CHAPTER

13

The Expenditure Cycle: Purchasing to Cash Disbursements

LEARNING OBJECTIVES

1. Discuss the basic business activities and related information processing operations in the expenditure cycle, explain the general threats to those activities, and describe the controls that can mitigate those threats.
2. Explain the process and key decisions involved in ***ordering goods and services***, identify the threats to those activities, and describe the controls that can mitigate those threats.
3. Explain the process and key decisions involved in ***receiving goods and services***, identify the threats to those activities, and describe the controls that can mitigate those threats.
4. Explain the process and key decisions involved in ***approving supplier invoices*** for goods and services, identify the threats to those activities, and describe the controls that can mitigate those threats.
5. Explain the process and key decisions involved in making ***cash disbursements*** to suppliers, identify the threats to those activities, and describe the controls that can mitigate those threats.

INTEGRATIVE CASE Alpha Omega Electronics

Although the new enterprise resource planning (ERP) system at Alpha Omega Electronics (AOE) has enabled the company to slash its costs associated with purchasing and accounts payable, Linda Spurgeon, AOE's president, is convinced that additional improvements are needed. She is particularly concerned about issues recently raised by LeRoy Williams, vice president of manufacturing for AOE. LeRoy is upset because several production runs were delayed at the Wichita plant because components that AOE's inventory records indicated as being in stock actually were not on hand. There were also delays at the Dayton plant because suppliers either did not deliver components on time or delivered substandard products.

Linda asked Elizabeth Venko, the controller, and Ann Brandt, AOE's vice president of information systems, for some recommendations on how AOE's new ERP system could help solve these problems. Specifically, she asked Elizabeth and Ann to address the following issues:

1. What must be done to ensure that AOE's inventory records are current and accurate to avoid unexpected components shortages like those experienced at the Wichita plant?
2. How could the problems at the Dayton plant be avoided in the future? What can be done to ensure timely delivery of quality components?
3. Is it possible to reduce AOE's investment in materials inventories?
4. How could the information system provide better information to guide planning and production?
5. How could IT be used to further reengineer expenditure cycle activities?

As this case reveals, deficiencies in the information system used to support expenditure cycle activities can create significant financial problems for an organization. Current and accurate information about inventories, suppliers, and the status of outstanding purchase orders is crucial for managing the expenditure cycle effectively. As you read this chapter, think about how to solve AOE's problems with its expenditure cycle activities.

expenditure cycle - A recurring set of business activities and related data processing operations associated with the purchase of and payment for goods and services.

Introduction

The **expenditure cycle** is a recurring set of business activities and related information processing operations associated with the purchase of and payment for goods and services (Figure 13-1). This chapter focuses on the acquisition of raw materials, finished goods,

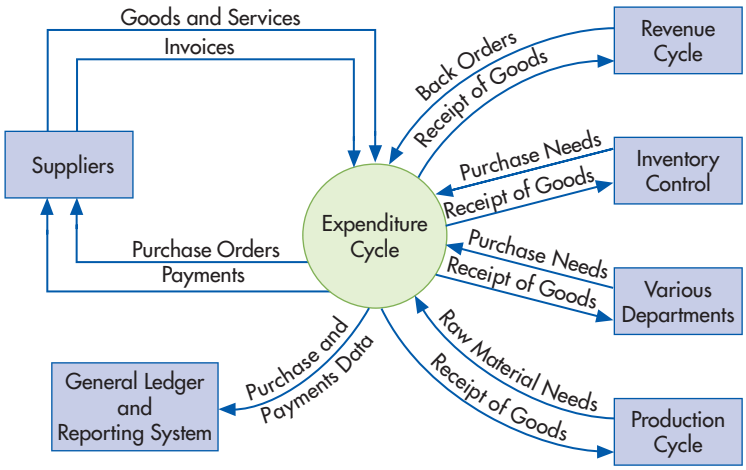


FIGURE 13-1
Context Diagram of the Expenditure Cycle

supplies, and services. Chapters 14 and 15 address two other special types of expenditures: the acquisition of fixed assets and labor services, respectively.

In the expenditure cycle, the primary external exchange of information is with suppliers (vendors). Within the organization, information about the need to purchase goods and materials flows to the expenditure cycle from the revenue and production cycles, inventory control, and various departments. Once the goods and materials arrive, notification of their receipt flows back to those sources from the expenditure cycle. Expense data also flow from the expenditure cycle to the general ledger and reporting function for inclusion in financial statements and various management reports.

The primary objective in the expenditure cycle is to minimize the total cost of acquiring and maintaining inventories, supplies, and the various services the organization needs to function. To accomplish this objective, management must make the following key decisions:

- What is the optimal level of inventory and supplies to carry?
- Which suppliers provide the best quality and service at the best prices?
- How can the organization consolidate purchases across units to obtain optimal prices?
- How can information technology (IT) be used to improve both the efficiency and accuracy of the inbound logistics function?
- How can the organization maintain sufficient cash to take advantage of any discounts suppliers offer?
- How can payments to vendors be managed to maximize cash flow?

The answers to those questions guide how an organization performs the four basic expenditure cycle activities depicted in Figure 13-2:

1. Ordering materials, supplies, and services
2. Receiving materials, supplies, and services
3. Approving supplier invoices
4. Cash disbursements

This chapter explains how an organization's information system supports each of those activities. We begin by describing the design of the expenditure cycle information system and the basic controls necessary to ensure that it provides management with reliable information to assess operational efficiency and effectiveness. We then discuss in detail each of the four basic expenditure cycle activities. For each activity, we describe how the information needed to perform and manage those activities is collected, processed, and stored. We also explain the controls necessary to ensure not only the reliability of that information but also the safeguarding of the organization's resources.

Expenditure Cycle Information System

As Table 13-1 shows, the activities in the expenditure cycle are mirror images of the basic activities performed in the revenue cycle. These close linkages between the buyer's expenditure cycle activities and the seller's revenue cycle activities have important implications for the design of both parties' accounting information systems. Specifically, by applying new IT developments to reengineer expenditure cycle activities, companies create opportunities for suppliers to reengineer their revenue cycle activities. Conversely, using IT to redesign a company's revenue cycle can create opportunities for customers to modify their own expenditure cycles. In fact, the changes in one company's operations may *necessitate* corresponding changes in the operations of other companies with which it does business. For example, the major automobile manufacturers and many large retailers, such as Walmart, require their suppliers to transmit invoices via electronic data interchange (EDI), or they will not do business with them. Consequently, those suppliers must modify their accounting information systems to incorporate the use of EDI.

PROCESS

Like most large organizations, AOE uses an ERP system. Figure 13-3 shows the portion of the ERP system that supports AOE's expenditure cycle business activities.

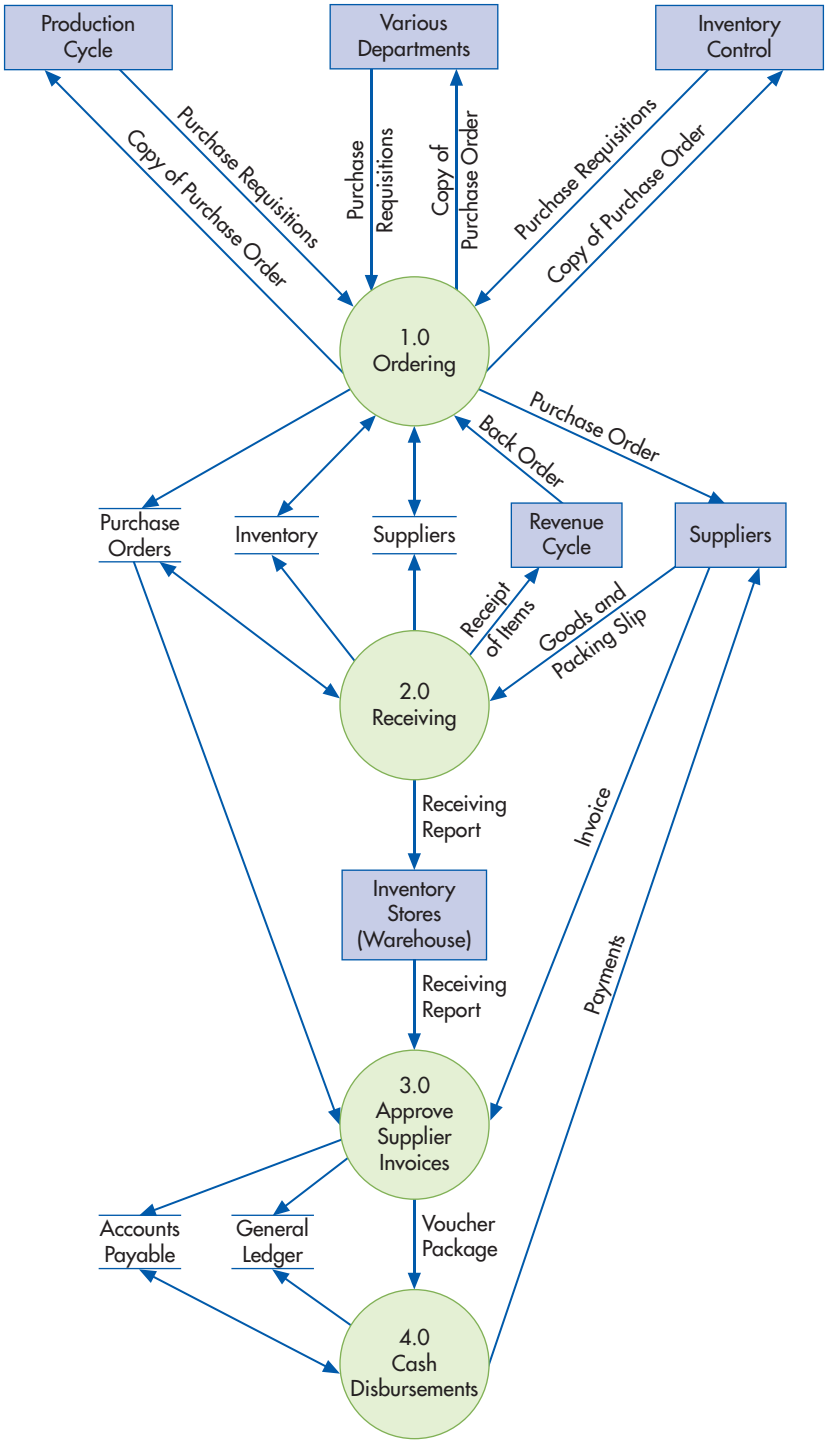


FIGURE 13-2
Level 0 Data Flow Diagram for the Expenditure Cycle

Although Figure 13-3 shows that AOE's inventory control department has primary responsibility for ensuring an adequate quantity of materials and supplies, any department can submit a request to purchase items. Once a purchase request has been approved, the system searches the inventory master file to identify the preferred supplier for that item. The system then creates a purchase order that is sent to the supplier via EDI. (If necessary, paper copies are printed and mailed.) The receiving department has access to the open purchase order file so that it can plan for and verify the validity of deliveries. Accounts payable is notified of orders so that it can plan for pending financial commitments. The department that generated the purchase requisition is also notified that its request has been approved.

