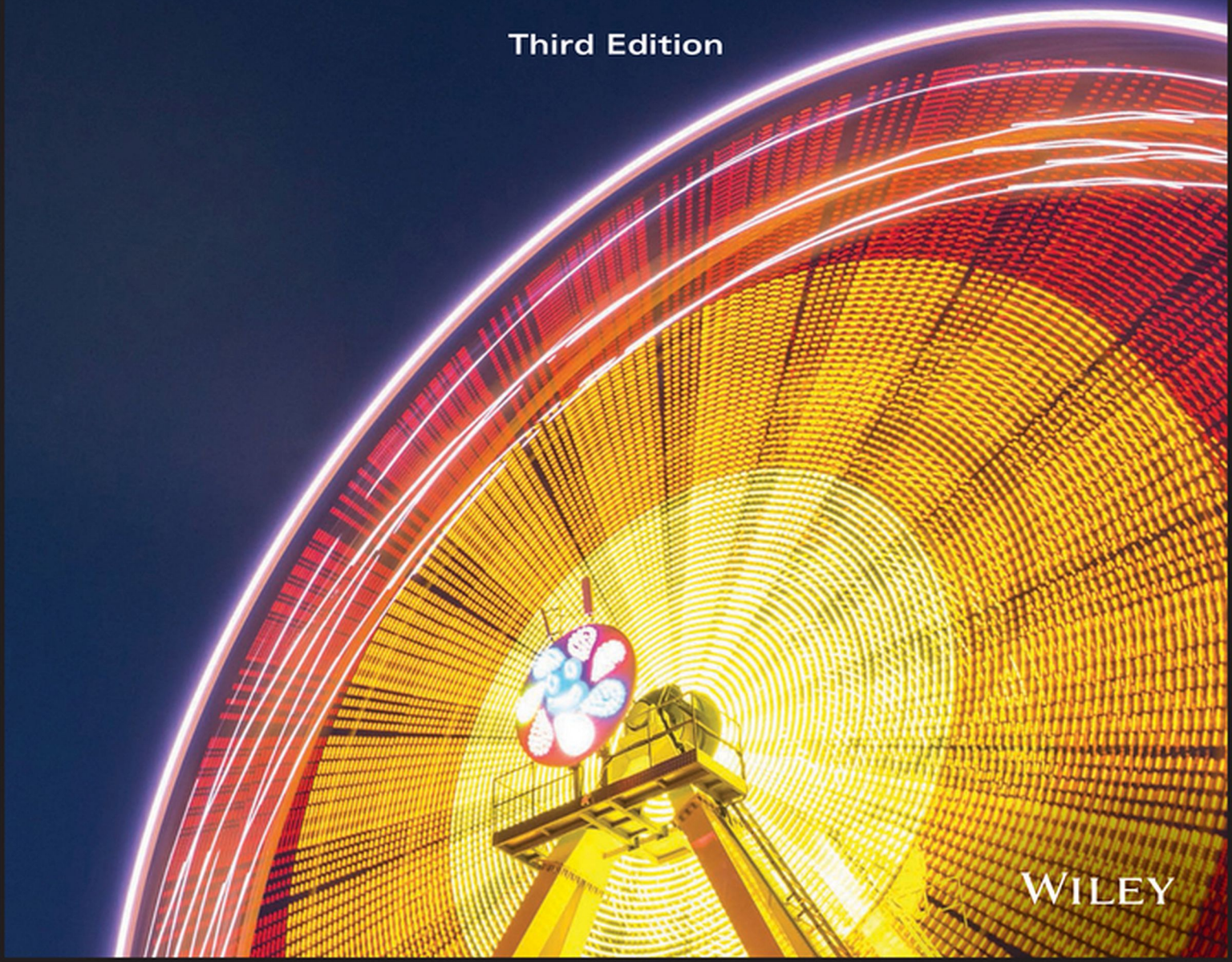
LESLIE TURNER | ANDREA WEICKGENANNT | MARY KAY COPELAND

ACCOUNTING INFORMATION SYSTEMS

Controls and Processes

Third Edition



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Leslie Turner

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Leslie Turner

To my parents and the many students who have inspired and motivated my work.

Andrea Weickgenannt

To my sons, Karl and Erik, for their encouragement, wit, and tolerance.

Mary Kay Copeland

To Bob and Barb Schiesser (my parents), Steve (my husband)
and Tim and Chris (my sons) for their continued support.

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Professor Copeland is a member of the American Accounting Association, the American Institute of Certified Public Accountants, and the Microsoft Dynamics National Academic Advisory Board.

PREFACE

Instructor

Overview Each of us who teaches Accounting Information Systems (AIS) faces the problem of providing students a comprehensive, but interesting knowledge base of AIS. However, we all know that it is difficult to find the right balance of coverage of technical concepts and student comprehension. When addressing this issue of balance, we began to see clearly that a better, more comprehensible approach was needed. With this book, we have achieved a good balance of covering technical concepts while still making the text easy to read and understand. Our textbook also reinforces AIS concepts with relevant, real-world examples and reasonable end-of-chapter materials.

This text incorporates the important content found in a typical AIS course, but has five distinguishing characteristics. Five characteristics we focus on throughout the text are simplicity and understandability of the writing, business processes, accounting and IT controls, examples from Microsoft Dynamics GP (an ERP/AIS system), and ethics as it relates to accounting systems.

