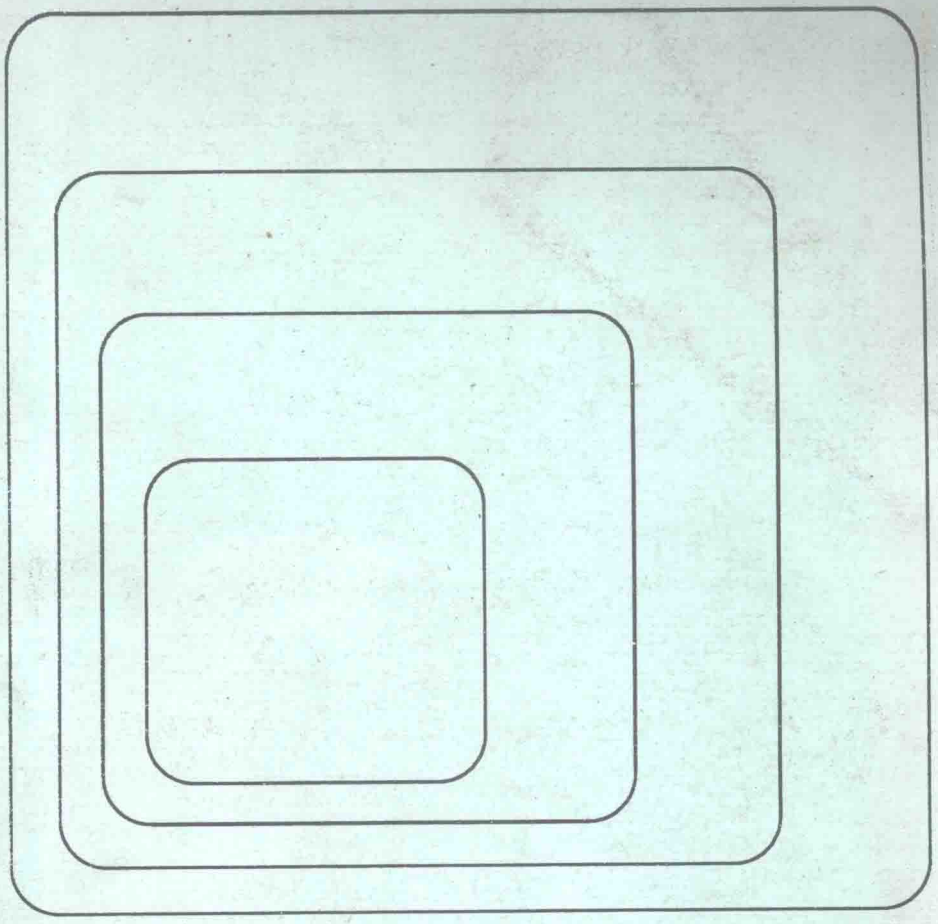

ACCOUNTING INFORMATION SYSTEMS

SECOND EDITION

ROBERT A. LEITCH / K. ROSCOE DAVIS

second edition

ACCOUNTING INFORMATION SYSTEMS
Theory and Practice

Robert A. Leitch
University of South Carolina

K. Roscoe Davis
University of Georgia

Prentice Hall, Englewood Cliffs, New Jersey 07632

Library of Congress Cataloging-in-Publication Data

Leitch, Robert A.
Accounting information systems : theory and practice / Robert A. Leitch, K. Roscoe Davis. -- 2nd ed.
p. cm.
Includes bibliographical references and index.
ISBN 0-13-006032-1
1. Accounting--Data processing. I. Davis, K. Roscoe II. Title.
HF5679.L38 1992
657'.0285--dc20 91-25982
CIP

Editorial/production supervision and interior design: Shelly Kupperman
Cover design: Wanda Lubelska Design
Prepress buyer: Trudy Pisciotti
Manufacturing buyer: Bob Anderson
Acquisitions editor: Joseph Heider
Acquisitions assistant: Linda Albelli
Copy editor: Sandy Di Somma

©1992, 1983 by Prentice Hall, Inc.
A Simon & Schuster Company
Englewood Cliffs, New Jersey 07632

All rights reserved. No part of this book may be reproduced, in any form or by any means, without permission in writing from the publisher.

