

# Conceptual Foundations of Accounting Information Systems

- Chapter 1** Accounting Information Systems: An Overview
- Chapter 2** Overview of Transaction Processing and Enterprise Resource Planning (ERP)
- Chapter 3** Systems Documentation Techniques
- Chapter 4** Relational Databases

# Chapter 1

## Accounting Information Systems: An Overview

### Learning Objectives

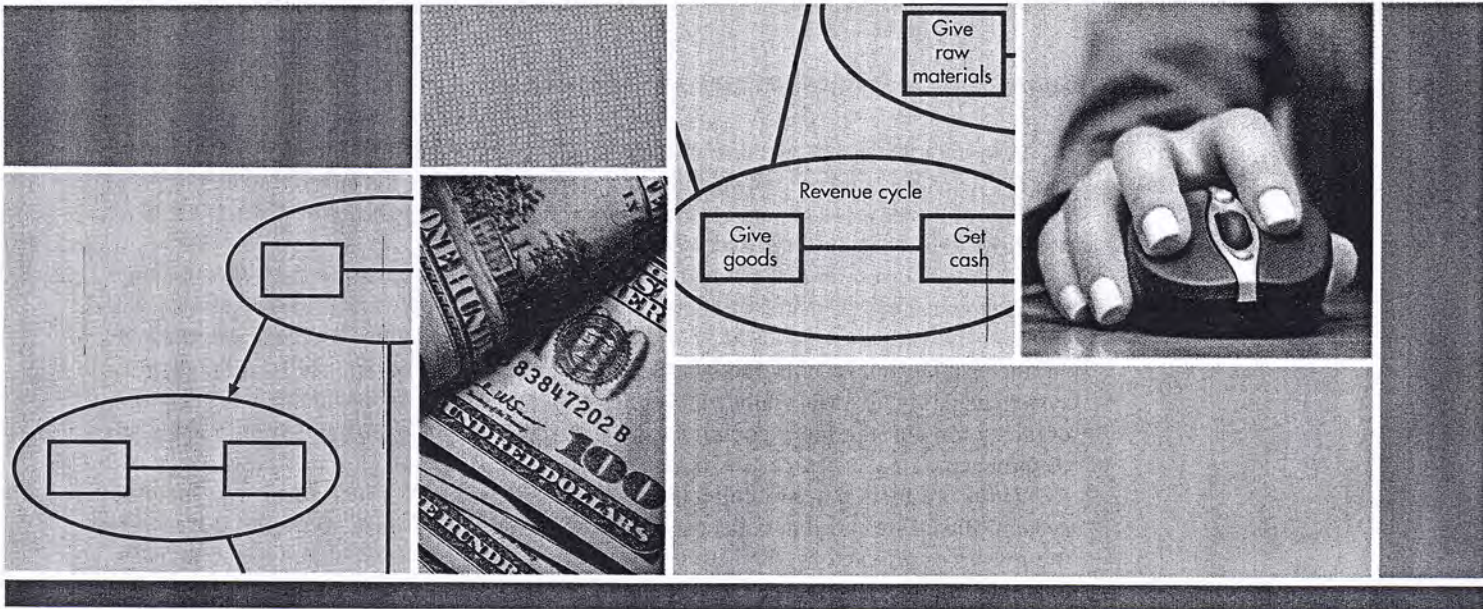
After studying this chapter, you should be able to:

1. Distinguish data from information, discuss the characteristics of useful information, and explain how to determine the value of information.
2. Explain the decisions an organization makes and the information needed to make them.
3. Identify the information that passes between internal and external parties and an AIS.
4. Describe the major business processes present in most companies.
5. Explain what an accounting information system (AIS) is and describe its basic functions.
6. Discuss how an AIS can add value to an organization.
7. Explain how an AIS and corporate strategy affect each other.
8. Explain the role an AIS plays in a company's value chain.

### INTEGRATIVE CASE S&S

After working for years as a regional manager for a retail organization, Scott Parry opened his own business with Susan Gonzalez, one of his district managers, as his partner. They formed S&S to sell appliances and consumer electronics. Scott and Susan pursued a “clicks and bricks” strategy by renting a building in a busy part of town and adding an electronic storefront.

Scott and Susan invested enough money to see them through the first six months. They will hire 15 employees within the next two weeks—three to stock the shelves, four sales representatives, six checkout clerks, and two to develop and maintain the electronic storefront.



Scott and Susan will host S&S's grand opening in five weeks. To meet that deadline, they have to address the following important issues:

1. What decisions do they need to make to be successful and profitable? For example:
  - a. How should they price products to be competitive yet earn a profit?
  - b. Should they extend credit, and, if so, on what terms? How can they accurately track what customers owe and pay?
  - c. How should they hire, train, and supervise employees? What compensation and benefits package should they offer? How should they process payroll?
  - d. How can they track cash inflows and outflows to avoid a cash squeeze?
  - e. What is the appropriate product mix? What inventory quantities should they carry, given their limited showroom space?
2. What information do Scott and Susan need to make those decisions?
  - a. What information do the external entities they interact with need?
  - b. What information do management and other employees need?
  - c. How can they gather, store, and disseminate that information?
3. What business processes are needed, and how should they be carried out?
4. What functionality should be provided on the Web site?

Although Scott and Susan could use an educated guess or "gut feeling" to make these decisions, they know they can make better decisions if they obtain additional information. A well-designed *accounting information system (AIS)* can solve these issues and provide the information they need to make any remaining decisions.

## Introduction

We begin this chapter by explaining important terms and discussing the kinds of information that organizations need and the business processes used to produce that information. We continue with an exploration of what an accounting information system (AIS) is, how an AIS adds value to an organization, how an AIS and corporate strategy affect each other, and the role of the AIS in the value chain.

A *system* is a set of two or more interrelated components that interact to achieve a goal. Most systems are composed of smaller subsystems that support the larger system. For example, a college of business is a system composed of various departments, each of which is a subsystem. Moreover, the college itself is a subsystem of the university.

Each subsystem is designed to achieve one or more organizational goals. Changes in subsystems cannot be made without considering the effect on other subsystems and on the system as a whole. *Goal conflict* occurs when a subsystem is inconsistent with the goals of another subsystem or with the system as a whole. *Goal congruence* occurs when a subsystem achieves its goals while contributing to the organization's overall goal. The larger the organization and the more complicated the system, the more difficult it is to achieve goal congruence.

*Data* are facts that are collected, recorded, stored, and processed by an information system. Businesses need to collect several kinds of data, such as the activities that take place, the resources affected by the activities, and the people who participate in the activity. For example, the business needs to collect data about a sale (date, total amount), the resource sold (good or service, quantity sold, unit price), and the people who participated (customer, salesperson).

*Information* is data that have been organized and processed to provide meaning and improve the decision-making process. As a rule, users make better decisions as the quantity and quality of information increase.

However, there are limits to the amount of information the human mind can absorb and process. *Information overload* occurs when those limits are passed, resulting in a decline in decision-making quality and an increase in the cost of providing that information. Information system designers use *information technology (IT)* to help decision makers more effectively filter and condense information. For example, Walmart has over 500 terabytes (trillions of bytes) of data in its data warehouse. That is equivalent to 2,000 miles of bookshelves, or about 100 million digital photos. Walmart has invested heavily in IT so it can effectively collect, store, analyze, and manage data to provide useful information.

The *value of information* is the benefit produced by the information minus the cost of producing it. Benefits of information are reduced uncertainty, improved decisions, and improved ability to plan and schedule activities. The costs are the time and resources spent to produce and distribute the information. Information costs and benefits can be difficult to quantify, and it is difficult to determine the value of information before it has been produced and utilized. Nevertheless, the expected value of information should be calculated as effectively as possible so that the costs of producing the information do not exceed its benefits.

To illustrate the value of information, consider the case of 7-Eleven. In 1973, a Japanese company licensed the very successful 7-Eleven name from Southland Corporation. As it opened its stores, 7-Eleven Japan invested heavily in IT, but the U.S. stores did not. Each 7-Eleven store in Japan was given a computer that:

- Keeps track of the 3,000 items sold in each store and determines what products are moving, at what time of day, and under what weather conditions.
- Keeps track of what and when customers buy to make sure it has in stock the products most frequently purchased.
- Orders sandwiches and rice dishes from suppliers automatically. Orders are placed and filled three times a day so that stores always have fresh food. In addition, 7-Eleven allows its suppliers to access sales data in their computers so that they can forecast demand.
- Coordinates deliveries with suppliers. This reduces deliveries from 34 to 12 a day, resulting in less clerical receiving time.
- Prepares a color graphic display that indicates which store areas contribute the most to sales and profits.

