Chapter 16

General Ledger and Reporting System

Learning Objectives

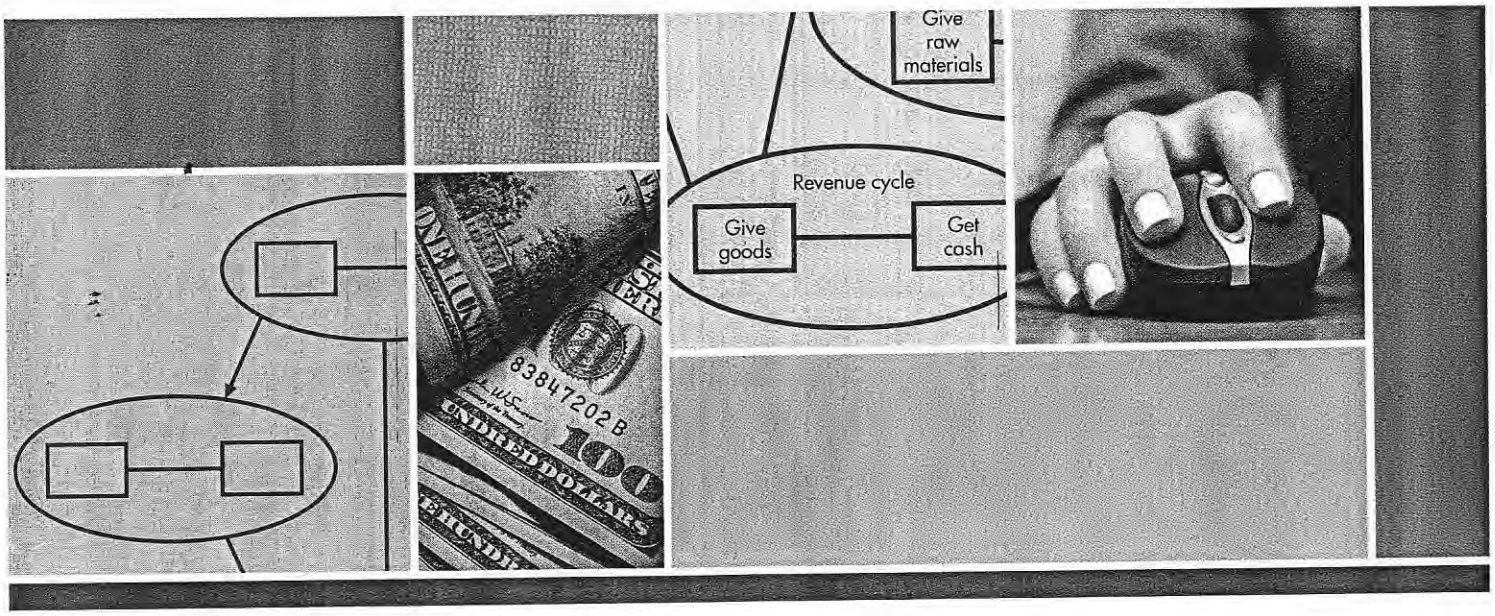
After studying this chapter, you should be able to:

1. Describe the information processing operations required to update the general ledger and to produce reports for internal and external users.
2. Identify the major threats in general ledger and reporting activities and evaluate the adequacy of various control procedures for dealing with them.
3. Understand the implications of new IT developments, such as XBRL, and changes in external reporting requirements, such as IFRS, for the design and operation of the general ledger and reporting system.
4. Discuss how tools like responsibility accounting, balanced scorecards, and graphs can be used to provide information managers need to effectively monitor performance.

INTEGRATIVE CASE ALPHA OMEGA ELECTRONICS

Linda Spurgeon, president and CEO of Alpha Omega Electronics (AOE), is not satisfied with the reporting capabilities of AOE's new enterprise resource planning (ERP) system. Although the monthly closing process now takes less than two days, the system only provides management with timely information about the firm's financial performance. Linda wants a report that integrates financial information with operational measures about how the firm is doing. She is also concerned about how to prepare AOE to transition from U.S. Generally Accepted Accounting Principles (GAAP) to International Financial Reporting Standards (IFRS) and about satisfying the SEC's new requirements to begin submitting financial information using XBRL.

Linda calls a meeting with Stephanie Cromwell, AOE's chief financial officer, Elizabeth Venko, AOE's controller, and Ann Brandt, AOE's vice president of information



systems, to discuss these issues. Stephanie mentions that she has been reading about something called a balanced scorecard that might provide the kind of multidimensional report Linda desires. Ann and Elizabeth agree to research the balanced scorecard and investigate how AOE's new ERP system could be configured to produce one. Stephanie asks them to also look at how AOE could make better use of the reporting and graphing capabilities of its new ERP system. In addition, they will report back on what needs to be done to prepare for IFRS and to use XBRL. As you read this chapter, think about how both technological and regulatory changes affect the design and operation of an organization's general ledger and reporting systems.

Introduction

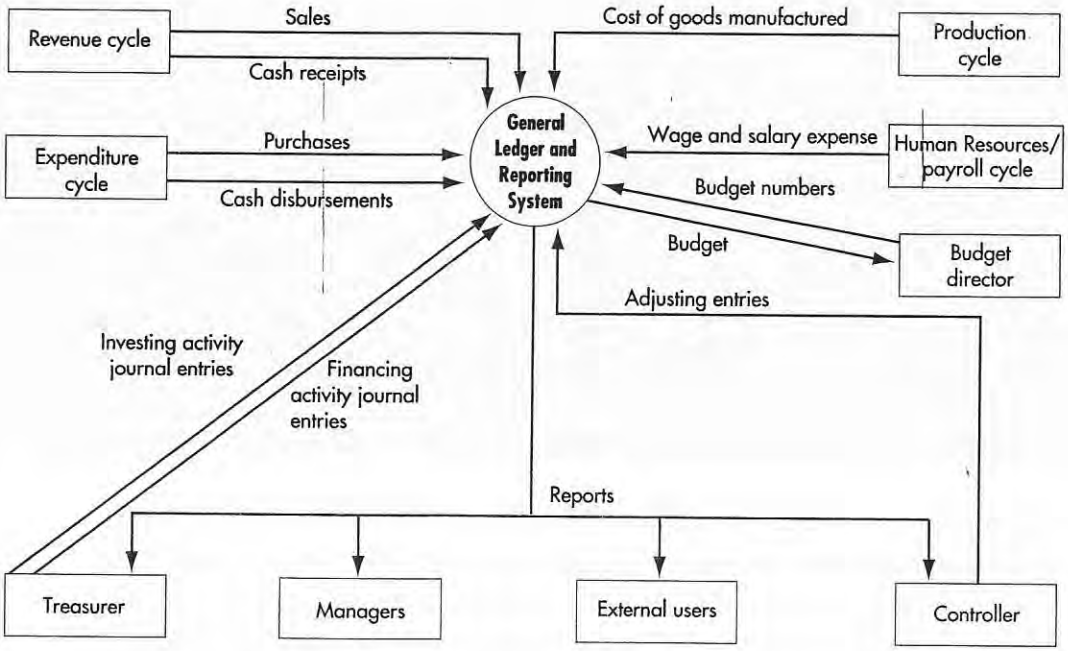
This chapter discusses the information processing operations involved in updating the general ledger and preparing reports that summarize the results of an organization's activities. As shown in Figure 16-1, the general ledger and reporting system plays a central role in a company's accounting information system. Its primary function is to collect and organize data from the following sources:

- Each of the accounting cycle subsystems described in Chapters 12 through 15 provides information about regular transactions. (Only the principal data flows from each subsystem are depicted, to keep the figure uncluttered.)
- The treasurer provides information about financing and investing activities, such as the issuance or retirement of debt and equity instruments and the purchase or sale of investment securities.
- The budget department provides budget numbers.
- The controller provides adjusting entries.

Figure 16-2 shows the basic activities performed in the general ledger and reporting cycle. The first three activities represent the basic steps in the accounting cycle, which culminate in the production of the traditional set of financial statements. The fourth activity indicates that, in addition to financial reports for external users, an organization's accounting system produces a variety of reports for internal management.

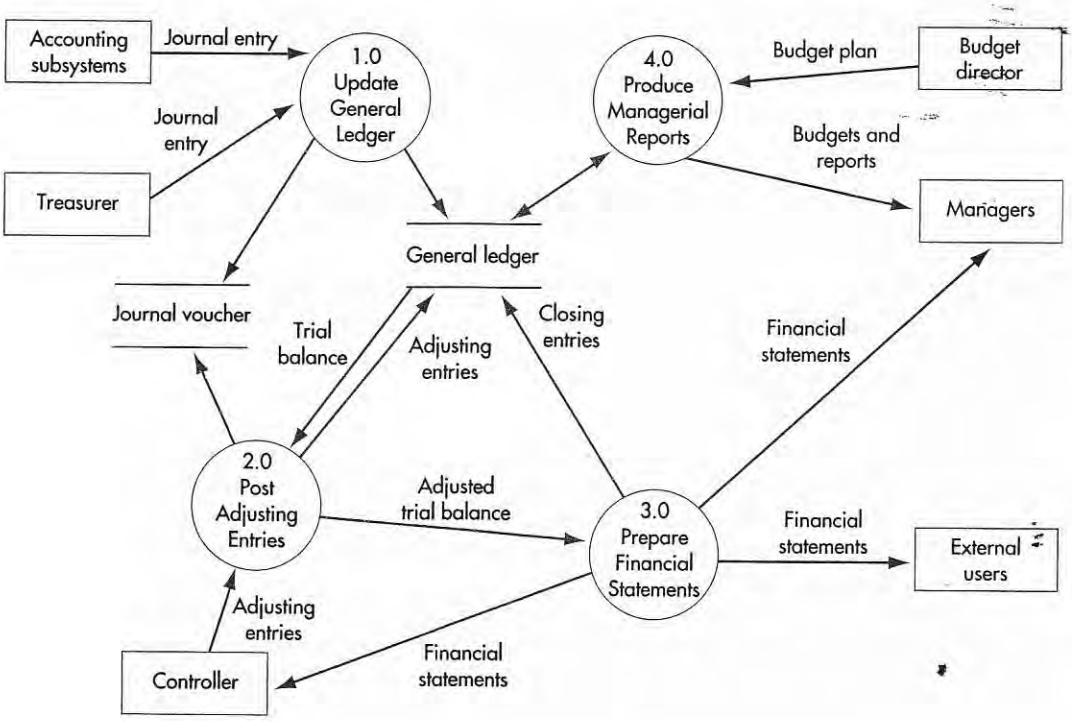
We begin by describing the design of a typical general ledger and reporting system and discuss the basic controls necessary to ensure that it provides management and various external stakeholders with reliable information. We then discuss in detail each of the basic general ledger and reporting cycle activities depicted in Figure 16-2. For each activity, we describe

FIGURE 16-1
Context Diagram of the General Ledger and Reporting System



how the information needed to perform and manage the activity 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. In addition, we discuss the impact of regulatory and technological changes, such as the proposed switch from GAAP to IFRS and the SEC's mandate to use XBRL for electronic filing, on the design and operation of the general ledger and reporting system. We also explore how tools such as responsibility accounting, balanced scorecards, and well-designed graphs can improve the quality of information provided to managers.

FIGURE 16-2
Level 0 Data Flow Diagram of the General Ledger and Reporting Cycle



General Ledger and Reporting System

Figure 16-3 shows the typical design of an online general ledger and reporting system.

Process

The centralized database must be organized in a manner that facilitates meeting the varied information needs of both internal and external users. Managers need timely detailed information about the results of operations in their particular area of responsibility. Investors and creditors want periodic financial statements and timely updates to help them assess the organization's performance. Various government agencies also mandate specific information requirements. To satisfy these multiple needs, the general ledger and reporting system not only produces periodic reports but also supports online inquiries.