We place extra emphasis on the students' understanding. We explain AIS in the context of business processes and incorporate many real-world examples. The richness of these examples improves the text, the discussion questions, and end-of-chapter exercises and cases. We explain IT controls by employing the framework in the AICPA Trust Services Principles. This is an encompassing, but easy to understand, framework of IT controls. We provide examples in the text of an AIS/ERP system, Microsoft Dynamics GP. Instructors are able to add a hands-on learning of Microsoft Dynamics GP that complements the theoretical concepts in the text. Finally, we believe that ethics continues to increase in importance as a topic to be included in accounting texts. We have included an ethics section in each chapter.

We think that including all these characteristics in a single text has resulted in an extremely user-friendly product: one that will help your students achieve a better foundation in AIS.

Features

The book is designed to enhance student learning with a focus on ease of use, business processes and the related controls, and ethics and corporate governance as they relate to accounting information systems (AIS).

Ease of Use This AIS textbook will allow students to easily read and comprehend the material, understand the charts and graphs, and successfully answer questions and cases at the end of the chapters. To attain ease of use, we included several features, including the following:

- **An approach to technical topics with a writing style that is easy to understand.**

- **Process maps and document flowcharts that provide a picture of business processes and that are easy to understand.** While there are several approaches to charts that depict systems, we have used the types of charts that illustrate business processes in the simplest, yet complete manner. Especially in the chapters focused on business processes, we use matched process maps, document flowcharts, and data flow diagrams to illustrate the processes that occur, and the related flow of information and documents. These charts are easy to follow and they will enhance the understanding of the business processes.
- **AICPA Trust Services Principles framework for IT controls.** Controls within Information Technology can be a very difficult subject to comprehend because of the underlying complexity of the technology. While COBIT is the most comprehensive source of IT control information, it is not typically easy for students to understand. This is especially true for students who have not had the opportunity to gain work experience with IT systems and business processes. We use the simplest framework available for the explanation of IT controls: the AICPA Trust Services Principles. The Trust Services Principles categorize IT Controls into five areas: security, availability, processing integrity, online privacy, and confidentiality.
- **Control and risk tables that summarize internal controls and the related risks.** Internal controls are easier to understand when students can see the corresponding types of risks that the controls are intended to lessen. We use control/risk exhibits to present risks that are reduced when controls are used.
- **Real-world examples to illustrate important concepts.** Concepts are often easier to comprehend when presented in a real-world scenario. Each chapter includes examples of issues faced by actual business organizations that help illustrate the nature and importance of concepts in the chapter. Real-world discussions are boxed in a feature titled "The Real World."
- **Microsoft Dynamics GP screen shots to present topics in the context of a real computer system.** New concepts are often easier for students to understand while presented within a real-life application. We use screen shots from Microsoft Dynamics GP software to show how various aspects of business processes would appear in this computer system. In addition, in this version, we have added the ability for instructors to add hands-on learning of Microsoft Dynamics GP to the coursework. See the textbook website for details. This add-on tool provides access to a cloud-based version of Microsoft Dynamics minimizing the involvement of a university's IT staff.
- **The IT technology that underlies AIS continually evolves and allows enhancements to those systems.** Several chapters integrate the concept of cloud computing and the increasing use of cloud computing. The effects of cloud computing on the risk benefits and auditing in AIS are also described.
- **End-of-chapter questions, problems, and cases that match well with the chapter content.** It is important to provide material at the end of each chapter that helps students reinforce the topics presented. It is equally important that this material be relevant and understandable. We have devoted our attention to providing a variety of end-of-chapter activities that are meaningful and manageable, including a concept check, discussion questions, brief exercises, Web exercises, problems, cases, and a continuing case. In addition, most chapters include activities adapted from professional (CPA, CMA, and CIA) examinations.

Business Processes, Accounting Controls, and IT Controls

Business transactions are portrayed within the text in terms of business processes, which are widely recognized throughout the accounting profession. These business processes are described in a manner that is applicable to many different business environments.

We incorporate the COSO framework and integrate discussions of risks and controls in all business process chapters. These discussions are also carried out in as many of the other chapters as possible. The COSO framework, especially the control procedure component, is used as a framework to describe accounting controls. This continued use of the framework across several chapters is intended to increase student understanding and retention of risk and control concepts.

In addition, we place a strong emphasis on IT controls. We accomplish this by using the guidance provided by the AICPA in the revised (2009) Trust Services Principles for WebTrust® and SysTrust® assurance engagements. The Trust Services Principles are the AICPA's guidance that is closely related to COBIT.

The Trust Services Principles risk and control procedures are incorporated into the chapters covering business processes and controls. These controls are also discussed in chapters on databases, ERP systems, auditing IT systems, and the system development life cycle.

Ethics and Corporate Governance It is indisputable within the business world that honest, consistent reporting and management of information has never been more important. Considering the increased responsibility on corporate managers for the overall financial reporting of the company, the study and use of accounting information systems is critical. Accordingly, business ethics and corporate governance continue to increase in focus and we made them a focus of this textbook. An ethics discussion is also found at the end of each chapter and an ethics icon highlights applicable end-of-chapter material.

In order to place emphasis on business ethics in many chapters, it is important to establish a foundation of ethics to build upon. Chapter 3 includes a significant section on ethics in the current environment and the relation of ethical problems to the need for internal controls and ethics codes. We establish Chapter 3 as the foundation for the chapters that follow. The ethics and control concepts in Chapter 3 are reinforced as themes throughout the text. We also include ethics-related questions or cases in the end-of-chapter materials.

