

COST ACCOUNTING

NINTH EDITION

A MANAGERIAL EMPHASIS

HORNGREN ♦ FOSTER ♦ DATAR



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A MANAGERIAL EMPHASIS

Charles T. Horngren

Stanford University

George Foster

Stanford University

Srikant M. Datar

Stanford University



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ABOUT THE AUTHORS

CHARLES T. HORNGREN is the Edmund W. Littlefield Professor Emeritus of Accounting at Stanford University. A graduate of Marquette University, he received his MBA from Harvard University and his Ph.D. from the University of Chicago. He is also the recipient of honorary doctorates from Marquette University and DePaul University.

A Certified Public Accountant, Horngren served on the Accounting Principles Board for six years, the Financial Accounting Standards Board Advisory Council for five years, and the Council of the American Institute of Certified Public Accountants for three years. In addition, he served as a trustee of the Financial Accounting Foundation, which oversees the Financial Accounting Standards Board and the Government Accounting Standards Board for six years.

A member of the American Accounting Association, Horngren has also served as its President and Director of Research. He received the Outstanding Accounting Educator Award in 1973, when the association initiated an annual series of such awards.

The California Certified Public Accountants Foundation gave Horngren its Faculty Excellence Award in 1975 and its Distinguished Professor Award in 1983. He is the first person to have received both awards. In 1985, the American Institute of Certified Public Accountants presented him with its first Outstanding Educator Award. Five years later, he was elected to the Accounting Hall of Fame.

In 1993, Horngren was named Accountant of the Year, Education, by the national professional accounting fraternity, Beta Alpha Psi.

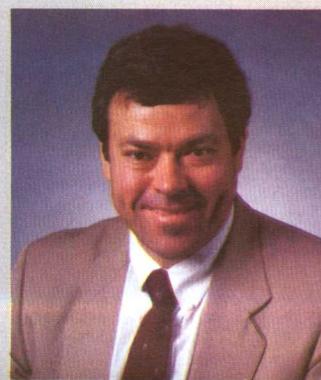
Professor Horngren is a member of the National Association of Accountants, and served on its research planning committee for three years. He was also a member of the Board of Regents, Institute of Management Accounting, which administers the Certified Management Accountant examinations.

Charles T. Horngren, the Consulting Editor for the Prentice Hall Series in Accounting, is the coauthor of six other books published by Prentice Hall: *Principles of Financial and Management Accounting: A Sole Proprietorship Approach* and *Principles of Financial and Management Accounting: A Corporate Approach*, 1994 (with Walter T. Harrison, Jr., and Michael A. Robinson); *Introduction to Financial Accounting*, Fifth Edition, 1993 (with Gary L. Sundem and John Elliott), *Introduction to Management Accounting*, Ninth Edition, 1993 (with Gary L. Sundem), *Financial Accounting*, 1992, and *Accounting*, Second Edition, 1993 (with Walter T. Harrison, Jr.).

GEORGE FOSTER is the Paul L. and Phyllis Wattis Professor of Management at Stanford University. He graduated with a university medal from the University of Sydney and has a Ph.D. from Stanford University. He has been awarded honorary doctorates from the University of Ghent, Belgium, and from the University of Vaasa, Finland. He has received the Outstanding Educator Award from the American Accounting Association.

Foster has received the Distinguished Teaching Award at Stanford University and the Faculty Excellence Award from the California Society of Certified Public Accountants. He has been a Visiting Professor to Mexico for the American Accounting Association.

Research awards Foster has received include the Competitive Manuscript Competition Award of the American Accounting Association, the Notable Contri-

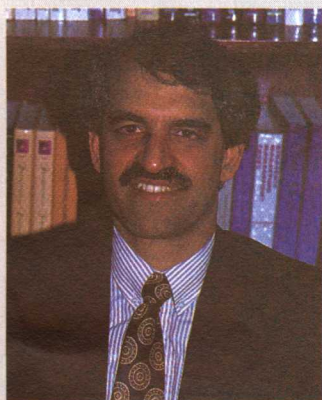


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tribution to Accounting Literature Award of the American Institute of Certified Public Accountants, and the Citation for Meritorious Contribution to Accounting Literature Award of the Australian Society of Accountants.

