take order” event is used to authorize the “Prepare food” event. Note the relationship between segregation of duties and this control. The kitchen staff has custody over assets (food), but a different agent (server) is responsible for providing the authorization to the kitchen staff (sales ticket). However, this control is not limited to cases where there is a segregation of duties. For example, even if the

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**Example 4.7**
Overview Activity Diagram for Angelo’s Diner

Customer > Server > Kitchen Staff > Cashier > Manager > Register

- Order Food
- Take Order
- Prepare Food
- Serve Food
- Pay Cash
- Ring Up Sale
- Close Register
- Reconcile Cash

- S: Sales ticket (in progress)
- S: Sales ticket (completed)
- S: Sales ticket (paid)
- S: Sale
- S: Sales ticket
- SS: Sales summary
- P: Price lookup

---
same employee took the order and cooked the food, the information from the order would help control errors in the cooking event.

Review Example 4.9 on page 127, and complete the requirements in Focus on Problem Solving exercise 4.h in the end-of-chapter section to make sure you understand the use of documents for control.

**Example 4.8**

Detailed Activity Diagram for Prepare Food and Serve Food Events
Example 4.9
Detailed Activity Diagram for the Picking and Shipping Events
Information from computer files. We have seen that one can use documents from a prior event to control a subsequent event. It is also very common to use data about prior events that were recorded in computer files to authorize new events. As seen in Example 4.10, information in the price lookup table is used to control the recording of sales data. Two examples are given here:

- Summary data in master files may be checked to authorize events. As an example, when passengers buy tickets, the number of seats may be updated in the Flights Master File.

- Transaction records may also help control events. An employee may check purchasing and receiving records in the computer in order to approve invoices for payment. This control is similar to using documents, such as a printed copy of the purchase order, and receiving a report before approving an invoice.

Review Example 4.11 on page 129 and complete the requirements in Focus on Problem Solving exercise 4.i in the end-of-chapter section to make sure you understand the use of computer files for control.
3. Required Sequence of Events

In many cases, organizations have policies that require a process to follow a particular sequence. For example, a doctor may require collection of insurance information before examining a patient. This information reduces the risk of not getting reimbursed for the service. Similarly, a hotel may require a credit card before booking a reservation, even though the card will not be charged until the customer has finished the stay. There is an
obvious overlap between this control and the controls described earlier, (segregation of duties and use of information about prior events). However, there are differences. A company can require a sequence of events without having prior recorded information to rely on, and duties can be segregated without a required sequence. For example, assume a doughnut store has segregated duties so that one person collects the cash and another serves the coffee and doughnuts. The customer has the option of paying before or after service. Thus, there is no constraint on the sequence of these two events.

4. Follow-Up on Events

An organization should have an automated or manual way to review transactions that haven’t been concluded. Here are some examples of events that may need follow-up:

- Customer orders that haven’t been filled
- Sales invoices that are past due
- Requisitions awaiting approval
- Services provided but not yet completed (e.g., printing jobs, repair jobs, and audits)

Events needing follow-up are identified through reports that list incomplete items. Such reports are sometimes known as “open” item reports or aging reports. Reports can list events in order by date or group items according to the amount of time that has passed since the event. An aging of accounts receivable is a common example. Companies can design and use routine reports that flag unfinished business, or users can create ad hoc reports by querying a database. We will discuss methods for querying a database in Chapter 6.

Complete the requirements in Focus on Problem Solving exercise 4.j in the end-of-chapter section to gain experience in considering the need for following up on events.

5. Prenumbered Documents

Prenumbering documents provides an opportunity to control events. Prenumbered documents created during one event are accounted for in a later event. Checking the sequence of prenumbered documents can help ensure that all events are executed and recorded appropriately. For example, Angelo’s Diner can ensure that all sales are recorded by accounting for the prenumbered sales tickets. This control helps in safeguarding cash. (The cashier cannot conceal a theft by taking the cash and discarding the sales ticket.)

Complete the requirements in Focus on Problem Solving exercise 4.k in the end-of-chapter section to consider how prenumbering might be used to control picking and shipping events.

6. Recording of Internal Agent(s) Accountable for an Event in a Process

An internal agent is designated as responsible for most events. For example, in Angelo’s Diner, the server is responsible for taking a customer order and pricing the sales ticket. The kitchen staff is responsible for cooking meals correctly and on time, and the cashier is responsible for collecting the correct amount of cash. Internal control policies and procedures work better when individuals understand their duties and are held accountable for their actions. Clear job descriptions and specific instructions from supervisors are important.

In large organizations, it is easier to hold employees accountable if the employee ID number is recorded at the time of recording the event. For example, at ELERBE,
the record used to record the shipment could include the ID number of the employee who packaged the goods and gave them to the carrier. As another example, at one university, faculty may register students into classes using an office computer that is networked with the university servers. When a student’s registration is recorded, the ID number of the professor who made the registration is also recorded, making him accountable for advising errors.

Accountability can also apply to the safeguarding of assets. Employees are frequently provided with equipment for performing their duties. In some cases, the equipment, such as computer laptops, can be easily removed from the premises. Many organizations identify such assets with serial numbers. A record is maintained for each asset, and the record includes the name of the individual who has custody of the asset.

Complete the requirements in Focus on Problem Solving exercise 4.1 in the end-of-chapter section concerning the accountability of internal agents.

7. Limitation of Access to Assets and Information

An important way to protect assets, such as cash, inventory, equipment, and data, is to limit access to only those employees who need them for their assigned duties. To limit access to them, physical assets are stored in secure locations. For example, the warehouse is open only to employees who pick, ship, and receive goods. As another example, only mail clerks are permitted in the mail room. Employees can be required to wear badges, and alarms can be placed at doors that provide entry to locations with assets. Access to data can be restricted by using passwords and other means that are covered in later chapters.

8. Reconciliation of Records with Physical Evidence of Assets

Reconciliation activities are used by organizations to ensure that the recorded event and master file data correspond to actual assets. Example 4.12 shows an example of a reconciliation activity for Angelo’s Diner. The total cash is reconciled against the register totals to ensure that cash is accounted for and is not lost or stolen. Reconciliation differs from the use of documents to control events in two key ways:

- Reconciliation is broader than a simple check or comparison of documents representing individual events. It usually involves data about multiple events.
- Reconciliation occurs after the events have been executed and recorded. As mentioned earlier, documents were used to initiate events.

