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HORNGREN'S COST ACCOUNTING

A MANAGERIAL EMPHASIS

16TH EDITION

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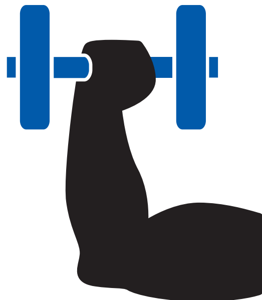

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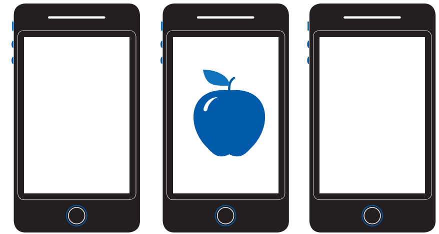

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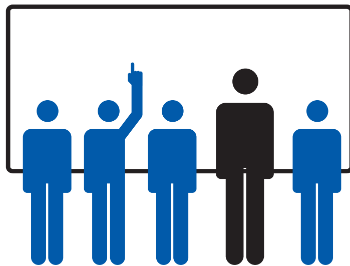

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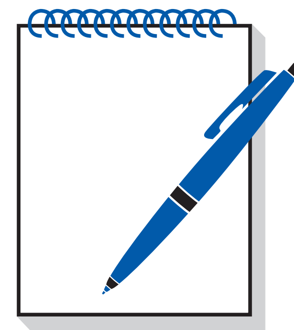

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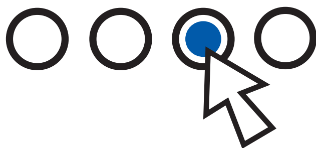

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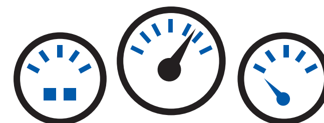

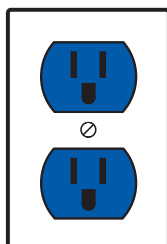

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Horngren's Cost Accounting

A MANAGERIAL EMPHASIS

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Preface

Studying cost accounting is one of the best business investments a student can make. Why? Because success in any organization—from the smallest corner store to the largest multinational corporation—requires the use of cost accounting concepts and practices. Cost accounting provides key data to managers for planning and controlling, as well as costing products, services, and even customers. This book focuses on how cost accounting helps managers make better decisions, as cost accountants are increasingly becoming integral members of their company's decision-making teams. In order to emphasize this prominence in decision making, we use the "different costs for different purposes" theme throughout this book. 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.

We also prepare students for the rewards and challenges they face in the professional cost accounting world of today and tomorrow. For example, we emphasize both the development of analytical skills such as Excel to leverage available information technology and the values and behaviors that make cost accountants effective in the workplace.

New to This Edition

Deeper Consideration of Global Issues

Businesses today have no choice but to integrate into an increasingly global ecosystem. Virtually all aspects, including supply chains, product markets, and the market for managerial talent, have become more international in their outlook. To illustrate this, we incorporate global considerations into many of the chapters. For example, Chapter 6 describes the special challenges of budgeting in multinational companies while Chapter 23 discusses the challenges of evaluating the performance of divisions located in different countries. Chapter 22 examines the importance of transfer pricing in minimizing the tax burden faced by multinational companies. The Concepts in Action for Chapter 16 explains the importance of joint-cost allocation in creating a trade war between poultry farms in the United States and South Africa. Several new examples of management accounting applications in companies are drawn from international settings.

Increased Focus on Merchandising and Service Sectors

In keeping with the shifts in the U.S. and world economy, this edition makes great use of merchandising and service sector examples, with corresponding de-emphasis of traditional manufacturing settings. For example, Chapter 10 illustrates linear cost functions in the context of payments for cloud computing services. Chapter 20 highlights inventory management in retail organizations and uses an example based on a seller of sunglasses. Chapter 21 incorporates a running example that looks at capital budgeting in the context of a transportation company. Several Concepts in Action boxes focus on the merchandising and service sectors, including achieving cost leadership at Trader Joe's (Chapter 1), using activity-based costing to reduce the costs of health care delivery at the Mayo Clinic (Chapter 5), reducing fixed costs at Twitter (Chapter 2), and analyzing operating income performance at Best Buy (Chapter 12) and web-based budgeting at 24 Hour Fitness (Chapter 6).

