

ACCOUNTING INFORMATION SYSTEMS

The CROSSROADS of ACCOUNTING & IT

SECOND EDITION

Donna Kay • Ali Ovlia



Your Roadmap for this Text

Part 1 Enterprise Accounting Systems: People, Processes, and Technology

Store
Accounting
Data

Chapter 1
Accounting System Insights

Chapter 2
Accounting Databases

Chapter 3
Accounting Interface:
Database Forms, Queries, and Reports

Chapter 4
Accounting Systems and Business Processes

Chapter 5
Business Processes: Purchasing, Sales, and Payroll Cycles

Chapter 6
Integrated Enterprise Systems and Cloud Computing

Part 2 Accounting and Intelligence Systems

Analyze
Accounting
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Chapter 7
Accounting and Business Intelligence

Chapter 8
Accounting and Sustainability Intelligence

Chapter 9
XBRL: Intelligent Business Reporting

Part 3 Security, Controls, and Risk

Safeguard
Accounting
Data

Chapter 10
Fraud and Internal Control

Chapter 11
Cybersecurity

Chapter 12
The Risk Intelligent Enterprise: Enterprise Risk Management

Part 4 Designing and Developing Accounting Systems

System
Design

Chapter 13
Accounting System Development

Chapter 14
Database Design: ERD, REA, and SQL

Part 5 Enterprise Accounting Systems: Capstone

Chapter 15
Emerging Trends and Technologies

Chapter 16
Accounting Systems in Action: LIVE Projects

Accounting Information Systems

The Crossroads of Accounting & IT

Second Edition

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Library of Congress Cataloging-in-Publication Data is on file at the Library of Congress

PEARSON

ISBN 10: 0-13-299132-2
ISBN 13: 978-0-13-299132-2



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**Part 5 Enterprise Accounting Systems:
Capstone**

**Chapter 15 Emerging Trends and Technologies
(Online Chapter)**



What's New in This Edition?

To bring you the latest, each chapter text has been carefully updated to reflect changes in the accounting and IT fields.

- Business process mapping has been entirely overhauled to focus on flowcharts as the process mapping tool preferred by accounting professionals. The new Business Process Modeling and Notation (BPMN) 2.0 is also presented in Chapters 4 and 5 because it is the business process mapping notation preferred in business to meet the simplicity requested by accounting professionals while providing more technical detail than flowcharts to meet the needs of IT professionals.
- Coverage of business process mapping using data flow diagrams (DFDs) is moved to Chapter Extensions 4 and 5, available online at www.pearsonhighered.com/kay.
- Chapter 6, *Enterprise Information Systems*, has been updated to include the portion of the enterprise system that is increasingly in the cloud, with a new section on cloud computing.
- Chapter 8, *Accounting and Sustainability Intelligence*, keeps you at the forefront of sustainability and how it affects your accounting system. Chapter 8 is updated to include coverage of integrated reporting that integrates traditional financial reporting and sustainability reporting. Novo Nordisk's Integrated Report appears in Chapter Extension 8 (located at www.pearsonhighered.com/kay) so you can learn from a leader in integrating reporting on financial, social, and environmental performance.
- *Cybersecurity*, Chapter 11, includes a new chapter extension with two leading IT control frameworks—ISO 27k IT controls and COBIT.
- Each chapter has updated assignments prepared by Ali Ovlia.
- The latest emerging trends and technologies, such as mobile technology and robotics, are covered in online Chapter 15, to keep you up to date on technologies impacting accounting.



It's All About You!

This book is all about you—the student!

- To save you time . . .
The materials focus on the key topics and skills you need to be successful in this course and on the job.
- To make your life easier . . .
The concepts and materials are presented in a friendly manner so the subject matter makes sense.
- To give you a competitive advantage . . .
Everything in this text is focused on aiding you in the successful navigation of the crossroads of accounting and IT.

Best wishes for your continued success!



What Gives Me a Competitive Advantage as an Accounting Professional?

This book is designed to assist you in developing the following top five core competencies for accounting professionals (AICPA):

1. Communication and leadership
2. Strategic and critical thinking
3. Customer focus
4. Interpretation of converging information
5. Technological skills

Technology is integral to accounting today. To fully understand accounting, the accounting professional must understand the crossroads of accounting and information technology. To navigate the crossroads, this book equips you to communicate using two different languages: the language of the accounting professional and the language of the IT professional.

This text contains straightforward presentation of leading edge technologies at the crossroads of accounting and IT. From business intelligence to XBRL, from integrated enterprise systems to cybersecurity, and from enterprise risk management to sustainability accounting, this text offers you the latest in accounting and technology in easy to understand terms.

This gives you a competitive advantage and better prepares you to successfully launch your career as an accounting professional.

How Can I Study Less and Learn More?

The art and science of effective learning is simple: It's not how long you study—it's how *effectively* you study.

How do you study effectively? *Connect new information to what you already know.* Build on what you already know to construct new knowledge.

If you can't connect new knowledge to something you can relate to, keep asking questions until you can build a bridge from what you know now to the new information.

Effective learning can be compared to global travel. Let's say your professor is very excited about exploring the city of Prague, so he or she gives you a Prague city map. The map has limited usefulness to you, however, if you are in Chicago, New York, or Los Angeles. Before the map has real meaning or significance to you, first you must travel to Prague.

In the same way, if your professor is excited about the latest development in accounting and business intelligence, for example, but you are unable to connect the new information to what you already know, you will not be able to construct new meaning. Connect the new information to something you already know.

By the way, this learning approach is called *constructivist pedagogy*, and it is woven throughout this text. The questions, examples, illustrations, and assignments are all designed to create an experience that provides an opportunity for you to construct deeper meaning and a memorable personal discovery.