TABLE 13-1 Comparison of Revenue and Expenditure Cycle Activities

REVENUE CYCLE ACTIVITY	EXPENDITURE CYCLE ACTIVITY
Sales order entry—process orders from customers	Ordering of materials, supplies, and services—send orders to suppliers
Shipping—deliver merchandise or services to customers (outbound logistics)	Receiving—receive merchandise or services from suppliers (inbound logistics)
Billing—send invoices to customers	Processing invoices—review and approve invoices from suppliers
Cash collections—process payments from customers	Cash disbursements—process payments to suppliers

Major suppliers send electronic notification of coming deliveries, which enables AOE to plan to have adequate staffing to process incoming shipments at its warehouses. When a shipment arrives, the receiving-dock workers use the inquiry processing system to verify that an order is expected from that supplier. Most suppliers bar-code or RFID (radio frequency identification) tag their products to facilitate the counting of the goods. Receiving-dock workers inspect the goods and use an online terminal to enter information about the quantity and condition of items received. The system checks that data against the open purchase order, and any discrepancies are immediately displayed on the screen so that they can be resolved. The exact time of the delivery also is recorded to help evaluate supplier performance.

Upon transfer of the goods to the warehouse, the inventory clerk verifies the count of the items and enters that data in the system. For suppliers who do not send invoices, the system automatically schedules a payment according to the terms agreed upon when the order was placed. Accounts payable clerks enter information from suppliers who send EDI, and sometimes paper, invoices. The system then compares the supplier invoice with the information

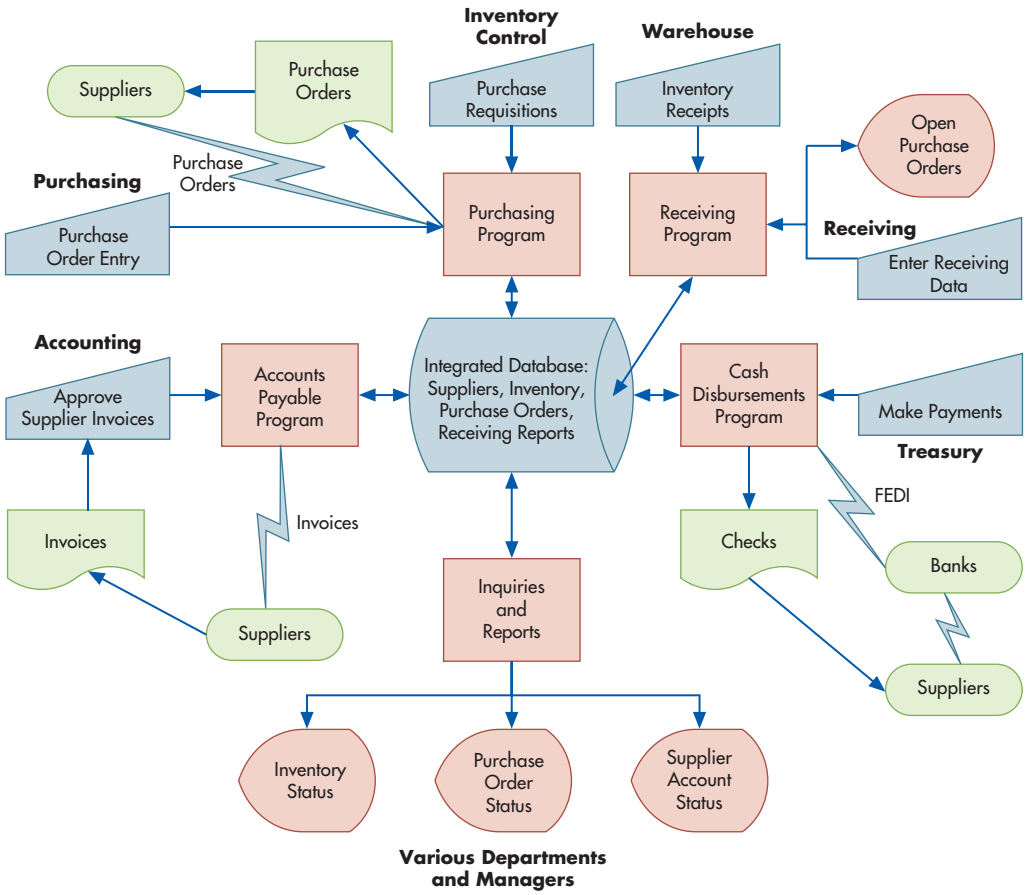


FIGURE 13-3
Overview of ERP System Design to Support the Expenditure Cycle

contained in the purchase order and receiving report to ensure accuracy and validity. For purchases of supplies or services that do not usually involve purchase orders and receiving reports, the invoice is sent to the appropriate supervisor for approval. The supplier invoice itself is also checked for mathematical accuracy. The system automatically schedules invoices for payment by due date.

AOE, like most companies, uses batch processing to pay its suppliers. Each day, the treasurer uses the inquiry processing system to review the invoices that are due and approves them for payment. AOE makes payments to some of its larger suppliers using financial electronic data interchange (FEDI) but still prints paper checks for many of its smaller suppliers. When an electronic funds transfer (EFT) payment is authorized or a check is printed, the system updates the accounts payable, open-invoice, and general ledger files. For each supplier, the totals of all vouchers are summed, and that amount is subtracted from the balance field in that supplier's master file record. The relevant purchase orders and receiving reports are flagged to mark that those transactions have been paid. The invoices that are paid are then deleted from the open-invoice file. A remittance advice is prepared for each supplier, which lists each invoice being paid and the amounts of any discounts or allowances taken. For payments made by EFT, the remittance data accompany the EFT payment as part of the FEDI package. For payments made by check, the printed remittance advice accompanies the signed check. After all disbursement transactions have been processed, the system generates a summary journal entry, debiting accounts payable and crediting cash, and posts that entry to the general ledger.

The cashier reviews checks against the supporting documents and then signs them. Checks above a specified amount also require a second signature by the treasurer or another authorized manager. The cashier then mails the signed checks and remittance advices to the suppliers. EFT transactions are also performed by the cashier and reviewed by the treasurer.

The easy access to up-to-date, accurate information enables managers to closely monitor performance. However, the quality of decisions depends upon the accuracy of the information in the database. We now discuss the general threats associated with the expenditure cycle activities and explain the controls that can mitigate them.

THREATS AND CONTROLS

Figure 13-3 shows that all expenditure cycle activities depend on the integrated database that contains information about suppliers, inventory, and purchasing activities. Therefore, the first general threat listed in Table 13-2 is inaccurate or invalid master data. Errors in the supplier master data could result in ordering from unapproved suppliers, purchasing materials of inferior quality, untimely deliveries, sending payments to the wrong address, and fraudulent disbursements to fictitious suppliers. Errors in the inventory master data can result in production delays due to unanticipated shortages of key materials or unnecessary purchases and excess inventory. Errors in the purchasing master data can result in unauthorized purchases and failure to take advantage of negotiated discounts.

Table 13-2 shows that one way to mitigate the threat of inaccurate or invalid master data is to employ the data processing integrity controls (control 1.1) described in Chapter 10. It is also important to restrict access to expenditure cycle master data and configure the system so that only authorized employees can make changes to master data (control 1.2). This requires changing the default configurations of employee roles in ERP systems to appropriately segregate incompatible duties. For example, consider the situation where an accounts payable clerk enters the name of a supplier who is not currently on the list of approved suppliers. The default configuration of many ERP systems would result in a prompt query as to whether the clerk wants to create a new supplier record. This violates proper segregation of duties by permitting the person responsible for recording payments to suppliers to also authorize the creation of new accounts. Similarly, the default configurations of many ERP systems permit accounts payable staff not only to read the prices of various products and the current balances owed to suppliers but also to change the values of those data items. These examples are just some of the many configuration settings that need to be reviewed to ensure proper segregation of duties. However, because such preventive controls can never be 100% effective, Table 13-2 also indicates that an important detective control is to regularly produce a report of all changes to master data and review them to verify that the database remains accurate (control 1.3).

TABLE 13-2 Threats and Controls in the Expenditure Cycle

ACTIVITY	THREAT	CONTROLS (FIRST NUMBER REFERS TO THE CORRESPONDING THREAT)
General issues throughout entire expenditure cycle	1. Inaccurate or invalid master data	1.1 Data processing integrity controls
		1.2 Restriction of access to master data
	2. Unauthorized disclosure of sensitive information	1.3 Review of all changes to master data
		2.1 Access controls
		2.2 Encryption
	3. Loss or destruction of data	3.1 Backup and disaster recovery procedures
	4. Poor performance	4.1 Managerial reports
Ordering	5. Stockouts and excess inventory	5.1 Perpetual inventory system
		5.2 Bar coding or RFID tags
		5.3 Periodic physical counts of inventory
	6. Purchasing items not needed	6.1 Perpetual inventory system
	7. Purchasing at inflated prices	6.2 Review and approval of purchase requisitions
		6.3 Centralized purchasing function
	8. Purchasing goods of inferior quality	7.1 Price lists
		7.2 Competitive bidding
	9. Unreliable suppliers	7.3 Review of purchase orders
	10. Purchasing from unauthorized suppliers	7.4 Budgets
		8.1 Purchasing only from approved suppliers
		8.2 Review and approval of purchases from new suppliers
	11. Kickbacks	8.3 Tracking and monitoring product quality by supplier
		8.4 Holding purchasing managers responsible for rework and scrap costs
		9.1 Requiring suppliers to possess quality certification (e.g., ISO 9000)
		9.2 Collecting and monitoring supplier delivery performance data
		10.1 Maintaining a list of approved suppliers and configuring the system to permit purchase orders only to approved suppliers
		10.2 Review and approval of purchases from new suppliers
		10.3 EDI-specific controls (access, review of orders, encryption, policy)
		11.1 Prohibit acceptance of gifts from suppliers
		11.2 Job rotation and mandatory vacations
		11.3 Requiring purchasing agents to disclose financial and personal interests in suppliers
		11.4 Supplier audits
Receiving	12. Accepting unordered items	12.1 Requiring existence of approved purchase order prior to accepting any delivery
	13. Mistakes in counting	13.1 Do not inform receiving employees about quantity ordered
	14. Not verifying receipt of services	13.2 Require receiving employees to sign receiving report
		13.3 Incentives
	15. Theft of inventory	13.4 Use of bar codes and RFID tags
		13.5 Configuration of the ERP system to flag discrepancies between received and ordered quantities that exceed tolerance threshold for investigation
		14.1 Budgetary controls
		14.2 Audits
		15.1 Restriction of physical access to inventory
		15.2 Documentation of all transfers of inventory between receiving and inventory employees
		15.3 Periodic physical counts of inventory and reconciliation to recorded quantities
		15.4 Segregation of duties: custody of inventory versus receiving
Approving supplier invoices	16. Errors in supplier invoices	16.1 Verification of invoice accuracy
		16.2 Requiring detailed receipts for procurement card purchases
	17. Mistakes in posting to accounts payable	16.3 ERS
		16.4 Restriction of access to supplier master data
		16.5 Verification of freight bill and use of approved delivery channels
		17.1 Data entry edit controls
		17.2 Reconciliation of detailed accounts payable records with the general ledger control account