In addition to business ethics, corporate governance is a related topic that has received much attention in the business world without a corresponding increase in focus by AIS texts. In addition, each process chapter in Module 3 discusses corporate governance in its application to the various business processes. Sarbanes–Oxley discussions are highlighted in the textbook margins with the letters "SOX."

Supplements

A **solutions manual, test bank, computerized test bank, instructor outlines,** and **PowerPoint** presentations accompany this textbook. They are available on the instructor companion site available with this textbook. The third edition of the text also provides instructors the option of adding hands-on learning of an ERP/AIS system, Microsoft Dynamics GP, to their coursework. This additional supplement provides instructional materials and cloud access to Microsoft Dynamics GP at a nominal cost. Details are provided in the textbook website. The authors would like to thank Patricia Fedje, Minot State University; Yvonne Phang, Borough of Manhattan Community College; and Coby Harmon, University of California–Santa Barbara for their help in developing the test bank and PowerPoint presentations.

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TO THE STUDENTS

Businesses, and the products and services they provide, are unquestionably a critically important part of our society. We would not have food, shelter, cars, computers, iPhones, or the other things we need and use daily without smoothly functioning businesses to provide those goods and services. Likewise, individual businesses could not operate at a level to sustain our society without accounting information. Accounting information is the lifeblood of business. Without the regular flow of accurate accounting information to managers and investors, businesses would collapse. Operating a business or investing in businesses without accounting information would be as difficult as driving with a covered windshield. You would have no feedback information about where you are going and what corrections you must make to get there. Just as your view through the windshield tells you when to make steering, braking, and accelerating corrections, accounting information allows managers and investors to determine how to make corrections that will allow them to achieve business objectives.

Accountants generate, evaluate, summarize, report, and confirm the information that managers and investors need to make good choices in their operations or objectives. The system that allows accountants to accomplish this is the accounting information system.

The study of AIS provides a very important set of concepts to prepare you for an accounting and business career. We hope the features of this book make your study of AIS a little more pleasant, interesting, and understandable. Now, go forward and learn more about AIS and its role in providing critical information to managers and investors!

A LIST OF REAL-WORLD EXAMPLES IN THIS TEXTBOOK

Chapter	Company Example	Subject
1	McDonald's remote order taking at drive-throughs	Business processes
1	McDonald's and a dedicated supplier of buns, East Balt	Supply chain
1	Ford and its reengineered vendor payment system	Business processes reengineering
1	American Institute of CPAS Top Technology Initiatives survey	IT priorities
1	BP and Deep Water Horizon oil spill	Risks
1	Anonymous company that inflated revenues	Ethics
2	Au Bon Pain and South Gate Restaurant updated ordering systems	Business processes
2	Bowen implementing a new system	Legacy systems
2	Thomas Kemper Soda Company's updated systems	Cloud computing
2	Cole Haan, a subsidiary of Nike and system integration	Legacy systems
2	Hawaii Commercial Real Estate, LLC's data sharing	Business processes
3	Phar-Mor fraud	Top management ethics
3	Johnson & Johnson fraud	Top management ethics
3	Association of Certified Fraud Examiners and fraud statistics	Fraud
3	Enron and its demise	Fraud
3	Xerox GAAP violations	Fraud
3	Koss Corporation embezzlement scheme	Fraud
3	Dow Chemical's warning signs of fraud	Fraud
3	Data Processors International and access to its database	Hackers
3	Denial of service attacks at Yahoo, eBay, Amazon.com	Hackers
3	Survey results: Ethical conduct in corporations	Financial pressures
4	Network break-ins at Stratfor and Target computers	Hackers
4	2003 North American power blackout	Disaster recovery
4	Internet company SurveyMonky	Business continuity
4	Microsoft Windows operating system	Hackers
4	Boeing's automated shop floor	Wireless networking
4	Availability risks at SalesForce.com and Coghead	Cloud computing
4	Public and private cloud applications at Starbucks	Cloud computing
4	Pornography on Federal computers at SEC	Fraud
5	Information and technology strategy committee at UPS	IT governance

Chapter	Company Example	Subject
5	Prioritizing IT projects at Allstate	IT governance
5	Anheuser-Busch's use of IT to improve beer sales	IT governance
6	Advantages of an ERP system at Agri-Beef Company	ERP
6	Advantages of an ERP system at Viper Motorcycle Company	ERP
6	SkullCandy's growth and ERP system	Cloud computing
6	Data security and availability at Microsoft	Cloud computing
6	Failed ERP implementation at the city of Tacoma, Washington and in Marin County, California	ERP implementation
6	Successful ERP implementation at Marathon	ERP implementation
7	JCPenney's vendor audit of Aurafin	IT audit benefits
7	Ford Motor Company's focus on financial processes and controls	Internal audit
7	Use of CAATs at EY	IT audit
7	Audit mistakes at Phar-Mor	Auditor independence
7	Koss Corporation's lack of controls	Audit failure
7	Crazy Eddie's fraud	Auditor independence
7	Enron, WorldCom, and Xerox and the need to test balances	Substantive testing
8	Sales processes performance measures at Staples	Sales processes
8	Internet sales processes at Staples	Sales processes
8	Internet EDI at Nortel	Internet EDI
8	Advantages of a POS system at Pizza Hut	POS systems
8	Fraud at MiniScribe	Fraud
8	Sales misstatements at Coca-Cola and McAfee	Ethics
8	Sales misstatements at HealthSouth	Fraud
9	General Electric's electronic invoice presentment system	IT enablement of purchasing
9	City Harvest doubles deliveries without increasing costs	Purchasing and procurement process
9	Frymaster's automated invoice matching system	IT enablement of purchasing
9	Federal government of the United States as strong advocate of e-invoicing	IT enablement of purchasing
9	Evaluated receipt settlement system at an anonymous company	IT enablement of purchasing
9	General Electric's procurement card use	Business process reengineering
9	Special checking account used at Phar-Mor	Fraud
9	Multiple instances of fraud by Paul Pigeon	Fraud
9	Walmart's ethics guidelines for employees in purchasing	Ethics
10	Prince George's County and Los Angeles county school districts payroll problems with ERP	Payroll processes
10	Amtrak ERP systems	Payroll processes
10	Automated payroll system at Scott Paper Company	IT enablement of payroll