To consider reconciliation activities further, read and perform the requirements in Focus on Problem Solving exercise 4.m in the end-of-chapter section. Example 4.13 on page 133 summarizes the workflow application controls discussed in this section as they apply to Angelo’s Diner.
Example 4.12
Detailed Activity Diagram for Close Register and Reconcile Cash Events

- Closes Register
- Prints Register Totals
- Gives Totals/Tickets to Manager
- Checks Prenumbered Tickets
- Calculates Total of Sales Tickets
- Counts Cash
- Checks Cash and Total

Sequence of prenumbered documents is checked.
Records and/or assets are reconciled.
Example 4.13  Summary of Risks and Workflow Control Activities at Angelo's Diner

<table>
<thead>
<tr>
<th>Control</th>
<th>Description</th>
<th>Risks addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Segregation of duties</td>
<td>Server authorizes, but cannot execute; kitchen staff executes, but cannot authorize.</td>
<td>Server could give customer more than ordered for increased tips. Kitchen staff could cook meals for friends without an order.</td>
</tr>
<tr>
<td>2. Use of information about prior events</td>
<td>Kitchen staff uses information from sales ticket to prepare meal. Cashier uses information on completed sales ticket to make sure the customer is charged correctly.</td>
<td>Errors in cooking meals and errors in collecting cash.</td>
</tr>
<tr>
<td>3. Required sequence of events</td>
<td>Kitchen staff cannot start cooking a meal until the server finishes taking the order.</td>
<td>Wasted food from cooking the wrong meal and theft of food by kitchen staff.</td>
</tr>
<tr>
<td>4. Follow-up on events</td>
<td>The narrative for Angelo's Diner made no reference to follow-up. However, a system could be implemented in which the diner makes sure that orders are followed by cooking. The policy of posting all orders to the wall using a clip, until they have been filled, could be established.</td>
<td>Lost sales from failing to fill orders.</td>
</tr>
<tr>
<td>5. Prenumbered documents</td>
<td>The manager checks the sequence of prenumbered sales tickets issued by servers.</td>
<td>Cash is lost or stolen. (The cashier cannot conceal a theft by taking the cash and discarding the sales ticket.)</td>
</tr>
<tr>
<td>6. Recording of internal agent(s) accountable for an event in a process</td>
<td>Not mentioned in the Angelo's Diner narrative. However, the server could be given a sales ticket book that has a specific range of identification numbers. Thus, it is obvious which server is responsible for missing sales tickets.</td>
<td>Server could take amounts paid by customer and destroy sales ticket.</td>
</tr>
<tr>
<td>7. Limitation of access to assets and information</td>
<td>The diner probably has the policy that no one has access to the cash register other than the cashier.</td>
<td>Server or kitchen staff cannot steal cash.</td>
</tr>
<tr>
<td>8. Reconciliation of records with physical evidence of assets</td>
<td>The register totals are reconciled with cash in register.</td>
<td>Cash is lost or stolen.</td>
</tr>
</tbody>
</table>

Complete the requirements in Focus on Problem Solving exercise 4.n in the end-of-chapter section to gain experience in identifying controls in a registration system.

**Performance Reviews**

Performance reviews measure performance by comparing actual data with budgets, forecasts, or prior-period data. Performance reviews include analyzing data (possibly from multiple periods), identifying problems, and taking corrective action. In this section, we explain this type of control further and show how file maintenance is used to implement it.

The application controls discussed in previous sections focused on controlling events. These activities are designed to reduce the risks of improper execution and improper recording. In addition to controlling the routine execution and recording of events, businesses must conduct performance reviews to ensure that events support broader long-
term goals (e.g., high-quality goods/services). Performance reviews typically involve comparing actual results to plans, standards, and prior performance. They often result in taking corrective action based on such comparisons.

The company’s information system, and perhaps especially the accounting information system, should be designed to record and store information about standards and actual outcomes so that managers can determine the extent to which a company is achieving its objectives. In order to control a business process, actual results must be compared to standards or historical experience. Actual results are obtained by recording transactions as they occur. Reports must be designed so that actual results can be analyzed meaningfully. Examples of performance reviews include the following:

- The marketing manager reviews sales of various products in order to determine which products to discontinue.
- The CEO wants to assess the success of the vice president in charge of international sales.
- Periodically, the credit manager checks a report listing past-due accounts so that a decision can be made as to what credit-collection efforts should be undertaken.
- The credit manager checks that uncollectible accounts are within a reasonable limit and revises credit policies as necessary.
- The purchasing officer uses periodic reports to determine whether the company should stop ordering from suppliers where purchase returns are high.

**Master records and performance reviews.** Performance reviews and file maintenance activities are related in two ways. First, planned standards and budget figures (reference data) are typically recorded during file maintenance activities in master records. Second, summary data stored in master records are often used to implement corrective action.

For example, the sales account record in the General Ledger File could include 12 fields, one field for each month’s budgeted sales. The budget figures are reference data and would be entered through the process of file maintenance. Actual results, as they occur, would be compared to the budget. Example 4.14 gives the file maintenance screen for recording budget amounts when using Microsoft® Great Plains software. Similarly, sales goals by salespeople could be included in employee records, and quantity sales goals by product could be stored in inventory records. Standard costs might also be included in the inventory records.

Summary fields in master records can also help in reviewing performance. For example, ELERBE, Inc., could store information about purchase returns in each supplier’s record. The purchase returns information can be reviewed periodically. The purchasing officer can then remove unsatisfactory suppliers from the Supplier File (maintenance activity).

Complete the requirements in Focus on Problem Solving exercise 4.0 in the end-of-chapter section concerning performance reviews.
Example 4.14
File Maintenance for a Budget in Microsoft® Great Plains Software

SUMMARY

We opened this chapter with a definition of internal control and a discussion of its five components, as indicated in the COSO Report. We focused on two of the components: risk assessment and control activities.

In the area of risk assessment, guidelines were presented for identifying execution risks in revenue and acquisition cycles in Key Points 4.3 and 4.4, respectively. Suggestions were also provided for identifying recording risks in Key Point 4.5 and update risks in Key Point 4.6. These guidelines have in common a focus on the elements in a process—events, agents, and goods and services. The focus carries forward the emphasis that was given to these elements in Chapters 2 and 3. There was also a special discussion of recording and updating risks in the general ledger system.

Control activities were identified and classified in Key Point 4.7 as either input, workflow, general controls, or performance reviews. We emphasized workflow controls and left a detailed explanation of input and general controls to later chapters. The workflow controls considered were segregation of duties, required sequence of events, accountability of internal agents, and others. Performance review and its implementation through file maintenance were also discussed.

