Chapter 8

Accounting Information Systems and Business Processes: Part II

After reading this chapter, you will:

1. *Appreciate* the many ways technology is changing management's ability to monitor and control business processes across the organization.
2. *Know* the objectives, inputs, and outputs of the resource management, production, and financing processes.
3. *Understand* how business strategy affects the data that are collected in the firm's AIS and how that impacts performance measures.
4. *Be able to explain* why some organizations have special accounting information needs.
5. *Recognize* the special information needs of several different types of organizations.
6. *Understand* how companies use business process reengineering (BPR) to cut costs and improve their operational efficiency.

"Companies using lean accounting have better information for decision-making; have simple and timely reports that are clearly understood by everyone in the company; understand the true financial impact of lean changes; and focus the business around the value created for the customers."

Brian Maskell and Frances Kennedy, ''Why Do We Need Lean Accounting and How Does it Work?'' *The Journal of Corporate Accounting & Finance*, (March/April 2007), p. 59.

INTRODUCTION

In the previous chapter we identified two processes that are common to almost every organization: the sales process and the purchasing process. This chapter continues the discussion of business processes by exploring three additional processes: resource management, production, and financing. The resource management process includes human resources and fixed assets. The production manufacturing cycle entails the conversion of raw materials (another resource) into finished goods available for sale. Finally, the financing process involves the ways that organizations fund their operations. Because organizations must finance activities either through borrowing or by selling shares of ownership, we discuss the objectives, inputs, and outputs of the financing process.

Many organizations, such as government agencies, have specialized information needs, apart from the typical AIS requirements for information about revenues, purchases, and resources. The second section of this chapter considers the unique aspects of such organizational entities that need different accounting information.

Maximizing the efficiency of every business process is critical to business success in today's ''business without boundaries'' operating environment. Sometimes managers decide that a current business process just isn't working and must be replaced. This is usually the case when a firm decides to implement a new enterprise-wide IT system. As a result, they turn to business process reengineering, which is the topic of the final section of this chapter.

THE RESOURCE MANAGEMENT PROCESS

Two resources that managers must closely manage, and therefore capture data for an AIS, are an organization's human resources and its fixed assets. Because the inputs, processing, and outputs for human resources and fixed assets are quite different, we examine them separately (see Figure 8-1).

Human Resource Management

The ''economic meltdown'' in the fall of 2008 has been one of the most challenging times for resource managers as they try to deal with cash flow problems, bankruptcies, plant closings, and layoffs. An organization's **human resource (HR) management** activity includes the personnel function, which is responsible for hiring or laying off employees. HR must properly maintain the personnel and payroll records for employees, as well as

The Human Resource Management Process

OBJECTIVES

Hiring, training, and employing workers
Maintaining employee earnings records
Complying with regulatory reporting requirements
Reporting on payroll deductions
Making timely and accurate payments to employees
Providing an interface for personnel and payroll activities

Inputs (Source Documents)	Outputs (Reports)
• Personnel Action Forms	• Financial Statement Information
• Time Sheets	• Employee Listings
• Payroll Deduction Authorizations	• Paychecks
• Tax Withholding Forms	• Check Registers
	• Deduction Reports
	• Tax (Regulatory) Reports
	• Payroll Summaries

FIGURE 8-1 Objectives, inputs, and outputs for the human resource management process.

handle the many actions associated with employee terminations. Nevertheless, the primary objective of the personnel function is to hire, train, and employ appropriately qualified people to do an organization's work.

In the past, HR professionals used technology to handle such administrative tasks as time clocking and payroll. However, many **business process management (BPM) software packages** are now available to automate the core processes that normally occur in an HR office. For example, HR departments are increasingly turning to technology to help with such diverse responsibilities as recruitment, oversight of legal and regulatory compliance, benefits administration, training, performance evaluation, and safeguarding confidential employee information.

Case-in-Point 8.1 Merix, a global supplier of advanced technology and printed circuit boards, focuses on the financial performance of its recruiting process. Using a cost-per-hire calculation, Merix determines whether its recruiting process is functioning at peak efficiency. Goals for this measure are set to assure that HR is financially responsive to the organization and is an efficient support service. Further, tracking this measure allows Merix to more effectively budget human resources expenditures for the coming year based on projections of staffing needs.[1]

Although the main purpose of **payroll processing information systems** is to pay employees for their work, such systems also maintain employee earnings records (a payroll history), comply with various government tax and reporting requirements, report on various deduction categories (e.g., pension funds and group insurance), and interact with other personnel functions. Figures 8-2 and 8-3 show system flowcharts for the personnel function and for the payroll function.

Inputs to Human Resource Management Processing. The source documents used in payroll processing are personnel action forms, time sheets, payroll deduction authorizations, and tax withholding forms. The personnel department sends *personnel*

[1] Source: http://www.merix.com.

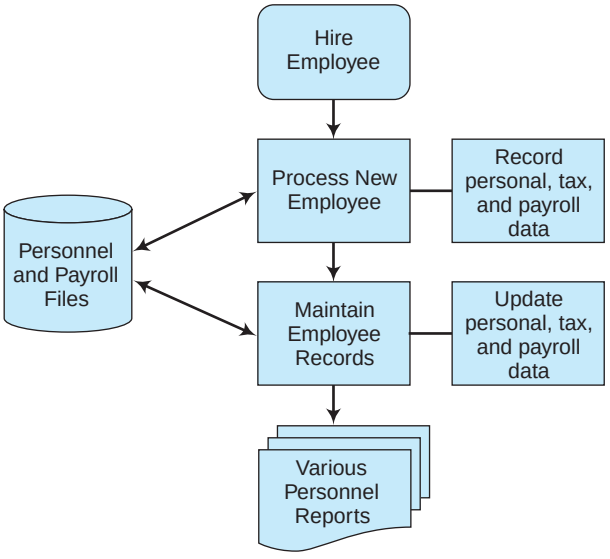

FIGURE 8-2 Systems flowchart of the AIS for the personnel function.

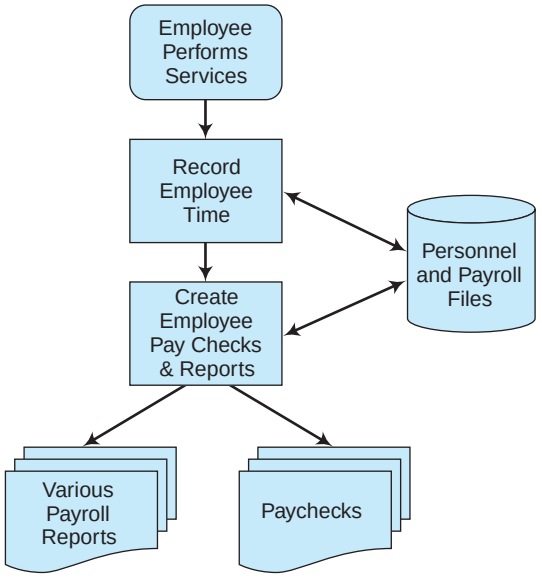

FIGURE 8-3 Systems flowchart of the AIS for the payroll function.

action forms to payroll that document the hiring of new employees or changes in employee status. For example, payroll receives a personnel action form when an employee receives a salary increase. This document is very important for control purposes. For example, auditors will detect an employee who increases his or her own salary when they fail to find a personnel action form authorizing the increase.

Many companies use *time sheets* to track the hours that employees work. The source of information for these time sheets varies widely with the level of technology that

the organization employs. For example, some companies use a time clock that requires employees to ''punch in'' (on time cards) when they arrive for work. Others use picture ID cards or RFID-enabled ID cards that record the time and verify employees when they enter and leave the workplace. To guard against employees having their friends punch in for them, some organizations now use various biometric devices (e.g., fingerprints or iris scans) to identify employees and capture their entry and departure from workplaces.

At the end of the pay period, the employee's supervisor verifies the number of hours worked and authorizes payment. Next, either a payroll clerk (or an internal control embedded in the payroll processing information system) looks for the appropriate authorization before processing these hours. Companies that use a job cost information system can cross-reference employee time sheets with time recorded on individual jobs.

Employees fill out *payroll deduction authorizations* that direct the payroll processing system to deduct amounts from gross pay for items such as health and life insurance, parking fees, retirement plan contributions, and union dues. An authorization form should document each deduction. In the U.S., every employee must also complete tax-withholding forms, which authorize the payroll system to reduce gross pay by the appropriate withholding tax. The information system uses each employee's W-4 withholding form to calculate the correct withholding for federal income taxes.

Outputs of Human Resource Management Processing. The outputs of human resource management processing include employee listings, check registers, paychecks, deduction reports, tax reports, and payroll summaries. As you might imagine, the processing of paychecks should include very strict internal control procedures (covered in Chapters 11 and 12). *Employee listings* show current employees and may contain addresses and other demographic information. *Check registers* accompany each printing of paychecks and list gross pay, deductions, and net pay. Payroll clerks use the check register information to make journal entries for salary and payroll-tax expenses. *Deduction reports* can contain summaries of deductions for all employees in a department, a division, or company-wide. Finally, the payroll function issues various *payroll summaries* that help managers analyze expenses. A typical payroll summary report might classify payroll expenses by department or job, or show total overtime hours worked in each department.

