CHAPTER

12

The Revenue Cycle: Sales to Cash Collections

LEARNING OBJECTIVES

1. Describe the basic business activities in the revenue cycle and discuss the general threats to that process and the controls that can be used to mitigate those threats.
2. Explain the ***sales order entry*** process, key decisions that need to be made and threats to that process, and describe the controls that can be used to mitigate those threats.
3. Explain the ***shipping*** process, key decisions that need to be made and threats to that process, and describe the controls that can be used to mitigate those threats.
4. Explain the ***billing*** process, key decisions that need to be made and threats to that process, and describe the controls that can be used to mitigate those threats.
5. Explain the ***cash collections*** process, key decisions that need to be made and threats to that process, and describe the controls that can be used to mitigate those threats.

INTEGRATIVE CASE Alpha Omega Electronics

Alpha Omega Electronics (AOE) manufactures a variety of inexpensive consumer electronic products, including calculators, digital clocks, radios, pagers, toys, games, and small kitchen appliances. Like most manufacturers, AOE does not sell its products directly to individual consumers, but only to retailers. Figure 12-1 shows a partial organization chart for AOE.

Linda Spurgeon, president of AOE, called an executive meeting to discuss two pressing issues. First, AOE has been steadily losing market share for the past three years. Second, cash flow problems have necessitated increased short-term borrowing. At the executive meeting, Trevor Whitman, vice president of marketing, explained that one reason for AOE's declining market share is that competitors are apparently providing better customer service. When Linda asked for specifics, however, Trevor admitted that his opinion was based on recent conversations with two major customers. He also admitted that he could not

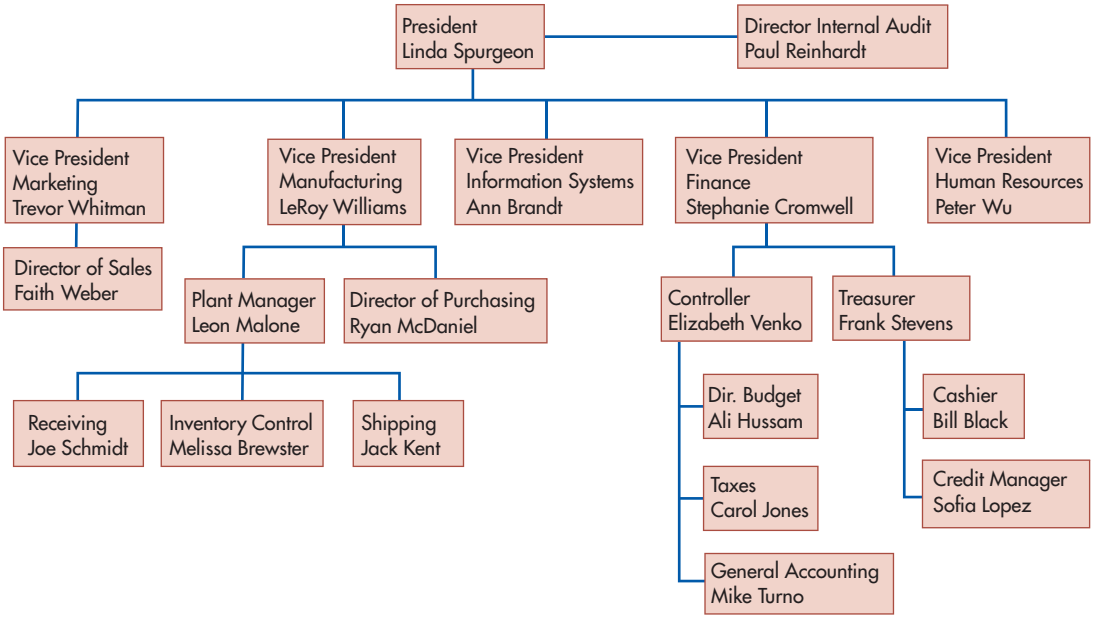


FIGURE 12-1
Partial Organization Chart for Alpha Omega Electronics

readily identify AOE's 10 most profitable customers. Linda then asked Elizabeth Venko, the controller, about AOE's cash flow problems. Elizabeth explained that the most recent accounts receivable aging schedule indicated a significant increase in the number of past-due customer accounts. Consequently, AOE has had to increase its short-term borrowing because of delays in collecting customer payments. In addition, the Best Value Company, a retail chain that has been one of AOE's major customers, recently went bankrupt. Elizabeth admitted that she is unsure whether AOE will be able to collect the large balance due from Best Value.

Linda was frustrated with the lack of detailed information regarding both issues. She ended the meeting by asking Elizabeth and Trevor to work with Ann Brandt, vice president of information systems, to develop improved reporting systems so that AOE could more closely monitor and take steps to improve both customer service and cash flow management. Specifically, Linda asked Elizabeth, Trevor, and Ann to address the following issues:

1. How could AOE improve customer service? What information does marketing need to perform its tasks better?
2. How could AOE identify its most profitable customers and markets?

3. How can AOE improve its monitoring of credit accounts? How would any changes in credit policy affect both sales and uncollectible accounts?
4. How could AOE improve its cash collection procedures?

The AOE case shows how deficiencies in the information system used to support revenue cycle activities can create significant problems for an organization. As you read this chapter, think about how a well-designed information system can improve both the efficiency and effectiveness of an organization's revenue cycle activities.

Introduction

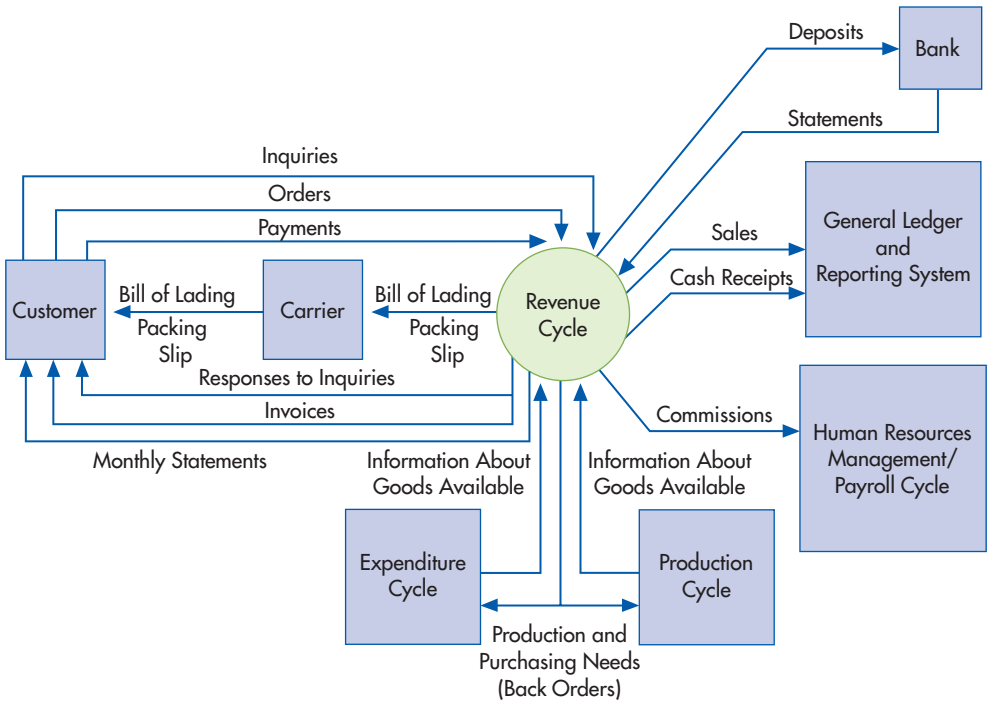
revenue cycle - The recurring set of business activities and data processing operations associated with providing goods and services to customers and collecting cash in payment for those sales.

The **revenue cycle** is a recurring set of business activities and related information processing operations associated with providing goods and services to customers and collecting cash in payment for those sales (Figure 12-2). The primary external exchange of information is with customers. Information about revenue cycle activities also flows to the other accounting cycles. For example, the expenditure and production cycles use information about sales transactions to initiate the purchase or production of additional inventory to meet demand. The human resources management/payroll cycle uses information about sales to calculate sales commissions and bonuses. The general ledger and reporting function uses information produced by the revenue cycle to prepare financial statements and performance reports.

The revenue cycle's primary objective is to provide the right product in the right place at the right time for the right price. To accomplish that objective, management must make the following key decisions:

- To what extent can and should products be customized to individual customers' needs and desires?
- How much inventory should be carried, and where should that inventory be located?
- How should merchandise be delivered to customers? Should the company perform the shipping function itself or outsource it to a third party that specializes in logistics?

FIGURE 12-2
The Context Diagram of the Revenue Cycle



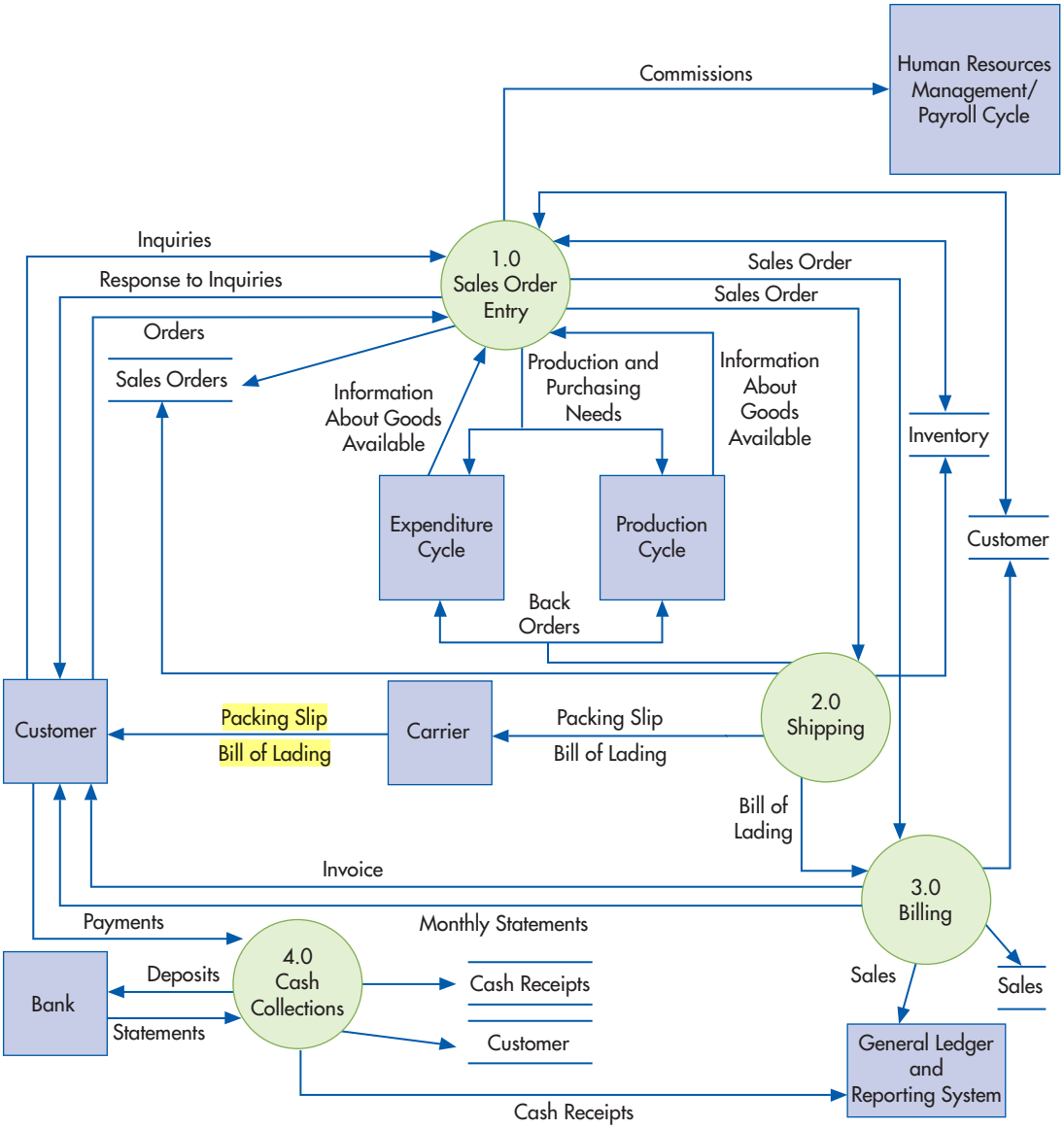


FIGURE 12-3
Level 0 Data Flow Diagram: Revenue Cycle

- What are the optimal prices for each product or service?
- Should credit be extended to customers? If so, what credit terms should be offered? How much credit should be extended to individual customers?
- How can customer payments be processed to maximize cash flow?