We will return to the topic of risks and controls throughout the text. In Chapter 7, input controls will be discussed in some detail as they apply to controls over data entry. In Chapter 8, batch processing controls and controls over updates are considered in some depth. Chapters 9 through 11 will revisit the internal controls discussed in this chapter and Chapter 6, in the context of a detailed examination of the revenue and acquisition cycles. General controls will be discussed in Chapter 13.
**Key Terms**

*Application controls.* Controls that apply to the initiation, recording, processing, and reporting of transactions and other financial information. (105)

*Control activities.* The policies and procedures developed by the organization to address the risks to the achievement of the organization’s objectives. (105)

*Control environment.* The broad factors that set the tone of an organization and affect the control consciousness of its employees. These factors include integrity and ethical values, management philosophy and operating style, and organizational structure. (105)

*Execution risks.* Risks that transactions will not be executed properly. (108)

*General controls.* Controls that (a) restrict access to a company’s computers, software, and data, (b) involve backup and recovery, or (c) affect development and maintenance of software. (105)

*Information systems risks.* Risks of improper recording, updating, or reporting of data in an information system. (113)

*Input controls.* These are used to control the input of data into computer systems. Examples include checking input data against master files and checking data format. (123)

*Internal control.* A process designed to provide reasonable assurance that a company will achieve its objectives. (103)

*Performance reviews.* Activities involving review of performance, including comparison of actual results with budgets, forecasts, standards, and prior-period data. (105)

*Recording risks.* Risks that event information is not captured accurately in an organization’s information system. (113)

*Risk assessment.* The identification and analysis of risks that interfere with the accomplishment of internal control objectives. (105)

*Segregation of duties.* A control technique where the responsibilities for (a) authorizing transactions, (b) executing transactions, (c) recording transactions, and (d) custody of assets are assigned to separate individuals. (105)

*Update risks.* Risks that summary fields in master records are not properly updated. (113)

*Workflow controls.* Controls that help manage a process as it moves from one event to the next. Examples include segregation of duties, required sequence of events, prenumbered documents, reconciliation of records with assets, and many others. (123)

**Focus on Problem Solving**

*Important Note to Students:* The solutions to the following Focus on Problem Solving exercises appear in a special section at the end of the text. After completing each exercise, you should check your answer and make sure you understand the solution before reading further.

4.a *Identifying Execution Risks in the Revenue Cycle (P1)*

Angelo’s Diner

The events in the revenue cycle of Angelo’s Diner have been repeated here. (Refer to Chapter 2 for the narrative and an explanation of how these events were identified.)

**Required:**

1. Restate each generic risk to describe the execution risks more precisely for the revenue process of Angelo’s Diner. Use the format in Example 4.1, Part B on page 109. If any of the generic risks are immaterial or not applicable, explain why.

2. For at least two of the risks you identified, suggest a possible cause, and indicate the related event.

*Each Focus on Problem Solving exercise title is followed by a reference to the learning objective it reinforces. It is provided as a guide to assist you as you learn the chapter’s key concept and performance objectives.*
### Events in the Revenue Cycle of Angelo’s Diner

<table>
<thead>
<tr>
<th>Event</th>
<th>Internal agent assuming responsibility</th>
<th>Starts when</th>
<th>Activities in the event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take order</td>
<td>Server</td>
<td>Customer is ready to order</td>
<td>Record customer order on sales ticket</td>
</tr>
<tr>
<td>Prepare food</td>
<td>Kitchen staff</td>
<td>Kitchen staff receives order</td>
<td>Cook meal</td>
</tr>
<tr>
<td>Serve food</td>
<td>Server</td>
<td>Server picks up meal</td>
<td>Deliver food</td>
</tr>
<tr>
<td>Collect cash</td>
<td>Cashier</td>
<td>Customer comes to cashier</td>
<td>Accept cash and sales ticket; ring up sale; give change</td>
</tr>
<tr>
<td>Close register</td>
<td>Cashier</td>
<td>At the end of the shift</td>
<td>Print register tape; give sales summary to manager</td>
</tr>
<tr>
<td>Reconcile cash</td>
<td>Manager</td>
<td>Cashier prints sales summary</td>
<td>Count cash and compare it to cash sales summary and total of sales tickets</td>
</tr>
</tbody>
</table>

### 4.b Comparing Execution Risks—Acquisition and Revenue Cycles (P1)

**Required:**

Compare the generic execution risks in Key Points 4.4 on page 110 and 4.3 on page 108. Suggest some reasons for the differences.

### 4.c Comparing Recording and Execution Risks (P1, P2)

**Required:**

Compare the generic recording risks (Key Point 4.5 on page 114) with the execution risks associated with receiving goods and services (Key Point 4.4 on page 110). Explain the reasons for the differences.

### 4.d Identifying Errors in Records (P2)

Errors in the shipping records in Example 4.4 on page 118 are identified by comments in script, such as “Wrong customer.” The basis for identification of these errors was three known facts: (1) information in Panels A and B is accurate; (2) all of the orders were completely filled and shipped, and (3) no other shipments were made during the period.

**Required:**

Which of the generic recording errors described in Key Point 4.5 (page 114) occurred in Example 4.4, and which did not? Explain your answer.

### 4.e Identifying Recording Risks—Payroll Application (P2)

**ELERBE, Inc.**

Review the payroll process for ELERBE, Inc., in Example 4.2, Part A on page 111.

**Required:**

1. Consider the “Prepare payroll” event. During this event, the payroll clerk enters employee hours in the payroll application software. Review the generic recording risks given in Key Point 4.5 on page 114, and reword the risk descriptions with specific terms that apply to the recording done by the payroll clerk. Use the format in Example 4.3, Part C on page 115. If one or more common risks are irrelevant or immaterial, explain why.

2. What could be some causes of the risks that you have identified?
4.f **Identifying Update Risks (P2)**

Required:
1. Use the format in Example 4.5, Part B on page 119, and identify the update risks in the “Take order” event of ELERBE’s revenue cycle.
2. Repeat Requirement 1 for the “Collect cash” event.

4.g **Recording and Updating General Ledger Accounts (P2)**

Required:
Make a journal entry to show the effect of the shipment of Order# 0100012.

4.h **Using Documents to Authorize Events (P3)**

Required:
Review the activity diagram for the picking and shipping events in Example 4.9 on page 127. Discuss how documents are used to control these events.

4.i **Using Files to Authorize Events (P3)**

Required:
Review the detailed activity diagram for the “Send order” event in Example 4.11 on page 129. Discuss how tables are used to control orders.

4.j **Follow-Up on Events (P3)**

Required:
Review the activity diagram for the picking and shipping events in Example 4.9 on page 127. Suggest a report that could be used to follow up on these events.

4.k **Using Prenumbered Documents (P3)**

Required:
Review the activity diagram for the picking and shipping events in Example 4.9 on page 127. Discuss how prenumbered documents can be used to ensure that all orders are shipped.

4.l **Implementing Accountability (P3)**

Required:
Review Example 4.4 on page 118 which shows some files used in ELERBE’s revenue cycle. How could one or more of the files be modified to improve the accountability of internal agents?

4.m **Reconciliation (P3)**

Required:
Assume that ELERBE, Inc., periodically does a physical count of the inventory in the warehouse. Discuss how the information from the physical count can be used to control inventory.