> ***Case-in-Point 8.2*** The city of Reno, Nevada, is one of many cities in the U.S. seeking ways to lower its expenditures. Recently, the issue of overtime pay for firemen came to the attention of the city council because reports showed there was so much of it. Apparently, the number of firemen that the city could hire was limited, but not the amount of overtime pay these individuals could earn.[2]

The U.S. government requires various *tax reports* for income tax, Social Security tax, and unemployment tax information. Employees pay some taxes in their entirety, but employers share others. For instance, both the employee and the employer pay equal amounts of Social Security taxes. The payroll system allocates shared taxes to the appropriate accounts. Taxes paid by employees are allocated to payroll expense, but employer taxes are part of the employer's tax expense.

Because manual payroll processing can be tedious, repetitive, and error-prone, the payroll function was one of the first accounting activities to be computerized in many organizations. Today, some companies find it easier and more cost-effective to outsource the process for paychecks and payroll reports.

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[2]Source: from the authors.

Case-in-Point 8.3 Automatic Data Processing, Inc., or ADP, is the world's largest payroll service provider. Almost a half-million companies in fifteen countries outsource their payroll processing and, in some cases, their human resource administration to ADP. The company has been in business for more than 50 years and pays more than one-in-six private sector employees in the U.S.[3]

Fixed Asset Management

Even small organizations generally own many fixed assets, which management must track as they are purchased and used. The objective of the **fixed asset management (FAM)** function is to manage the purchase, maintenance, valuation, and disposal of an organization's fixed assets (also called ''long-term assets'' because they last more than one year).

In thinking about how complex it might be to track fixed assets, consider all the fixed assets found in a typical college classroom. There are desks, chairs, computers, projectors, podiums, and so on. A university must record each of these fixed assets on its books when it purchases the asset. In addition, the university must maintain depreciation schedules for its fixed assets. Not only can an AIS calculate the depreciation for a company's financial statements, it can also prepare separate depreciation schedules for income tax reporting purposes. Employees often move fixed assets around within an organization, and although an AIS should keep track of all asset locations, this can be quite difficult in practice. Bar codes affixed to physical assets make this job easier.

Because fixed assets often require repairs, an AIS should also track repair costs, and distinguish between revenue expenditures and capital expenditures. (Revenue expenditures are ordinary repair expenses, whereas capital expenditures add to the value of assets.) Finally, the AIS calculates the amount of gain or loss upon disposal of individual fixed assets. By comparing the amount received for the asset with the asset's book value, the AIS can compute a gain or loss. Fortunately, software companies offer a variety of solutions to help managers.

Case-in-Point 8.4 Some **Fixed Asset Management (FAM) software** helps enterprises record and track details about their fixed assets before placing them into service (e.g., Best Software). Depreciation Solution[R] offers a ''Method/Life Wizard'' so a company can select a depreciation method and estimate the life of an asset. FixedAssets∗32 allows companies to automate and monitor depreciation of fixed assets.

Increasingly, organizations are adopting **enterprise asset management (EAM) systems** to automate the management of a broad spectrum of assets. For example, Green Bay Packaging, Inc. is using an EAM solution to streamline purchasing, reduce inventory, and trim machine downtime and maintenance costs. Because of reduced overall operating expenses, the company expects the software to pay for itself in six months. Avantis makes a global EAM solution that focuses on maintenance, inventory, procurement, and invoicing efficiencies. Finally, the U.S. government purchased a $1.9 million EAM system to integrate data and coordinate logistics for the 5,000-plus major rebuilding projects underway in Iraq.

Inputs to Fixed Asset Management Processing. Fixed asset processing begins with a request for a fixed asset purchase. The individual making the request enters the appropriate information on a purchase requisition form (typically an e-form). *Fixed asset requests* usually require approval by one or more managers, especially where purchases

[3]Source: http://www.adp.com/corporate/adp_corpoverview_main.html

require substantial investments. Other documents associated with fixed asset purchases are receiving reports, supplier invoices, and repair and maintenance records. The receiving department either scans in the information electronically to the AIS or fills out a *receiving report* upon receipt of a fixed asset. The asset's supplier sends an *invoice* when it ships the asset. Sometimes a company builds a fixed asset, for example, a warehouse, rather than acquiring it from an outside vendor. Here, processing fixed assets requires a *work order* detailing the costs of construction.

There is no source document that prompts depreciation expense. However, there may be documentation dictating the appropriate depreciation method or methods for this allocation. AISs often allocate fixed asset costs using multiple depreciation methods. Companies commonly use a separate depreciation method for tax versus financial reporting purposes. In addition, government or industry regulations may require businesses to use still other depreciation methods for special reports.

Those responsible for a particular fixed asset should complete a *fixed asset change form* when transferring fixed assets from one location to another. The fixed asset change form also records the sale, trade, or retirement of fixed assets. Fixed asset management requires maintaining repair and maintenance records for each asset individually or for categories of fixed assets. The department performing this service should record these activities on a *repair and maintenance form*. This form notifies the AIS to update expense or asset accounts. Figure 8-4 is a systems flowchart that shows fixed asset acquisition, maintenance, and disposition.

Outputs of Fixed Asset Management Processing. One output of the fixed asset processing system is a listing of all fixed assets acquired during a particular period. A *fixed asset register* lists the identification number of all fixed assets held by a company

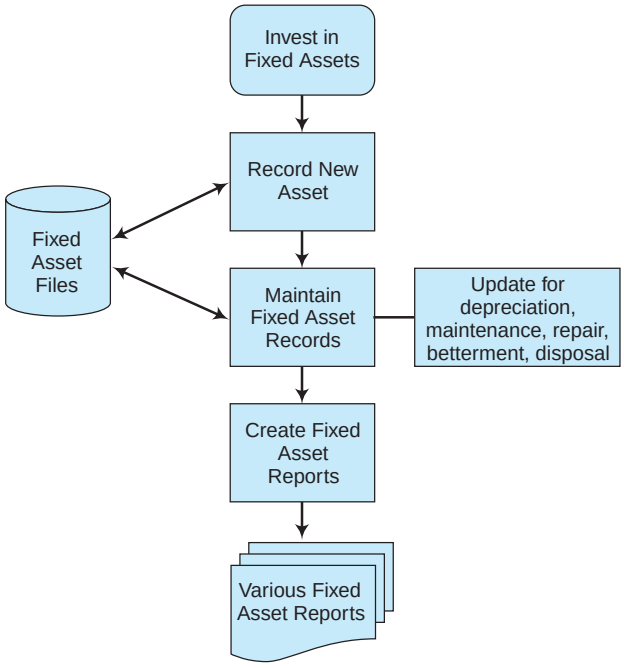

FIGURE 8-4 Systems flowchart of the AIS for the fixed asset management function.

The Fixed Asset Management Process

OBJECTIVES

Tracking purchases of fixed assets
Recording fixed asset maintenance
Valuing fixed assets
Allocating fixed asset costs (recording depreciation)
Tracking disposal of fixed assets

Inputs (Source Documents)	Outputs (Reports)
• Purchase Requisition	• Financial Statement Information
• Receiving Reports	• Fixed Asset Register
• Supplier Invoices	• Depreciation Register
• Construction Work Orders	• Repair & Maintenance Reports
• Repair & Maintenance Records	• Retired Asset Report
• Fixed Asset Change Forms	

FIGURE 8-5 Objectives, inputs, and outputs for the fixed asset management process.

and each asset's location. The *depreciation register* shows depreciation expense and accumulated depreciation for each fixed asset. *Repair and maintenance reports* show the current period's repair and maintenance expenses, as well as each fixed asset's repair and maintenance history. Finally, a *report on retired assets* reflects the disposition of fixed assets during the current period. Figure 8-5 summarizes the objectives, inputs, and outputs of the fixed asset management process.

THE PRODUCTION PROCESS

The production process (sometimes called the conversion process) begins with a request for raw materials and ends with the transfer of finished goods to warehouses.

Objectives of the Production Process

The objective of a manufacturing organization's production process is to convert raw materials into finished goods as efficiently as possible. Today's production of goods and services often requires expensive factory machinery, such as computer-assisted design (CAD) technology or robotics (used in the manufacture of automobiles).

Accounting for the acquisition and use of production machinery is part of the fixed asset management process described in the previous section of this chapter. Another important objective of an AIS's production process is collecting cost accounting data for operational managers, who then can make informed decisions with respect to the products produced in their departments. Figure 8-6 identifies the objectives, inputs, and outputs associated with the production of goods and services.

Cost Accounting Subsystem. Because the cost of goods sold is likely to be the largest expense on a manufacturing firm's income statement, an important part of the production process is an AIS's **cost accounting subsystem**. The cost accounting subsystem provides important control information (e.g., variance reports reflecting differences between actual

The Production Process

OBJECTIVES

Track purchases and sales of inventories
Monitor and control manufacturing costs
Control inventory
Control and coordinate the production process
Provide input for budgets

Inputs (Source Documents)	Outputs (Reports)
• Materials Requisition Form	• Financial Statement Information
• Bill of Materials	• Material Price Lists
• Master Production Schedule	• Periodic Usage Reports
• Production Order	• Inventory Status Reports
• Job Time Cards	• Production Cost Reports
	• Manufacturing Status Reports
	• Value Stream Reports

FIGURE 8-6 Objectives, inputs, and outputs commonly associated with the production process.

and standard production costs) and varies with the size of the company and the types of product produced. As you might guess, a bakery producing baked goods would collect very different data in its AIS than that of an automobile manufacturer. Cost accounting subsystems for manufacturing organizations will most likely be job costing, process costing, or activity-based costing systems.

