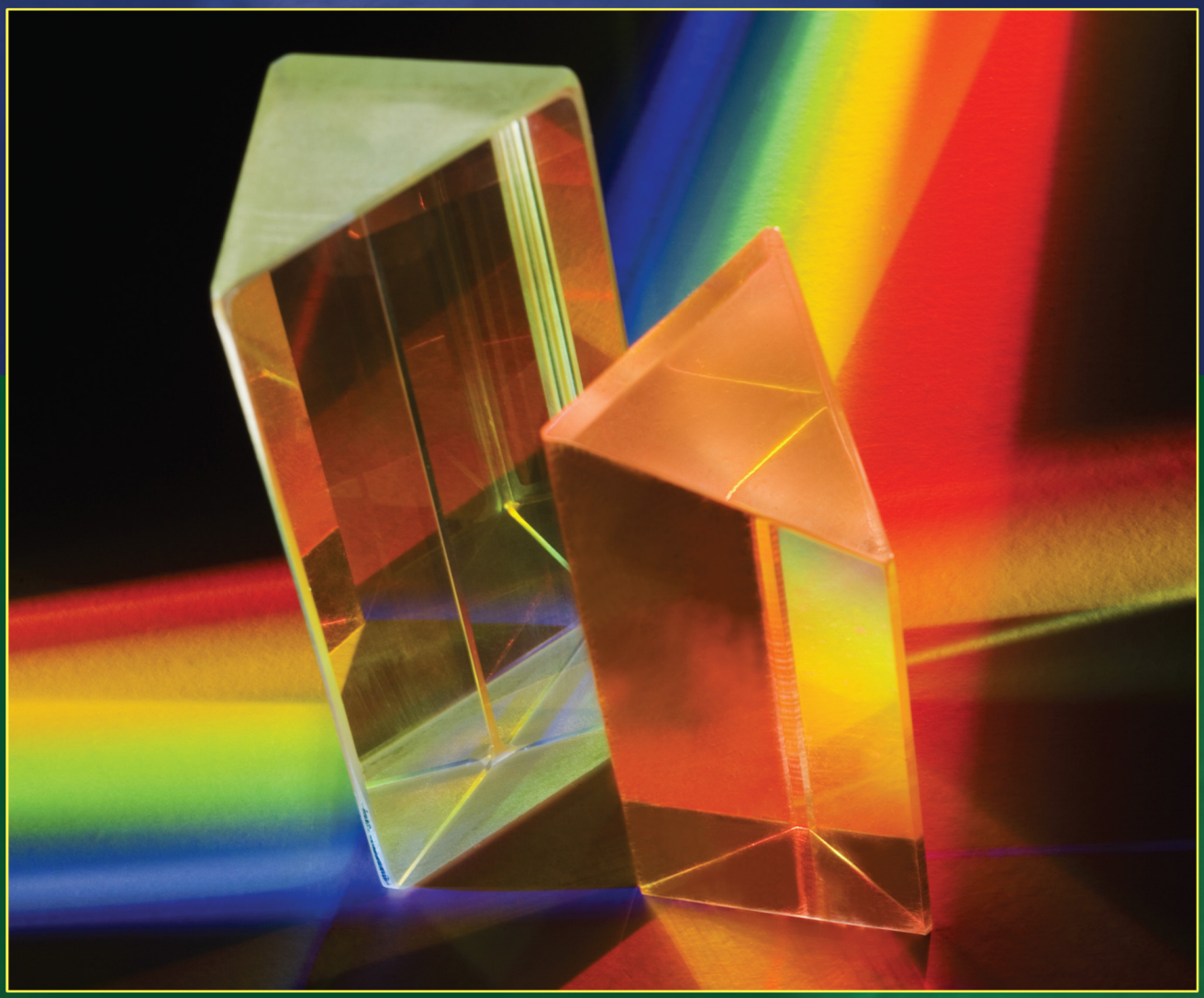
Accounting Information Systems

Basic Concepts and Current Issues



FOURTH EDITION

Mc Graw Hill Education

Robert L. Hurt

Accounting Information Systems

Basic Concepts and Current Issues

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Basic Concepts and Current Issues

Fourth Edition

Robert L. Hurt
California State Polytechnic University, Pomona

Mc Graw Hill Education

ACCOUNTING INFORMATION SYSTEMS: BASIC CONCEPTS AND CURRENT ISSUES,
FOURTH EDITION

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1 2 3 4 5 6 7 8 9 0 DOW/DOW 1 0 9 8 7 6 5

ISBN 978-0-07-802588-4
MHID 0-07-802588-5

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Cover Designer: *Studio Montage, St. Louis, MO*
Cover Image: *Tetra Images / age fotostock*
Compositor: *Laserwords Private Limited*
Typeface: *10/12 TimesLTStd-Roman*
Printer: *R. R. Donnelley*

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Library of Congress Cataloging-in-Publication Data

Hurt, Robert L.
Accounting information systems: basic concepts and current issues / Robert L. Hurt.—Fourth edition.
pages cm
ISBN 978-0-07-802588-4 (alk. paper)
1. Accounting—Data processing. 2. Information storage and retrieval systems—Accounting. I. Title.
HF5679.H865 2014
657.0285—dc23 2014031863

The Internet addresses listed in the text were accurate at the time of publication. The inclusion of a website does not indicate an endorsement by the authors or McGraw-Hill Education, and McGraw-Hill Education does not guarantee the accuracy of the information presented at these sites.

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Preface

MESSAGE FROM THE AUTHOR

To the Instructor

Greetings, colleagues . . .

In the years since the publication of the third edition, I've had the pleasure of corresponding with many of you on a variety of AIS-related topics. I value your input and have incorporated much of it into this new fourth edition of the text.

