



高等院校双语教学适用教材·会计

第 五 版

Fifth Edition

会计信息系统

Accounting Information Systems

James A. Hall

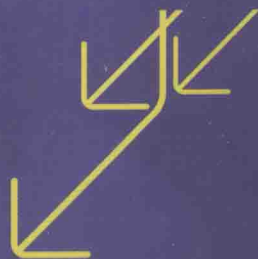
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詹姆斯·霍尔 著



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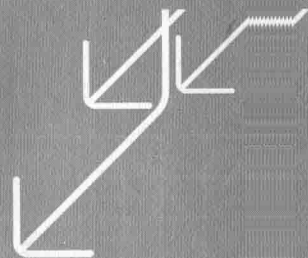
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(大连市黑石礁尖山街 217 号 邮政编码 116025)

总编室: (0411) 84710523

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读者信箱: dufep@dufe.edu.cn

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出版者的话

当前,在教育部的的大力倡导下,财经和管理类专业的双语教学在我国各大高校已经逐步开展起来。一些双语教学开展较早的院校积累了丰富的经验,同时也发现了教学过程中存在的一些问题,尤其对教材提出了更高的要求;一些尚未进入这一领域的院校,也在不断探索适于自身的教学方式和方法以及适用的教材,以期时机成熟时加入双语教学的行列。总之,对各类院校而言,能否找到“适用”的教材都成为双语教学成功与否的关键因素之一。

然而,国外原版教材为国外教学量身定做的一些特点,如普遍篇幅较大、侧重于描述性讲解、辅助材料(如习题、案例、延伸阅读材料等)繁杂,尤其是许多内容针对性太强,与所在国的法律结构和经济、文化背景结合过于紧密等,显然不适于国内教学采用,并成为制约国内双语教学开展的重要原因。因此,对国外原版教材进行本土化的精简改编,使之变成更加“适用”的双语教材,已然迫在眉睫。

东北财经大学出版社作为国内较早涉足引进版教材的一家专业出版社,秉承自己一贯服务于财经教学的宗旨,总结自身多年的出版经验,同培生教育出版集团和汤姆森学习出版集团等国外著名出版公司通力合作,在国内再次领先推出了会计、工商管理、经济学等专业的“高等院校双语教学适用教材”。这套丛书的出版经过了长时间的酝酿和筛选,编选人员本着“品质优先、首推名作”的选题原则,既考虑了目前我国财经教育的现状,也考虑了我国财经高等教育所具有的学科特点和需求指向,在教材的遴选、改编和出版上突出了以下一些特点:

● 优选权威的最新版本。入选改编的教材是在国际上多次再版的经典之作的最新版本,其中有些教材的以前版本已在国内部分高校中进行了试用,获得了一致的好评。

● 改编后的教材在保持英文原版教材特色的基础上,力求内容精要,逻辑严密,适合中国的双语教学。选择的改编人员既熟悉原版教材内容,又具有本书或本门课程双语教学的经验。

● 改编后的教材配有丰富的辅助教学支持资源,教师可在网上免费获取。

● 改编后的教材篇幅合理,符合国内教学的课时要求,价格相对较低。

本套教材是在双语教学教材出版方面的一次新的尝试。我们在选书、改编及出版的过程中得到了国内许多高校的专家、教师的支持和指导,在此深表谢意,也期待广大读者提出宝贵的意见和建议。

尽管我们在改编的过程中已加以注意,但由于各教材的作者所处的政治、经济和文化背景不同,书中的内容仍可能有不妥之处,望读者在阅读中注意比较和甄别。

导 读

在所有的会计专业课程中,“会计信息系统”这门课程似乎是最不那么标准化的。这一课程的授课内容通常由任课教师的目标、背景及偏好所决定,而不是忠实于一种标准化的知识主体。基于此,本书在内容的设计上力求赋予学生及任课教师以最大的灵活性。任课教师可以灵活地选择课程的内容并调整授课的强度。

与以前的版本相比,第五版的《会计信息系统》在内容上进行了全面的更新,使读者能够获得目前最新的关于业务流程、系统开发方法、IT治理及战略、安全、内部控制以及《萨班斯—奥克斯利法案》等相关方面的内容。除此之外,本书的特点还表现在以下几个方面:

1. 运用概念性框架

本书运用了概念性框架,来强调会计人员、审计人员以及设计、操作并控制会计信息系统的管理人员的专业职责和法律职责。这一概念性框架还特别强调了会计信息系统的应用必须服从于特定的内部控制标准。

2. 明晰会计信息系统的演变过程

在会计信息系统的发展过程中,经常会推陈出新,新的方法和模型不断地产生,但是一个有趣的现象是,这些新方法、新模型并不是立即就取代了旧方法、旧模型。因而在某一时间段上,旧系统与新系统可能会同时存在于不同的组织,甚至是同一组织之中。作为当代的财务人员,应该通晓各类系统的特点。因此,本书明晰了会计信息系统的演变过程,既介绍了历史传承下来的方法,又介绍了代表当今技术发展水平的新模型。

3. 强调内部控制

本书还特别介绍了一个内部控制模型。这个模型可以用于解释一些关于手工会计信息系统和计算机会计信息系统内部控制的问题。

4. 引入系统设计和文件工具的内容

本书还审视了多种用于系统分析和设计的方法及方法论,包括结构化设计、面向对象设计、计算机辅助软件工程等。

本书在结构上分为五个部分,共17章。在每一章后都配有大量的习题,有的章节还设有附录,这部分教学辅助内容,读者可以从书后所附的光盘中获取。

Preface

WELCOME TO THE FIFTH EDITION

The fifth edition of *Accounting Information Systems* includes a full range of new and revised homework assignments, up-to-date content changes, as well as several reorganized chapters based on reviewer feedback. All of these changes add up to more student and instructor enhancements than ever before. As this preface makes clear, we have made these changes to keep students and instructors as current as possible on issues such as business processes, systems development methods, IT governance and strategy, security, internal controls, and relevant aspects of Sarbanes-Oxley legislation.

FOCUS AND FLEXIBILITY IN DESIGNING YOUR AIS COURSE

Among accounting courses, accounting information systems (AIS) courses tend to be the least standardized. Often the objectives, background, and orientation of the instructor, rather than adherence to a standard body of knowledge, determines the direction the AIS course takes. Therefore, we have designed this text for maximum flexibility:

- This textbook covers a **full range of AIS topics** to provide instructors with flexibility in setting the direction and intensity for their courses.
- At the same time, for those who desire a **structured model**, the first nine chapters of the text, along with the chapters on electronic commerce and computer controls, provide what has proven to be a **successful template for developing an AIS course**.
- Earlier editions of this book have been used successfully in introductory, advanced, and graduate-level AIS courses.
- The topics in this book are presented from the perspective of the managers' and accountants' AIS-related responsibilities under the Sarbanes-Oxley Act.
- While the book was written primarily to meet the needs of accounting majors about to enter the modern business world, we have also developed it to be an effective text for general business and industrial engineering students who seek a thorough understanding of AIS and internal control issues as part of their professional education.

KEY FEATURES

CONCEPTUAL FRAMEWORK

This book employs a **conceptual framework** to emphasize the professional and legal responsibility of accountants, auditors, and management for the design, operation, and control of AIS applications. This responsibility pertains to business events that are narrowly defined as financial transactions. Systems that process nonfinancial transactions are not subject to the new standards of internal control under Sarbanes-Oxley legislation. Supporting the information needs of all users in a modern organization, however, requires systems that integrate both accounting and nonaccounting functions. While providing the

organization with unquestioned benefit, a potential consequence of such integration is a loss of control due to the blurring of the lines that traditionally separate AIS from non-AIS functions. The conceptual framework presented in this book distinguishes AIS applications that are legally subject to specific internal control standards.