Printed in the United States of America
10 9 8 7 6 5 4 3 2 1

ISBN 0-13-006032-1

Prentice Hall International (UK) Limited, *London*
Prentice Hall of Australia Pry. Limited, *Sydney*
Prentice Hall Canada Inc., *Toronto*
Prentice Hall Hispanoamericana, S.A., *Mexico*
Prentice Hall of India Private Limited, *New Delhi*
Prentice Hall of Japan, Inc., *Tokyo*
Simon & Schuster Asia Pte. Ltd., *Singapore*
Editors Prentice Hall do Brasil, Ltda., *Rio de Janiero*

PREFACE

Accounting information systems support the transaction processing, reporting, and decision-making systems of most organizations. To support these management systems and their requirements effectively, an accountant must be able to integrate data processing elements with managerial activities within the decision-making and organizational framework of the organization.

This text provides a conceptual framework for integrating all the elements required to support accounting information systems. These are: hardware, software, database, controls, procedures, and personnel. The framework builds on the premise that the elements should be organized to support the transaction processing, reporting, and decision-making requirements of the organization. This framework is well-founded in management information systems design theory, and it is the focal point of all the discussion in the text.

The objective of this text is to expose students to the elements that constitute an accounting system and the theory upon which a system should be designed and organized. The material is also written for the education of current

or future practitioners who will deal with challenging systems design and operation problems of clients or their own organizations.

The text encompasses six major areas: (1) a theoretical framework for accounting systems; (2) procedures for systems analysis and design that are founded on organizational and behavioral concepts; (3) accounting and management information requirements that follow from transaction processing, reporting, and decision-making needs; (4) information technology and database concepts; (5) a broad spectrum of accounting systems applications; and (6) internal control structure and EDP auditing. The text covers the entire range of accounting systems from small, ledgerless bookkeeping systems to complex decision support systems used by large international corporations. This coverage includes marketing, production, financial, and personnel accounting systems. Moreover, microcomputer as well as mainframe computer networks are illustrated.

The sequence followed in the text begins with a discussion of the importance and the use of accounting information. This is followed by an outline of general systems theory and a framework for the development of an effective and efficient accounting information system. This general framework is followed by several chapters on systems elements and information technology (Chapters 3 to 10). It is important that accountants have an understanding of the organizational concepts, behavioral factors, decision-making processes, and communication theory prior to initiating any systems analysis, design, and implementation activities. Moreover, it is important that they understand the value of information to the organization in today's competitive environment. These concepts are reviewed in Chapters 3 and 4. It is also important that a student have a basic understanding of information technology, including microcomputer developments such as local area networks (Chapters 5 and 6). Chapter 7 is designed to introduce students to various modes of data processing as well as the communication hardware and networks involved in distributed processing. Accountants must also have a working knowledge of flowcharting and documentation concepts. These topics are covered in detail in Chapter 8. File management and database system form the basis for more and more accounting information systems, thus, it is essential that accounting students have an understanding of these systems (Chapters 9 and 10).

Since one of the major roles of accountants is the evaluation of accounting systems, this text gives considerable emphasis to an accounting and information systems control structure. In addition to the detailed discussion of control structure in Chapter 11, the risks associated with various transaction processing cycles and database systems are emphasized throughout the text. The control structure discussion is founded on SAS 55.

Structured systems analysis and design procedures are used to integrate the theoretical and technical material in the text. Chapters 12 and 13 set forth a structured set of procedures for the analysis, design, and implementation of accounting systems. The philosophy upon which these chapters are built is that a well-conceived, designed, and implemented system will go a long way toward achieving the control that management and accountants desire for an organization.