Greater Emphasis on Sustainability

This edition places significant emphasis on sustainability as one of the critical managerial challenges of the coming decades. Many managers are promoting the development and implementation of strategies to achieve long-term financial, social, and environmental performance as key imperatives. We highlight this in Chapter 1 and return to the theme in several

subsequent chapters. Chapter 12 discusses the benefits to companies from measuring social and environmental performance and how such measures can be incorporated in a balanced scorecard. Chapter 23 provides several examples of companies that mandate disclosures and evaluate managers on environmental and social metrics. A variety of chapters, including Chapters 2, 4, 6, 10, 13, 15, and 21, contain material that stress themes of recognizing and accounting for environmental costs, energy independence and the smart grid, setting stretch targets to motivate greater carbon reductions, using cost analysis, carbon tax, and cap-and-trade auctions to reduce environmental footprints, and constructing "green" homes in a cost-effective manner.

Focus on Innovation

We discuss the role of accounting concepts and systems in fostering and supporting innovation and entrepreneurial activities in firms. In particular, we discuss the challenges posed by recognizing R&D costs as period expenses even though the benefits of innovation accrue in later periods. In Chapter 6, we describe how companies budget for innovation expenses and develop measures to monitor success of the innovation efforts delinked from operational performance in the current period. Chapter 11 presents the importance of nonfinancial measures when making decisions about innovation. Chapter 13 stresses that innovation starts with understanding customer needs while Chapter 19 discusses process innovations for improving quality.

New Cutting-Edge Topics

The pace of change in organizations continues to be rapid. The sixteenth edition of *Cost Accounting* reflects changes occurring in the role of cost accounting in organizations.

- We have introduced sustainability strategies and the methods companies use to implement sustainability and business goals.
- We describe ideas based on academic research regarding the weights to be placed on performance measures in a balanced scorecard. We have also added a new section on methods to evaluate strategy maps such as the strength of links, differentiators, focal points, and trigger points.
- We have provided details on the transfer pricing strategies used by multinational technology firms such as Apple and Google to minimize income taxes.
- We discuss current trends in the regulation of executive compensation.
- We describe the evolution of enterprise resource planning systems and newer simplified costing systems that practice lean accounting.
- We have added new material around recent trends in big data and data analytics in predicting costs and when making demand forecasts.

Opening Vignettes

Each chapter opens with a vignette on a real company situation. The vignettes engage the reader in a business situation or dilemma, illustrating why and how the concepts in the chapter are relevant in business. For example, Chapter 2 describes how surf wear company Quiksilver was driven into bankruptcy by the relatively high proportion of fixed costs in its operations. Chapter 5 explains the use of activity-based costing by General Motors to evaluate its suppliers. Chapter 9 highlights the use of lean manufacturing by Boeing to work through its backlog of orders and reduce its inventory costs. Chapter 14 shows how Delta made changes to its frequent flyer program to reward its most profitable customers, who drive a disproportionate share of Delta's revenues. Chapter 18 shows the impact on Honda of the rework costs associated with recalling millions of cars with defective airbags. Chapter 23 describes the misalignment between performance measurement and pay at Viacom, whose CEO has since been forced to step down.

Concepts in Action Boxes

Found in every chapter, these boxes cover real-world cost accounting issues across a variety of industries, including defense contracting, entertainment, manufacturing, retailing, and sports. New examples include:

- Cost–Volume–Profit Analysis Makes Subway's $5 Foot-Long Sandwiches a Success but Innovation Challenges Loom (Chapter 3)
- Can Chipotle Wrap Up Its Materials-Cost Variance Increases? (Chapter 7)
- H&M Uses Target Pricing to Bring Fast Fashion to Stores Worldwide (Chapter 13)
- Amazon Prime and Customer Profitability (Chapter 14)
- Hybrid Costing for Under Armour 3D Printed Shoes (Chapter 17)
- Netflix Works to Overcome Internet Bottlenecks (Chapter 19)

Streamlined Presentation

We continue to try to simplify and streamline our presentation of various topics to make it as easy as possible for students to learn the concepts, tools, and frameworks introduced in different chapters. We received positive feedback for the reorganization of Chapters 12 through 16 in the fifteenth edition and have maintained that order in the sixteenth edition. Chapter 13 is the first of four chapters on cost allocation. We introduce the purposes of cost allocation in Chapter 13 and discuss cost allocation for long-run product costing and pricing. Continuing the same example, Chapter 14 discusses cost allocation for customer costing. Chapter 15 builds on the Chapter 4 example to discuss cost allocation for support departments. Chapter 16 discusses joint cost allocation.