The answers to those questions guide how an organization performs the four basic revenue cycle activities depicted in Figure 12-3:

1. Sales order entry
2. Shipping
3. Billing
4. Cash collections

This chapter explains how an organization's information system supports each of those activities. We begin by describing the design of the revenue cycle information system and the basic controls necessary to ensure that it provides management with reliable information. We then discuss in detail each of the four basic revenue 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.

Revenue Cycle Information System

Like most large organizations, AOE uses an enterprise resource planning (ERP) system. Figure 12-4 shows the portion of the ERP system that supports AOE's revenue cycle business activities.

PROCESS

AOE's customers can place orders directly via the Internet. In addition, salespeople use portable laptops to enter orders when calling on customers. The sales department enters customer orders received over the telephone, by fax, or by mail. Regardless of how an order is initially received, the system quickly verifies customer creditworthiness, checks inventory availability, and notifies the warehouse and shipping departments about the approved sale. Warehouse and shipping employees enter data about their activities as soon as they are performed, thereby updating information about inventory status in real time. Nightly, the invoice program runs in batch mode, generating paper or electronic invoices for customers who require invoices. Some of AOE's customers still send checks to one of the regional banks with which AOE has established electronic lockboxes, but an increasing number use their bank's online bill paying service. Each day, the bank sends AOE a file containing remittance data, which the cashier uses to update the company's cash account balances and the accounts receivable clerk uses to update customer accounts.

THREATS AND CONTROLS

Table 12-1 lists the threats that occur throughout the various stages of the revenue cycle and the controls that can be used to mitigate those threats. Figure 12-4 shows that all revenue cycle

FIGURE 12-4
Overview of ERP System Design to Support the Revenue Cycle

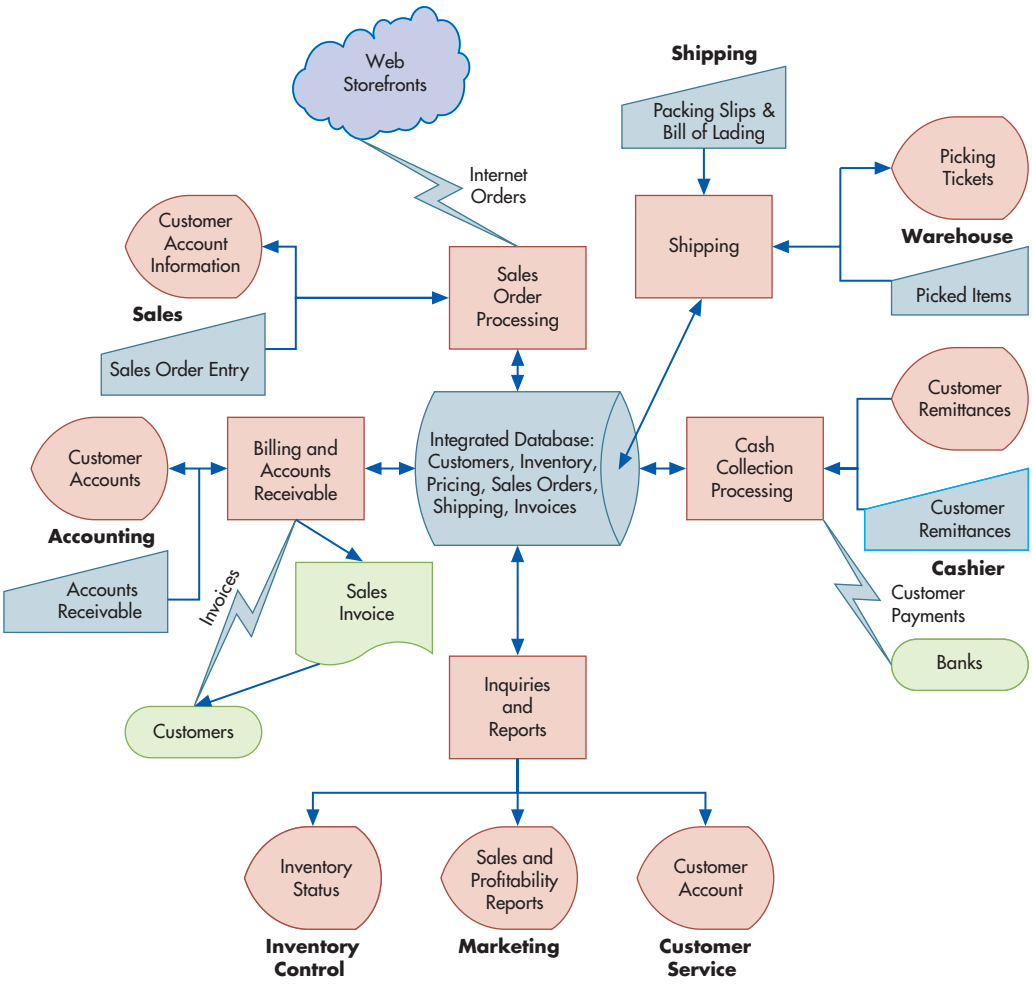


TABLE 12-1 Threats and Controls in the Revenue Cycle

ACTIVITY	THREAT	CONTROLS (FIRST NUMBER REFERS TO THE CORRESPONDING THREAT)
General issues throughout entire revenue cycle	1. Inaccurate or invalid master data 2. Unauthorized disclosure of sensitive information 3. Loss or destruction of data 4. Poor performance	1.1 Data processing integrity controls 1.2 Restriction of access to master data 1.3 Review of all changes to master data 2.1 Access controls 2.2 Encryption 2.3 Tokenization of customer personal information 3.1 Backup and disaster recovery procedures 4.1 Managerial reports
Sales order entry	5. Incomplete/inaccurate orders 6. Invalid orders 7. Uncollectible accounts 8. Stockouts or excess inventory 9. Loss of customers	5.1 Data entry edit controls (see Chapter 10) 5.2 Restriction of access to master data 6.1 Digital signatures or written signatures 7.1 Credit limits 7.2 Specific authorization to approve sales to new customers or sales that exceed a customer's credit limit 7.3 Aging of accounts receivable 8.1 Perpetual inventory control system 8.2 Use of bar codes or RFID 8.3 Training 8.4 Periodic physical counts of inventory 8.5 Sales forecasts and activity reports 9.1 CRM systems, self-help websites, and proper evaluation of customer service ratings
Shipping	10. Picking the wrong items or the wrong quantity 11. Theft of inventory 12. Shipping errors (delay or failure to ship, wrong quantities, wrong items, wrong addresses, duplication)	10.1 Bar-code and RFID technology 10.2 Reconciliation of picking lists to sales order details 11.1 Restriction of physical access to inventory 11.2 Documentation of all inventory transfers 11.3 RFID and bar-code technology 11.4 Periodic physical counts of inventory and reconciliation to recorded quantities 12.1 Reconciliation of shipping documents with sales orders, picking lists, and packing slips 12.2 Use RFID systems to identify delays 12.3 Data entry via bar-code scanners and RFID 12.4 Data entry edit controls (if shipping data entered on terminals) 12.5 Configuration of ERP system to prevent duplicate shipments
Billing	13. Failure to bill 14. Billing errors 15. Posting errors in accounts receivable 16. Inaccurate or invalid credit memos	13.1 Separation of billing and shipping functions 13.2 Periodic reconciliation of invoices with sales orders, picking tickets, and shipping documents 14.1 Configuration of system to automatically enter pricing data 14.2 Restriction of access to pricing master data 14.3 Data entry edit controls 14.4 Reconciliation of shipping documents (picking tickets, bills of lading, and packing list) to sales orders 15.1 Data entry controls 15.2 Reconciliation of batch totals 15.3 Mailing of monthly statements to customers 15.4 Reconciliation of subsidiary accounts to general ledger 16.1 Segregation of duties of credit memo authorization from both sales order entry and customer account maintenance 16.2 Configuration of system to block credit memos unless there is either corresponding documentation of return of damaged goods or specific authorization by management

(*continued*)

TABLE 12-1 Continued

ACTIVITY	THREAT	CONTROLS (FIRST NUMBER REFERS TO THE CORRESPONDING THREAT)
Cash collections	17. Theft of cash 18. Cash flow problems	17.1 Segregation of duties—the person who handles (deposits) payments from customers should not also: a. Post remittances to customer accounts b. Create or authorize credit memos c. Reconcile the bank account 17.2 Use of EFT, FEDI, and lockboxes to minimize handling of customer payments by employees 17.3 Obtain and use a UPIC to receive EFT and FEDI payments from customers 17.4 Immediately upon opening mail, create list of all customer payments received 17.5 Prompt, restrictive endorsement of all customer checks 17.6 Having two people open all mail likely to contain customer payments 17.7 Use of cash registers 17.8 Daily deposit of all cash receipts 18.1 Lockbox arrangements, EFT, or credit cards 18.2 Discounts for prompt payment by customers 18.3 Cash flow budgets

activities depend on the integrated database that contains information about customers, inventory, and pricing. Therefore, the first general threat listed in Table 12-1 is inaccurate or invalid master data. Errors in customer master data could result in shipping merchandise to the wrong location, delays in collecting payments because of sending invoices to the wrong address, or making sales to customers that exceed their credit limits. Errors in inventory master data can result in failure to timely fulfill customer orders due to unanticipated shortages of inventory, which may lead to loss of future sales. Errors in pricing master data can result in customer dissatisfaction due to overbilling or lost revenues due to underbilling.

Control 1.1 in Table 12-1 shows that one way to mitigate the threat of inaccurate or invalid master data is to use the various processing integrity controls discussed in Chapter 10 to minimize the risk of data input errors. It is also important to use the authentication and authorization controls discussed in Chapter 8 to restrict access to that data and configure the system so that only authorized employees can make changes to master data (control 1.2 in Table 12-1). This requires changing the default configurations of employee roles in ERP systems to appropriately segregate incompatible duties. For example, sales order entry staff should not be able to change master pricing data or customer credit limits. Similarly, the person who maintains customer account information should not be able to process cash collections from customers or issue credit memos to authorize writing off sales as uncollectible. However, because such preventive controls can never be 100% effective, Table 12-1 (control 1.3) 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.

A second general threat in the revenue cycle is unauthorized disclosure of sensitive information, such as pricing policies or personal information about customers. Table 12-1 (control 2.1) 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. It is also important to configure the system to limit employees' ability to use the system's built-in query capabilities to access only those specific tables and fields relevant to performing their assigned duties. 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. The organization should also design its websites to encrypt information requested from customers while that information is in transit over the Internet. However, because encryption does not protect information during processing, organizations should also

tokenize customer personal information (control 2.3) to protect it from being viewed by employees who have authority to perform various revenue cycle activities.

A third general threat in the revenue 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.

Accurate master data enables management to better use an ERP system's extensive reporting capabilities to monitor performance (see threat 4 in Table 12-1). Accountants should use their knowledge about the underlying business processes to design innovative reports (control 4.1) that provide management with insights beyond those provided by traditional financial statements. For example, companies have always closely monitored sales trends. Additional information is needed, however, to identify the causes of changes in that measure. Metrics such as revenue margin[1] can provide such information. Revenue margin equals gross margin minus all expenses incurred to generate sales, including payroll, salesforce-related travel, customer service and support costs, warranty and repair costs, marketing and advertising expenses, and distribution and delivery expenses. Thus, revenue margin integrates the effects of changes in both productivity and customer behavior. Growth in revenue margin indicates that customers are satisfied (as reflected in repeat sales), productivity is increasing (reflected in reduced costs per sale), or both. Conversely, a declining revenue margin indicates problems with customer retention, productivity, or both. Revenue margin is a metric to evaluate overall performance of revenue cycle activities. As we will see in the following sections, accountants can help managers design detailed reports and metrics that are relevant to evaluating each business activity.