Chapter	Company Example	Subject
10	Technology enhancements to property accounting at Tempel Steel and Pepsi-Cola	IT enablement of fixed assets
10	Misclassification of fixed asset at WorldCom, Krispy Kreme, and Sunbeam	Fraud
10	Adelphia's poor corporate governance related to fixed assets	Corporate governance
11	Nissan's robotic plant	IT enablement of manufacturing
11	CAD/CAM at Jean Larrivée Guitars	IT enablement of manufacturing
11	CAD/CAM at Wild West Motorcycle Company	IT enablement of manufacturing
11	Walmart's sophisticated database	IT enablement of logistics
11	Fraud in conversion processes at F&C Flavors	Fraud
12	Typical timing of month-end closing processes	Administrative processes
12	Fast closing process at Alcoa	Administrative processes
12	Fraud in administrative processes at echapman.com	Fraud
12	Automated authorization at Walmart	Administrative processes
12	Interconnected systems at Walmart and Procter & Gamble	Administrative processes
12	Automatic triggering in ERP systems	Administrative processes
12	Misleading data for investors at Krispy Kreme	Ethics
13	Large database at Walmart	Databases
13	High-impact processes at Anheuser-Busch and Hewlett Packard	High-impact processes
13	Failed ERP and IT projects	Data mining
13	Data mining at Anheuser-Busch	Data mining
13	Procter & Gamble (P&G) as a multinational consumer products manufacturer	Cloud computing
13	Data mining activities in Walmart	Data mining
13	Control breakdown at Netflix	Ethics
13	Distributed databases at McDonald's	Distributed data
13	Theft of data at Bloodstock	Ethics
14	Walmart's change to Internet EDI	Internet EDI
14	E-business at General Electric	E-business
14	E-business at General Motors	E-business
14	E-business at Komatsu	E-business
14	E-business at Kenworth Truck Company	E-business
14	E-business at Staples	E-business
14	Extranet use at Staples	Extranet
14	Abuse of private information at Gateway Learning Corporation	Ethics

CONTENTS

MODULE 3 BUSINESS PROCESSES The sets of business processes and the internal controls in organizations. With process maps, document flowcharts, and data flow diagrams, the core business processes are described and the necessary controls to manage risk are discussed.

MODULE 4 IT INFRASTRUCTURE TO ENABLE PROCESSES The hardware, software, and systems that support business processes.

CHAPTER 1

Introduction to AIS

STUDY OBJECTIVES

This chapter will help you gain an understanding of the following concepts:

1. An overview of business processes
2. An overview of an accounting information system
3. The business process linkage throughout the supply chain
4. The IT enablement of business processes
5. Basic computer and IT concepts
6. Examples of IT enablement
7. The internal control structure of organizations
8. The importance of accounting information systems to accountants
9. The relation of ethics to accounting information systems

Overview of Business Processes (Study Objective 1)

The Real World example on the next page will help you understand the context of many concepts in this chapter. Please read that Real World example to begin effective reading and studying of this chapter. You might wonder how the Real World example relates to accounting information systems (AIS). An accounting information system must capture, record, and process all financial transactions. Prior to McDonald's implementation of the experimental drive-through order systems, all in-store and drive-through orders were processed through the cash registers at each location. When the new, experimental systems were implemented, consider their effects on the system that recorded sales. The new technology had to be configured in such a way that

1. Order details were taken accurately
2. Those details were forwarded to the correct McDonald's location so that the order could be handed to the customer at the drive-through
3. The order data had to be included with McDonald's sales and cash received for the day
4. The correct McDonald's location had to be properly credited with the sale so that the franchise and managers would be given credit for sales they generated

The point of this example is that there are many different ways that sales transactions can be conducted. No matter the form of those business transactions, the accounting information system must identify the transactions to record, capture all the important details of the transaction, properly process the transaction details into the correct accounts, and provide reports externally and internally. Many types of transactions that result from business processes must be captured, recorded, and reported.

A **business process** is a prescribed sequence of work steps performed in order to produce a desired result for the organization. A business process is initiated by a particular kind of event and has a well-defined beginning and end. In the McDonald's example, the business process is the taking and filling of a drive-through order.

The Real World

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A few years ago, the fast food restaurant industry experimented with remote order-taking at the drive-through. Fastfood chains such as Hardee's, Wendy's, Jack in the Box, and McDonald's each experimented with remote order-taking at some of their drive-through windows. In the case of McDonald's, an experimental order-taking center takes drive-through orders for several different McDonald's locations. In addition, some McDonald's locations use off-site order-takers such as stay-at-home moms. Order-takers under both arrangements use voice over Internet protocol, or VoIP technology, a T1 phone line, and instant photographs to process the orders. A car pulling up to the menu board trips a magnetic loop that alerts the order-taker, who takes and confirms the order, enters the details on a computer screen, and transmits it instantly to the restaurant. In-store employees focus on taking the cash and delivering the food. Using photos of diners allows stores to install multiple drive-through lanes, which can boost car counts. While the industry appears to have gotten away from this trend, this example illustrates how companies are always searching for new ways to conduct business more efficiently. Often, changes such as these affect the accounting system.