He is the author of *Financial Statement Analysis*, published by Prentice Hall. He is co-author of *Activity-Based Management Consortium Study (APQC and CAM-I)* and *Marketing, Cost Management and Management Accounting (CAM-I)*. He is also co-author of two monographs published by the American Accounting Association—*Security Analyst Multi-Year Earnings Forecasts and The Capital Market* and *Market Microstructure and Capital Market Information Content Research*. Journals publishing his articles include *Abacus*, *The Accounting Review*, *Harvard Business Review*, *Journal of Accounting and Economics*, *Journal of Accounting Research*, *Journal of Cost Management*, *Journal of Management Accounting Research*, and *Management Accounting*.

Foster works actively with many companies, including Apple Computer, ARCO, BHP, Digital Equipment Corp., Exxon, Frito-Lay Corp., Hewlett-Packard, McDonalds Corp., Octel Communications, PepsiCo, Santa Fe Corp., and Wells Fargo. He also has worked closely with Computer Aided Manufacturing-International (CAM-I) in the development of a framework for modern cost management practices. Foster has presented seminars on new developments in cost accounting in North America, Asia, Australia, and Europe.



SRIKANT M. DATAR is the Edmund W. Littlefield Professor of Accounting and Management at Stanford University. A graduate with distinction from the University of Bombay, he received gold medals upon graduation from the Indian Institute of Management, Ahmedabad, and the Institute of Cost and Works Accountants of India. A Chartered Accountant, he holds two masters degrees and a Ph.D. from Stanford University.

Cited by his students as a dedicated and innovative teacher, Datar received the George Leland Bach Award for Excellence in the Classroom at Carnegie Mellon University and the Distinguished Teaching Award at Stanford University.

Datar has published his research in various journals, including *The Accounting Review*, *Contemporary Accounting Research*, *Journal of Accounting, Auditing and Finance*, *Journal of Accounting and Economics*, *Journal of Accounting Research*, and *Management Science*. He has also served on the editorial board of several journals and presented his research to corporate executives and academic audiences in North America, South America, Asia, and Europe.

Datar has worked with many corporations, including AT&T, Boeing, British Columbia Telecommunications, The Cooperative Bank, Du Pont, Ford, General Motors, Hewlett-Packard, Mellon Bank, Solectron, TRW, and VISA, on field-based projects in management accounting. He is a member of the American Accounting Association and the Institute of Management Accountants.

PREFACE

Studying cost accounting is one of the best business decisions a student can make. Why? Because success in any business—from the smallest corner store to the largest multinational corporation—requires the use of cost accounting principles and practices. Cost accounting provides key data to managers for planning and controlling, as well as for costing products, services, and customers. Today especially, as more and more cost accountants are being called on to become decision makers instead of data providers, our theme of “different costs for different purposes,” which we stress throughout the book, is essential for a thorough and useful accounting education. By focusing on basic concepts, analyses, uses, and procedures instead of procedures alone, we recognize cost accounting as a managerial tool for business strategy and implementation, and we also prepare students for the rewards and challenges facing them in the world of professional cost accounting both today and tomorrow.

STRENGTHS OF THE EIGHTH EDITION RETAINED AND ENHANCED

Reviewers of the eighth edition praised the following features, which have been retained and strengthened in the ninth edition:

- ◆ Clarity and understandability of the text
- ◆ Coverage of important topics, including current developments in actual practice
- ◆ Extensive use of real-world examples
- ◆ Excellent quantity, quality, and range of assignment material
- ◆ Helpful Problems for Self-Study for each chapter
- ◆ Flexible organization through a modular approach

The first fourteen chapters provide the essence of a one-term (quarter or semester) course. There is ample text and assignment material in the book's twenty-six chapters for a two-term course. This book can be used immediately after the student has had an introductory course in financial accounting. Alternatively, this book can build on an introductory course in managerial accounting.

Deciding on the sequence of chapters in a textbook is a challenge. Every instructor has a favorite way of organizing his or her course. Hence, we present a modular, flexible organization that permits a course to be custom-tailored. *This organization facilitates diverse approaches to teaching and learning.*

As an example of the book's flexibility, consider our treatment of process costing. Process costing is described in Chapters 17 and 18. Instructors interested in filling out a student's perspective of costing systems can move directly from job-order costing described in Chapters 4 and 5 to Chapter 17 without interruption in the flow of material. Other instructors may want their students to delve into budgeting and more decision-oriented topics early in the course. These instructors may prefer to postpone discussion of process costing.