Average daily sales of 7-Eleven Japan were 30% higher and its operating margins almost double those of its closest competitor. What happened to Southland and its 7-Eleven stores in the United States? Profits declined, and Southland eventually had to file for bankruptcy. Who came to the company's rescue? Along with its parent company, 7-Eleven Japan purchased 64% of Southland.

Table 1-1 presents seven characteristics that make information useful and meaningful.

**TABLE 1-1** Characteristics of Useful Information

Relevant	Reduces uncertainty, improves decision making, or confirms or corrects prior expectations.
Reliable	Free from error or bias; accurately represents organization events or activities.
Complete	Does not omit important aspects of the events or activities it measures.
Timely	Provided in time for decision makers to make decisions.
Understandable	Presented in a useful and intelligible format.
Verifiable	Two independent, knowledgeable people produce the same information.
Accessible	Available to users when they need it and in a format they can use.

## Information Needs and Business Processes

All organizations need information in order to make effective decisions. In addition, all organizations have certain business processes that they are continuously engaged in. A *business process* is a set of related, coordinated, and structured activities and tasks that are performed by a person or by a computer or a machine, and that help accomplish a specific organizational goal.

To make effective decisions, organizations must decide what decisions they need to make, what information they need to make the decisions, and how to gather and process the data needed to produce the information. This data gathering and processing is often tied to the basic business processes in an organization. To illustrate the process of identifying information needs and business processes, let's return to our case study of S&S.

### Information Needs

Scott and Susan decide they must understand how S&S functions before they can identify the information they need to manage S&S effectively. Then they can determine the types of data and procedures they will need to collect and produce that information. They created Table 1-2 to summarize part of their analysis. It lists S&S's basic business processes, some key decisions that need to be made for each process, and information they need to make the decisions.

Scott and Susan realize that the list is not exhaustive, but they are satisfied that it provides a good overview of S&S. They also recognize that not all the information needs listed in the right-hand column will be produced internally by S&S. Information about payment terms for merchandise purchases, for example, will be provided by vendors. Thus, S&S must effectively integrate external data with internally generated data so that Scott and Susan can use both types of information to run S&S.

S&S will interact with many external parties, such as customers, vendors, and governmental agencies, as well as with internal parties such as management and employees. To get a better handle on the more important interactions with these parties, they prepared Figure 1-1.

### Business Processes

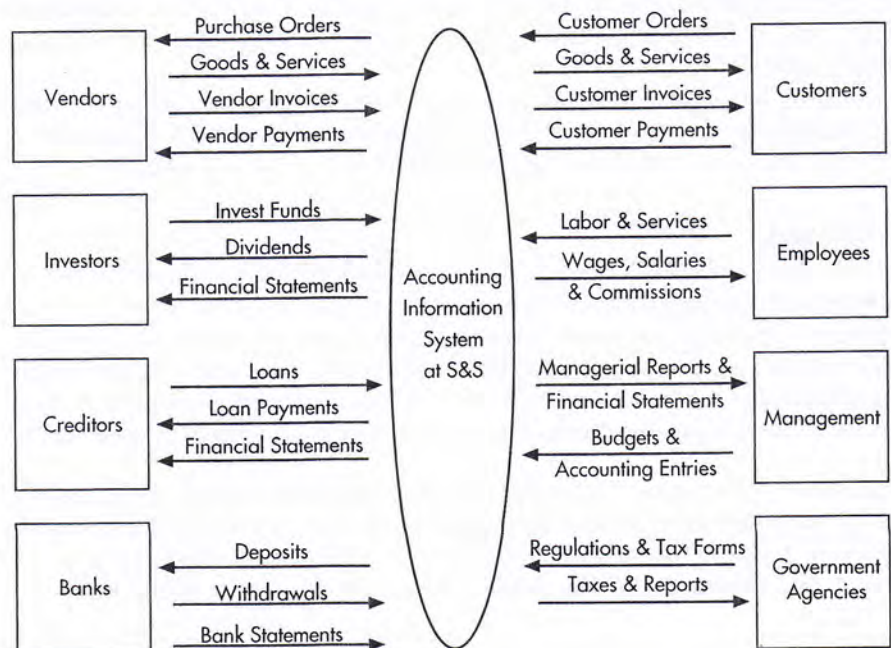
Scott decides to reorganize the business processes listed in Table 1-2 into groups of related transactions. A *transaction* is an agreement between two entities to exchange goods or services or any other event that can be measured in economic terms by an organization. Examples include selling goods to customers, buying inventory from suppliers, and paying employees. The process that begins with capturing transaction data and ends with informational output, such as the financial statements, is called *transaction processing*. Transaction processing is covered in more depth in Chapter 2.

Many business activities are pairs of events involved in a *give-get exchange*. Most organizations engage in a small number of give-get exchanges, but each type of exchange happens many times. For example, S&S will have thousands of sales to customers every year in exchange for cash. Likewise, S&S will continuously buy inventory from suppliers in exchange for cash.

**TABLE 1-2 Overview of S&S's Business Processes, Key Decisions, and Information Needs**

Business Processes	Key Decisions	Information Needs
Acquire capital	How much Find investors or borrow funds If borrowing, obtaining best terms	Cash flow projections Pro forma financial statements Loan amortization schedule
Acquire building and equipment	Size of building Amount of equipment Rent or buy Location How to depreciate	Capacity needs Building and equipment prices Market study Tax tables and depreciation regulations
Hire and train employees	Experience requirements How to assess integrity and competence of applicants How to train employees	Job descriptions Applicant job history and skills
Acquire inventory	What models to carry How much to purchase How to manage inventory (store, control, etc.) Which vendors	Market analyses Inventory status reports Vendor performance
Advertising and marketing	Which media Content	Cost analyses Market coverage
Sell merchandise	Markup percentage Offer in-house credit Which credit cards to accept	Pro forma income statement Credit card costs Customer credit status
Collect payments from customers	If offering credit, what terms How to handle cash receipts	Customer account status Accounts receivable aging report Accounts receivable records
Pay employees	Amount to pay Deductions and withholdings Process payroll in-house or use outside service	Sales (for commissions) Time worked (hourly employees) W-4 forms Costs of external payroll service
Pay taxes	Payroll tax requirements Sales tax requirements	Government regulations Total wage expense Total sales
Pay vendors	Whom to pay When to pay How much to pay	Vendor invoices Accounts payable records Payment terms

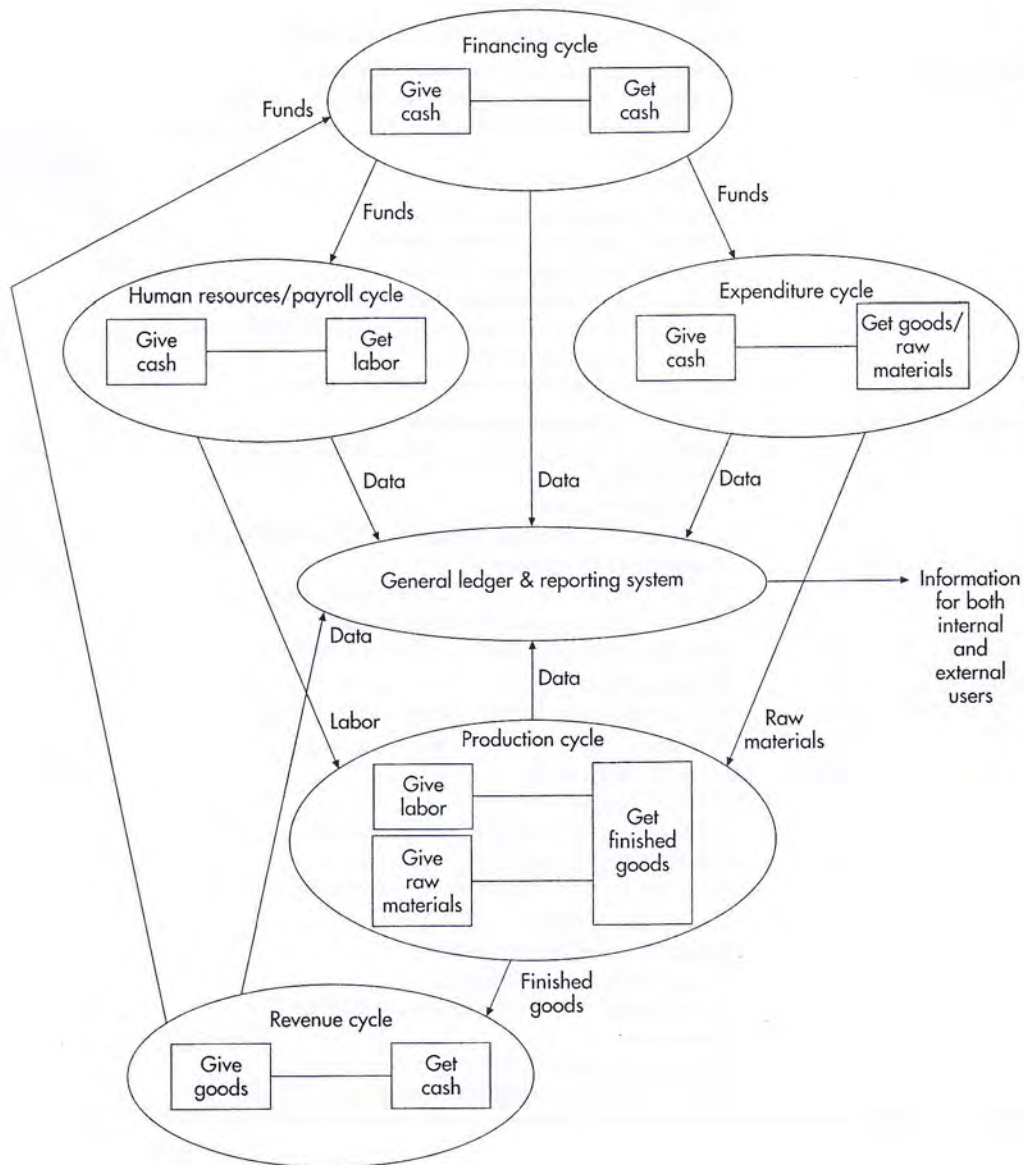
**FIGURE 1-1**  
Interactions Between  
S&S and External and  
Internal Parties