4.n **Identifying Controls—Registration System (P3)**

**Iceland Community College**

Required:
Read the following narrative, and identify the controls at Iceland Community College. Use a table with the same format as Example 4.13 on page 133 to record your observations (copy the first column and then create new entries for the second and third columns). Where controls don’t exist, suggest additional controls, if appropriate.
Business majors at Iceland Community College register for classes as follows:
  The process starts when the student completes a registration card indicating the courses that she is interested in taking in the following semester. The student also updates her degree plan sheet to reflect all courses taken through the current semester. The degree plan sheet lists all course requirements for the student’s major. As a student completes these requirements, she checks off the requirement on the sheet. The student takes the completed registration card and degree plan sheet to the meeting with the advisor. The advisor reviews the registration card and degree plan sheet. He makes sure that the student has taken the prerequisite courses and selected appropriate courses. He signs the registration card.
  The student takes the signed registration card to the registrar’s office. The registrar’s office clerk enters the information into the computer system. The computer checks the student record. Then, the clerk enters the course number and section number of each course selected by the student. The computer checks that the course is available. Once all the classes have been entered, the computer accepts the registration slip and gives it to the student. The registration slip lists the student details (e.g., social security number, name, etc.) and the details of each course for which the student has registered (course number, description, section, date, time, and location). Once the registration period is over, the registrar’s clerk prints an enrollment report. The enrollment report shows the number of students in each class. The clerk sends the enrollment report to the dean. The dean reviews the enrollment report. If a class has low enrollment, the dean requests the registrar to cancel the class. At the first class, the faculty member takes attendance to determine if there is anyone present who did not register for the course.

4.0 Performance Reviews (P3)

Required:
Review the narrative for the registration process at Iceland Community College in Focus on Problem Solving exercise 4.n, and answer the following questions:
1. Give an example of a performance review for Iceland Community College.
2. How can reference and summary data in master files be used in this review process?
**REVIEW QUESTIONS**

1. Briefly describe the five internal control components.
2. Briefly explain the four internal control objectives discussed in this chapter.
3. List the generic execution risks in the revenue cycle.
4. List the generic execution risks in the acquisition cycle.
5. What are recording risks? List the generic recording risks that you can use to identify recording risks in any process.
6. What are update risks? List the generic update risks that you can use to identify update risks in a process.
7. Briefly describe the eight workflow level controls discussed in this chapter.
8. What are performance reviews? Discuss the role of reports and file maintenance in performance reviews.

**EXERCISES**

The following exercises are based on the MallMart Company narrative. Review the narrative carefully before completing the exercises.

*MallMart Company Layaway Plan.* MallMart Company is a retail store that sells a wide variety of clothing, electronics, and household goods. Their layaway plan works as follows:

A customer selects a product to put on layaway and brings it to the customer service clerk. The clerk determines whether the particular item can be placed on layaway. Any item that is on sale, on clearance, or a seasonal item (e.g., lawn furniture) is not qualified. The customer completes a customer form with name, address and telephone number and is assigned a customer account number. An invoice is prepared identifying the item and showing the total cost (including tax) less a 10 percent down payment that the customer must make immediately. The customer signs one copy of the invoice and returns it to the clerk. The customer gives the clerk cash or a check for the 10 percent payment. The product is tagged with the customer’s number and stored at a special place in the back of the store. The clerk enters the information about the customer into the computer system. The layaway details (date, layaway items, the total amount due on the invoice, and the cash payment) are also recorded in the computer system. The status field in the layaway record is set to “open.”

The customer can make payments at any time, but the full amount must be paid within 60 days. Payments can be made at the cash register or by mail. The clerk records the payments in the computer system. When the final payment is received, the clerk changes the status field in the layaway record to “paid.” The customer is given or sent a receipt that shows the customer name, layaway items, and amount paid. The customer arrives to pick up the merchandise and presents the invoice. The clerk checks the customer to check that the final payment has been made. The merchandise is given to the customer, and the sale is recorded in the system. The layaway status is changed to “closed.” The customer signs the invoice copy to indicate that the goods have been received and gives it to the clerk. The quantity on hand of the inventory is reduced. Twice a week, the manager prepares a report of expired layaways (payment is not complete by 60 days). A check is prepared for all but $10 of the money collected on expired layaways and mailed to the customer. The information about the refund check is recorded in the computer system. The layaway status is changed to “expired.”

**E4.1.** List the four internal control objectives discussed in the text. Briefly describe the meaning of each objective as it applies to the layaway system at MallMart.

**E4.2.** Restate each generic risk to describe the execution risks more precisely for MallMart’s layaway process. Use the format in Example 4.1, Part B on page 109. If any of the generic risks are immaterial or not applicable, explain why. For at least two of the risks you identified, suggest a possible cause, and indicate the related event.

**E4.3.** Consider the event of creating a layaway agreement with the customer (all activities in the second paragraph of the narrative). Restate the generic recording risk descriptions in Key Point 4.5 on page 114 in terms of the specific event being recorded. Exclude any recording risks that are irrelevant or immaterial.
E4.4. Use the following table to identify all of the other events in MallMart’s business process. Indicate the events for which you would need to assess recording risks.

<table>
<thead>
<tr>
<th>Event</th>
<th>Assess recording risk?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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</table>

E4.5. Use the format in Example 4.5, Part B on page 119, and identify the update risks in the event involving the pickup of goods by the customer.

E4.6. Study MallMart’s narrative to identify internal controls. Prepare your answer using the format in the following table. For each control, indicate in the second column, whether it is being used by MallMart or how it could be used. If the control is not appropriate for this system, explain why.

<table>
<thead>
<tr>
<th>Workflow control</th>
<th>How the control applies to MallMart’s system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segregation of duties</td>
<td></td>
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<tr>
<td>Use of information about prior events to control activities</td>
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<td>Required sequence of events</td>
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<td>Follow-up on events</td>
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<tr>
<td>Sequence of prenumbered documents</td>
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<tr>
<td>Recording of internal agent accountable for an event</td>
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<tr>
<td>Limitation of access to assets and information</td>
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</tr>
<tr>
<td>Reconciliation of records with assets</td>
<td></td>
</tr>
</tbody>
</table>

E4.7. Give three examples of how workflow controls can reduce an execution, recording, or update risk for MallMart.

PROBLEM SOLVING ON YOUR OWN

Important Note to Students:

The following problem solving (PS) assignments tie closely to the Focus on Problem Solving exercises on pages 136–139. However, the solutions to these assignments are not provided in the text.