CHANGES IN CONTENT AND PEDAGOGY OF THE NINTH EDITION

The pace of change in organizations continues to be rapid. The ninth edition of *Cost Accounting* reflects changes occurring in the role of cost accounting in organizations and in research on cost accounting. We have shortened and streamlined individual chapters, focused on the major issues facing the management accountant, and achieved greater integration across chapters. Each chapter was scrutinized by knowledgeable critics before a final draft was reached.

1. *Newly evolving management themes.* These themes guided us in choosing the topics to be given increased emphasis.

- ◆ *Focus on customers.* Chapter 1 takes a customer-driven perspective on changes in cost accounting. The customer focus is emphasized in many other chapters. For example, Chapters 11 and 16 include sections on customer costing and profitability analysis.
- ◆ *Key success factors,* such as cost, quality, and time. Chapters 8 and 12 include discussion on cost planning and cost management. Chapter 19 discusses cost management aspects of quality and time. Chapter 21 describes cost management issues in just-in-time environments.
- ◆ *Total value-chain analysis.* The value chain is systematically emphasized throughout the book. Chapter 1 introduces the value chain. The text in many areas (such as Chapter 2 on cost drivers, Chapter 6 on budgeting, Chapter 7 on explanations for variances, and Chapter 12 on pricing decisions) emphasizes the importance of considering all areas of the value chain. We have also integrated value-chain analysis in our discussion of quality in Chapter 19 and just-in-time in Chapter 21.
- ◆ *Dual internal/external focus.* Topics such as benchmarking (Chapter 7) and customer satisfaction (Chapter 19) highlight the increased attention given to external factors in management accounting. Greater recognition is given to how cost accounting is expanding its horizons to incorporate environment-related considerations, for example in capital budgeting (Chapter 22) and performance evaluation (Chapter 26).
- ◆ *Continuous improvement.* Topics such as kaizen budgeting (Chapter 6) and productivity (Chapter 24) focus on the heightened emphasis companies now give to continuous improvement.

2. *Broad coverage of the service sector.* The service sector is now the single largest sector in the economy, and it is sometimes easier to use in teaching because there is no work in process to consider. Chapter 2 discusses cost concepts in the service sector as well as in the merchandising and manufacturing sectors. Chapter 4 illustrates job costing in the service sector. Chapter 16 on revenue analysis, Chapter 22 on capital budgeting, Chapter 25 on transfer pricing, and Chapter 26 on performance evaluation are discussed using service-sector illustrations.

3. *Expanded global content of the text.* Our coverage of international business is highly visible in our continued use of boxed features: Surveys of Company Practice and Concepts in Action. Both types of boxes, described in more detail later, draw on businesses from around the globe. In addition, company examples from many different countries are cited throughout the chapter material. Chapter 16 on revenue analysis, Chapter 25 on transfer pricing, and Chapter 26 on performance evaluation have expanded discussions within multinational contexts.

4. *Professional ethics.* The ninth edition continues our emphasis on ethics. The second-to-last problem in every chapter of the book has a component on ethics. This feature gives the instructor the flexibility to reinforce the importance of ethics in as many areas as is deemed appropriate.

5. *Cost management.* The eighth edition expanded its coverage of cost management. The ninth edition continues this expansion. Each chapter has an explicit discussion

of how the ideas described in it help the management accountant to plan, manage, and control costs.

Activity-based management is integrated into many chapters of the ninth edition. Chapter 2 discusses cost drivers and value-added costs. Chapters 4 and 5 illustrate how an activity-based costing approach can be used to refine job-costing systems. Chapter 6 illustrates activity-based budgeting. Chapter 11 applies activity-based costing to decisions regarding adding or dropping customers. Chapter 12 discusses how companies can reduce costs by reengineering product design or by reducing individual activity costs. Chapters 5, 14 and 16 present cost hierarchies. Chapter 15 examines capacity costing issues. Chapter 19 describes how activity-based costing can be used to manage quality.