As I promised in the third edition, the Table of Contents has not changed. But, you will find a lot of new and updated content within the pages of the fourth edition. Here are a few examples:

- *COSO Internal Control Framework.* The COSO framework was updated in 2013, and those updates are now included in Chapter 3.
- *FASB Conceptual Framework.* I've rewritten the material on the Conceptual Framework in Chapter 2 in the light of its revision; I've also included more explanatory material and end-of-chapter exercises on it.
- *Discussion of business processes.* Although business processes still comprise the fourth part of the text, I introduce them much earlier so that students can become familiar with them at a conceptual level.
- *Excel applications.* Each chapter now includes an Excel application. The problems focus on a wide variety of skills, from statistical tools to time value of money functions and many others.
- *Comprehensive problem.* This new edition has a five-part comprehensive problem based on Big Marker (www.bigmarker.com), a Chicago-based videoconferencing service.

My philosophy for teaching AIS continues to inform this edition and to differentiate it from other AIS textbooks. My goal is to provide students some baseline concepts, ideas, and examples, then provide opportunities for them to apply those concepts.

My thanks to you for using/considering the use of this book for your AIS course. Don't hesitate to share with me constructive criticism, comments, and suggestions for improvement.

Bob Hurt
(robert.hurt@gmail.com)

About the Author

Dr. Robert L. Hurt *California State Polytechnic University, Pomona*

Robert L. Hurt is Professor of Accounting in the College of Business Administration at California State Polytechnic University Pomona, where he teaches Accounting Information Systems, Forensic Accounting, and Accounting Ethics. Dr. Hurt received his Ph.D. in Management with a concentration in information science from Claremont Graduate University. He also holds an M.S. in Business Administration (concentration in business education) from Cal Poly Pomona and a B.S. in Business Administration (concentration in accounting) from Southeast Missouri State University.

Hallmarks of Dr. Hurt's classroom approach include utilizing active learning, developing students' critical thinking skills, and helping students apply and connect accounting-related concepts in diverse settings. His courses are also competency based to help students focus their efforts on important skills.

Dr. Hurt is published in the *International Research Journal of Applied Finance*, *Journal of Forensic and Investigative Accounting*, *NACADA Journal*, and *Fraud Magazine*. He is also the author of Global Consulting Corporation: An Accounting Information Systems Practice Case.

Acknowledgments

We could not produce a textbook of the quality and scope of *Accounting Information Systems: Basic Concepts and Current Issues* without the help of a great number of people.

The efforts of many people are needed to develop and improve a text. Among these people are the reviewers who point out areas of concern and areas of strength and make recommendations for change. The following professors provided feedback that was enormously helpful in preparing *Accounting Information Systems: Basic Concepts and Current Issues.*

Tanya Benford
Florida Gulf Coast University
Mark Best
The University of Kansas School of Business
Dr. Passard C. Dean
Saint Leo University
Andy Garcia
Bowling Green State University
Dr. Marina Grau
Houston Community College
Andrew Griffith
Iona College
James E. Groff
University of Texas–San Antonio
Lois S. Mahoney
Eastern Michigan University
Ann O'Brien
University of Wisconsin–Madison
Robert L. Osborne
Ohio Dominican University
Michael Prindle
Simpson College
Vasant Raval
College of Business Administration–Creighton University
Michael Ridenour
Pennsylvania State University–Fayette Campus
Jason L. Smith
University of Nevada–Las Vegas
Dan Stone
University of Kentucky
Eileen Z. Taylor
North Carolina State University
James F. Waegelein
Emporia State University
Linda Wallace
Virginia Tech

I'd also like to acknowledge the efforts of Steve Schuetz, Executive Brand Manager, Gail Korosa, Senior Product Developer, Michelle Nolte, Marketing Manager, MaryJane Lampe, Content Project Manager, and Sandy Schnee, Media Project Manager. All contributed significantly to the project, and I appreciate their efforts.

Walkthrough

What's New in This Edition!

Features

- *Text organization*. The fourth edition is once again organized in five parts. Each part includes new and revised material in both the chapter text and end-of-chapter exercises.
- The text has been updated to reflect developments in the field, including the COSO Internal Control Framework, FASB Conceptual Framework of Accounting, Audit Clarity Project, and CoBIT 5.
- Every chapter has a brand new "AIS in the Business World" focused on a company students are likely to recognize. Companies include Starbucks, Amazon, Google, Barnes & Noble, and Netflix.
- Every chapter includes an Excel application. Topics covered include the use of common Excel formulas (descriptive statistics, time value of money, depreciation methods), graphs and charts (including pivot tables), and selection of random samples and data analysis tools (regression, ANOVA, and others). Many of the data sets for the Excel applications are available on Bob's AIS blog (bobhurtais.blogspot.com).
- The fourth edition's Online Learning Center features a "progressive problem" for each chapter. Those problems take one topic from the chapter and provide problems/questions/exercises at progressively more challenging levels of Bloom's taxonomy.
- The AICPA Core Competency Framework is mentioned throughout the text, demonstrating the importance and relevance of AIS to students' careers.
- Many of the end-of-chapter exercises and problems have been revised and updated.
- At the end of each part of the fourth edition, you'll find an installment of a "comprehensive problem." All installments are based on Big Marker, a videoconferencing service.
- Ancillaries, including online quizzes, the test bank, and PowerPoint slides, have all been updated for the new edition.

Overall Features

Readability

The writing style has been highly praised. Students easily comprehend chapter concepts because of the conversational tone. The author has made every effort to ensure that the writing style remains engaging, lively, and consistent.

Structure

The text puts the most important, fundamental topics first, followed by applications in transaction cycles. Nice-to-know topics are included and can be covered or not at the instructor's discretion.

Philosophy

The text emphasizes the art of AIS over its "science." It helps students begin to develop their professional judgment as accountants, rather than encouraging them to memorize examples and solutions.