These exchanges can be grouped into five major *business processes or transaction cycles*:

- The *revenue cycle*, where goods and services are sold for cash or a future promise to receive cash. This cycle is discussed in Chapter 12.
- The *expenditure cycle*, where companies purchase inventory for resale or raw materials to use in producing products in exchange for cash or a future promise to pay cash. This cycle is discussed in Chapter 13.
- The *production or conversion cycle*, where raw materials are transformed into finished goods. This cycle is discussed in Chapter 14.
- The *human resources/payroll cycle*, where employees are hired, trained, compensated, evaluated, promoted, and terminated. This cycle is discussed in Chapter 15.
- The *financing cycle*, where companies sell shares in the company to investors and borrow money and where investors are paid dividends and interest is paid on loans.

These cycles process a few related transactions repeatedly. For example, most revenue cycle transactions are either selling goods or services to customers or collecting cash for those sales. Figure 1-2 shows the main transaction cycles and the give-get exchange inherent in each cycle.



**FIGURE 1-2**  
The AIS and Its Subsystems

These basic give-get exchanges are supported by a number of other business activities. For example, S&S may need to answer a number of customer inquiries and check inventory levels before it can make a sale. Likewise, it may have to check customer credit before a credit sale is made. Accounts receivable will have to be increased each time a credit sale is made and decreased each time a customer payment is received. Table 1-3 lists the major activities in each transaction cycle.

**TABLE 1-3 Common Cycle Activities**

Transaction Cycle	Major Activities in the Cycle
Revenue	<ul style="list-style-type: none"> <li>Receive and answer customer inquiries</li> <li>Take customer orders and enter them into the AIS</li> <li>Approve credit sales</li> <li>Check inventory availability</li> <li>Initiate back orders for goods out of stock</li> <li>Pick and pack customer orders</li> <li>Ship goods to customers or perform services</li> <li>Bill customers for goods shipped or services performed</li> <li>Update (increase) sales and accounts receivable</li> <li>Receive customer payments and deposit them in the bank</li> <li>Update (reduce) accounts receivable</li> <li>Handle sales returns, discounts, allowances, and bad debts</li> <li>Prepare management reports</li> <li>Send appropriate information to the other cycles</li> </ul>
Expenditure	<ul style="list-style-type: none"> <li>Request that goods and services be purchased</li> <li>Prepare, approve, and send purchase orders to vendors</li> <li>Receive goods and services and complete a receiving report</li> <li>Store goods</li> <li>Receive vendor invoices</li> <li>Update (increase) accounts payable</li> <li>Approve vendor invoices for payment</li> <li>Pay vendors for goods and services</li> <li>Update (reduce) accounts payable</li> <li>Handle purchase returns, discounts, and allowances</li> <li>Prepare management reports</li> <li>Send appropriate information to the other cycles</li> </ul>
Human Resources/Payroll	<ul style="list-style-type: none"> <li>Recruit, hire, and train new employees</li> <li>Evaluate employee performance and promote employees</li> <li>Discharge employees</li> <li>Update payroll records</li> <li>Collect and validate time, attendance, and commission data</li> <li>Prepare and disburse payroll</li> <li>Calculate and disburse taxes and benefit payments</li> <li>Prepare employee and management reports</li> <li>Send appropriate information to the other cycles</li> </ul>
Production	<ul style="list-style-type: none"> <li>Design products</li> <li>Forecast, plan, and schedule production</li> <li>Request raw materials for production</li> <li>Manufacture products</li> <li>Store finished products</li> <li>Accumulate costs for products manufactured</li> <li>Prepare management reports</li> <li>Send appropriate information to the other cycles</li> </ul>
Financing	<ul style="list-style-type: none"> <li>Forecast cash needs</li> <li>Sell stock/securities to investors</li> <li>Borrow money from lenders</li> <li>Pay dividends to investors and interest to lenders</li> <li>Retire debt</li> <li>Prepare management reports</li> <li>Send appropriate information to the other cycles</li> </ul>

Notice that the last activity listed in Table 1-3 for each transaction cycle is “Send appropriate information to the other cycles.” Figure 1-2 shows how these various transaction cycles relate to one another and interface with the *general ledger and reporting system*, which is used to generate information for both management and external parties. The general ledger and reporting system is discussed in more depth in Chapter 16.

In many accounting software packages, the various transaction cycles are implemented as separate modules. Not every organization needs to implement every module. Retail stores like S&S, for example, do not have a production cycle and would not implement that module. Moreover, some types of organizations have unique requirements. Financial institutions, for example, have demand deposit and installment-loan cycles that relate to transactions involving customer accounts and loans, respectively. In addition, the nature of a given transaction cycle differs across different types of organizations. For example, the expenditure cycle of a service company, such as a public accounting or a law firm, does not involve processing transactions related to the purchase, receipt, and payment for merchandise that will be resold to customers.

Each transaction cycle can include many different business processes or activities. Each business process can be relatively simple or quite complex. Focus 1-1 shows how SA Kargo’s attention to continuously improving its business processes has helped it expand its operations globally.



## Information Systems Are Key to Success at SA Kargo Sdn Bhd

SA Kargo Sdn Bhd, a Malaysian freight-forwarding company, was registered as a private limited company in 1991. The company started its operations as a small-scale business with minimum financing. After more than a decade of continuous commitment to its mission of becoming an internationally recognized freight forwarder, the company has successfully expanded its operations to seven major ports in Malaysia, placing the company as one of the main players in the shipping, transportation, and warehousing industry. The company has also spread its operations to the United Kingdom and the United States.

The strength of the company lies in its ability to provide complete logistic services that include transportation (via air, land, and sea), packing and removals, and express courier services. With a strong staff of 105 people, the company has embarked on more challenging jobs and has successfully secured contracts with government bodies and agencies and with companies in various industries, including textiles, computers, electronics, leather, automobiles, and aviation.

The success of SA Kargo lies in the information systems it utilizes. Appropriate information systems are fundamental in the design of innovative solutions that enable clients to streamline their operations, improve efficiencies, and maximize service levels. To this end, the company has adopted three main systems that address its main operations and costing process:

- **A customs information system.** This system is provided by the Malaysian Customs Department for the purpose of online customs declaration. The system eliminates the need for paper-based forms, which the company previously had to purchase at a cost from the

National Printing Agency. This has resulted in significant cost savings to the company.