TABLE 13-2 Continued

ACTIVITY	THREAT	CONTROLS (FIRST NUMBER REFERS TO THE CORRESPONDING THREAT)
Cash disbursements	18. Failure to take advantage of discounts for prompt payment	18.1 Filing of invoices by due date for discounts 18.2 Cash flow budgets
	19. Paying for items not received	19.1 Requiring that all supplier invoices be matched to supporting documents that are acknowledged by both receiving and inventory control 19.2 Budgets (for services) 19.3 Requiring receipts for travel expenses 19.4 Use of corporate credit cards for travel expenses
	20. Duplicate payments	20.1 Requiring a complete voucher package for all payments 20.2 Policy to pay only from original copies of supplier invoices 20.3 Cancelling all supporting documents when payment is made
	21. Theft of cash	21.1 Physical security of blank checks and check-signing machine 21.2 Periodic accounting of all sequentially numbered checks by cashier 21.3 Access controls to EFT terminals 21.4 Use of dedicated computer and browser for online banking 21.5 ACH blocks on accounts not used for payments 21.6 Separation of check-writing function from accounts payable 21.7 Requiring dual signatures on checks greater than a specific amount 21.8 Regular reconciliation of bank account with recorded amounts by someone independent of cash disbursements procedures 21.9 Restriction of access to supplier master file 21.10 Limiting the number of employees with ability to create one-time suppliers and to process invoices from one-time suppliers 21.11 Running petty cash as an imprest fund 21.12 Surprise audits of petty cash fund
	22. Check alteration	22.1 Check-protection machines 22.2 Use of special inks and papers 22.3 "Positive Pay" arrangements with banks
	23. Cash flow problems	23.1 Cash flow budget

A second general threat in the expenditure cycle is unauthorized disclosure of sensitive information, such as banking information about suppliers and special pricing discounts offered by preferred suppliers. Table 13-2 shows that one way to mitigate the risk of this threat is to configure the system to employ strong access controls that limit who can view such information (control 2.1). It is also important to configure the system to limit employees' ability to use the system's built-in query capabilities to specific tables and fields. In addition, sensitive data should be encrypted (control 2.2) in storage to prevent IT employees who do not have access to the ERP system from using operating system utilities to view sensitive information. Information exchanged with suppliers over the Internet should also be encrypted during transmission.

As Table 13-2 shows, a third general threat in the expenditure cycle concerns the loss or destruction of master data. The best way to mitigate the risk of this threat is to employ the backup and disaster recovery procedures (control 3.1) that were discussed in Chapter 10. A best practice is to implement the ERP system as three separate instances. One instance, referred to as *production*, is used to process daily activity. A second is used for testing and development. A third instance should be maintained as an online backup to the production system to provide near real-time recovery.

An ERP system's extensive reporting capabilities (control 4.1) can be used to monitor the threat of poor performance. Because inventory represents a sizable investment of working capital, reports that help manage inventory are especially valuable. A key measure to evaluate inventory management is inventory turnover, which is the ratio of cost of goods sold divided by inventory on hand. Consider the following example: annual sales are $500 million, and annual cost of goods sold total $360 million. An inventory turnover ratio of 1 means that the company is effectively carrying a year's supply of inventory, tying up $360 million. Improving

the inventory turnover ratio to 3 would reduce that unprofitable investment to $120 million, thereby freeing up $240 million that could be used for other purposes.

Accountants need to understand how business activities are performed in order to design other reports that can help management better manage inventory. For example, it is useful to monitor the percentage of requisitions that are filled from inventory on hand. For critical items, this should be close to 100% to avoid stockouts and delays in filling customer orders. For most items, however, such a high fill rate is undesirable because it requires carrying too much inventory. Other reports can help management identify the relative importance of various inventory items. For example, it may be useful to classify items along several dimensions, such as frequency of purchase, frequency of use or resale, and contribution to profitability. Items that are frequently purchased and used and that make a significant contribution to profitability are of high importance and should be managed so as to maintain high fill rates. In contrast, management may wish to consider eliminating items that are seldom purchased, infrequently used, and that do not contribute much to profitability. As we will see in the following sections, accountants can help managers by designing a variety of detailed reports and metrics that are relevant to evaluating each business activity in the expenditure cycle.

Ordering Materials, Supplies, and Services

The first major business activity in the expenditure cycle (circle 1.0 in Figure 13-2) is ordering inventory, supplies, or services. Figure 13-4 shows that this involves first identifying what, when, and how much to purchase, and then choosing from which supplier to purchase.

IDENTIFYING WHAT, WHEN, AND HOW MUCH TO PURCHASE

As the introductory case showed, inaccurate inventory records can create significant problems for organizations. Therefore, accountants and systems professionals need to understand best practices for managing inventory.

PROCESS The traditional approach to managing inventory is to maintain sufficient stock so that production can continue without interruption even if inventory use is greater than

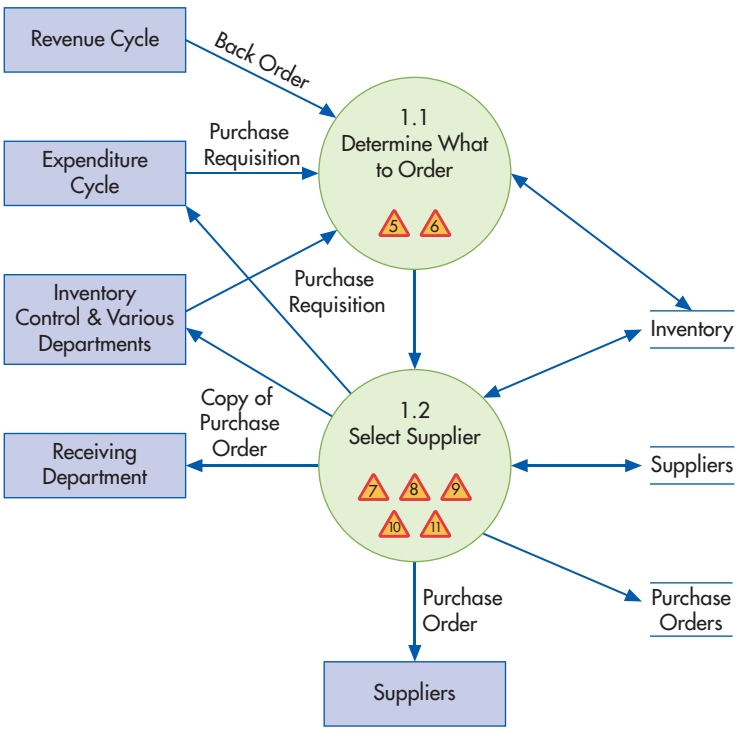


FIGURE 13-4
Level 1 Data Flow Diagram: Ordering Materials, Supplies, and Services (annotated to include threats)

expected or if suppliers are late in making deliveries. This traditional approach is often called the **economic order quantity (EOQ)** approach because it is based on calculating an optimal order size to minimize the sum of ordering, carrying, and stockout costs. *Ordering costs* include all expenses associated with processing purchase transactions. *Carrying costs* are those associated with holding inventory. *Stockout costs* are those that result from inventory shortages, such as lost sales or production delays.

economic order quantity (EOQ) - The optimal order size to minimize the sum of ordering, carrying, and stockout costs.

Actual application of the EOQ approach varies depending on the type of item. For high-cost or high-use items, such as the computer chips and displays AOE uses, all three types of costs are included in the formula. For low-cost or low-usage items, such as the screws and springs AOE uses to assemble its products, ordering and carrying costs are usually ignored, and the sole objective is to maintain sufficient inventory levels. The EOQ formula is used to calculate *how much* to order. The **reorder point** specifies *when* to order. Companies typically set the reorder point based on delivery time and desired levels of safety stock to handle unexpected fluctuations in demand.

reorder point - Specifies the level to which the inventory balance of an item must fall before an order to replenish stock is initiated.

The traditional EOQ approach to inventory control often results in carrying significant amounts of inventory. The money invested in carrying inventory earns nothing. Consequently, in recent years many large U.S. manufacturing companies, including Xerox, Ford, Motorola, NCR, Intel, McDonnell Douglas, and Delco Electronics, have minimized or even eliminated the amount of inventory on hand by adopting either materials requirements planning or just-in-time inventory management systems.

Materials requirements planning (MRP) seeks to reduce required inventory levels by improving the accuracy of forecasting techniques to better schedule purchases to satisfy production needs. For example, the production planning department of a company using MRP would use sales forecasts to prepare a detailed schedule specifying the quantities of each finished product to manufacture in a specified time period, such as the next three months. This schedule and the engineering specifications for each product identify the quantities of raw materials, parts, and supplies needed in production and the point in time when they will be needed. Thus, MRP systems reduce uncertainties about when raw materials are needed and therefore enable companies to carry less inventory.

materials requirements planning (MRP) - An approach to inventory management that seeks to reduce required inventory levels by improving the accuracy of forecasting techniques to better schedule purchases to satisfy production needs.

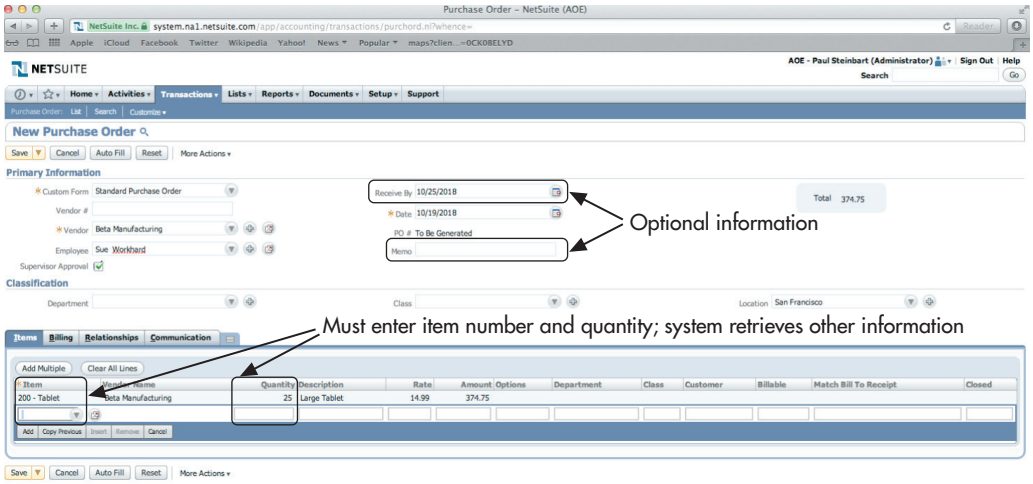
A **just-in-time (JIT) inventory system** attempts to minimize, if not totally eliminate, finished goods inventory by purchasing and producing goods only in response to actual, rather than forecasted, sales. Consequently, JIT systems are characterized by frequent deliveries of small amounts of materials, parts, and supplies directly to the specific locations that require them when they are needed, rather than by infrequent bulk deliveries to a central receiving and storage facility. Therefore, a factory using a JIT system will have multiple receiving docks, each assigned to accept deliveries of items needed at nearby work centers.

just-in-time (JIT) inventory system - A system that minimizes or virtually eliminates inventories by purchasing and producing goods only in response to actual, rather than forecasted, sales.