A **job costing information system** keeps track of the specific costs for raw materials, labor, and overhead associated with each product or group of products, called a ''job.'' This type of costing system is most appropriate for manufacturers of large-scale or custom products, such as home-builders or book publishers. Manufacturers of homogeneous products (such as soft drinks or toothbrushes) that are produced on a regular and continuous basis use a **process costing information system**. In this system, it is not feasible or practical to keep track of costs for each item or group of items produced. Instead, process costing systems use averages to calculate the costs associated with goods in process and finished goods produced.

Activity-based costing systems help managers describe processes, identify cost drivers of each process, and then determine the unit costs of products created in each process. By studying their business processes, managers are in a better position to recognize opportunities to improve those processes. Thus, activity-based costing gives managers a better understanding of their processes, an improved ability to allocate indirect costs to those processes, and a better understanding of the true cost of each product. The systems flowchart in Figure 8-7 shows the information flow for production in a manufacturing firm.

Just-in-Time (JIT) Inventory Systems. Inventory control ensures that the production process handles inventory transactions appropriately so that the financial statements correctly state the value of the inventory and cost of goods sold accounts. Carrying inventory has a number of costs associated with it, including storage, obsolescence, shrinkage, or reduction in sales value.

Toyota (of Japan) popularized the use of **just-in-time (JIT) inventory** systems. Some managers refer to a JIT system as a ''make-to-order inventory system.'' This phrase indicates that the organization produces goods to fill an order rather than to fill inventory. The objective of a JIT system is to minimize inventories at all levels. Each stage in the production operation manufactures (or acquires) a part just in time for the next process to

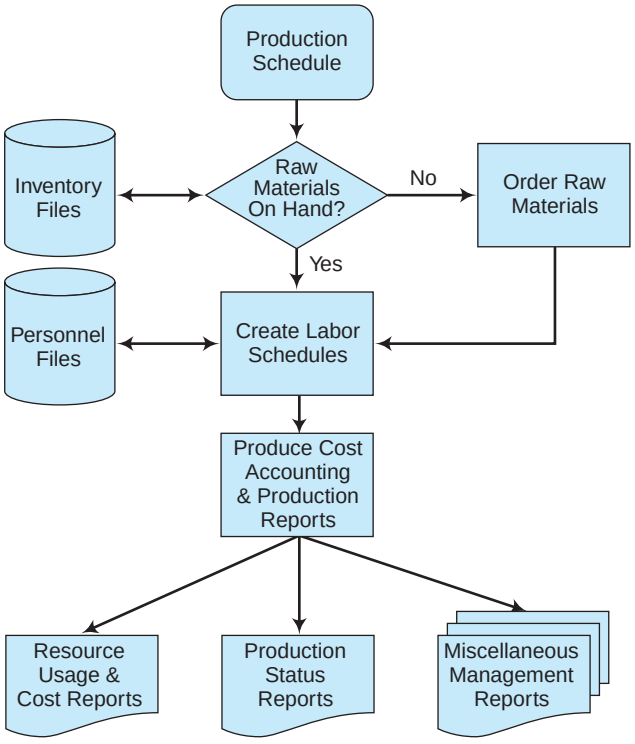

FIGURE 8-7 Systems flowchart of the AIS for the production process in a manufacturing organization.

use it. Although the best possible JIT system would maintain zero inventory balances, this is often not practical in real-world applications. Manufacturing organizations need some inventories to protect against interruptions in supply from manufacturers and fluctuations in demand for their finished goods that are beyond the manufacturers' control.

A JIT system depends on an AIS. If the AIS does not process transactions on a timely and accurate basis, manufacturing processes may lack the raw materials inventory necessary to maintain a constant work flow. Inefficient processing of transactions can also lead to shortages of finished goods that in turn translate into lost sales. This leads some organizations to be proactive and reengineer the process.

Case-in-Point 8.5 JIT is a great concept for a company that is intent on efficiently managing stock, but it makes life difficult for the accounts payable department that is responsible for paying all those JIT invoices. For example, Dell Computer Company found itself ordering certain parts as frequently as 12 times a day. The A/P department was inundated with paper invoices. GE Capital dispatched several of its Six Sigma analysts, known as "black belts," to Dell to analyze its A/P process. The consultants mapped out the entire process and then recommended that Dell change to an Internet-based electronic filing process. The move saves Dell about $2.4 million per year.[4]

[4]Source: http://www.ge.com/sixsigma.

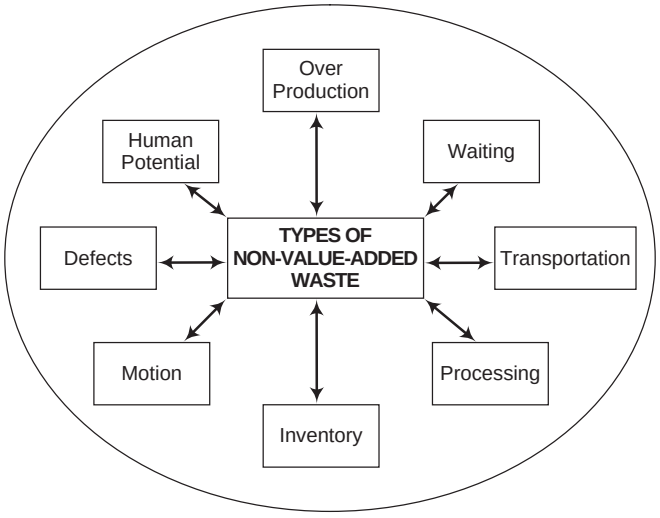

FIGURE 8-8 Categories of waste that are the focus of lean operations management.

Sources: Daniel Tracy & John Knight, ''Lean Operations Management,'' *Journal of American Academy of Business* (March 2008), pp. 8–14; Burton, T. and S. Boeder, *The lean extended enterprise: Moving beyond the four walls to value stream excellence* (2003), Boca Raton, FL: J. Ross Publishing.

Lean Production/Manufacturing. Although JIT inventory systems are an important step for manufacturing companies to control costs associated with inventory, the truth is that companies must learn to eliminate waste throughout the manufacturing process—indeed, throughout the organization, if they hope to become a world-class organization. The concept of lean manufacturing is that a company makes the commitment to eliminate waste throughout the organization (not just in production), which is a philosophy that is often attributed to the *Toyota Production System (TPS)*. The TPS essentially focuses on elimination or reduction of **non-value-added waste** to improve overall customer value and to increase the profitability of the products or services that the organization offers. So we might say that lean manufacturing developed through the concepts of JIT as well as Total Quality Management.

Figure 8-8 depicts eight different categories of waste that companies hope to reduce or eliminate. In the figure, *overproduction* means producing more than your customers want to purchase. *Waiting* refers to the time that is lost when employees, products, services, or machines wait for the next step in a process to occur. *Transportation* identifies the unnecessary movement of materials or information around a firm or organization. Excessive *processing* can be the result of an organization that has poor products, defective inputs, or an inefficient business process. From JIT principles, we know that it is wasteful to store more *inventory* than the minimum required to produce the goods or services of the company. Excess (or unnecessary) *motion* of people, materials, products, or anything should be avoided. Whenever substandard products are produced, companies end up with *defects*, scrap, rework, and/or paperwork errors. Finally, when organizations do not fully engage the skills, talents, and abilities of their employees, they lose some of the *human potential* that is available to the firm.

Lean Accounting. Accountants are quick to point out that you cannot have lean manufacturing without **lean accounting**. A company that follows lean manufacturing concepts must identify value from the perspective of their customers, organize production

(and data collection) in value streams, empower employees to make decisions, and then continually pursue excellence in all areas of the organization. Thus, you can't use the same old performance measures—you need new ones. Why is that the case? Because the goal of performance measures is to communicate, motivate, clarify, and evaluate. Management accountants use performance measures to give managers information and feedback for decision-making. Traditional performance measures typically support only managers as decision-makers. The premise behind lean manufacturing is that empowered team members (also called continuous operational improvement leaders) are also decision-makers, which means they need timely information to be effective.

Although reengineering the traditional performance measures would be ideal, this is usually not possible. However, management accountants, managers, and empowered team members can work together to identify critical data that the AIS must collect to support lean production. As a minimum, these data should include metrics that will help managers and team members make wise decisions regarding methods to reduce or eliminate waste that is identified in Figure 8-8 (overproduction, waiting, transportation, processing, inventory, motion, defects, and human potential).

Jan Brosnahan, the controller for Watlow Electric Manufacturing Co. (WEM) describes how her team adopted lean accounting, which means measuring and evaluating results by **value stream management** rather than by *traditional departments* (such as customer service, purchasing, etc.). For example, an order fulfillment value stream includes all metrics from the sales/order entry point, through manufacturing, all the way to after-sales support. Each value stream has a leader who is responsible for coaching and profitability of the specific metrics identified for that value stream. Standard costs, variances and overhead allocations are not used—rather, only directly-incurred costs are used for decision-making.