Top Ten Tips for Studying AIS

1. Connect new information to what you already know.
2. If you can't do Tip No. 1, then build a learning bridge. Ask your professor questions. Perform an online search and read more about the topic. Find something about the new topic that you can use to build a bridge to what you already know.
3. Clarify your learning. Clear up any misunderstandings by asking questions. Don't give up when you feel confused. Persist and keep asking questions to clear up any confusion.
4. Streamline your learning. For example, this text uses models that streamline learning large amounts of new information. One baseline accounting system model is representative of most accounting systems. This saves you from learning dozens of different accounting systems. If you can connect your current knowledge to the new model, you can dramatically improve the effectiveness of your study.
5. Connect to your classmates. Classmates can help you build the bridge to connect new knowledge to what you already know. Or maybe you can assist in building the bridge for a classmate. Sometimes when we teach others, we learn the most.
6. Learn to see things in a new way. In this book, we use GPS as a reminder to see both the details of accounting and the global picture of an entire accounting system.
7. Discover the relevance. Are you ever frustrated in courses when you are asked to learn things that do not seem relevant? Discover the relevance of AIS topics and give yourself a reason to learn.
8. Write down your questions. It's amazing how the process of formulating questions can clarify your own thinking. Don't be surprised if during the process of writing down your question, you discover the answer.
9. Review the chapters and your notes three times. Read the chapter and make notes. Review the chapter a day later and again one week later. You will retain more information if you review the material three times instead of just once. This will save you time and improve your grades!
10. Remember: AIS is SASSY. The main areas of AIS are shown on the inside front cover and listed below:
 - Store accounting data.
 - Analyze accounting data.
 - Safeguard accounting data.
 - SYstem design.



How Do I Navigate the Crossroads of Accounting and IT?

The roadmap to navigating the crossroads of accounting and IT is shown on the inside front cover.

Remember – AIS is SASSY:

Part 1: Store accounting data.

Part 2: Analyze accounting data.

Part 3: Safeguard accounting data.

Part 4: SYstem design.

The fifth and final part of the book is a capstone, integrating AIS topics.

If you want to know more, here is a brief summary for you. By the way, don't be surprised if your professor covers the chapters in a different order. There are many different approaches to teaching and learning AIS.

Part 1: Enterprise Accounting Systems: People, Processes, and Technology introduces you to the design, development, and functioning of accounting systems today. In *Chapter 1: Accounting System Insights* we provide you with insights into understanding how accounting systems function in today's business environment. *Chapter 2: Accounting Databases* provides an introduction to databases and their integral role in accounting systems. *Chapter 3: Accounting Interface: Database Forms, Queries, and Reports* describes the accounting system interface and its role in the accounting system. In *Chapter 4: Accounting Systems and Business Processes*, we share with you how to read and develop business process maps that document business processes. *Chapter 5: Business Processes: Purchasing, Sales, and Payroll Cycles* covers documentation for business processes using business process maps for purchasing, sales, and payroll cycles. In *Chapter 6: Integrated Enterprise Systems and Cloud Computing* we explore how the accounting system is integrated into the larger enterprise system and how cloud computing is being used by enterprises.

Part 2: Accounting and Intelligence Systems explores the impact of intelligent systems on accounting. *Chapter 7: Accounting and Business Intelligence* discusses how enterprises use analytics to create business intelligence for improved decision making and business performance. *Chapter 8: Accounting*

and Sustainability Intelligence provides an overview of the emerging field of accounting for sustainability and the resulting impact on the accounting system. *Chapter 9: XBRL: Intelligent Business Reporting* explores the who, what, where, when, and how of eXtensible Business Reporting Language (XBRL) that electronically tags each piece of financial data.

Part 3: Security, Controls, and Risk focuses on safeguarding information assets stored in accounting systems. *Chapter 10: Fraud and Internal Control* introduces COSO's Internal Control Framework and COBIT's IT controls framework. *Chapter 11: Cybersecurity* explores the threats posed by cybercrime to an accounting system. This chapter introduces you to the International Information Systems Security Certification Consortium (ISC)² 10 domains for cybersecurity. *Chapter 12: The Risk Intelligent Enterprise: Enterprise Risk Management* introduces COSO's enterprise risk management (ERM) framework. The chapter presents the top 10 tips for spreadsheet risk management.

Part 4: Designing and Developing Accounting Systems provides an overview of different approaches to developing accounting systems and the related accounting database. *Chapter 13: Accounting System Development* explores the phases of the system development life cycle (SDLC) as applied to developing an accounting system. *Chapter 14: Database Design: ERD, REA, and SQL* compares and contrasts two approaches to accounting database design: entity relationship diagram (ERD) and resources, entities, and agents (REA). This chapter also explores how data is extracted from the database using Structured Query Language (SQL).

Part 5: Enterprise Accounting Systems: Capstone provides a capstone experience for integrating accounting system topics. *Chapter 15: Emerging Trends and Technologies* is an online chapter that explores the latest trends in information technology and the impact on accounting systems. *Chapter 16: Accounting Systems in Action: LIVE Projects* provides opportunities for LIVE projects to develop your project management and team building skills, two critical skills for your future success as an accounting professional at the crossroads of accounting and IT.

How Can Features of This Book Streamline My Learning?

Every feature in this book has been designed for you and your success in learning the content of this course.

- Real and relevant makes the content come alive!

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Sustainable Economics
Meet Tom Brown, founder of SPACE LLC. Brown is on the left. Meet Matt Long of SPACE Construction, LLC (shown on right). Video: www.spaceof.com Twitter: @spaceofllc © SPACE LLC 2011



Hi, I'm Tom, founder of SPACE LLC. I established SPACE, an ARCHITECTURE + DESIGN firm, in March of 2009. As seems to be our luck, many things fell into place for us. When we were ready to design and build a first-class studio to accommodate our design talents, we determined that we would utilize all the "best practices" of sustainable design, but that we would not attempt LEED certification. By our estimates, for our project we would spend \$40,000 to \$60,000 more to go through the LEED process, with the required paper work and documentation. We made a conscious decision to use that money instead to create a more sustainable building.

Our first thoughts turned to solar to something viable so it would be sustainable. To our dismay, we had pressure ROI. Spending \$50,000 to generate energy.

Instantly, we assumed that we were going to compete with rooftop solar around this time that we met Anne. It was through that company that we decided to convert the roof's energy to stored energy we had to harvest.

While we could use the hot water users of hot water. The best use of it was an existing concrete slab already. By Brownfield remediation, we figured out so it would be paid for through the \$ system for heat, but what about cool?

Our building purchase came with suggested using that heat to create a amount 95 degrees and then pump it degrees. The cold water would be of

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Database Form Design
Well-designed database forms are designed to save time and minimize data entry errors. A few general guidelines for database form design include the following:

- Enter data once.
- Use data validation.
- Support auto entry.
- Minimize paper forms.
- Design user-friendly forms.
- Implement appropriate security.