A major difference between MRP and JIT systems is production scheduling. MRP systems schedule production to meet forecasted sales, thereby creating an "optimal" quantity of finished goods inventory. JIT systems schedule production in response to customer demands, thereby virtually eliminating finished goods inventory, but they require carrying sufficient quantities of raw materials in order to quickly adjust production in response to consumer demand. Both MRP and JIT systems can reduce costs and improve efficiency. Choosing between them depends, in part, on the types of products a company sells. MRP systems are more effectively used with products that have predictable patterns of demand, such as consumer staples. For such items, companies can plan purchases to minimize stockouts (with the resultant lost sales) while simultaneously minimizing the risk of overstocking and the subsequent costs of marking down or scrapping the excess inventory. In contrast, JIT inventory systems are especially useful for products that have relatively short life cycles and for which demand cannot be accurately predicted, such as toys associated with specific movies. In such cases, it is important that the business be able to quickly speed up production to meet unanticipated demand as well as to quickly stop production to avoid accumulating large inventories that must be marked down for clearance because the product is no longer in demand.

A request to purchase goods or supplies is triggered either by the inventory control function or when employees notice a shortage of materials. The advanced inventory control systems used in large manufacturing companies, such as IBM and Ford, automatically generate purchase requests when the quantity of an item on hand falls below its reorder point. In small companies, however, the employees who use the items note when stock is running low and request that it be reordered. Moreover, even in large companies, employees typically initiate requests to reorder office supplies.

FIGURE 13-5
Purchase Requisition Data Entry Screen



Source: 2010 © NetSuite Inc.

purchase requisition - A document or electronic form that identifies the requisitioner; specifies the delivery location and date needed; identifies the item numbers, descriptions, quantity, and price of each item requested; and may suggest a supplier.

Regardless of its source, the need to purchase goods or supplies often results in the creation of a **purchase requisition** that identifies the requisitioner; specifies the delivery location and date needed; identifies the item numbers, descriptions, quantity, and price of each item requested; and may suggest a supplier. The person approving the purchase requisition indicates the department number and account number to which the purchase should be charged.

Figure 13-5 shows a typical purchase requisition data entry screen used in ERP systems. Minimizing the amount of data that must be manually entered improves both efficiency and accuracy. Thus, in Figure 13-5, the employee initiating the purchase request needs to complete only the supplier (vendor), date required, and location (where to ship the merchandise) fields in the header section (the top of the screen) and the item number and quantity requested in the details section. The system then pulls up all the other relevant information from the related master files. You probably noticed the similarity in design to the sales order data entry screen (see Figure 12-6). This is intentional; it makes it easier for employees to learn how to perform new job duties arising from promotions or transfers.

THREATS AND CONTROLS Inaccurate inventory records can result in stockouts that lead to lost sales or to carrying excess inventory that increases costs (threat 5). To reduce the risk of these problems, the perpetual inventory method should be used to ensure that information about inventory stocks is always current (control 5.1). However, data entry errors can result in inaccurate perpetual inventory records because even expert typists do make mistakes. Therefore, using information technology (control 5.2) to eliminate the need for manual data entry can improve the accuracy of perpetual inventory records.

Bar-coding is one option, but it is not a panacea. Errors can still occur if employees attempt to save time by scanning one item and then manually entering the quantity. For example, a grocery store orders 12 varieties of a private-brand soda, but the receiving clerk may scan only one can and then manually enter the number purchased. Since the flavors are all priced the same, the amount of the purchase is correctly calculated. The perpetual inventory records will be incorrect, however, because the exact count of the flavors purchased is not correctly recorded.

Affixing RFID tags to individual products eliminates the problems just discussed because the reader automatically records each item. RFID technology is also more efficient than bar codes because there is no need for a human to align the bar code on the product with the reader. However, RFID technology is more expensive than bar-coding and cannot be used for every type of product.

It is also important to periodically count inventory on hand and investigate any discrepancies between those counts and the perpetual inventory records (control 5.3 in Table 13-2). One annual physical inventory count will generally not be sufficient to maintain accurate inventory records, especially for MRP and JIT systems. Instead, an *ABC cost analysis* should be used to classify items according to their importance: The most critical items (A items) should be counted most frequently, and the least critical items (C items) can be counted less often. If such interim counts reveal significant discrepancies with inventory records, a comprehensive

count of all inventory should be immediately undertaken. This approach might have alerted management at AOE's Wichita plant in the chapter introductory case about shortages of key components early enough to avoid production delays.

Another threat is purchasing items that are not currently needed. Accurate perpetual inventory records (control 6.1) ensure the validity of purchase requisitions that the inventory control system automatically generates. Supervisors need to review and approve purchase requisitions (control 6.2) that individual employees initiate. A related problem is multiple purchases of the same item by different subunits of the organization. As a result, the organization may be carrying a larger inventory than desired and may fail to take advantage of volume discounts that might be available. A centralized purchasing function (control 6.3) mitigates this threat.

CHOOSING SUPPLIERS

Once the need to purchase has been identified, the next step is to select a supplier. Purchasing agents (sometimes called buyers) usually perform this task. In manufacturing companies such as AOE, the purchasing function is closely related to the production cycle. Thus, as Figure 12-1 shows, Ryan McDaniel, the head of the purchasing department at AOE, reports directly to LeRoy Williams, the vice president of manufacturing.

PROCESS Several factors should be considered when selecting suppliers:

- Price
- Quality of materials
- Dependability in making deliveries

Note that properly evaluating suppliers involves more than just comparing prices. Companies also incur costs, such as rework and scrap, related to the quality of the products purchased. There are also costs associated with supplier delivery performance (such as the problems described in the introductory case at AOE's Dayton plant). Supplier dependability is especially important for companies that use JIT systems because late deliveries can bring the entire system to a halt.

Once a supplier has been selected for a product, the supplier's identity should become part of the product inventory master record to avoid repeating the supplier selection process for every subsequent order. (In some cases, however, such as for the purchase of high-cost and low-usage items, management may explicitly want to reevaluate all potential suppliers each time that product is ordered.) A list of potential alternative suppliers for each item should also be maintained, in case the primary supplier is out of stock of a needed item.

A **purchase order** (Figure 13-6) is a document or electronic form that formally requests a supplier to sell and deliver specified products at designated prices. It is also a promise to pay and becomes a contract once the supplier accepts it. The purchase order includes the names of the supplier and purchasing agent, the order and requested delivery dates, the delivery location and shipping method, and information about the items ordered. Frequently, several purchase orders are generated to fill one purchase requisition, because different vendors may be the preferred suppliers for the various items requested. The quantity ordered may also differ from that requested to allow the purchaser to take advantage of quantity discounts.

purchase order - A document that formally requests a supplier to sell and deliver specified products at designated prices. It is also a promise to pay and becomes a contract once the supplier accepts it.

Many companies maintain special purchasing arrangements with important suppliers. A **blanket purchase order or blanket order** is a commitment to purchase specified items at designated prices from a particular supplier for a set time period, often one year. Blanket purchase orders reduce the buyer's uncertainty about reliable sources of raw materials and help the supplier plan its capacity and operations more effectively.

blanket purchase order or blanket order - A commitment to purchase specified items at designated prices from a particular supplier for a set time period, often one year.

The major cost driver in the purchasing function is the number of purchase orders processed. Thus, finding ways to reduce the number of orders processed and to streamline the steps involved can yield significant savings. Using EDI is one way to improve the purchasing process. EDI reduces costs by eliminating the clerical work associated with printing and mailing paper documents. The time between recognizing the need to reorder an item and subsequently receiving it also is reduced. Consequently, the risk of running out of stock is diminished, which can significantly increase profitability. In the past, EDI was expensive because it required the use of proprietary third-party networks and software. However, the development of standards for EDI over the Internet (EDINT), such as the AS2 protocol for secure electronic exchange

FIGURE 13-6
Example of a Purchase Order (items in bold are pre-printed)

Alpha Omega Electronics **No. 2463**

Billing Address: **2431 Bradford Lane**
San Francisco, CA 94403
(314) 467-2341

Reference the above number on all invoices and shipping documents

PURCHASE ORDER

To: Best Office Supply
4567 Olive Blvd.
Dayton, OH 33422-1234

Ship To: AOE, Inc.
1735 Sandy Dr.
Dayton, OH 33421–2243

Vendor Number:	**Order Date:**	**Requisition Number:**	**Buyer:**	**Terms:**
121	07/03/2018	89010	Fred Mozart	1/10, n/30

F.O.B.	**Ship Via:**	**Delivery Date:**	**Remarks:**
Destination	Your choice	07/15/2018	

Item	**Item Number**	**Quantity**	**Description**	**Unit Price**
1	32047	15 boxes	Xerox 4200 paper, 20 wt., 10 ream box	$33.99
2	80170	5 boxes	Moore 2600 continuous form, 20 lb.	$31.99
3	81756	20 boxes	CD cases, box of 10	$ 6.49
4	10407	100	700 MB CDs, 1 box	$19.99

Approved by: *Susan Beethoven*

of documents, has drastically cut the costs of EDI. For example, AS2 makes it possible for the sender to encode and the receiver to correctly decode purchase orders and other documents.

Vendor-managed inventory programs provide another means of reducing purchase and inventory costs. A **vendor-managed inventory (VMI)** program essentially outsources much of the inventory control and purchasing function: Suppliers are given access to sales and inventory data and are authorized to automatically replenish inventory when stocks fall to predetermined reorder points. This arrangement cuts carrying costs by reducing the amount of inventory on hand and lowers processing costs by eliminating the need to generate and exchange formal purchase orders.

vendor-managed inventory (VMI) - Practice in which manufacturers and distributors manage a retail customer's inventory using EDI. The supplier accesses its customer's point-of-sale system in order to monitor inventory and automatically replenish products when they fall to agreed-upon levels.

Reverse auctions provide yet another technique to reduce purchasing-related expenses. In reverse auctions, suppliers compete with one another to meet demand at the lowest price. Although reverse auctions can yield significant cost savings, because the primary focus is on price, they are probably best suited to the purchase of commodity items rather than critical components for which quality, vendor reliability, and delivery performance are important.

One other way to reduce purchasing-related costs is to conduct a pre-award audit. Pre-award audits are typically used for large purchases that involve formal bids by suppliers. The internal auditor visits each potential supplier who has made the final cut in the contracting process to verify the accuracy of its bid. Pre-award audits often identify simple mathematical errors in complex pricing formulas and other discrepancies that, when corrected, can provide considerable savings.

EDI, vendor-managed inventory, reverse auctions, and pre-award audits are techniques for reducing the purchasing-related costs of raw materials and finished goods inventory. New IT developments can also change how companies account for their inventory. Traditionally, most companies have used the LIFO, FIFO, or weighted-average approaches to allocate costs to inventory and cost of goods sold. RFID, however, provides the capability to track individual inventory items. Thus, RFID makes it possible for companies to more accurately account for actual inventory-related costs by switching to the specific identification method for accounting for inventories.