Case-in-Point 8.6 In 2005, 17 of the finance and continuous operational improvement leaders at WEM attended a Lean Accounting Summit. They learned how to transform their AIS from a traditional system to a lean accounting system. This process included (1) identifying the company's main value streams, (2) mapping out key metrics to monitor achievement, (3) organizing into three or four value streams per site, (4) changing the chart-of-accounts structure to a few value stream groupings rather than by traditional departments, (5) zeroing out labor and overhead rates from the system and stopping collection of these data, (6) splitting out material costs from other conversion costs, and (7) using a memo line in internal financial statements to increase visibility of inventory purchases.[5]

Clearly, we can see the implications that lean accounting might have throughout organizations of the future. Based on the many changes that WEM implemented in their company to support lean accounting, we can quickly see that two areas might need to be evaluated by management accountants—the collection of data in the AIS and the chart-of-accounts that the company uses. Fortunately, AISs that are built upon a relational database (see Chapters 4 and 5) can be modified to support lean accounting. Regarding the chart-of-accounts (covered in Chapter 7), apparently the accountants at each organization will need to work with managers and team leaders to determine the most appropriate coding system to use, based on the value streams that are identified.

Inputs to the Production Process

When a production manager needs raw materials, he or she issues a *materials requisition form* to acquire more material from a storeroom or warehouse where the raw materials

[5]Source: Jan Brosnahan, ''Unleash the Power of Lean Accounting,'' *Journal of Accountancy* (July 2008), pp. 60–66.

are kept. If the level of inventory falls below a certain predetermined level, the inventory control clerk issues a purchase requisition to the purchasing department (probably an e-form, but this might also be an automatic determination that is transmitted electronically to the vendor). Finished goods consist of a complex array of parts or subassemblies. For example, an armchair consists of four legs, a seat, two arms, and a back. The *bill of materials* shows the types and quantities of parts needed to make a single unit of product.

An important input to the production process is the *master production schedule*, which shows the quantities and the timing of goods needed to meet quantities required for anticipated sales. The marketing department's sales projections, combined with desired inventory levels, are inputs to the production order, which authorizes the manufacture of goods and dictates the production schedule. Tracking labor time is important to a job costing system because one employee may work on many jobs and one job might require the work of many employees. An input to a job costing system is the *job time card*. This card shows the distribution of labor costs to specific jobs or production orders. Each worker completes a job time card (usually daily or weekly), detailing the hours worked on specific operations and jobs.

Typically, large and medium-sized firms use enterprise resource planning (ERP) systems to collect essential data about their production operations so that they can better manage these processes. ERPs are multi-module application software packages that help a manufacturer effectively track, monitor, and manage product planning, parts purchasing, maintaining inventories, interacting with suppliers, providing customer service, and tracking orders. We discuss ERP software in more depth in Chapter 9.

In conjunction with ERPs, manufacturers are also replacing manual data entry with such automated technologies as bar code readers, radio frequency (RF) technology, RFIDs, or other advanced electronic tags. These input technologies can be used individually or combined in innovative ways to significantly reduce input errors (compared to human data entry) and support fast, accurate, real-time production and data collection.

Case-in-Point 8.7 Mail-order fulfillment of drug prescriptions is a booming business for the U.S. Veteran's Administration, CVS, Kaiser Permanente, and others. When mail-order prescription centers first started, a worker would stand next to a printer, wait for a label to be printed, wrap the label around the bottle, and put it in a box. The box traveled to the next worker who read the label, found the correct pill-counter station, held the bottle under the counter as the bottle filled, replaced the lid on the bottle and sent the prescription down the line for final packing. It took 20–30 people to complete the operation. Now, a computer system using plastic transport carriers (called "pucks") with RFID tags in the base automates this entire process. The prescription and the puck are linked in the system and travel along the conveyor automatically, eliminating the need for human intervention until the prescription is ready to be placed in the mailing envelope.[6]

Other technologies are being combined in innovative ways to improve management's ability to track and monitor production. For example, the production of United Parcel Service (UPS) is to effectively and accurately collect, track, and deliver packages, not only for the benefit of management information, but also for customers who demand almost real-time tracking ability. Rather than use RFID technology, UPS uses a mix of Bluetooth and Wi-Fi technology.

Case-in-Point 8.8 UPS made a $120 million investment in Bluetooth-equipped ring scanners (worn on an individual's finger), paired with belt-worn terminals (wireless receivers) to more quickly and efficiently scan the bar codes on over 14 million parcels daily. This

[6]www.intermec.com/eprise/main/Intermec/Content/Technology/DataCapture/DataCapture?section = casestudies

technology was approved for each of the 55,000 sorting workers at 1,700 worldwide facilities. UPS estimated that the new equipment would pay for itself within 16 months of full deployment.[7]

Outputs of the Production Process

Examples of output reports for the production process include materials price lists, periodic usage reports, inventory reconciliation reports, detailed inventory status reports, production cost reports, and manufacturing status reports. The *materials price list* shows the prices charged for raw materials. The purchasing department updates this list. Cost accountants use price lists to determine the standard costs needed to budget production costs. *Periodic usage reports* show how various production departments use raw materials. Managers scrutinize these reports to detect waste by comparing raw material usage to output (finished goods) produced.

A company using a perpetual inventory system issues an inventory reconciliation report. When auditors take a physical inventory, the accounting subsystem compares the physical inventory results with book balances, and notes discrepancies on this *inventory reconciliation report*. Another report important for inventory control purposes is the periodic detailed *inventory status report*. This report allows purchasing and production managers to monitor inventory levels.

Cost accountants use *production cost reports* to calculate budget variances. Some manufacturing organizations use standard costing systems that allow them to compare standard costs with actual costs and compute variances for materials, labor, and overhead. The production cost report details the actual costs for each production operation, each cost element, and/or each separate job. *Manufacturing status reports* provide managers with information about the status of various jobs. Because manufacturing a product usually requires coordination of many operations, it is important to report on production status regularly.

Of course, as more companies move to lean production and manufacturing methods, some of these production reports will be replaced with value stream management metrics that will be more useful for decision-making.

THE FINANCING PROCESS

The financing process describes how a company acquires and uses such financial resources as cash, other liquid assets, and investments. Cash and liquid assets are an organization's working capital. The financing process interfaces with the revenue, purchasing, fixed asset, and human resource processes. Much of the capital available in an organization comes from sales revenue and is used to pay expenses and personnel, and to buy fixed assets.

Besides obtaining financial resources through the sales of goods and services, most organizations also acquire funds by borrowing cash or selling ownership shares. The financing process includes managing these activities. Figure 8-9 is a data flow representation of the financing process.

[7]Source: Mashbert, Tom, ''Brown Goes Bluetooth,'' *Technology Review* (June 2005), p. 42.

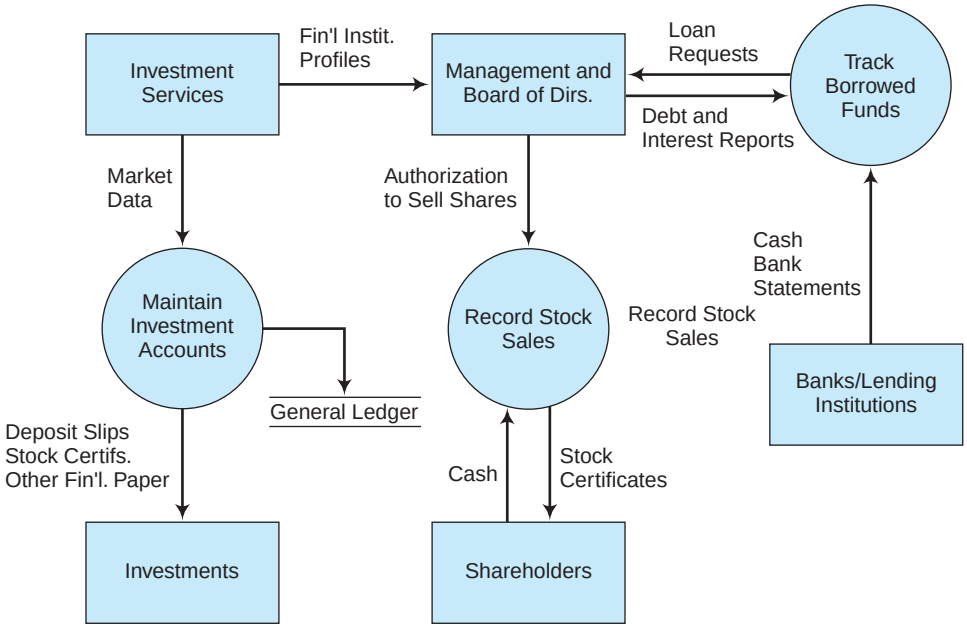

FIGURE 8-9 A data flow diagram of the financing process. This data flow diagram does not include cash management related to sales revenue, purchases, payroll, or fixed assets.

Objectives of the Financing Process

The financing process has a number of objectives. These include managing cash effectively, minimizing the cost of capital, investing for maximum returns, and projecting cash flows. Effective cash management requires collecting cash as soon as possible and spending it carefully. To collect cash quickly, an organization's AIS can provide useful information about how quickly customers pay their bills. An AIS can also show trends in cash collections.

Organizations can use **lockbox systems** to reduce the float period during which checks clear the bank. A lockbox system is an effective cash management tool because banks typically require several days, and sometimes a full week, to provide an organization with credit for out-of-state checks. With a lockbox system, a company directs its customers to mail their checks on account to a lockbox in their home state. A local bank collects the checks in the lockbox, clears the checks, sends the customer payment data in an electronic format, and deposits the cash into the company's account. In this way, cash is available for use more quickly. Figure 8-10 identifies additional benefits that companies might realize by using a lockbox system.