Accounting Insight No. 9: Enter Data Once
Accounting Insight No. 9, *Enter Data Once*, which was introduced in Chapter 2, can be applied to database form design. The database form should require the user to enter the data only one time, saving data automatically as needed. Some organizations have streamlined data entry using bar codes to bypass the process of keying data into an onscreen form. Another method of streamlining data entry is to use default values when possible. These values automatically appear in the field on the default. For example, the current date might appear on the default value on invoices, and the user only needs to change values significant times when entering data because they require review instead of re-entry.

ACCOUNTING INSIGHT NO. 9
Enter Data Once

DATA VALIDATION Data validation tools let onscreen forms use data validation features to field can be a drop-down list of 1 through 12. The space, into the Month field.

Another example is a global company that is was professional because employees used the United States, employees entered Germany, in Germany, employees entered Deutschland. The Country field for Germany only partial results the use of a drop-down list of countries using a consistent data entry.

Other data validation techniques include using a specific number of characters. For example, limited to five spaces. Data validation can include range checks (for example, between 1200 and 11

AUTO ENTRY Database forms are often designed after you make a selection. For example, when QuickBooks accounting software, QuickBooks and sales terms. When you select the customer's tag a database query to retrieve the customer address.

Accounting Insight No. 11: Mirror
Accounting Insight No. 11 is to mirror database data. For example, if sales representatives in the onscreen data entry form and the hard-copy form and reduce data entry errors.

ACCOUNTING INSIGHT NO. 11
To Save Time Entering Data... Mirror Database Forms and Paper Forms

USER-FRIENDLY FORMS The database form creating professional typically does not want a data list as onscreen form. Instead, the onscreen onscreen prompts that eliminate the need to enter

- Accounting Insights simplify the complex!

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- Identify the table relationships between the CUSTOMERS, SALES ORDERS, SALES ORDER LINES, and ITEM TABLES. Use database software to create the database table relationships.
- Print the table relationships.

2.30 (Continuation of TE 2.27)
Tech Task: Database Software
Software Values: Database Tables
This is a continuation of the previous exercise.

ExpressOffice asked for your assistance in entering data into database tables to record sales transactions.

1. Using Microsoft Access database software and your database file from the previous exercise, enter the following customer information into the CUSTOMERS table.

Customer No.	Company Name	Last Name	First Name	Street Address	City	State	ZIP	Country	Account Balance
12712	Propane	Anna	Angela	13 Joseph Ave	Agatona	WI	54811	USA	\$100.00
81901	EspressoBar	Pao	Vincenzo	58 Duane	Pisa	Tuscany	43001	Italy	\$ 530.00

2. Enter the following items into the ITEM table.

Item No.	Item Name	Item Description
908	Espresso Machine Lux	Espresso Machine Lux Model 2009 all electronic
AR01	Puro Arabica	Puro Arabica from Colombia and Africa
AR02	Arabica Colombian Mix	Arabica Colombian Mix: 60% Arabica, 40% Colombian
BB01	Espresso Machine Basic	Espresso Machine Basic Model 2010 with basic features
WC1	Specialty Caps	Specialty Caps - White and espresso caps
WC2	Specialty Caps Lux	Specialty Caps Lux - White and espresso caps quality

3. Enter the following sales into the SALES ORDERS table and the SALES ORDER LINES table:

- On December 5, 2012, customer Angela Ashford places an order to buy the following items:
 - Item No. AR02 for \$40 each.
 - On December 22, 2012, customer Vincenzo Pao places an order to buy the following items:
 - Item No. 908 for \$400 each.
 - Item No. WC1 for \$15 each.

4. Print the CUSTOMERS, SALES ORDERS, SALES ORDER LINES, and ITEM TABLES.

2.40
Tech Task: Database Software
Software Values: Database Tables, Database Table Relationships
Complete the following:

- Select an authentic enterprise of your choice. Using Microsoft Access database software, develop the following tables for the enterprise, identify appropriate fields, and select the primary keys.
 - CUSTOMERS table
 - SALES ORDER NUMBER
 - SALES ORDER LINE TABLE
 - ITEM TABLE
- Identify the relationships between the tables as one-to-one, one-to-many, or many-to-many.

Online materials keep you current!

- Online Chapter 15 – Emerging Trends and Technologies
- Online Chapter 16 – Live Projects

It's Your Call

This is your training ground. These scenarios provide you with the opportunity to use your knowledge and professional skills.

2.30 Since your background is in AIS, you have been asked to provide training to the other accountants in your company about the new accounting system design. How would you explain to your colleagues about the three tiers in an accounting system architecture? (02-1)

2.34 You have been called in as a consultant to act as a liaison between the accountants and the IT professionals at a company. The accountants are complaining that they must re-enter all the customer information each time an order is placed. The accountants see this as inefficient and time consuming with no value added.

The only response from the IT professionals has been to say that the database tables need to be normalized. The accountants have asked you what this means. Communication between the two groups of professionals has deteriorated.

How would you facilitate communication between the accountants and the IT professionals? How would you explain to both sides what is needed to resolve the issue? (02-4)

2.35 Your company is expanding its operations to include overseas markets. Your supervisor asked you to prepare a summary explaining changes to the CUSTOMER database table that need to be implemented as a result of the overseas expansion. (02-3, 3-4)

2.36 You work at a university and have been assigned to a project team to update the university database to include information about employee dependents. The university provides tuition free to all employee dependents and wants to track dependent information to estimate free tuition in the future.

One of the project team members has suggested simply adding the employee dependent information to the EMPLOYEE database table. What do you think? Is this advisable? Prepare your notes to respond to his suggestion at the next team meeting. (02-3, 3-4)

2.37 Your supervisor would like to know why calculated fields are typically not included as database fields in accounting software. Prepare a short report on advantages and disadvantages of including and not including the calculated field for your supervisor. (02-3, 3-4)

Tech in Practice

These technology in practice exercises are perfect for both individuals and teams.

Tech Exercises

Sharpen your skills with these technology exercises. Watch the software videos at www.pearsonhighered.com/kay.

2.38

Tech Tool: Database Software

Software Videos: Database Tables, Database Table Relationships

EmpireCoffee asked for your assistance in building database tables to record sales transactions.

1. Using Microsoft Access database software and information in Figure 2.21, build the following database tables. Identify the primary key for each table.