Sales Order Entry

The revenue cycle begins with the receipt of orders from customers. The sales department, which reports to the vice president of marketing (refer to Figure 12-1), typically performs the sales order entry process, but increasingly customers are themselves entering much of this data through forms on a company's website storefront.

Figure 12-5 shows that the sales order entry process entails three steps: taking the customer's order, checking and approving customer credit, and checking inventory availability. Figure 12-5 also includes an important related event that may be handled either by the sales order department or by a separate customer service department (which typically also reports to the vice president of marketing): responding to customer inquiries.

TAKING CUSTOMER ORDERS

Customer order data are recorded on a sales order document. In the past, organizations used paper documents; today, as Figure 12-6 shows, the **sales order** document is usually an electronic form displayed on a computer monitor screen (interestingly, many ERP systems continue to refer to these data entry screens as documents). Examination of Figure 12-6 reveals that the sales order contains information about item numbers, quantities, prices, and other terms of the sale.

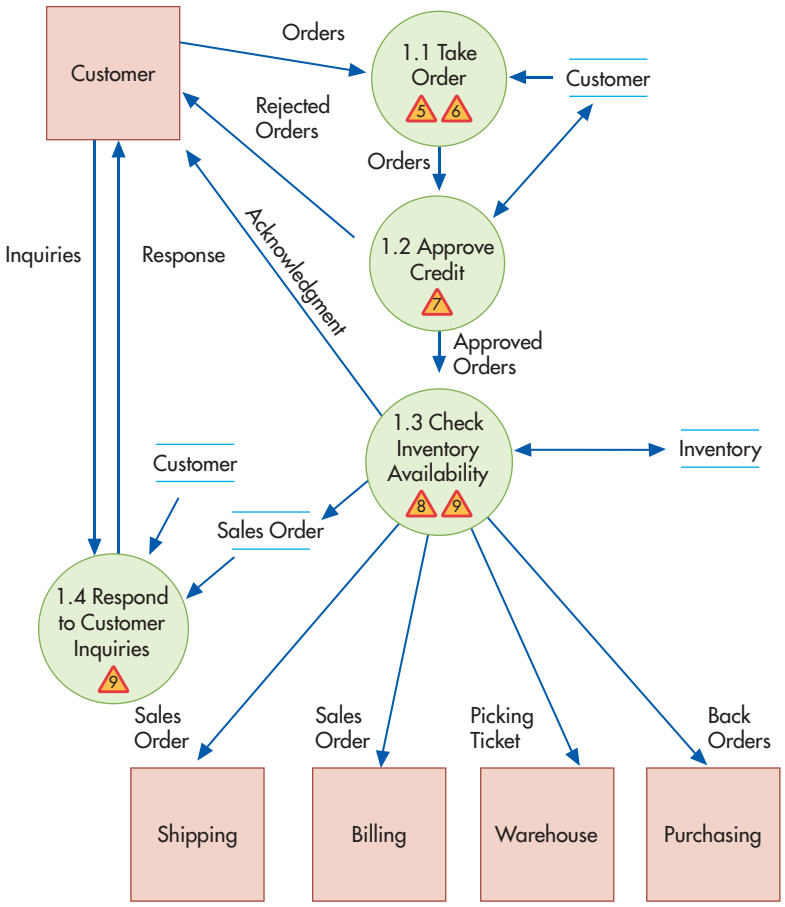
sales order - The document created during sales order entry listing the item numbers, quantities, prices, and terms of the sale.

PROCESS In the past, customer orders were entered into the system by employees. Increasingly, organizations seek to leverage IT to have customers do more of the data entry themselves. One way to accomplish this is to have customers complete a form on the company's website. Another is for customers to use **electronic data interchange (EDI)** to submit the order electronically in a format compatible with the company's sales order processing system.

electronic data interchange (EDI) - The use of computerized communications and a standard coding scheme to submit business documents electronically in a format that can be automatically processed by the recipient's information system.

[1]The concept of revenue margin was developed by James B. Hangstefer, "Revenue Margin: A Better Way to Measure Company Growth," *Strategic Finance* (July 2000): pp. 40–45.

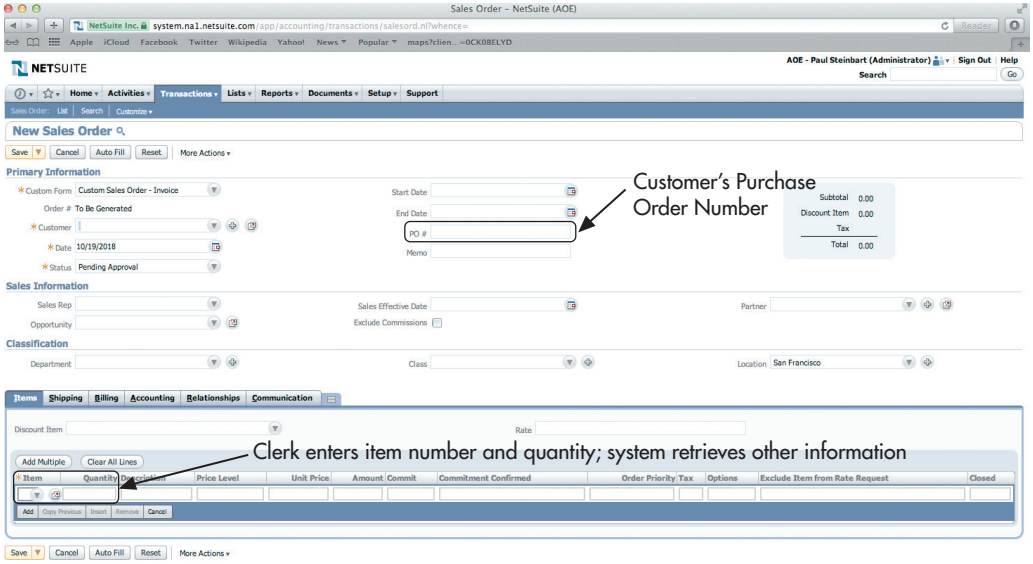
FIGURE 12-5
Level 1 Data Flow Diagram: Sales Order Entry (annotated to identify threats)



Both techniques improve efficiency and cut costs by eliminating the need for human involvement in the sales order entry process. Focus 12-1 describes how another recent IT development, QR codes, can further improve the efficiency and effectiveness of interacting with customers.

Besides cutting costs, IT also provides opportunities to increase sales. One technique, used by many Internet retailers, is to use sales history information to create marketing messages tailored to the individual customer. For example, once an Amazon.com customer selects

FIGURE 12-6
Example of a Sales Order Document (Order Entry Screen)



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FOCUS 12-1 Using QR Codes to Improve Interactions with Customers

QR codes are two-dimensional bar codes that can be scanned with a smartphone. They provide potential customers with access to multimedia anywhere at anytime. For example, consider a charity fund-raising event such as an outdoor concert. QR codes can be printed on posters, displayed on video screens, and included in the program. When attendees scan the code, they are directed to a mobile website where they can make a donation via their smartphone. Such a process is likely to result in a higher percentage of attendees actually donating, because they can act immediately upon their impulse. QR codes can also increase sales by enhancing customer service. For example, in South Korea, the grocery chain Tesco places display cases stocked with commonly purchased items at subway stops. Consumers can scan the QR codes next to the items they want, then enter their account number, and the groceries are delivered to their home within an hour. QR codes also facilitate real-time changes to advertising: The seller need only log in to that account, change the content at that one central location, and every subsequent time that a potential customer scans a QR code in a magazine, transportation stop, or other location, he or she will see the new updated information.

a book, the website suggests related books that other customers have purchased when they bought the one the customer has already selected. Amazon.com and other Internet retailers also use sales history data to create customized electronic coupons that they periodically send to customers to encourage additional purchases. Another technique involves the use of interactive sales order entry systems that allow customers to customize products to meet their exact needs. For example, visitors to Dell Computer's website can try numerous combinations of components and features until they find a configuration that meets their needs at a price they can afford. Such interactive sales order entry systems not only increase sales but also help improve cash flow in two ways. First, because many sales are built to order, less capital needs to be tied up in carrying a large inventory of finished goods. Second, the build to order model allows companies to collect all or part of the payment in advance, possibly even before they have to pay for the raw materials.

The effectiveness of a website depends largely on its design, however. Therefore, companies should regularly review records of customer interaction on their websites to quickly identify potential problems. A hard-to-use website may actually hurt sales by frustrating customers and creating ill will. Conversely, a well-designed website can provide useful insights. For example, when managers at National Semiconductor noticed a marked increase in customer interest in the company's new heat sensors, they ramped up production so that the company was able to satisfy increased demand for those products.

Like AOE, many companies continue to employ a sales staff in addition to using a website storefront because of the benefits associated with face-to-face contact with existing and prospective business customers. Information technology provides many opportunities to improve sales force efficiency and effectiveness, a process referred to as sales force automation. Storing promotional information online is cheaper than printing and mailing those materials to sales representatives. E-mail and instant messaging (IM) reduce the costs and time it takes to inform sales staff of pricing changes and sales promotions. Both techniques also can be used to provide sales staff with last-minute reminders about a particular customer's special needs and interests and to enable management to quickly approve special deals. E-mail and IM also reduce the need for salespeople to return to the home office, thereby increasing the proportion of time they can spend with customers. Technology also enhances the quality of sales presentations. Laptop computers and tablets enable salespeople to make multimedia presentations, which improves their ability to demonstrate and explain the capabilities and features of complex technical products.

THREATS AND CONTROLS A basic threat during sales order entry is that important data about the order will be either missing or inaccurate (threat 5 in Table 12-1). This not only creates inefficiencies (someone will have to call the customer back and reenter the order in the system),

but also may negatively affect customer perceptions and, thereby, adversely affect future sales. ERP systems use a variety of data entry edit controls (control 5.1) that were discussed in Chapter 10 to mitigate this threat. For example, completeness checks can ensure that all required data, such as both shipping and billing addresses, are entered. Automatic lookup of reference data already stored in the customer master file, such as customer addresses, prevents errors by eliminating data entry. To illustrate, examine the sales order entry screen depicted in Figure 12-6. In the header section (the top portion of the screen), the salesperson need only enter the name of the customer in the sold-to and ship-to fields, and the system pulls the rest of the information from the customer master file. In the detail section (the lower portion of the figure), the salesperson needs to enter only the item number and quantity ordered, and the rest of the information is pulled from the inventory and pricing master files. Note that by looking up the reference data, the ERP system is necessarily performing a validity check of the customer name and inventory item number entered by the salesperson. ERP systems should also be configured to perform reasonableness tests to compare the quantity ordered with item numbers and past sales history.

Data entry controls also need to be incorporated in website forms and EDI systems used to accept customer orders. Of course, all of these data entry controls presuppose that the master data is accurate, which is why Table 12-1 also indicates the need to restrict access to the integrated database (control 5.2) to prevent unauthorized changes that could destroy the integrity of the data.

A second threat associated with the sales order entry activity concerns the legitimacy of orders (threat 6 in Table 12-1). If a company ships merchandise to a customer and the customer later denies having placed the order, there is a potential loss of assets. Even if the goods are returned, the company wasted time and money to both ship them and to receive them back. For paper-based transactions, the legitimacy of customer orders is established by the customer's signature. As explained in Chapter 9, digital signatures (control 6.1) provide similar assurance of legitimacy and the evidence to support nonrepudiation for electronic transactions.

Finally, accountants can help managers to better monitor sales activity by using their knowledge about business processes to design reports that focus on key performance drivers. For example, reports that break down sales by salesperson, region, or product provide a means to evaluate sales order entry efficiency and effectiveness. Reports that show marginal profit contribution by product, distribution channel, region, salesperson, or customer can provide additional insights.

CREDIT APPROVAL

Most business-to-business sales are made on credit. Therefore, another revenue cycle threat listed in Table 12-1 (threat 7) is the possibility of making sales that later turn out to be uncollectible. Requiring proper authorization for each credit sale diminishes this threat.