此为试读,需要完整PDF请访问: www.ertongbook.com

An application section is presented in the final section of the book. The objective is to integrate the theoretical, organizational, decision-making, technical, and design concepts of previous chapters. The emphasis here is on the characteristics of systems that are required to meet the various transaction processing, reporting, and decision-making needs of management. Examples are used to demonstrate the achievement of these objectives. Manual, batch, on-line, database, and distributed processing accounting systems, are all illustrated.

Many of the illustrations and cases used in this section have been abstracted from actual business situations. They include microcomputer as well as mainframe examples. Chapters 14 and 15 concentrate on logistical and marketing systems and their respective processing cycles. Contemporary JIT logistics systems as well as microcomputer sales order-entry systems are illustrated for special emphasis. Financial management systems are discussed in Chapter 16. The financial accounting aspects of accounts receivable, accounts payable, payroll, inventory, general ledger, and facilities management transaction processing systems are emphasized in Chapter 16. A complete financial accounting system for a microcomputer is provided in an appendix to Chapter 19 for small businesses to illustrate financial information requirements. Decision support systems with a special emphasis on budgeting, financial planning, and modeling systems that are used for managerial and strategic decision making are described in Chapter 17. Newer developments in artificial intelligence which are designed to help management make decisions are also reviewed here. Large and complex distributed processing accounting systems that rely on electronic data interchange and integrate a number of functional areas are illustrated in Chapter 18. Chapter 19 focuses on systems that are required to satisfy the special needs of small businesses. All of these applications chapters emphasize the effective use of an accounting system to meet the information needs of management with respect to transaction processing, reporting, and decision making. Finally, an introduction to key aspects of EDP auditing is presented in Chapter 20.

In summary, some of the special features of this text are:

1. A theoretical framework for systems development.
2. A structured approach to systems analysis and design.
3. An emphasis on the control structure set forth in SAS 55.
4. A chapter on data flow diagrams and system flowcharting.
5. A chapter on organizational and behavioral theory related to systems design.
6. A chapter on decision-making and communication concepts that are essential to an effective accounting information system.
7. A substantive review of systems hardware and software including microcomputers and networks.
8. Two chapters on file management and database systems.
9. A complete discussion of small entrepreneurial accounting systems with a microcomputer illustration.

10. A chapter of decision support systems with an emphasis on financial planning systems.
11. A detailed discussion of large complex distributed processing accounting systems.
12. Cases and examples based on actual experience.
13. Many cases that require the student to integrate knowledge from several chapters, such as flowcharting, system design, control structure, database, and software concepts.
14. Many CPA and CMA questions.
15. Several cases requiring the use of common microcomputer software to give the students hands-on experience in the development and use of accounting information systems.

This text is designed for either a one-semester or a one-quarter junior, senior, or introductory graduate level course. With the addition of outside readings and extensive EDP or system design projects, the text can easily be used for a two-semester or two-quarter course sequence in accounting systems.

This text assumes that students have had a basic course in computers or computer programming. An elementary understanding of computer processing is assumed; Chapters 5, 6, and 7 are designed for an update and review. If a student has no prior background, a supplement may be used to develop the computer basics. The text also assumes that students have had some accounting course work so that they have a very basic understanding of the various transaction processing accounting cycles.

The text is flexible enough that the instructor can select subsets of chapters, depending on the background of the students, the material to be introduced, the level at which the course is to be taught, and the credit hours to be assigned. For example, if the course follows an in-depth course in computers, Chapters 5, 6, 7, and 8 may be used only for review. If it follows an auditing course in which internal control is stressed, Chapter 11 may be reviewed lightly. If it precedes an auditing course the control chapter and the EDP audit chapter serve as excellent introductions to these aspects of auditing. On the other hand, if the instructor is pressed for time, Chapter 4, the technology chapters, and a few of the application chapters may be either skipped or treated lightly.