PS4.1 Iceland Community College (Similar to Focus on Problem Solving exercise 4.a)

Review the narrative concerning Iceland Community College in Focus on Problem Solving 4.n on p. 139. The execution risks in this case can be foreseen before the first day of class, based on the classes in which the student is registered. Restate each generic execution risk using the format in Example 4.1, Part B on p. 109.

PS4.2. Iceland Community College (Similar to Focus on Problem Solving exercise 4.e)

Review the narrative concerning Iceland Community College in Focus on Problem Solving 4.n on p. 139. Restate each generic recording risk at the registrar’s office using the format in Example 4.3, Part C on p. 115.
PS4.3. Iceland Community College. (Similar to Focus on Problem Solving exercise 4.f)

Review the narrative concerning Iceland Community College in Focus on Problem Solving 4.n on p. 139. Consider the process at the registrar’s office. Restate each update risk using the format in Example 4.5, Part B on p. 119.

PS4.4. Iceland Community College. (Similar to Focus on Problem Solving exercises 4.h, 4.i, and 4.j)

Review the narrative concerning Iceland Community College in Focus on Problem Solving 4.n on p. 139. (a) How are documents used to control the advising and registration events and the decision to cancel classes? (b) How are files used to control the registration process? (c) There is no procedure at Iceland Community College to allow the professor to follow up and determine for what courses the student actually registers. Suggest a control that would allow follow-up.

PROBLEMS

P4.1. Lakeview Hotel Lakeview Hotel uses a manual system for recording reservations. A receptionist at Lakeview receives a request from a customer for a room. The customer specifies the type of room that she requires (e.g., smoking or nonsmoking). The receptionist checks the Reservation Calendar to see if a room is available for that date or series of days. There is a separate page for each day in the reservation calendar, and each page is organized into two sections, smoking and nonsmoking. An example of a page follows.

<table>
<thead>
<tr>
<th>Reservation Calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, August 23</td>
</tr>
<tr>
<td><strong>Nonsmoking</strong></td>
</tr>
<tr>
<td>Room#</td>
</tr>
<tr>
<td>101 Joan Smith</td>
</tr>
<tr>
<td>102</td>
</tr>
<tr>
<td>103</td>
</tr>
<tr>
<td>104</td>
</tr>
<tr>
<td>105 Thomas Brown</td>
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<td>107</td>
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<td>206</td>
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<tr>
<td><strong>Smoking</strong></td>
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<tr>
<td>Room#</td>
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<tr>
<td>108</td>
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<tr>
<td>109 Donna Cohen</td>
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<td>110</td>
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<td>211</td>
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<td>212</td>
</tr>
</tbody>
</table>

The receptionist records each reservation in the Reservation Calendar by entering the person’s name, in pencil, next to the room number for each day of the stay. The receptionist also records the customer’s name, address, and so on, on a form that is added to the Guest Folder. A third recording completes the process. The details of the reservation are recorded in a Reservations Journal. Entries to the journal are made daily and appear in the order in which the reservations were made.

When the guest arrives, the receptionist checks the Reservation Calendar to make sure that a reservation has been made. The receptionist then gives the keys to the customer.

At the end of the stay, the customer gives a checkout form and the key to the receptionist. The receptionist calculates charges for the room and other services and prepares an invoice. The customer pays the amount due. The receptionist prepares two copies of the receipt and gives one copy to the customer. The receptionist places the cash in the cash box with the second copy of the receipt.
Required:

Restate each generic risk from Key Point 4.3 on page 108 to describe the execution risks more precisely for Lakeview’s revenue process. Use the format in Example 4.1, Part B on page 109. If any of the generic risks are immaterial or not applicable, explain why.

P4.2. Wright Printing Company

Wright Printing Company designs and prints business cards, invoices, letterhead, vinyl signs, and banners. Customers place orders by completing an order form. The customer pays a minimum deposit of 10 percent. A salesperson accepts the order and payment and records the deposit details on the order form. The customer is given one copy of the form. Another copy is placed in the customer folder. A customer can order multiple products from the company. For example, a customer may order business cards and invoices. The customer folder includes the new order as well as any designs used for various products ordered by that customer in the past. The layouts of business cards and invoices and a list of the customer’s employees (for business cards) would be included in the customer folder.

The salesperson gives the customer folder to the manager. The manager reviews the folder. If the order is for an existing product, the manager sends the folder to the Production Department. If the order is for a new or modified product, the manager sends it to a graphic designer. The graphic designer creates a layout for the product. For example, the customer in our earlier example may want to order envelopes and letterhead for the first time. A customer may also need modifications to existing designs. For example, if business cards are required for a new employee of a business or if the business changes location, the information for specific products is changed.

The designer gives the completed layout to the manager. The manager faxes the layout to the customer for approval. Once the customer approves the design, the manager adds the approved layouts to the customer folder. The manager then sends the customer folder with the required order and design information to the Production Department. When the order is finished, it is sent to the manager. The manager prepares an invoice. The customer is notified that the order is ready.

Required:

1. Restate each generic risk from Key Point 4.3 on page 108 to describe the execution risks more precisely for Wright’s revenue process. Use the format in Example 4.1, Part B on page 109. If any of the generic risks are immaterial or not applicable, explain why.

2. Identify the risks in Wright’s business process. For at least two of the risks you identified, suggest a possible cause, and indicate the related event.

P4.3. Accounts Payable System at Garner Clothing Company

The following narrative describes the accounts payable and cash disbursements system at Garner Clothing Company. The narrative has been organized according to the events in the process.

Record supplier invoices. The accounts payable clerk picks up mail from the mailroom. She stamps the invoice with the current date and pulls the corresponding purchase orders from the unpaid file drawer. She also pulls receiving documents to make sure that the items were received. Then, she checks to see if prices and quantities match on the documents. She assembles a data entry packet that includes the purchase order, invoice, and receiving document. She stamps the prepared packets with a voucher number and writes the supplier number. The accounts payable clerk adds shipping and handling charges if necessary. When enough invoices are accumulated, she counts the invoices and calculates the total of the batch of invoices. She enters the batch into the computer. The invoices are recorded in an Invoice File. The invoice record includes an Invoice_Status field. This field is set to “open” when the invoice is recorded. The computer prints a batch summary listing showing the number of invoices and total amount of the invoices. The clerk checks the computer total with the manual total.

Prepare checks. The accounts payable clerk prepares checks for payment every week. The system generates a list of all open invoices that should be paid this week. An invoice will be selected for payment if an early payment discount would be lost by waiting until next week or if the invoice would become past due by next week. The clerk prints a cash requirements report that lists each invoice selected for payment and the total cash required. She compares the checkbook balance to the report to determine whether there is adequate cash
to make the required payments. The payments are recorded in a Payment File, and the status of the invoice is changed to “paid” in the Invoice File. Then, the clerk prints two-part checks.