THREATS AND CONTROLS Table 13-2 lists five threats to placing orders with suppliers. One (threat 7) involves purchasing items at inflated prices. The cost of purchased components represents a substantial portion of the total cost of many manufactured products. Therefore, companies

strive to secure the best prices for the items they purchase. Several procedures can help ensure that companies do not pay too much for specific products. Price lists for frequently purchased items should be stored in the computer and consulted when orders are made (control 7.1). The prices of many low-cost items can be readily determined from catalogs. Competitive, written bids should be solicited for high-cost and specialized products (control 7.2). Purchase orders should be reviewed (control 7.3) to ensure that these policies have been followed.

Budgets (control 7.4) are also helpful in controlling purchasing expenses. Purchases should be charged to an account that is the responsibility of the person or department approving the requisition. Actual costs should be compared periodically with budget allowances. To facilitate control, these reports should highlight any significant deviations from budgeted amounts for further investigation (the principle of management by exception).

In attempting to obtain the lowest possible prices, another threat is purchasing inferior-quality products. Substandard products can result in costly production delays. Moreover, the costs of scrap and rework often result in higher total production costs than if higher-quality, more expensive materials had been initially purchased. Through experience, buyers often learn which suppliers provide the best-quality goods at competitive prices. Such informal knowledge should be incorporated into formal control procedures so that it is not lost when a particular employee leaves the company. One best practice is to establish lists of approved suppliers known to provide goods of acceptable quality (control 8.1). Purchase orders should be reviewed to ensure that only these approved suppliers are being used (control 8.2). In addition, the accounting information system should collect detailed product quality data (control 8.3). For example, AOE can measure the quality of a supplier's products by tracking how often its items fail to pass inspection in the receiving department and the amount of production that has to be reworked or scrapped because of substandard materials. The purchasing manager should regularly review that data to maintain and revise the list of approved suppliers. Finally, purchasing managers should be held accountable for the total cost of purchases (control 8.4), which includes not only the purchase price but also the quality-related costs of rework and scrap. Doing this requires designing the system to track the latter costs so that they can be allocated back to the purchasing department.

As the introductory case demonstrated, another potential problem is unreliable performance by suppliers (threat 9 in Table 13-2). One way to reduce the risk of problems with supplier dependability is to require that suppliers be certified as meeting international quality standards such as ISO 9000 (control 9.1). However, the accounting information system should also be designed to capture and track information about supplier performance (control 9.2). For example, AOE can track actual delivery dates versus those promised. Indeed, the ERP system can be configured to automatically generate reports of purchase orders that have not been delivered within the promised time period.

Purchasing from unauthorized suppliers (threat 10) can result in numerous problems. Items may be of inferior quality or overpriced. The purchase may even cause legal problems. Various government agencies, such as the Office of Foreign Assets Control and the Bureau of Industry and Security in the Department of Commerce, maintain lists of individuals and companies with whom it is illegal to transact business. Payments to entities on such lists can result in substantial fines and, sometimes, imprisonment. Consequently, ERP systems should be configured to prevent issuing purchase orders to suppliers not in the approved master file (control 10.1). All purchase orders should be reviewed to ensure that only approved suppliers are used (control 10.2). It is especially important to restrict access to the approved supplier list and to periodically review the list for any unauthorized changes.

Using EDI for purchase orders requires additional control procedures. Access to the EDI system should be controlled and limited to authorized personnel through the use of passwords, user IDs, access control matrices, and physical access controls. Procedures to verify and authenticate EDI transactions also are needed. Most EDI systems are programmed to send an acknowledgment for each transaction, which provides a rudimentary accuracy check. Further protection against transmission problems, which can result in the loss of orders, is provided by time-stamping and numbering all EDI transactions. Companies should maintain and periodically review a log of all EDI transactions to ensure that all have been processed and that established policies are being followed. Encryption can ensure the privacy of EDI transactions, which is especially important for competitive bids. Digital signatures should be used to ensure the authenticity of transactions.

Numerous policy-related threats also arise with EDI, each of which must be covered in the trading agreement. Examples of these types of issues include the following:

- At what point in the process can the order be canceled?
- Which party is responsible for the cost of return freight if contract terms are not followed?
- Which party is responsible for errors in bar codes, RFID tags, and labels?
- What happens if errors in the purchasing company's sales system cause additional errors in the amount of goods that suppliers provide?
- Can suppliers ship more inventory than ordered if doing so reduces total freight costs because it results in a full, rather than partial, truckload?

kickbacks - Gifts given by suppliers to purchasing agents for the purpose of influencing their choice of suppliers.

Table 13-2 shows that **kickbacks**, which are gifts from suppliers to purchasing agents for the purpose of influencing their choice of suppliers, are another threat. For the kickback to make economic sense, the supplier must find some way to recover the money spent on the bribe. This usually is accomplished by inflating the price of subsequent purchases or by substituting goods of inferior quality. Even if neither of these problems occurs, kickbacks impair the buyer's objectivity.

To prevent kickbacks, companies should prohibit purchasing agents from accepting any gifts (control 11.1) from potential or existing suppliers. (Trinkets that are clearly of inconsequential value may be allowed.) These policies should apply not only to gifts of tangible goods, but also to services. For example, meeting planners should be informed that it is against company policy to accept frequent-traveler points from hotels for booking the company's meetings there. Training employees how to respond to unsolicited "gifts" from suppliers is also important, because many kickback schemes are initiated when unethical suppliers send such "tokens of appreciation," usually in the form of cash, to unwary employees. Once the employee accepts the gift, the supplier threatens to disclose the payment to a supervisor unless the employee makes additional purchases from that supplier.

Job rotation (control 11.2) is another important control to reduce the risk of kickbacks: Purchasing agents should not deal with the same suppliers indefinitely, because doing so increases the risk that they may succumb to the constant temptations offered by an unethical supplier. If the organization is too small to rotate job duties across different purchasing agents, it should periodically conduct a detailed audit of the purchasing agent's activities. Purchasing agents should also be required to take their allotted vacation time each year, because many frauds are discovered when the perpetrator is absent and unable to continue covering up the illicit activity. Finally, purchasing agents should be required to sign annual conflict of interest statements, (control 11.3) disclosing any financial interests they may have in current or potential suppliers.

Kickbacks are difficult to prevent, so detective controls are also necessary. Focus 13-1 discusses one particularly effective detection control: the supplier audit (control 11.4).

FOCUS 13-1 Supplier Audits: A Means to Control Purchasing

Supplier audits may be one of the best tools for assessing the effectiveness of expenditure cycle controls. They entail having an internal auditor visit a supplier's office to check its records. The objective is to identify suppliers likely to be associated with problems such as kickbacks. Red flags that indicate potential problems include:

1. A large percentage of the supplier's gross sales was to the company conducting the supplier audit.
2. The supplier's pricing methods differ from standard industry practice.
3. The supplier does not own the equipment it rents but is itself renting that equipment from a third party.
4. Entertainment expenses are high in terms of a percentage of the supplier's gross sales.
5. The supplier submits altered or fictitious third-party invoices.
6. The supplier's address on its invoices is fictitious.

Supplier audits can yield substantial returns. One company recovered more than $250,000 for such problems as duplicate billings. Supplier audits also often uncover violations of the company's conflict of interest policy. Interestingly, many suppliers support the idea of supplier audits, because the process gives them a "good excuse" for not offering purchasing agents gifts or entertainment. Nevertheless, organizations should include a "right to audit" clause in all purchase orders and contracts with suppliers to ensure the ability to use this powerful detective control.

Receiving

The second major business activity in the expenditure cycle (circle 2.0 in Figure 13-2) is the receipt and storage of ordered items. Figure 13-7 shows these two steps as distinct processes because each is performed by a different organizational function. The receiving department is responsible for accepting deliveries from suppliers. It usually reports to the warehouse manager, who in turn reports to the vice president of manufacturing. The inventory stores department, which also reports to the warehouse manager, is responsible for storage of the goods. Information about the receipt of ordered merchandise must be communicated to the inventory control function to update the inventory records.

PROCESS

When a delivery arrives, a receiving clerk compares the purchase order number referenced on the supplier's packing slip with the open purchase order file to verify that the goods were ordered. The receiving clerk then counts the quantity of goods delivered. Before routing the inventory to the warehouse or factory, the receiving clerk also should examine each delivery for signs of obvious damage.

The **receiving report** documents details about each delivery, including the date received, shipper, supplier, and purchase order number (Figure 13-8). For each item received, it shows the item number, description, unit of measure, and quantity. The receiving report also contains space to identify the persons who received and inspected the goods as well as for remarks concerning the quality of the items received.

receiving report - A document that records details about each delivery, including the date received, shipper, supplier, and quantity received.

The three possible exceptions to this process are (1) receiving a quantity of goods different from the amount ordered, (2) receiving damaged goods, or (3) receiving goods of inferior quality that fail inspection. In all three cases, the purchasing department must resolve the situation with the supplier. Usually the supplier will give the buyer permission to correct the invoice for any discrepancies in quantity. In the case of damaged or poor-quality goods, a document called a debit memo is prepared after the supplier agrees to take back the goods or to grant a price reduction. The **debit memo** records the adjustment being requested. One copy of the debit memo is sent to the supplier, who subsequently creates and returns a credit memo in acknowledgment. The accounts payable department is notified and adjusts the account balance owed to that supplier. A copy of the debit memo accompanies the goods to the shipping department to authorize their return to the supplier.

debit memo - A document used to record a reduction to the balance due to a supplier.