- **A global positioning system (GPS).** This system enables the monitoring and control of transport vehicles. The movement of each vehicle can be tracked at any time during the transportation of goods, and the system can provide accurate information to executives and clients. The system also provides a means of control whereby the company can monitor the fuel consumption of each vehicle. By using this system, the company can check fuel consumption against the distance traveled for each shipment, and therefore any inconsistencies will be highlighted. This system prevents employees from stealing fuel or using the vehicles for personal use. The system also offers additional safety features, including a panic button that will automatically alert the company should there be any emergency or vehicle breakdown.
- **An office automation system (OAS).** This is a job-costing system that enables employees to create job numbers and record shipment data. The system enables executives to monitor costs and the movement of each shipment and provides the company with initial profit and loss projections. The system provides data on a real-time basis.

With the strategic implementation of current technologies, SA Kargo has been able to establish partnerships with reputable agents and partners in the United States and Europe. With these partnerships, the company successfully carries out its business activities on a global front while at the same time providing local businesses with immediate access to international markets.

After preparing Tables 1-2 and 1-3 and Figures 1-1 and 1-2, Scott and Susan believe that they understand S&S well enough to begin shopping for an information system. Susan recalled a previous employer that had several separate information systems, because their software was not designed to accommodate the information needs of all managers. She also vividly recalled attending one meeting where she witnessed the negative effects of having multiple systems. The head of marketing had one report on year-to-date sales by product, the production manager had a different report that contained different sales figures, and the controller's report, which was produced by the general ledger system, had yet a third version of year-to-date sales. Over an hour was wasted trying to reconcile those different reports! Susan vowed that she would make sure that S&S did not ever find itself in such a mess. She would make sure that any system selected would have the capability to integrate both financial and nonfinancial data about S&S's various business processes so that everyone could pull information from the same system.

## Accounting Information Systems

It has often been said that accounting is the language of business. If that is the case, then an *accounting information system (AIS)* is the intelligence—the information-providing vehicle—of that language.

Accounting is a data identification, collection, and storage process as well as an information development, measurement, and communication process. By definition, accounting is an information system, since an AIS collects, records, stores, and processes accounting and other data to produce information for decision makers. This is illustrated in Figure 1-3.

An AIS can be a paper-and-pencil manual system, a complex system using the latest in IT, or something in between. Regardless of the approach taken, the process is the same. The AIS must collect, enter, process, store, and report data and information. The paper and pencil or the computer hardware and software are merely the tools used to produce the information.

This text does not distinguish an AIS from other information systems. Instead, our viewpoint is that the AIS can and should be the organization's primary information system and that it provides users with the information they need to perform their jobs.

There are six components of an AIS:

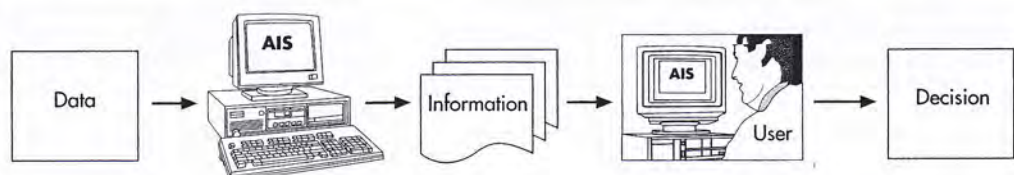
1. The *people* who use the system
2. The *procedures and instructions* used to collect, process, and store data
3. The *data* about the organization and its business activities
4. The *software* used to process the data
5. The *information technology infrastructure*, including the computers, peripheral devices, and network communications devices used in the AIS
6. The *internal controls and security measures* that safeguard AIS data

These six components enable an AIS to fulfill three important business functions:

1. Collect and store data about organizational activities, resources, and personnel. Organizations have a number of business processes, such as making a sale or purchasing raw materials, which are repeated frequently.
2. Transform data into information so management can plan, execute, control, and evaluate activities, resources, and personnel. Decision making is discussed in detail later in this chapter.
3. Provide adequate controls to safeguard the organization's assets and data. Control concepts are discussed in detail in Chapters 5–11.

Since accounting data comes from an AIS, AIS knowledge and skills are critical to an accountant's career success. Interacting with an AIS is one of the most important activities that accountants perform. Other important AIS-related activities include designing internal control

**FIGURE 1-3**  
An AIS Processes Data to Produce Information for Decision Makers



systems and business process improvements, topics covered in detail in the book. Focus 1-2 explains a specialty to designate that certain CPAs have an in-depth knowledge of AIS topics.

### How an AIS Can Add Value to an Organization

A well-designed AIS can add value to an organization by:

1. **Improving the quality and reducing the costs of products or services.** For example, an AIS can monitor machinery so operators are notified immediately when performance falls outside acceptable quality limits. This helps maintain product quality, reduces waste, and lowers costs.
2. **Improving efficiency.** For example, timely information makes a just-in-time manufacturing approach possible, as it requires constant, accurate, up-to-date information about raw materials inventories and their locations.
3. **Sharing knowledge.** Sharing knowledge and expertise can improve operations and provide a competitive advantage. For example, CPA firms use their information systems to share best practices and to support communication between offices. Employees can search the corporate database to identify experts to provide assistance for a particular client; thus, a CPA firm's international expertise can be made available to any local client.
4. **Improving the efficiency and effectiveness of its supply chain.** For example, allowing customers to directly access inventory and sales order entry systems can reduce sales and marketing costs, thereby increasing customer retention rates.
5. **Improving the internal control structure.** An AIS with the proper internal control structure can protect systems from fraud, errors, system failures, and disasters.
6. **Improving decision making.** Improved decision making is vitally important and is discussed below in more detail.



### CITP—An IT Specialty Designation for CPAs

The American Institute of Certified Public Accountants (AICPA) offers several specialty designations for CPAs. The CITP (Certified Information Technology Professional) designation reflects the AICPA's recognition of the importance of information technology and its interrelationship with accounting. A CITP possesses a broad range of technological knowledge and understands how organizations use IT to achieve their business objectives.

There are many reasons to earn the CITP certification:

- Because only CPAs can be CITPs, this certification further differentiates you from others in the marketplace.
- It affirms your value as an IT specialist and increases your value to your employer or clients.
- It is a great "calling card" for IT people who want to be leaders in industry, public practice, government, or academia.
- It opens the doors to new technology-related roles and opportunities.
- Automatic membership in the IT Section, which allows you to meet, share best practices, network, and communicate with other CITPs. You can also receive monthly CITP newsletters and other communications, attend monthly CITP Webinars, and access exclusive CITP resources and content on the IT Center Web site.

To qualify for the CITP designation, you must be a CPA and a member of the AICPA. You must earn 100 points in the areas of business experience, lifelong learning, and an optional exam. Candidates must earn a minimum of 15 points, up to a maximum of 75 points, in the area of business experience. The number of points awarded depends on the number of hours spent working in the following areas in the three-year period preceding application for the CITP designation:

- IT Strategic Planning
- Information Systems Management
- Systems Architecture
- Business Applications and E-Business
- Security, Privacy, and Contingency Planning
- Systems Development, Acquisition, and Project Management
- Systems Auditing and Internal Control
- Databases and Database Management

You must also earn a minimum of 30 points, up to a maximum of 70 points, in lifelong learning, which includes continuing education, additional degrees, and obtaining or maintaining other technology-related certifications.

Candidates who have earned at least 60 points in business experience and lifelong learning can earn 40 points by passing an exam that covers the eight previously mentioned topical areas.

Decision making is a complex, multistep activity: identify the problem, collect and interpret information, evaluate ways to solve the problem, select a solution methodology, and implement the solution. An AIS can provide assistance in all phases of decision making. Reports can help to identify potential problems. Decision models and analytical tools can be provided to users. Query languages can gather relevant data to help make the decision. Various tools, such as graphical interfaces, can help the decision maker interpret decision model results, evaluate them, and choose among alternative courses of action. In addition, the AIS can provide feedback on the results of actions.

An AIS can help improve decision making in several ways:

- It can identify situations requiring management action. For example, a cost report with a large variance might stimulate management to investigate and, if necessary, take corrective action.
- It can reduce uncertainty and thereby provide a basis for choosing among alternative actions.
- It can store information about the results of previous decisions, which provides valuable feedback that can be used to improve future decisions. For example, if a company tries a particular marketing strategy and the information gathered indicates that it did not succeed, the company can use that information to select a different marketing strategy.
- It can provide accurate information in a timely manner. For example, Walmart has an enormous database that contains detailed information about sales transactions at each of its stores. It uses this information to optimize the amount of each product carried at each store.
- It analyzes sales data to discover items that are purchased together, and it uses such information to improve the layout of merchandise to encourage additional sales of related items. In a similar vein, Amazon.com uses its database of sales activity to suggest additional books for customers to purchase.