Electronic funds transfer (EFT), or electronic payment, is another cash management technique. Using EFT, business organizations eliminate paper documents and instead transfer funds electronically. Similarly, most companies today pay their employees electronically by directly depositing the funds to each employee's bank account directly rather than issuing a paper check.

Managing cash on the expenditure side means paying cash as bills come due and taking advantage of favorable cash discounts. Although an organization wants to make sure there is cash available for timely payments to vendors and employees, it is also possible to have too

- Better-managed large-volume deposit customers
- Capture market share with lockbox services
- Process any coupon payment format
- Reduce operating costs
- Increase efficiencies
- Cross-selling opportunities through daily access
- Online home page marketing capabilities
- Flexible implementation options
- Archive all check payment information online
- Research images for all lockbox transactions
- Capture greater share of wallet

FIGURE 8-10 Additional benefits firms may realize by using a lockbox system. Source: website for ImageWay® Payment Processing.

much cash on hand. Idle cash is an unproductive asset and short-term investments typically earn less of a return than long-term investments. Effective cash management means cash balances are not unreasonably high and managers invest excess cash wisely. Managers in large companies monitor excess cash and invest it for very short times, sometimes less than a day.

Minimizing the cost of capital (i.e., the cost of obtaining financial resources) requires management to decide how much cash to borrow and how many shares of ownership (stock) to sell. Borrowed funds require interest payments. Although businesses do not pay interest to shareholders, they do pay dividends. Financial managers frequently use **financial planning models** to help them select an optimum strategy for acquiring and investing financial resources. These models require an information system that can make complex calculations and consider alternative investment, borrowing, and equity (sales of stock) strategies.

A final objective of the financing process is to project cash flows. An output of the revenue process is a cash receipts forecast, and the purchasing and human resource processes contribute to a forecast of cash disbursements. The financing process makes use of these forecasts to invest excess funds and decide debt and equity strategies. The AIS for the financing process contributes to cash flow predictions through estimates of interest and dividend payments and receipts. Figure 8-11 summarizes the objectives, inputs, and outputs of this process.

The Financing Process

OBJECTIVES

Effective cash management
Cost of capital optimization
Earn maximum return on investments
Project cash flows

Inputs (Source Documents)

- Remittance Advices
- Deposit Slips
- Checks
- Bank Statements
- Stock Market Data
- Interest Data
- Financial Institution Profiles

Outputs (Reports)

- Financial Statement Information
- Cash Budget
- Investment Reports
- Debt and Interest Reports
- Financial Ratios
- Financial Planning Model Reports

FIGURE 8-11 Objectives, inputs, and outputs associated with the financing process.

Inputs to the Financing Process

Many inputs to the financing process originate outside an organization. Externally-generated data or source documents might include remittance advices, deposit slips, checks, bank statements, stock market data, interest data, and data about financial institutions. Chapter 7 explained that a *remittance advice* accompanies a customer's payment on account. Banks provide *deposit slips* to document account deposits. For example, you receive a deposit slip when you make a cash deposit to your account through an automated teller machine and a credit slip when you purchase gasoline with your debit card.

Regardless of whether companies transfer funds electronically or receive/issue paper checks, accountants use the company's *bank statement* to reconcile any account discrepancies and as proof of payment. Accountants use bank statements to reconcile the cash account balance in the company's ledger against the cash balance in the bank account. Discrepancies between these two accounts arise from outstanding checks, deposits in transit, and various other transactions. Sometimes, of course, discrepancies are due to errors or even fraud. Because cash is a company's most liquid asset, AISs use control procedures to help protect against misappropriations.

Outputs of the Financing Process

Like all other business processes, the financing process provides general ledger information to help an AIS produce periodic financial statements. Examples include interest revenue and expense amounts, dividend revenue and expense reports, and summaries of cash collections and disbursements. It also provides information about balances in debt, equity, and investment accounts. Besides providing general ledger information, the financing process of an AIS produces a *cash budget* showing projected cash flows.

The AIS for the financing process can produce a variety of reports about investments and borrowings. Investment reports may show changes in investments for a period, dividends paid, and interest earned. Reports on borrowings could show new debt and retired debt for a period. These reports should list the lending institutions, interest rates charged, and payments of principal and/or interest for the period.

Managers perform *ratio analyses* to manage an organization's capital effectively. Significant ratios, such as return on investment and debt to equity, help management decision-making regarding investment and borrowing strategies. A company's financial planning model calculates and reports these ratios. The planning model also prepares recommendations regarding the appropriate mix of debt versus equity financing, and short- versus long-range investments. Figure 8-12 is a systems flowchart of an AIS for the financing process.

BUSINESS PROCESSES IN SPECIAL INDUSTRIES

The term **vertical market** refers to markets or industries that are distinct in terms of the services they provide or the goods they produce. When you think about it, most organizations fit into a vertical market category. For example, an accounting firm is a professional service organization, and a grocery store is in the retail industry. However, large conglomerates may operate in several different vertical markets—for instance, many large manufacturers have branched out to also provide professional and financial services.

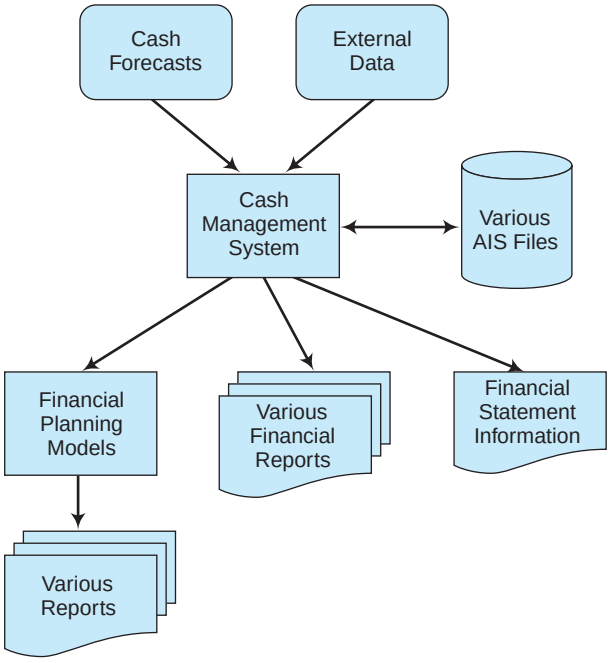

FIGURE 8-12 Systems flowchart of the AIS for the financing process.

The same is true of retail firms. Consider, for example, Sears and Roebuck. While still known primarily as a retailer, a large share of the company's profit comes from providing consumer credit.

Vertical markets with specialized AIS-related needs include professional services, not-for-profit, health care, retail, construction, government, banking and financial services, and hospitality. This section describes a few of these organizations in terms of their unique characteristics and AIS needs.

Professional Service Organizations

Professional service organizations are business establishments providing a special service to customers, such as accounting, law, engineering, consulting, and architectural firms. Compared with organizations that provide tangible goods (such as automobile manufacturers), professional service organizations have several unique operating characteristics: (1) no merchandise inventory, (2) emphasis on professional employees, (3) difficulty in measuring the quantity and quality of output, and (4) small size. These are common characteristics, although not every organization in this industry segment has all of them. For instance, some accounting and consulting firms are not small. They have hundreds of partners and international offices in cities around the world.

Because professional service organizations do not maintain a product inventory, they do not need an AIS that tracks inventory levels. Instead, the primary accounting information needed by professional service organizations relates to time and billing for their professional staff. **Time and billing information systems** are similar to job order costing systems—they track hours and costs associated with each job (i.e., each client) and each employee (i.e., professional staff). There are two major outputs of the time and billing

MARTIN & ASSOC.

10385 Spartan Dr.
Cincinnati, OH 45215
Office 513/772-7284
Fax 513/772-4529

Invoice #	7031
Invoice Date	4/14/2010
Terms	Net 15 Days
Due Date	4/29/2010
Customer Number	WMI

Mr. Richard Wilson
WMI, Inc.
5917 Hamilton Ave.
Cincinnati, OH 45224

FOR SERVICES RENDERED

Work Type	Date	Comments/Description	Staff	Hours
Chargeable	2/04/10	Connectivity Planning	ADB	0.50
No Charge	2/09/10	F9 issues/set-up	KMM	0.25
Chargeable	2/10/10	AP processing Error	KMM	0.25
Chargeable	2/17/10	AP and ODBC errors	KMM	0.50
Chargeable	2/18/10	Bank lock/GL detail/plan	KMM	3.00
Chargeable	2/19/10	Drive to and from WMI	KMM	1.00
Chargeable	2/19/10	Hard drive reformat	KMM	0.50
Chargeable	2/22/10	Training on GL and AP	ADB	1.25
No Charge	2/22/10	Shipping	CLP	0.25
Chargeable	2/24/10	GL recap file/Adrian	KMM	0.25
			WMI Total Hours:	**7.75**
			Not Charged Hours:	**0.50**
			Chargeable Hours:	**7.25**
			Invoice Dollar Total:	**$1,087.50**

FIGURE 8-13 A sample client bill for a software consulting firm. (Printed with permission from Kevin Martin and Associates)

system: (1) the client bill and (2) the professional staff member's record of billable hours (hours actually spent working on client business).