Threats and Controls

Figure 16-3 shows that all general ledger and reporting cycle activities depend on the integrated database. Therefore, the first general threat listed in Table 16-1 is inaccurate or invalid general ledger data. Inaccurate general ledger data can result in misleading reports that cause managers to make erroneous decisions. Similarly, errors in financial statements provided to creditors, investors, and government agencies can cause those stakeholders to make wrong decisions. In addition, errors in financial statements and reports provided to external stakeholders can also result in fines and negative reactions from the capital markets.

One way to mitigate the threat of inaccurate or invalid general ledger data is to use the various processing integrity controls discussed in Chapter 10 to minimize the risk of data input errors when the treasurer and controller make direct journal entries. It is also important to restrict access to the general ledger and configure the system so that only authorized employees can make changes to master data. Thus, multifactor authentication should be used to restrict access to

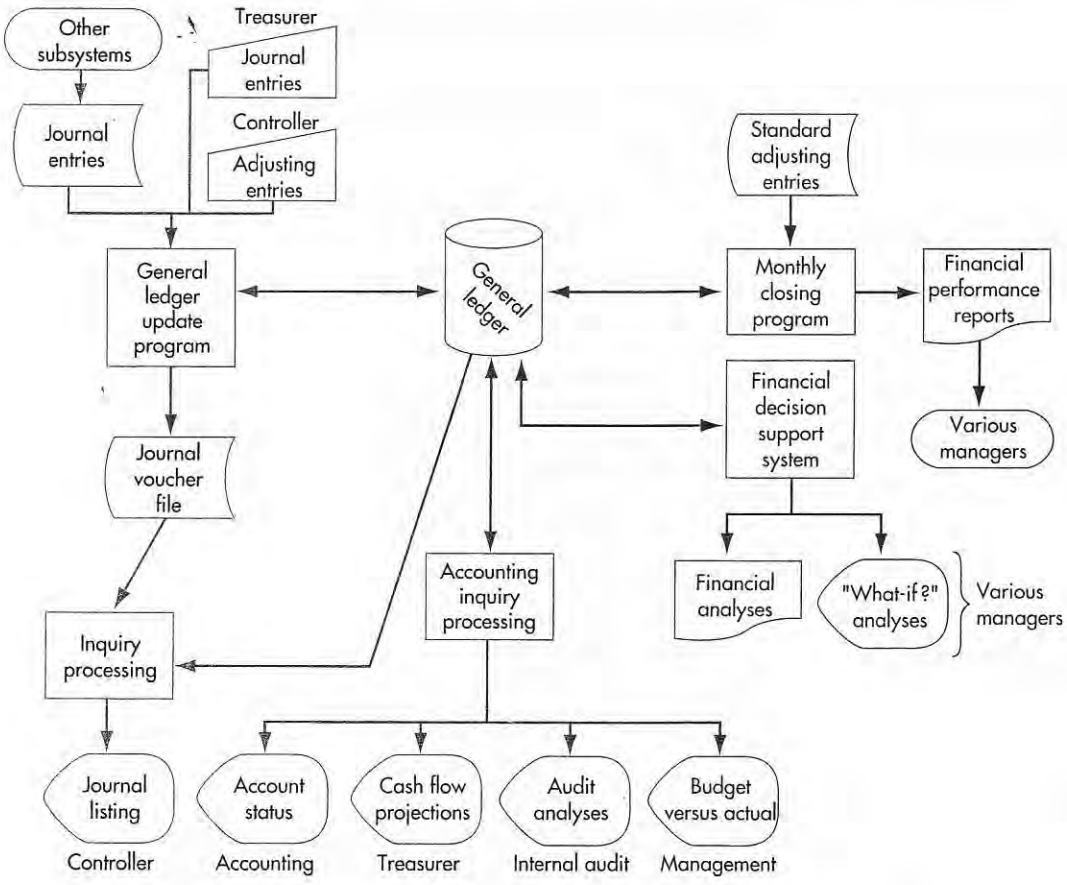


FIGURE 16-3
Typical Design of Online General Ledger and Reporting System

the general ledger. In addition, authorization controls (an access control matrix and compatibility tests) should also be used to limit the functions that each legitimate user may perform. For example, most managers should be given read-only access to the general ledger, as depicted at the bottom of Figure 16-3. Otherwise, an unscrupulous manager can conceal theft of assets or poor performance by altering the information in the general ledger. In addition, the access control matrix should also be designed to limit the functions that can be performed at various terminals. Adjusting entries, for example, should be allowed only from terminals in the controller's office. However, because such preventive controls can never be 100% effective, Table 16-1 also indicates that an important detective control is to regularly produce a report of all changes to the general ledger and review them to verify that the database remains accurate.

A second general threat in the general ledger and reporting cycle is unauthorized disclosure of financial information. In particular, it is important not to prematurely release financial statements; doing so is likely to result in fines from various regulatory agencies and possible shareholder lawsuits. The best control procedure for reducing the risk of unauthorized disclosure of financial statements is to use multifactor authentication and physical security controls to restrict access to the general ledger to only those employees who need such access to perform their jobs. Encrypting the database provides additional protection by making the information unintelligible to anyone who succeeds in obtaining unauthorized access to the database. Encryption also prevents IT employees who do not have access to the ERP system from using operating system utilities to view sensitive information. In addition, general ledger data should be encrypted when it is being transmitted over the Internet to other corporate offices, analysts, or government agencies.

A third general threat in the general ledger and reporting 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 that were discussed in Chapter 10.

TABLE 16-1 Threats and Controls in the General Ledger and Reporting System

Activity	Threat	Controls (first number refers to the corresponding threat)
General issues throughout entire general ledger and reporting cycle	1. Inaccurate or invalid general ledger data 2. Unauthorized disclosure of financial statement 3. Loss or destruction of data	1.1 Data processing integrity controls 1.2 Restriction of access to general ledger 1.3 Review of all changes to general ledger data 2.1 Access controls 2.2 Encryption 3.1 Backup and disaster recovery procedures
Update general ledger	4. Inaccurate updating of general ledger 5. Unauthorized journal entries	4.1 Data entry processing integrity controls 4.2 Reconciliations and control reports 4.3 Audit trail creation and review 5.1 Access controls 5.2 Reconciliations and control reports 5.3 Audit trail creation and review
Post adjusting entries	6. Inaccurate adjusting entries 7. Unauthorized adjusting entries	6.1 Data entry processing integrity controls 6.2 Spreadsheet error protection controls 6.3 Standard adjusting entries 6.4 Reconciliations and control reports 6.5 Audit trail creation and review 7.1 Access controls 7.2 Reconciliations and control reports 7.3 Audit trail creation and review
Prepare financial statements	8. Inaccurate financial statements 9. Fraudulent financial reporting	8.1 Processing integrity controls 8.2 Use of packaged software 8.3 Training and experience in applying IFRS and XBRL 8.4 Audits 9.1 Audits
Produce managerial reports	10. Poorly designed reports and graphs	10.1 Responsibility accounting 10.2 Balanced scorecard 10.3 Training on proper graph design

Update General Ledger

As shown in Figure 16-2, the first activity in the general ledger system (circle 1.0) is updating the general ledger.

Process

Updating consists of posting journal entries that originate from two sources:

1. *Accounting subsystems.* Each of the accounting subsystems described in Chapters 12 through 15 creates a journal entry to update the general ledger. In theory, the general ledger could be updated for each individual transaction. In practice, however, the various accounting subsystems usually update the general ledger by means of summary journal entries that represent the results of all transactions that occurred during a given period of time (day, week, or month). For example, the revenue cycle subsystem would generate a summary journal entry debiting accounts receivable and cash and crediting sales for all sales made during the update period. Similarly, the expenditure cycle would generate summary journal entries to record the purchase of supplies and inventories and to record cash disbursements in payment for those purchases.
2. *Treasurer.* The treasurer's office provides information for journal entries to update the general ledger for nonroutine transactions such as the issuance or retirement of debt, the purchase or sale of investment securities, or the acquisition of treasury stock. Figure 16-4 shows an example of a typical journal entry screen for an ERP system.

Figure 16-3 shows that the individual journal entries used to update the general ledger are stored in the ***journal voucher file.*** The journal voucher file contains the information that would be found in the general journal in a manual accounting system: the date of the journal entry, the accounts debited and credited, and the amounts. Note, however, that the journal voucher file is a by-product of, not an input to, the posting process. As we will explain later, the journal voucher file forms an important part of the audit trail, providing evidence that all authorized transactions have been accurately and completely recorded.

Threats and Controls

Table 16-1 shows that two related threats at this stage are inaccurate and unauthorized journal entries to update the general ledger. Both can lead to poor decision making based on erroneous information in financial performance reports.

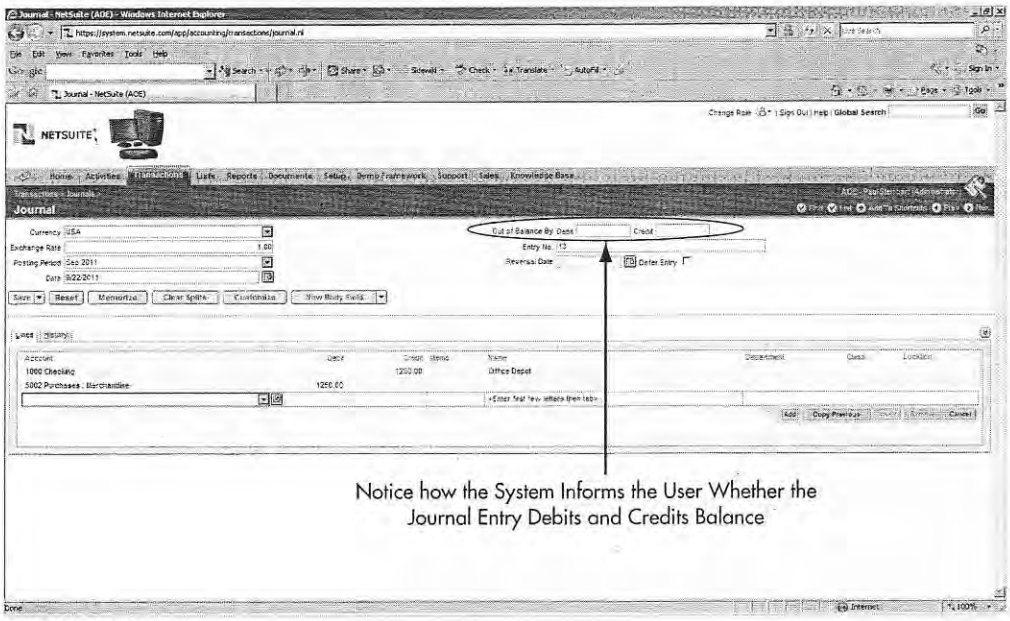


FIGURE 16-4
Example of Journal Entry Input Screen

As Figure 16-3 shows, there are two sources of journal entries for updating the general ledger: summary journal entries from the other AIS cycles and direct entries made by the treasurer. The former are themselves the output of a series of processing steps, each of which was subject to a variety of application control procedures designed to ensure accuracy and completeness, as described in the preceding four chapters. Consequently, the primary input edit control for summary journal entries from the other cycles is configuring the system to verify that the entries represent activity for the most recent time period.