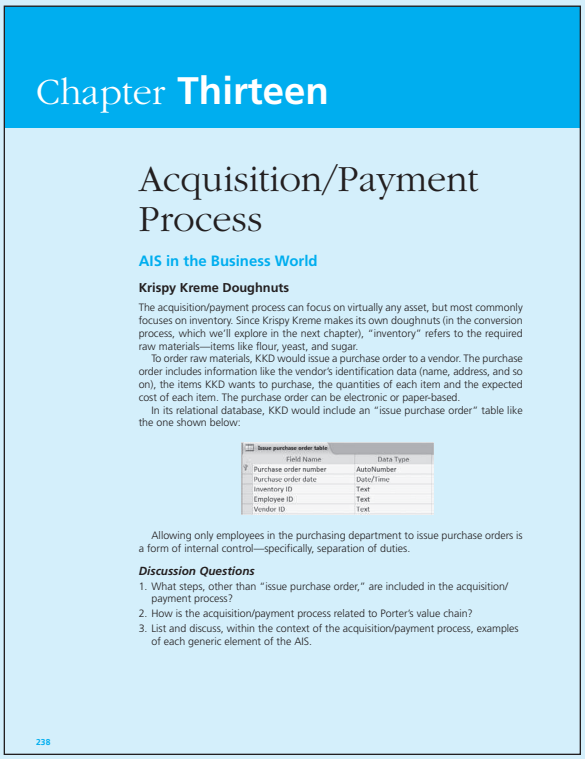
Content

The text incorporates modeling techniques and information technology, but at a level appropriate for accountants rather than CIS majors/professionals. While remaining true to its accounting roots, the text moves beyond a strict accounting orientation; it integrates information technology, behavioral issues, management concerns, quantitative reasoning, and ideas from business law and ethics. Thus, students will have a clear grasp of how AIS concepts impact business practice, regardless of the organizational contexts where they pursue their careers.

Chapter Features

Real-World Examples

Each chapter's "AIS in the Business World" opening vignette has been rewritten. All of them are based on real-world companies students will recognize, such as Target and Microsoft.



Chapter **Thirteen**

Acquisition/Payment Process

AIS in the Business World

Krispy Kreme Doughnuts

The acquisition/payment process can focus on virtually any asset, but most commonly focuses on inventory. Since Krispy Kreme makes its own doughnuts (in the conversion process, which we'll explore in the next chapter), "inventory" refers to the required raw materials—items like flour, yeast, and sugar.

To order raw materials, KKD would issue a purchase order to a vendor. The purchase order includes information like the vendor's identification data (name, address, and so on), the items KKD wants to purchase, the quantities of each item and the expected cost of each item. The purchase order can be electronic or paper-based.

In its relational database, KKD would include an "issue purchase order" table like the one shown below:

Issue purchase order table

Field Name	Data Type
Purchase order number	AutoNumber
Purchase order date	Date/Time
Inventory ID	Text
Employee ID	Text
Vendor ID	Text

Allowing only employees in the purchasing department to issue purchase orders is a form of internal control—specifically, separation of duties.

Discussion Questions

1. What steps, other than "issue purchase order," are included in the acquisition/payment process?
2. How is the acquisition/payment process related to Porter's value chain?
3. List and discuss, within the context of the acquisition/payment process, examples of each generic element of the AIS.

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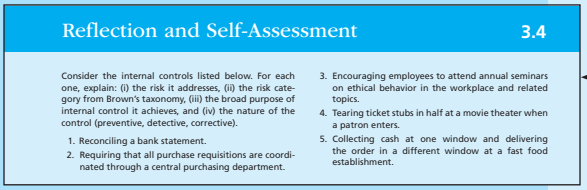
Reflection and Critical Thinking



Reflection and Self-Assessment **3.4**

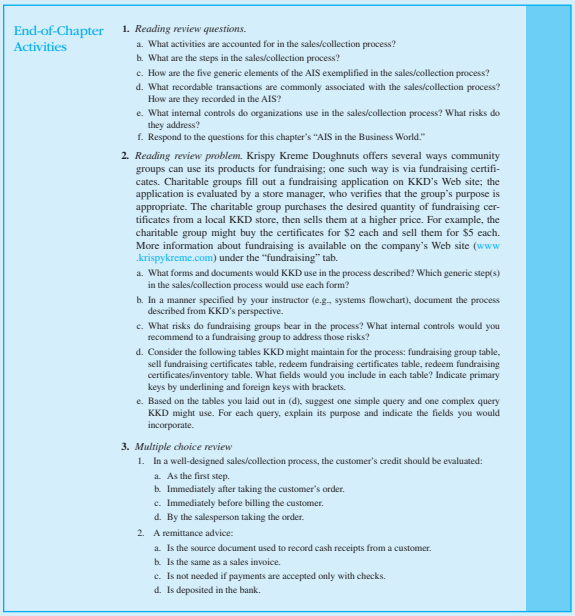
Consider the internal controls listed below. For each one, explain: (i) the risk it addresses, (ii) the risk category from Brown's taxonomy, (iii) the broad purpose of internal control it achieves, and (iv) the nature of the control (preventive, detective, corrective).

1. Reconciling a bank statement.
2. Requiring that all purchase requisitions are coordinated through a central purchasing department.
3. Encouraging employees to attend annual seminars on ethical behavior in the workplace and related topics.
4. Tearing ticket stubs in half at a movie theater when a patron enters.
5. Collecting cash at one window and delivering the order in a different window at a fast food establishment.

Each chapter presents basic ideas and then encourages students to reflect on those ideas. "Reflection and Self-Assessment" activities throughout each chapter will help students think critically about the material. In addition, each chapter continues to include a "critical thinking" application that gets students started down that path; most of those sections have been rewritten for the new edition.

End-of-Chapter Activities

The homework material remains a strength of the text. The sheer number of questions, problems, and Internet assignments will test and therefore expand the students' knowledge of chapter concepts. Further, many chapters include questions and problems that refer back to earlier material in the text and earlier courses in the accounting curriculum to discourage students from doing a "memory wipe" once they've studied a particular topic.