For existing customers with well-established payment histories, a formal credit check for each sale is usually unnecessary. Instead, management gives sales staff general authorization to approve orders from customers in good standing, meaning those without past-due balances, provided that such sales do not increase the customer's total account balance beyond their credit limit (control 7.1). A **credit limit** is the maximum allowable account balance that management wishes to allow for a customer based on that customer's past credit history and ability to pay. Thus, for existing customers, credit approval simply involves checking the customer master file to verify the account exists, identifying the customer's credit limit, and verifying that the amount of the order plus any current account balance does not exceed this limit. This can be done automatically by the system.

credit limit - The maximum allowable credit account balance for each customer, based on past credit history and ability to pay.

The system can also automatically flag orders that require specific authorization because they exceed a customer's preapproved credit limit. For such cases, and for sales to new customers, Table 12-1 shows that someone *other than the sales representative* should specifically approve extension of credit (control 7.2). This is especially important if the sales staff is paid on commission because their motivation is to make sales, not focus on collectability. The organization chart for AOE (see Figure 12-1) shows how most companies segregate these duties. The credit manager, who sets credit policies and approves the extension of credit to new customers

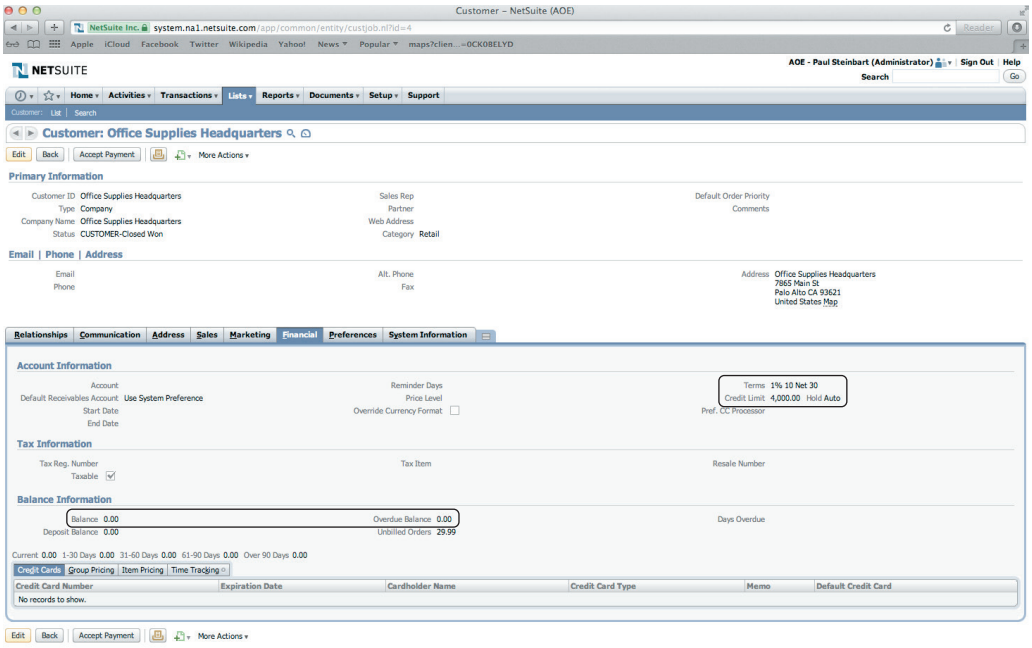

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FIGURE 12-7
Sample Inquiry Screen for Checking Customer Credit

and the raising of credit limits for existing customers, is independent of the marketing function. To enforce this segregation of duties in ERP systems, sales order entry clerks should be granted read-only access to information about individual customer credit limits; the ability to actually change credit limits should be granted only to the credit manager. Figure 12-7 shows some of the information the system makes available to help the credit manager decide whether to adjust a customer's credit limit. The quality of those decisions depends upon maintaining accurate and current information about account balances, sales, and customer remittances.

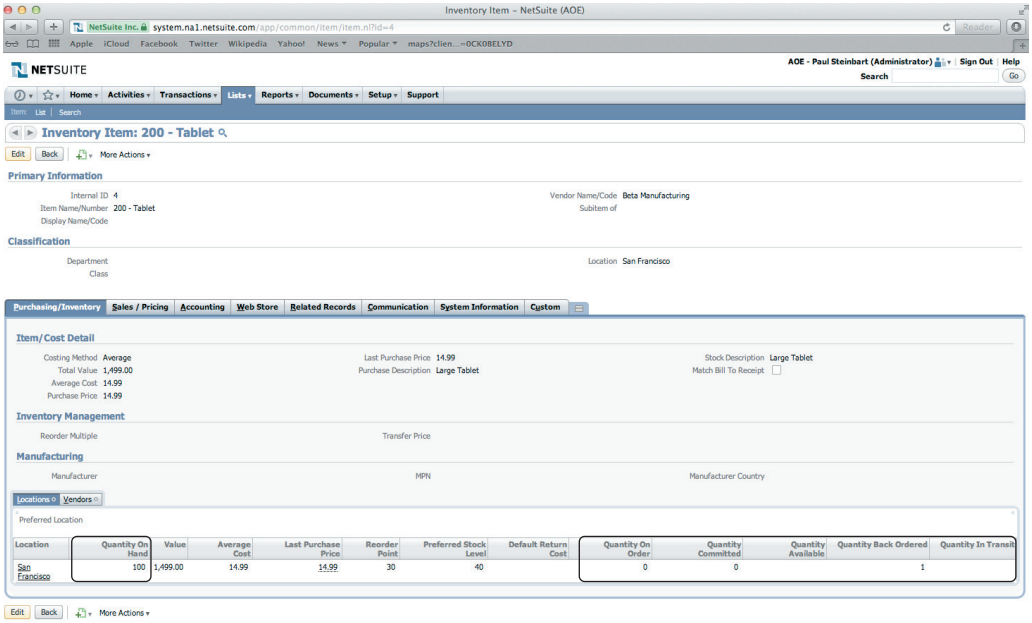
To be effective, credit approval must occur *before* the goods are released from inventory and shipped to the customer. Nevertheless, problems will occur, and some customers will end up not paying off their accounts. Therefore, careful monitoring of accounts receivable (control 7.3) is extremely important. A useful report for doing this is an **accounts receivable aging report**, which lists customer account balances by length of time outstanding (Figure 12-8). The information provided by such reports is useful for projecting the timing of future cash inflows related to sales, deciding whether to increase the credit limit for specific customers, and for estimating bad debts. Management needs to regularly review the accounts receivable aging report because prompt attention to customers who fall behind in

accounts receivable aging report - A report listing customer account balances by length of time outstanding.

Customer	Amount	Current	1–30 Days Past Due	31–60 Days Past Due	61–90 Days Past Due	Over 90 Days Past Due
Able						
Invoice 221	$3,450	$3,450				
Invoice 278	2,955	2,955				
Total	$6,405	$6,405				
Baker						
Invoice 178	$4,500			$4,500		
Invoice 245	2,560	2,560				
Total	$7,060	$2,560		$4,500		
Other Accounts	$185,435	$137,935	$28,500	$5,500	$2,500	$11,000
Totals	$198,900	$146,900	$28,500	$10,000	$2,500	$11,000

FIGURE 12-8
Example of an Accounts Receivable Aging Report

FIGURE 12-9
Sample Inquiry Screen for Checking Inventory Availability



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their payments can minimize losses. Such a report could have enabled AOE to spot problems with the Best Value Company earlier, so that it could have stopped making additional credit sales. In addition, reports that show trends in bad-debt expense can help management decide whether changes are needed in credit policies.

CHECKING INVENTORY AVAILABILITY

In addition to checking a customer's credit, salespeople also need to determine whether sufficient inventory is available to fill the order, so that customers can be informed of the expected delivery date.

PROCESS Figure 12-9 shows an example of the information typically available to the sales order staff: quantity on hand, quantity already committed to other customers, and quantity available. If sufficient inventory is available to fill the order, the sales order is completed, and the quantity-available field in the inventory file for each item ordered is reduced by the amount ordered. The shipping, inventory control, and billing departments are then notified of the sale, and an acknowledgment may be sent to the customer. If there is not sufficient inventory on hand to fill the order, a **back order** authorizing the purchase or production of those items must be created. In manufacturing companies, creating a back order involves notifying the production department to initiate the production of the requested items. In retail companies, the purchasing department would be notified about the need to order the required items.

back order - A document authorizing the purchase or production of items that is created when there is insufficient inventory to meet customer orders.

Once inventory availability has been determined, the system then generates a **picking ticket** that lists the items and quantities of each item that the customer ordered. The picking ticket authorizes the inventory control function to release merchandise to the shipping department. Although traditionally a paper document, picking tickets today are often electronic forms that may be displayed on portable handheld devices or on monitors built into forklifts. To improve efficiency, the picking ticket often lists the items by the sequence in which they are stored in the warehouse, rather than in the order listed on the sales order.

picking ticket - A document that lists the items and quantities ordered and authorizes the inventory control function to release that merchandise to the shipping department.

THREATS AND CONTROLS Accurate inventory records are important to prevent both stockouts and excess inventory (threat 8 in Table 12-1). Stockouts may result in lost sales if customers are not willing to wait and instead purchase from another source. Conversely, excess inventory increases carrying costs and may even require significant markdowns that reduce profitability. Frequent markdowns can change a company's image to that of a discount retailer, thereby conditioning customers to expect price cuts.

Integrated ERP systems, like the one depicted in Figure 12-4, facilitate the use of the perpetual inventory method (control 8.1), which reduces the risk of unexpected stockouts or excessive inventories. However, the accuracy of the perpetual inventory records requires careful data entry during performance of revenue cycle activities. In particular, shipping and sales clerks must correctly record the quantity of items removed from inventory and delivered to customers. This task is particularly error-prone in retail establishments. For example, when customers purchase multiple items with the same price, the checkout clerks may scan only one item and then enter the total quantity purchased. Although this will generate the correct total sales amount, it will introduce errors into the inventory records. The recorded quantity-on-hand for the one item that was physically scanned will be too low, and the recorded quantity-on-hand for the other varieties of that item will be too high. Proper handling of sales returns is another task that contributes to inaccurate inventory records, particularly in retail establishments. In clothing stores, for example, when a customer returns a wrong-sized item and exchanges it for another, the clerks should enter the exchange into the system. Often, especially during extremely busy sales periods, the clerks simply make the exchange and put the returned item back on the shelf but fail to make the proper entry in the system. Consequently, the system's records for both items are inaccurate.

Replacing bar codes with radio-frequency identification (RFID) tags (control 8.2 in Table 12-1) can eliminate many of these problems because the data entry occurs automatically. For situations where use of bar codes or RFID tags is uneconomical or not practical, training and regular reminders from management can reduce the frequency of the undesired behavior (control 8.3). Nevertheless, because the behaviors described above are likely to occur during particularly busy times, periodic physical counts of inventory (control 8.4) are necessary to verify the accuracy of recorded amounts. Figure 12-10 shows an example of a physical inventory worksheet. Notice that it lists each inventory item and the quantity that should be on hand, according to system records. It also includes a column to record the results of the physical count.

Sales forecasts (control 8.5 in Table 12-1) are another tool to help companies better predict inventory needs and thereby reduce the risk of stockouts or carrying excess inventory. Accountants can also prepare reports that enable sales managers to identify the need to adjust those forecasts. For example, reports about the frequency and size of back orders can identify items for which forecasts need to be adjusted to better avoid stockouts. Conversely, reports that break down sales by item can identify slow-moving products in time to prevent excessive stockpiling.