EVOLUTIONARY APPROACH

Over the past 50 years, accounting information systems have been represented by a number of different approaches or models. Each new model evolved because of the shortcomings and limitations of its predecessor. An interesting feature in this evolution is that older models are not immediately replaced by the newest technique. Thus, at any point in time, various generations of legacy systems exist across different organizations and often coexist within a single enterprise. The modern accountant needs to be familiar with the operational characteristics of all AIS approaches that he or she is likely to encounter. Therefore, this book presents the salient aspects of five models that relate to both legacy and state-of-the-art systems:

1. manual processes
2. flat-file systems
3. the database approach
4. the resources, events, and agents (REA) model
5. enterprise resource planning (ERP) systems

EMPHASIS ON INTERNAL CONTROLS

The book presents a conceptual model for internal control based on COSO and *Statement on Auditing Standards (SAS) No. 78*. This model is used to discuss control issues for both manual processes and computer-based information systems (CBIS). Three chapters (Chapters 15, 16 and 17) are devoted to the control of CBIS. Special emphasis is given to the following areas:

- computer operating systems
- database management systems
- electronic data interchange (EDI)
- electronic commerce systems
- ERP systems
- systems development and program change processes
- the organization of the computer function
- the security of data processing centers
- verifying computer application integrity

EXPOSURE TO SYSTEMS DESIGN AND DOCUMENTATION TOOLS

The book examines various approaches and methodologies used in systems analysis and design, including the following:

- structured design
- object-oriented design

- computer-aided software engineering (CASE)
- prototyping

In conjunction with these general approaches, professional systems analysts and programmers use a number of documentation techniques to specify the key features of systems. The modern auditor works closely with systems professionals during IT audits and must learn to communicate in their language. The book deals extensively with documentation techniques such as data flow diagrams (DFDs), entity relationship diagrams (ERDs), as well as system, program, and document flowcharts. The book contains numerous systems design and documentation cases and assignments intended to develop the students' competency with these tools.

SIGNIFICANT CHANGES IN THE FIFTH EDITION

Chapter 3, "Ethics, Fraud, and Internal Control"

A revised internal control model based on the COSO framework. This framework was recommended by both the SEC and the PCAOB as the preferred model for achieving compliance with Sarbanes-Oxley control requirements.

Chapter 4, "The Revenue Cycle"; Chapter 5 "The Expenditure Cycle Part I: Purchases and Cash Disbursements Procedures"; Chapter 6, "The Expenditure Cycle Part II: Payroll Processing and Fixed Asset Procedures"; and Chapter 8, "General Ledger, Financial Reporting, and Management Reporting Systems"

All the transaction processing and financial reporting chapters have been reorganized and revised to create a better balance between the treatments of manual and computer systems. Accounting systems are presented first conceptually in a technologically neutral setting. The objective is to focus on the tasks to be performed, the risks, and the control issues. The reader then moves on to examine the physical system. At this juncture, some instructors prefer to teach manual systems before moving on to computer applications. Others favor moving directly to computer-based systems. The chapters have been redesigned to accommodate both teaching styles. The reader may continue with the review of manual systems or, without loss of technical content, bypass this material and go directly to computer-based systems.

Chapter 15, "IT Controls Part I: Sarbanes-Oxley and IT Governance"; Chapter 16, "IT Controls Part II: Security and Access Control"; and Chapter 17, "IT Controls Part III: Systems Development, Program Changes, and Application Controls"

These three chapters have been completely rewritten to comply with the COSO framework for internal controls as prescribed by the PCAOB. Chapter 15 provides an overview of management and auditor responsibilities under Section 404 as well as the general control and audit issues related to IT governance issues. Chapter 16 addresses control and audit issues related to operating systems, networks, and database access and security. Chapter 17 focuses on the control and audit of systems development and program change procedures. The chapter also presents application controls and audit procedures.

GLOBAL CHANGES

- The end-of-chapter problems have been significantly revised throughout.
- All of the internal control cases in the revenue and expenditure cycle chapters have been replaced with new cases.

ORGANIZATION AND CONTENT

PART 1: OVERVIEW OF ACCOUNTING INFORMATION SYSTEMS

Chapter 1, "The Information System: An Accountant's Perspective"

This chapter places the subject of accounting information systems in perspective for accountants. It is divided into four major sections, each dealing with a different aspect of information systems.