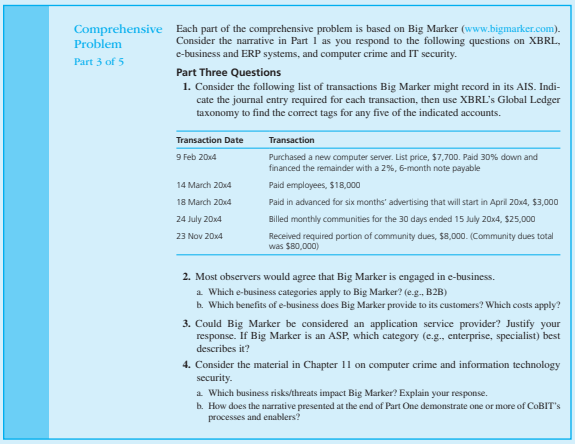


End-of-Chapter Activities

1. *Reading review questions.*
   a. What activities are accounted for in the sales/collection process?
   b. What are the steps in the sales/collection process?
   c. How are the five generic elements of the AIS exemplified in the sales/collection process?
   d. What recordable transactions are commonly associated with the sales/collection process? How are they recorded in the AIS?
   e. What internal controls do organizations use in the sales/collection process? What risks do they address?
   f. Respond to the questions for this chapter's "AIS in the Business World."
2. *Reading review problem.* Krispy Kreme Doughnuts offers several ways community groups can use its products for fundraising; one such way is via fundraising certificates. Charitable groups fill out a fundraising application on KKD's Web site; the application is evaluated by a store manager, who verifies that the group's purpose is appropriate. The charitable group purchases the desired quantity of fundraising certificates from a local KKD store, then sells them at a higher price. For example, the charitable group might buy the certificates for $2 each and sell them for $5 each. More information about fundraising is available on the company's Web site (www.krispykreme.com) under the "fundraising" tab.
   a. What forms and documents would KKD use in the process described? Which generic step(s) in the sales/collection process would use each form?
   b. In a manner specified by your instructor (e.g., systems flowchart), document the process described from KKD's perspective.
   c. What risks do fundraising groups bear in the process? What internal controls would you recommend to a fundraising group to address those risks?
   d. Consider the following tables KKD might maintain for the process: fundraising group table, sell fundraising certificates table, redeem fundraising certificates table, redeem fundraising certificates/inventory table. What fields would you include in each table? Indicate primary keys by underlining and foreign keys with brackets.
   e. Based on the tables you laid out in (d), suggest one simple query and one complex query KKD might use. For each query, explain its purpose and indicate the fields you would incorporate.
3. *Multiple choice review*
   1. In a well-designed sales/collection process, the customer's credit should be evaluated:
      a. As the first step.
      b. Immediately after taking the customer's order.
      c. Immediately before billing the customer.
      d. By the salesperson taking the order.
   2. A remittance advice:
      a. Is the source document used to record cash receipts from a customer.
      b. Is the same as a sales invoice.
      c. Is not needed if payments are accepted only with checks.
      d. Is deposited in the bank.

Comprehensive Problem

The fourth edition includes this comprehensive problem as a new feature; you'll find one part of the problem at the end of each part of the text—that is, after Chapters 5, 8, 11, 14, and 17. Each installment of the comprehensive problem will ask you to refer back to the narrative below; each installment will have application questions based on the material in the associated part of the text. As with all aspects of the book, I'm eager to hear your feedback via email or comment in my AIS blog.



Comprehensive Problem
Part 3 of 5

Each part of the comprehensive problem is based on Big Marker (www.bigmarker.com). Consider the narrative in Part 1 as you respond to the following questions on XBRL, e-business and ERP systems, and computer crime and IT security.

Part Three Questions

1. Consider the following list of transactions Big Marker might record in its AIS. Indicate the journal entry required for each transaction, then use XBRL's Global Ledger taxonomy to find the correct tags for any five of the indicated accounts.

Transaction Date	Transaction
9 Feb 20x4	Purchased a new computer server. List price, $7,700. Paid 30% down and financed the remainder with a 2%, 6-month note payable
14 March 20x4	Paid employees, $18,000
18 March 20x4	Paid in advanced for six months' advertising that will start in April 20x4, $3,000
24 July 20x4	Billed monthly communities for the 30 days ended 15 July 20x4, $25,000
23 Nov 20x4	Received required portion of community dues, $8,000. (Community dues total was $80,000)

2. Most observers would agree that Big Marker is engaged in e-business.
   a. Which e-business categories apply to Big Marker? (e.g., B2B)
   b. Which benefits of e-business does Big Marker provide to its customers? Which costs apply?
3. Could Big Marker be considered an application service provider? Justify your response. If Big Marker is an ASP, which category (e.g., enterprise, specialist) best describes it?
4. Consider the material in Chapter 11 on computer crime and information technology security.
   a. Which business risks/threats impact Big Marker? Explain your response.
   b. How does the narrative presented at the end of Part One demonstrate one or more of CoBIT's processes and enablers?

Supplements

For the Instructor

Instructor's Online Learning Center (www.mhhe.com/hurt4e) includes:

Instructor's Resource and Solutions Manual includes the solutions to all the discussion questions, end-of-chapter questions and problems, and reflection and self-assessment questions.

Test Bank includes a substantial number of questions in each chapter offering a large pool of material to choose from when creating a test.

EZTest Computerized Test Bank can be used to create different versions of the same test, change the answer order, edit and add questions, and conduct online testing.

PowerPoint Presentations deliver a complete set of slides covering many of the key concepts presented in each chapter. The instructor's versions of the slides include classroom assessment and feedback exercises.

For the Student

PowerPoint Presentations (www.mhhe.com/hurt4e) are available on the Student Center of the text's Online Learning Center. These presentations accompany each chapter of the text.

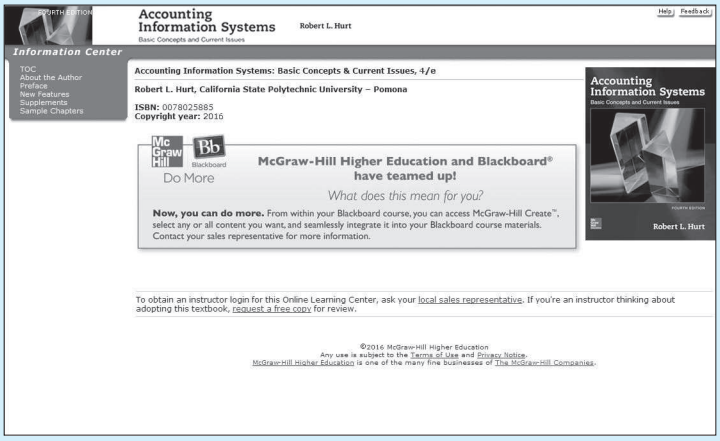
Technology

Online Learning Center

www.mhhe.com/hurt4e

For instructors, the book's Web site contains, the Instructor's Solutions Manual, PowerPoint slides, Test Bank, EZTest software, Text and Supplement Updates, and links to professional resources.