RESPONDING TO CUSTOMER INQUIRIES

Besides processing customer orders, as Figure 12-5 shows, the sales order entry process also includes responding to customer inquiries. Sometimes these inquiries precede an order, and often they occur after orders have been placed. In either case, responding to customer inquiries promptly and accurately is extremely important to a company's long-run success. The objective is to retain customers (threat 9 in Table 12-1). This is important because a

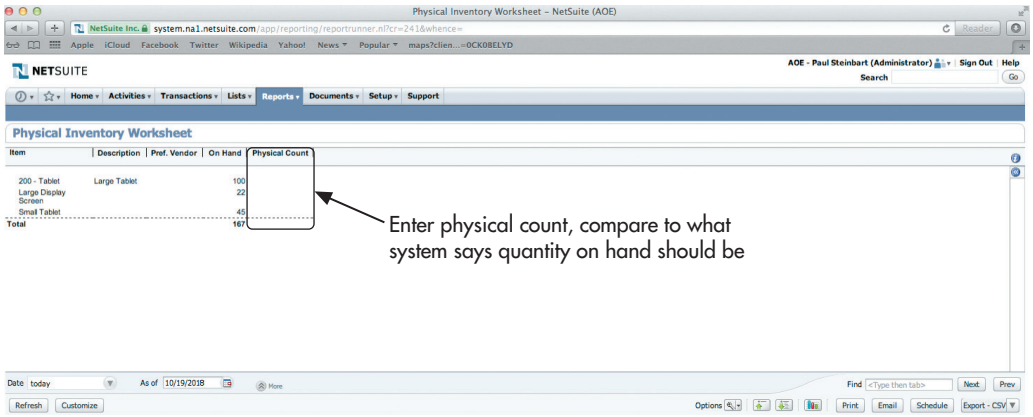


FIGURE 12-10
Example of Physical Inventory Worksheet

Source: 2010 © NetSuite Inc.

general marketing rule of thumb is that it costs at least five times as much to attract and make a sale to a new customer as it does to make a repeat sale to an existing customer. One way to monitor retention performance is to periodically produce a report that "ages" customers by the number of years they have made purchases. However, retention requires more than merely satisfying customers. It requires creating loyalty. Research indicates that if customer satisfaction is rated on a 1-to-5 scale, with 5 representing completely satisfied and 1 representing completely dissatisfied, customers who rated their satisfaction level at 5 were many times more likely to make repeat purchases than were customers who rated their satisfaction level only at 4. Moreover, that same research indicates that the key to generating total satisfaction, and thereby retaining customers, is the quality and nature of the post-sale customer contacts.

customer relationship management (CRM) systems - Software that organizes information about customers in a manner that facilitates efficient and personalized service.

Customer service is so important that many companies use special software packages, called **customer relationship management (CRM) systems**, to support this vital process (control 9.1). CRM systems help organize detailed information about customers to facilitate more efficient and more personalized service. Customer service can be further improved by using data such as cumulative sales over multiple time periods to identify "preferred" customers. CRM systems also help generate additional sales. For example, after responding to a customer inquiry, a customer service representative can use information about customer preferences and transaction history to suggest other products that may be of interest to the customer. Detailed data about customer requirements and business practices can also be used to proactively contact customers about the need to reorder.

Many customer inquiries are routine, however. Consequently, companies can and should use IT to automate the response to common requests, such as questions about account balances and order status, so that sales order and customer service representatives can concentrate their time and effort on handling the more complex, nonroutine inquiries. For example, websites provide a cost-effective alternative to traditional toll-free telephone customer support, automating that process with a list of frequently asked questions (FAQs). Advances in artificial intelligence techniques also make it possible to create automated advice-giving tools (called "chat bots") that parse customer input to provide canned responses to common questions when ordering. Additional social media tools such as blogs and discussion boards can also be used to create virtual communities where customers can share information and useful tips with one another. Websites also enable customers to use PINs to directly access their account information and to check on the status of orders. All of these techniques can significantly reduce customer service costs. Wells Fargo, for example, found that customers with online access to their accounts made 40% fewer calls to the customer service department than did customers without such access. It is impossible, however, to anticipate every question customers may ask. Therefore, websites designed to provide customer service should include an IM or chat feature to enable customers to obtain real-time expert assistance and advice for dealing with special issues the FAQ list does not satisfactorily address. Finally, it is important for accountants to design reports that will assist managers in *properly* evaluating the performance of customer service representatives by incorporating both internal and external measures. Failure to include both types of data can result in reports that cause dysfunctional behavior. For example, reports that use only internal data, such as number of inquiries handled per unit of time, may encourage customer service representatives to try to maximize their efficiency at the expense of satisfying customers. Conversely, relying solely on customer satisfaction ratings removes incentives to be efficient.

Shipping

The second basic activity in the revenue cycle (circle 2.0 in Figure 12-3) is filling customer orders and shipping the desired merchandise. As Figure 12-11 shows, this process consists of two steps: (1) picking and packing the order and (2) shipping the order. The warehouse and shipping departments perform these activities, respectively. Both functions include custody of inventory and, as shown in Figure 12-1, report ultimately to the vice president of manufacturing.

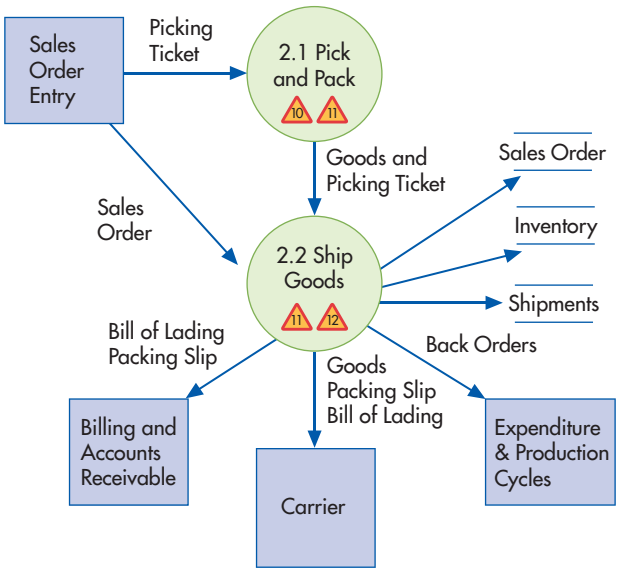


FIGURE 12-11
Level 1 Data Flow Diagram: Shipping (annotated to include threats)

PICK AND PACK THE ORDER

The first step in filling a customer order involves removing the correct items from inventory and packaging them for delivery.

PROCESS The picking ticket generated by the sales order entry process triggers the pick and pack process. Warehouse workers use the picking ticket to identify which products, and the quantity of each product, to remove from inventory. Warehouse workers record the quantities of each item actually picked, either on the picking ticket itself (if a paper document is used) or by entering the data into the system (if electronic forms are used). The inventory is then transferred to the shipping department.

AOE, like many companies, has made significant investments in automated warehouse systems consisting of computers, bar-code scanners, conveyer belts, and communications technology. The goal of such investments is to reduce the time and cost of moving inventory into and out of the warehouse while also improving the accuracy of perpetual inventory systems. Wireless technology, in particular, increases warehouse productivity by eliminating the need for workers to repeatedly return to a centralized dispatch center to receive printed instructions. For example, JCPenney equips its forklifts with radio-frequency data communication (RFDC) terminals to provide drivers with information about which items to pick next and where they are located. At Corporate Express, an office supplies distributor in Broomfield, Colorado, warehouse workers wear headsets and listen to computer-synthesized voice instructions about what items to pick and package for delivery. The company reports that the oral instructions result in fewer mistakes than occur when drivers try to read a small terminal screen in dim light. Focus 12-2 explains how some companies use robots to totally automate order picking.

RFID tags improve the efficiency and accuracy of tracking inventory movement. With bar codes, the item or box must be positioned properly so that the bar code can be read by the scanner. Switching to an RFID tag eliminates this need to align items with scanners; instead, the tags can be read as the inventory moves throughout the warehouse. In addition, each RFID tag can store detailed information to facilitate proper storage and routing of the inventory item. For companies that handle large volumes of merchandise, such as Federal Express and UPS, RFID's ability to reduce by even a few seconds the time it takes to process each package can yield enormous cost savings.

Automated warehouse systems not only cut costs and improve efficiency in handling inventory but also can allow for more customer-responsive shipments. For example, manufacturers can use bar-code and RFID systems in their warehouses to facilitate packing and shipping related items (e.g., matching shirts and ties) together. The cartons can then be either

FOCUS 12-2 Using Robots to Increase Efficiency and Effectiveness in the Warehouse

Companies such as Amazon.com, Crate & Barrel, Dillard's, the Gap, and Walgreens are using robots to dramatically improve the efficiency and effectiveness of their warehouse operations. Whereas in most warehouses workers must roam the warehouse (either on foot or on fork lifts) to pick inventory ordered by customers, workers in warehouses that use Kiva Systems' battery-powered robots remain at stations around the perimeter of the room. The orange-colored robots use a combination of optical scanning technology, bar codes, and wireless communications to locate items. Inventory is stored on movable shelving units, called pods, which the robots can go under and "lift." The robots then bring the pods to the worker, who removes the desired quantity of items from the shelves and then packs the items in boxes to be shipped to customers. Eliminating the need for workers to travel around the warehouse often results in one worker being able to pack up to three times as many orders in a given time period. By having the same worker fill an entire order, the system also reduces the opportunity for errors that can occur when several different workers sequentially fill portions of an order.

bar-coded or RFID-tagged so that retailers can quickly check in the merchandise and move it to the selling floor. These services not only save retailers time and money but also help improve turnover, thereby increasing the manufacturer's sales.

THREATS AND CONTROLS One potential problem is the risk of picking the wrong items or in the wrong quantity (threat 10 in Table 12-1). The automated warehousing technologies described earlier can minimize the chance of such errors. Bar-code and RFID scanners (control 10.1), in particular, virtually eliminate errors when they are used by the system to automatically compare the items and quantities picked by warehouse workers with the information on sales orders (control 10.2).

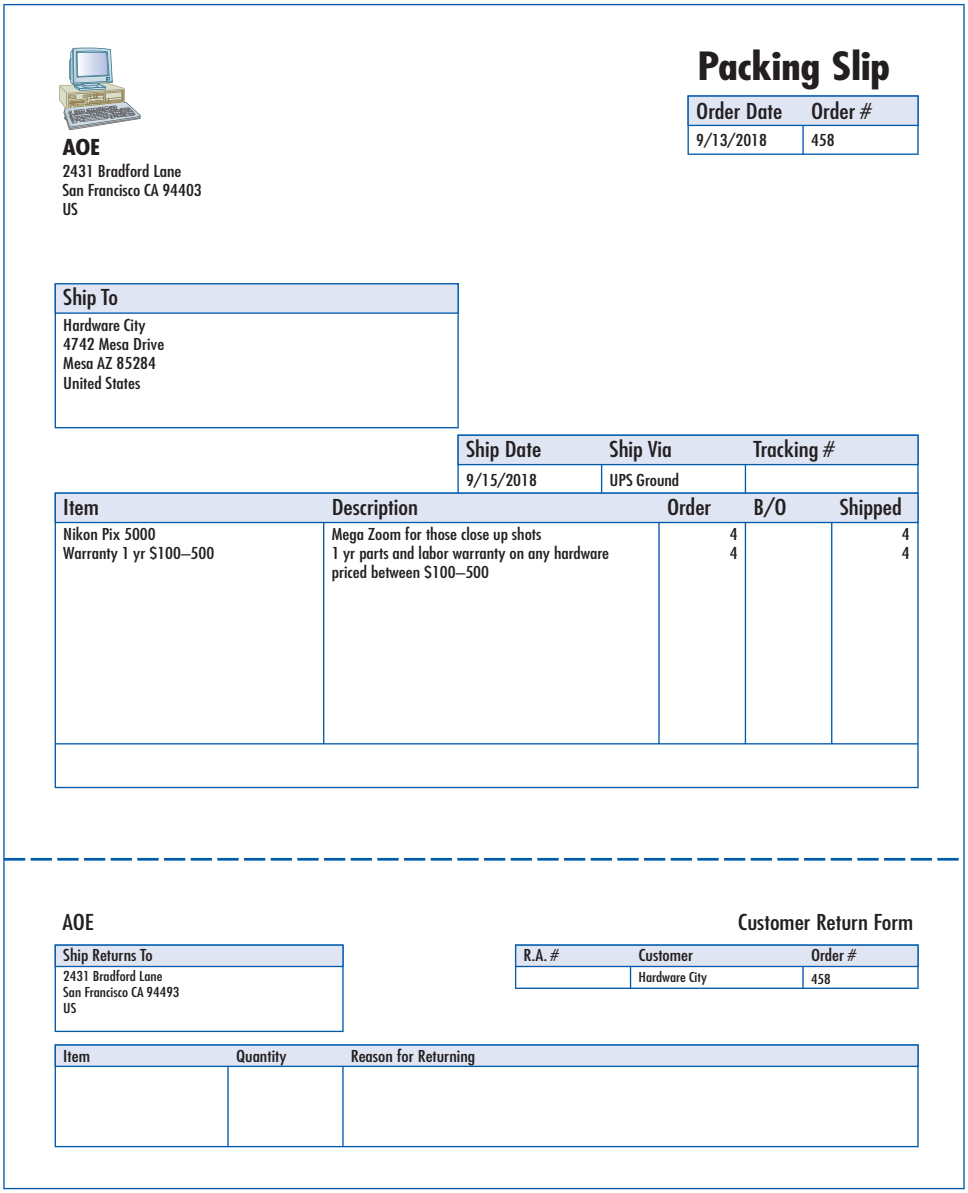
Another threat involves the theft of inventory (threat 11). In addition to a loss of assets, theft also makes inventory records inaccurate, which can lead to problems in filling customer orders. Table 12-1 lists several control procedures that can reduce the risk of inventory theft. First, inventory should be kept in a secure location to which physical access is restricted (control 11.1). Second, all inventory transfers within the company should be documented (control 11.2). Inventory should be released to shipping employees based only on approved sales orders. Both warehouse and shipping employees should sign the document accompanying the goods (or make the appropriate acknowledgment of the transfer online) at the time the goods are transferred from inventory to shipping. This procedure facilitates tracking the cause of any inventory shortages, and the accountability provided encourages employees to prepare and maintain accurate records. The use of wireless communications technologies and RFID tags (control 11.3) can provide real-time tracking of inventory in transit, which may help reduce theft. Finally, recorded amounts of inventory should be periodically reconciled with physical counts of inventory on hand (control 11.4), and the employees responsible for inventory custody should be held accountable for any shortages.