6. Performance evaluation. Corporations have continued to innovate in their performance evaluation systems, placing greater emphasis on nonfinancial measures and combining these measures with financial measures. We describe performance evaluation considerations throughout the text, for example, when describing costing systems, variance analysis, relevant costs, overhead cost allocations, quality, productivity, and just-in-time. Chapter 26 develops a conceptual framework, based on recent research, for understanding performance evaluation issues.

Major Changes in Content and Sequence

1. The sequence of topics in Chapters 1 through 12 of the eighth edition is unchanged in the ninth edition, except that Process Costing previously introduced in Chapter 5 is instead presented comprehensively in Chapter 17. Material within these chapters is updated, reorganized, and integrated to facilitate student learning. For example, the discussion of cost hierarchies in Chapter 10 of the eighth edition is integrated with activity-based costing in Chapter 5 of the ninth edition; Chapters 4 and 5 streamline the presentation of job costing, cost-system refinements, and activity-based costing; and Chapter 10 on estimating cost functions and determining how costs behave is presented in a more graphical way.

2. The topics covered in the eighth edition Chapter 13 ("Management Control Systems") have been integrated into other chapters. Benchmarking is combined with variance analysis in Chapter 7; discretionary and engineered costs are described in an Appendix to Chapter 8 as an extension of overhead-variance analysis; value-added and nonvalue-added distinctions are discussed in the context of value engineering in Chapter 12; and management control issues are integrated with the transfer pricing discussion in Chapter 25.

3. Old Chapters 14 through 16 (on cost allocation and joint costs) are now Chapters 13 through 15.

4. Chapter 16 in the ninth edition is a new chapter that focuses on revenue management. Part One is new material on revenue tracing and revenue allocation. Part Two covers sales variances from old Chapter 22, and Part Three describes the customer profitability analysis from old Chapter 4.

5. Old Chapters 17 and 18 (on process costing and spoilage) continue as Chapters 17 and 18. However, the ninth edition introduces a new method for process costing. This method uses inventory-costing procedures that are virtually identical to inventory-costing methods, which students encountered in their introductory financial accounting classes. The only additional feature is the equivalent unit cost calculations.

6. Old Chapters 19 and 24 (on operation costing, backflush costing, inventory management, and just-in-time) have been reorganized into new Chapters 20 and 21 to achieve an expanded and integrated treatment of costing and cost management in a just-in-time environment.

7. Old Chapters 20 and 21 (on capital budgeting) are now Chapters 22 and 23. The new capital budgeting chapters include the topics of breakeven time (BET)

from old Chapter 23, control of projects from old Chapter 19, and expanded discussions of post-investment audits and tax aspects.

8. Old Chapter 22 (Part Two on input variances and Part Three on productivity measurement) is now Chapter 24.

9. Old Chapter 23 (on quality and time) is now Chapter 19. The discussion of quality cost management in new Chapter 19 builds on the accounting for spoilage, rework, and scrap in new Chapter 18.

10. Old Chapters 25 and 26 (on transfer pricing and performance evaluation) continue as Chapters 25 and 26 but with an expanded multinational flavor.

Assignment Material

The ninth edition continues the widely applauded tight linkage between text and assignment material formed in previous editions. We have also significantly expanded the assignment material, provided more structure, and added greater variety. Notable changes are as follows:

- ◆ End-of-chapter assignment material are divided into three groups: Exercises, Problems, and a Collaborative Learning Problem. Exercises are short, structured assignments that test basic issues presented in the chapter. Problems are longer and more difficult assignments. The Collaborative Learning Problem is the last assignment in each chapter. These problems are group assignments that require students to think critically about a particular problem or specific business situation.
- ◆ Each of the seven parts of the book has a video case. The video case covers and integrates material from the various chapters in that part. For example, Nally & Gibson Georgetown, Inc., a limestone mining and processing company, is used to illustrate cost allocation and process costing at the end of Part Four. Instructors can use these video cases and the accompanying photo walkthroughs to summarize major segments of the course and to challenge their students' comprehension of the topics covered in those segments.

ILLUSTRATIONS OF ACTUAL BUSINESSES

Students become highly motivated to learn cost accounting if they can relate the subject matter to the real world. We have spent considerable time interacting with the business community, investigating new uses of cost accounting data and gaining insight into how changes in technology are affecting the roles of cost accounting information. Real-world illustrations are found in many parts of the text.