Moreover, the sequence may be altered. For example, the flowcharting chapter may be taught at an earlier point in time, and the chapter on small business may follow either Chapter 13 or 16 if the students need the background earlier in the semester for a project. In addition some like to delay Chapter 4 and use it as an introduction to Chapter 17 on decision support systems.

In summary, the core of the text is contained in Chapters 1, 2, 3, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17. The other chapters build upon and support this basic framework.

The overall objective of the text is to develop a sound framework for the analysis, design, and review of accounting information systems. Based on this framework, the objective is then to show the student how to analyze, design, and implement accounting information systems that satisfy the transaction processing, reporting, and decision-making requirements of management. In addition,

the objective is to provide accounting students with a better understanding of accounting systems and their related controls and to enable them to more effectively audit accounting systems.

Robert A. Leitch
K. Roscoe Davis

CONTENTS

1 INFORMATION PROCESSING: AN OVERVIEW 1

Introduction 1
Management Use of Accounting Information 5
- Transaction Processing 5
- Decision-Making, Planning, and Control Activities 5
- Product and Service Use of Information 5

Strategic Use of Information 6
Information as a Resource 6
Accounting and Information 7
- Accounting Information 7
- The Role of the Accountant 8

Definition of Information Systems and Information Processing 8
- General Definition 8
- Historical Perspective 9
- General Characteristics of Information Systems 13

Generalized Accounting Cycle 14
Data Sources 14
Summary 16
Selected References 17
Review Questions 17
Cases 18

2 ACCOUNTING INFORMATION SYSTEM CONCEPTS AND DIMENSIONS 22

Introduction 22
General Systems Model 23
Definition of Systems 23
Dimensions of Accounting Information Processing 23
Data Processing (Elements) 23
Managerial Activities 24
Activity Levels 25
Organizational Functions 27
Information and Management System 29
Major Components 30
System vs. Component Approach 32
Types of Information Systems 33
Transaction Processing System 34
Office Automation System 34
Management Information Systems 35
Decision Support Systems 35
Executive Information System 35
An Information System Framework 36
A Systematic Procedure for System Design and Development 37
Information System Life Cycle 37
AICPA Phases to Systems Development 38
Summary 39
Selected References 40
Review Questions 41
Cases 41

3 ORGANIZATIONAL AND BEHAVIORAL PRINCIPLES 46

Overview 46
Organizational Theory 47
Organizational Structure 51
Structure and Process 51
Criteria for Assessing Structure and Process 51
Basic Framework 52
Adaptive Framework 55

Decision and Transaction Flow Network 58
Data Structure 58
Information Systems Structure 59
Centralized Systems 59
Distributed Systems 59
Integrated Systems 60
Summary 60
Organization of Accounting and MIS Department 60
MIS Location Issues 60
Controllership and Treasurership Functions 61
Organization of Information Systems Department 63
Management of Information Systems 63
Behavioral Concepts 64
Basic Motivation Concepts 64
Levels of Management 67
Impact of Information Systems on Business Organizations 70
Summary 70
Selected References 71
Review Questions 72
Cases 73

4 DECISION-MAKING, INFORMATION, AND COMMUNICATION CONCEPTS 87

Overview 87
Conceptual Framework for Decision Making 88
Decision-Making Systems 88
Decision-Making Process 88
Types of Decision-Making Systems 90
Information and Communication Concepts—Overview 94
Measurement 94
Communication 95
Form, Screen, and Reported Design 96
Value of Accounting Information 97
Relevance, Timing, and Accuracy 97
Competitive Value of Accounting Information 98
Summary 100
Module A: Decision-Making Theory—Overview 101
Decision-Making Process 102
Descriptive Theory 102
Decision Models and Search Process 103
Module B: The Value of Information 105
Selected References 110
Review Questions 111
Cases 111

此为试读,需要完整PDF请访问: www.ertongbook.com

5 INFORMATION TECHNOLOGY 117

Introduction 117
Hardware Components 118
- Central Processing Unit 118
- Input/Output Devices 121
- Secondary Storage Devices 125
- Additional Hardware Concepts 129