Journal entries made by the treasurer, however, are original data entry. Consequently, the following types of input edit and processing controls are needed to ensure that they are accurate and complete:

1. A *validity check* to ensure that general ledger accounts exist for each account number referenced in a journal entry.
2. *Field (format) checks* to ensure that the amount field in the journal entry contains only numeric data.
3. A *zero-balance check* to verify that total debits equal total credits in a journal entry.
4. A *completeness test* to ensure that all pertinent data are entered, especially the source of the journal entry.
5. *Closed-loop verification* matching account numbers with account descriptions, to ensure that the correct general ledger account is being accessed.
6. A *sign check* of the general ledger account balance, once updating is completed, to verify that the balance is of the appropriate nature (debit or credit).
7. Calculating *run-to-run totals* to verify the accuracy of journal voucher batch processing. (The computer calculates the new balance of the general ledger account, based on its beginning balance and the total debits and credits applied to that account, then compares that with the actual account balance in the updated general ledger. Any discrepancies indicate a processing error that must be investigated.)

Strong access controls, including multifactor authentication and compatibility tests based on access control matrices, reduce the risk of unauthorized journal entries. In addition to these preventive controls, Table 16-1 lists two types of detective controls that should be used to identify inaccurate and unauthorized journal entries: reconciliations and control reports, and maintenance of an adequate audit trail.

RECONCILIATIONS AND CONTROL REPORTS Reconciliations and control reports can detect whether any errors were made during the process of updating the general ledger. One form of reconciliation is the preparation of a trial balance. The ***trial balance*** is a report that lists the balances for all general ledger accounts (see Figure 16-5). Its name reflects the fact that if all activities have been properly recorded, the total of all debit balances in various accounts should equal the total of all credit balances; if not, a posting error has occurred.

Another important reconciliation is comparing the general ledger control account balances to the total balance in the corresponding subsidiary ledger. For example, the sum of the balances of individual customer accounts should equal the amount of the accounts receivable control account in the general ledger. If these two totals do not agree, the difference must be investigated and corrected. It is also important to examine all transactions occurring near the end of an accounting period to verify that they are recorded in the proper time period.

At the end of a fiscal period it is also important to verify that any temporary "suspense" or "clearing" accounts have zero balances. Clearing and suspense accounts provide a means to ensure that the general ledger is always in balance. To illustrate how these types of special accounts are used, assume that one clerk is responsible for recording the release of inventory to customers and that another clerk is responsible for recording the billing of customers. The first clerk would make the following journal entry:

Unbilled shipments	x x x	
Inventory		x x x

The second clerk would make this entry:

Accounts receivable	x.xx	
Unbilled shipments		x.xx

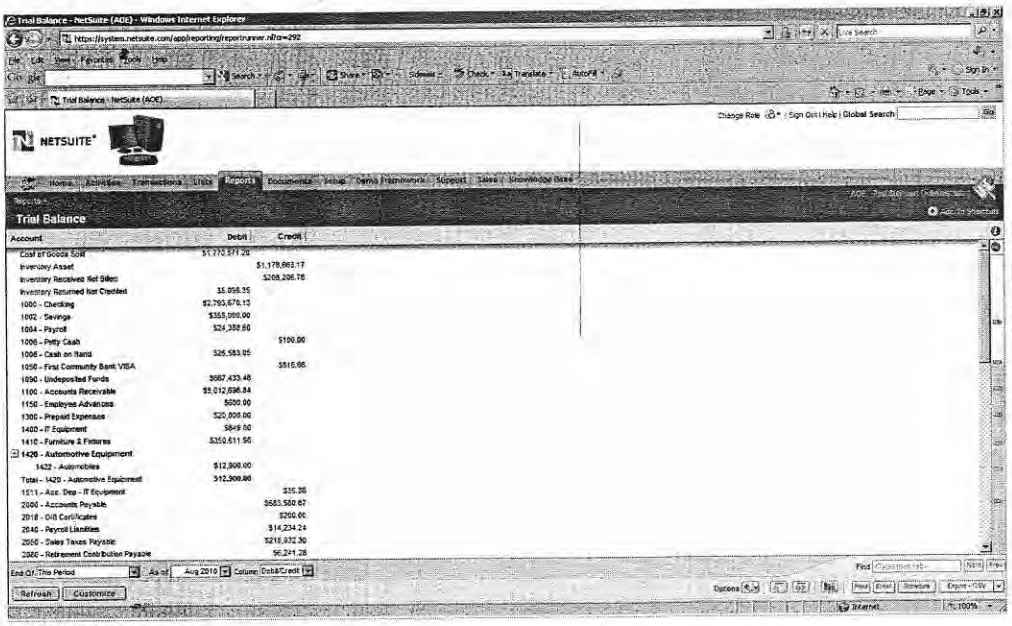


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FIGURE 16-5
Example Portion of Trial Balance

Once both entries have been completed, the special clearing account, unbilled shipments, should have a zero balance. If not, an error has been made and must be investigated and corrected.

Figure 16-6 is an example of one of the many kinds of control reports that ERP systems provide to help identify the source of any errors that occurred in the general ledger update process. Listing journal vouchers by general account number facilitates identifying the cause of errors affecting a specific general ledger account. Listing the journal vouchers by numerical sequence, date, and account number can indicate the absence of any journal entry postings. These reports often include totals to show whether total debits and credits posted to the general ledger were equal.

THE AUDIT TRAIL The *audit trail* is a traceable path that shows how a transaction flows through the information system to affect general ledger account balances. It is an important detective

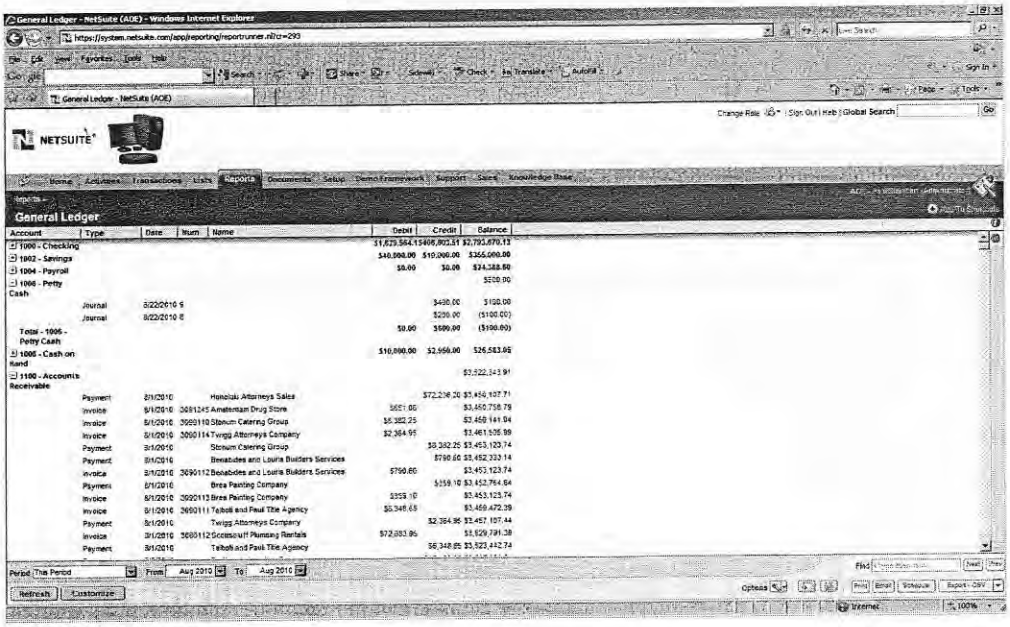

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FIGURE 16-6
Example of Control Report Providing Details About Changes to a General Ledger Account Balance

control that provides evidence about the causes of changes in general ledger account balances. A properly designed audit trail provides the ability to perform the following tasks:

1. Trace any transaction from its original source document (whether paper or electronic) to the journal entry that updated the general ledger and to any report or other document using that data. This provides a means to verify that all authorized transactions were recorded.
2. Trace any item appearing in a report back through the general ledger to its original source document (whether paper or electronic). This provides a means to verify that all recorded transactions were indeed authorized and that they were recorded correctly.

In legacy accounting systems, the journal voucher file is an important part of the audit trail, providing information about the source of all entries made to update the general ledger. The same capability is provided by the business workflow features in ERP systems, which make it easy to trace every step performed in processing a transaction. The usefulness of the audit trail depends on its integrity. Therefore, it is important to periodically make backups of all audit trail components and to control access to them to ensure that they cannot be altered. Thus, as Figure 16-7 shows, access to the audit trail is typically restricted to managers. In addition, ERP systems provide built-in tools to ensure the integrity of the audit trail. SAP, for example, creates prenumbered records (called documents) for every action that is performed. These documents cannot be deleted; thus, enabling this built-in feature ensures that SAP creates and maintains a secure audit trail.

Post Adjusting Entries

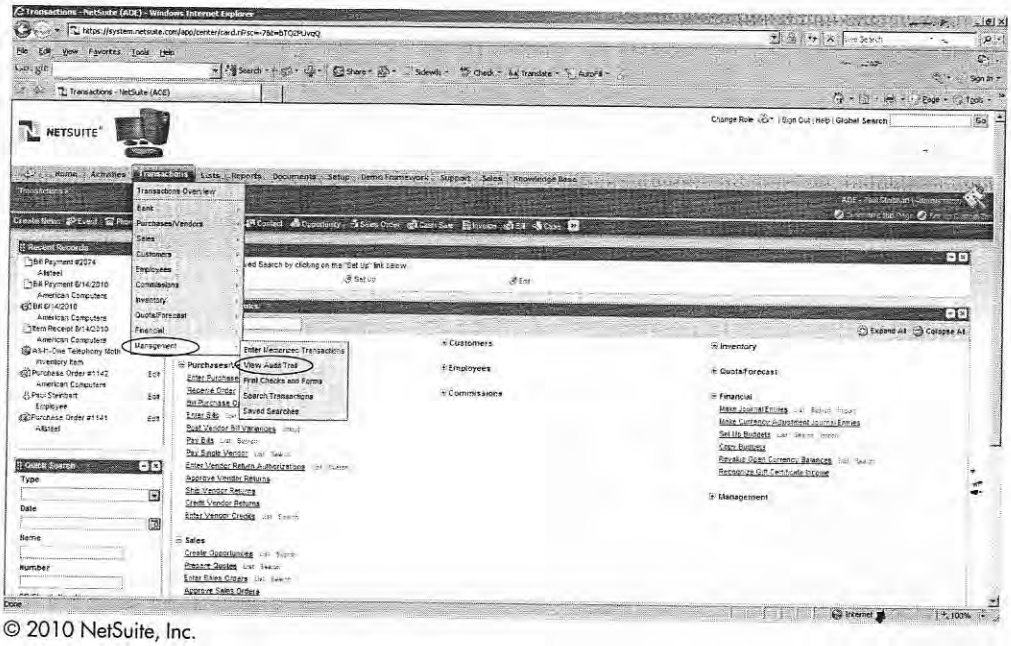
The second activity in the general ledger system is posting various adjusting entries (circle 2.0 in Figure 16-2).

Process

Adjusting entries originate from the controller's office, after the initial trial balance has been prepared. Adjusting entries fall into five basic categories:

1. *Accruals* are entries made at the end of the accounting period to reflect events that have occurred but for which cash has not yet been received or disbursed. Examples include the recording of interest revenue earned and wages payable.

FIGURE 16-7
Illustration of How Access to Audit Trail is Restricted to Managers



2. *Deferrals* are entries made at the end of the accounting period to reflect the exchange of cash prior to performance of the related event. Examples include recognizing advance payments from customers as a liability and recording certain payments (e.g., rent, interest, and insurance) as prepaid assets.
3. *Estimates* are entries that reflect a portion of expenses expected to occur over a number of accounting periods. Examples include depreciation and bad-debt expenses.
4. *Revaluations* are entries made to reflect either differences between the actual and recorded value of an asset or a change in accounting principle. Examples include a change in the method used to value inventory, reducing the value of inventory to reflect obsolescence, or adjusting inventory records to reflect the results noted during a physical count of inventory.
5. *Corrections* are entries made to counteract the effects of errors found in the general ledger.

