Table of Contents

Part I	Overview of Accounting Information Systems			
Chapter 1	The Information System: An Accountant's Perspective 2			
	The Information Environment3What Is a System?4An Information Systems Framework6AIS Subsystems9A General Model for AIS10Acquisition of Information Systems15			
	Organizational Structure 16 Business Segments 16 Functional Segmentation 17 The Accounting Function 20 The Information Technology Function 21			
	The Evolution of Information System Models26The Manual Process Model26The Flat-File Model27The Database Model29The REA Model31Enterprise Resource Planning Systems34			
	The Role of the Accountant34Accountants as Users35Accountants as System Designers35Accountants as System Auditors36Summary37			
Chapter 2	Introduction to Transaction Processing 44			
	An Overview of Transaction Processing 45 Transaction Cycles 45 The Expenditure Cycle 45 The Conversion Cycle 46 The Revenue Cycle 47			

Accounting Records 47

Manual Systems 47 The Audit Trail 54 Computer-Based Systems 55

Documentation Techniques 57

Data Flow Diagrams and Entity Relationship Diagrams 58

Flowcharts 61 Record Layout Diagrams 72

Computer-Based Accounting Systems 73 Differences between Batch and Real-Time Systems **74**

Alternative Data Processing Approaches75Batch Processing Using Real-Time Data Collection78Real-Time Processing80

Summary 82

Appendix 82

Chapter 3 Ethics, Fraud, and Internal Control 112

Ethical Issues in Business 113

Business Ethics 113 Computer Ethics 114 Sarbanes-Oxley Act and Ethical Issues 117

Fraud and Accountants 119

Definitions of Fraud 119 Factors that Contribute to Fraud 120 Financial Losses from Fraud 122 The Perpetrators of Frauds 122 Fraud Schemes 125

Internal Control Concepts and Techniques 134

SAS 78/COSO Internal Control Framework 139

Summary 145

Part II Transaction Cycles and Business Processes 161

Chapter 4 The Revenue Cycle 162

The Conceptual System 163

Overview of Revenue Cycle Activities 163 Sales Return Procedures 170 Cash Receipts Procedures 173 Revenue Cycle Controls 177

Physical Systems 181

Manual Systems 182

Sales Order Processing182Sales Return Procedures185Cash Receipts Procedures185

Computer-Based Accounting Systems 188

Automating Sales Order Processing with Batch Technology 188 Keystroke 191 Edit Run 191 Update Procedures 191 Reengineering Sales Order Processing with Real-Time Technology 193 Transaction Processing Procedures 194 General Ledger Update Procedures 194 Advantages of Real-Time Processing 195 Automated Cash Receipts Procedures 195 Reengineered Cash Receipts Procedures 197 Point-of-Sale (POS) Systems 197 Daily Procedures 198 End-of-Day Procedures 199 Reengineering Using EDI 200 Reengineering Using the Internet 200 Control Considerations for Computer-Based Systems 201 PC-Based Accounting Systems 203 PC Control Issues 204

Summary 204

Appendix 205

Chapter 5

The Expenditure Cycle Part I: Purchases and Cash Disbursements Procedures 234

The Conceptual System 235

Overview of Purchases and Cash Disbursements Activities 235 The Cash Disbursements Systems 243 Expenditure Cycle Controls 245

Physical Systems 249

A Manual System 249 The Cash Disbursements Systems 251

Computer-Based Purchases and Cash Disbursements Applications 252

Automating Purchases Procedures Using Batch Processing Technology 253 Cash Disbursements Procedures 258

Reengineering the Purchases/Cash Disbursements System 259 Control Implications 261

Summary 263

Chapter 6 The Expenditure Cycle Part II: Payroll Processing and Fixed Asset Procedures 285

The Conceptual Payroll System286Payroll Controls294

The Physical Payroll System296Manual Payroll System297

Computer-Based Payroll Systems 298 Automating the Payroll System Using Batch Processing 298 Reengineering the Payroll System 298

The Conceptual Fixed Asset System301The Logic of a Fixed Asset System302

The Physical Fixed Asset System305Computer-Based Fixed Asset System305Controlling the Fixed Asset System307

Summary 310

Chapter 7 The Conversion Cycle 332

The Traditional Manufacturing Environment 333 Batch Processing System 334 Controls in the Traditional Environment 344

World-Class Companies and Lean

Manufacturing 347

What Is a World-Class Company? 348 Principles of Lean Manufacturing 348

Techniques and Technologies that Promote Lean Manufacturing 350

Physical Reorganization of the ProductionFacilities350Automation of the Manufacturing Process350