Counting and recording inventory deliveries is a labor-intensive task. One way for companies such as AOE to improve the efficiency of this process is to require suppliers to bar-code

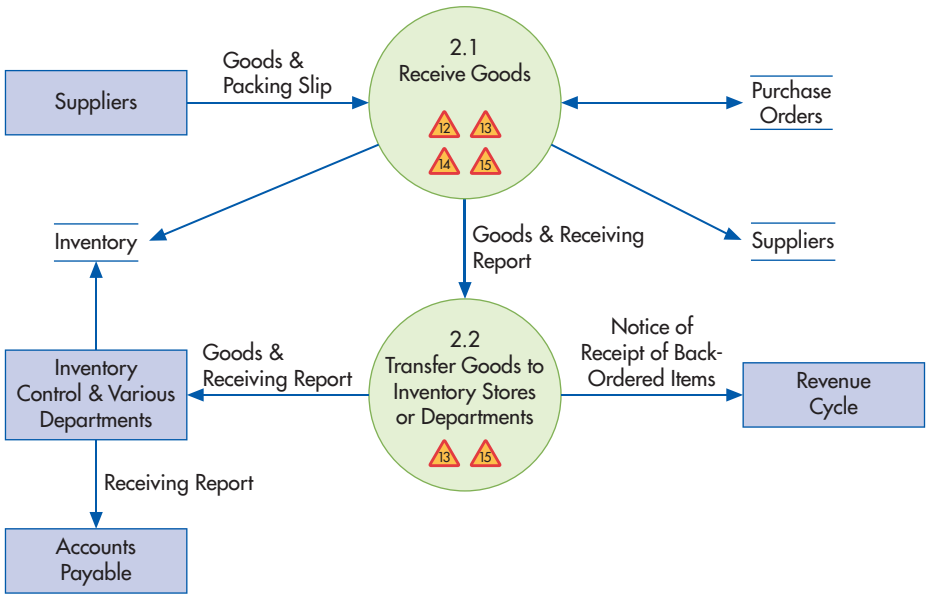
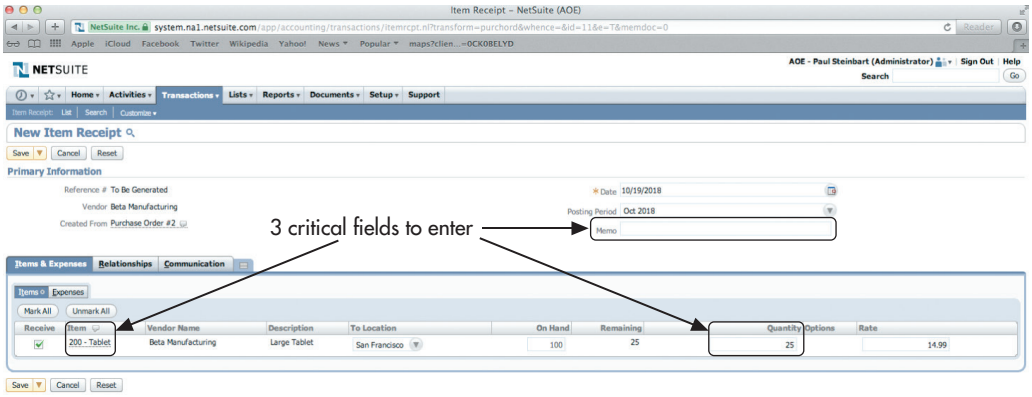


FIGURE 13-7
Level 1 Data Flow Diagram: Receiving (annotated to include threats)

FIGURE 13-8
Example of a Receiving Report Data Entry Screen



Source: 2010 © NetSuite Inc.

or affix RFID tags to their products. Either approach streamlines the counting of items received but does not eliminate the need to inspect the quality.

EDI and satellite technology provide another way to improve the efficiency of inbound logistics. EDI advance shipping notices inform companies when products have been shipped. By using shipping companies whose trucks are equipped with data terminals linked to satellites, a business can track the exact location of all incoming shipments and ensure that adequate staff will be there to unload the trucks. Truck drivers also can be directed to pull up to specific loading docks closest to the place where the goods will be used.

THREATS AND CONTROLS

Accepting delivery of unordered goods (threat 12) results in costs associated with unloading, storing, and later returning those items. The best control procedure to mitigate this threat is to instruct the receiving department to accept only deliveries for which there is an approved purchase order (control 12.1). That is why Figure 13-7 shows the receiving department needs access to the open purchase orders file.

Another threat is making mistakes in counting items received. Correctly counting the quantity received is crucial for maintaining accurate perpetual inventory records. It also ensures that the company pays only for goods actually received. To encourage the receiving clerk to accurately count what was delivered, many companies design the inquiry processing system so that when reviewing open purchase orders, receiving-dock workers do not see the quantity ordered (control 13.1). (If paper documents are still used, the quantity-ordered field is blacked out on the receiving department's copy of the purchase order.) Nevertheless, the receiving clerk still knows the expected quantity of goods because suppliers usually include a packing slip with each order. Consequently, there is a temptation to do just a quick visual comparison of quantities received with those indicated on the packing slip, to quickly route the goods to where they are needed. Therefore, companies must clearly communicate to receiving clerks the importance of carefully and accurately counting all deliveries. An effective means of communication is to require receiving clerks not only to record the quantity received but also to sign the receiving report or enter their employee ID numbers in the system (control 13.2). Such procedures indicate an assumption of responsibility, which usually results in more diligent work. Some companies also offer bonuses (control 13.3) to receiving clerks for catching discrepancies between the packing slip and actual quantity received before the delivery person leaves. Wherever feasible, use of bar codes and RFID tags (control 13.4) can significantly reduce accidental mistakes in counting. Finally, the ERP system should be configured to automatically flag discrepancies between receiving counts and order quantities that exceed a predetermined tolerance level so that they can be promptly investigated (control 13.5).

Thus far, the discussion has centered on the purchase of inventory items. Different procedures are needed to control the purchase of services, such as painting or maintenance work. The major challenge in this area is establishing that the services were actually performed

(threat 14), which may be difficult. For example, visual inspection can indicate whether a room has been painted; it does not reveal, however, whether the walls were appropriately primed, unless the inspection was done during the painting process, which may not always be feasible.

One way to control the purchase of services is to hold the appropriate supervisor accountable for all such costs incurred by that department. The supervisor is required to acknowledge receipt of the services, and the related expenses are then charged to accounts for which he or she is responsible. Actual versus budgeted expenses should be routinely compared and any discrepancies investigated (control 14.1).

It is difficult to prevent fraudulent billing for services. Therefore, detective controls are also needed. One of the most effective techniques is for the internal audit function to periodically conduct detailed reviews of contracts for services (control 14.2), including audits of supplier records, as discussed in Focus 13-1.

Theft of inventory is another threat. Several control procedures can be used to safeguard inventory against loss. First, inventories should be stored in secure locations with restricted access (control 15.1). Second, all transfers of inventory within the company should be documented (control 15.2). For example, both the receiving department and the inventory stores department should acknowledge the transfer of goods from the receiving dock into inventory. Similarly, both the inventory stores and the production departments should acknowledge the release of inventory into production. This documentation provides the necessary information for establishing accountability for any shortages, thereby encouraging employees to take special care to record all inventory movements accurately. Third, it is important to periodically count the inventory on hand and to reconcile those counts with the inventory (control 15.3).

Finally, proper segregation of duties (control 15.4) can further help minimize the risk of inventory theft. Employees who are responsible for controlling physical access to inventory should not be able to adjust inventory records without review and approval. Neither the employees responsible for custody of inventory nor those authorized to adjust inventory records should be responsible for the receiving or shipping functions.

Approving Supplier Invoices

The third main activity in the expenditure cycle is approving supplier invoices for payment (circle 3.0 in Figure 13-2).

PROCESS

The accounts payable department approves supplier invoices for payment. A legal obligation to pay suppliers arises at the time goods are received. For practical reasons, however, most companies record accounts payable only after receipt and approval of the supplier's invoice. This timing difference is usually not important for daily decision making, but it does require making appropriate adjusting entries to prepare accurate financial statements at the end of a fiscal period.

When a supplier's invoice is received, the accounts payable department is responsible for matching it with a corresponding purchase order and receiving report. This combination of the supplier invoice and associated supporting documentation creates what is called a **voucher package**. Figure 13-9 shows an example of a data entry screen for approving a supplier invoice. Once the approver has verified that the company received what it had ordered, the invoice is approved for payment.

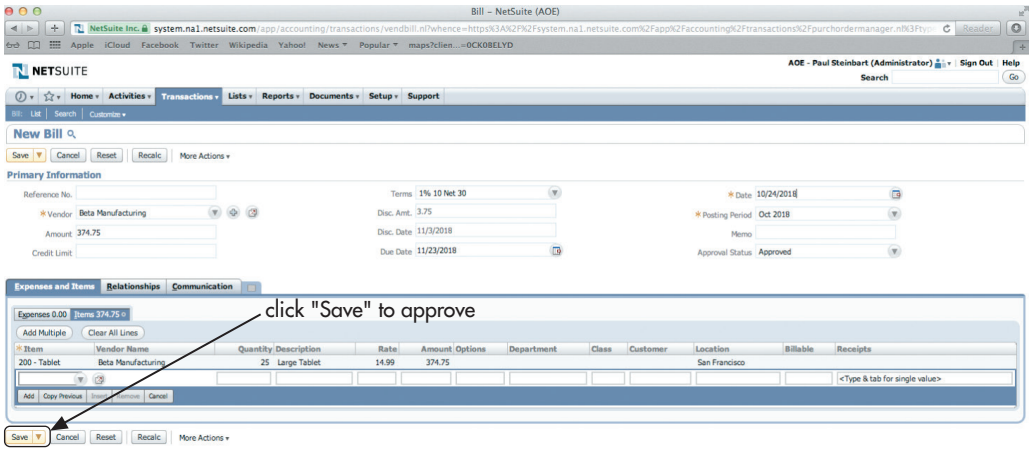
There are two ways to process supplier invoices, referred to as nonvoucher or voucher systems. In a **nonvoucher system**, each approved invoice (along with the supporting documentation) is posted to individual supplier records in the accounts payable file and is then stored in an open-invoice file. When a check is written to pay for an invoice, the voucher package is removed from the open-invoice file, the invoice is marked paid, and then the voucher package is stored in the paid-invoice file. In a **voucher system**, an additional document called

voucher package - The set of documents used to authorize payment to a supplier. It consists of a purchase order, receiving report, and supplier invoice.

nonvoucher system - A method for processing accounts payable in which each approved invoice is posted to individual supplier records in the accounts payable file and is then stored in an open invoice file. Contrast with *voucher system*.

voucher system - A method for processing accounts payable in which a disbursement voucher is prepared instead of posting invoices directly to supplier records in the accounts payable subsidiary ledger. The disbursement voucher identifies the supplier, lists the outstanding invoices, and indicates the net amount to be paid after deducting any applicable discounts and allowances. Contrast with *nonvoucher system*.

FIGURE 13-9
Example of Supplier Invoice Approval Screen



Source: 2010 © NetSuite Inc.

disbursement voucher - A document that identifies the supplier, lists the outstanding invoices, and indicates the net amount to be paid after deducting any applicable discounts and allowances.

a disbursement voucher is also created when a supplier invoice is approved for payment. The **disbursement voucher** identifies the supplier, lists the outstanding invoices, and indicates the net amount to be paid after deducting any applicable discounts and allowances.

Voucher systems offer three advantages over nonvoucher systems. First, they reduce the number of checks that need to be written, because several invoices may be included on one disbursement voucher. Second, because the disbursement voucher is an internally generated document, it can be prenumbered to simplify tracking all payables. Third, because the voucher provides an explicit record that a supplier invoice has been approved for payment, it facilitates separating the time of invoice approval from the time of invoice payment. This makes it easier to schedule both activities to maximize efficiency.

The accounts payable process, which matches supplier invoices to purchase orders and receiving reports, is a prime candidate for automation. Large global companies can process over a million supplier invoices each year. Processing efficiency can be improved by requiring suppliers to submit invoices electronically, by EDI, and having the system automatically match those invoices to the appropriate purchase orders and receiving reports. Only those supplier invoices that fail this matching process need be processed manually.