**Stamp checks.** She gives the checks to the controller. The controller puts a signature stamp on the checks.

**Make payment.** The accounts payable clerk then staples one part of the check to the invoice and mails the other part to the supplier. She files the paid claims in the Paid File.

**Required:**

1. Restate each generic risk in Key Point 4.4 on page 110 to describe the execution risks more precisely for Garner’s acquisition process. The narrative addresses only invoice processing and cash disbursements. Consider the risks associated with cash payments only. Use the format in Example 4.2, Part B on page 112. If any of the generic risks are immaterial or not applicable, explain why.

2. For at least two of the risks you identified, suggest a possible cause, and indicate the related event.

**P4.4. Bedford Medical Associates** The business process begins when a patient calls the office with a request for an appointment. The receptionist asks for the patient’s name and telephone number. The receptionist reviews the doctor’s schedule to find an available time slot and then records the appointment in the computer.

Upon arrival, the patient signs in on an appointment sheet. The receptionist checks that the patient insurance information is still valid. The receptionist pulls the patient’s medical folder and places it on a counter. The folders are stacked so that the one most recently pulled is at the bottom. When an examination room becomes available, a nurse takes a patient folder from the top of the stack. The nurse then calls the patient’s name and takes the patient to an examination room. The nurse records the reason for the visit.

The doctor reviews the patient information, examines the patient, and updates the patient folder. The patient takes the folder to the receptionist. The patient makes the co-payment. The receptionist prints a receipt, reviews the patient folder, and enters the billing data into the computer system. Bills are then sent to insurance companies.

**Required:**

1. Consider the event of billing insurance companies and collecting co-payments. Restate each generic risk in Key Point 4.5 on page 114 to describe the recording risk more precisely for this event. Exclude any recording risks that are irrelevant or immaterial.

2. Use the following table to identify all of the other events in Bedford’s business process. Indicate the events for which you would need to assess recording risks.

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<thead>
<tr>
<th>Event</th>
<th>Assess recording risk?</th>
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**P4.5. Lambert Insurance** Lambert Insurance’s process starts when a customer calls and requests an automobile insurance quote. A receptionist notes the customer information on a fact finder form. The information includes the customer’s name, address, telephone number, vehicle identification number, make/model of vehicle, number of drivers, ages, anti-theft device, prior insurance, and coverage. The fact finder form is given to the agent. Based on the information gathered, the agent decides on a rate. If the customer has had a license for more than five years, does not have any tickets or accidents in the past three years, and has prior insurance for at least a year with no lapse of more than 30 days without coverage, he or she gets the lowest rate. If any requirement is not met, the customer will have to pay a higher rate. The agent then enters all the information into the computer system. The computer prints the quotes. The quote is faxed to the customer for review.
After the final approval of the price, the customer comes into the office and signs the agreement binder. The binder shows the vehicles insured, the named drivers, coverage details, amount of payment made, agent’s signature, and customer’s signature. Then, the customer makes an initial payment (cash or check) for the first and second months of coverage. The agent records the agreement details into the computer system. Every month, the home office prepares monthly statements. These statements are mailed to the customer. The customer sends a check and the statement to the agent. The agent reviews the statement and check and then enters the payment details into the computer. The computer records the payment and updates the customer’s balance.

Required:

1. Consider the event of preparing the insurance quote (after the receptionist has given the fact finder form to the agent). Restate each generic risk in Key Point 4.5 on page 114 to describe the recording risk more precisely for this event. Exclude any recording risks that are irrelevant or immaterial.

2. Use the following table to identify all of the other events in Lambert’s business process. Indicate the events for which you would need to assess recording risks.

3. Review your answer to Requirement 2, and explain how you would proceed with the assessment of recording risks that you started in Requirement 1.

P4.6. Silver City Library A description of the process for issuing membership cards to new members and for checking out and returning books follows. The narrative has been organized according to the events in the process.

Process membership application. To become a member, an applicant completes an application form with details including name, address, and telephone number. The applicant submits the form and proof of residence to the librarian. Applicants must be from the town of Raynham. The librarian reviews the form and proof of residence and then enters the member information into the computer system. The computer records the information in the Member File. The librarian prints a temporary membership card with member details. The librarian gives the temporary card to the member.

Prepare permanent membership card. The member gives the temporary card to the secretary. The secretary takes a photograph of the applicant and prepares the permanent card with photo identification.

Check out books. Books owned by the library are labeled with a bar code. There is a record for each book in the system with the following information: ISBN, title, author, number of pages, class, copy#, year-to-date checkouts, and status. The class refers to whether the book can be circulated or must be held in the reference section of the library. A member selects books from shelves and presents a valid card and the books to the librarian. The librarian enters the member identification into the computer system. The computer then displays member information and any books currently on loan to that member. The librarian checks whether the books are past due, checks that no more than five books are loaned to a member at any one time, and checks that the books are not from the reference section. The librarian then scans the bar code of each book. The computer records the checkout event details, changes the book status to “checked out,” and updates the amount of year-to-date checkouts for the book. The librarian desensitizes the books and gives them to the member. After two weeks, the books must be returned.
Return books. Returned books are scanned by the librarian and then returned to the shelves. The computer records the return and updates the book status to “available.”

Required:
1. Identify the events in which a master file is updated in the preceding process.
2. For each event where a master file is updated, consider the generic update risks in Key Point 4.6 on page 117. Restate each generic risk to describe the update risk more precisely for the particular event under consideration. Exclude any update risks that are irrelevant or immaterial. Use the format in Example 4.5, Part B on page 119 to present your answer.

P4.7. McMillan Networking McMillan Networking provides Web design and hosting services. The company is also an Internet service provider (ISP). The company began operations recently. It has two consultants who provide the various services. Most of their clients are individuals or small businesses. The following narrative focuses on their ISP activities.

Individuals or business owners contact the company to inquire about services. The secretary describes various options; the charges are different depending on the plan. If the customer is interested, the secretary sets up an appointment with one of the consultants.

The consultant discusses the details with the client. The consultant completes an agreement form describing the services. Services vary according to the monthly fee and the number of minutes per month allowed before extra charges, if any, are applied. The customer information (customer number, name, address, and telephone number) is entered into the computer and recorded in the Customer File. Then, the agreement details are entered into the computer and recorded in an Agreements File. Customers usually bring their computers to the company’s office when they come for their appointments. The consultant installs the necessary software and performs setup tasks to provide Internet access.

At the end of every month, a secretary uses the computer to record the monthly charge, and the system increases the customer’s balance due. The computer prints the invoices. The bills show the current month’s charges as well as any past balance. The secretary mails them to the customer. Customers usually pay by check. The secretary receives the checks and places the cash receipts in a file. At the end of the day, the secretary calculates the dollar totals of the cash receipts using an adding machine. The secretary enters the payment details about the checks received that day into the computer. The payment is recorded, and the customer balance is reduced. The computer displays summary data about the batch (the total number of cash receipts entered and the total amount). The secretary checks that the batch totals and record counts generated by the computer equal the adding machine totals and then edits the cash receipts data, if necessary. A deposit slip is printed. The secretary gives the checks and deposit slips to one of the consultants for deposit.