Focus 1-3 discusses how information technology adds value to UPS.



## The Use of Technology by UPS

UPS used to invest heavily in training its employees to perform tasks in less time but spent little money on IT. Today, because of the value added to its business, UPS spends well over \$1 billion a year on IT. That is much more than it spends on trucks and about as much as it spends on airplanes. UPS has 4,700 employees devoted to developing and maintaining proprietary software and a Web site that 20 million people visit each day. Its 15 mainframe computers and 9,000 servers allow UPS customers to control each shipment (16 million a day) from the time a delivery order is initiated to the time it arrives at its destination. Here is how the system works:

- Customers use UPS software or the UPS Web site to initiate a delivery. They create, print, and attach labels to their shipment containing detailed sender information and the time the shipment should arrive.
- They schedule a pickup time electronically.
- The UPS system routes the label information to the distribution center closest to the shipment's destination.
- At the distribution center, proprietary software uses the destination, desired arrival time, traffic and weather conditions, and street information (one-way streets, etc.) to create the most efficient delivery route. Drivers have handheld computers with a global positioning system (GPS) that guide their routes.

- The system creates a label that specifies where to put the shipment on the delivery truck so the earliest shipments are nearest the driver. Drivers average 100 pickups and deliveries a day, and boxes loaded out of order can delay the driver up to 30 minutes.
- Customers can use the UPS Web site to reroute or track their shipment. The GPS allows UPS to predict accurately the shipment's approximate arrival time.
- The handheld computer is programmed to beep at the driver if a shipment is delivered to the wrong address or forgotten.

UPS's commitment to IT has produced dramatic results. Recent system improvements allowed drivers to make seven to nine more stops each day, reduced the number of miles UPS drives each year by 1.9 million, and saved over \$600 million per year in operating costs.

However, UPS is not congratulating itself on how well it has used IT to improve its business. The UPS system is a work in progress. UPS continues to innovate and find ways to use IT to become even more efficient and better serve the customer.

Source: Corey Dade, "How UPS Went from Low-Tech to an IT Power—and Where It's Headed Next," *The Wall Street Journal*, July 24, 2006, R4.

## The AIS and Corporate Strategy

Since most organizations have limited resources, it is important to identify the AIS improvements likely to yield the greatest return. Making a wise decision requires an understanding of the organization's overall business strategy. To illustrate, consider the results of a *CIO* magazine survey of five hundred Chief Information Officers. Asked to identify the three most important skill sets for a CIO, over 75% put strategic thinking and planning on their list.

Figure 1-4 shows three factors that influence the design of an AIS: developments in IT, business strategy, and organizational culture. It is also important to recognize that the design of the AIS can also influence the organization's culture by controlling the flow of information within the organization. For example, an AIS that makes information easily accessible and widely available is likely to increase pressures for more decentralization and autonomy.

IT developments can affect business strategy. For example, the Internet has profoundly affected the way many activities are performed, significantly affecting both strategy and strategic positioning. The Internet dramatically cuts costs, thereby helping companies to implement a low-cost strategy. If every company used the Internet to adopt a low-cost strategy, then the effects might be problematic. Indeed, one possible outcome may be intense price competition among firms, with the likely result that most of the cost savings provided by the Internet get passed on to the industry's customers, rather than being retained in the form of higher profits. Moreover, because every company can use the Internet to streamline its activities, a company is unlikely to gain a sustainable long-term competitive advantage.

Many other technological advances affect company strategy and provide an opportunity to gain a competitive advantage. An example is *predictive analysis*, which uses data warehouses and complex algorithms to forecast future events, based on historical trends and calculated probabilities. Predictive analysis provides an educated guess of what one may expect to see in the near future, allowing companies to make better business decisions and improve their processes. FedEx uses predictive analysis to predict, with 65% to 90% accuracy, how customers respond to price changes and new services. Blue Cross Blue Shield of Tennessee uses a neural-based predictive model to predict the health care that specific patients will need, the severity of illnesses, and organ failures. Stock market analysts are using predictive analysis to predict short-term trends in the stock market.

An organization's AIS plays an important role in helping it adopt and maintain a strategic position. Achieving a close fit among activities requires that data be collected about each activity. It is also important that the information system collect and integrate both financial and non-financial data about the organization's activities.

## The Role of the AIS in the Value Chain

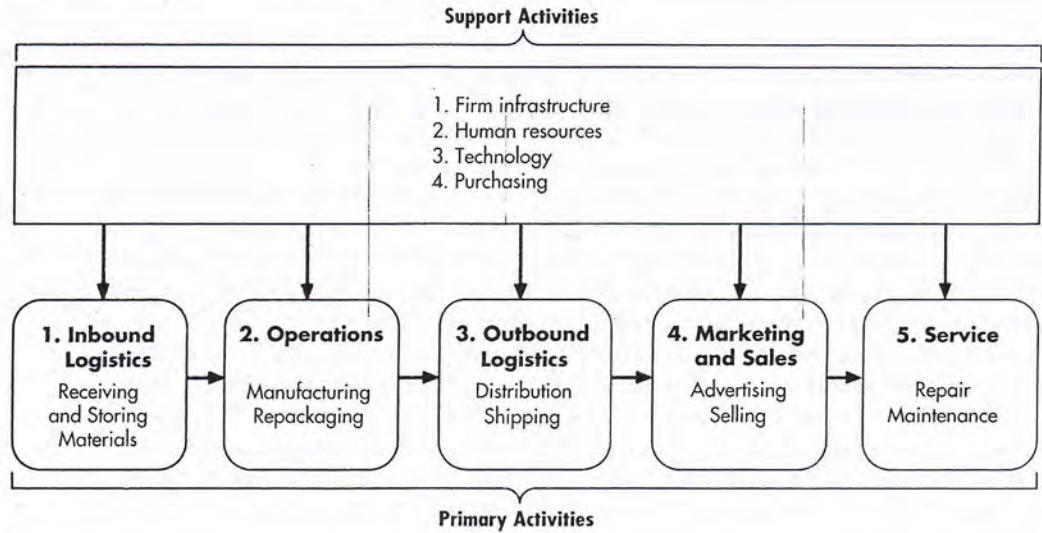
To provide value to their customers, most organizations perform a number of different activities. Figure 1-5 shows that those activities can be conceptualized as forming a *value chain* consisting of five *primary activities* that directly provide value to customers:

1. **Inbound logistics** consists of receiving, storing, and distributing the materials an organization uses to create the services and products it sells. For example, an automobile manufacturer receives, handles, and stores steel, glass, and rubber.
2. **Operations** activities transform inputs into final products or services. For example, assembly line activities convert raw materials into a finished car.



**FIGURE 1-4**  
Factors Influencing  
Design of the AIS

**FIGURE 1-5**  
The Value Chain



- 3. *Outbound logistics* activities distribute finished products or services to customers. An example is shipping automobiles to car dealers.
- 4. *Marketing and sales* activities help customers buy the organization's products or services. Advertising is an example of a marketing and sales activity.
- 5. *Service* activities provide post-sale support to customers. Examples include repair and maintenance services.

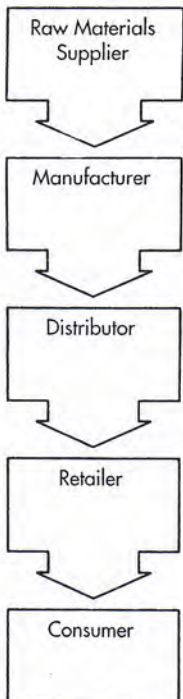
*Support activities* allow the five primary activities to be performed efficiently and effectively. They are grouped into four categories:

- 1. *Firm infrastructure* is the accounting, finance, legal, and general administration activities that allow an organization to function. The AIS is part of the firm infrastructure.
- 2. *Human resources* activities include recruiting, hiring, training, and compensating employees.
- 3. *Technology* activities improve a product or service. Examples include research and development, investments in IT, and product design.
- 4. *Purchasing* activities procure raw materials, supplies, machinery, and the buildings used to carry out the primary activities.

Using IT to redesign supply chain systems yields tremendous benefits and cost savings. For example, Tennessee Valley Authority, a power generator, reengineered its supply chain and created an enterprisewide system that provides up-to-the-minute information, rather than the "current once a day" system that it replaced. The new system replaced 20 smaller and incompatible systems, reduced head count by 89 people, and saved \$270 million in its first five years.