As with the other steps in the revenue cycle, accountants can help managers better monitor performance by designing useful reports. Note that the order-picking process does not involve any direct interaction with customers. Therefore, reports using only internally generated measures such as orders filled per unit of time are sufficient.

SHIP THE ORDER

After the merchandise has been removed from the warehouse, it is shipped to the customer.

PROCESS The shipping department should compare the physical count of inventory with the quantities indicated on the picking ticket and with the quantities indicated on the sales order. Discrepancies can arise either because the items were not stored in the location indicated on the picking ticket or because the perpetual inventory records were inaccurate. In such cases,



Packing Slip

Order Date	Order #
9/13/2018	458

AOE
2431 Bradford Lane
San Francisco CA 94403
US

Ship To
Hardware City 4742 Mesa Drive Mesa AZ 85284 United States

Ship Date	Ship Via	Tracking #
9/15/2018	UPS Ground	

Item	Description	Order	B/O	Shipped
Nikon Pix 5000 Warranty 1 yr $100–500	Mega Zoom for those close up shots 1 yr parts and labor warranty on any hardware priced between $100–500	4 4		4 4

AOE

Customer Return Form

Ship Returns To
2431 Bradford Lane San Francisco CA 94493 US

R.A. #	Customer	Order #
	Hardware City	458

Item	Quantity	Reason for Returning

FIGURE 12-12
Example of a Packing Slip

the shipping department needs to initiate the back ordering of the missing items and enter the correct quantities shipped on the packing slip.

After the shipping clerk counts the goods delivered from the warehouse, the sales order number, item number(s), and quantities are entered using online terminals. This process updates the quantity-on-hand field in the inventory master file. It also produces a packing slip and multiple copies of the bill of lading. The **packing slip** (see Figure 12-12) lists the quantity and description of each item included in the shipment. The **bill of lading** is a legal contract that defines responsibility for the goods in transit. It identifies the carrier, source, destination, and any special shipping instructions, and it indicates who (customer or vendor) must pay the carrier (see Figure 12-13). A copy of the bill of lading and the packing slip accompany the shipment. If the customer is to pay the shipping charges, this copy of the bill of lading may serve as a *freight bill*, to indicate the amount the customer should pay to the carrier. In other cases, the freight bill is a separate document.

packing slip - A document listing the quantity and description of each item included in a shipment.

bill of lading - A legal contract that defines responsibility for goods while they are in transit.

One important decision that needs to be made when filling and shipping customer orders concerns the choice of delivery method. Traditionally, many companies have maintained their own truck fleets for deliveries. Increasingly, however, manufacturers are outsourcing this function to commercial carriers such as DHL, Federal Express, Ryder System, Inc., Schneider Logistics, UPS, and YRC. Outsourcing deliveries reduces costs and allows manufacturers to

FIGURE 12-13
Sample Bill of Lading

STRAIGHT BILL OF LADING — SHORT FORM **Not Negotiable.**

Shipper's No.

Carrier **Carrier's No.**

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading.

at _____ **20**____ **from** _____

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in any or all of said property, that every service to be performed hereunder shall be subject to all terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Uniform Freight Classification in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to _____

(Mail or street address of consignee — For purposes of notification only.)

Destination _____ State _____ Zip Code _____ County _____

Delivery Address ★ _____

(★ To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Route _____

Delivering Carrier Car or Vehicle Initials No.

No. Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Sub. to Cor.)	Class or Rate	Check Column

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement.

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of Consignor.)

If charges are to be prepaid, write or stamp here, "To Be Prepaid."

*If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight."

NOTE — Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

per

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____

amount prepaid

Charges advanced:
$

†"The fiber boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Uniform Freight Classification."

†Shipper's imprint in lieu of stamp; not a part of bill of lading approved by the Interstate Commerce Commission.

_____ Shipper, per _____ Agent, Per _____

Permanent post office address of shipper, _____ _____ _____

concentrate on their core business activity (the production of goods). Selecting the proper carrier, however, requires collecting and monitoring information about carrier performance (e.g., percentage of on-time deliveries and damage claims) because customers will blame the company, not the carrier, for delivery problems.

Another important decision concerns the location of distribution centers. Increasingly, many customers are asking suppliers and manufacturers to deliver products only when needed. Consequently, suppliers and manufacturers must use logistics software tools to identify the optimal locations to store inventory in order to minimize the total amount of inventory carried and to meet each customer's delivery requirements. Logistics software also helps optimize daily activities, such as how to most efficiently use 17 available trucks to make 300 deliveries to various locations in one metropolitan area.

Globalization adds further complexity to outbound logistics. The efficiency and effectiveness of different distribution methods, such as trucking or rail, differ around the world. Taxes and regulations in various countries can also affect distribution choices. Therefore, an organization's information system must include logistics software that can maximize the efficiency and effectiveness of its shipping function.

THREATS AND CONTROLS Table 12-1 indicates that two potential problems are theft (threat 11) and shipping errors (threat 12). We discussed the various controls to reduce the threat of theft in the prior section. Regular reconciliation of information about shipments with sales orders (control 12.1) enables timely detection of delay or failure to ship goods to customers. In addition, RFID systems (control 12.2) can provide real-time information on shipping status and thus provide additional information about possible delays. If the seller learns that a shipment is going to be late, prompt notification can help the customer revise its plans accordingly. The cost of providing such notifications is minimal, especially if done via e-mail or IM, but the effort is likely to significantly improve customer satisfaction and loyalty.

Shipping the wrong items or quantities of merchandise and shipping to the wrong location can cause customer dissatisfaction, resulting in the loss of future sales. Shipping errors may also result in the loss of assets if customers do not pay for goods erroneously shipped. To minimize the risk of shipping errors, ERP systems like the one depicted in Figure 12-4 should be configured to compare the quantities and item numbers entered by shipping employees to the information on the sales order and to display a warning about any discrepancies so that the problem can be corrected prior to shipment. Of course, the effectiveness of this control depends upon the accuracy of the information collected about outgoing shipments. To reduce data entry errors by shipping employees, bar codes and RFID tags should be used whenever possible (control 12.3). If shipping data must be entered manually at a terminal, data entry controls such as field checks, limit or range checks, and completeness tests are necessary (control 12.4).

Duplicate shipments result in increased costs associated with shipping and then processing the return of merchandise. To mitigate this threat, ERP systems should be configured to "block" the line items on sales orders once shipping documents are printed (control 12.5) to prevent using that same sales order to authorize another shipment of the same goods to the same customer. Companies that still use paper documents can reduce the risk of duplicate shipments by sequentially prenumbering all shipping documents, requiring that they be matched with the supporting sales order and picking ticket, and then marking those documents in a manner that prevents their reuse.

Billing

The third basic activity in the revenue cycle (circle 3.0 in Figure 12-3) involves billing customers. Figure 12-14 shows that this involves two separate, but closely related, tasks: invoicing and updating accounts receivable, which are performed by two separate units within the accounting department.

INVOICING

Accurate and timely billing for shipped merchandise is crucial. The invoicing activity is just an information processing activity that repackages and summarizes information from the sales order entry and shipping activities. It requires information from the shipping department identifying the items and quantities shipped and information about prices and any special sales terms from the sales department.

PROCESS The basic document created in the billing process is the **sales invoice** (Figure 12-15), which notifies customers of the amount to be paid and where to send payment. Like many companies, AOE still prints paper invoices that it mails to many of its smaller customers. Larger customers, however, receive invoices via EDI. EDI not only eliminates printing and

sales invoice - A document notifying customers of the amount of a sale and where to send payment.

FIGURE 12-14
Level 1 Data Flow Diagram: Billing Process (annotated to include threats)

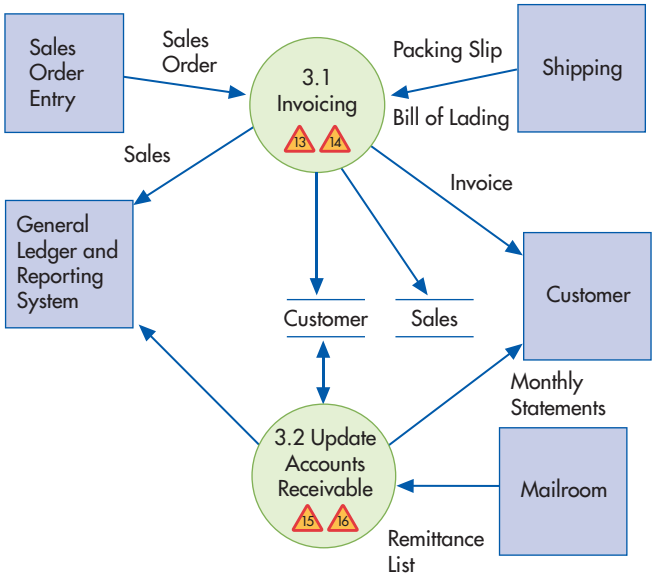


FIGURE 12-15
Example of a Sales Invoice

AOE
2431 Bradford Lane
San Francisco, CA
99403

Invoice

Date	Invoice #
9/16/2018	3091380

Bill To	Ship To
Hardware City 35 Appliance Way Phoenix AZ 85201 United States	Hardware City 4742 Mesa Drive Mesa AZ 85284 United States

Terms	Due Date	PO #	Sales Rep	Ship Via	Tracking Numbers
Net 30	10/16/2018		JKL	UPS Ground	

Item	Qty	Description	Price	Amount
Nikon Pix 5000	4	Mega Zoom for those close up shots	200.00	800.00
Warranty 1 yr $100–500	4	1 yr parts and labor warranty on any hardware priced between $100–500	19.95	79.80

Subtotal	879.80
Shipping Cost (UPS Ground)	30.04
Total	$909.84

postage costs, but also the labor involved in performing those tasks. For companies that generate hundreds of thousands of sales invoices annually, saving even a few seconds per invoice can yield significant cost reductions. EDI invoices and online bill payment also benefit customers by reducing their time and costs, which should increase both satisfaction and loyalty.