Organizations have many different business processes, such as completing a sale, purchasing raw materials, paying employees, and paying vendors. Each business process has either a direct or an indirect effect on the financial status of the organization. For example, completing a sale directly increases cash or other assets, while paying employees directly reduces cash or increases liabilities. Purchasing new, efficient equipment also directly affects assets and/or liability accounts; yet this transaction is also expected to indirectly increase sales and assets, as it provides for increased productivity and an expanded customer base. Therefore, we can see why, as business processes occur, the accounting information system must capture and record the related accounting information.

All of the possible business processes would be too numerous to list. However, the four general types of business processes typical in organizations (which will be described in later chapters of this book) are as follows:

1. Revenue processes (Chapter 8)
   - **a.** Sales processes
   - **b.** Sales return processes
   - **c.** Cash collection processes
2. Expenditure processes (Chapters 9 and 10)
   - **a.** Purchasing processes
   - **b.** Purchase return processes
   - **c.** Cash disbursement processes
   - **d.** Payroll processes
   - **e.** Fixed asset processes
3. Conversion processes (Chapter 11)
   - **a.** Planning processes
   - **b.** Resource management processes
   - **c.** Logistics processes

4. Administrative processes (Chapter 12)
   a. Capital processes
   b. Investment processes
   c. General ledger processes

In the example on the previous page, the remote drive-though processing is part of the revenue processes. The order-taking combines the sales process and the cash collection process. For a fast food franchise such as McDonald's, these processes are the most visible and obvious to customers. However, there are many other business processes that occur that may not be as apparent to customers.

In addition to revenue processes to sell food to customers and collect the cash, McDonald's must implement some or all of the remaining processes in the preceding list. That is, to sell a Big Mac Extra Value Meal to a customer, McDonald's must first engage in purchase processes to buy meat, vegetables, buns, soft drinks, and other food items, as well as operating supplies. In addition, it must have payroll processes to pay employees, and fixed asset processes to buy and maintain equipment and other fixed assets. McDonald's must have conversion processes to convert the raw meat, vegetables, and buns into customer products that can be sold.

McDonald's must have capital processes that raise funds to buy capital assets, and investment processes to manage and invest any extra cash flow. Finally, McDonald's needs general ledger processes to ensure that all transactions are recorded into the appropriate general ledger accounts and that financial information is reported to external and internal users. For example, each sale to a customer must be recorded as a sale, and the results of the sale must eventually be posted to the general ledger accounts of cash and sales.

The purpose here of reviewing these processes is not to cover the entire set of details, but to emphasize that there must be prescribed work steps in every area. Employees, work steps, and transaction recording systems must be established in any organization to ensure that business processes occur and that any accounting effects of those processes are captured and recorded. For example, employees who work the cash register must be trained to apply company policies for customer payment (such as cash and credit cards accepted, but no personal checks). As these employees perform their work steps, the system in place should be capturing the relevant accounting information. In the case of McDonald's, the cash register captures the in-store sales data, including the items sold, price paid, sales tax, and date of sale. The cash registers are connected to a computer system that feeds the sales and cash data to corporate headquarters so that management reports can be created and external financial statements can be prepared at the end of the period.

In addition, organizations implement internal control processes into their work steps to prevent errors and fraud. **Internal controls** are the set of procedures and policies adopted within an organization to safeguard its assets, check the accuracy and reliability of its data, promote operational efficiency, and encourage adherence to prescribed managerial practices. For example, McDonald's probably requires that at the end of every day, a manager close each cash register and reconcile the cash in the register to the recorded total sold at that register. This is an internal control process to prevent and detect errors in cash amounts and to discourage employees from stealing cash. Reconciliation of cash to cash register records is a business process designed to control other processes. Thus, we begin to see that the accounting information system has many components, as explained further in the next section.

Overview of an Accounting Information System (Study Objective 2)

The **accounting information system** comprises the processes, procedures, and systems that capture accounting data from business processes; record the accounting data in the appropriate records; process the detailed accounting data by classifying, summarizing, and consolidating; and report the summarized accounting data to internal and external users. Many years ago, accounting information systems were paper-based journals and ledgers that were recorded manually by employees. Today, nearly every organization uses computer systems for maintaining records in its accounting information system. The accounting information system has several important components, listed next. An example from McDonald's is used to describe each component.

1. *Work steps within a business process capture accounting data* as that business process occurs. When McDonald's employees greet a customer at the cash register, they perform several work steps to complete a sale, some of which are accounting related and some of which are not. Greeting the customer with a smile may be an important step, but it has no impact on accounting records. However, using the touch screen at the cash register to conduct the sale does have an accounting effect: sales amounts in the sales records should be increased and cash amounts in cash records should be increased.
2. *Manual or computer-based records record the accounting data* from business processes. As is true of most companies, McDonald's has a system of computers and computer processes to record the appropriate data from the sale process. These systems usually involve both manual and computerized steps. For McDonald's, the manual process is that a person must operate the cash register. The remainder of the McDonald's system is computer-based, and the computer records the sale and all related data.
3. *Work steps serve as internal controls* within the business process to safeguard assets and ensure accuracy and completeness of the data. As mentioned before, requiring a manager to close and reconcile the cash register at the end of the day is an example of an internal control within the sales processes.
4. *Work steps are used to process, classify, summarize, and consolidate the raw accounting data.* For example, sales at each McDonald's franchise must be summarized and consolidated into a single total of sales revenue to be reported on the income statement. At McDonald's, these steps are accomplished by the computer system and the accounting software. In some companies, there may be manual or handwritten accounting records, although currently most organizations use information technology (IT) systems to conduct some or all of the accounting recording and summarizing processes.
5. *Work steps generate both internal and external reports.* McDonald's needs many types of internal reports to monitor the performance of individual franchise locations and regions. In addition, year-end external financial statements such as the income statement, balance sheet, and statement of cash flows must be prepared for external users.