Software and Operating Systems 131
- Operating Systems: Functions, Types, Structure 132
- Operating System Components 132
- File Maintenance and Database Management Systems 135
- Application and End-user Programs 135
- Programming Languages 135
- Advanced Software Concepts 138

Summary 141
Selected References 142
Review Questions 142
Cases 143

6 MICROCOMPUTER AND LOCAL AREA NETWORK (LAN) PROCESSING TECHNOLOGY 148

Introduction 148
Hardware 149
- CPU 149
- Operating Systems 151
- Communication 152
- Storage 153
- User Interface 153

Personal Productivity and End-User Software 153
- Word Processing 154
- Spreadsheets 154
- Databases 154
- Communication Packages 154
- Graphics 154
- Statistical 155
- Summary 155

Accounting Software 155
End-User Applications 156
Minicomputers 156
Local Area Networks 157
- Technology 158
- Network Protocol 158
- Hardware Sharing 161
- Sharing Data and Communication 161
- Electronic Mail and Office Automation 162
- Stand-Alone System 162

Network Administration 162
LAN Summary 163
Micro—Mainframe Links 163
Summary 164
Selected References 164
Review Questions 164
Cases 165

7 SYSTEM STRUCTURES AND ASSOCIATED HARDWARE **167**

Batch Processing and On-Line Processing 168
Batch Processing 168
On-line Processing 171
Evolution of Accounting Systems 173
Traditional Manual Accounting Systems 173
Computerized Transaction Processing Systems 173
Management Information Systems (MIS) 174
Decision Support Systems (DSS) 179
Executive Information System (EIS) 179
Office Information Systems 180
Distributed Processing and Data Networks 180
Characteristics of Distributed Processing Systems 180
Partitioned vs. Duplicate Data 181
Autonomy of Data Processing Operations 181
Network Structures 185
Distributed System Hardware: Telecommunication Equipment 189
Telecommunications 189
Communication Control Units 190
Terminals 191
Summary 193
Selected References 193
Review Questions 193
Cases 194

8 DATA FLOW DIAGRAMS, SYSTEMS FLOWCHARTING, AND DOCUMENTATION **200**

Basic Concepts 200
Data Flow Diagrams 201
System Flowcharts 205
Systems Flowcharting Techniques 207
System Flowchart Illustrations 209
Manual Illustration 209
Batch Processing 210
On-Line Interactive Processing 212
Document Flowchart 212

Systems Flowchart Utilization 217
Preparing Data Flow Diagrams and System Flowcharts 217
Systems Documentation 218
Systems Definition 219
Program Documentation 220
Operator Instructions 220
Documentation Control and Summary 221
Summary 222
Selected References 222
Review Questions 222
Cases 223

9 FILE MANAGEMENT ACCOUNTING SYSTEMS 233

Introduction 233
Data Hierarchy and Keys 235
Data Item (Element), Field, Record, and File 235
Keys 235
Data Classification and Coding 237
Single File Organization and Access 240
Sequential Files 241
Indexed-Sequential Files 241
Direct Access and Random Files 242
Multiple-Application Single File Access 242
Linked List 243
Indexing (Inverted Lists or Files) 245
Processing Modes 245
Weakness in the File-Oriented Approach 246
Data Redundancy 246
Data Dependence 246
Lack of Compatiblity and Flexibility 247
Lack of Data Integration 247
Summary 248
Selected References 248
Review Questions 249
Cases 249

10 DATABASE ACCOUNTING INFORMATION SYSTEMS 254

Introduction 254
Database Processing 255
Components of Database Processing 256
Users 256
Database Administrator 258
The Database 259

Data Structure 262
Database Management System (DBMS) 269
Operation and Use of Database Processing 274
Database Use 274
Backup and Recovery 276
Summary of Advantages and Disadvantages of Database Processing 277
Advantages 277
Disadvantages 278
Comparison of Advantages and Disadvantages 279
Summary 279
Selected References 280
Review Questions 280
Appendix: REA Accounting Model 281
Cases 283