- The first section explores the *information environment of the firm*. It introduces basic systems concepts, identifies the types of information used in business, and describes the flows of information through an enterprise. This section also presents a framework for viewing accounting information systems in relation to other information systems components.
- The second section of the chapter deals with the *impact of organizational structure on AIS*. The centralized and distributed models are used to illustrate extreme cases in point.
- The third section reviews the evolution of *information systems models*. Accounting information systems have been represented by a number of different approaches or models. *Five dominant models* are examined: manual processes; flat-file systems; the database approach; the resources, events, agents (REA) model; and enterprise resource planning (ERP) systems.
- The final section discusses the *role of accountants as users, designers, and auditors of AIS*. The nature of the responsibilities shared by accountants and computer professionals for developing AIS applications are examined.

Chapter 2, "Introduction to Transaction Processing"

The second chapter expands on the subject of transaction cycles introduced in Chapter 1. While the operational details of specific transaction cycles are covered in subsequent chapters, this chapter presents material that is common to all cycles. Topics covered include:

- the relationship between source documents, journals, ledgers, and financial statements in both manual and computer-based systems;
- system documentation techniques, such as data flow diagrams, entity relationship (ER) diagrams, document systems, and program flowcharts; and
- data processing techniques, including batch and real-time processing.

The techniques and approaches presented in this chapter are applied to specific business cycle applications in later chapters. The chapter is supported by material in the appendix and on the web site.

Chapter 3, "Ethics, Fraud, and Internal Control"

Chapter 3 deals with the related topics of ethics, fraud, and internal control.

- The chapter first examines ethical issues related to business and specifically to computer systems. The questions raised are intended to stimulate class discussions.
- The chapter then addresses the subject of fraud. There is perhaps no area of greater controversy for accountants than their responsibility to detect fraud. Part of the problem stems from confusion about what constitutes fraud. This section distinguishes between management fraud and employee fraud. The chapter presents techniques for identifying unethical and dishonest management and for assessing the risk of management fraud. Employee fraud can be prevented and detected by a system of internal controls. The section discusses several fraud techniques that have been perpetrated in both manual and computer-based environments. The results of a research study conducted by the Association of Certified Fraud Examiners as well as the provisions of the Sarbanes-Oxley Act are presented.
- The final section of the chapter describes the internal control structure and control activities specified in SAS 78 and the COSO framework. The control concepts discussed in this chapter are applied to specific applications in chapters that follow.

PART 2: TRANSACTION CYCLES AND BUSINESS PROCESSES

Chapters 4, 5, and 6, The Revenue and Expenditure Cycles

The approach taken in all three chapters is similar. First, the business cycle is reviewed conceptually using data flow diagrams to present key features and control points of each major subsystem. At this point the reader has the choice of either continuing within the context of a manual environment or moving directly to computer-based examples. Each system is examined under two alternative technological approaches:

- First examined is automation, which preserves the basic functionality by replacing manual processes with computer programs.
- Next, each system is reengineered to incorporate real-time technology.

Under each technology, the effects on operational efficiency and internal controls are examined. This approach provides the student with a solid understanding of the business tasks in each cycle and an awareness of how different technologies influence changes in the operation and control of the systems.

Chapter 7, "The Conversion Cycle"

Manufacturing systems represent a dynamic aspect of AIS. Chapter 7 describes several manufacturing environments, including the following:

- traditional mass production (batch) processing
- just-in-time production systems
- computer-integrated manufacturing

These environments are driven by information technologies such as materials requirements planning (MRP) and manufacturing resources planning (MRP II). The chapter

addresses the shortcomings of traditional accounting models and the advantages of activity-based accounting (ABC) in assessing value-added business activities.

Chapter 8, "Financial Reporting and Management Reporting Systems"

Chapter 8 begins with a review of data coding techniques used in transaction processing systems and for general ledger design. It explores several coding schemes and their respective advantages and disadvantages. Next it examines the objectives, operational features, and control issues of three related systems: the general ledger system (GLS), the financial reporting system (FRS), and the management reporting system (MRS). The emphasis is on operational controls and the use of advanced computer technology to enhance efficiency in each of these systems. The chapter distinguishes the MRS from the FRS in one key respect: financial reporting is *mandatory* and management reporting is *discretionary*. Management reporting information is needed for planning and controlling business activities. Organization management implements MRS applications at their discretion, based on internal user needs.