The student section of the site features online chapter quizzing activities, including a multiple-choice quiz to accompany each chapter of text. PowerPoint presentations are also available to download. The author has listed several important links relating to text and professional material. The student section also includes a progressive problem for each chapter, designed primarily as a study aid. Progressive problem solutions appear on the blog.



Message from the Author

To the Student

Many students are attracted to accounting as a major because they believe at least some of the following:

- Accounting is fundamentally about numbers.
- Accounting problems always have a right answer.
- Success in accounting is achieved by memorizing rules and procedures.
- Accounting is the most important function in a business.

As you'll see in your AIS course, most of those beliefs are (at best) skewed—in some cases, they are patently untrue. Therefore, you're likely to find your AIS course challenging, and very different from other accounting courses—particularly different from introductory accounting.

In my view, success in an AIS course (and in the broader field of accounting) is a matter of:

- Mastering a few fundamental principles and ideas, such as the purposes of internal control, database design, and the accounting cycle, and applying them in diverse contexts.
- Relating new material to previously learned material, both within and between courses. You'll often note, for example, that this book discusses relationships between accounting, finance, information systems, quantitative methods, management concepts, and many other areas.
- Evaluating information and thinking critically in responding to textbook problems, course assignments and exam questions. Pay particular attention, therefore, to the material in Chapter 1 on AIS Information Sources and Information Literacy Concepts, as well as to each chapter's "critical thinking" section.

I appreciate the comments, questions, and observations I've received from student users of previous editions, and have done my best to address them in this revision. If you'd like to share your thoughts on the book, please drop me an e-mail any time (robert.hurt@gmail.com). You're also most welcome to leave comments on my AIS blog (www.bobhurtais.blogspot.com).

Dr. Bob Hurt, C.F.E.

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Part **One**

AIS Fundamentals

1. Role and Purpose of Accounting Information Systems
2. Transaction Processing in the AIS
3. Internal Controls
4. Management Concepts
5. Information Systems Concepts

The ideas in these chapters are fundamental to the study of accounting information systems, regardless of approach or philosophy. They define the nature of accounting information systems, review the accounting cycle, and provide a firm foundation in internal controls. They also begin developing the idea that accounting information systems (AIS) is a multidisciplinary field by examining relevant concepts from both management and information systems. While these chapters present the topics at a basic level, the material is reinforced and applied in various contexts throughout the rest of the text.

Chapter **One**

Role and Purpose of Accounting Information Systems

AIS in the Business World

Starbucks

If you're like the students in my accounting information systems courses, you've probably purchased coffee and snacks at a local Starbucks. Starbucks is a vast worldwide operation; according to the corporate Web site (www.starbucks.com), it has more than 18,000 stores in 62 countries. Its stock is publicly traded under the symbol SBUX.

Through the Web site, prospective owners can apply to open a licensed Starbucks store. Menus include everything from traditional coffee to more exotic offerings like iced cinnamon dolce latte; various holidays have their own special offerings, too.

To create value for its stakeholders, a typical Starbucks retail store would engage in activities like:

1. Purchasing capital equipment.
2. Buying inventory.
3. Making beverages on demand.
4. Selling those beverages to customers.
5. Paying employees.
6. Reporting financial results to the corporate office.

To accomplish those activities, Starbucks needs an accounting information system.

The purpose of this text is to help you understand how companies like Starbucks account for their various transactions—not just the debits and credits, but the documents, tools, and controls they use that ultimately produce general-purpose financial statements and other reports. Each chapter opens with a short vignette like this one, followed by some discussion questions to stimulate your thinking.

Discussion Questions

1. What are the essential elements of an accounting information system?
2. How do examples of those elements change for different businesses?
3. Does the presence or absence of computers and other forms of information technology determine whether or not a business has an accounting information system?

We'll explore various kinds of audits and their relationship to the AIS in Chapter 17.

Welcome to the study of accounting information systems (AIS)! AIS is a critically important area of study for future accountants. It ties together what accounting students often see as separate, unrelated areas of accounting: financial, managerial, tax, and governmental. Additionally, AIS brings in considerations from management, finance, and information systems. Finally, a deep, fundamental comprehension of accounting information systems is a great help in the study of auditing.

You'll often hear the phrase "single, correct, deterministic responses" throughout this text—that's another way of saying there is "one right answer."

Many accounting students are drawn to the discipline because of its perceived objectivity; they like solving problems that have "right answers." And your prior study of accounting may have focused on such problems. But, in practice, such problems are few and far between. And even when they exist, you won't be able to look up the right answer in a textbook or solutions manual. Problems and issues in accounting information systems seldom have single, correct, deterministic responses. So, to get you ready to confront and respond to those kinds of problems in practice, I'm including many of them in this textbook. One of this book's main purposes is to help you develop professional judgment and confidence in your ability to analyze **unstructured problems.**

Examples of structured questions with deterministic responses include the following: How much cash is in the bank at a given point in time? What are the three parts of a balance sheet? Unstructured, nondeterministic questions, on the other hand, require critical thinking. They include questions like this: What documentation tool should I use to design an AIS and/or to describe a business process? What internal controls should be implemented for a business process?

You'll find a paragraph like this one at the beginning of every chapter in the book. The enumerated items are often referred to as "learning objectives" or "expected student outcomes."

When you've finished studying this chapter, and completing the activities at its conclusion, you should be able to:

1. Define "accounting information systems."
2. Discuss why AIS is an important area of study for future accountants.
3. Compare and contrast AIS with other areas of study in accounting.
4. Explain the structure of most accounting information systems.
5. Locate and evaluate information sources on accounting information systems.
6. Describe the structure and content of the remainder of this text.