An organization's value chain is a part of a larger system called a *supply chain*. As shown in Figure 1-6, a manufacturing organization interacts with its suppliers and distributors. By paying attention to its supply chain, a company can improve its performance by helping the others in the supply chain to improve their performance. For example, S&S can improve its purchasing and inbound logistics activities by implementing a more efficient just-in-time inventory management system that reduces its costs and minimizes the capital tied up in inventory. S&S can reap additional benefits if it links its new systems with its suppliers so they can perform their primary value chain activities more efficiently. For example, by providing more detailed and timely information about its inventory needs, S&S suppliers can more efficiently plan their production schedules. Part of the resultant cost reduction can be passed on to S&S in the form of lower product costs.

The problems created by an ineffective supply chain are illustrated by Limited Brands. Limited experienced explosive growth, including acquisitions of other retail companies such as Victoria's Secret and Abercrombie & Fitch. These acquisitions left Limited with a tangled web of over 60 incompatible information systems. The problems came to a head one night when 400 trailers converged on a distribution center parking lot that could fit only 150 trailers. The trailers blocked traffic along all the highways around the distribution center and caused countless traffic and community



**FIGURE 1-6**  
The Supply Chain

problems. No one in Limited knew where all the trailers came from, what the merchandise was, or where it was to be sent. Chaos reigned for some time, until the merchandise could be routed to stores and other distribution centers. Limited solved many of its problems by installing a new, integrated system that greatly improved its supply chain processes and technologies. Developing the new system was not easy. Limited has over a thousand suppliers and sells its merchandise using various platforms, including retail stores, the Internet, catalogs, and third-party retailers.

## Summary and Case Conclusion

Susan and Scott reflected on what they had done to try and understand what decisions S&S would need to make and the information needed to make them. They had begun by obtaining an understanding of S&S's basic business processes and of the key decisions that must be made to operate the business effectively. They followed that with an analysis of the internal and external parties that the AIS would have to interact with and the information the AIS would have to provide them.

Since S&S is a retail merchandising company, its business processes could be described in terms of four basic transaction cycles:

1. The *revenue cycle* encompasses all transactions involving sales to customers and the collection of cash receipts for those sales.
2. The *expenditure cycle* encompasses all transactions involving the purchase of and payment for the merchandise sold by S&S, as well as other services it consumes, such as rent and utilities.
3. The *human resources/payroll cycle* encompasses all the transactions involving the hiring, training, and payment of employees.
4. The *financing cycle* encompasses all transactions involving the investment of capital in the company, borrowing money, payment of interest, and loan repayments.

These four cycles interface with the *general ledger and reporting system*, which consists of all activities related to the preparation of financial statements and other managerial reports.

Scott and Susan will need a well-designed AIS to provide the information they need to effectively plan, manage, and control their business. Their AIS must be able to process data about sales and cash receipts, purchasing and paying for merchandise and services, payroll and tax-related transactions, and acquiring and paying for fixed assets. The company's AIS must also provide the information needed to prepare financial statements.

Fortunately, there are many computer-based accounting packages available for the retail industry. As they begin looking at various software packages, however, Scott and Susan quickly learn that considerable accounting knowledge is required to choose the one that will best fit their business. Because neither has an accounting background, Scott and Susan decide that their next task will be to hire an accountant.

## Key Terms

system 24	transaction processing 25	general ledger and reporting system 29
goal conflict 24	give-get exchange 25	accounting information system (AIS) 30
goal congruence 24	business processes or transaction cycles 27	predictive analysis 33
data 24	revenue cycle 27	value chain 33
information 24	expenditure cycle 27	primary activities 33
information overload 24	production (conversion) cycle 27	support activities 34
information technology (IT) 24	human resources/payroll cycle 27	supply chain 34
value of information 24	financing cycle 27	
business process 25		
transaction 25		

# AIS IN ACTION

## Chapter Quiz

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1. Data differ from information in which way?
  - a. Data are output, and information is input.
  - b. Information is output, and data are input.
  - c. Data are meaningful bits of information.
  - d. There is no difference.
2. Which of the following is NOT a characteristic that makes information useful?
  - a. It is reliable.
  - b. It is timely.
  - c. It is inexpensive.
  - d. It is relevant.
3. Which of the following is a primary activity in the value chain?
  - a. purchasing
  - b. accounting
  - c. post-sales service
  - d. human resource management
4. Which transaction cycle includes interactions between an organization and its suppliers?
  - a. revenue cycle
  - b. expenditure cycle
  - c. human resources/payroll cycle
  - d. general ledger and reporting system
5. Which of the following is NOT a means by which information improves decision making?
  - a. increases information overload
  - b. reduces uncertainty
  - c. provides feedback about the effectiveness of prior decisions
  - d. identifies situations requiring management action
6. In the value chain concept, upgrading IT is considered what kind of activity?
  - a. primary activity
  - b. support activity
  - c. service activity
  - d. structured activity
7. In which cycle does a company ship goods to customers?
  - a. production cycle
  - b. financing cycle
  - c. revenue cycle
  - d. expenditure cycle
8. Which of the following is a function of an AIS?
  - a. reducing the need to identify a strategy and strategic position
  - b. transforming data into useful information
  - c. allocating organizational resources
  - d. automating all decision making
9. A firm, its suppliers, and its customers collectively form which of the following?
  - a. supply chain
  - b. value chain
  - c. ERP system
  - d. AIS
10. A report telling how well all approved vendors have performed in the prior 12 months is information that is MOST needed in which business process?
  - a. paying vendors
  - b. acquiring inventory
  - c. selling merchandise
  - d. paying employees

## Discussion Questions

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- 1.1. The value of information is the difference between the benefits realized from using that information and the costs of producing it. Would you, or any organization, ever produce information if its expected costs exceeded its benefits? If so, provide some examples. If not, why not?
- 1.2. Can the characteristics of useful information listed in Table 1-1 be met simultaneously? Or does achieving one mean sacrificing another?

- 1.3. You and a few of your classmates decided to become entrepreneurs. You came up with a great idea for a new mobile phone application that you think will make lots of money. Your business plan won second place in a local competition, and you are using the \$10,000 prize to support yourselves as you start your company.
- Identify the key decisions you need to make to be successful entrepreneurs, the information you need to make them, and the business processes you will need to engage in.
  - Your company will need to exchange information with various external parties. Identify the external parties, and specify the information received from and sent to each of them.
- 1.4. How do an organization's business processes and lines of business affect the design of its AIS? Give several examples of how differences among organizations are reflected in their AIS.
- 1.5. Figure 1-4 shows that organizational culture and the design of an AIS influence one another. What does this imply about the degree to which an innovative system developed by one company can be transferred to another company?
- 1.6. Figure 1-4 shows that developments in IT affect both an organization's strategy and the design of its AIS. How can a company determine whether it is spending too much, too little, or just enough on IT?
- 1.7. Apply the value chain concept to S&S. Explain how it would perform the various primary and support activities.
- 1.8. Information technology enables organizations to easily collect large amounts of information about employees. Discuss the following issues:
- To what extent should management monitor employees' e-mail?
  - To what extent should management monitor which Web sites employees visit?
  - To what extent should management monitor employee performance by, for example, using software to track keystrokes per hour or some other unit of time? If such information is collected, how should it be used?
  - Should companies use software to electronically "shred" all traces of e-mail?
  - Under what circumstances and to whom is it appropriate for a company to distribute information it collects about the people who visit its Web site?

## Problems

- 1.1. Information technology is continually changing the nature of accounting and the role of accountants. Write a two-page report describing what you think the nature of the accounting function and the accounting information system in a large company will be like in the year 2020.
- 1.2. The annual report is considered by some to be the single most important printed document that companies produce. In recent years, annual reports have become large documents. They now include such sections as letters to the stockholders, descriptions of the business, operating highlights, financial review, management discussion and analysis, a discussion of company internal controls, segment reporting, inflation data, and the basic financial statements. The expansion has been due in part to a general increase in the degree of sophistication and complexity in accounting standards and disclosure requirements for financial reporting.



The expansion also is reflective of the change in the composition and level of sophistication of users. Current users include not only stockholders but also financial and securities analysts, potential investors, lending institutions, stockbrokers, customers, employees, and—whether the reporting company likes it or not—competitors. Thus, a report that was originally designed as a device for communicating basic financial information now attempts to meet the diverse needs of an ever-expanding audience.

Users hold conflicting views on the value of annual reports. Some argue that they fail to provide enough information, whereas others believe that disclosures in annual reports

have expanded to the point where they create information overload. Others argue that the future of most companies depends on acceptance by the investing public and by its customers; therefore, companies should take this opportunity to communicate well-defined corporate strategies.