The chapter examines a number of factors that influence and shape information needs. These include management principles, decision type and management level, problem structure, reports and reporting methods, responsibility reporting, and behavioral issues pertaining to reporting.

PART 3: ADVANCED TECHNOLOGIES IN ACCOUNTING INFORMATION

Chapter 9, "Database Management Systems"

Chapter 9 deals with the design and management of an organization's data resources.

- It begins by demonstrating how problems associated with traditional flat-file systems are resolved under the database approach.
- The second section describes in detail the functions and relationships among four primary elements of the database environment: the users, the database management system (DBMS), the database administrator (DBA), and the physical database.
- The third section is devoted to an in-depth explanation of the characteristics of the relational model. A number of database design topics are covered, including data modeling, deriving relational tables from ER diagrams, the creation of user views, and data normalization techniques.
- The fourth section concludes the chapter with a discussion of distributed database issues. It examines three possible database configurations in a distributed environment: centralized, partitioned, and replicated databases.

Chapter 10, "The REA Approach to Business Process Modeling"

Chapter 10 presents the REA model as a means of specifying and designing accounting information systems that serve the needs of all users within an organization. The chapter is composed of three major sections.

- The first section introduces the REA approach and describes how it overcomes a number of problems associated with traditional accounting practice.
- The second section examines traditional database applications and their limitations. Although superior to flat-file systems, traditional database systems suffer from serious problems that limit their usefulness. A limitation of particular importance is their

almost exclusive support of financial information users and their inadequacy at meeting the growing need for nonfinancial information. A second problem is their inability to respond to noneconomic events that may be of extreme importance to an organization.

- The third section provides a detailed review of the steps involved in developing an REA model. This approach is then compared to the traditional ER approach to modeling business processes.

Chapter 11, "Enterprise Resource Planning Systems"

This chapter presents a number of issues related to the implementation of enterprise resource planning (ERP) systems. It is composed of five major sections.

- The first section outlines the key features of a generic ERP system by comparing the function and data storage techniques of a traditional flat file or database system to that of an ERP.
- The second section describes various ERP configurations related to servers, databases, and bolt-on software.
- Data warehousing is the topic of the third section. A data warehouse is a relational or multidimensional database that supports on-line analytical processing (OLAP). A number of issues are discussed, including data modeling, data extraction from operational databases, data cleansing, data transformation, and loading data into the warehouse.
- The fourth section examines risks associated with ERP implementation. These include "big bang" issues, opposition to change within the organization, choosing the wrong ERP model, choosing the wrong consultant, cost overrun issues, and disruptions to operations. The fifth section reviews several control and auditing issues related to ERPs. The discussion follows the SAS 78 framework.
- The chapter appendix provides a review of the leading ERP software products including SAP, Oracle, PeopleSoft, J.D. Edwards, and BAAN.

Chapter 12, "Electronic Commerce Systems"

Driven by the Internet revolution, electronic commerce is dramatically expanding and undergoing radical changes. While electronic commerce promises enormous opportunities for consumers and businesses, its effective implementation and control are urgent challenges facing organization management and accountants. To properly evaluate the potential exposures and risks in this environment, the modern accountant must be familiar with the technologies and techniques that underlie electronic commerce. **This chapter and the associated appendix deal with several aspects of electronic commerce.**

- The body of the chapter examines Internet commerce including business-to-consumer and business-to-business relationships. It presents the risks associated with electronic commerce and reviews security and assurance techniques used to reduce risk and to promote trust.
- The chapter concludes with a discussion of how Internet commerce impacts the accounting and auditing profession. The internal usage of networks to support distributed data processing and traditional business-to-business transactions conducted via EDI systems are presented in the appendix.

PART 4: SYSTEMS DEVELOPMENT ACTIVITIES

Chapter 13, "Managing the Systems Development Life Cycle" and Chapter 14, "Construct, Deliver, and Maintain Systems Projects"

These chapters examine the accountant's role in the systems development process.