Concepts in Action Boxes Found in many chapters, these boxes discuss how cost accounting concepts are applied by individual companies. Examples are drawn from many different countries, including the United States (Motorola on p. 15, Harley-Davidson on p. 41, General Motors on p. 68, Clark-Hurth on p. 149, Parker-Hannifin on p. 231), Canada (Ontario Hydro on p. 799), France (CFM International on p. 441), Germany (Porsche on p. 757), Japan (Nissan and Toyota on p. 441 and Japanese National Tax Agency on p. 916), Mexico (Crysel on p. 690), and the United Kingdom (Allied-Signal Skelmersdale on p. 700).

Surveys of Company Practice Boxes Results from surveys in more than 15 countries are cited in the many Surveys of Company Practice boxes found throughout the book. Examples include

- ◆ Growing Interest in Activity-Based Costing (p. 113)—cites evidence from the United States, Canada, the United Kingdom, and New Zealand.
- ◆ Budgeting Practices (p. 188)—cites evidence from the United States, Australia, Holland, Japan, and the United Kingdom.

- ◆ Standard Costing (p. 225)—cites evidence from the United States, Canada, Ireland, Japan, Sweden, and the United Kingdom.
- ◆ Variable Costing (p. 312)—cites evidence from the United States, Australia, Canada, Japan, Sweden, and the United Kingdom.
- ◆ Pricing Practices (p. 445)—cites evidence from the United States, Australia, Ireland, Japan, and the United Kingdom.
- ◆ Purposes of Cost Allocation (p. 490)—cites evidence from the United States, Australia, Canada, and the United Kingdom.
- ◆ Performance Measures in Just-in-Time Systems (p. 761)—cites evidence from the United States, Canada, Ireland, Italy, and the United Kingdom.
- ◆ Capital Budgeting Methods (p. 794)—cites evidence from the United States, Australia, Canada, Ireland, Japan, Poland, Scotland, South Korea, and the United Kingdom.
- ◆ Transfer Pricing Methods (p. 912)—cites evidence from the United States, Australia, Canada, India, Japan, New Zealand, and the United Kingdom.

This extensive survey evidence enables students to see that many of the concepts they are learning are widely used across the globe.

Photos from Actual Companies All chapters open with a photo that illustrates an important concept discussed in that chapter. These photos feature companies from many different countries, including the United States (Ben & Jerry's), Canada (Cott Corporation), and the United Kingdom (Tomkins, PLC). Each Concepts in Action box has an accompanying photo.

- ◆ Photo Walkthroughs are a new feature of the ninth edition. These appear at the end of each of the seven parts of the book and provide visual images of a manufacturing or business process described in that part. Visualizing a process helps students better understand the text descriptions. Video cases, tied to the photo essays, help students to further consolidate their thinking.

SUPPLEMENTS TO THE NINTH EDITION

A complete package of supplements is available to assist students and instructors in using this book. Supplements available to students include the following:

- ◆ *Student Guide and Review Manual* by John K. Harris and Dudley W. Curry.
- ◆ *Student Solutions Manual* by Charles T. Horngren, George Foster, and Srikant M. Datar.
- ◆ *Applications in Cost Accounting Using Excel* by David M. Buehlmann and Dennis P. Curtin.
- ◆ *Spreadsheet Templates* by Albert Fisher.

Supplements available to instructors include the following:

- ◆ *Annotated Instructor's Edition* with annotations by Linda S. Bamber.
- ◆ *Prentice Hall Course Manager*.
- ◆ *Instructor's Manual and Media Guide* by Michael C. Nibbelin.
- ◆ *Test Item File* by Marvin L. Bouillon.
- ◆ *Prentice Hall Custom Test* by ESA, Inc.
- ◆ *Solutions Manual* by Charles T. Horngren, George Foster, and Srikant M. Datar.
- ◆ *Solutions Transparencies*.
- ◆ *Solutions Manual for Applications in Cost Accounting Using Excel* by David M. Buehlmann and Dennis P. Curtin.