- CUSTOMER table
- SALES ORDER table
- SALES ORDER LINE table
- ITEM table

- **Key Terms Check**
Understanding the language used at the crossroads of accounting and IT is key to your success.
- **Short Exercises**
Warm up with short exercises.
- **It's Your Call**
Your training ground for an opportunity to use your knowledge and professional skills.
- **Tech Exercises**
Sharpen your technology skills with exercises that are perfect for both individuals and teams.
- **Go Online**
In the fast-paced world of technology, your skill at finding answers fast can be vital. Go online and experience typical assignments you may encounter as a professional.

2.20 An item table's record has 5 fields: Item code, Item name, description, location ID, and warehouse ID. Which of these fields is a good candidate for the primary key?

- a. Location ID
- b. Item Code
- c. Warehouse ID
- d. Item name

2.21 An item may appear on many orders. An order contains many items. The relationship between Item table and Order table is:

- a. Many-to-one
- b. Many-to-many
- c. One-to-many
- d. One-to-one

2.22 Stondy, an accountant, wants to search for a specific customer address. She should search using:

- a. Customer name
- b. Customer address
- c. Customer ID
- d. a and b

2.23 Which of the following is NOT a database essential?

- a. Form
- b. Table
- c. Query
- d. DBMS

Exercises

Each Exercise relates to one of the major questions addressed in the chapter and is labeled with the question number in green.

Short Exercises

Warm up with these short exercises.

2.24 Match the following database fields with the appropriate database table. (02-3)

- a. VENDOR table
 - b. CUSTOMER table
 - c. EMPLOYEE table
 - d. ACCOUNTS table
 - e. SALES ORDER table
 - f. SALES ORDER LINE table
 - g. PURCHASE ORDER table
 - h. PURCHASE ORDER LINE table
- ___ 1. Customer name
 - ___ 2. Account number
 - ___ 3. Customer number
 - ___ 4. Employee address
 - ___ 5. Item quantity sold
 - ___ 6. Item quantity purchased
 - ___ 7. Sales order number
 - ___ 8. Sales order date
 - ___ 9. Purchase order date
 - ___ 10. Purchase order number
 - ___ 11. Vendor address
 - ___ 12. Sales order total

- **Technology Projects**
- **Practice Quizzes**



What Online Resources Go with My Textbook?

To make your life a little easier, the following online resources are provided for you on your textbook Web site (www.pearsonhighered.com/kay).

- **Part 5: Enterprise Accounting Systems: Capstone** found online on your text Web site includes the following two online chapters.
 - **Chapter 15: Emerging Trends and Technologies (Online Chapter)**. A complete version of this chapter, including the latest technology trends impacting accounting, is available online.
 - **Chapter 16: Accounting Systems in Action: LIVE Projects (Online Chapter)**. A complete version of Chapter 16, including templates for project deliverables, is available online.
- **Chapter Extension 4**, covering business process maps using data flow diagrams (DFDs), is available online.
- **Chapter Extension 5**, covering business process mapping using DFDs for the sales, purchasing, payroll, and financial cycles, is available online.
- **Software videos** referenced in the end-of-chapter assignments will assist you in completing the tech exercises.
- **Tech Exercise data files** to use when completing your assignments can be downloaded from your text Web site.
- **Presentation slides** summarizing important points in each chapter to streamline your learning are available online.
- **And more....**



What Certifications Can Give Me a Competitive Advantage as an Accounting Professional?

Some of the certifications you may want to consider as an accounting professional include the following.

- **Certified Public Accountant (CPA):** Up to 20% of some CPA exam sections relate to accounting and IT topics covered in this book. Some text assignments are designed to assist you in preparing for the new writing assignments on the CPA exam. For more information about requirements to take the CPA Exam, visit www.aicpa.org/BecomeACPA.
- **Certified Information Technology Professional (CITP):** If you are a CPA and enjoy being at the crossroads of accounting and IT, you might consider obtaining the Certified Information Technology Professional (CITP) credential. To learn more about the CITP credential, visit www.aicpa.org/CITP.
- **Certified Information Systems Auditor (CISA):** CISA is a certification for IT auditors. For more information, see www.isaca.org/CISA.
- **Certified Internal Auditor (CIA):** This certification is for accounting professionals who specialize in internal audit. See www.theiaa.org for more information.
- **Certified Information Systems Security Professional (CISSP):** The CISSP is a globally recognized credential for professionals in the information security field. For more information, see www.isc2.org/CISSP.
- **Certified in Financial Forensics (CFF):** The Certified in Financial Forensics credential is exclusively for CPAs who pass the CFF Exam and possess the necessary experience requirements. If you would like to learn more about the CFF credential, visit www.aicpa.org/CFF.



Acknowledgments

We would like to acknowledge the following individuals:

Pearson Education Team:

Donna Battista, Editor in Chief
Nicole Sam, Editorial Project Manager
Jeffrey Holcomb, Managing Editor
Alison Eusden, Production Project Manager
Anthony Gemmellaro, Art Director

Brian Behrens for his steadfast support

Pam Horwitz, Dean of Business, Maryville University of Saint Louis, for her kind words of encouragement

The Maryville Team: Kim Temme, Karen Tabak, John Lewington, and the late Mark Roman for support and encouragement

Benjamin Akande, Dean of Business, Webster University, for his encouragement

Al Cawns, Chair of Mathematics and Computer Science, Webster University, for his support

To the following individuals for their engaging sidebar contributions to the text:

Tim Gaidis, HOK
Tom Niemeier and Matt Lung, SPACE LLC

To the following reviewers for thoughtful comments and constructive feedback:

Wael Aguir, *University of Texas – San Antonio*
T. S. Amer, *Northern Arizona University*
Fred Barbee, *University of Alaska – Anchorage*
Katherine Boswell, *University of Louisiana at Monroe*
Joyce Bryer, *Indiana University*
Mark Cecchini, *University of South Carolina*
Lewis Chasalow, *University of Findlay*
Deb Cosgrove, *University of Nebraska – Lincoln*
Sandra Devona, *Northern Illinois University*
David Dulany, *Aurora University*
Doris Duncan, *California State University – East Bay*
Kurt Fanning, *Grand Valley State University*
Marilyn Griffin, *Virginia Tech*
Rita Hays, *Southwestern Oklahoma State University*
Kenneth Henry, *Florida International University*
Steven Hornik, *University of Nebraska – Lincoln*
Constance Hylton, *George Mason University*
Andrew Jansma, *SUNY Buffalo*
Grover Kearns, *University of South Florida – St. Petersburg*