These five components are part of any accounting information system but are likely to be applied differently in different business organizations. Exhibit 1-1 shows an overview of an accounting information system. The circles represent the many business processes that occur in the organization—revenue, expenditure, conversion,

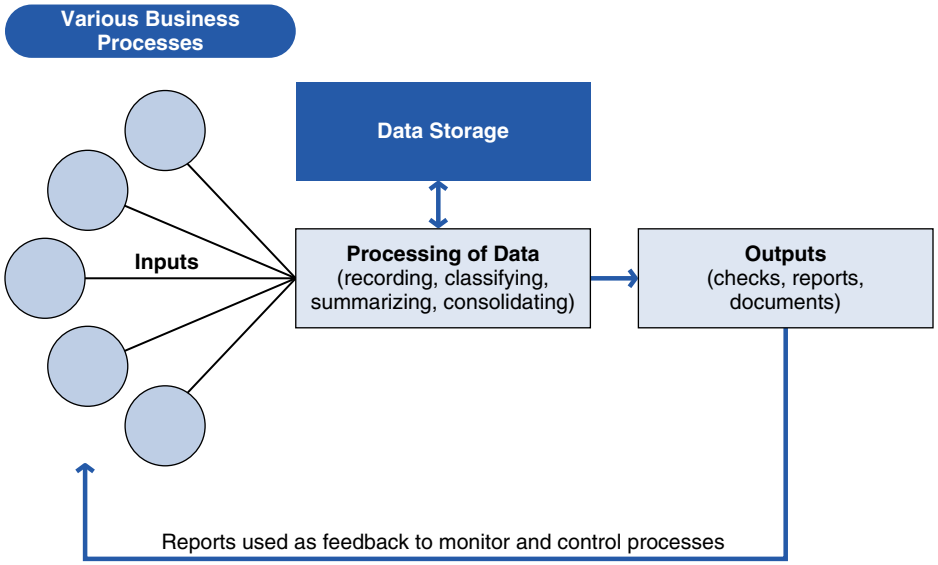

EXHIBIT 1-1 Overview of an Accounting Information System

and administrative processes. As those processes occur, data is captured and becomes input into the accounting information system. The accounting information system classifies, summarizes, and consolidates the data. As input and processing occur, data must be added to or retrieved from data storage. From this stored data and processing, several types of output are prepared. Some of the outputs would be documents such as purchase orders, invoices, and customer statements; other output would be checks to vendors and employees. The output reports are feedback that managers within the organization use to monitor and control the business processes. The number of computerized versus manual work steps may vary across organizations, but every organization should have each of these component pieces. In some organizations, the processes may be manual steps performed by employees, and the accounting records may be paper journals and ledgers. At the other extreme are companies where many or all of these work steps are performed by computers, and the accounting records are in computer files. In most cases, there is a combination of manual and computerized work steps.

The accounting system internal controls are not pictured in Exhibit 1-1, but there should be internal controls throughout the accounting information system. As defined earlier, internal controls are the set of procedures and policies adopted within an organization to safeguard its assets, check the accuracy and reliability of its data, promote operational efficiency, and encourage adherence to prescribed managerial practices. Internal controls are described later in this chapter and covered in detail in the Control Environment section (Chapters 3–7) of this book.

Business Process Linkage Throughout the Supply Chain (Study Objective 3)

The accounting information system and the reports generated by the system are intended to help management monitor and control the organization. However, any organization operates in an environment in which it has many interactive relationships

with other organizations. For example, McDonald's could not operate without its relationships with the many suppliers that provide the ingredients for its menu selections. There is an entire set of activities (business processes) that culminate when McDonald's sells a Big Mac® to a customer. Consider the road that leads to this culminating sale—it stretches far back into many other organizations. To illustrate these activities, let's trace just a small part of that Big Mac sale back as far as we can reasonably go. In order to sell a Big Mac, McDonald's had to purchase and keep an inventory of hamburger meat. McDonald's would have purchased this meat from a meat supplier called a vendor. A **vendor** provides materials or operating supplies to an organization. The terms "vendor" and "supplier" are usually used interchangeably.

For the McDonald's meat vendor to supply meat, that vendor had to buy cattle to process into raw meat. Therefore, McDonald's meat supplier must have relationships with vendors that sell cattle. The cattle seller can be called a secondary supplier to McDonald's. To trace back one step farther, we could say that the cattle seller had to buy cattle from a rancher who raised cattle.