11 CONTROL STRUCTURE 288

Internal Control and Risk 288
Objective of Control Systems 288
Control Structure 291
Control Environment 296
Accounting System 299
Control Procedures 300
Control Procedures for Advanced EDP Systems 310
On-line Input Control Procedures (Passwords) 311
Distributed Processing and Communication Procedures 313
Integrated Systems 314
Database Control Procedures 314
Spreadsheet Controls 316
Local Area Network Controls 317
Summary 317
Selected References 318
Review Questions 319
Cases 320

12 STRUCTURED SYSTEMS ANALYSIS AND DESIGN CONCEPTS: ANALYSIS AND DEFINITION OF THE SYSTEM 345

Introduction 345
General Approaches to Systems Analysis and Design 348
Structured Approach to Systems Analysis and Design 349
Steering Committee and Project Teams 352
Systems Boundaries 353
Problem Definition 355
Feasibility Study 356

Analysis 360
Systems Evaluation and Operational Review 364
Summary 366
Appendix: Shared Data Environment—Analysis and Design 367
Selected References 367
Review Questions 368
Cases 369

13 STRUCTURED SYSTEMS ANALYSIS AND DESIGN CONCEPTS: DESIGN AND IMPLEMENTATION 379

Objective of Systems Design and Implementation 379
Strategy for Change 381
Modular Concept 381
Planning Change 382
Structured Design 382
General (Conceptual) Systems Design 382
Detailed Systems Design and Vendor Selection 385
Implementation 394
Alternate Systems Analysis and Design 399
Prototyping 399
End-User Development 400
Case 401
Spreadsheet Analysis and Design 402
Summary 404
Appendix: Scheduling the Analysis, Definition, Design, and Implementation of Information Systems—PERT 405
Selected References 407
Review Questions 407
Cases 408

14 PRODUCTION AND INVENTORY SYSTEMS 426

Objective 426
Traditional Production and Inventory Systems 427
Contemporary Logistics Systems 428
Decision and Transaction Processing Characteristics 429
Basic Environmental Considerations 429
Logistics Subsystems 432
Production Operations 433
Flexible Manufacturing Systems (FMS) 434
Planning and Scheduling 435
Engineering and Product Design 439
Maintenance 441
Quality Control 441
Purchasing 442

Inventory 443
Information Systems 444
Cost Accounting System 445
Transaction Processing Networks 445
Information Retrieval Considerations 446
Traditional Job-Cost System: Microcomputer Illustration 447
Traditional Batch Processing Illustration 450
Database Extension 453
Risk and Internal Control 454
Summary 455
Appendix: A Manual Purchasing, Receiving, and Inventory System 455
Selected References 459
Review Questions 460
Cases 460

15 MARKETING SYSTEMS AND THE REVENUE CYCLE 472

Objective 472
Decision and Transaction Processing Characteristics 473
Environmental Considerations and Information Flow 473
Market Decision Support Systems 474
Marketing Decision Support System Illustration 476
Marketing Organization 478
Marketing Subsystems 479
Transaction Processing Revenue Cycle 484
Coordination of Subsystems and Supporting Systems 495
Interface with Logistical and Protection Systems 496
Marketing Systems' Inherent and Control Risks 496
Summary 497
Appendix 498
Manual System Illustration: Order Entry 498
Batch Processing Illustration: Order Entry, Accounts Receivable, and Sales Analysis 498
Selected References 501
Review Questions 502
Cases 502

16 FINANCIAL INFORMATION SYSTEMS 519

Objective 519
Financial Decision-Making Activities 520
Financial Planning and Budgeting 521
Cash Management and Funds Acquisition 521
Capital Budgeting 521
Environmental Considerations 522
Financial Accounting Information Systems 522

此为试读,需要完整PDF请访问: www.ertongbook.com