In fact, a well-designed accounting system can entirely eliminate the need to create and store invoices, at least with customers that have sophisticated systems of their own. To understand this concept, reexamine the information included in a typical sales invoice (see Figure 12-15). The invoice indicates the quantity of each item sold and the price charged for that item; but the price is usually set at the time the order is placed, and the actual quantity sold is known at the time the merchandise is shipped to the customer. Thus, the selling company's accounting system already contains all the information needed to calculate the amount of the sale at the time the goods are shipped. Indeed, invoices are often printed in a batch process without any manual data entry. Conversely, the buyer knows the price at the time the order is placed and knows the quantity purchased when the goods are received. Consequently, if both companies have accurate transaction processing systems, it may be possible to establish an agreement in which the buyer will automatically remit payments within a specified number of days after receiving the merchandise. The seller sends an electronic notification, usually via e-mail, when the goods are shipped and the customer sends an electronic acknowledgment when the goods are received. Ford is just one of many companies that have established such relationships with their major suppliers. Note that the seller can still monitor and determine accounts receivable by reconciling shipments to customer remittances because accounts receivable represents all shipments for which the seller has not yet been paid. The attraction of such invoiceless billing is that it saves both the seller and buyer considerable amounts of time and money by eliminating the need to perform a traditional business process (invoicing) that does not provide any new information.

An integrated ERP system also provides the opportunity to merge the billing process with the sales and marketing function by using data about a customer's past purchase history to send information about related products and services. Such customized advertising may generate additional sales with little if any incremental costs.

THREATS AND CONTROLS One threat associated with the invoicing process is a failure to bill customers (threat 13 in Table 12-1), which results in the loss of assets and erroneous data about sales, inventory, and accounts receivable. Segregating the shipping and billing functions (control 13.1) reduces the risk that this occurs intentionally. Otherwise, an employee performing both functions could ship merchandise to friends without billing them. To reduce the risk of unintentional failure to bill, ERP systems need to be configured to regularly compare sales orders, picking tickets, and shipping documents with sales invoices to produce reports of shipments for which an invoice has not been created (control 13.2). (For invoiceless systems, this control involves matching sales orders to shipping documents.) Management needs to regularly review such reports and take corrective action. In paper-based systems, prenumbering all documents and periodically accounting for them identifies shipments that have not been invoiced.

Billing errors (threat 14 in Table 12-1), such as pricing mistakes and billing customers for items not shipped or on back order, represent another potential threat. Overbilling can result in customer dissatisfaction, and underbilling results in the loss of assets. Incorrect calculation of sales taxes can result in fines and penalties. Pricing mistakes can be avoided by having the system retrieve the appropriate data from the pricing master file (control 14.1) and by restricting the ability of employees to make changes to that data (control 14.2). If employees must enter billing data manually, the use of the data entry edit controls discussed in Chapter 10 can minimize errors (control 14.3). Mistakes involving quantities shipped can be caught by reconciling the quantities listed on the packing slips with those on the sales order (control 14.4).

MAINTAIN ACCOUNTS RECEIVABLE

open-invoice method - Method for maintaining accounts receivable in which customers typically pay according to each invoice.

The accounts receivable function, which reports to the controller, performs two basic tasks: It uses the information on the sales invoice to debit customer accounts and subsequently credits those accounts when payments are received.

FIGURE 12-16
Example of a Monthly Statement

MONTHLY STATEMENT March 2018
Alpha Omega Electronics
2431 Bradford Lane
San Francisco, CA 99403

Hardware City
35 Appliance Way
Phoenix, AZ 85201

Invoice Number	Date	Current	Past Due 1–30	Past Due 31–60	Past Due 61–90	Past Due Over 90
34567	3/20/2018	4292.50				
34591	3/27/2018	2346.50				
	Totals	6639.00				
				Total Amount Due	6639.00	

Please detach here and return with remittance

Bill date 03/31/2018
Account number 73256
Payment due 04/10/2018
Total amount due 6639.00
Amount enclosed

Pay To: AOE
PO Box 7341
San Francisco, CA 99403-7341

PROCESS The two basic ways to maintain accounts receivable are the open-invoice and the balance-forward methods. The two methods differ in terms of when customers remit payments, how those payments are applied to update the accounts receivable master file, and the format of the monthly statement sent to customers. Under the **open-invoice method**, customers typically pay according to each invoice. Usually, two copies of the invoice are mailed to the customer, who is requested to return one copy with the payment. This copy is a turnaround document called a **remittance advice**. Customer payments are then applied against specific invoices. In contrast, under the **balance-forward method**, customers typically pay according to the amount shown on a monthly statement, rather than by individual invoices. The **monthly statement** lists all transactions, including both sales and payments, that occurred during the past month and informs customers of their current account balances (Figure 12-16). The monthly statement often has a tear-off portion containing preprinted information, including the customer's name, account number, and balance. Customers are asked to return this stub, which serves as a remittance advice, with payment. Remittances are applied against the total account balance, rather than against specific invoices.

remittance advice - A copy of the sales invoice returned with a customer's payment that indicates the invoices, statements, or other items being paid.

balance-forward method - Method of maintaining accounts receivable in which customers typically pay according to the amount shown on a monthly statement, rather than by individual invoices. Remittances are applied against the total account balance, rather than specific invoices.

monthly statement - A document listing all transactions that occurred during the past month and informing customers of their current account balance.

One advantage of the open-invoice method is that it is conducive to offering discounts for prompt payment, as invoices are individually tracked and aged. It also results in a more uniform flow of cash collections throughout the month. A disadvantage of the open-invoice method is the added complexity required to maintain information about the status of each individual invoice for each customer. Consequently, the open-invoice method is typically used by business whose customers are primarily other businesses, because the number of individual transactions is relatively small and the dollar value of those transactions is high. Companies with large numbers of customers who make many small purchases each month, such as utility companies, credit card issuers (e.g., Citibank), or national retail chains (e.g., Sears and JCPenney), typically use the balance-forward method. For them, this method

is more efficient and reduces costs by avoiding the need to process cash collections for each individual sale. It is also more convenient for the customer to make one monthly remittance.

Many companies that use the balance-forward method use a process called cycle billing to prepare and mail monthly statements to their customers. Under **cycle billing**, monthly statements are prepared for subsets of customers at different times. For example, the customer master file might be divided into four parts, and each week monthly statements would be prepared for one-fourth of the customers. Cycle billing produces a more uniform flow of cash collections throughout the month and reduces the time that the computer system is dedicated to printing monthly statements. Cycle billing can significantly affect processing requirements. Consider the case of a utility company serving several million customers in a large metropolitan area. If it prepared monthly statements for all its customers at the same time, even if it took only 1 second to print out each one, its printers would be tied up for several days.

cycle billing - Producing monthly statements for subsets of customers at different times.

Image processing technology can further improve the efficiency and effectiveness of managing customer accounts. The digital images of customer remittances and invoices can be stored electronically and then be easily retrieved, manipulated, and integrated with other images and data to produce various types of output. Doing so provides employees fast access to all documents relating to a customer and eliminates the time wasted searching through file cabinets for lost paperwork. If a customer needs a duplicate copy of a monthly statement or an invoice to replace a lost original, it can be retrieved, printed, and faxed while the employee is talking to the customer on the phone. Image processing also can facilitate resolving customer complaints, because the same image can be viewed simultaneously by more than one person. Thus, a customer account representative and a credit manager could both review an image of a document in question while discussing the problem with the customer on the telephone. Image processing also reduces the space and cost associated with storing paper documents. The savings in this area can be substantial: One optical disk can store thousands of documents, in a fraction of the space.

Adjustments to a customer's account are sometimes necessary. For example, customer accounts may be credited to reflect either the return of items or allowances granted for damaged goods. To credit a customer's account for returned goods, the credit manager must obtain information from the receiving dock that the goods were actually returned and placed back in inventory. Upon notification from the receiving department that the goods have been returned, the credit manager issues a **credit memo** (Figure 12-17), which authorizes the crediting of the customer's account. If the damage to the goods is minimal, the customer may agree to keep them for a price reduction. In such cases, the credit manager issues a credit memo to reflect the amount that should be credited to the customer's account. A copy of the credit memo is sent to accounts receivable to authorize an adjustment to the customer's account balance; another copy is sent to the customer.

credit memo - A document, approved by the credit manager, authorizing the billing department to credit a customer's account.

After repeated attempts to collect payment have failed, it may be necessary to write off a customer's account. In such cases, the credit manager issues a credit memo to authorize the write-off. Unlike the cases involving damaged or returned goods, however, a copy of the credit memo used to authorize the write-off of an account is not sent to the customer.

THREATS AND CONTROLS Errors in maintaining customer accounts (threat 15 in Table 12-1) can lead to the loss of future sales and also may indicate possible theft of cash. The data entry edit checks discussed in Chapter 10 can minimize the risk of errors in maintaining customer accounts (control 15.1). For example, validity checks and closed-loop verification can ensure that the correct customer account is being updated, and field checks can ensure that only numeric data is entered for sales and payments. Customer payments are often processed in batches, so batch totals (control 15.2) can provide an additional means to detect posting errors. Specifically, the sum of all customer payments processed should equal the change to the total of all customer account balances. To ensure that all remittances were processed, the number of customer accounts updated should be compared with the number of checks received. These reconciliations should be performed by someone other than the individual involved in processing the original transactions because (1) it is easier to catch someone else's mistakes than

FIGURE 12-17
Example of a Credit Memo

11121

CREDIT MEMORANDUM

Alpha Omega Electronics
2431 Bradford Lane
San Francisco, CA 99403

Credit To: Hardware City
35 Appliance Way
Phoenix, AZ 85201

Date April 7, 2018

Salesperson FRM

Apply To Invoice Number	Date	Customer's Order No.
34603	April 1, 2018	7413

Quantity	Item Number	Description	Unit Price	Amount
3	4120	PCS	85.00	255 00

Reason Credit Issued: Units damaged during shipment.
Returned on April 6, 2018

Received By: ALZ

Authorized By: PJS

We Credit Your Account For This Amount 255 00

one's own, and (2) it provides a means to identify possible cases of fraud. Mailing monthly account statements to every customer (control 15.3) provides an additional independent review of posting accuracy because customers will complain if their accounts have not been properly credited for payments they remitted. In legacy systems, another important control to verify the accuracy of updates to accounts receivable involved reconciling the subsidiary accounts receivable records with the general ledger (control 15.4). After customer payments are processed, the sum of all individual customer account balances (the accounts receivable subsidiary file) should equal the total balance of the accounts receivable control account in the general ledger. If the two are not equal, an error in posting has probably occurred, and all transactions just entered should be reexamined. In ERP systems, however, postings to general ledger control accounts can occur only through the subsidiary ledger and are only made by the system itself. Although this eliminates the possibility of discrepancies between the subsidiary and general ledger arising from data entry errors, configuration errors may sometimes allow errors to occur.

Threat 16 listed in Table 12-1 is that an employee may issue credit memos to write-off account balances for friends or to cover up the theft of cash or inventory. Proper segregation of duties (control 16.1) can reduce the risk of this threat. To prevent employees making sales to friends that are then written off, the ERP system should be configured so that the person who can issue credit memos does not also have rights to enter sales orders or to maintain customer accounts. The system should also be configured to match all credit memos to sales invoices. In addition, the system should be configured to block credit memos for which there does not exist validated documentation that the goods have been returned by the customer (control 16.2). Blocking forces specific managerial review and approval of cases where the company agrees to let the customer both keep the merchandise and receive credit.

Cash Collections

The final step in the revenue cycle is collecting and processing payments from customers (circle 4.0 in Figure 12-3).

PROCESS

Because cash and customer checks can be stolen so easily, it is important to take appropriate measures to reduce the risk of theft. As discussed more fully in the section on controls, this means that the accounts receivable function, which is responsible for recording customer remittances, should not have physical access to cash or checks. Instead, the cashier, who reports to the treasurer (see Figure 12-1), handles customer remittances and deposits them in the bank.

How then, does the accounts receivable function identify the source of any remittances and the applicable invoices that should be credited? One method involves mailing the customer two copies of the invoice and requesting that one be returned with the payment. This remittance advice is then routed to accounts receivable, and the actual customer payment is sent to the cashier. An alternative solution is to have mailroom personnel prepare a **remittance list**, which is a document identifying the names and amounts of all customer remittances, and send it to accounts receivable. Yet another alternative is to photocopy all customer remittances and send the copies to accounts receivable while forwarding the actual remittances to the cashier for deposit.

remittance list - A document listing names and amounts of all customer payments received in the mail.