As shown in Figure 16-3, information about these adjusting entries is also stored in the journal voucher file. After all adjusting entries have been posted, an adjusted trial balance is prepared. The adjusted trial balance serves as the input to the next step in the general ledger and financial reporting cycle, the preparation of financial statements.

Threats and Controls

As Table 16-1 shows, inaccurate and unauthorized adjusting journal entries are threats that need to be addressed because they can produce erroneous financial statements that lead to poor decisions. To reduce the risk of erroneous input, the same types of data entry processing integrity controls discussed earlier to prevent the threat of erroneous journal entries by the treasurer should also be applied to adjusting journal entries made by the controller. Often, however, adjusting journal entries are calculated in spreadsheets. Therefore, it is also important to employ the various spreadsheet error protection controls discussed in Chapter 10 to minimize the risk of mistakes. Additional control is provided by creating a standard adjusting entry file for recurring adjusting entries made each period, such as depreciation expense. A standard adjusting entry file improves input accuracy by eliminating the need to repeatedly key in the same types of journal entries. It also reduces the risk of forgetting to make a recurring adjusting entry, thereby ensuring input completeness.

Strong access controls reduce the risk of unauthorized adjusting entries. In addition to the preceding preventive controls, periodic reconciliations and audit trails provide a means to detect unauthorized or inaccurate adjusting entries.

Prepare Financial Statements

The third activity in the general ledger and reporting system is preparing financial statements (circle 3.0 in Figure 16-2).

Process

Most organizations "close the books" to produce financial statements both monthly and annually. A closing journal entry zeroes out all revenue and expense accounts in the adjusted trial balance and transfers the net income (or loss) to retained earnings. The income statement summarizes performance for a period of time (usually either a month or a year). The balance sheet presents information about the organization's assets, liabilities, and equity at a point in time. The statement of cash flows provides information about how the organization's operating, investing, and financing activities affected its cash balance. We now discuss two important recent regulatory and technological developments that are likely to significantly affect the process of preparing financial statements: the proposed upcoming change from U.S. GAAP to IFRS and the mandatory use of XBRL to submit reports to the SEC.

TRANSITION FROM GAAP TO IFRS In 2010, the SEC reaffirmed its commitment to decide in 2011 whether it will require American companies to switch from U.S.-based Generally Accepted Accounting Principles (GAAP) to International Financial Reporting Standards (IFRS) as the basis for preparing financial statements. Although the switch to IFRS will not likely occur until 2015 at the earliest, companies need to begin planning for the transition now because it will likely require extensive changes to their general ledger and reporting systems.

IFRS differs from GAAP in several ways that affect the design of a company's general ledger and reporting systems. One major difference concerns accounting for fixed assets. Under GAAP, most major fixed assets are recorded and depreciated on a composite basis. For example, the entire cost of a new corporate headquarters building would be recorded as one asset and depreciated over its estimated useful life, which, for buildings, is typically 40 years. In contrast, IFRS generally requires componentization of fixed assets, to recognize the fact that different elements (components) may have different economic lives. In terms of a corporate headquarters building, that would mean that the costs of the roof and of the heating and air conditioning systems would be recorded separately from the building itself, because they are not likely to last 40 years. Componentization will require companies to dig through their databases to identify and disaggregate the costs of many fixed assets. For large companies that may have tens of thousands of fixed assets, componentization will be a major undertaking that carries the risk of classification and recording errors as they change the structure of their general ledgers.

Another difference involves accounting for research and development (R&D) costs. IFRS permits capitalization of development costs at an earlier stage of the process than does GAAP. Consequently, American companies may need to improve the way that they collect and record R&D related costs so that they can properly decide which costs must be expensed and which can be capitalized. At a minimum, this process will require creating additional fields in data records to capture information about the stage of the R&D process when costs were incurred. In turn, this will necessitate careful modification and testing of existing programs to ensure that they correctly process the redesigned transaction records.

A third difference is that IFRS does not permit use of the last-in first-out (LIFO) method of accounting for inventory. Consequently, companies that use LIFO will have to modify their cost accounting systems and the calculations used to value inventory. Those changes will need to be carefully reviewed and tested to minimize the risk of errors.

XBRL: REVOLUTIONIZING THE REPORTING PROCESS *XBRL* stands for e**X**tensible **B**usiness **R**eporting **L**anguage; it is a special programming language designed specifically to facilitate the communication of business information. Beginning in June 2009, the SEC required the 500 largest U.S. public companies to use XBRL when submitting their filings. By June 2011 all public companies will have to use XBRL.

To understand the revolutionary nature of XBRL, examine Figure 16-8. The top portion shows that prior to XBRL, preparers had to manually create reports in various formats for different users. Although those reports were then sent electronically to users, the recipients then had to reenter the data into their own systems in order to manipulate it. The entire process was inefficient and prone to error.

The bottom portion of Figure 16-8 shows how XBRL improves the reporting process. Preparers encode the data and transmit it electronically in various formats to users, who can directly analyze it. Thus, XBRL saves time and reduces the chances for data entry errors.

Without XBRL, electronic documents, regardless of format (text, HTML, PDF, etc.) were essentially just digital versions of paper reports. Humans could read the data, but computers could not automatically process it until the recipient manually entered it in the appropriate format. XBRL changes that by encoding information about what a particular data item means so that other computer programs can understand what to do with it. To illustrate, Figure 16-9 shows how XBRL can annotate a number in a spreadsheet to indicate that it represents sales for a particular time period, following U.S. GAAP and measured in U.S. dollars. (The top portion of Figure 16-9 shows the spreadsheet that most users would see; the XBRL code in the bottom portion is intended for use by software, although it can be viewed by programmers, auditors, or anyone who needs or wants to see it).

XBRL Process and Terminology Figure 16-10 provides a high-level view of the basic steps in preparing and delivering XBRL reports. The XBRL file containing the tagged data that is delivered to users is called an ***instance document***. The instance document contains facts about specific financial statement line items, including their values and contextual information such as the measurement unit (dollars, euros, yuans, etc.) and whether the value is for a specific point in time (e.g., a balance sheet item) or a period of time (e.g., an income statement item). Each specific data item in an XBRL document is called an ***element***. An element's specific value is displayed in an instance document between tags. Angle brackets are used to identify tags. Two tags are used for

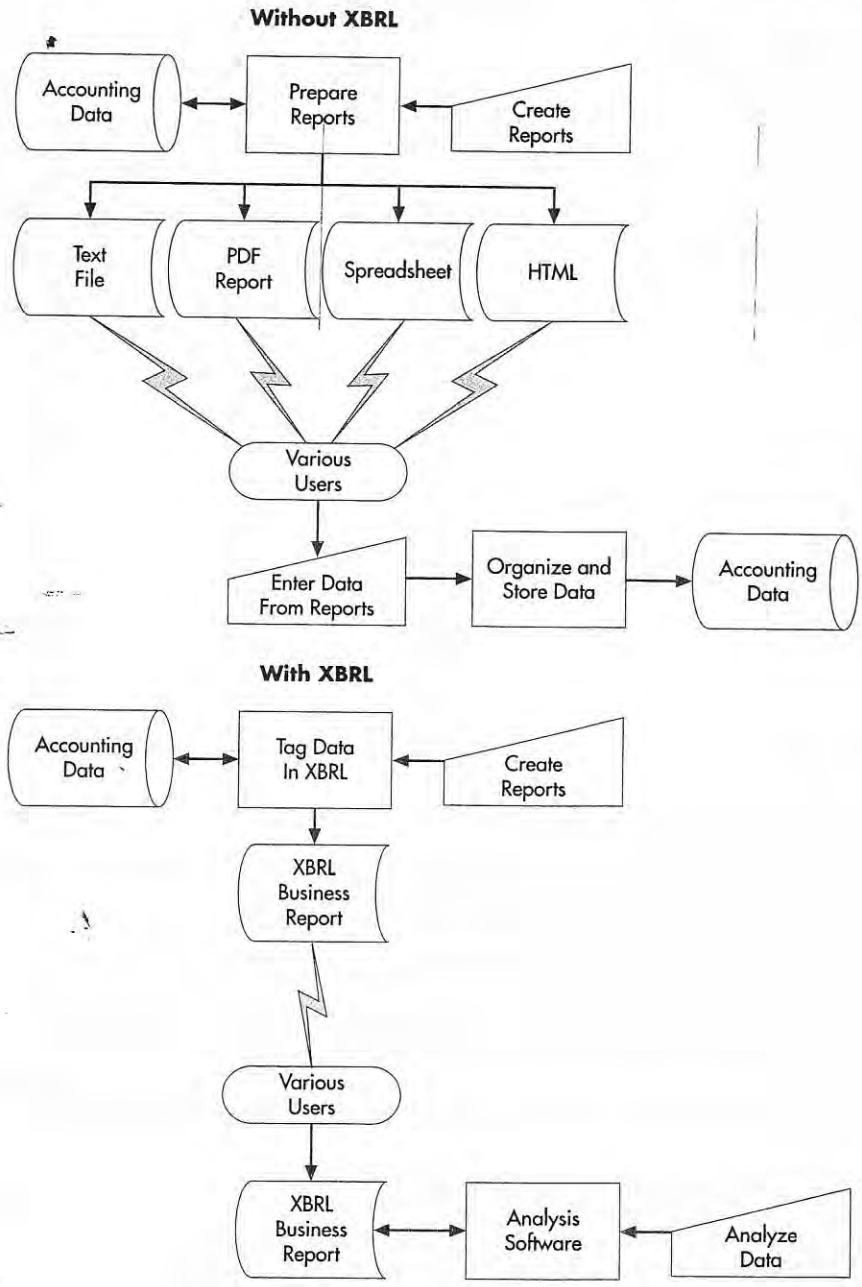


FIGURE 16-8
How XBRL Transforms the Reporting Process

each element. The first tag presents the element name inside a pair of angle brackets; the second tag also uses a pair of angle brackets but precedes the element name with a slash. For example, the XBRL code *2590* indicates that value of the element called Net Sales equals 2590. Additional information is needed to properly interpret that value, such as the monetary units used to measure net sales and the time period during which those sales occurred. That context information is also presented in the instance document between tags. For example, the XBRL code *ISO 4217:USD* indicates that items are being measured in U.S. dollars, and *P1Y 2011-12-31* indicates that sales are being reported for the 1-year period ending December 31, 2011.