Frank Klaus, *Cleveland State University*
Michael Lavine, *University of Maryland*
Maria Leach, *Auburn Montgomery*
Deborah Lee, *Northeastern State University – Broken Arrow*
Chan Li, *University of Pittsburgh*
Robert Lin, *California State University – East Bay*
Maureen Mascha, *Marquette University*
Sue Minke, *Indiana University – Purdue University at Fort Wayne*
Vishal Munsif, *Florida International University*
Brandis Phillips, *North Carolina A&T*
Theresa Phinney, *Texas A&M University*
Erik Rolland, *University of California – Riverside*
Ward Thrasher, *University of Bridgeport*
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Dr. Kay earned BS and MBA degrees from Southern Illinois University at Edwardsville before receiving a PhD from Saint Louis University, where she conducted action research on the perceived effectiveness of technology and instructional techniques. Named to *Who's Who of American Women*, Dr. Kay holds certifications as both a Certified Public Accountant (CPA) and Certified Informational Technology Professional (CITP). She is an active member of the American Institute of Certified Public Accountants, the Missouri Society of CPAs (MSCPA), the American Accounting Association (AAA), Teachers of Accounting at Two-Year Colleges (TACTYC), the Missouri Association of Accounting Educators (MAAE), and the AIS Educator Association (AISEA). Dr. Kay serves on the Information Technology Committee of the MSCPA.

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Dr. Ovlia earned a BS from the Italian Naval Academy of Livorno, Italy, a BS and MS in Computer Science from the University of Oklahoma, and a Doctorate of Management from Webster University. His doctoral dissertation research investigated the impact of electronic commerce on small and medium-size organizations. Prior to teaching at Webster University, Dr. Ovlia taught at Harris-Stowe State University, where he developed and implemented the i960 processor performance monitoring technique for aerospace manufacturer McDonnell Douglas. Dr. Ovlia is a member of the Association of Computing Machinery (ACM), the Institute of Electrical and Electronics Engineers (IEEE), the Association of Information Technology Professionals (AITP), and the American Accounting Association (AAA).

Part One *Enterprise Accounting Systems: People, Processes, and Technology* focuses on how people, processes, and technology are used to process and store accounting data.

Part One Enterprise Accounting Systems: People, Processes, and Technology

Chapter 1
Accounting System Insights

Chapter 2
Accounting Databases

Chapter 3
Accounting Interface: Database Forms,
Queries, and Reports

Chapter 4
Accounting Systems and Business Processes

Chapter 5
Business Processes: Purchasing, Sales, and
Payroll Cycles

Chapter 6
Intergrated Enterprise Systems and
Cloud Computing



**Store
Accounting
Data**

1

Accounting System Insights

How Can the Data in Your Accounting System Create Value?

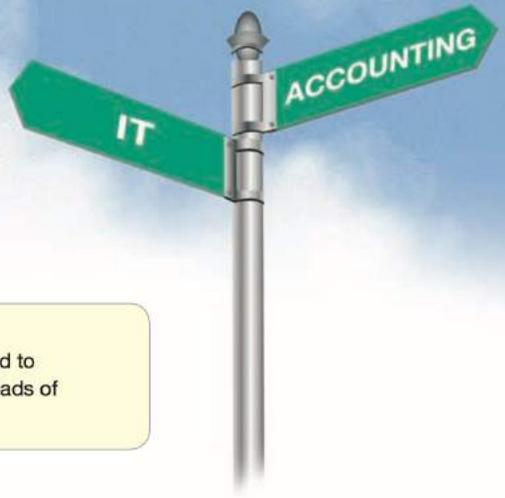
Meet Business Intelligence.

Can you imagine how the data stored in your accounting system can make millions of dollars for your business?

Meet business intelligence. Business intelligence (BI) uses data in smarter ways. BI involves analyzing data to glean insights for improved decisions and performance. The accounting system stores data, such as sales data, that can be used in BI analytics.

- Southwest Airlines used BI to increase profitability.
- Travelocity, a leader in the online travel industry, used BI to personalize customer service, increasing its gross bookings and earnings by 100% in the first year.
- Coca-Cola Bottling Company used BI about sales from vending machines to better forecast demand, increasing sales by 10%.
- The state of Texas used BI to recover over \$600 million in taxes from noncompliant taxpayers by crosschecking returns with other sources of data.
- Wells Fargo & Co., a leader in online financial services, used BI to provide its customers with a 360-degree view of their spending, credit and debit card transactions, checking accounts, and online bill payments.





At the Crossroads of Accounting and IT...

When you open this book and begin reading the first page, you are on the road to becoming a successful accounting professional who can navigate the crossroads of accounting and IT.

My Questions

- Q 1.1 How do I navigate the crossroads of accounting and IT?
- Q 1.2 How is the accounting system related to the enterprise system?
- Q 1.3 What are the secrets of my success at the crossroads of accounting and IT?
- Q 1.4 What are three keys to opportunity at the crossroads of accounting and IT?

How Do I Navigate the Crossroads of Accounting and IT?

Imagine that you just landed a new job! You have been hired as the IT auditor for EspressoCoffee Company, an online retailer of Italian espresso beans and espresso machines. You are responsible for auditing the accounting system and the related information technology (IT).

Can you conduct a successful audit if you don't understand the IT used by the system? How do you evaluate IT security for the accounting system if you don't understand the underlying IT? Did you know IT auditors often receive higher salaries because of their specialized knowledge of accounting and IT?

To audit accounting systems, IT auditors must be able to communicate with both accounting and IT professionals. Often accountants and IT professionals appear to be speaking different languages. The specialties of their unique fields often have terms and definitions that differ. For example, what an IT professional might call a *computer application*, the accountant might refer to as *software*. Some enterprises have addressed this need by hiring professionals with experience in both accounting and IT who serve as liaisons between the organization's accounting and IT professionals.

In today's business environment, the accounting professional stands at the crossroads of accounting and information technology. The goal of this text is to assist you in navigating the crossroads. We will equip you with IT terminology to facilitate communication with IT professionals, give you tools that IT professionals use, and provide you with insights to understand better the role of the accounting professional at the crossroads of accounting and IT. Having IT knowledge gives you a competitive advantage as an accounting professional.