- Chapter 13 begins with an overview to the systems development life cycle (SDLC). This multistage process guides organization management through the development and/or purchase of information systems.
- Next, Chapter 13 presents the key issues pertaining to developing a systems strategy, including its relationship to the strategic business plan, the current legacy situation, and feedback from the user community. The chapter provides a methodology for assessing the feasibility of proposed projects and for selecting individual projects to go forward for construction and delivery to their users. The chapter concludes by reviewing the role of accountants in managing the SDLC.
- Chapter 14 covers the many activities associated with in-house development, which fall conceptually into two categories: (1) construct the system and (2) deliver the system. Through these activities, systems selected in the project initiation phase (discussed in Chapter 13) are designed in detail and implemented. This involves creating input screen formats, output report layouts, database structures, and application logic. Finally, the completed system is tested, documented, and rolled out to the user.
- Chapter 14 then examines the increasingly important option of using commercial software packages. Conceptually, the commercial software approach also consists of construct and delivery activities. In this section we examine the pros, cons, and issues involved in selecting off-the-shelf systems.
- Chapter 14 also addresses the important activities associated with systems maintenance and the associated risks that are important to management, accountants, and auditors.
- Several comprehensive cases designed as team-based systems development projects are available on the web site. These cases have been used effectively by groups of three or four students working as a design team. Each case has sufficient details to allow analysis of user needs, preparation of a conceptual solution, and the development of a detailed design, including user views (input and output), processes, and databases.

PART 5: COMPUTER CONTROLS AND AUDITING

Chapters 15, "IT Controls Part I: Sarbanes-Oxley and IT Governance"

This chapter provides an overview of management and auditor responsibilities under Sections 302 and 404 of the Sarbanes-Oxley Act (SOX). The design, implementation, and assessment of internal control over the financial reporting process form the central theme for this chapter and the two chapters that follow. This treatment of internal control complies with the Committee of Sponsoring Organizations of the Treadway Commission (COSO) control framework. Under COSO, IT controls are divided into application controls and general controls. Chapter 15 presents risks, controls and tests of controls related to IT governance including organizing the IT function, controlling computer center operations, and designing an adequate disaster recovery plan.

Chapter 16, "IT Controls Part II: Security and Access"

Chapter 16 continues the treatment of IT controls as described by the COSO control framework. The focus of the chapter is on SOX compliance regarding the security and control of operating systems, database management systems, and communication networks. This chapter examines the risks, controls, audit objectives, and tests of controls that may be performed to satisfy either compliance or attest responsibilities.

Chapter 17, "IT Controls Part III: Systems Development, Program Changes, and Application Controls"

This chapter concludes our treatment of IT controls as outlined in the COSO control framework. The focus of the chapter is on SOX compliance regarding systems development, program changes, and applications controls. This chapter examines the risks, controls, audit objectives, and tests of controls that may be performed to satisfy compliance or attest responsibilities. The chapter examines **five computer-assisted audit tools and techniques (CAATT)** for testing application controls:

- the test data method
- base case system evaluation
- tracing
- integrated test facility
- parallel simulation

It also reviews two substantive testing techniques: embedded audit modules and generalized audit software.

SUPPLEMENTS

Instructor's Manual (available at <http://aise.swlearning.com>)

The *Instructor's Manual*, updated by Georgia Smedley of the University of Nevada–Las Vegas, was written with the first-time instructor in mind. This resource contains lecture notes for each chapter and also suggests which parts of the chapter to cover in class and which to leave to the students for independent study. The manual also includes a helpful assignment grid indicating subject content and degree of difficulty of each exercise.

PowerPoint® Slides (available at <http://aise.swlearning.com>)

The PowerPoint® slides, prepared and completely updated by Patrick Wheeler of University of South Florida, provide colorful lecture outlines of each chapter of the text, incorporating text graphics and flowcharts where needed.

Test Bank (available at <http://aise.swlearning.com>)

The *Test Bank*, written and updated by the text author, contains true/false, multiple-choice, short answer, and essay questions. It is available both as text and computerized ExamView® versions.

Solutions Manual (available at <http://aise.swlearning.com>)

The *Solutions Manual*, written by the author, contains solutions to all end-of-chapter problems and cases.

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Dedication

To my wife Eileen, and my children Elizabeth and Katie

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