### Required

- a. Identify and discuss the basic factors of communication that must be considered in the presentation of the annual report.
  - b. Discuss the communication problems a corporation faces in preparing the annual report that result from the diversity of the users being addressed.
  - c. Select two types of information found in an annual report, other than the financial statements and accompanying footnotes, and describe how they are helpful to the users of annual reports.
  - d. Discuss at least two advantages and two disadvantages of stating well-defined corporate strategies in the annual report.
  - e. Evaluate the effectiveness of annual reports in fulfilling the information needs of the following current and potential users: shareholders, creditors, employees, customers, and financial analysts.
  - f. Annual reports are public and accessible to anyone, including competitors. Discuss how this affects decisions about what information should be provided in annual reports. (*CMA Examination, adapted*)
- 1.3. United Services Automotive Association (USAA) is one of the largest diversified financial services companies in the United States, with close to \$75 billion in assets under management. One reason for its success is the use of IT to lower costs and improve customer service. USAA operates one of the most advanced and successful information systems in the world. It communicates with its widely scattered customers, mostly military officers and their families, primarily by e-mail, phone, and its Web site.

Early on, USAA made a strategic choice to become one of the more technology-intensive companies in the world. It views IT as a strategic weapon and uses it in several ways, including the following:

- When customers call from their homes, offices, or cell phones, USAA personnel greet them personally by name. Unlike many diversified companies, a customer representative can handle inquiries and transactions about all of USAA's products using a highly integrated database.
- USAA uses its extensive database to keep track of minute details, such as which auto parts are fixed most frequently. It also uses its database to find ways to reduce claims costs. For example, USAA discovered that repair shops would rather charge up to \$300 to replace a windshield with punctures than to charge \$40 to repair it. USAA began offering to waive the deductible if the owners would repair the windshield rather than replace it.
- USAA spent extensively to develop an image-processing system that digitizes all paper documents sent in by claimants (over 25 million a year). It takes only a few keystrokes for a policy service representative to retrieve pictures of all the documents in a customer's file. The system can sort and prioritize documents so that employees are always working on the most important and urgent tasks.
- USAA offers its customers remote deposit capture using scanning technology. It was the first U.S. bank to implement a remote deposit capture application for the iPhone. The iPhone application allows customers to take pictures of the front and back of each check and submit them electronically for deposit.
- USAA is a world leader in mobile banking. Customers can use their cell phones and other mobile devices to access and execute banking, investment, stock trading, and insurance applications such as filing claims. Customers can also use USAA's two-way text messaging system to send messages and receive text alerts and real-time information. They can also access person-to-person payment applications as well as social networking and personal financial management tools connected to bank accounts. Over 70% of USAA's logins are from cell phone users.

**Required**

- Why should USAA collect data on which auto parts are fixed most frequently? What could it do with this data?
- Even though USAA offered to waive the deductible, the repair shops still managed to convince 95% of the owners to replace rather than repair their damaged windshields. How could USAA use its AIS to persuade more shop owners to repair rather than replace their windows?
- How does the image-processing system at USAA add value to the organization?
- How do the remote deposit capture and mobile banking system at USAA add value to the organization?
- Do an Internet search and find out what other advancements USAA has introduced. Write a brief paragraph on each new application or other newsworthy item you find (maximum limit of three applications or items).

**1.4. Matching**

Match the description listed in the right column with the information characteristic listed in the left column.

- |                       |   |
|-----------------------|---|
| ___ 1. Relevant       | a. The report was carefully designed so that the data contained in the report became information to the reader.   |
| ___ 2. Reliable       | b. The manager was working one weekend and needed to find some information about production requests for a certain customer. He was able to find the report on the company's network. |
| ___ 3. Complete       | c. The data in a report was checked by two clerks working independently.  |
| ___ 4. Timely         | d. An accounts receivable aging report included all customer accounts.  |
| ___ 5. Understandable | e. A report was checked by three different people for accuracy.   |
| ___ 6. Verifiable     | f. An accounts receivable aging report is used in credit-granting decisions.  |
| ___ 7. Accessible     | g. An accounts receivable aging report was received before the credit manager had to make a decision whether to extend credit to a customer.  |

- 1.5.** The Howard Leasing Company is a privately held, medium-sized business that purchases school busses and leases them to school districts, churches, charitable organizations, and other businesses. To better serve its customers and, more important, to protect its investment in the busses, Howard operates a large maintenance facility to maintain and repair leased vehicles. Howard's annual sales for last year were \$37 million, with a net income of \$2.9 million. Howard employs approximately 150 people.



You were recently hired by Howard, and you are eager to prove your worth to the company. Your supervisor just called you into her office and asked you to prepare an accounts receivable aging report as of the end of the year for use in the upcoming audit of the company's financial statements.

**Required**

- What is an accounts receivable aging report?
- Why is an accounts receivable aging report needed for an audit?
- What is an accounts receivable aging report used for in normal company operations?
- What data will you need to prepare the report?
- Where will you collect the data you need to prepare the report?
- How will you collect the necessary data for the report?



- g. What will the report look like (i.e., how will you organize the data collected to create the information your supervisor needs for the audit)? Prepare an accounts receivable aging report in Excel or another spreadsheet package.
- h. How will you distribute the report? How many copies will you make? Who should receive the copies? What security features will you implement?
- 1.6. Based on Walmart's success in the United States, many expected the company to quickly dominate the British market after it bought the Asda grocery chain in 1999. That has not happened; Walmart's market share in groceries is a little more than half that of its biggest competitor, Tesco. Initially, Tesco's sales and net income rose significantly while Walmart's sales and net income increased at a much slower rate. More recently, Walmart has made small gains in market share, and Tesco has had small decreases.

Walmart found out that Tesco is a formidable worldwide competitor. Tesco operates almost 2,400 stores in Britain in four different formats. It has a very successful operation in Central Europe, and it has expanded to the United States with Fresh & Easy stores. In Korea, Tesco's 174 stores are thriving while Walmart gave up after an eight-year effort to succeed and sold its 16 stores.

One of the biggest reasons for Tesco's success is its use of technology. In 1995, Tesco started a loyalty card program, called Clubcard, and over 80% of its shoppers are members. Shoppers fill out an application in the store and receive a plastic card and a key fob in the mail that is scanned before they make a purchase. Tesco gathers massive amounts of data about its customers' 15 million purchases each week. Sales data are analyzed and turned into information that provides Tesco with a significant competitive advantage.

As traditional advertising loses effectiveness, these large stores of data allow Tesco to find new and creative ways to market its products.

#### Required

- What kind of information do you think Tesco gathers?
  - How do you think Tesco has motivated over 22 million customers to sign up for its Clubcard program?
  - What can Tesco accomplish with the Clubcard data it collects? Think in terms of strategy and competitive advantage.
  - What are some of the disadvantages to the Clubcard program?
  - Do an Internet search to find out how Tesco is doing in comparison to Walmart and other grocers and retailers. Write a few paragraphs explaining your findings.
- 1.7. Have you ever imagined having one electronic device that does everything you would ever need? Mobile phone makers in Japan have gone beyond the imagining phase. Cell phones in Japan are becoming more versatile than ever. Newer models of cell phones contain a myriad of applications and can do many of the things that a personal computer (PC) can do. PCs are also able to function as phones. A small but growing number of professionals are trading in their laptops for handheld computers. Cell phone manufacturers in the United States and elsewhere are quickly catching up to their Japanese counterparts.