Accounting in a Lean Manufacturing Environment 355

What's Wrong with Traditional Accounting Information? 355 Activity-Based Costing (ABC) 356 Value Stream Accounting 358

Information Systems that Support Lean Manufacturing 360

Materials Requirement Planning (MRP)360Manufacturing Resource Planning (MRP II)360Enterprise Resource Planning (ERP) Systems363

Summary 364

Chapter 8

Financial Reporting and Management Reporting Systems 381

Data Coding Schemes 382

A System without Codes 382 A System with Codes 383 Numeric and Alphabetic Coding Schemes 383

The General Ledger System 387

The Journal Voucher 387 The GLS Database 388 GLS Procedures 389

The Financial Reporting System 389

Sophisticated Users with Homogeneous Information Needs 389 Financial Reporting Procedures 389

Controlling the FRS 391 COSO/SAS 78 Control Issues 392

The Management Reporting System 394

Factors that Influence the MRS 394

Management Principles 395 Management Function, Level, and Decision Type 398 Problem Structure 401 Types of Management Reports 403 Responsibility Accounting 405 Behavioral Considerations 409

Summary 412

Part III Advanced Technologies in Accounting Information 429

Chapter 9 Database Management Systems 430

Overview of the Flat-File vs. Database Approach 431 Data Storage 431

Data Updating 431 Currency of Information 431 Task-Data Dependency 431 The Database Approach 432 Flat-File Problems Solved 432 Controlling Access to the Database 433 The Database Management System 433 Three Conceptual Models 434

Elements of the Database Environment 434

Users 435 Database Management System 436 Database Administrator 438 The Physical Database 441

The Relational Database Model 442

Relational Database Concepts 443 Anomalies, Structural Dependencies, and Data Normalization 447

Designing Relational Databases 454

Identify Entities 455 Construct a Data Model Showing Entity Associations 457 Add Primary Keys and Attributes to the Model 458 Normalize Data Model and Add Foreign Keys 459 Construct the Physical Database 460 Prepare the User Views 463 Global View Integration 464

Databases in a Distributed Environment 464

Centralized Databases 464 Distributed Databases 466

Summary 470

Appendix 471

Chapter 10 The REA Approach to Database Modeling 496

The REA Approach 497

The REA Model 497

Developing an REA Model 501

Differences between ER and REA Diagrams 501 View Modeling: Creating an Individual REA Diagram 502

View Integration: Creating an Enterprise-Wide REA Model 509

Step 1. Consolidate the Individual Models 510 Step 2. Define Primary Keys, Foreign Keys, and Attributes 513

Step 3. Construct Physical Database and Produce User Views 516

REA and Value Chain Analysis 520

REA Compromises in Practice 521

Summary 521

Chapter 11 Enterprise Resource Planning Systems 528

What Is an ERP? 529

ERP Core Applications 531 Online Analytical Processing 531

ERP System Configurations 532

Server Configurations 532 OLTP Versus OLAP Servers 532 Database Configuration 535 Bolt-on Software 535

Data Warehousing 537

Modeling Data for the Data Warehouse 537
Extracting Data from Operational Databases 538
Cleansing Extracted Data 540
Transforming Data into the Warehouse Model 540
Loading the Data into the Data Warehouse
Database 541
Decisions Supported by the Data Warehouse 542
Supporting Supply Chain Decisions from the Data Warehouse 542

Risks Associated with ERP Implementation 543

Big Bang Versus Phased-in Implementation 544 Opposition to Changes in the Business's Culture 544 Choosing the Wrong ERP 545 Choosing the Wrong Consultant 546 High Cost and Cost Overruns 547 Disruptions to Operations 548

Implications for Internal Control and Auditing 549

Transaction Authorization 549 Segregation of Duties 549 Supervision 549 Accounting Records 550 Access Controls 550 Auditing the Data Warehouse 551

Summary 552 Appendix 553

Chapter 12 Electronic Commerce Systems 563

Intra-Organizational Networks and EDI 564

Internet Commerce 564

Internet Technologies 564 Protocols 567 Internet Protocols 569 Benefits from Internet Commerce 577

Risks Associated with Electronic Commerce 578

Intranet Risks 580 Internet Risks 581 Risks to Consumers 581

Security, Assurance, and Trust 587

Encryption 588 Digital Authentication 588 Firewalls 590 Seals of Assurance 591

Implications for the Accounting Profession 592

Privacy Violation 593 Audit Implications of XBRL 594 Continuous Auditing 594 Electronic Audit Trails 594 Confidentiality of Data 595 Authentication 595 Nonrepudiation 595 Data Integrity 595 Access Controls 595 A Changing Legal Environment 596 Summary 596