Required:
1. Use the format in Example 4.5, Part B on page 119, and identify the update risks in the event involving the preparation and mailing of invoices.
2. Repeat Requirement 1 for the event involving the collection of cash from customers.

P4.8. Tasty Burger A customer arrives at Tasty Burger and waits in line to place an order. When an employee becomes available, the customer places an order. The employee keys the order information into the register, which is a point-of-sale device connected to the office computer. The register displays the amount due. The employee collects the amount due and gives the customer his or her change. The computer records the sale and updates the inventory. The employee then gives the food to the customer.

Registers are assigned to employees for the duration of their shifts. When this shift is over, the manager either reassigns the drawer to someone else or decides to close it. To close the drawer, the manager enters a register report command. The register generates a report showing how much cash should be in the drawer. The manager then counts the actual cash in the drawer, compares it to the register’s amount, and records the overage or shortage (if any).

At the end of the day, the manager closes all the drawers, counts the cash, and prepares a daily summary report. The report includes total amount collected, sales, sales tax, and amount short or over for the day.
After finishing the report, the manager leaves the restaurant and deposits the cash in the night deposit slot at the bank.

Required:

Study the narrative for Tasty Burger to identify internal controls. Prepare your answer using the format given in the following table. For each control, comment in the second column on whether it is used by Tasty Burger or how it could be used. If the control is not appropriate for this system, explain why.

<table>
<thead>
<tr>
<th>Workflow control</th>
<th>How the control applies to Tasty Burger's system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segregation of duties</td>
<td></td>
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<tr>
<td>Reconciliation of records with assets</td>
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</table>

**P4.9. Bowden Building Supplies** Bowden Building Supplies sells building supplies in San Antonio. They offer free delivery of goods within the city. Bowden uses the following system for recording credit sales to builders.

A builder gives an order to a sales clerk. The sales clerk completes a prenumbered delivery slip for the sales order. Two copies of the delivery slip are sent to the warehouse, and one copy is sent to the Billing Department. A warehouse employee uses the delivery slip to pick the goods. The employee gives the goods and the two delivery slips to a driver. The driver delivers the goods to the customer. The customer signs the delivery slip. The customer keeps one copy and gives the other copy back to the driver. Signed delivery slips are forwarded to the Billing Department each evening.

The following morning, the billing clerk checks to see that the sequence of prenumbered documents is complete. The clerk calculates the dollar totals of the sales using an adding machine and then enters the information from the delivery slips into the computer. The computer records the sale and updates the customer’s balance and inventory balance. The computer prints a list of sales, the total number of delivery slips entered, and the total dollar amount of sales. The clerk checks the adding machine totals with the totals generated by the computer and also verifies that the number of delivery slips entered equals the number of prenumbered slips. The computer prints three copies of customer invoices. The first copy is mailed to the customer, the second is filed by Billing, and the third is forwarded to Accounts Receivable.

Required:

Study the narrative for Bowden Building Supplies to identify internal controls. Prepare your answer using the format given in the following table. For each control, comment in the second column on whether the control is used in Bowden’s system, or how it could be used. If the control is not appropriate for this system, explain why.

<table>
<thead>
<tr>
<th>Workflow control</th>
<th>How the control applies to Bowden’s system</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Follow-up on events</td>
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*(continued)*
P4.10. Austin National Bank The following narrative describes the process for tracking the time spent on audits at Austin National Bank. It has been organized according to the events in the process.

Prepare audit plan. Austin National Bank has several branches throughout the city of Austin. The Internal Audit Department audits various departments in all branches. At the beginning of each year, the manager of the Internal Audit Department prepares an annual audit plan that lists all audits projected, audit start dates, budgeted hours, and auditors assigned. The manager enters the audit plan into the computer. The computer records the plan in the Audits Master File.

Prepare timesheets. Several auditors can be involved in the performance of a single audit, and over the course of a week, an auditor may be involved in more than one audit. Every week, each auditor prepares a timesheet. The timesheet is used to track the amount of time spent by the auditor on different audits during the week. The auditors send the timekeeping sheets to the secretary.

Record timesheets. At the end of every week, the secretary enters the details of the work performed and time spent by each auditor on each audit from the timekeeping sheets into the computer. The computer records the data in a timekeeping file. The total amount of hours spent on audits by each auditor during the year is updated in the Auditor Master File. The total time spent on each audit is also updated in the Audits Master File.

Review audit list. At the end of the year, the manager of the Internal Audit Department prepares an audit list that summarizes the total time spent on each audit and the budgeted hours. The manager reviews this information when deciding on the budgeted hours for each audit in the next year.

Required:
1. How are performance reviews used in Austin National Bank’s system?
2. Explain the link between performance reviews and reporting activities.
3. Explain the role of file maintenance in performance reviews.

P4.11. College Dining Services This narrative describes part of the planning and ordering system used at College Dining Services. College Dining operates student cafés and faculty dining rooms on college campuses across the country. We focus on the ordering process in student dining halls operated by College Dining Services at one college. The production manager is responsible for ordering decisions. Every week, the production manager takes a physical count of inventory and writes it in the inventory ledger. The amount of inventory carried at any time is low, and a perpetual inventory system is not needed.

The company uses food planning software to provide information for ordering decisions. The software stores recipe information and menus. The menus are generally repeated once a month. A purchasing clerk selects a menu from the list in the food planning system. The system uses the Menu File to identify the specific menu items to be served on that day. For example, one menu may offer customers the choice of lasagna or chicken pot pie as an entrée. For each menu item, a portion factor is available in the Menu File. The portion factor and projected attendance are used to calculate the number of portions to prepare for each item. For example, if the portion factor for lasagna is 0.9 and the projected attendance is 300, then 270 portions of lasagna will be prepared.

Once the menu items are identified, the system uses the Recipe File to determine the ingredients required to prepare one portion of each menu item. The total amount of each ingredient is calculated by multiplying the
amount per portion by the number of portions. Then, the system prints out an ordering list that identifies the amount of each inventory item required. As noted earlier in the narrative, the business does not maintain the current amount of each inventory item in the storeroom. Thus, it can only suggest that two cartons of tomatoes are required for tomorrow. If one carton is already available in the storeroom, then the production manager must order only one carton. The manager reviews the ordering list and decides on the items to be ordered. The manager then writes the items to be ordered on a purchase order (PO) and sends it to the supplier.