Supplements new to the ninth edition include the following:

- ◆ **PH Professor: A Classroom Presentation on PowerPoint** by William O. Stratton. Approximately 20 PowerPoint slides are available for each chapter of the text. This software allows instructors to offer an interactive presentation that uses colorful graphics, outlines of chapter material, additional examples, and graphical explanations of difficult topics. Some slides also have hidden spreadsheets that allow instructors to do what-if analyses for the situation being discussed in the slide. It is not necessary to have PowerPoint to run the presentations. However, if PowerPoint is available, you will be able to add, delete, revise, and change the order of the slides. Students may purchase a copy of *Power Notes*, which is a print out of all of the slides along with additional space for taking notes.
- ◆ **Power Notes** by William O. Stratton. This handy note-taking tool contains print-outs of all PowerPoint slides available for the text. Students can focus their attention on the lecture because they already possess the information on the slide. Extra space is provided next to each slide to jot down additional explanations, examples, and so on that are supplied by the instructor.
- ◆ **CD-ROM—Career Paths in Accounting** by Convergence Multimedia. With *Career Paths*, students can explore facts and trends in business, find out where the jobs are, and find out how to succeed in marketing themselves in the information age. Each CD-ROM contains 250 original video clips describing the nature of specific jobs, successful applicant profiles and entry requirements in today's volatile business world; interviews with key practitioners in the field; modules for preparing a winning resume, interviewing, networking, and negotiating; and interactive aptitude tests to determine skills and preferences.
- ◆ **ABC News/PH Video Library for Cost Accounting.** Video is a dynamic way to enhance your class presentations. However, the quality of the video material and how well it relates to your course can still make all the difference. For these reasons, Prentice Hall and ABC News worked together to bring you the best and most comprehensive video ancillaries available in the college market.
- ◆ In addition to the *ABC News Videos*, and *ON LOCATION!* Videos, company-specific plant tours from Fortune 500 service and manufacturing companies are also provided. Through these videos your students are able to experience shop floors like Chrysler and AT&T.

Through its wide variety of award-winning programs—"Nightline," "Business World," "On Business," "This Week with David Brinkley," "World News Tonight," and "The Wall Street Journal Report"—ABC offers a resource for feature and documentary-style videos related to text concepts and applications. The programs have extremely high production quality, present substantial content, and are hosted by well-versed, well-known anchors. Prentice Hall—its authors and its editors—provides videos on topics that work well with this course and text and gives instructors teaching notes on using them in the classroom.

- ◆ **ON LOCATION! Custom Case Videos for Cost Accounting.** Broadcast journalism and accounting education meet to create a series of custom produced case videos that have all the fast-paced and engaging qualities of TV and focus on the successful cost accounting activities of five dynamic companies. Take your students on a field trip to Dell Computers or Deer Valley Ski Resort to see the impact of cost accounting on their business strategies. Each video is approximately six to eight minutes in length and is tied directly to the issue-oriented end-of-part video case studies in *Cost Accounting*.

The ABC News/PH Video Library *ON LOCATION!* for *Cost Accounting* offers video material for almost every chapter in the text. An excellent video guide that is included in your *Instructor's Manual* carefully and completely integrates the videos into your lecture.

We are indebted to many for their ideas and assistance. Our primary thanks go to the many academics and practitioners who have advanced our knowledge of cost accounting.

The package of teaching material we present is the work of many skillful and valued team members. John K. Harris aided us immensely at all stages in the development and production of this book. He critiqued the eighth edition and gave a detailed review of the manuscript for the ninth edition. Linda S. Bamber reviewed the manuscript and gave suggestions for improvement in addition to working on the *Annotated Instructor's Edition*. Beverly Amer proved to be an invaluable resource in researching and writing the photo essays and video cases.

Professors providing detailed written reviews of the previous edition or comments on our drafts of this edition include

Tarek S. Amer, Northern Arizona University
 Charles D. Bailey, University of Central Florida
 Ken M. Boze, University of Alaska, Anchorage
 Somnath Das, University of California, Berkeley
 Peggy deProphetis, University of Pennsylvania
 Amin A. Elmallah, California State University, Sacramento
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 Tony B. Wong, Northern Alberta Institute of Technology
 Russell Yerkes, Roosevelt University, Emeritus
 Marilyn T. Zarzeski, University of Central Florida

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Comments from users are welcome.