Likewise, the bun on the Big Mac can be traced back to a bakery, which had to purchase flour from another company, and that flour producer needed wheat to produce flour. Tracing back one step farther, we find that the wheat was sold by a wheat farmer. You might wonder what the purpose is of tracing a Big Mac back to the rancher who raised cattle and the farmer who grew wheat. The point is that for McDonald's to operate efficiently, each of these interactive relationships between buyer and seller must operate efficiently. For example, a labor union strike at a bakery could interrupt the supply of buns for McDonald's. Therefore, the top management at McDonald's must ensure that it properly manages, monitors, and controls the internal processes, as well as those processes that are linked to outside parties such as vendors. McDonald's may not be able to directly control all of these interrelated activities stretching back through the many suppliers, but McDonald's may be able to influence those activities by the suppliers they choose and the expectations they place on those suppliers in terms of price, quality, and delivery timing. This set of linked activities is called the supply chain. The **supply chain** is the entities, processes, and information flows that involve the movement of materials, funds, and related information through the full logistics process, from the acquisition of raw materials to the delivery of finished products to the end user. The supply chain includes all vendors, service providers, customers, and intermediaries.

The Real World

An organization such as McDonald's must have many different suppliers of the same product because of the need for fresh ingredients. For example, the regional bakery in the next exhibit provides buns for McDonald's in a five-state area.

As you have traveled, you may have noticed that your Big Mac is always the same, no matter where you go. Even the buns are exactly the same in each town and city. McDonald's plans for this uniformity in buns and must have many suppliers throughout the world that can make and deliver a consistent quality bun.

East Balt, Inc. is one of the large bakeries that supplies McDonald's with buns. East Balt bakeries make these buns according to strict standards of size, shape, color, height, and seed coverage. To maintain freshness, the buns have to be baked in regional locations. It would be much too difficult to have one central location bake all buns for McDonald's. Therefore, McDonald's must have many different suppliers of buns throughout the world.

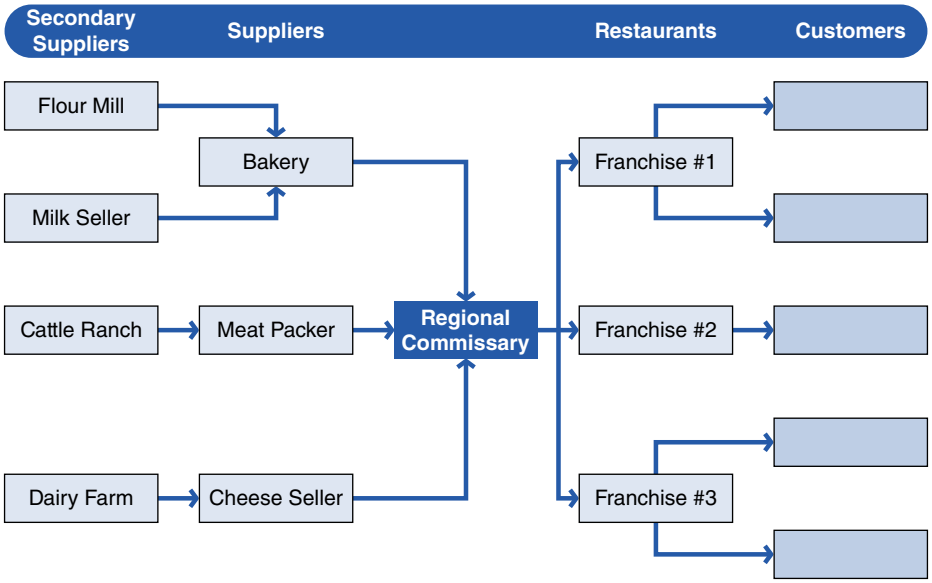

EXHIBIT 1-2 A Simplified Supply Chain for McDonald's

The concept of monitoring and controlling the linked set of activities in the supply chain is called supply chain management. **Supply chain management** is the organization and control of all materials, funds, and related information in the logistics process, from the acquisition of raw materials to the delivery of finished products to the end user (customer). A simplified view of a supply chain for McDonald's is shown in Exhibit 1-2.

The management at McDonald's would find it in the best interest of its company to closely manage, monitor, and control the processes within the supply chain as much as possible. For example, a large organization such as McDonald's can demand certain levels of quality from the bakery that supplies buns. In addition, McDonald's can apply pressure to make sure that the bakery has reliable suppliers of high-quality flour. To the extent that McDonald's can influence primary and secondary suppliers to maintain quality of supplies and efficiency of operations, the business processes within McDonald's will operate more smoothly. As an example, McDonald's bun purchasing process will operate more efficiently when the bakery's bun selling processes run efficiently. This connection between the purchasing processes used by McDonald's and the supplier's selling processes represents a supply chain linkage. In order to increase the efficiency and effectiveness of these supply chain linkages, many organizations employ IT systems. Using IT systems to enhance efficiency and effectiveness of internal or supply chain processes is called **IT enablement**.

IT Enablement of Business Processes (Study Objective 4)

Generally, information technology (IT) comprises all types of technology used to create, store, exchange, and utilize information in its various forms, including business data, conversations, still images, motion pictures, and multimedia presentations. For the purposes of this book, **information technology** is defined as the

computers, ancillary equipment, software, services, and related resources as applied to support business processes. IT usage to support business processes accomplishes one or more of the following objectives:

1. Increased efficiency of business processes
2. Reduced cost of business processes
3. Increased accuracy of the data related to business processes

Any processes within an organization, including the linkages within its supply chain, may benefit by IT enablement. The touch-screen cash register at McDonald's is an example of IT enablement that increases the efficiency of the sales process. Another popular example of IT enablement is e-commerce sales such those in place at Amazon.com, Inc. Amazon.com uses complex IT systems to present a sales model that allows customers to place orders on its website.