An instance document is created by applying a taxonomy to a set of data. A ***taxonomy*** is a set of files that defines the various elements and the relationships between them. One part of the taxonomy is called the ***schema,*** which is a file that contains the definitions of every element that could appear in an instance document. The following are some of the basic attributes used to define each element:

- A unique identifying *name* used by the software
- A *description* that can be used to correctly interpret the element

Panel A: Portion of XBRL-Encoded Spreadsheet

Statement Of Income Alternative (USD $) (in Millions, except per share data)	12 Months Ended		
	Dec. 31, 2008	Dec. 31, 2007	Dec. 31, 2006
Sales (Q)	26,901	29,280	28,950
Cost of goods sold (exclusive of expenses below)	22,175	22,803	21,955
Selling, general administrative, and other expenses	1,167	1,444	1,372
Research and development expenses	246	238	201
Provision for depreciation, depletion, and amortization	1,234	1,244	1,252
Restructuring and other charges (D)	939	268	507
Interest expense (V)	407	401	384
Other income, net (O)	-59	-1,920	-236
Total costs and expenses	26,109	24,478	25,435
Income from continuing operations before taxes on income	792	4,802	3,515
Provision for taxes on income (T)	342	1,623	853
Income from continuing operations before minority interests' share	450	3,179	2,662
Minority interests	221	365	436
Income from continuing operations (Statement [Line Items])	229	2,814	2,226
(Loss) income from discontinued operations (B)	-303	-250	22
Net (Loss) Income (Statement [Line Items])	-74	2,564	2,248
Income from continuing operations (Basic:)	0.28	3.27	2.56
(Loss) income from discontinued operations (Basic:)	-0.37	-0.29	0.03
Net (loss) income (Basic:)	-0.09	2.98	2.59
Income from continuing operations (Diluted:)	0.28	3.23	2.54
(Loss) income from discontinued operations (Diluted:)	-0.37	-0.28	0.03
Net (loss) income (Diluted:)	-0.09	2.95	2.57