Another option is to eliminate supplier invoices. After all, for most recurring purchases, companies know the prices of goods and services at the time they are ordered. Thus, as soon as receipt of the goods or services is verified, all the information required to pay the supplier is already known. This "invoiceless" approach is called **evaluated receipt settlement (ERS)**. ERS replaces the traditional three-way matching process (supplier invoice, receiving report, and purchase order) with a two-way match of the purchase order and receiving report (Figure 13-10). ERS saves time and money by reducing the number of documents that need to be matched and, hence, the number of potential mismatches. In fact, ERS systems are often configured to automate the two-way matching process and automatically generate payments; manual review is necessary only when there are discrepancies between the receiving report and purchase order. ERS also saves suppliers the time and expense of generating and tracking invoices. This is an example of how improvements in one company's expenditure cycle processes provide benefits to another company's revenue cycle processes. Finally, as Focus 13-2 shows, dramatic improvements can often result from reengineering the accounts payable process itself.

evaluated receipt settlement (ERS) - An invoiceless approach to accounts payable that replaces the three-way matching process (supplier invoice, receiving report, and purchase order) with a two-way match of the purchase order and receiving report.

Noninventory purchases for supplies provide perhaps the biggest opportunity to improve the efficiency of accounts payable and cash disbursements. Noninventory purchases typically account for a large proportion of accounts payable transactions but represent a small percentage of the total dollar value of all purchases. For example, an AICPA-sponsored survey found that over 60% of all invoices processed by accounts payable departments were for amounts under $2,000. Procurement cards provide one way to eliminate the need for accounts payable to process many such small invoices. A **procurement card** is a corporate credit card that employees can use only at designated suppliers to purchase specific kinds of items. Spending

procurement card - A corporate credit card that employees can use only at designated suppliers to purchase specific kinds of items.

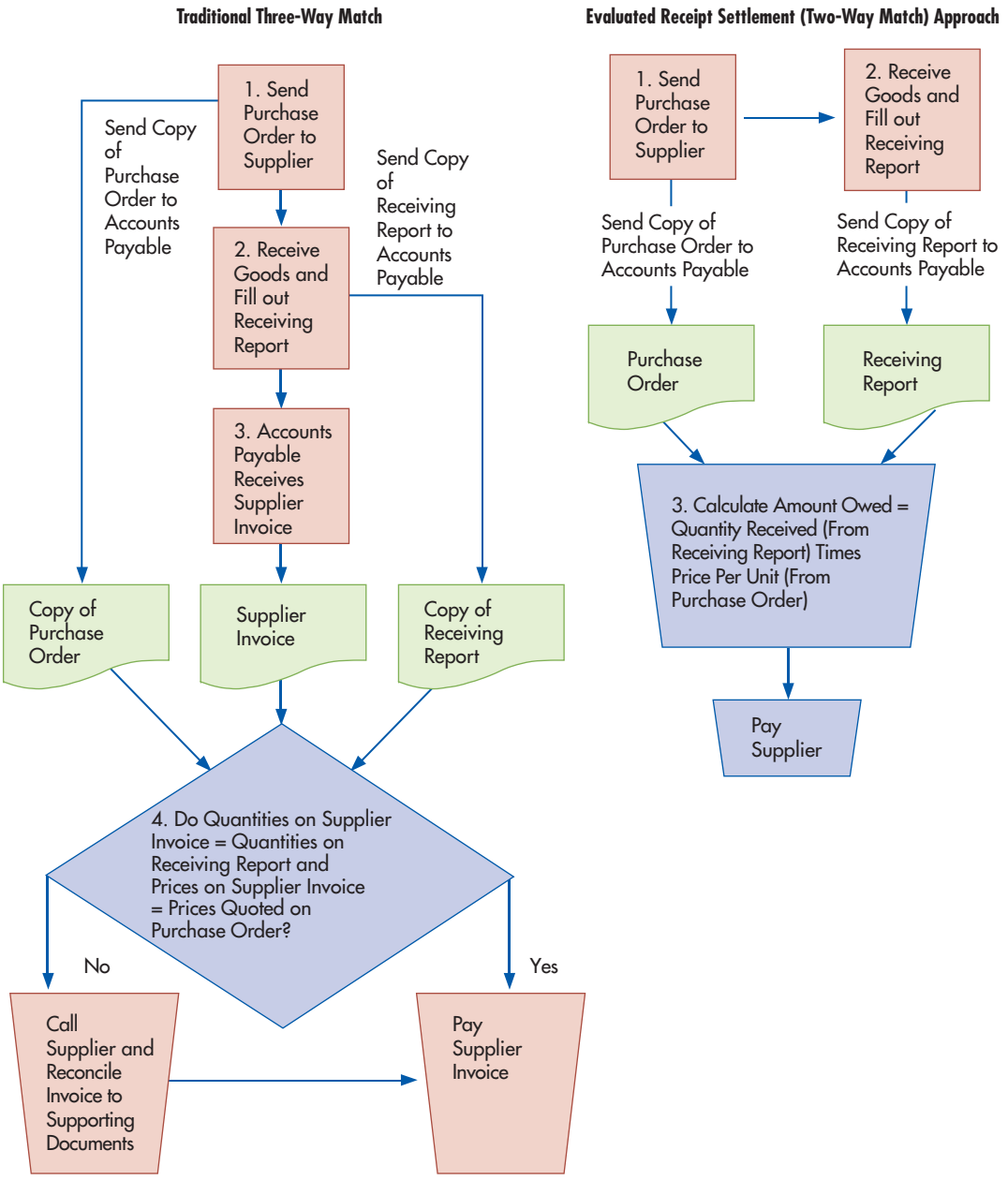


FIGURE 13-10
Comparison of Traditional Three-Way Match for Accounts Payable with the Two-Way Match used by Evaluated Receipt Settlement (ERS) Systems

limits can be set for each card. In addition, the account numbers on each procurement card can be mapped to specific general ledger accounts, such as office supplies. Procurement cards simplify accounts payable because the company receives one monthly statement that summarizes noninventory purchases by account category. Procurement cards also improve the efficiency of the cash disbursement process because the company only has to make one payment for all noninventory purchases during a given time period, instead of making separate payments to various suppliers.

THREATS AND CONTROLS

Table 13-2 indicates that one threat is errors on supplier invoices, such as discrepancies between quoted and actual prices charged or miscalculations of the total amount due. Consequently, the mathematical accuracy of supplier invoices must be verified (control 16.1) and the prices and quantities listed therein compared with those indicated on the purchase order and receiving report. For procurement card purchases, users should be required to keep

FOCUS 13-2 Applying Manufacturing Process Improvement Principles to Accounts Payable

Medtronic, Inc., a global medical technology company, is demonstrating that process improvement principles originally developed to improve manufacturing activities can also be successfully adopted to improve the accounts payable function. Like many manufacturers, Medtronic had successfully used both Six Sigma and Lean principles to streamline its work-flow activities and improve product quality. Six Sigma is a philosophy that focuses on improving quality by reducing mistakes. Lean analysis seeks to improve efficiency by eliminating bottlenecks and redundancies. Medtronic decided to try to apply these same techniques used in manufacturing to its accounts payable function. The initial motivation for doing so was the insight that financial transactions, just like manufacturing a product, involved moving an item (e.g., a supplier invoice) through a sequence of steps.

Medtronic initiated a series of intensive five-day projects, called *kaizen*, to apply Six Sigma and Lean principles to improve accounts payable. On day 1, a team consisting of accounts payable employees and manufacturing process improvement experts carefully studied how supplier invoices were processed, beginning with the time when mail was first opened all the way through printing and mailing checks. On day 2, the team measured the time it took to perform each step of the process and the volume of transactions passing through each step. On days 3 and 4, the team diagrammed the physical flow of all accounts payable documentation. They then rearranged cubicles and desks and added new wheeled carts and paper bins to slash the physical distance a supplier invoice traveled from 1,464 to 165 feet. They also modified the image-scanning process to be able to merge all supplier invoices (those for inventory purchases, with associated purchase orders, and those without purchase orders) into one queue. On day 5, the team walked the entire department through the reengineered work-flow process.

Medtronic's application of process improvement techniques yielded a dramatic improvement in the efficiency and effectiveness of its accounts payable function:

- The time required to open the mail and to sort, process, and record supplier invoices dropped from three days to one day.
- The number of invoices for which discounts for prompt payment were taken increased by 15%.
- Payment processing times were cut by 50%.

It is important to note that these benefits were obtained with the same employees who had been working in accounts payable prior to the reengineering effort. This shows that when companies are seeking to improve results, they should focus first on fixing the process, rather than on replacing the people who perform it.

receipts (control 16.2) and verify the accuracy of the monthly statement. Adopting the ERS approach (control 16.3) eliminates the potential for errors in supplier invoices because companies pay by matching counts of what they receive with prices quoted when the goods were ordered. However, the use of ERS makes it important to control access to the supplier master file (control 16.4) and monitor all changes made to it because the supplier master file now contains information about the prices of the various items being purchased. Upon entry of data about the quantity of goods received, the system uses those prices to establish the amount to be paid to suppliers. Thus, unauthorized changes to those prices can result in overpayments to suppliers.

Even with ERS, freight expenses require special consideration because their complexity creates numerous opportunities for mistakes to occur. The best way to reduce freight-related threats is to provide the purchasing and accounts payable staffs with adequate training on transportation practices and terminology. For example, if the purchase contract says "full freight allowed," then the supplier is responsible for the freight costs. When the purchasing organization is responsible for freight expenses, using a designated carrier for all incoming shipments can reduce costs. The discounts will only be realized, however, if suppliers comply with requests to use that carrier. Therefore, an important detective control is to have internal audit periodically verify the accuracy of freight bills and invoices to ensure that the company is not being charged for transportation costs that the supplier is supposed to pay (control 16.5).

Mistakes in recording and posting payments to suppliers (threat 17) result in additional errors in financial and performance reports that, in turn, can contribute to poor decision making.

The data entry and processing controls to ensure processing integrity that were discussed in Chapter 10 (control 17.1) are necessary to prevent these types of problems. One such control is to compare the difference in supplier account balances with the total amount of invoices processed—before and after processing checks. The total of all supplier account balances (or unpaid vouchers) also should be reconciled periodically with the amount of the accounts payable control account in the general ledger (control 17.2).

Cash Disbursements

The final activity in the expenditure cycle is paying suppliers (circle 4.0 in Figure 13-2).

PROCESS

The cashier, who reports to the treasurer, is responsible for paying suppliers. This segregates the custody function, performed by the cashier, from the authorization and recording functions, performed by the purchasing and accounts payable departments, respectively. Payments are made when accounts payable sends the cashier a voucher package. Although many payments continue to be made by check, the use of EFT and FEDI is increasing.

THREATS AND CONTROLS

Failing to take advantage of purchase discounts for prompt payment (threat 18) can be costly. For example, a 1% discount for paying within 10 days instead of 30 days represents a savings of 18% annually. Proper filing can significantly reduce the risk of this threat. Approved invoices should be filed by due date, and the system should be designed to track invoice due dates and print a periodic list of all outstanding invoices (control 18.1). A cash flow budget (control 18.2) that indicates expected cash inflows and outstanding commitments also can help companies plan to utilize available purchase discounts. The information in this budget comes from a number of sources. Accounts receivable provides projections of future cash collections. The accounts payable and open purchase order files indicate the amount of current and pending commitments to suppliers, and the human resources function provides information about payroll needs.