Managing cash flow is important to overall profitability, as the AOE case showed. Therefore, companies are continually seeking ways to speed up the receipt of payments from customers. One way to do this when customers send payments directly to the company is to use Remote Deposit Capture software to scan customer checks and then transmit an encrypted digital file to the bank. Doing so eliminates the time and cost associated with going to the bank to make a physical deposit.

Another way to speed up the processing of customer payments involves the use of a lockbox arrangement with a bank. A **lockbox** is a postal address to which customers send their remittances. The participating bank picks up the checks from the Post Office box and deposits them in the company's account. The bank then sends the remittance advices, an electronic list of all remittances, and photocopies of all checks to the company. Having customers send payments to a lockbox eliminates the delay associated with processing customer remittances before depositing them. Cash flow can be further improved by selecting several banks around the country to maintain lockboxes, with the locations chosen to minimize the time customer checks are in the mail. Similarly, establishing lockbox arrangements with foreign banks reduces the time it takes to collect payments from sales to international customers.

lockbox - A postal address to which customers send their remittances.

Information technology can provide additional efficiencies in the use of lockboxes. In an **electronic lockbox** arrangement, the bank electronically sends the company information about the customer account number and the amount remitted as soon as it receives and scans those checks. This method enables the company to begin applying remittances to customer accounts before the photocopies of the checks arrive.

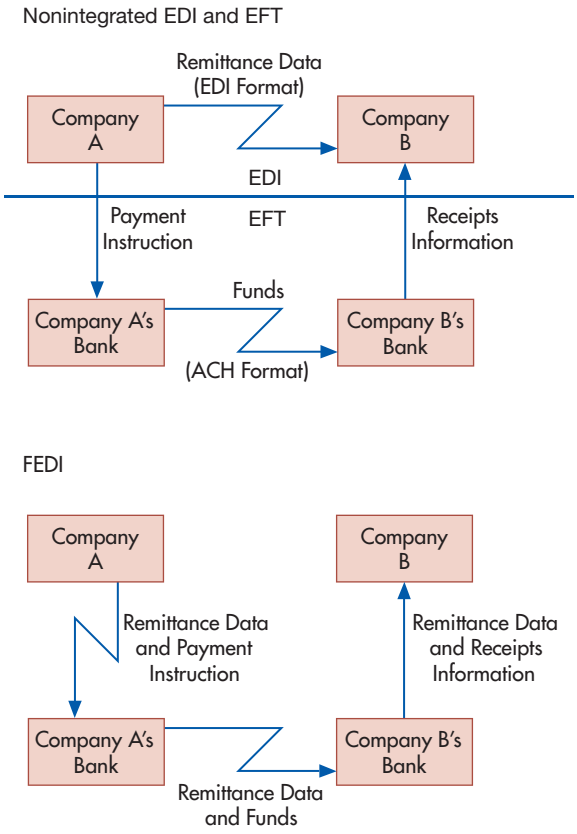
electronic lockbox - A lockbox arrangement (see *lockbox*) in which the bank electronically sends the company information about the customer account number and the amount remitted as soon as it receives payments.

Lockbox arrangements, however, eliminate only those delays that are associated with internal processing of remittances mailed directly to the company. With **electronic funds transfer (EFT)**, customers send their remittances electronically to the company's bank and thus eliminate the delay associated with the time the payment is in the mail system. EFT also reduces the time lag before the bank makes the deposited funds available to the company. EFT is usually accomplished through the banking system's Automated Clearing House (ACH) network.

electronic funds transfer (EFT) - The transfer of funds through use of online banking software.

EFT, however, involves only the transfer of funds. To properly credit customer accounts, companies also need additional data about each remittance, such as invoice numbers and discounts taken. Although every bank can do EFT through the ACH system, not every bank possesses the EDI capabilities necessary to process the related remittance data. Consequently, many companies have had to separate the EFT and EDI components of processing customer payments, as shown in the top panel of Figure 12-18. This complicates the selling company's task of properly crediting customer accounts for payments because information about the total

FIGURE 12-18
EFT and FEDI



amount of funds received arrives separately from information about the invoices that payment should be applied against. Similarly, the customer's task is complicated by the need to send information about the payment to two different parties.

financial electronic data interchange (FEDI) - The combination of EFT and EDI that enables both remittance data and funds transfer instructions to be included in one electronic package.

Financial electronic data interchange (FEDI) solves these problems by integrating the exchange of funds (EFT) with the exchange of the remittance data (EDI). As shown in the lower panel of Figure 12-18, the customer sends both remittance data and funds transfer instructions together. Similarly, the seller receives both pieces of information simultaneously. Thus, FEDI completes the automation of both the billing and cash collections processes. To fully reap the benefits of FEDI, however, requires that both the selling company and its customers use banks that are capable of providing EDI services.

Companies can also speed the collection process by accepting credit cards or procurement cards (a special type of credit card that will be discussed in Chapter 13). The benefit is that the card issuer usually transfers the funds within two days of the sale. This benefit must be weighed against the costs of accepting such cards, which typically range from 2% to 4% of the gross sales price.

THREATS AND CONTROLS

The primary objective of the cash collections function is to safeguard customer remittances. Special control procedures must be utilized because cash is so easy to steal (threat 17 in Table 12-1). Segregation of duties is the most effective control procedure for reducing the risk of such theft (control 17.1). Employees who have physical access to cash should not have responsibility for recording or authorizing any transactions involving its receipt. Specifically, the following pairs of duties should be segregated:

1. ***Handling cash or checks and posting remittances to customer accounts.*** A person performing both of these duties could commit the special type of embezzlement called *lapping* that was discussed in Chapter 5. Therefore, only the remittance data should be sent

to the accounts receivable department, with customer payments being sent to the cashier. Such an arrangement establishes two mutually independent control checks. First, the total credits to accounts receivable recorded by the accounting department should equal the total debit to cash representing the amount deposited by the cashier. Second, the copy of the remittance list that is sent to the internal audit department can be compared with the validated deposit slips and bank statements to verify that all checks the organization received were deposited. Finally, the monthly statements mailed to customers provide another layer of control, because customers would notice the failure to properly credit their accounts for payments remitted.

2. ***Handling cash or checks and authorizing credit memos.*** A person performing both of these duties could conceal theft of cash by creating a credit memo equal to the amount stolen.
3. ***Handling cash or checks and reconciling the bank statement.*** An important detective control is reconciliation of the bank account statement with the balance of cash recorded in the company's information system. Having this reconciliation performed by someone who does not have access to cash or customer remittances provides an independent check on the cashier and prevents manipulation of the bank statement to conceal the theft of cash.

In ERP systems, employee roles must be properly configured to segregate these combinations of incompatible duties. In addition, the system should be configured to require specific approval by an appropriate manager of high-risk transactions, such as issuing credit memos without requiring the customer to return the merchandise.

In general, the handling of money and checks within the organization should be minimized. The optimal methods are a bank lockbox arrangement or the use of EFT, FEDI, or credit cards for customer payments (control 17.2), which totally eliminates employee access to customer payments. When customers pay via EFT or FEDI, sellers should obtain a **universal payment identification code (UPIC)** from their bank (control 17.3). The UPIC is a number that enables customers to remit payments via an ACH credit without requiring the seller to divulge detailed information about its bank account. The costs of these arrangements must be weighed against the benefits of reduced internal processing costs and faster access to customer payments. If customer payments must be processed internally, prompt documentation of remittances is crucial, because the risk of loss is greatest at the time of first receipt. Therefore, a list of all checks received should be prepared *immediately* after opening the mail (control 17.4). The checks should also be restrictively endorsed at that time (control 17.5). To further minimize the risk of misappropriating any cash or checks received, two people should open all incoming mail (control 17.6).

universal payment identification code (UPIC) - A number that enables customers to remit payments via an ACH credit without requiring the seller to divulge detailed information about its bank account.

Retail stores and organizations that receive cash directly from customers should use cash registers that automatically produce a written record of all cash received (control 17.7). In these situations, customers also can play a role in controlling cash collections. For example, many stores use signs to inform customers that their purchase is free if they fail to get a receipt or that receipts marked with a red star entitle them to a discount. Such policies encourage customers to watch that employees actually ring up the cash sale and do so correctly.

All customer remittances should be deposited, intact, in the bank each day (control 17.8). Daily deposits reduce the amount of cash and checks at risk of theft. Depositing all remittances intact, and not using any of them for miscellaneous expenditures, facilitates reconciliation of the bank statement with the records of sales, accounts receivable, and cash collections. ERP systems should be configured to require that all cash collections transactions be processed through an approved list of bank accounts.

Finally, as the AOE case illustrated, cash flow problems are a serious concern (threat 18 in Table 12-1). The use of lockbox arrangements, EFT, credit cards, and offering discounts for early payment can speed up cash collections (controls 18.1 and 18.2). However, the best control procedure to reduce the risk of unanticipated cash shortfalls is to use a **cash flow budget** (control 18.3). As Figure 12-19 shows, a cash flow budget presents estimates of cash inflows (projected collections from sales) and outflows (outstanding payables). A cash flow budget can alert an organization to a pending short-term cash shortage, thereby enabling it to plan

cash flow budget - A budget that shows projected cash inflows and outflows for a specified period.

FIGURE 12-19
Sample Cash Flow Budget

	January	February	March	April
Beginning Balance	10,000	11,000	8,000	8,000
Projected Cash Receipts:				
Cash Sales	7,000	8,500	8,000	9,000
Collections on Account	26,000	29,000	28,000	30,000
Total Cash Available (A)	43,000	48,500	44,000	47,000
Projected Cash Disbursements (B)	(32,000)	(41,000)	(39,000)	(36,000)
Projected Ending Cash Balance (C = A − B)	11,000	7,500	5,000	11,000
Desired Minimum Balance (D)	8,000	8,000	8,000	8,000
Amount Needed to Borrow	0	500	3,000	0
Ending Balance	11,000	8,000	8,000	11,000

ahead to secure short-term loans at the best possible rates. Conversely, an organization that knows a surplus of cash is pending can take steps to invest those excess funds to earn the best possible returns. Regular monitoring of a cash flow budget would have helped AOE avoid the need for short-term borrowing at unfavorable rates.

Summary and Case Conclusion

An organization's accounting system should be designed to maximize the efficiency and effectiveness with which the four basic revenue cycle activities (sales order entry, shipping, billing, and cash collections) are performed. It must also incorporate adequate internal control procedures to mitigate such threats as uncollectible sales, billing errors, and lost or misappropriated inventory and cash. Control procedures also are needed to ensure that the information provided for decision making is both accurate and complete. Finally, to facilitate strategic decision making, the accounting system should be designed to accommodate the integration of internally generated data with data from external sources.

At the next executive meeting, Elizabeth summarized the proposals that she, Trevor, and Ann developed to provide the information needed to better manage customer relationships and cash flows. Among the recommendations were the following:

1. Equip the sales force with wireless-enabled pen-based tablets. Trevor Whitman, vice president of marketing, believes that AOE will still need its sales staff to visit existing customers to identify which additional products can be profitably carried. Sales staff also will continue to make cold calls on prospective customers to try to convince them to carry AOE's products. As they walk down store aisles, sales representatives can check off the items that need to be restocked and then write in the appropriate quantities. When the order is complete, they can transmit the order back to headquarters. The system can check the customer's credit status and inventory availability and confirm orders within minutes, including an estimated delivery date. After the customer approves the order, the system will immediately update all affected files so that current information about inventory status is available to other sales representatives.
2. Improve warehouse and shipping efficiency by replacing bar codes with RFID tags.
3. Improve billing process efficiency by increasing the number of customers who agree to participate in invoiceless sales relationships and, when possible, by using EDI to transmit invoices to those customers who still require them.
4. In an effort to improve customer service, periodically survey and monitor customer satisfaction with AOE's products and performance.
5. Improve efficiency of cash collections by encouraging customers to use EFT and, preferably, FEDI to remit payments. Obtain a UPIC from their bank to avoid having to share detailed bank account information with customers. Develop and monitor cash flow budgets monthly to anticipate short-term borrowing needs.

Linda Spurgeon approved these proposals. She then asked Elizabeth and Ann to turn their attention to solving several problems related to AOE's expenditure cycle business activities.