Crossroads

This feature will appear throughout your book to clue you in to important terms and topics at the crossroads of accounting and IT.

To guide you through the crossroads of accounting and IT, this book is organized around three major functions of the accounting system:

1. **Store.** People, processes, and technology to store accounting data are covered in Part 1.
2. **Analyze.** Financial analytics and business intelligence for decision making are covered in Part 2.
3. **Safeguard.** Safeguarding information assets stored in the accounting system using security, controls, and risk management is covered in Part 3.

Numbers...2 Digits or 10?

Both accounting and IT professionals deal with numbers. Computers are digital and can process only 0s and 1s, so computer scientists distill everything down to two digits: 0s and 1s.

Accountants distill business transactions into numbers. The difference is that accountants use all 10 digits instead of just 2. So at the crossroads of accounting and IT, it all comes down to numbers.

When the Numbers Change....

One enterprise found that its accounting staff and IT professionals were in a heated disagreement about a relatively minor update to an accounting program needed by the accounting staff. The IT staff wanted to charge thousands of dollars to the accounting department for the minor change. When a liaison was called in, she facilitated communication and discovered that all the numbers in the accounting program had been “hard keyed” into the program. Thus, actual numbers, such as 127 or 580, had been used in the program instead of using spreadsheet cell addresses for the source data. The only way to update the program was to manually replace the numbers that had been hard-keyed into the program with updated numbers. This time-consuming, labor-intensive approach was costly.

Imagine if an accounting professional with IT knowledge had been present at the meeting when the initial program was designed. If cell addresses had been used, results would have updated automatically when the numbers changed. Imagine the resources and time that the enterprise might have saved had this oversight never occurred. This example of accounting and IT professionals who need to work together and communicate well underscores the need for accountants who understand accounting and IT. It also underscores your value as an accounting professional if you understand the crossroads of accounting and IT.

My Connection...

How do I study less and learn more? Make connections. Try the following:

- Active Review 1.9
- It's Your Call 1.26

What Is Your Competitive Advantage?

To understand how to be a valued accountant, you need to understand how the accounting system (and you) fit into the larger enterprise system. What value do you add to the enterprise?

Throughout your book the terms *enterprise* and *organization* are used interchangeably.



Crossroads

As an accounting professional, you will encounter symbols and terminology used by IT professionals. A cloud is used by IT professionals to represent the enterprise network. This is known as a network cloud (Figure 1.1).

How Is the Accounting System Related to the Enterprise System?

Imagine that you just received your first paycheck on your new job! How was the data collected to create your paycheck? Who collected the data? Who created the paycheck?

When you were hired, the human resources department collected personal data about you, such as your name, address, and Social Security number. Human resources also collected data about your salary, pay grade, and benefits. That information was shared with the accounting department to generate your paycheck.

Within an enterprise there are numerous activities performed by various departments. These activities are often interconnected, such as human resources and accounting working together to create your paycheck.

An **enterprise system** supports people conducting business activities throughout the enterprise. Three basic functions of an enterprise system involve the following:

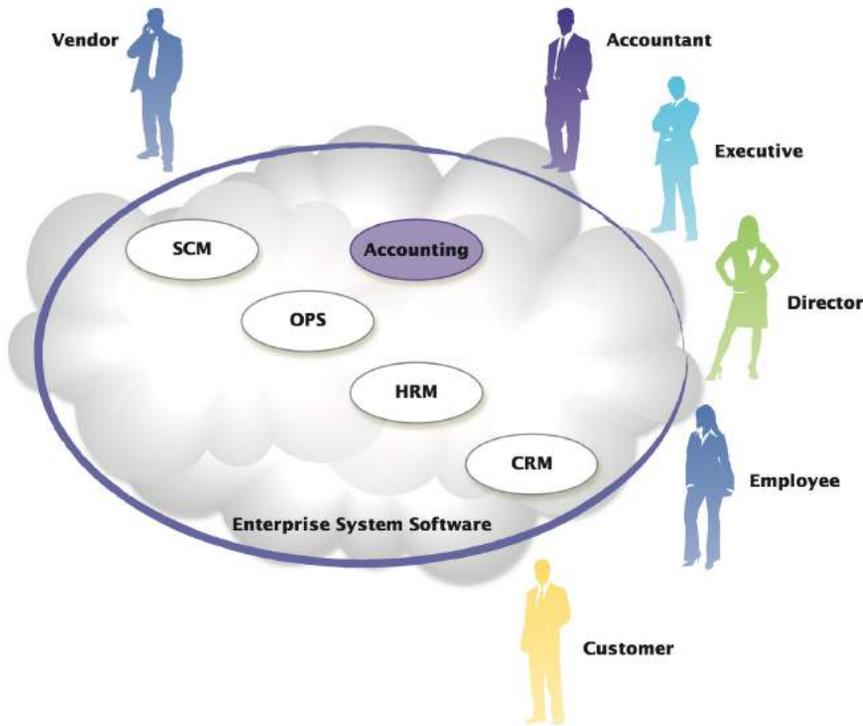
- **Input:** Capturing information to store in the system (such as your salary data)
- **Processing:** Sorting and storing information (such as calculating the amount of your paycheck)
- **Output:** Summarizing information to generate documents and reports used by executives, managers, and employees (such as your paycheck)

Because people performing different activities (such as human resources and accounting) have different needs, unique software may be required to meet their specific needs. For example, accountants use an accounting system to meet their needs. This accounting system is a subsystem of the larger enterprise system (Figure 1.1).

An accounting system captures accounting information about transactions, processes the accounting information captured, and generates financial reports, such as income statements and sales reports.

In addition to the accounting system (see Figure 1.1) additional modules or subsystems of an enterprise system might include the following:

- Supply chain management (SCM)
- Operations/production system (OPS)
- Human resource management (HRM)
- Customer relationship management (CRM)

**FIGURE 1.1****Enterprise System**

How do you see the accounting system interacting with HRM to create your paycheck? When you make an online purchase, how do you interact with an enterprise system?

An **integrated enterprise system** shares data across functional areas within the enterprise. The same information is often used by different departments, as in the case of your paycheck. In an integrated enterprise system, when human resources enters your personal salary data into

Integrated Enterprise Systems...