Another threat is paying for goods not received. The best control to prevent this threat is to compare the quantities indicated on the supplier invoice with the quantities entered by the inventory control person, who accepts the transfer of those goods from the receiving department. Many companies require the inventory control department to verify the quantities on the receiving report before it can be used to support payment of a supplier invoice (control 19.1). Verification that services (e.g., cleaning or painting) were performed in the manner billed is more difficult. Therefore, most companies rely on budgetary controls and careful review of departmental expenses (control 19.2) to indicate potential problems that need investigation.

Reimbursement of employees' travel and entertainment expenses warrants special attention because this is an area in which fraud often occurs and technological trends have made it easier for employees to submit fraudulent claims. For example, most airlines now encourage travelers to print their boarding passes at home. This saves the traveler time at check-in, but it also reduces the value of a boarding pass as supporting documentation for a claimed expense because the document can be altered by the traveler or printed but never used. Consequently, many organizations require employees to submit additional evidence, such as a conference agenda that identifies attendees, to prove that they actually took a trip (control 19.3). Another potential threat is for an employee to book multiple flights or hotels, cancel all but the cheapest ones, but submit a reimbursement claim for the most expensive option. The best way to prevent this problem is to require all employees to use corporate credit cards for travel (control 19.4), as this ensures that the organization will receive a complete audit trail of all charges *and* credits to the account.

Duplicate payments (threat 20) can happen for a variety of reasons. It may be a duplicate invoice that was sent after the company's check was already in the mail, or it may have become separated from the other documents in the voucher package. Although the supplier

usually detects a duplicate payment and credits the company's account, it can affect a company's cash flow needs. In addition, the financial records will be incorrect, at least until the duplicate payment is detected.

Several related control procedures can mitigate this threat. First (control 20.1), invoices should be approved for payment only when accompanied by a complete voucher package (purchase order and receiving report). Second, only the original copy of an invoice should be paid (control 20.2). Most duplicate invoices that suppliers send clearly indicate that they are not originals. Payment should never be authorized for a photocopy of an invoice. Third, when the check to pay for an invoice is signed, the invoice and the voucher package should be canceled (marked "paid") in a manner that would prevent their resubmission (control 20.3). Although ERS eliminates vendor invoices entirely, it is still important to mark all receiving reports as paid to avoid duplicate payments.

Probably the most serious threat associated with the cash disbursements function is theft or misappropriation of funds (threat 21). Because cash is the easiest asset to steal, access to cash, blank checks, and the check-signing machine should be restricted (control 21.1). Checks should be sequentially numbered and periodically accounted for (control 21.2) by the cashier.

EFT, either by itself or as part of FEDI, requires additional control procedures. Strict access controls over all outgoing EFT transactions (control 21.3) are important. Passwords and user IDs should be used to specifically identify and monitor each employee authorized to initiate EFT transactions. The location of the originating terminal should also be recorded. EFT transactions above a certain threshold should require real-time supervisory approval. There should also be limits on the total dollar amount of transactions allowed per day per individual. All EFT transmissions should be encrypted to prevent alteration. In addition, all EFT transactions should be time-stamped and numbered to facilitate subsequent reconciliation. Special programs, called *embedded audit modules*, can be designed into the system to monitor all transactions and identify any that possess specific characteristics. A report of those flagged transactions then can be given to management and internal audit for review and, if necessary, more detailed investigation.

Online banking transactions require constant monitoring. Timely detection of suspicious transactions and prompt notification of the bank are necessary for recovering any funds that are fraudulently disbursed. A serious threat is that keystroke-logging software could infect the computer used for online banking and provide criminals with the organization's banking credentials. Indeed, in recent years criminals have directed spear phishing attacks (see Chapter 6) at treasurers to attempt to do this. The best way to mitigate this threat is to designate a specific computer to be used for online banking (control 21.4), to restrict access to that computer to the treasurer or whoever is responsible for authorizing payments, and to use that computer *only* for online banking and no other activity. Otherwise, if the treasurer uses the same computer for both e-mail and online banking and falls victim to a spear phishing attack, criminals can install keylogging software, use it obtain the organization's banking credentials, and then steal the organization's funds. Companies should also consider placing Automated Clearing House (ACH) blocks, which instruct banks to not allow ACH debits (outflows) from specific accounts. For example, if a company makes all payments to its suppliers only from its main operating checking account, it may wish to instruct the bank to block all ACH debits from any of its other bank accounts (control 21.5).

Fraudulent disbursements, particularly the issuance of checks to fictitious suppliers, are a common type of fraud. Proper segregation of duties (control 21.6) can significantly reduce the risk of this threat. The accounts payable function should authorize payment, including the assembling of a voucher package; however, only the treasurer or cashier should sign checks. To ensure that checks are sent to the intended recipients, the cashier should mail the signed checks rather than return them to accounts payable. The cashier also should cancel all documents in the voucher package to prevent their being resubmitted to support another disbursement. Checks in excess of a certain amount, such as $5,000 to $10,000, should require two signatures (control 21.7), thereby providing yet another independent review of the expenditure. Finally, someone who did not participate in processing either cash collections or disbursements should reconcile all bank accounts (control 21.8). This control provides an independent check on accuracy and prevents someone from misappropriating cash and then concealing the theft by adjusting the bank statement.

Access to the approved supplier list should be restricted (control 21.9), and any changes to that list should be carefully reviewed and approved. It is especially important to restrict the ability to create one-time suppliers (control 21.10) and process invoices so that the same employee cannot both create a new supplier and issue a check to that supplier.

When possible, expenditures should be made by check or EFT. Nevertheless, it is often more convenient to pay for minor purchases, such as coffee or donuts, in cash. A petty cash fund (control 21.11), managed by an employee who has no other cash-handling or accounting responsibilities, should be established to handle such expenditures. The petty cash fund should be set up as an imprest fund. An **imprest fund** has two characteristics: it is set at a fixed amount, such as $100, and it requires vouchers for every disbursement. At all times, the sum of cash plus vouchers should equal the preset fund balance. When the fund balance gets low, the vouchers are presented to accounts payable for replenishment. After accounts payable authorizes this transaction, the cashier then writes a check to restore the petty cash fund to its designated level. As with the supporting documents used for regular purchases, the vouchers used to support replenishment of the petty cash fund should be canceled at the time the fund is restored to its preset level.

imprest fund - A cash account with two characteristics: (1) It is set at a fixed amount, such as $100; and (2) vouchers are required for every disbursement. At all times, the sum of cash plus vouchers should equal the preset fund balance.

The operation of an imprest petty cash fund technically violates the principle of segregation of duties, because the same person who has custody of the cash also authorizes disbursements from the fund and maintains a record of the fund balance. The threat of misappropriation is more than offset, however, by the convenience of not having to process small miscellaneous purchases through the normal expenditure cycle. Moreover, the risk of misappropriation can be mitigated by having the internal auditor make periodic unannounced counts of the fund balance and vouchers and by holding the person in charge of the petty cash fund accountable for any shortages discovered during those surprise audits (control 21.12).

Theft can also occur through check alteration (threat 22). Check-protection machines (control 22.1) can reduce the risk of this threat by imprinting the amount in distinctive colors, typically a combination of red and blue ink. Using special inks that change colors if altered and printing checks on special papers (control 22.2) that contain watermarks can further reduce the probability of alteration. Many banks also provide special services to help protect companies against fraudulent checks. One such service, called Positive Pay (control 22.3), involves sending a daily list of all legitimate checks to the bank, which will then clear only checks appearing on that list. Reconciling bank accounts every month is an important detective control for identifying check fraud. It is important to reconcile bank accounts in a timely manner because many banks will cover bad-check losses only if a company notifies them promptly of any such checks it discovers.

Finally, it is important to plan and monitor expenditures in order to avoid cash flow problems (threat 23). A cash flow budget (control 23.1) is the best way to mitigate this threat.

Summary and Case Conclusion

The basic business activities performed in the expenditure cycle include ordering materials, supplies, and services; receiving materials, supplies, and services; approving supplier invoices for payment; and paying for goods and services.

The efficiency and effectiveness of these activities can significantly affect a company's overall performance. For example, deficiencies in requesting and ordering necessary inventory and supplies can create production bottlenecks and result in lost sales due to stockouts of popular items. Problems in the procedures related to receiving and storing inventory can result in a company's paying for items it never received, accepting delivery and incurring storage costs for unordered items, and experiencing a theft of inventory. Problems in approving supplier invoices for payment can result in overpaying suppliers or failing to take available discounts for prompt payment. Weaknesses in the cash disbursement process can result in the misappropriation of cash.

IT can help improve the efficiency and effectiveness with which expenditure cycle activities are performed. In particular, EDI, bar-coding, RFID, and EFT can significantly reduce the time and costs associated with ordering, receiving, and paying for goods. Proper control

procedures, especially segregation of duties, are needed to mitigate various threats such as errors in performing expenditure cycle activities and the theft of inventory or cash.

At the next executive meeting, Ann Brandt and Elizabeth Venko presented to Linda Spurgeon their recommendations for improving AOE's expenditure cycle business activities. Ann indicates that LeRoy Williams's plan to conduct more frequent physical counts of key raw materials components will increase the accuracy of the database and reduce the likelihood of future stockouts at the Wichita plant. She also designed a query to produce a daily supplier performance report that will highlight any negative trends before they become the types of problems that disrupted production at the Dayton plant. Ann also indicated that it would be possible to link AOE's inventory and production planning systems with major suppliers to better manage AOE's inventory levels.

Elizabeth Venko stated that she was working to increase the number of suppliers who either bar-code or RFID tag their shipments. This would improve both the efficiency and accuracy of the receiving process and also the accuracy of AOE's inventory records, thereby providing possible additional reductions in inventory carrying costs. In addition, Elizabeth wants to encourage more suppliers to either send invoices via EDI or agree to ERS, which should improve the efficiency and accuracy of processing invoices and reduce the costs associated with handling and storing paper invoices. Concurrently, Elizabeth plans to increase EFT as much as possible to further streamline the cash disbursements process and reduce the costs associated with processing payments by check.

As the meeting draws to a close, LeRoy Williams asks if Elizabeth and Ann can meet with him to explore additional ways to improve how AOE's new system tracks manufacturing activities.

KEY TERMS

expenditure cycle 395
economic order quantity (EOQ) 403
reorder point 403
materials requirements planning (MRP) 403
just-in-time (JIT) inventory system 403
purchase requisition 404
purchase order 405
blanket purchase order or blanket order 405
vendor-managed inventory (VMI) 406
kickbacks 408
receiving report 409
debit memo 409
voucher package 411
nonvoucher system 411
voucher system 411
disbursement voucher 412
evaluated receipt settlement (ERS) 412
procurement card 412
imprest fund 417

AIS in Action

CHAPTER QUIZ

1. Which of the following inventory control methods is most likely to be used for a product for which sales can be reliably forecast?
a. JIT
b. EOQ
c. MRP
d. ABC

2. Which of the following matches is performed in evaluated receipt settlement (ERS)?
a. the vendor invoice with the receiving report
b. the purchase order with the receiving report
c. the vendor invoice with the purchase order
d. the vendor invoice, the receiving report, and the purchase order