Different university accounting curricula place the AIS course differently. In some schools, AIS is the first course accounting majors take after the introductory sequence. In other programs, AIS is near the end of the required sequence. And you'll find some schools allow students discretion in the timing of AIS study. In my university, students study AIS early in their accounting education—within one or two terms of completing their introductory sequence. But this book can be used in any of the three frameworks mentioned above.

As you can probably tell already, I tend to write in a conversational tone—as if I'm talking to you. I've found students appreciate such an approach, and that it motivates them to read the text more systematically and regularly. If something in the text seems unclear, or could be stated differently to enhance your understanding, I encourage you to contact me with your thoughts. My e-mail is RLHurt@csupomona.edu. While I can't promise a response to every e-mail I receive, I can promise each one will receive serious consideration in any future edition of the text. You're also welcome to leave comments about the text on my AIS blog (www.bobhurtais.blogspot.com).

DEFINITION AND IMPORTANCE OF AIS

You've probably heard of the FASB by this time in your accounting education. It develops the rules we use to prepare financial statements. You can learn more about them at their Web site (www.fasb.org).

The test bank for this book includes some questions on the conceptual framework. If some of the terms in it are unfamiliar to you, you'll want to research them as part of studying the chapter. My AIS blog is a good place to start.

An **accounting information system** is a set of interrelated activities, documents, and technologies designed to collect data, process it, and report information to a diverse group of internal and external decision makers in organizations. AIS is an important area of study for future accountants for at least three reasons:

- Developing a strong accounting information system helps achieve some of the components of the FASB conceptual framework of accounting.
- Studying AIS helps students develop many of the core competencies suggested by the American Institute of Certified Public Accountants (AICPA).
- Acquiring knowledge about AIS helps students learn more about common business processes.

Let's take a closer look at each of the three reasons.

The Financial Accounting Standards Board (FASB) developed the **conceptual framework** in the late 1970s as a guide for the development of future accounting principles; the conceptual framework was revised and updated in 2010.

Detailed study of the conceptual framework often comprises the first part of intermediate accounting, so we won't go into great detail on it here. But, you can see a summary of it in Figure 1.1.

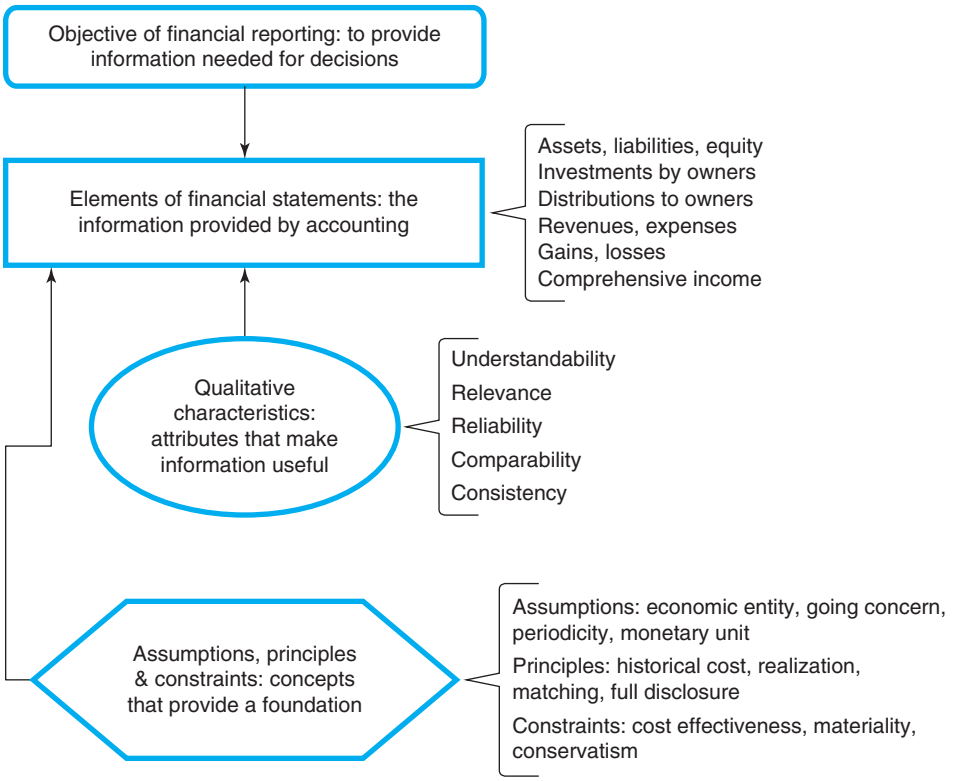
Reflection and Self-Assessment 1.1

Which terms in the conceptual framework do you recognize from your previous accounting courses? Which ones are unfamiliar? Do some research and define or give examples of at least three of the latter.

A well-designed accounting information system relates to the conceptual framework by

- *Capturing data on the elements of financial statements.* No matter what form they take or information technologies they use, accounting information systems document changes in the 10 elements of financial statements identified in the conceptual framework. Those elements are organized into four general-purpose financial statements: income statement, statement of shareholders' equity, balance sheet, and statement of cash flows.
- *Transforming those data into relevant and reliable information.* Well-designed accounting information systems can also gather data beyond the elements of financial statements. Items like sales by geographic area, customer characteristics and transaction histories, demand for inventory items, and vendor quality ratings can improve decision making by enhancing the elements of relevance: predictive value, feedback value, and timeliness. Additionally, internal controls in the accounting information system promote reliability (verifiability, neutrality, and representational faithfulness), as you'll see in later chapters.
- *Recognizing and adapting to the cost–benefit constraint.* Accounting information systems are all about choices and trade-offs: What data should I capture? What information technologies should I use to process them? What information should I report? Looking at the conceptual framework diagram in Figure 1.1, you'll see "cost-effectiveness" as one

FIGURE 1.1
FASB Conceptual Framework



of the constraints on accounting information. Cost-effectiveness reminds us that we can't design the world's perfect accounting information system. Even in the best organizations with the most effective systems, you'll find managers who want more data or different data, who question the system's integrity, and/or who want business processes to be structured differently. As a designer, implementer, and interpreter of accounting information systems, always keep in mind that the benefit of having data, processes, and information must outweigh the costs of obtaining or implementing them. Those costs and benefits might be economic, behavioral, psychological, or financial, but they should always be considered.