Figure 8-13 shows an example of a software consulting firm's client bill. The client bill may detail the number of hours worked by every professional staff member and the rate charged by each. For example, an audit client might incur charges for audit staff, supervisors or seniors, managers, and partners. An AIS multiplies the hours worked by each staff member by his or her respective billing rate to compute the total charge. Time and billing systems can also show other charges on the bill or client invoice—for example, charges for overhead and detailed charges for phone, fax, mail, support staff, and copy costs.

Billable hours are important in a professional service organization. Law firms, for example, stress the importance of accumulating an accurate accounting of the number of billable hours. Nonbillable hours are hours spent in training, marketing, and general research. Although these latter activities are important, they do not directly generate revenue for a law firm. A time and billing system can track each staff member's hours in many ways. The increments of time recorded vary by firm. Some professional service firms record every fifteen minutes spent working on a client job. Some law firms may record time in six-minute increments. Because time is literally money, it is important to keep records as detailed and accurate as possible.

Automation helps professional service organizations keep accurate records on billable hours. For example, phone systems can record the amount of time spent on calls to client numbers and can enter values directly into the time and billing system. A copy machine in which users enter client numbers for each job is another tool that helps assign copy costs to client accounts. Finally, as professional staff members rely increasingly on their computers for their work, special computer programs can automatically record the time spent on each job as the staff member logs on to different programs with client-oriented passwords.

Not-for-Profit Organizations

Not-for-profit organizations provide services for the protection and betterment of society. Examples include public schools, museums, churches, and governmental agencies. Not-for-profits differ from for-profit businesses in that they: (1) are usually staffed by volunteers as well as professional employees, (2) are usually not as affected by market forces, and (3) sometimes have a political emphasis.

As with other vertical markets, not-for-profit organizations have special accounting information needs that reflect their unique characteristics. For example, public schools (such as a university) must keep records of students' schedules, grades, health records, and so on. Religious organizations, on the other hand, must track members and account for donations. The federal government (certainly the largest not-for-profit organization) must value various unique assets that are not traded in a market. How much, for instance, is the Lincoln Memorial worth, and how would you determine the annual depreciation for this national landmark? As daunting as this task may sound, the Commonwealth of Virginia did undertake such a task in 2004 to estimate deferred maintenance costs for all state-owned facilities, as described in the following case-in-point. Not surprisingly, the State Auditors turned to a facility asset management software package.

Case-in-Point 8.9 After a period of budget difficulties, the Virginia state legislature asked the Auditor of Public Accounts (APA) to estimate the total cost of deferred maintenance for public buildings so that the cost of these repairs could be included in the upcoming budget. The APA quickly determined that there was no complete inventory of all Commonwealth-owned buildings and no current information on the condition of any of the buildings. That is, no data were available to make the estimate! The APA quickly researched the available software packages available for this task and recommended a Facility Asset Management System (FAMS), which included a phased approach to collect the necessary data. In May 2006, the responsibility for FAMS was turned over to the Department of General Services.[8]

In general, it is the lack of a profit goal that most influences the special AIS needs of not-for-profit organizations. Accounting standards, such as the Financial Accounting Standards Board's Statement No. 117, Financial Statements of Not-for-Profit Organizations, now require the financial statements to more closely resemble those of profit-seeking entities. However, the internal reporting systems of not-for-profit organizations focus on funds, rather than income. Fund accounting systems show the resources available for carrying out an organization's objectives. Funds may be restricted for special purposes (e.g., funds donated to a university for student scholarships) or available for general use. To reconcile the internal and external accounting systems, an AIS of a not-for-profit institution must be able to reconcile between these two different reporting structures.

[8]Source: http://www.apa.state.va.us/deferred_maintenance.htm.

Although not-for-profit organizations cannot be evaluated using profit measures, some mechanism for performance evaluation is still desirable. A frequently used mechanism is a budgetary AIS. By comparing actual performance against planned activity, the managers in not-for-profit entities can determine how well they met their goals. Many not-for-profit entities (especially governmental organizations) employ formal long-range budgetary techniques. These budgets include projections of future activity that may serve as performance measures when compared with actual data. One difficulty often encountered in not-for-profit budgetary systems is the lack of a monetary measure of performance output. Consequently, managers must often use *process measures* (i.e., nonmonetary measures) to measure performance. In a police department, for example, the process measures might be number of arrests, number of homicides, or burglary rates. Public universities might use the number of students graduating each academic year or persistence rates.

A good short-range budgetary planning and controlling system is typically more important to a not-for-profit entity than to a profit-oriented company. The reason is the fixed, rather than flexible, nature of these organizations' annual budgets. In a not-for-profit organization, budgetary revisions are difficult, if not impossible, to carry out once the budget year begins. For example, at publicly-financed state universities, biannual state legislators approve annual operating budgets years in advance—budgets that cannot be changed in off years. Thus, in those not-for-profit organizations subject to fixed or static budgets, good short-range planning is necessary to obtain accurate budget projections for the coming year.

Health Care Organizations

The dollars spent for the health care industry have made this vertical market segment the target of much controversy and concern as the United States struggles to contain health care costs. As a result, health care reform remains a very important political issue. Interestingly, the AISs associated with health care are a large part of the controversy. Paperwork has been a major bottleneck in delivering efficient health care, and it is also a major cost. Figure 8-14, which shows the many subsystems in a health care organization's AIS, demonstrates part of the problem.

Health care entities share many characteristics with professional service organizations and not-for-profit institutions. Like these entities, health care organizations do not provide tangible goods to their customers (except for drugs). In addition, health care organizations also count professional staff as their most important asset resource. Some health care organizations are public and operate on a not-for-profit basis. Finally, output is exceptionally difficult to measure for this industry. For example, a patient may get well due to the quality of health care received, or the patient may simply get well due to his or her body's ability to overcome an illness. On the other hand, some patients die despite excellent health care and heroic measures.

The special accounting information needs of health care organizations primarily relate to **third-party billing**. Health care organizations usually do not bill their customers directly for services received. Rather, they bill insurance companies or government agencies who in turn reimburse these service providers. Typically, bills to third-party payers (insurance companies) use standardized codes for both the medical diagnosis and the procedures performed by medical personnel. Although standardized codes promote efficiency in processing information, coding can still be difficult. For example, sometimes a diagnosis is hard to pinpoint, and medical personnel often do procedures for multiple purposes. Reimbursement from an insurance company depends on the codes used. In addition, one

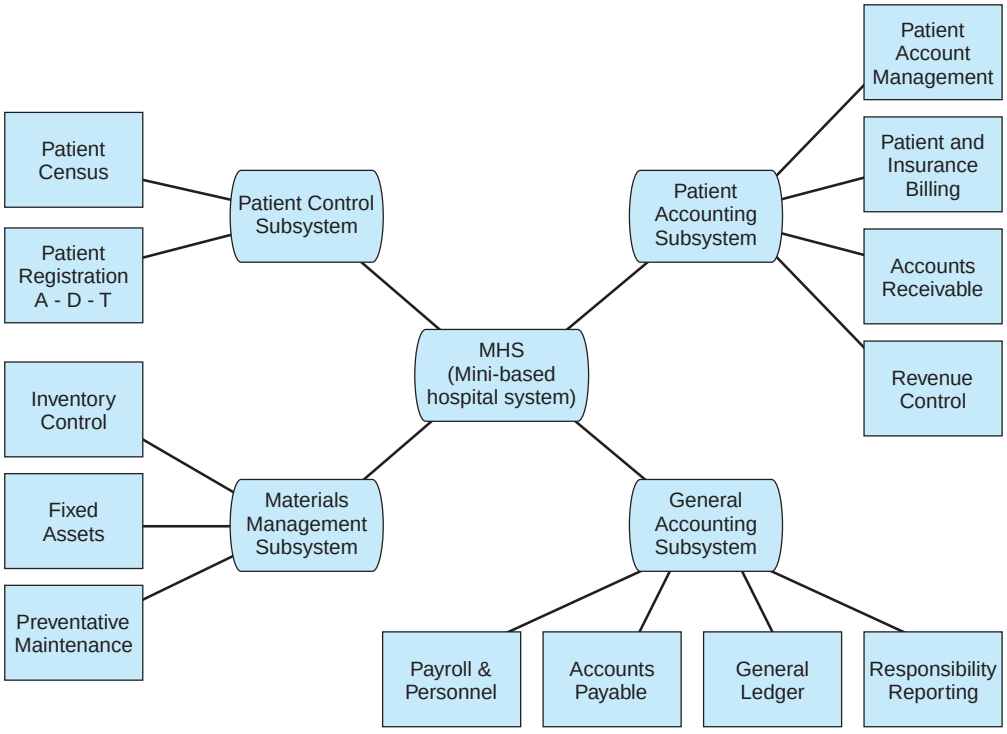

FIGURE 8-14 Mini-based hospital system. (Used with the permission of McDonnell Douglas Corporation, Hazelwood, Missouri)

plan may cover a particular procedure, and another may not. Because doctors often have discretion in making a diagnosis or prescribing a procedure, the accounting staff needs to understand the nuances of the codes and general classifications. Errors in coding can be costly, and not just in terms of the processing costs associated with them. Errors can also lead to fraud charges by insurance carriers.