CHARLES T. HORNGREN
GEORGE FOSTER
SRIKANT M. DATAR

TO OUR FAMILIES

Joan, Scott, Mary, Susie, Cathy (CH)

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BRIEF CONTENTS

PART ONE COST ACCOUNTING FUNDAMENTALS

- 1 The Accountant's Role in the Organization 1
- 2 An Introduction to Cost Terms and Purposes 25
- 3 Cost-Volume-Profit Relationships 59
- 4 Costing Systems and Activity-Based Costing (I): Service and Merchandising Applications 93
- 5 Costing Systems and Activity-Based Costing (II): Manufacturing Applications 131
 - A Walk through Dell Computer 172
 - Dell Computer Video Case 174

PART TWO TOOLS FOR PLANNING AND CONTROL

- 6 Master Budget and Responsibility Accounting 175
- 7 Flexible Budgets, Variances, and Management Control: I 217
- 8 Flexible Budgets, Variances, and Management Control: II 253
- 9 Income Effects of Alternative Inventory-Costing Methods 297
 - A Walk through Ritz-Carlton 332
 - Ritz-Carlton Video Case 334

PART THREE COST INFORMATION FOR DECISIONS

- 10 Determining How Costs Behave 335
- 11 Relevant Revenues, Relevant Costs, and the Decision Process 383
- 12 Pricing Decisions, Product Profitability Decisions, and Cost Management 429
 - A Walk through Grand Canyon Railway 468
 - Grand Canyon Railway Video Case 470

PART FOUR COST ALLOCATION AND REVENUES

- 13 Cost Allocation: I 471
- 14 Cost Allocation: II 509
- 15 Cost Allocation: Joint Products and Byproducts 543
- 16 Revenues, Revenue Variances, and Customer-Profitability Analysis 575
- 17 Process-Costing Systems 611
 - A Walk through Nally & Gibson Georgetown, Inc. 648
 - Nally & Gibson Georgetown, Inc. Video Case 650

PART FIVE QUALITY AND JIT

- 18 Spoilage, Reworked Units, and Scrap 651
- 19 Cost Management: Quality, Time, and the Theory of Constraints 681
- 20 Operation Costing, Just-in-Time Systems, and Backflush Costing 717
- 21 Inventory Management and Just-in-Time 747
 - A Walk through Ritz-Carlton 776
 - Ritz-Carlton Video Case 778

PART SIX CAPITAL BUDGETING

- 22 Capital Budgeting and Cost Analysis 779
- 23 Capital Budgeting: A Closer Look 821
 - A Walk through Deer Valley Resort 862
 - Deer Valley Resort Video Case 864

PART SEVEN MANAGEMENT CONTROL SYSTEMS

- 24 Measuring Input Yield, Mix, and Productivity 865
- 25 Control Systems, Transfer Pricing, and Multinational Considerations 899
- 26 Systems Choice: Performance Measurement, Compensation, and Multinational Considerations 931
 - A Walk through Dell Computer 968
 - Dell Computer Video Case 970
- Appendix A Surveys of Company Practice 971
- Appendix B Recommended Readings 975
- Appendix C Notes on Compound Interest and Interest Tables 979
- Appendix D Cost Accounting in Professional Examinations 987
- Author Index 1001
- Company Index 1002
- Subject Index 1004

CONTENTS

PREFACE



PART ONE COST ACCOUNTING FUNDAMENTALS

1

THE ACCOUNTANT'S ROLE IN THE ORGANIZATION 1

The Major Purposes of Accounting Systems	2
Management Accounting, Financial Accounting, and Cost Accounting	2
Cost Management and Accounting Systems	3
Modern Cost Accounting	3
Managers as Customers of Accounting	3
The Value Chain of Business Functions	3
Elements of Management Control	4
Planning and Control	4
Feedback: A Major Key	6
Cost-Benefit Approach	6
Organization Structure and the Management Accountant	7
Line and Staff Relationships	7
The Chief Financial Officer and the Controller	7
Scorekeeping, Attention-Directing, and Problem-Solving Functions	8
Professional Ethics	9

Ethical Guidelines 9

Typical Ethical Challenges 9

Newly Evolving Management Themes Around the Globe 12

◆ **Surveys of Company Practice: Common Ethical Dilemmas and Codes of Ethics** 13