The AICPA (www.aicpa.org) has suggested a very comprehensive list of competencies most accounting professionals will need—whether those professionals are practicing in public accounting or some other area. The **AICPA core competencies** are divided into three broad groups; here are some that are particularly related to accounting information systems (AICPA, 2013):

- Broad business perspective competencies
  - *Strategic/critical thinking.* "Critical thinking encompasses the ability to link data, knowledge and insight together from various disciplines to provide information for decision making. Being in tune with the 'big picture' perspective is a necessary component for success."
  - *Resource management.* "Individuals entering the accounting profession should be able to apply management and human resources development theories to human resource issues and organizational problems."

- Functional competencies
  - *Risk analysis.* "The understanding of business risk . . . affects how business strategy is created and implemented."
  - *Research.* "The individual preparing to enter the accounting profession needs to have strong research skills to access relevant guidance or other information, understand it, and apply it."
- Personal competencies
  - *Problem solving and decision making.* "Accounting professionals are often asked to discern the true nature of a situation and then determine the principles and techniques needed to solve problems or make judgments. Thus, individuals entering the accounting profession should display effective problem solving and decision-making skills, good insight, and judgment, as well as innovative and creative thinking."
  - *Communication.* "Accounting professionals are called upon to communicate financial and non-financial information so that it is understood by individuals with diverse capabilities and interests. Individuals entering the accounting profession should have the skills necessary to give and exchange information within a meaningful context and with appropriate delivery. They should have the ability to listen, deliver powerful presentations and produce examples of effective business writing."

Finally, AIS study will also help you understand **business processes** from an accounting point of view; business processes are a very common way of organizing AIS courses. We'll take an in-depth look at various business processes in Part Four of the text; for now, though, here's a brief overview of a few:

- *Sales/collection process.* This process comprises activities from taking a customer's order to collecting payment from the customer. It involves documents such as a remittance advice and customer invoice; common transactions include sales on account and collecting cash on account.
- *Acquisition/payment process.* This process can apply to just about any resource an organization needs, but is most commonly discussed in the context of inventory. In our later discussions of the acquisition/payment process, you'll learn about documents like purchase orders and receiving reports. Common transactions include purchasing inventory on account and paying vendor invoices.
- *Conversion process.* When an organization manufactures a product, it has a conversion process. You may recall from previous study that product costs come in three groups: direct material, direct labor, and overhead. In the conversion process, organizations combine these three resources to create a finished product; they then sell that product through their sales/collection process.
- *Financing process.* Virtually no organization can obtain all the cash it needs to operate simply by selling goods and services; most periodically need to acquire external financing in the form of debt (such as bonds payable) and equity (such as capital stock). The financing process deals with that aspect of the company.
- *Human resources process.* The human resource process encompasses activities such as hiring new employees, evaluating employee performance, paying employees, and managing their separation from the company. This process is heavily regulated by federal and state law.

I hope this section has demonstrated to you that AIS is an important area of study, worthy of your best attention and effort. Next, let's think about the structure of a "typical" accounting information system.

AIS STRUCTURE

I often refer to "organizations" rather than "companies" or "businesses." That's because every organization needs an AIS, but not all organizations are "businesses."

An accounting information system is a set of interrelated activities, documents, and technologies designed to collect data, process them, and report information to a diverse group of internal and external decision makers in organizations. Most accounting information systems comprise five parts, as shown in Figure 1.2.

Each part of the **AIS structure** plays a vital role in its overall efficiency and effectiveness. And each part is filled with the kinds of design choices and cost–benefit trade-offs mentioned earlier. Consider the questions below to illustrate them:

1. *Inputs.* Inputs to an AIS might include documents such as sales invoices and purchase orders. Accountants would also need to ask questions like these to design and/or audit the system:
   a. What kinds of source documents will system users need?
   b. Should the source documents be paper-based, electronic, or both?
   c. How many copies of each source document will be required?
   d. What information should the documents contain?
2. *Processes.* Processing tools can include computers and satellites; however, please keep in mind that an AIS does not necessarily have to use information technology (IT). In smaller organizations, accounting tasks may still be completed with paper and pen. Here are some questions you might ask about processing tools:
   a. Which processing tools should the AIS use?
   b. Should the tools be manual, computer-based, or both?
   c. If computer-based tools are used in the AIS, which software and hardware packages should be implemented?
3. *Outputs.* System outputs for most organizations would include the general-purpose financial statements as well as internal reports such as variance analyses. Other considerations include:
   a. Beyond the general-purpose financial statements, what other reports will managers and system users need?
   b. How should the AIS be designed to facilitate their production?
4. *Storage.* Data in an accounting information system could be stored in paper form, electronically, or a mix of both. If the data are stored electronically, they are often broken down into three broad file types. Master files typically contain data about "things," such as inventory, customers, and vendors. Transaction files usually focus on "activities," such as earning revenue and incurring expenses. Junction files link other files together, as you'll see later in the text. Relevant questions about storage include:
   a. How should data be stored? On paper? Electronically? Both?
   b. Where should data be stored? Locally? Remotely? Both?
   c. How long should data be stored?
   d. Under what conditions can/should data be destroyed?