Panel B: Portion of XBRL Code

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<us-gaap:ResearchAndDevelopmentExpense contextRef="eol_0001193125-09-029469_STD_p12m_20061231_0"
    decimals="-6" unitRef="USD">201000000</us-gaap:ResearchAndDevelopmentExpense>
<us-gaap:RestructuringCharges contextRef="eol_0001193125-09-029469_STD_p12m_20061231_0" decimals="-6"
    unitRef="USD">507000000</us-gaap:RestructuringCharges>
<us-gaap:SalesRevenueGoodsNet contextRef="eol_0001193125-09-029469_STD_p12m_20061231_0" decimals="-6"
    unitRef="USD">28950000000</us-gaap:SalesRevenueGoodsNet>
<us-gaap:SellingGeneralAndAdministrativeExpense contextRef="eol_0001193125-09-029469_STD_p12m_20061231_0"
    decimals="-6" unitRef="USD">1372000000</us-gaap:SellingGeneralAndAdministrativeExpense>
```

Explanation:

The spreadsheet shows that the company had sales of $28,950,000,000 for the year ended December 31, 2006. The XBRL code reveals that:

- The number 28950 appearing on the spreadsheet is based on us-gaap (the element begins with <usgaap: SalesRevenueGoodsNet and closes with </us-gaap:SalesRevenueGoodsNet>).
- The context is the SEC Edgar Online filing (eol) for a 12-month period (p12m) ending on December 31, 2006.
- The numbers on the spreadsheet are rounded to the nearest million (decimals = -6, raw value = 28950000000).
- The value is in U.S. dollars ("USD").

FIGURE 16-9 Example of an XBRL Report

- The element's *data type* (monetary unit, text, date, etc.)
- The element's normal *balance type* (debit or credit)
- The element's *period type* (one point in time, called an instant, or a period of time, called a duration)

Attribute information is enclosed within tags. Thus, to continue our example, the schema would contain the following portion of a definition of the *Net Sales* element:

<element name="NetSales" description="Sales net of returns and allowances" type=monetaryItemType balance="credit" periodType="duration" </element>

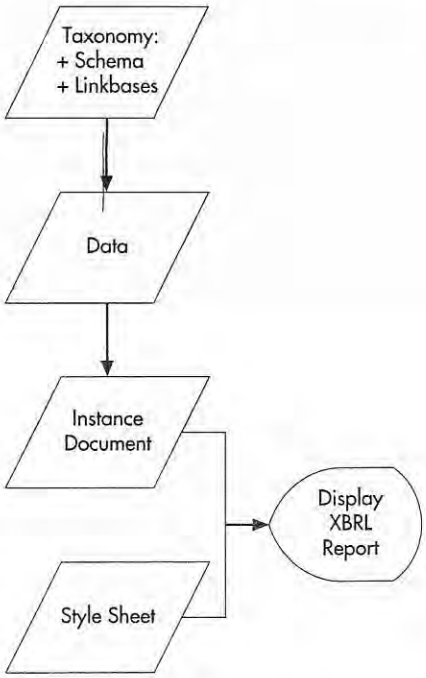


FIGURE 16-10
Electronic Reporting with XBRL

The taxonomy also includes a set of files called ***linkbases,*** which define the relationships among elements. Important linkbases include the following:

- The *Reference* linkbase identifies relevant authoritative pronouncements (e.g., U.S.-GAAP, IFRS) for that element.
- The *Calculation* linkbase specifies how to combine elements (e.g., that "Current Assets" equals the sum of Cash, Accounts Receivable, and Inventory).
- The *Definition* linkbase indicates hierarchical relationships among elements (e.g., that "Current Assets" is a subset of "Assets").
- The *Presentation* linkbase describes how to group elements (e.g., Assets, Liabilities, and Equities).
- The *Label* linkbase associates human-readable labels with elements.

As Figure 16-10 shows, the information in an XBRL taxonomy is used to tag the data and create an instance document. The same taxonomy is usually used to create a set of separate instance documents, one for each reporting year. Instance documents, however, contain only the data values.. Another document, called the ***style sheet,*** provides the instructions on how to appropriately display the content of an instance document, either on a computer screen or in a printed report.

The benefits of XBRL are not limited to its use for external reporting. Internal reporting will also benefit because data can be exported from the basic ERP system in a format that managers can import directly into a variety of applications, saving time and eliminating the errors arising from having to manually reenter data.

The Accountant's Role Accountants can, and should, play a major role in all phases of producing XBRL reports, beginning with the selection of an appropriate taxonomy. To ensure comparability across XBRL reports produced by different organizations, standard taxonomies have been developed for many different countries and industries. Accountants use their knowledge of the organization's business practices plus general accounting principles to select the standard taxonomy that best fits the organization. They then map each data item in the organization's accounting system to its corresponding element in the taxonomy.

However, standard taxonomies cannot cover every possible situation. Sometimes, an organization needs to record financial information in a different manner or level of detail to reflect its unique way of doing business. In such cases, accountants can create new tags to more accurately

present information about the organization's business activities. These new tags create what is called an ***extension taxonomy.*** This ability to modify XBRL is why it is referred to as an *extensible* language.

Accountants are also likely to use software to apply the taxonomy (and any extensions) to tag their organization's data, create instance documents, and then validate those instance documents before they are submitted. Accountants will also typically participate in creating style sheets to ensure that the information is displayed appropriately.

Not only do accountants use XBRL; as Focus 16-1 explains, the accounting profession played a major role in its creation. XBRL is a work in process. You should bookmark and regularly visit both the xbrl.org and sec.gov Web sites to stay abreast of continued developments in this important reporting tool.

Threats and Controls

Table 16-1 shows that one threat is the creation of inaccurate financial statements. The data processing integrity controls for journal entries discussed earlier combined with the use of packaged software (e.g., an ERP system) to produce the financial statements minimizes the risk numerical errors in the data. However, because both IFRS and XBRL require numerous judgments about how to classify information, there is a risk that financial statements may not accurately represent the results of operations. For example, mistakes in componentizing fixed assets can result in inaccurate depreciation expenses for IFRS financial statements. XBRL standard taxonomies offer many fine-grained choices (e.g., more than 20 elements define the concept "Cash and Cash Equivalents"), which can result in selecting an inappropriate tag unless the person doing the mapping has extensive knowledge both about the organization's business practices and the XBRL taxonomies. Unnecessarily creating taxonomy extensions instead of using a standard tag is another potential problem. Training and experience will likely reduce the risk of making such mistakes. In addition, an independent external audit is necessary as a detective control.

Fraudulent financial reporting (threat 9) is another potential problem. Financial statement fraud often involves journal entries by upper-level management that cause the organization's financial statements to either overstate revenues or understate liabilities. It is difficult to prevent

The Accounting Profession's Role in XBRL

The origins of XBRL can be traced back to the early 1990s. At that time, a software engineer named Jon Bosak recognized that a critical shortcoming of HTML is its inability to describe the content of the data being presented. Bosak convinced the World Wide Web Consortium (W3C) to sponsor the development of a language with this capability. That project resulted in Bosak and two other software engineers creating a programming language called XML, which stands for extensible markup language. XML is a general-purpose tool that can tag any data with identifying markers.

XML was a step in the right direction. Charlie Hoffman, a CPA who worked for a local accounting firm in Tacoma, Washington realized, however, that XML did not go far enough to be a general-purpose language for communicating financial information. What was needed was the ability not only to identify each piece of data but also how to process it and how to relate it to other data items. Hoffman started work on adding the desired capabilities to XML but realized that the project required additional support. He sought and obtained the AICPA's help to pursue the development of a prototype set of XML-enhanced financial statements.

As the work progressed, the results were shared with major software companies, who recognized the value of such a common business language and joined the project. Eventually, many leading software companies, and important user groups, cooperated in the venture with the AICPA. The result: XBRL. The continued development and maintenance of XBRL is now overseen by a nonprofit international organization (XBRL International). Vendors are currently working on making a wide range of financial and decision support software capable of supporting XBRL. Industry-specific coding taxonomies have been developed in many countries. XBRL is on its way to becoming the global computer language for communicating financial data. And it all started with one CPA who was looking for a better way to disseminate financial data on the Internet!

Postscript: In December 2006, the AICPA formally recognized Charlie Hoffman's pioneering work in developing XBRL with a special achievement award.

such journal entries because upper-level management inherently has the ability to override most internal controls. Therefore, the best control to mitigate the threat of financial statement fraud is an independent review (audit) of all special journal entries to the general ledger (i.e., all entries other than the summary journal entries automatically generated by the various cycles discussed in Chapters 12 to 15). Although Statement of Auditing Standards number 99 requires external auditors to "test the appropriateness of journal entries recorded in the general ledger and other adjustments," internal auditors should also regularly review all adjustments to the general ledger. To be effective, however, such testing requires proper configuration of the accounting system, so that every change to general ledger accounts is captured and recorded as part of the audit trail.

Produce Managerial Reports

The final activity in the general ledger and reporting system (circle 4.0 in Figure 16-2) is to produce various managerial reports, including budgets.

Process

ERP systems like the one depicted in Figure 16-3 can produce a number of budgets to help managers plan and evaluate performance. An operating budget depicts planned revenues and expenditures for each organizational unit. A capital expenditures budget shows planned cash inflows and outflows for each capital project. Cash flow budgets compare estimated cash inflows from operations with planned expenditures and are used to determine borrowing needs.

In addition to budgets, the inquiry processing capabilities of ERP systems enable managers to easily create an almost unlimited number of performance reports. For example, sales can be broken down by products, by salesperson, and by customer. Displaying the data in graphs can help managers quickly identify important trends and relationships, as well as areas in need of more detailed analysis. Accountants should understand how to use the flexible reporting and graphing capabilities of ERP systems so that they can add value by suggesting alternative ways to organize and analyze data about business processes.

Threats and Controls

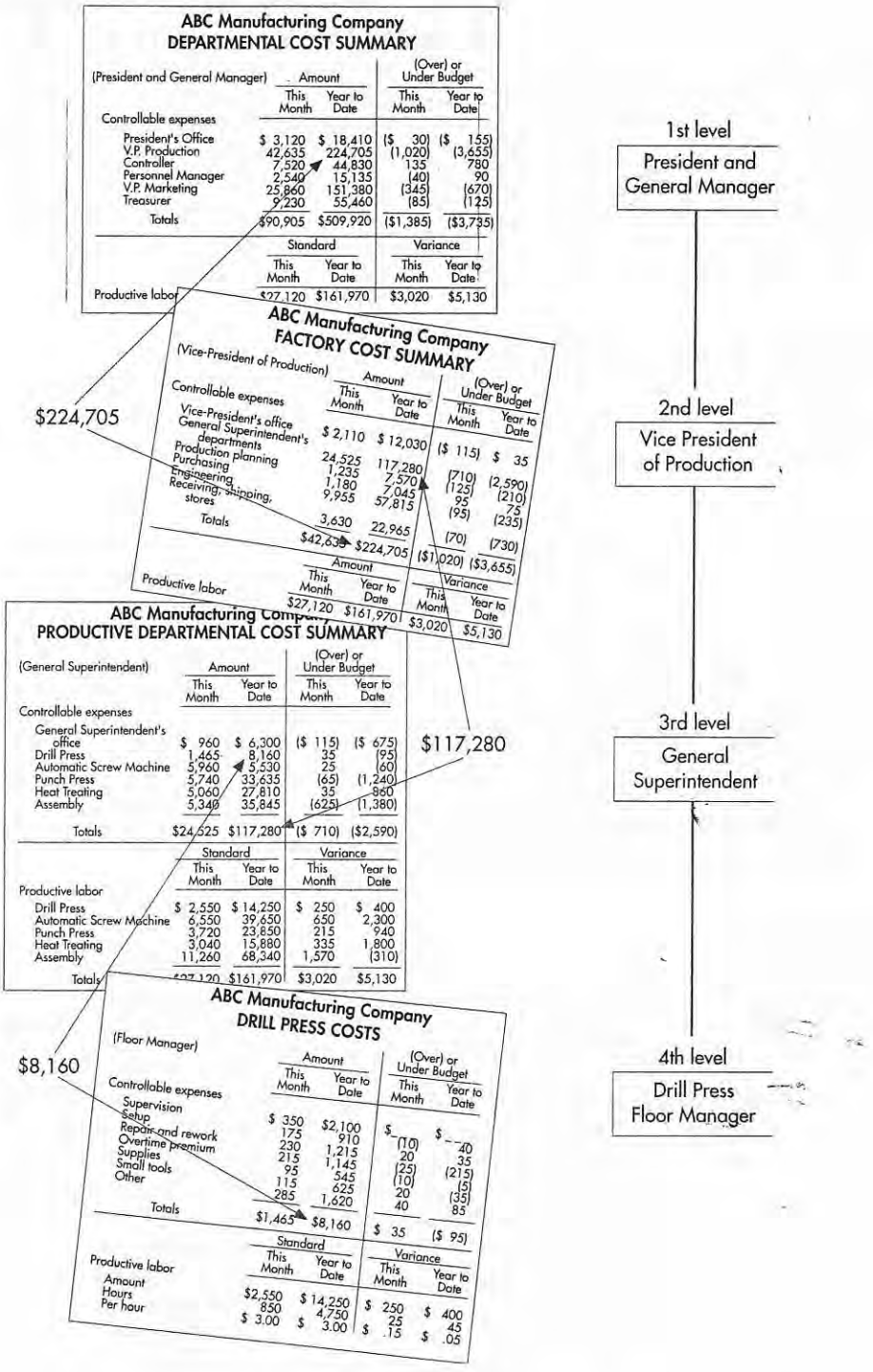
Poorly designed reports and graphs (threat 10 in Table 16-1) can cause managers to make biased or erroneous decisions. The following subsections discuss three important controls to mitigate that threat: the use of responsibility accounting and flexible budgets to design performance reports, the balanced scorecard, and understanding the principles of proper graph design.

RESPONSIBILITY ACCOUNTING AND FLEXIBLE BUDGETING To properly evaluate performance, reports should highlight the results that can be directly controlled by the person or unit being evaluated. ***Responsibility accounting*** does this by producing a set of correlated reports that break down the organization's overall performance by the specific subunits which can most directly control those activities, as shown in Figure 16-11. Note how each report shows actual costs and variances from budget for the current month and the year to date, but only for those items that the manager of that subunit controls. Note also the hierarchical nature of the reports: The total cost of each individual subunit is displayed as a single line item on the next-higher-level report.

It is also important to design the budget so that its content matches the nature of the unit being evaluated. For example, the performance reports depicted in Figure 16-11 focus on costs, because production departments are usually treated as cost centers. In contrast, sales departments are often evaluated as revenue centers. Consequently, their performance reports should compare actual to forecasted sales, broken down by appropriate product and geographic categories. Similarly, reports for departments that are treated as profit centers should include both revenues and expenses.

No matter which basis is used to prepare a unit's budgetary performance report, the method used to calculate the budget standard is crucial. The easiest approach is to establish fixed targets for each unit, store those figures in the database, and compare actual performance with those preset values. A major drawback to this approach is that the budget number is static and does not reflect unforeseen changes in the operating environment. Consequently, individual managers may be penalized or rewarded for factors beyond their control. For example, assume that the

FIGURE 16-11
Sample Set of Reports to Illustrate Responsibility Accounting



budgeted amounts in Figure 16-11 for the general superintendent are based on planned output of 2,000 units. If, however, actual production is 2,200 units because of greater-than-anticipated sales, then the negative variances for each expense category may indicate not inefficiency, but rather the increased level of output.

A ***flexible budget,*** in which the budgeted amounts vary in relation to some measure of organizational activity, mitigates such problems. In terms of our previous example, flexible budgeting would entail dividing the budget for each line item in the general superintendent's department into its fixed and variable cost components. In this way, budget standards would be automatically adjusted for any unplanned increases (or decreases) in production. Thus, any differences between these adjusted standards and actual costs can more appropriately be interpreted.

TABLE 16-2 Example of a Balanced Scorecard

Dimension Goals	Measure	Target	Current Period	Prior Period
FINANCIAL				
New revenue streams	Sales of new products (000s)	104	103	100
Improve profitability	Return on equity (%)	12.5%	12.6%	12.2%
Positive cash flow	Cash from operations (000s)	156	185	143
CUSTOMER				
Improve satisfaction	Rating (0–100)	95	93	92
Be a preferred supplier	Percentage of key customers' electronics purchases made from us	20%	20%	18%
INTERNAL OPERATIONS				
Service quality	Orders filled without error (%)	98%	97%	95%
Speed of delivery	Order cycle time (days)	10.4	10.5	11.2
Process efficiency	Defect rate	1.0%	1.1%	1.05%
INNOVATION AND LEARNING				
New products	Number of new products	4	4	3
Employee learning	Personnel attending advanced training courses (%)	10%	25%	9%