◆ **Concepts in Action: Quality in Accounting at Motorola** 15

Problem for Self-Study 16 *Summary* 16

Terms to Learn 17 *Assignment Material* 17

2

AN INTRODUCTION TO COST TERMS AND PURPOSES 25

Costs in General	26
Cost Objects	26
Cost Accumulation and Cost Assignment	26
Direct Costs and Indirect Costs	27
Cost Tracing and Cost Allocation	27
Factors Affecting Direct/Indirect Cost Classifications	28
Cost Drivers and Cost Management	28
Cost Behavior Patterns: Variable Costs and Fixed Costs	29
Major Assumptions	30
Relevant Range	30
◆ Surveys of Company Practice: Purposes for Distinguishing Between Variable Costs and Fixed Costs	31
Relationships of Types of Costs	32
Total Costs and Unit Costs	32
Meaning of Unit Costs	32
Use Unit Costs Cautiously	33
Financial Statements and Cost Terminology	35
Service-Sector Companies	35

Merchandising- and Manufacturing-Sector Companies 36

Merchandising-Sector Example 36

Manufacturing-Sector Example 38

Manufacturing Costs 40

Three-Part and Two-Part Cost Classifications 40

◆ **Concepts in Action: Harley-Davidson Eliminates the Direct Manufacturing Labor Cost Category 41**

Prime Costs and Conversion Costs 41

Benefits of Defining Accounting Terms 42

The Many Meanings of Product Costs 43

Classifications of Costs 43

Problem for Self-Study 44 Summary 46

Terms to Learn 47 Assignment Material 47

3

COST-VOLUME-PROFIT RELATIONSHIPS 59

Revenue Drivers and Cost Drivers: The General Case and a Special Case 60

Terminology and Abbreviations 61

CVP Assumptions 61

The Breakeven Point 62

Equation Method 62

Contribution Margin Method 62

Graph Method 63

Target Operating Income 64

The PV Graph 65

Sensitivity Analysis and Uncertainty 65

Cost Planning and CVP 66

Alternative Fixed-Cost/Variable-Cost Structures 66

◆ **Concepts in Action: How a Jobs-Bank Agreement Increased GM's Breakeven Point 68**

Effect of Time Horizon 68

Effects of Revenue Mix on Income 69

Role of Income Taxes 70

Nonprofit Institutions and CVP 71

Contribution Margin and Gross Margin 71

Merchandising Sector 72

Manufacturing Sector 72

Problem for Self-Study 73 Summary 74

Appendix: Decision Models and Uncertainty 75

Coping with Uncertainty 75

Terms to Learn 79 Assignment Material 79

4

COSTING SYSTEMS AND ACTIVITY-BASED COSTING (I): SERVICE AND MERCHANDISING APPLICATIONS 93

Building Block Concept of Costing Systems 94

Job-Costing and Process-Costing Systems 95

Job Costing in Service Organizations Using Actual Costing 96

Job Costing of an Audit Engagement 96

General Approach to Job Costing 96

Source Documents 97

Normal Costing 98

Time Period Used to Compute Indirect-Cost Rates 100

Extended Normal Costing 101

Broad Averaging via Peanut-Butter Costing Approaches 102

Undercosting and Overcosting 102

Product-Cost Cross-Subsidization 103

Refining a Costing System 103

Cost Refinement in the Service Sector 105

Refinement via Increased Direct-Cost Tracing 105

Refinement via Increased Number of Indirect-Cost Pools and Cost Drivers 106

Activity-Based Costing in Merchandising 107

◆ **Concepts in Action: Banks End the "Free Lunch" for Many Services 109**

◆ **Surveys of Company Practice: Growing Interest in Activity-Based Costing 112**

Problem for Self-Study 113 Summary 114

Appendix: Computation of Direct Labor Cost Rates 115

Terms to Learn 116 Assignment Material 117

5

COSTING SYSTEMS AND ACTIVITY-BASED COSTING (II): MANUFACTURING APPLICATIONS 131

Job Costing in Manufacturing 132

Source Documents 134

◆ **Surveys of Company Practice: Cost-Allocation Bases Used for Manufacturing Overhead 135**

An Illustration of a Job-Costing System in Manufacturing 135

General Ledger and Subsidiary Ledgers 135

Explanations of Transactions 137