The receiver receives the goods from suppliers and accepts goods after matching them with the PO and the supplier packing slip. The receiver stamps the date on the items received and stores them in such a way that older items are always used earlier. The receiver checks the items received on the PO and forwards it to Accounts Payable. At the end of each day, the chefs complete a worksheet indicating how much of each menu item was prepared as well as leftover amounts. Past trends are used in revising portion factors. For example, if the chef’s worksheet indicates that only half the lasagna portions were used last time it was served, the production manager might reduce the portion factor from 0.9. The revised portion factor is entered in the computer system. The computer system records it in the Menu File.

Required:
1. Discuss two controls that protect the assets (food items) in this business process. Assume that chefs have a key to the storage room where the food items are kept. They take the food items as required. The manager and the receiver also have keys.
2. How are performance reviews used in this system?
3. Explain the link between performance reviews and reporting activities.
4. Explain the role of file maintenance in performance reviews.

P4.12. International Perspective: Garcia

U.S. Customs Brokers

Garcia U.S. Customs Brokers helps customers import merchandise into the United States from Mexico. The business has been operating since 1995. The process of bringing merchandise into the United States is complex. First, the customer’s documents (invoices, bill of lading, and packing list) are received by fax or e-mail. Garcia assigns an account executive to each client. The account executive reviews these documents. Additional documents may be required in some situations. For example, a NAFTA Certificate of Origin should be included for shipments originating in Canada or Mexico to qualify for reduced duty or duty-free entry. The account executive advises the client if any additional documents are needed.

The account executive then classifies each item on the invoice in terms of the Harmonized Tariff Schedule of the United States. If needed, the account executive discusses merchandise classification with the client. Once the items are classified, duties are calculated. The account executive enters the details of the import into the computer, and the computer records the details in an Imports File. The computer prepares a customs entry from the information in the Imports File. The entry is submitted electronically to U.S. Customs using ABI (Automatic Broker Interface).

Once the entry has been reviewed, the company receives electronic notification from U.S. Customs. If necessary, the account executive submits a modified entry. If no modifications are needed, a certification document is included in the information from Customs. The account executive prints the certification information. The account executive then determines whether an examination of the documents is required for that shipment. If Customs wants to examine the documents, the account executive gives a hard copy of the documents (customs entry, certification, invoice, bill of lading, and packing list) to the company dispatcher. The dispatcher takes the documents to U.S. Customs for review. The details of the documents reviewed are recorded by Customs in its computer system.

Once the trailer crosses the border and the goods are released from Customs, the account executive receives an electronic notification from U.S. Customs with the release date and time which are recorded in a Releases File. Customs duty and taxes may have to be paid to Customs at the time of entry for some merchandise or within 10 days from the date of Customs release. For some clients, the broker handles the payment of duties and taxes. For such clients, the account executive pays duties to Customs electronically.
Required:

1. List the four internal control objectives discussed in this chapter. Briefly describe the meaning of each objective for the Customs process.

2. Restate each generic risk from Key Point 4.3 on page 108 to describe the execution risks more precisely for this revenue process. Use the format in Example 4.1, Part B on page 109. If any of the generic risks are immaterial or not applicable, explain why.

3. For at least two of the risks you identified, suggest a possible cause, and indicate the related event.

4. Consider the event of creating a customs entry (all activities in the first and second paragraphs of the narrative). Restate the generic recording risk descriptions from Key Point 4.5 on page 114 in terms of the specific event being recorded. Exclude any recording risks that are irrelevant or immaterial.

5. Use the following table to identify all of the other events in the Customs business process. Indicate the events for which you would need to assess recording risks.

<table>
<thead>
<tr>
<th>Event</th>
<th>Assess recording risk?</th>
</tr>
</thead>
</table>

ACCOUNTING SOFTWARE EXERCISES

Review your accounting software sufficiently to answer the following questions. For questions that require a YES or NO answer, explain how you arrived at your answer.

A4.1. Passwords Does the system allow for assignment of passwords in a way that enforces separation of duties? For example, can permissions be set so that some users are permitted to add customers but not record sales, and vice versa?

A4.2. Credit Limits Can credit limits be set for customers? Can a sale still be made if a customer is over the credit limit? Is an exception report printed if this is done?

A4.3. Selecting Invoices for Payment Does the purchasing system have an automatic procedure for choosing invoices for payment, so that discount and due dates are not missed?

A4.4. Follow-up Reports What reports does the system provide that would help users follow up on unfinished transactions? Examples of unfinished transactions include customer or purchase orders not filled, customer and purchase invoices past due, etc.

A4.5. Serial Number Assignments Are serial numbers automatically assigned to these records/documents: purchase orders, customer orders, sales invoices, and checks?

A4.6. Internal Agent Accountability Do data entry fields for recording sales orders or sales invoices allow for recording the ID or name of the internal agent recording the event or the internal agent responsible for the event?

A4.7. Reconciling Inventory Does the system have a form or other special feature for comparing quantities of inventory according to the system to the quantity of inventory according to a physical count?

A4.8. Bank Reconciliation Does the system have a procedure facilitating bank reconciliation?
DATABASE PROJECT

The database project requires you to design and implement an AIS for a business of your choice. Requirements for this project start in Chapter 2 and continue until Chapter 7.

DB4.1 Briefly describe the internal control objectives for the process under study.

DB4.2 Identify execution risks for the selected process. Document the risks using the format suggested in the chapter.

DB4.3 Identify recording risks for the selected process. Document the risks using the format suggested in the chapter.

DB4.4 Identify update risks for the selected process. Document the risks using the format suggested in the chapter.

DB4.5 Study the narrative of the selected process to identify internal controls. Prepare your answer using the format in the following table. For each control, comment in the second column on whether the control is used in the process under study, or how it could be used. If the control is not appropriate for the process, explain why.

<table>
<thead>
<tr>
<th>Workflow control</th>
<th>How the control applies to the process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segregation of duties</td>
<td></td>
</tr>
<tr>
<td>Use of information about prior events</td>
<td></td>
</tr>
<tr>
<td>to control activities</td>
<td></td>
</tr>
<tr>
<td>Required sequence of events</td>
<td></td>
</tr>
<tr>
<td>Follow-up on events</td>
<td></td>
</tr>
<tr>
<td>Sequence of prenumbered documents</td>
<td></td>
</tr>
<tr>
<td>Recording of internal agent accountable for an event</td>
<td></td>
</tr>
<tr>
<td>Limitation of access to assets and information</td>
<td></td>
</tr>
<tr>
<td>Reconciliation of records with assets</td>
<td></td>
</tr>
</tbody>
</table>

COMPREHENSIVE CASE—HARMONY MUSIC SHOP

Refer to the end-of-text Comprehensive Case section (pages 595–606) for the case description and requirements related to this chapter.