Appendix 597

Part IV	Systems	Develop	oment .	Activities	623
	-				

Chapter 13 Managing the Systems Development Life Cycle 624

The Systems Development Life Cycle 625

Participants in Systems Development 626

Systems Strategy 627

Assess Strategic Information Needs 627

Strategic Business Needs 627 Legacy Systems 628 User Feedback 629

Develop a Strategic Systems Plan 631

Create an Action Plan 632

The Learning and Growth Perspective 634 The Internal Business Process Perspective 634 The Customer Perspective 634 The Financial Perspective 634 Balanced Scorecard Applied to IT Projects 634

Project Initiation 635

Systems Analysis 635

The Survey Step 636 The Analysis Step 638

Conceptualization of Alternative Designs 640

How Much Design Detail Is Needed? 640

Systems Evaluation and Selection 642

Perform a Detailed Feasibility Study 642 Perform Cost-Benefit Analysis 643 Prepare Systems Selection Report 649 Announcing the New System Project 650 User Feedback 650

The Accountant's Role in Managing the SDLC 651

How Are Accountants Involved with SDLC?651The Accountant's Role in Systems Strategy651The Accountant's Role in Conceptual Design652The Accountant's Role in Systems Selection652

Summary 652

Chapter 14 Construct, Deliver, and Maintain Systems Project 659

In-House Systems Development 660

Tools for Improving Systems Development 660

Construct the System 664

The Structured Design Approach 664 The Object-Oriented Design Approach 667 System Design 669 Data Modeling, Conceptual Views, and Normalized Tables 670 Design Physical User Views 670 Design the System Process 677 Design System Controls 681 Perform a System Design Walk-Through 681 Program Application Software 682 Software Testing 683

Deliver the System 684

Testing the Entire System 684 Documenting the System 685 Converting the Databases 687 Converting to the New System 688 Post-Implementation Review 689 The Role of Accountants 690

Commercial Packages 691

Trends in Commercial Packages 691 Advantages of Commercial Packages 693 Disadvantages of Commercial Packages 693

Choosing a Package 693

xiii

Maintenance and Support 698 User Support 698 Knowledge Management and Group Memory 698 Summary 699 Appendix 699

Part V Computer Controls and Auditing 723

Chapter 15 IT Controls Part I: Sarbanes-Oxley and IT Governance 724

Overview of Sections 302 and 404 of SOX 725

Relationship between IT Controls and Financial Reporting 725 Audit Implications of Sections 302 and 404 726

IT Governance Controls 728

Organizational Structure Controls 728

Segregation of Duties within the Centralized Firm 729 The Distributed Model 731 Creating a Corporate IT Function 732 Audit Objectives Relating to Organizational Structure 734 Audit Procedures Relating to Organizational Structure 734

Computer Center Security and Controls 734 Computer Center Controls 735

Disaster Recovery Planning 737 Providing Second-Site Backup 738

Identifying Critical Applications 739 Performing Backup and Off-Site Storage Procedures 740 Creating a Disaster Recovery Team 740 Testing the DRP 740 Audit Objective: Assessing Disaster Recovery Planning 741 Audit Procedures for Assessing Disaster Recovery Planning 741 Summary 742

Appendix 743

Chapter 16 IT Controls Part II: Security and Access 759

Controlling the Operating System 760

Operating System Objectives 760 Operating System Security 760 Threats to Operating System Integrity 761 Operating System Controls and Test of Controls 762

Controlling Database Management Systems 767

Access Controls 767 Backup Controls 770

Controlling Networks 771

Controlling Risks from Subversive Threats 771 Controlling Risks from Equipment Failure 780

Electronic Data Interchange (EDI) Controls 782

Transaction Authorization and Validation 783 Access Control 783 EDI Audit Trail 783 Summary 785

Annondiu 70

Appendix 786

Chapter 17 IT Controls Part III: Systems Development, Program Changes, and Application Controls 797

Systems Development Controls 798

Controlling Systems Development Activities 798 Controlling Program Change Activities 800 Source Program Library Controls 801 The Worst-Case Situation: No Controls 802 A Controlled SPL Environment 802

Application Controls 806

Input Controls 806 Processing Controls 809 Output Controls 812

Testing Computer Application Controls 815

Black Box Approach 815 White Box Approach 816 White Box Testing Techniques 818 The Integrated Test Facility 822 Parallel Simulation 823

Substantive Testing Techniques 824 The Embedded Audit Module 825 Generalized Audit Software (GAS) 826 Summary 830

GLOSSARY INDEX G-1 I-1