These two examples only scratch the surface of the types of processes that can be IT-enabled. Any business process has the potential to be improved by IT enablement. In many cases, using IT to enable processes leads to a completely different approach to those processes. For example, the remote order-taking system described at the beginning of this chapter is a completely different order-taking process from the usual drive-through system. Using more complex IT such as voice over IP and digital photos, McDonald's is experimenting with improving the efficiency of drive-through order taking. Applying IT to business processes is an opportunity to "think outside the box" and consider new and different methods for business processes. This concept of revising processes as IT enabling occurs is called business process reengineering.

Business process reengineering (BPR) is the purposeful and organized changing of business processes to make them more efficient. BPR not only aligns business

The Real World

An example of business process reengineering with IT enablement occurred at Ford Motor Company several years ago. Ford used a purchasing process that required a three-part purchase order. One copy was sent to the vendor, one was kept by the purchasing department, and one was forwarded to the accounts payable department. When purchased parts were received, the receiving department prepared a two-part receiving report. The receiving department kept a copy, and the other copy was forwarded to accounts payable. The vendor mailed an invoice to Ford's accounts payable department. Matching purchase orders, receiving reports, and invoices required more than 500 people. These employees spent a great deal of time investigating mismatched documents. For example, the quantity on the purchase order might not have agreed with the quantity on the invoice. These time-consuming steps of document matching and reconciling mismatches led to late payments to vendors and, therefore, unhappy vendors.

Using IT and business process reengineering, Ford changed its purchasing and payment processes. After a BPR, an online database replaced the manual matching of documents. No document copies were prepared or circulated internally. When parts were received, the receiving employee verified that the goods matched to an outstanding purchase order in the ERP system. The computer system verified the matching of the part number, unit of measure, and supplier code between the purchase order and receiving report. When they agree, the computer system prepared a check to pay the vendor. This reengineered process allowed Ford to reduce the number of employees in accounts payable by 75 percent. Today, automated matching of documents such as a purchase order, receiving report, and vendor invoice have become the normal process in many companies.

processes with the IT systems used to record processes, it also improves efficiency and effectiveness of these processes. Thus, the use of these sophisticated IT systems usually leads to two kinds of efficiency improvements. First, the underlying processes are reengineered to be conducted more efficiently. Second, the IT systems improve the efficiency of the underlying processes. Through rethinking and redesigning a process, the organization may be able to improve, and thereby enhance, the process. This rethinking and redesign is especially aided by the use of IT. When technology or computers are introduced into processes, the processes can be radically redesigned to take advantage of the speed and efficiency of computers to improve processing efficiency. IT and BPR have a mutually enhancing relationship. IT capabilities should support the business processes, and any business process should be designed to match the capabilities that the IT system can provide. BPR should leverage the capabilities of IT to improve the efficiency of processes. This is exactly what McDonald's has done in the remote drive-through example; it has taken advantage of the capabilities offered by technology to improve the process and match it to the capability of the IT system.

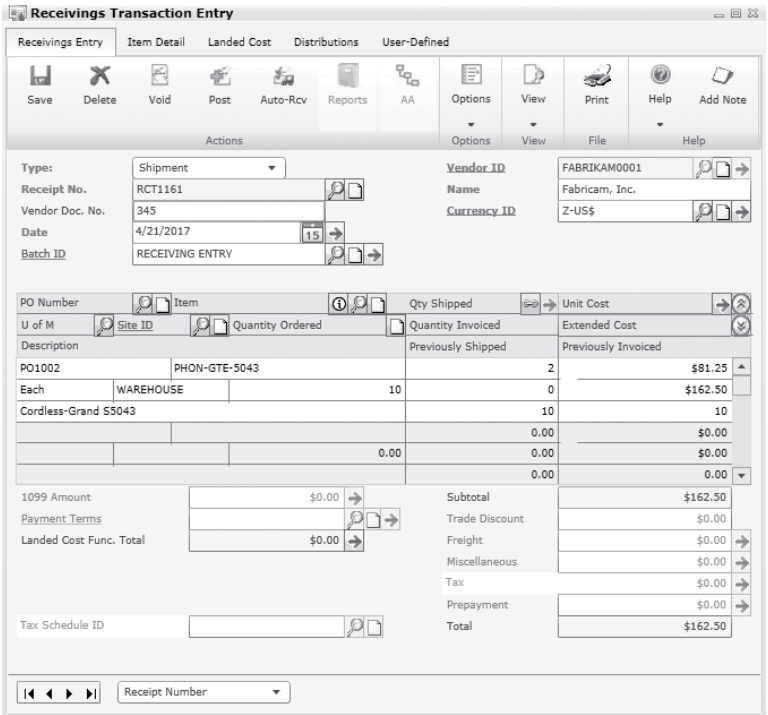

EXHIBIT 1-3 Microsoft Dynamics GP Receivings Transaction Entry Screen Used to Complete Automated Matching of a Purchase Order and Product Receipt

Exhibit 1-3 is a screen from Microsoft Dynamics GP®, an ERP system that this text will use to illustrate details in an accounting information system. The screen provided is the Receivings Transaction Entry window. The screen illustrates the concept of automated matching in an ERP system. This screen would be completed by a receiving clerk or someone responsible for entering inventory items received that had previously been ordered on a purchase order. When a receiving transaction is entered, the user can view all purchase orders placed with the vendor and all inventory items ordered. When the correct purchase order is selected, the items ordered by the company populate the Receivings Transaction Entry screen. The user can