...share data across the enterprise. For example, when data is entered into the supply chain management system to record the receipt of an inventory order, the same data can be shared with the accounting system to record the related accounting transactions. This is a good news/bad news situation. The good news is that other people are entering accounting data for you. The bad news is that they may not enter it correctly.

The Road to Integrated Enterprise Systems... How Did We Get Here?

Enterprise resource planning or ERP software of the 1990s was developed as an enterprise-wide system to help managers plan and control organizational resources. ERPs focused on resource planning for the enterprise, integrating information flows across an entire enterprise including accounting, human resources, supply chain, production, and marketing.

In the 2000s ERPs evolved further into the next generation of integrated business processing software called **enterprise software**. Enterprise software goes beyond resource planning. It encompasses all the information processing needs of the entire enterprise, including, but not limited to, resource planning. Enterprise software integrates the various business functions and transaction processing in the enterprise system. One widely used enterprise software is SAP (Systems, Applications, and Products in Data Processing) AG headquartered in Germany. A SAP enterprise system offers modules to assist in managing business processes including the following:

- Financials
- Human resources
- Operations
- Customer relationship management (CRM)
- Supply chain management (SCM)
- Enterprise resource planning (ERP)

If the modules are integrated with the capability to pass electronic documents and information from one module to another, the system is called an integrated enterprise system (IES).

How many times today have you re-entered the same information?

the system, the accounting department could access that data to create your paycheck. Thus, the integrated enterprise system can save time and reduce errors by eliminating the need to rekey the same data into multiple systems.

Enterprise system users can be internal or external users. Internal users can include employees, accountants, directors, and executives. External users include vendors and customers given access to the enterprise system to streamline and coordinate business activities. Amazon.com, for example, permits vendors to access its supply chain system to coordinate inventory deliveries.

Asking the following key questions about an enterprise can provide a deeper understanding of the underlying business the enterprise system serves:

- How does the enterprise create value?
- What are its business operations?
- What are the enterprise's business processes for conducting operations?
- Can the business processes be streamlined or improved?

Business Processes

To understand an enterprise system, first you must understand the underlying business and business processes. **Business processes** are related activities performed by an enterprise to create value by transforming input into output (a product or service sold to customers). Apple Inc., for example, buys input (components such as Intel processors, memory chips, copper wire, transformers, etc.) to transform into output (MacBook Air laptops).

The enterprise value chain is an organizing framework for business processes. The **value chain** is useful in coordinating activities with suppliers and customers.

There are many variations of the value chain. In general, the value chain begins with purchasing items from vendors and ends with selling items to customers. As shown in Figure 1.2, one variation of the value chain includes the impact of innovation on an enterprise's ability to create value. Innovation in the current business environment includes not only designing new services and products but also designing new experiences for customers. For example, Twitter.com is a social networking tool that created a new type of social networking experience for online users. Starbucks Coffee sold not only coffee, but provided the coffee house experience to customers.

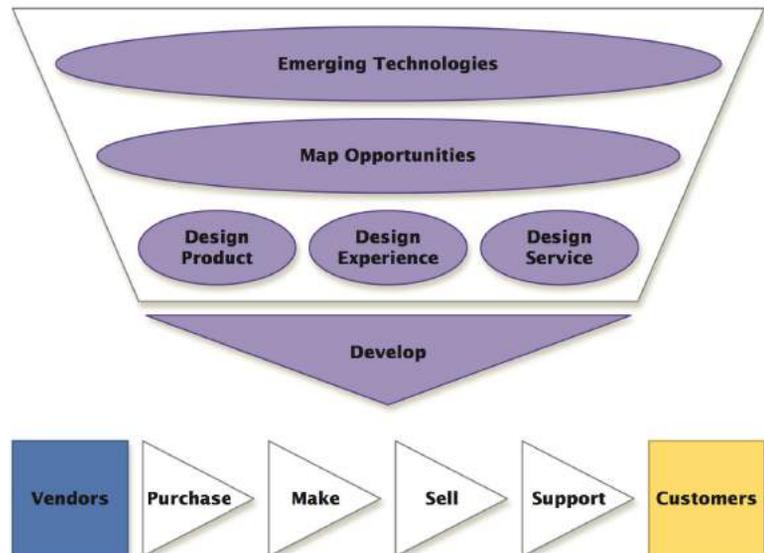


FIGURE 1.2

Value Chain and Innovation

Pair and Share: Share with a classmate your response to the following question: How do you think emerging technologies will create opportunities for accounting?

Based upon The New Value Chain from *The Imagination Challenge: The Strategic Foresight and Innovation in the Global Economy* by Alexander Manu. peachpit.com/articles/ (accessed July 2009).

By Any Other Name...

The system that supports financial and accounting activities in an organization can be called many different names. In academia, such a system is often called an *accounting information system* or *AIS*. However, if you use that term on the job, be prepared for responses such as “What are you talking about?” Typically, AIS is not a term that is used in practice. Instead, terms used may be *accounting system*, *enterprise accounting system*, *financial system*, or *general ledger system*. Boeing, for example, uses the term *enterprise accounting system*.

For simplicity, this book uses the term *accounting system* to refer to systems that support financial and accounting activities within an enterprise. Keep in mind as you are reading that the term *accounting system* may be used interchangeably with *accounting information system* or *enterprise accounting system*.

As shown in Figure 1.2, in addition to research and development for new services, products, and experiences, the value chain is comprised of a series of business processes. These processes include the following:

- Purchase items from vendors.
- Make the service, product, or experience.
- Market and sell the service, product, or experience to customers.
- Support and maintain the service, product, or experience.