#### Required

- What commercial activities can be done with a cell phone? With a cell phone/PC combination device? What do you do when you're on your cell phone? What do you expect to be doing in five years?
  - How can businesses utilize this technology to attract more customers, sell more products, advertise their products, facilitate the sale of products, and conduct and manage their businesses more efficiently and effectively?
  - What are some problems or drawbacks you can see with using these devices in business?
- 1.8. Classify each of the following items as belonging in the revenue, expenditure, human resources/payroll, production, or financing cycle.
- Purchase raw materials
  - Pay off mortgage on a factory

- ▶ c. It is inexpensive. [Correct. This is NOT one of the information characteristics listed in Table 1-1 on page 25.]
  - d. It is relevant. [Incorrect. This is one of the information characteristics listed in Table 1-1 on page 25.]
3. Which of the following is a primary activity in the value chain?
- a. purchasing [Incorrect. This is a support activity.]
  - b. accounting [Incorrect. This is a firm infrastructure support activity.]
  - ▶ c. post-sales service [Correct. Service is a primary activity.]
  - d. human resource management [Incorrect. This is a support activity.]
4. Which transaction cycle includes interactions between an organization and its suppliers?
- a. revenue cycle [Incorrect. The revenue cycle involves interactions between an organization and its customers.]
  - ▶ b. expenditure [Correct.]
  - c. human resources/payroll cycle [Incorrect. The human resources/payroll cycle involves interactions between an organization and its employees, government, and potential hires.]
  - d. general ledger and reporting system [Incorrect. The general ledger and reporting system receives summary information from all cycles.]
5. Which of the following is NOT a means by which information improves decision making?
- ▶ a. increases information overload [Correct. Decision makers receiving too much information have difficulty incorporating all of the information into their decision framework, and, as a result, decision quality can be reduced rather than improved.]
  - b. reduces uncertainty [Incorrect. More reliable information leads to less uncertainty and thus better decisions.]
  - c. provides feedback about the effectiveness of prior decisions [Incorrect. Knowledge of effective and ineffective decisions can lead to better decisions in the future.]
  - d. identifies situations requiring management action [Incorrect. Identifying the need for management action can lead to improved decision making.]
6. In the value chain concept, upgrading IT is considered what kind of activity?
- a. primary activity [Incorrect. Investing in IT is a support activity.]
  - b. support activity [Correct. Technology activities, including investing in IT, are considered a support activity.]
  - c. service activity [Incorrect. The value chain includes only primary and support activities. A service activity is a type of primary activity.]
  - d. structured activity [Incorrect. The value chain includes only primary and support activities. A structured activity is neither a primary nor a secondary activity.]
7. In which cycle does a company ship goods to customers?
- a. production cycle [Incorrect. The production cycle involves the transformation of raw materials into finished goods.]
  - b. financing cycle [Incorrect. The financing cycle deals with interactions between an organization and its lenders and owners.]
  - ▶ c. revenue cycle [Correct. The revenue cycle involves interactions between an organization and its customers, such as shipping them goods.]
  - d. expenditure cycle [Incorrect. The expenditure cycle involves interactions between an organization and its suppliers.]
8. Which of the following is a function of an AIS?
- a. reducing the need to identify a strategy and strategic position [Incorrect. An AIS does not reduce the need to identify a strategy. It provides information to executives for the purpose of making strategic decisions.]
  - ▶ b. transforming data into useful information [Correct. This is one of the primary functions of an AIS.]

- c. Hire a new assistant controller
- d. Establish a \$10,000 credit limit for a new customer
- e. Pay for raw materials
- f. Disburse payroll checks to factory workers
- g. Record goods received from a vendor
- h. Update the allowance for doubtful accounts
- i. Decide how many units to make next month
- j. Complete a picking ticket for a customer order
- k. Record factory employee timecards
- l. Sell concert tickets
- m. Draw on line of credit
- n. Send new employees to a business ethics course
- o. Pay utility bills
- p. Pay property taxes on an office building
- q. Pay federal payroll taxes
- r. Sell a DVD player
- s. Collect payments on customer accounts
- t. Obtain a bank loan
- u. Pay sales commissions
- v. Send an order to a vendor
- w. Put purchased goods into the warehouse

### Case 1-1 Ackoff's Management Misinformation Systems

The Web site for this book contains an adaption of Russell L. Ackoff's classic article "Management Misinformation Systems" from *Management Science*. In the article, Ackoff identified five common assumptions about information systems and then explained why he disagreed with them.

#### Required

Read the five assumptions, contentions, and Ackoff's explanations. For each of the five assumptions, decide whether you agree or disagree with Ackoff's contentions. Prepare a report in which you defend your stand and explain your defense.

## AIS IN ACTION SOLUTIONS

### Quiz Key

1. Data differ from information in which way?
  - a. Data are output, and information is input. [Incorrect. Data are facts and figures that, once organized, can become information. Therefore, data are inputs, and information is output.]
  - ▶ b. Information is output, and data are input. [Correct.]
  - c. Data are meaningful bits of information. [Incorrect. Information is organized and processed data that provide meaning.]
  - d. There is no difference. [Incorrect. There is a difference. Data are unorganized facts and figures. Information is meaningful, organized, and processed data.]
2. Which of the following is NOT a characteristic that makes information useful?
  - a. It is reliable. [Incorrect. This is one of the information characteristics listed in Table 1-1 on page 25.]
  - b. It is timely. [Incorrect. This is one of the information characteristics listed in Table 1-1 on page 25.]

- ▶ c. It is inexpensive. [Correct. This is NOT one of the information characteristics listed in Table 1-1 on page 25.]
  - d. It is relevant. [Incorrect. This is one of the information characteristics listed in Table 1-1 on page 25.]
3. Which of the following is a primary activity in the value chain?
- a. purchasing [Incorrect. This is a support activity.]
  - b. accounting [Incorrect. This is a firm infrastructure support activity.]
  - ▶ c. post-sales service [Correct. Service is a primary activity.]
  - d. human resource management [Incorrect. This is a support activity.]
4. Which transaction cycle includes interactions between an organization and its suppliers?
- a. revenue cycle [Incorrect. The revenue cycle involves interactions between an organization and its customers.]
  - ▶ b. expenditure [Correct.]
  - c. human resources/payroll cycle [Incorrect. The human resources/payroll cycle involves interactions between an organization and its employees, government, and potential hires.]
  - d. general ledger and reporting system [Incorrect. The general ledger and reporting system receives summary information from all cycles.]
5. Which of the following is NOT a means by which information improves decision making?
- ▶ a. increases information overload [Correct. Decision makers receiving too much information have difficulty incorporating all of the information into their decision framework, and, as a result, decision quality can be reduced rather than improved.]
  - b. reduces uncertainty [Incorrect. More reliable information leads to less uncertainty and thus better decisions.]
  - c. provides feedback about the effectiveness of prior decisions [Incorrect. Knowledge of effective and ineffective decisions can lead to better decisions in the future.]
  - d. identifies situations requiring management action [Incorrect. Identifying the need for management action can lead to improved decision making.]
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  - b. support activity [Correct. Technology activities, including investing in IT, are considered a support activity.]
  - c. service activity [Incorrect. The value chain includes only primary and support activities. A service activity is a type of primary activity.]
  - d. structured activity [Incorrect. The value chain includes only primary and support activities. A structured activity is neither a primary nor a secondary activity.]
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  - ▶ c. revenue cycle [Correct. The revenue cycle involves interactions between an organization and its customers, such as shipping them goods.]
  - d. expenditure cycle [Incorrect. The expenditure cycle involves interactions between an organization and its suppliers.]
8. Which of the following is a function of an AIS?
- a. reducing the need to identify a strategy and strategic position [Incorrect. An AIS does not reduce the need to identify a strategy. It provides information to executives for the purpose of making strategic decisions.]
  - ▶ b. transforming data into useful information [Correct. This is one of the primary functions of an AIS.]

- c. allocating organizational resources [Incorrect. Decision makers allocate resources, and the purpose of the AIS is to provide information to the decision makers so that they can make the allocation.]
  - d. automating all decision making [Incorrect. The AIS provides information to decision makers; it is not designed to automate all decision making.]
9. A firm, its suppliers, and its customers collectively form which of the following?
- ▶ a. supply chain [Correct. The supply chain is made up of the firm, its suppliers, and customers.]
  - b. value chain [Incorrect. The value chain is made up of primary and support activities within the firm.]
  - c. ERP system [Incorrect. An ERP system integrates all aspects of an organization's activities into one system.]
  - d. AIS [Incorrect. The AIS is made up of the human and capital resources within an organization that are responsible for collecting and processing transactions and preparing financial information.]
10. A report telling how well all approved vendors have performed in the prior 12 months is information that is MOST needed in which business process?
- a. paying vendors [Incorrect. To pay a vendor, a company needs to know whether merchandise ordered was received in good condition. They do not need a 12-month history of vendor performance.]
  - ▶ b. acquiring inventory [Correct. Companies want to acquire inventory from companies that have performed well in the past. A vendor performance report would disclose whether the vendor shipped inventory on time, whether the inventory was of the requested quality, whether the prices were as agreed upon, etc.]
  - c. selling merchandise [Incorrect. A 12-month history of vendor performance is usually not very helpful in trying to sell products to customers. More important would be customer tastes and preferences, customer credit status, etc.]
  - d. paying employees [Incorrect. It is very rare for an employee's pay to be based on a 12-month history of vendor performance. More important are hours worked, annual salary, sales figures to calculate commissions, etc.]