THE BALANCED SCORECARD[1] As the chapter opening case illustrated, one problem with the reports produced by many accounting systems is that the reports too narrowly focus on just one dimension of performance: that reflected in the financial statements. Balanced scorecards attempt to solve that problem. A ***balanced scorecard*** is a report that provides a multidimensional perspective of organizational performance. As shown in Table 16-2, a balanced scorecard contains measures reflecting four perspectives of the organization: financial, customer, internal operations, and innovation and learning. The financial section contains lagging indicators of past performance, whereas the other three sections provide leading indicators about likely future performance. For each dimension, the balanced scorecard shows the organization's goals and specific measures that reflect performance in attaining those goals. Together, the four dimensions of the balanced scorecard provide a much more comprehensive overview of organizational performance than that provided by financial measures alone. Let us now examine Table 16-2 to see how the four parts of the balanced scorecard reflect key aspects of an organization's strategy and important causal relationships between various measures.

AOE's top management, like many companies, agreed on three key financial goals: increased revenue streams through sales of new products, increased profitability as reflected in return on equity, and maintaining adequate cash flow to meet obligations. As shown in Table 16-2, specific measures and targets were developed to track the attainment of those goals. Both the choice of key metrics and the setting of target values are important management decisions. Many organizations make the mistake of setting targets that reflect industry benchmark values. The problem with such an approach is that the organization's aspirations and, hence, its performance are limited by its competitors' performance. Although industry benchmarks may provide a useful reference point, management should set targets that take into consideration the organization's unique strengths and weaknesses.

For every organization, customers are the key to achieving financial goals. Accordingly, the customer perspective of AOE's balanced scorecard contains two key goals: Improve customer satisfaction and become the preferred supplier for key customers. In turn, meeting those customer-oriented goals requires efficiently and effectively performing internal business processes. Consequently, the internal operations perspective portion of AOE's balanced scorecard focuses on those activities most likely to directly affect customer perceptions: service quality, speed of delivery, and process efficiency. Finally, AOE's top management acknowledged the

[1]This section is based on two articles by Robert S. Kaplan and David P. Norton: "The Balanced Scorecard—Measures That Drive Performance," *Harvard Business Review* (January–February 1992): 71–79; and "Using the Balanced Scorecard as a Strategic Management System," *Harvard Business Review* (January–February 1996): 75–85. Additional information about the balanced scorecard can be found at www.balancedscorecard.org.

importance of developing new products and training its workforce to continuously improve service and results. Therefore, measures of those two items are included in the innovation and learning perspective of AOE's balanced scorecard.

Note that the preceding discussion implied a number of hypotheses about cause-and-effect relationships. For example, increased employee training is expected to improve service quality, as reflected in the percentage of customer orders filled correctly. In turn, improved service quality is expected to result in increased customer satisfaction and in more purchases from key customers. Finally, increased customer satisfaction is expected to result in improved profitability and cash flow. Thus, the measures in the innovation and learning, internal operations, and customer perspective portions of the balanced scorecard can be thought of as leading indicators of financial measures of the organization's strategy. Analyzing trends in the actual measures allows AOE's management to test the validity of those hypotheses. If improvements in one perspective do not generate expected improvements in other areas in subsequent time periods, top management must reevaluate and probably revise hypotheses about the determinants of organizational success. Indeed, this ability to test and refine strategy is one of the major benefits the balanced scorecard provides.

Accountants and systems professionals should participate in the development of a balanced scorecard. Top management's role is to specify the goals to be pursued in each dimension. Accountants and information systems professionals can then help management choose the most appropriate measures for tracking achievement of those goals. In addition, they can provide input concerning the feasibility of collecting the data that would be required to implement various proposed measures.

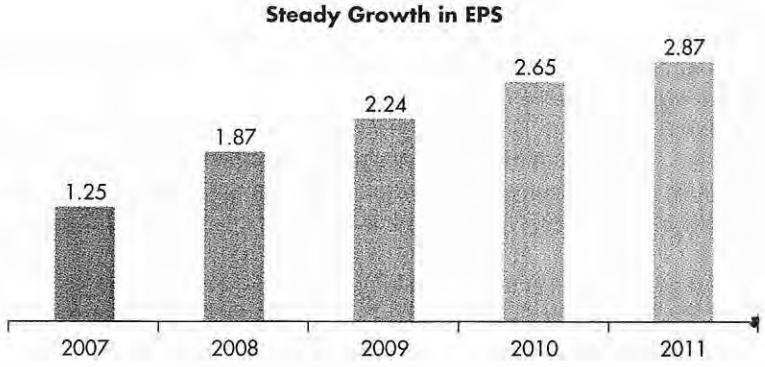
Although the balanced scorecard was initially developed as a strategic management tool, it can also be used as a vehicle to better manage enterprise risk by incorporating appropriate risk-based goals and measures in the various dimensions. For example, an organization might want to increase information security awareness among employees. One way to motivate attention to that objective is to explicitly list increased security awareness as one of the goals in the Innovation and Learning section of the scorecard and then measure employee knowledge about security best practices. Similarly, listing reduced inventory shrinkage as one of the Internal Operations Process goals and measuring it can help focus attention on reducing the risk of employee theft. External threats, such as loss of market share, can likewise be addressed by including appropriate measures (e.g., sales to repeat customers, number of new customers) in the Customer and Financial sections of the balanced scorecard. Thus, the balanced scorecard can be used as one tool to monitor and evaluate an organization's controls and risk management program.

PRINCIPLES OF PROPER GRAPH DESIGN Well-designed graphs make it easy to identify and understand trends and relationships. Poorly designed graphs, however, can impair decision making by misdirecting attention, hiding important changes in the data, or causing erroneous initial impressions.

Although many types of graphs exist, bar charts are the most common type used to display trends in financial data. Therefore, we will focus on some basic principles that make bar charts easy to read. Figure 16-12 illustrates the following principles of good graph design:

1. Use a title that summarizes the basic message.
2. Include data values with each element to facilitate mental calculations and analyses.

FIGURE 16-12
Example of a Well-Designed Graph



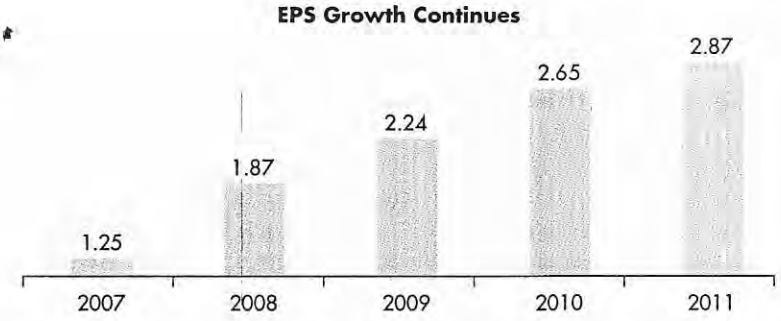


FIGURE 16-13
Example of a Poorly Designed Graph: Vertical Axis Does Not Begin at Zero

3. Use 2-D, instead of 3-D, bars because that makes it easier to accurately assess the magnitude of changes and trends.

However, graphs not only must be easy to read but also must lead to accurate interpretations of the underlying data. The following two principles are essential for properly designing bar charts of financial data so that they are accurately interpreted:

1. ***Begin the vertical axis at zero.*** Doing so ensures that the depicted magnitude of change in the data *accurately* reflects the actual change in the data. Beginning at a value other than zero, by contrast, magnifies the visual appearance of a trend. To see the importance of this rule, compare Figure 16-12, which follows this principle, to Figure 16-13, which does not. Exception: Beginning the vertical axis at a value other than zero may be useful if there is a need to monitor minor fluctuations in the data. For example, a day trader may need to quickly identify small changes in stock prices.
2. ***For graphs that depict time-series data, order the x-axis chronologically from left to right.*** This principle is illustrated in Figure 16-12. Otherwise, the viewer may form an erroneous initial impression of the nature of the change in the data. For example, the initial visual impression created by Figure 16-14 is that of a declining trend.

The rules for proper graph design are simple, but they are easy to violate. Sometimes, such violations are created automatically by the software program used to create the graph. For example, many financial spreadsheets display the data in reverse chronological order, with the most recent year's data in the column immediately to the right of the descriptive labels. In this case, selecting the data and using the spreadsheet's built-in charting functions automatically produces a graph in which the *x*-axis is in reverse chronological order. Other times, however, violations occur because of deliberate choices made by the graph designer. Regardless of the reason, violating the principles of proper graph design can result in graphs that mislead viewers. Therefore, it is important for accountants and information systems professionals to understand the principles for properly designing graphs so that they can avoid inadvertently creating misleading graphs and identify and correct any such graphs they encounter.

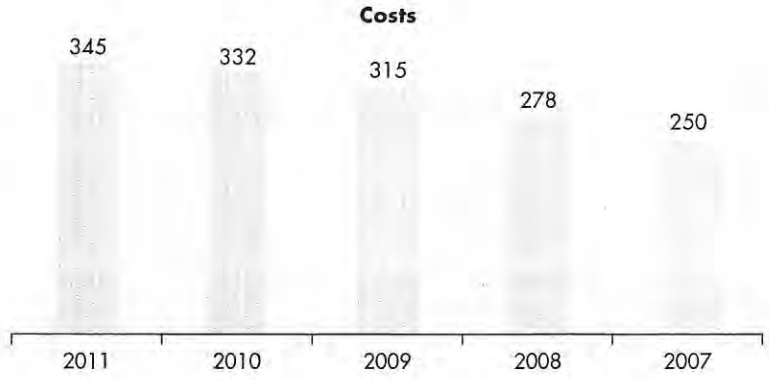


FIGURE 16-14
Example of a Poorly Designed Graph: X-Axis in Reverse Chronological Order

Summary and Case Conclusion

The general ledger and financial reporting system integrates and summarizes the results of the various accounting subsystems for the revenue, expenditure, production, and human resources cycles. The general ledger is the central master file in the accounting system. Consequently, it is important to implement control procedures to ensure its accuracy and security. Important controls include data processing integrity checks of the journal voucher records posted to the general ledger, access controls, an adequate audit trail, and appropriate backup and disaster recovery procedures.

The outputs produced by the general ledger system fall into two primary categories: financial statements and managerial reports. The former are prepared periodically in accordance with regulatory frameworks (GAAP or IFRS) and are distributed to both internal and external users. The latter are prepared for internal use only and therefore often include comparisons between actual and budgeted performance. The usefulness of these reports, whether presented in the form of tables or graphs, is affected by how well they are designed.

Organizations must provide information to a wide variety of users, including government agencies, industry analysts, financial institutions, and individual decision makers. XBRL provides a mechanism for improving the efficiency of generating such information, as well as for using information obtained from external sources. Elizabeth Venko and Ann Brandt proposed that AOE purchase special software designed to create XBRL documents from data in AOE's system. Linda Spurgeon approved their request.

Elizabeth and Ann also explained that AOE's new integrated transaction processing database provides much of the data needed to create a balanced scorecard. They told Linda that they could help her design a balanced scorecard that included metrics that would reflect AOE's strategic goals. Elizabeth also suggested that managers should be trained on how to design graphs properly to depict accurately key performance trends. Linda and Stephanie agreed with those suggestions. They asked Elizabeth and Ann to to oversee the development of some classes in graph design. Finally, Linda approved Elizabeth and Ann's request for two accountants and two IS staff to be assigned to begin work on reconfiguring AOE's new ERP system to generate financial statements in accordance with IFRS.

This chapter concludes our examination of the various cycles in an integrated accounting system. This chapter and the previous four explained how an accounting system should be designed: (1) to process transactions for accountability purposes, (2) to maintain adequate controls to ensure the integrity of the organization's data and the safeguarding of its assets, and (3) to provide information to support decision making. One other theme that appears throughout this book is the need for accountants to move beyond the traditional role of scorekeeper and actively seek to add value to their organization. Accountants should participate in decisions about adopting new technology and implementing new information systems because they have the training to properly evaluate the relative costs and benefits, as well as the economic risks, underlying such investments. Effectively participating in decisions concerning technology, however, requires accountants not only to keep abreast of current accounting developments but also to stay informed about advances in IT. Thus, as an accountant, you must make a commitment to lifelong learning. We wish you well in this endeavor.

Key Terms

journal voucher file 487
trial balance 488
audit trail 489
XBRL 492
instance document 492
element 492
taxonomy 493
schema 493
linkbases 495
style sheet 495
extension taxonomy 496
responsibility accounting 497
flexible budget 498
balanced scorecard 499

AIS IN ACTION

Chapter Quiz

1. From where do adjusting entries usually come?
   a. treasurer
   b. controller
   c. various accounting cycle subsystems, such as sales order entry
   d. unit managers

2. Preparing performance reports that contain data only about items that a specific organizational unit controls is an example of which of the following?
   a. flexible budget system
   b. responsibility accounting system
   c. closing the books
   d. management by exception

3. The definition of an XBRL element, including such information as whether its normal account balance is a debit or a credit, is found in which of the following?
   a. linkbase
   b. instance document
   c. schema
   d. style sheet

4. Which of the following shows the implied linkages among the portions of the balanced scorecard?
   a. Financial → Internal → Innovation and learning → Customer
   b. Innovation and learning → Internal → Customer → Financial
   c. Customer → Financial → Internal → Innovation and learning
   d. Internal → Customer → Innovation and learning → Financial

5. Which of the following XBRL documents contains the actual data values for a company's net income for a particular year?
   a. style sheets
   b. schema
   c. linkbases
   d. instance document

6. The number of orders shipped per warehouse worker each day is a metric that would most likely appear in which part of the balanced scorecard?
   a. innovation and learning
   b. customer
   c. internal operations
   d. financial

7. Which of the following is an important part of the audit trail?
   a. journal vouchers
   b. flexible budgets
   c. trial balance
   d. data warehouse

8. An adjusting journal entry to record interest revenue that has been earned but not yet received is an example of which of the following?
   a. accrual
   b. deferral
   c. estimate
   d. revaluation

9. Which of the following is designed primarily to improve the efficiency of financial reporting?
   a. XML
   b. XBRL
   c. IFRS
   d. the balanced scorecard

10. Which of the following graph design principles is most important for ensuring that financial data are accurately interpreted?
    a. including a title that summarizes the point of the graph
    b. attaching data values to specific elements in the graph
    c. starting the *y*-axis of the graph at zero