Payment policies and filing forms may vary among third-party insurers. Government insurance (Medicare and Medicaid) presents another problem in terms of claim forms. These health care programs are state administered and each state has special filing requirements. The several hundred medical insurance carriers in the United States all use the same coding base. However, clerical personnel and AISs do not uniformly apply these codes. As previously mentioned, special AIS needs for the health care industry relate mostly to third-party billing, but other features of the industry also require special processing.

Health care AISs generally need to maintain patient information. Hospitals, doctors' offices, and nursing homes all need systems to efficiently schedule patients. Home health care services need to keep track of travel costs for employees. Information needs may be unique to very specific industry segments. For instance, physical therapy offices, chiropractic practices, ophthalmologists, optometrists, and dental offices each have some very special information needs. For example, physical therapy offices are different from other medical offices in that a patient may spend an hour in therapy on many different kinds of equipment. An AIS might charge differently for ten minutes spent in the whirlpool versus ten minutes on exercise equipment. The following case describes one specialized health care software program.

Case-in-Point 8.10 Chiropractic software programs help chiropractors with many of their business processes. For example, Advantage Software includes scheduling, medical records management, accounting, insurance claims, and other features that are desirable for this industry. The software tracks patient histories, treatments, payments, appointments, and claims.[9]

BUSINESS PROCESS REENGINEERING

Business process reengineering (BPR) is about redesigning business processes that are no longer efficient or effective. As an example, consider the order process that begins with inquiries from a customer about the products available for sale and ends when the customer pays cash to complete a sale. In many organizations, several individuals handle the order process. Each person has responsibility for a particular function: a receptionist or secretary may handle inquiries, a salesperson follows up on product inquiries, warehouse personnel assume responsibility for filling the order, an accounts receivable clerk bills the customer, and so on. This division of responsibility makes it difficult for some organizations to fill customer orders quickly. The result: dissatisfied customers.

Reengineering the order process may result in an integration of functional activities so that one specified individual handles customers from start to finish. This redesign means a customer knows who to talk to when an order is late and the customer is not passed around from one person to another when problems occur. As we discussed earlier in this chapter, this might be an opportunity for the firm to evaluate the possibility of *value stream management*.

Case-in-Point 8.11 Approving an insurance application at Mutual Benefit Life previously included 30 steps performed by 19 people in five departments. Because paperwork moved among so many workers, an approval took from 5 to 25 days. When the insurance company reengineered its system, it abolished existing job descriptions and departmental boundaries. In their place, the company created the position of "case manager" and provided each manager with the authority to perform all application approval tasks. Because every case manager is in charge of the entire process associated with approving applications, files are not passed around. The results have been fewer errors, decreased costs, and a significantly reduced turnaround time for approval. A new application can now be processed in approximately four hours, with an average approval turnaround time of two to five days.

Why Reengineering Sometimes Fails

Despite the best efforts of their managers, some BPR initiatives fail. There are several reasons for these failures, including unrealistic expectations, employee resistance, and lack of top management support. Some organizations that contract with consultants for BPR services expect significant improvements in their products and services, and expect significantly lower costs. Successful BPR projects can result in increased profit and more satisfied customers, but often not to the extent envisioned. Employees frequently dread hearing the term "BPR" because it has become synonymous with "downsizing." It is often a challenge to get employees to embrace change, especially change that may make what they do unnecessary or possibly more difficult.

[9]Source: http://www.advantagesoftware.com/chiropractic.html.

Although employee resistance is often fatal to BPR efforts, management support can help overcome some of the obstacles. BPR needs champions in top management who are willing to push projects forward despite potential employee resistance. Successful BPR efforts also need top managers who are good communicators and are willing to give employees both good and bad news. Managers who try to mask the downside of change are likely to run into difficulty. Finally, managers should consider the professional help of **change management consultants** to facilitate this complex process and overcome potential negative behavioral aspects.

AIS AT WORK
Reengineering the Doctor's Office[10]

Imagine if you still went to the grocery store and the clerk at the register had to manually enter the price of every item you purchased. Imagine if airlines still used only paper tickets—the ones with the carbon paper on the back of each flight segment. Imagine . . . well, you get the point. But, isn't that still the way business is accomplished at most doctors' offices? At almost every visit, you're handed a clipboard with a form (or several forms) and must fill out the exact same information you did the last time you came for an appointment!

According to Charles Fishman, the information systems at any McDonald's are far more advanced, and more useful, than those in your doctor's office or any hospital, although the stakes couldn't be more different. Estimates suggest that fewer than 25% of all hospitals and health care providers in the United States use electronic medical records or digitized clinical systems. Even fewer physician practices use such technology.

However, there are exceptions. Take for example, a gynecologist in Missouri who decided to move from his paper-based practice to a digital, paperless medical office. He took out a loan to buy the necessary hardware and software and, with his staff of three, switched everything over to the new system. Patient information is now electronic, rather than paper-based, and the doctor takes notes using a tablet PC.

After several months of complete chaos, the doctor is finally reaping the benefits of his investment in technology. The cost of dictation services dropped from $1200 per month to $60; claims are filed electronically and the doctor gets paid by insurance companies in 10 to 14 days instead of 1 to 2 months. The doctor can access patient charts from home at night, view office records from the hospital, and can always find patient charts because they're safe on a server rather than being misplaced, misfiled, or left on the wrong counter.

Of course, doctors (or the medical profession) are not the only ones who benefit from digital medical records—patients benefit, too. One study estimated that 100,000 people in the United States die each year because of preventable medical errors that digital medical records can help eliminate. For example, if a particular drug is pulled off the market, a doctor could quickly and easily identify the patients who need to be notified. That's a great use of BPR!

[10] "Computerized Records Help UNC Health Care Doctors Treat Patients," *InformationWeek* (June 1, 2006): NA; Charles Fishman, "Record Time," *Fast Company* (April 2006), pp. 63–66.

SUMMARY

- This chapter discusses three additional business processes: resource management, production, and financing.
- The resource management process actually includes two areas of interest: human resource management and fixed asset management. Human resource management encompasses both the personnel activities in an organization and the payroll events.
- The production process includes the events related to converting raw materials into finished goods inventories. Controlling all costs is an important objective of today's firms.
- The concept of lean manufacturing is a commitment to eliminate waste throughout the organization (not just in production).
- A company that follows lean manufacturing concepts must identify value from the perspective of their customers, organize production (and data collection) in value streams, empower employees to make decisions, and then continually pursue excellence in all areas of the organization.
- To support lean manufacturing concepts, the firm must also adopt lean accounting concepts, which means measuring and evaluating results by value stream management rather than by traditional departments.
- The financing process overlaps all the other processes because it is concerned with the acquisition and use of funds needed for operations.
- The financing process also includes investing, borrowing, and stock-selling activities.
- Cash management is an important part of the financing process. Sound cash management requires companies to constantly monitor cash balances, investing any excess and covering temporary shortfalls with bank loans.
- There are many other business processes unique to specific industries. Each industry, or vertical market segment with specialized processes, has associated custom AIS needs.
- This chapter only described three of these AISs: professional services, not-for-profits, and health care organizations.
- Current technology, combined with management scrutiny of business processes, provides opportunities to reengineer business processes in ways that help organizations achieve their objectives.
- Business process reengineering (BPR) is the practice of examining business processes and redesigning them from scratch.
- Many companies today are engaged in BPR as a way to improve customer service and satisfaction, increase profitability, and decrease costs.
- Accounting processes and procedures are also being reengineered to make them more efficient and cost-effective.

KEY TERMS YOU SHOULD KNOW

activity-based costing systems
business process reengineering (BPR)
business process management software
change management consultants
cost accounting subsystems
electronic funds transfer (EFT)
enterprise asset management (EAM)
financial planning models
financing process
fixed asset management
human resource management
JIT information systems
job costing information systems
lean accounting

lean production/manufacturing
lockbox systems
non-value-added waste
payroll processing information systems
process costing information systems
third-party billing
time and billing information systems
value stream management
vertical market

TEST YOURSELF

Q8-1. All of the following activities are common to the Human Resource Management function except:

a. Hiring, training, and employing workers
b. Reporting on payroll deductions
c. Maintaining employee earnings records
d. Certified financial planning for employees

Q8-2. Which of the following outputs (reports) is common to all of the processes described in this chapter?

a. Financial statement information
b. Deduction reports
c. Supplier invoices
d. Budget reports

Q8-3. What is the objective of the fixed asset management function?

a. To track purchases of fixed assets
b. To manage the purchase, management, valuation, and disposal of an organization's fixed assets
c. To record maintenance and depreciation of fixed assets
d. To keep a current listing of approved vendors

Q8-4. Why do companies use BPM solutions for the fixed asset management function?

a. Decrease machine downtime and maintenance costs
b. Reduce inventory
c. Integrate data and coordinate logistics
d. All of the above

Q8-5. Which of the following automated systems help minimize inventory costs?

a. JIT systems
b. ABC systems
c. Job order costing systems
d. Process costing systems

Q8-6. Automated point-of-sale technology offers many advantages to retailers as well as customers. Which of the following is the most commonly used POS technology?

a. Cell phones
b. RFID
c. Bar code scanners
d. None of these

Q8-7. The concept of lean production or manufacturing includes all of the following, except:

a. Commitment to eliminate ''waste'' throughout the manufacturing process
b. Eliminate or reduce non-value added waste
c. Improve overall customer value and the profitability of products or services
d. There are 12 categories of waste that companies hope to reduce or eliminate

Q8-8. Lean accounting is:

a. An AIS that is generally considered low cost (i.e., an entry-level system)

b. Designed to support traditional financial performance measures

c. New performance measures that support decision-making by managers and operational improvement leaders

d. None of these

Q8-9. Business process reengineering:

a. Is an incremental approach to redesigning business processes

b. Involves redesigning business processes from scratch

c. Is rarely successful in cutting an organization's costs

d. Is usually welcomed by an organization's employees

DISCUSSION QUESTIONS

8-1. The resource management process includes events associated with both personnel and payroll functions. Describe four data items that could be used by both functions. Describe two data items for each function that would not necessarily be needed by the other (e.g., spouse name for personnel but not payroll).