The enterprise system supports these business processes. As shown in Figure 1.3, the supply chain management (SCM) system supports the business process of purchasing items from vendors. The operations/production system (OPS) provides the resources to support tracking

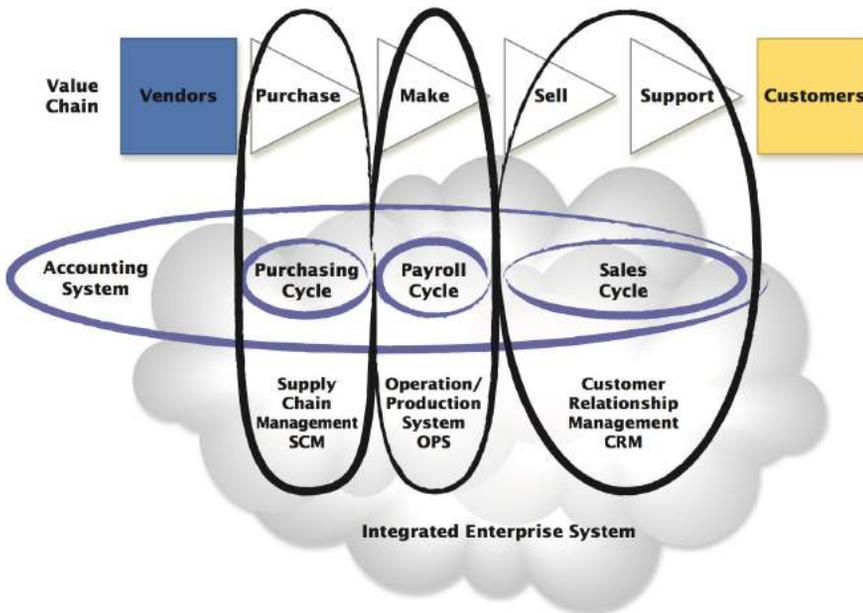


FIGURE 1.3

Business Processes, Transaction Cycles, and the Integrated Enterprise System

Pair and Share: Share with a classmate your response to the following question: Of all the systems, why is the accounting system the most indispensable in the integrated enterprise system?

and coordinating operations of the business to make the service, product, or experience. The customer relationship management (CRM) system supports marketing and sales activities. The accounting system is unique in that it spans the value chain, tracking transaction information from the purchase of items from vendors through the sale to customers (Figure 1.3).

Transaction Cycles

An enterprise's business processes and accounting system are interrelated. The accounting transactions related to specific business processes are frequently called **transaction cycles**. Figure 1.3 shows the relationship between the business processes in the value chain and the accounting transaction cycles. As the figure illustrates, the **purchasing cycle** consists of transactions related to purchasing items from vendors. Sometimes the purchasing cycle is referred to as the *vendors transaction cycle* or *purchasing transaction cycle*. The purchasing cycle relates to transactions between an enterprise and its vendors, including suppliers and consultants.

The **payroll cycle** consists of employee and payroll transactions. These expenditures make it possible to conduct operations to create a service, product, or experience for the enterprise's customers. Together, the purchasing cycle and payroll cycle are referred to as the *expenditure transaction cycle*.

The **sales cycle** in the accounting system corresponds to the selling component of the value chain. The sales cycle may also be called the *revenue cycle* or *revenue transaction cycle*. The sales cycle involves exchanges or transactions between an enterprise and its customers.

To understand the accounting system for an enterprise, it is essential to understand the underlying business processes and transaction cycles. Next, we share with you some accounting system insights. These insights will aid you in navigating the crossroads of accounting and IT.

Crossroads

What IT professionals may refer to as *business processes*, accounting professionals may call *transaction cycles*.

Crossroads

Some IT professionals may mistakenly use the term *accounting cycle* to refer to the purchasing, payroll, and sales cycle.

Accounting professionals typically use the term *accounting cycle* to refer to the accounting activities that span the accounting period, such as preparing a trial balance, making adjusting entries, and creating financial statements.

My Connection...

How do I study less and learn more? Make connections. Try the following:

- Active Review 1.8
- Short Exercise 1.29

Have You Ever Purchased a Used Car?

CARFAX.com is an online service for used car buyers. For a fee, you can obtain information about the car you would like to purchase, such as previous owner(s), prior accidents, repairs, and the resale value. What is the value of this information to a used car buyer?

What do you think?

1. How does CARFAX.com create value? What is the enterprise's value chain? What are the business processes that make up the value chain for the enterprise?
2. What are the accounting events or transactions that correspond to the enterprise's business processes?
3. What transactions make up the purchasing cycle for the business?
4. What are the transactions in the payroll cycle?
5. What is the sales cycle for the enterprise?

Would You Like to Know a Secret?

We will share with you some secrets about accounting that you may not have heard about in your previous accounting classes. These secrets will provide you insights to effectively prepare you for your transition into the world of accounting/IT professionals.

Accounting System Insights: What Are the Secrets of My Success at the Crossroads of Accounting and IT?

Imagine that you take your first paycheck to the bank and deposit it using the ATM. Accountants are well known for focusing on details, such as recording your single bank deposit accurately.

Now imagine the accounting system required to track all deposits made at Wells Fargo's 12,000 ATMs. In addition to getting the details right, the accounting/IT professional must also be able to understand the overall accounting system, such as Wells Fargo's system's ability to track deposits made at over 12,000 ATMs.

Can't See the Forest for the Trees?

Studying accounting systems is very different from studying other areas of accounting, such as financial, tax, or managerial accounting. Financial accounting focuses on external reporting for creditors and investors. Tax accounting focuses on tax reports for the Internal Revenue Service (IRS), state departments of revenue, and local tax agencies. Managerial accounting focuses on providing accounting information to internal users, primarily management. Successful accountants are well known for focusing on details, which is imperative for a successful accounting professional. However, understanding accounting systems involves seeing the overall system as well as focusing on details.



FIGURE 1.4
Satellite Mapping
(learn.arc.nasa.gov)

Your prior accounting courses, such as financial, managerial, and tax accounting, focused more on details. You may find that this course requires you to think differently about accounting. To aid you in this transition, we share with you some accounting system insights.

Accounting Insight No. 1: Think Satellite Mapping

Viewing an accounting system can be compared to satellite mapping. With satellite mapping, you can use an aerial satellite view to see the entire globe or zoom in to see cities or even streets (Figure 1.4). Obtain the level of detail needed by zooming in or out until the satellite map is in focus.

The aerial view of accounting is the enterprise-wide view of the accounting system. To see the detailed view of accounting, zoom in (drill down) to focus on specific, detailed information, events, and transactions recorded in the accounting system.



ACCOUNTING INSIGHT NO. 1
Use Satellite Mapping
to View Accounting Systems ...
Zoom out for Aerial View ...
Zoom in for Detail View ...

BASELINE ACCOUNTING SYSTEM MODEL To assist you in envisioning a global view of an accounting system, Figure 1.5 shows an accounting system model that is representative of most enterprises. This will be referred to as a baseline accounting system model.



FIGURE 1.5
Baseline Accounting System Model