    d. using different colors for different variables

Discussion Questions

16.1. *Although XBRL facilitates the electronic exchange of financial information, some external* users do not think it goes far enough. They would like access to the entire general ledger, not just to XBRL-tagged financial reports that summarize general ledger accounts. Should companies provide external users with such access? Why or why not?

16.2. How can responsibility accounting and flexible budgets improve morale?

16.3. Why is the audit trail an important control?

16.4. The balanced scorecard measures organizational performance along four dimensions. Is it possible that measures on the customer, internal operations, and innovation and learning dimensions could be improving without any positive change in the financial dimension? If so, what are the implications of such a pattern?

16.5. Do you think that mandatory standards should be developed for the design of graphs of financial data that are included in annual reports and other periodic communications to investors? Why or why not?

Problems

16.1. Match the term in the left column with its appropriate definition from the right column:

____ 1. Journal voucher file	a. An individual financial statement item
____ 2. Instance document	b. Evaluating performance based on controllable costs
____ 3. XBRL element	c. Evaluating performance by computing standards in light of actual activity levels
____ 4. Balanced scorecard	d. The set of journal entries that updated the general ledger
____ 5. XBRL extension taxonomy	e. A set of files that defines XBRL elements and specifies the relationships among them
____ 6. Audit trail	f. A multidimensional performance report
____ 7. XBRL taxonomy	g. A file that defines relationships among XBRL elements
____ 8. XBRL linkbase	h. A file that defines the attributes of XBRL elements
____ 9. XBRL schema	i. A detective control that can be used to trace changes in general ledger account balances back to source documents
____ 10. XBRL style sheet	j. A file that explains how to display an XBRL instance document
____ 11. Responsibility accounting	k. A file that contains specific data values for a set of XBRL elements for a specific time period or point in time
____ 12. Flexible budget	l. A file containing a set of customized tags to define new XBRL elements that are unique to a specific organization

16.2. Which control procedure would be most effective in addressing the following problems?

a. When entering a journal entry to record issuance of new debt, the treasurer inadvertently transposes two digits in the debit amount.

b. The spreadsheet used to calculate accruals had an error in a formula. As a result, the controller's adjusting entry was for the wrong amount.

c. The controller forgot to make an adjusting entry to record depreciation.

d. A sales manager tipped off friends that the company's financial results, to be released tomorrow, were unexpectedly good.

e. The general ledger master file is stored on disk. For some reason, the disk is no longer readable. It takes the accounting department a week to reenter the past month's transactions from source documents in order to create a new general ledger master file.
f. The controller sent a spreadsheet containing a preliminary draft of the income statement to the CFO by e-mail. An investor intercepted the e-mail and used the information to sell his stock in the company before news of the disappointing results became public.
g. A company's XBRL business report was incorrect because the controller selected the wrong element from the taxonomy.
h. Instead of a zero, an employee entered the letter o when typing in data values in an XBRL instance document.

16.3. Explain the components of an audit trail for verifying changes to accounts payable. Your answer should specify how those components can be used to verify the accuracy, completeness, and validity of all purchases, purchase returns, purchase discounts, debit memos, and cash disbursements.

16.4. As manager of a local pizza parlor, you want to develop a balanced scorecard so you can more effectively monitor the restaurant's performance.

Required

a. Propose at least two goals for each dimension, and explain why those goals are important to the overall success of the pizza parlor. One goal should be purely performance oriented, and the other should be risk related.
b. Suggest specific measures for each goal developed in part a.
c. Explain how to gather the data needed for each measure developed in part b.

16.5. Use Table 16-1 to create a questionnaire checklist that can be used to evaluate controls in the general ledger and reporting cycle.
a. For each control issue, write a Yes/No question such that a "No" answer represents a control weakness. For example, one question might be "Is access to the general ledger restricted?"
b. For each Yes/No question, write a brief explanation of why a "No" answer represents a control weakness.

16.6. Visit the SEC website (www.sec.gov), and explore what is available in terms of interactive data (the SEC's term for XBRL reports). Use the SEC's viewer software, and examine the annual reports for two companies.

16.7. Obtain the annual report of a company assigned by your professor. Read the management discussion and analysis section, and develop a balanced scorecard that reflects that company's vision, mission, and strategy. Create both performance-oriented and risk-based goals and measures for each section of the balanced scorecard.

16.8. Excel Problem. Objective: Practice graph design principles.

Required (continues on next page)

Use the data in Table 16-3 to create the following graphs:
a. Sales
b. Sales and Gross Margin
c. Earnings per Share

TABLE 16-3 Data for Problem 16-8

	2010	2009	2008	2007	2006
Sales	598,000	640,000	575,000	560,000	530,000
Cost of Goods Sold	350,000	400,000	375,000	330,000	300,000
Gross Margin	248,000	240,000	200,000	230,000	230,000
Earnings Per Share	12.52	12.10	11.95	11.66	10.50

Which principles of graph design, if any, did you have to manually implement to override the default graphs created by Excel?

16.9. Excel Problem

Objective: Create pivot tables for what-if analysis.

Required

Read the article "Make Excel an Instant Know-It-All" by Roberta Ann Jones in the March 2004 issue of the *Journal of Accountancy* (available at www.aicpa.org).

a. Follow the instructions in the article to create a spreadsheet with pivot tables.
b. Print out a report that shows sales by month for each salesperson.
c. Assume that Brown and David are in sales group 1 and that the other three salespeople are in sales group 2. Print out a report that shows monthly sales for each group.

16.10. Excel Problem

Objective: How to do what-if analysis with graphs.

Required

a. Read the article "Tweaking the Numbers," by Theo Callahan in the June 2001 issue of the *Journal of Accountancy* (available at www.aicpa.org). Follow the instructions in the article to create a spreadsheet with graphs that do what-if analysis.
b. Now create a spreadsheet to do graphical what-if analysis for the "cash gap." Cash gap represents the number of days between when a company has to pay its suppliers and when it gets paid by its customers. Thus,

$$\text{Cash gap} = \text{Inventory days on hand} + \text{Receivables collection period} - \text{Accounts payable period}$$

The purpose of your spreadsheet is to display visually what happens to cash gap when you "tweak" policies concerning inventory, receivables, and payables. Thus, you will create a spreadsheet that looks like Figure 16-15.

c. Set the three spin buttons to have the following values:

	Spin Button for Inventory	Spin Button for Receivables	Spin Button for Payables
Linked cell	C2	C3	C4
Maximum	120	120	90
Minimum	0	30	20
Value	30	60	20
Small change	10	10	10

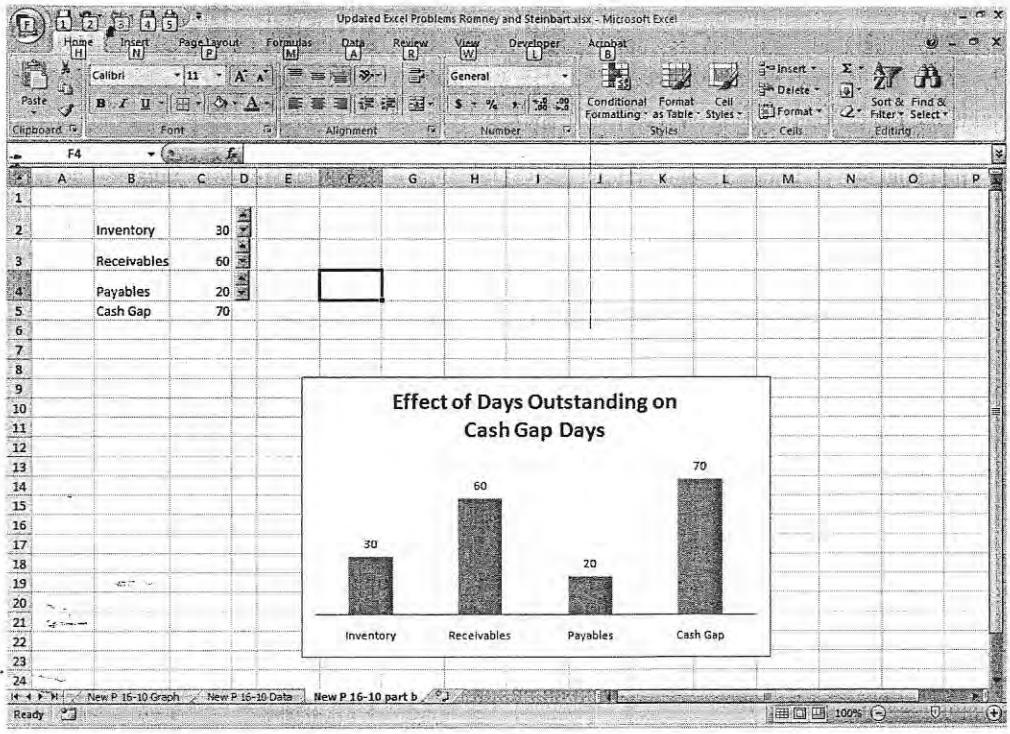


FIGURE 16-15
Spreadsheet for Problem 16-10, part b

Case16-1 Keeping Current with XBRL

Like IT in general, XBRL is continually evolving. Visit xbrl.org to identify developments in the standard, the use of XBRL by companies and regulatory agencies, and XBRL-related products that have come out during the past twelve months. Write a report summarizing your findings.

Case16-2 Evaluating a General Ledger Package

Accounting magazines such as *Journal of Accountancy* and *Strategic Finance* periodically publish reviews of accounting software. Obtain a copy of a recent software review article, and read its comments about a general ledger package to which you have access. Using the software, write a report that indicates whether, and why, you agree or disagree with the review's opinions about the following features of the general ledger package:

a. Ease of installation
b. Flexibility in the initial setup of the chart of accounts and during subsequent modifications
c. Frequency of updates from subsystems (sales, cash receipts, etc.)
d. Control procedures available to restrict access
e. Control procedures to ensure accuracy of input and processing
f. Report flexibility (how easy it is to design reports, etc.)
g. Adequacy of the audit trail (e.g., what reference data are automatically provided versus how much of the audit trail has to be manually constructed)

AIS IN ACTION SOLUTIONS

Quiz Key

1. From where do adjusting entries usually come?
   a. treasurer (Incorrect. Adjusting entries are entered by the controller after the trial balance has been prepared. The treasurer makes regular journal entries to record financing activities, such as issuing or retiring debt.)
   b. controller (Correct. Adjusting entries are entered by the controller after the trial balance has been prepared.)
   c. various accounting cycle subsystems, such as sales order entry (Incorrect. Subsystems send summary regular journal entries, not adjusting entries, to the general ledger.)
   d. unit managers (Incorrect. Unit managers should not make any journal entries.)

2. Preparing performance reports that contain data only about items that a specific organizational unit controls is an example of which of the following?
   a. flexible budget system (Incorrect. Flexible budgets adjust targets based on actual inputs.)
   b. responsibility accounting system (Correct. This is the essence and purpose of responsibility accounting.)
   c. closing the books (Incorrect. Closing the books is a process performed at the end of a fiscal period to prepare financial statements.)
   d. management by exception (Incorrect. Management by exception is a reporting technique that focuses on unusual variations from standards.)

3. The definition of an XBRL element, including such information as whether its normal account balance is a debit or a credit, is found in which of the following?
   a. linkbase (Incorrect. The linkbase files in the taxonomy provide information about relationships among elements.)
   b. instance document (Incorrect. The instance document contains the value of an element and contextual information, but not its full definition.)
   c. schema (Correct. The schema file in the taxonomy contains definitions of XBRL elements.)
   d. style sheet (Incorrect. The style sheet specifies how to display an instance document on either a computer screen or on a printed report.)

4. Which of the following shows the implied linkages among the portions of the balanced scorecard?
   a. Financial → Internal → Innovation and learning → Customer (Incorrect.)
   ▶ b. Innovation and learning → Internal → Customer → Financial (Correct. The theory underlying the balanced scorecard is that learning and innovation will improve internal measures of performance, which will in turn improve customer satisfaction, which will then be reflected in better financial performance.)
   c. Customer → Financial → Internal → Innovation and learning (Incorrect.)
   d. Internal → Customer → Innovation and learning → Financial (Incorrect.)

5. Which of the following XBRL documents contains the actual data values for a company's net income for a particular year?
   a. style sheets (Incorrect. Style sheets provide information about how to display the information in an instance document.)
   b. schema (Incorrect. Schemas define elements of financial statements, such as net income, but do not provide actual data values for those elements.)
   c. linkbases (Incorrect. Linkbases describe relationships among taxonomy elements.)
   ▶ d. instance document (Correct. An instance document contains specific values for financial statement elements.)

6. The number of orders shipped per warehouse worker each day is a metric that would most likely appear in which part of the balanced scorecard?
   a. innovation and learning (Incorrect. The proposed metric is a measure of process efficiency and, therefore, would appear in the internal operations section of the balanced scorecard.)
   b. customer (Incorrect. The proposed metric is a measure of process efficiency and, therefore, would appear in the internal operations section of the balanced scorecard.)
   ▶ c. internal operations (Correct.)
   d. financial (Incorrect. The proposed metric is a measure of process efficiency and, therefore, would appear in the internal operations section of the balanced scorecard.)

7. Which of the following is an important part of the audit trail?
   ▶ a. journal vouchers (Correct. Journal vouchers provide information concerning the source of changes to the general ledger accounts.)
   b. flexible budgets (Incorrect. Flexible budgets are a performance evaluation tool.)
   c. trial balance (Incorrect. The trial balance is a step in the preparation of financial statements.)
   d. data warehouse (Incorrect. A data warehouse is used for business intelligence.)

8. An adjusting journal entry to record interest revenue that has been earned but not yet received is an example of which of the following?
   ▶ a. accrual (Correct.)
   b. deferral (Incorrect. A deferral would involve postponing recognition of an event for which cash has already been exchanged in advance of performing the event.)
   c. estimate (Incorrect. An estimate is an entry used to record the results of judgmental analysis.)
   d. revaluation (Incorrect. A revaluation entry is used to correct a prior error.)

9. Which of the following is designed primarily to improve the efficiency of financial reporting?
   a. XML (Incorrect. XML is a general-purpose language but is not designed for financial reporting.)
   ▶ b. XBRL (Correct. The eXtensible Business Reporting Language was developed, in part, by accountants to facilitate business reporting.)
   c. IFRS (Incorrect. IFRS is an alternative to GAAP.)
   d. the The balanced scorecard (Incorrect. The balanced scorecard is a multidimensional performance report.)

10. Which of the following graph design principles is most important for ensuring that financial data is accurately interpreted?
    a. including a title that summarizes the point of the graph (Incorrect. This principle improves readability but is not specifically designed to ensure that the graph is accurately interpreted.)
    b. attaching data values to specific elements in the graph (Incorrect. This principle facilitates making mental calculations but is not specifically designed to ensure that the graph is accurately interpreted.)
    ▶ c. starting the *y*-axis of the graph at zero (Correct. Starting the *y*-axis at zero accurately depicts the magnitude of changes in the data.)
    d. using different colors for different variables (Incorrect. This principle improves readability but is not specifically designed to ensure that the graph is accurately interpreted.)