8-2. Why are accounting transactions associated with payroll processing so repetitive in nature? Why do some companies choose to have payroll processed by external service bureaus rather than in-house?

8-3. In this chapter, we discussed many data inputs to an organization's production process. What are the specific data items to input to a system when adding a new raw materials inventory item? What specific data items need to be input when a worker records time spent on the production line?

8-4. What non-financial information would be important for an AIS to capture about a manufacturing firm's production process?

8-5. What are the basic concepts of lean manufacturing? What concepts are the ''root'' of lean production and lean manufacturing?

8-6. Find an example of a firm that is using lean manufacturing concepts. Has the company realized any improvements? What are they?

8-7. Can you find an example (other than the one described in case-in-point 8-6) of a firm that is using lean production concepts that are supported by lean accounting? How are they doing?

8-8. Are the inputs and outputs of a production process likely to be different for a home builder than for a cement company? How?

8-9. There are many vertical market industries with special accounting information needs apart from the industries discussed in this chapter. Identify three additional vertical market industries. What are the unique characteristics of these industries that affect their AISs?

8-10. Discuss specific steps you would take as a manager to ensure that a business process reengineering effort is successful.

PROBLEMS

8-11. Choose an industry described in this chapter and find out what vertical market accounting software is available for that industry. You may use resources such as the library, trade associations, interviews with organizations within the industry, or interviews with software consultants.

8-12. Literally thousands of business process management (BPM) solutions are available to help managers accomplish tasks in a more effective, efficient manner. Assume that you work in a payroll processing function and your supervisor asked you to select a BPM for your company. Which BPM software would you select and why? Identify the vendor, the name of the software package, and several of the features that you thought would be most beneficial to your company.

8-13. Now, assume that you work in the internal audit function at a company that is considering a software package to help automate the process of complying with the requirements of the Sarbanes-Oxley Act of 2002. Which BPM software would you select and why? Identify the vendor, the name of the software package, and several of the features that you thought would be most beneficial to your company.

8-14. Assume that you started your own law practice ten years ago, specializing in estate planning, and you currently employ five attorneys, two legal assistants, one legal secretary, and a bookkeeper/receptionist. The firm has always used a manual accounting system, which includes procedures for time and billing. How could an automated time and billing system help your firm? Search the Internet for a specific technology to automatically capture a professional employee's time spent on a particular client engagement. What is the name of the software package and what are the primary features of this BPM software?

8-15. Search the Internet for a picture of a dashboard (save the picture to include in your report). Next, prepare a single-spaced one-page report that (1) describes the content of the dashboard and (2) identifies at least 3–4 reasons this dashboard would help a manager make decisions.

CASE ANALYSES

8-16. Hammaker Manufacturing I (AIS for New Manufacturing Firm)

Dick Hammaker has been fascinated with Corvette cars, especially convertibles, since he was a teenager. Dick grew up in Michigan and worked part-time through his high school and college years at a car manufacturer, so he knew the business well. Not surprisingly, when he graduated from college he bought his first car, a used Corvette convertible, and became a member of the local Corvette Club of America.

As an accounting graduate, Hammaker was hired by one of the large automobile manufacturers in Michigan and was selected for the ''fast-track'' management training program. After five years, Hammaker decided to leave Michigan and start a specialty parts manufacturing company strictly for Corvettes. Before he even left Michigan, a potential customer contacted him—the repair shop was replacing the black convertible top on a 1967 Corvette that the owner was going to sell for $76,995!

Hammaker decided to locate his company, Hammaker Manufacturing Co. (HMC), in Northern Virginia because this is the site of the oldest Corvette Club of America. Dick knows he will need the appropriate technology to support his company, so he decided to focus on this aspect of his company prior to starting any production activities. His first action was to hire a CFO (Denise Charbonet) who could work with Lloyd Rowland (a software consultant) to determine the inputs and outputs needed for an AIS for the new company. Of particular concern is the data the AIS will need to collect regarding inventories. As Dick, Denise, and Lloyd know, inventory management will be a key factor for the success of HMC because Corvette cars are unique—parts are needed for these cars since the 1960s!

Dick believes that an AIS will give him the data and information needed for good decision-making, especially to manage inventory investments. HMC's customers are primarily Corvette specialty repair shops and they typically demand parts only as needed, but exactly when needed. Inventory can be very costly for HMC if they must stockpile many specialty parts to be able to quickly meet customer orders.

Hammaker knows from his work experience in Michigan that there are a number of costs associated with holding inventories (warehousing, obsolescence, and insurance costs)—money that could be put to better use elsewhere. Dick knows that he will need to buy raw materials from suppliers and hold raw materials inventories plus make-to-stock parts, or customers will find other parts suppliers.

Denise and Lloyd meet to discuss the issues. They decide that they need to do two things. First, they need to determine what AIS software package would be best for the new company, one that is particularly focused on inventory control, or one with an inventory control module that would be well-suited for HMC. Second, they need to decide what data elements they need to capture about each inventory item to optimize inventory management and control. Denise notes that though some inventory descriptors are easy to determine, such as item number, description, and cost, others are more difficult. For instance, inventory on hand and inventory available for sale could be two different data items because some of the inventory on hand might be committed but not yet shipped.

Requirements:

1. Explain how an AIS could help HMC optimize inventory management and control.
2. What data elements should HMC include in the new AIS to describe each inventory item?

8-17. Hammaker Manufacturing II (Business Process Reengineering or Outsource)

Implementation of a new AIS went smoothly, for the most part. It is 15 years later, and now HMC is interested in mapping a variety of their business processes to determine whether improvements can be made and whether business process reengineering should be considered. Hammaker asked Denise to work with the consulting firm analysts to determine the feasibility of these two options and also to consider the possibility of outsourcing. Denise does not know much about outsourcing and she is not sure which process (or processes) Dick might want to outsource.

Denise discovers that a number of developing countries have the capacity and the labor to make the parts that HMC is currently producing, and at much cheaper prices. Further, Denise discovers that many companies are outsourcing and offshoring a number of processes that used to be accomplished by company employees. Denise makes a note to herself to check the number of employees in each of the following departments: HR, computer support, accounting, and janitorial services. She also decides to query the AIS to determine what performance measures are available to assess the efficiency and effectiveness of each of these departments. Denise places a call to Lloyd Rowland to discuss this issue with him.

HMC is not unionized, but Denise ponders the legal and social issues associated with outsourcing jobs, because many of the 365 employees at Hammaker Manufacturing have been with the company for well over a decade.

Requirements:

1. Identify tools that would help Denise and Rowland map HMC's business processes. Which processes do you think they should work on first? Why those processes?
2. Identify at least six reasons why companies choose to outsource or offshore a business process. Which of these reasons might Dick use to make his decision to outsource or to attempt BPR?
3. Is producing automotive parts a ''core'' business process for Hammaker manufacturing? Explain.
4. Do companies ever outsource ''core'' business processes? Search the Internet to see if you can find an example of a company or an industry that oursources core business processes. What are they? Why are they doing this?
5. What social or legal issues might Denise consider? Be specific and explain why these issues might be important to Hammaker manufacturing.
6. What would you recommend if you were one of the analysts at the consulting firm? Explain.

8-18. Hammaker Manufacturing III (Lean Production/Lean Accounting)

HMC continues to be profitable. Although Denise and Lloyd Rowland mapped several business processes five years ago to determine whether HMC should work on process improvements or consider business process reengineering, they never really finished that effort, nor did HMC decide whether to outsource any processes. Hammaker still thinks that HMC could be more efficient and more profitable, but he's not really sure how the company can achieve this ''next level'' of excellence.

About a year ago, Denise started reading books and trade journals on the topics of business strategy, lean production, and lean manufacturing. So when Dick approached her regarding his intent to improve the company, she began to share with him some of the insights she had gained over the past year on business strategy and how their current AIS might not be capturing the most useful metrics for optimal decision-making. Denise mentioned that the next Lean Accounting Summit will be in September and suggested that she and her three financial analysts go to the four-day conference to gain a better understanding of lean production and accounting concepts to determine how they might be able to better support HMC and Dick's goal of improving the company.

Requirements:

1. If Dick decided to adopt the business strategy of lean production, what changes might he and his managers consider?
2. Explain how HMC might benefit from implementing lean production/manufacturing concepts.

3. Why would it be important for Denise and her financial analysts to attend the Lean Accounting Summit? What benefits would you expect them to acquire from this conference that would be useful at HMC?

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ANSWERS TO TEST YOURSELF

1. **d** 2. **a** 3. **b** 4. **d** 5. **a** 6. **c** 7. **d** 8. **c** 9. **b**