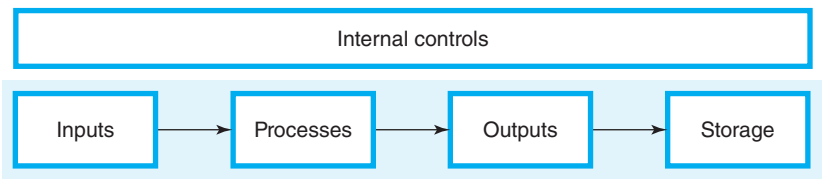


FIGURE 1.2
Generic AIS Structure

5. *Internal controls.* We'll explore internal controls in much greater depth later in the text. Most organizations employ internal controls such as daily backup of data and separation of duties (custody, authority, and recordkeeping) to maintain control over specific assets. Other questions might be:
   a. What controls are necessary to promote information integrity in the AIS?
   b. What behavioral effects are the controls likely to have?
   c. Are the controls cost-effective?

The preceding questions don't have clear-cut, easy, simplistic answers. They do have "common" or "usual" answers, and that's part of what you'll learn throughout this course. But the rest of what you'll learn may be even more important. You'll learn how to make choices and judgments within the context of accounting information systems—choices and judgments that may not be perfect but that you'll be able to explain, along with their costs and benefits. Additionally, you'll be able to critique and evaluate the choices made by others. At first blush, that kind of thinking may seem daunting. Try to set aside your anxiety so you can think critically. Recognize that even seasoned professionals have to discuss and debate ideas to solve problems.

Reflection and Self-Assessment 1.2

How do you feel about starting a course that doesn't have clear-cut, easy, simplistic answers? What study tools and techniques could you use to develop your ability to respond to open-ended questions?

So, to move you forward toward that goal, let's examine places (other than this book) where you can find information about AIS, as well as some guidelines for evaluating that information.

AIS INFORMATION SOURCES AND INFORMATION LITERACY CONCEPTS

If you're like some of my students, you may have heard about information literacy in a philosophy or English class. So, you may be wondering why we're talking about it in AIS. Here's the connection: Accounting information systems is a rapidly changing field; with the possible exception of forensic accounting and fraud examination, it may be the newest field of study for accounting students. And, to a greater degree than with other areas of accounting, practitioners and professors alike take different approaches to it. So, throughout the course, you'll often be called upon to do research as part of answering questions/responding to problems/preparing projects.

When your professor assigns a research or current article project, where is the first place you look? If you're like most accounting students, you answered, "the Internet." And, since AIS is such a "hot topic" in today's business world, you're bound to find tons of information on it there. But you're probably not surprised to learn that not all information on the Internet is valid, trustworthy, or reliable. In other words, you can't necessarily believe everything you read on the Internet. You should evaluate information critically for yourself, rather than believe everything you read on the Internet.

According to Dictionary.com, "validity" refers to something that is well grounded or something that is binding. Although validity doesn't appear formally in the conceptual framework, it is definitely implied—particularly by the qualitative characteristics of accounting information.

Reflection and Self-Assessment 1.3

Society is full of urban legends that may or may not be true. For example, some people believe the Earth is flat. Others believe that the first U.S. landing on the moon was nothing more than a hoax. Choose one of those urban legends or some other you prefer. Find an information source that attempts to assess its validity, and comment on the believability of the source.

Depending on the kinds of assignments your instructor gives you this term, you may find yourself doing a lot of research for this class. The point of this section of the chapter is to give you tools to evaluate the information you find during your research—to think about it critically, rather than assuming it's all "true" on its face.

Evaluating information reliability, whether on the Internet or from other sources, comes under the broad heading of "information literacy" or "information competence." For ease of discussion, I'll use the term **information competence** (IC) here, but you're likely to hear both terms in conversation about this topic. IC is much, much broader than the evaluation of information reliability, but we'll limit our discussion here to that aspect of it. According to the California State University's Work Group on Information Competence (Curzon, 1995), it is "the ability to find, evaluate, use, and communicate information in all of its various formats."

Why is information competence important in the study of accounting information systems? AIS is full of emerging concepts, ideas, and issues. Answers to the problems you'll confront in this class are not always found in textbooks but may require significant research. Evaluating the validity of sources you encounter in that research is a critical skill for reaching reliable conclusions and finding genuinely valuable information.

Many sources can assist you in evaluating information, but I've found the checklist developed by the University of Maryland's University College (UMUC) to be especially helpful. You can find the checklist at http://umuc.edu/library/guides/evaluate.html. The UMUC site presents five evaluation criteria, each with several specific questions you can use in your research. The five criteria are:

If you'd like to learn more about information competence in general and assess the degree to which you have it, I encourage you to visit the American Association of School Librarians' Web site on the topic: www.ala.org/ala/aasl/aaslproftools/informationpower/informationliteracy.htm.

Your university library probably has numerous materials on information literacy as well; most librarians are well versed in the topic and eager to share their knowledge with students.

You'll also find a lot of resources about this important topic at www.calstate.edu/LS/Tutorials.shtml.

1. *Authority.* Can you tell who created the information? The purpose of its creation? Can you contact the author or creating organization, or otherwise establish their credentials? For example, authors published in *Strategic Finance* (the monthly publication of the Institute of Management Accountants) are required to provide background and contact information as part of their articles. Reading that information carefully can help you make decisions about authority as you evaluate information for AIS course projects.
2. *Accuracy.* Does the site/article/source tell you where the information came from? Does it contain any obvious errors of fact or misleading graphs, charts, or statistics? Consider, for instance, information presented in a graph. Differences can be exaggerated simply by changing the graph's scaling. Consider Figure 1.3 as an illustration of this point. Notice how the differences appear more pronounced in graph (a) than in graph (b), although the only difference between the two graphs is the scaling on the vertical axis.
3. *Objectivity.* Does the information contain advertising? Is it available freely? By this time in your accounting education, you have probably heard of the Sarbanes-Oxley Act of 2002. We'll explore the details of SOX later in the text, but consider www.soxlaw.com in terms of this information criterion. Figure 1.4 gives you a partial screen shot of the Web site. Although I've found the information there to be objective and valuable in learning about SOX, notice the "Contact Us" link on the left side. Clicking that link reveals the name of the consulting firm that compiled the information, offering its services to help companies comply with SOX.
4. *Currency.* Can you tell when the source was created/written? When was the last time it was updated? Does the page contain any "dead links"? Earlier in this chapter, I introduced you to the AICPA core competency framework. In researching this chapter, I came