Other examples of streamlined presentations can be found in:

- Chapter 2 on the discussion of fundamental cost concepts and the managerial framework for decision making.
- Chapter 6, where the appendix ties the cash budget to the chapter example.
- Chapter 8, which has a comprehensive chart that lays out all of the variances described in Chapters 7 and 8.
- Chapter 9, which uses a single two-period example to illustrate the impact of various inventory-costing methods and denominator level choices.

Try It! Examples

Found throughout the chapter, Try It! interactive questions give students the opportunity to apply the concept they just learned. Linking in the eText will allow students to practice in MyAccountingLab© without interrupting their interaction with the eText.

Becker Multiple-Choice Questions

Sample problems, assignable in MyAccountingLab, provide an introduction to the CPA Exam format and an opportunity for early practice with CPA exam style questions.

Selected Chapter-by-Chapter Content Changes

Thank you for your continued support of Cost Accounting. In every new edition, we strive to update this text thoroughly. To ease your transition from the fifteenth edition, here are selected highlights of chapter changes for the sixteenth edition.

Chapter 1 has been rewritten to include greater discussion of sustainability and innovation and why these issues have become increasingly critical for managers. We discuss the challenges of planning and control for innovation and sustainability and how companies use these systems to manage these activities. We continue to emphasize the importance of ethics, values, and behaviors in improving the quality of financial reporting.

Chapter 2 has been updated and revised to make it easier for students to understand core cost concepts and to provide a framework for how cost accounting and cost management help

managers make decisions. We have added more material on environmental costs to explain how and why these costs may be missed in costing systems even though they are a part of product costs. We discuss the challenges of accounting for R&D costs and the implications for innovation.

Chapter 3 now includes greater managerial content, using examples from real companies to illustrate the value of cost–volume–profit analysis in managerial decision making. We have rewritten the section on CVP analysis in service and not-for-profit companies using the context of a management consulting firm. Chapter 4 has been revised to discuss the creation of cost pools, the level of fixed costs in a seasonal business, and the need to adjust normal costs to actual costs using end-of-accounting-year adjustments. The chapter also develops the criteria for allocating costs and relates them to real examples to highlight why managers need allocated cost information to make decisions.

Chapter 5 adds more discussion of product undercosting and overcosting and refining a costing system. The chapter example has been changed to add new material on time-driven activity-based costing (TDABC) compared to driver-rate activity-based costing. We integrate the discussion of behavioral considerations in implementing activity-based costing with the technical material in the chapter.

Chapter 6 presents material on the mismatch between costs incurred for breakthrough innovations in the annual budget and the revenues earned in that year. The chapter describes ways to delink innovation from current year operational performance by developing measures to monitor the success of innovation efforts. The chapter discusses how stretch targets motivate greater carbon reductions. We also elaborate on tradeoffs managers must make when choosing different organization structures.

In Chapter 7, the appendix on mix and yield variances, which used a one-off example, has now been recast using the same running example that winds its way through both Chapters 7 and 8. Chapter 8 provides a revised comprehensive summary of the variances in both Chapters 7 and 8 via an innovative exhibit.

Chapter 9 retains the simplified two-period integrated example of capacity choice. There is greater emphasis now on linking the impact of the choice of capacity concept to recent changes in financial reporting and tax requirements.

Chapter 10 provides an expanded description of big data and the reasons behind the explosion in data availability and analytics today. It also incorporates several examples of how companies are gathering and using large quantities of data to make better decisions.

Chapter 11 has been revised to emphasize nonfinancial factors in decisions, particularly in environmental and innovation decisions. The chapter explicitly considers how relevant cost analysis is distinct from the absorption costing method of preparing financial statements under Generally Accepted Accounting Principles (GAAP). The focus is on identifying and understanding why relevant costs and relevant revenues are important when making decisions.

Chapter 12 introduces a completely new section around evaluating strategy maps by identifying strong and weak links, differentiators, focal points, and trigger points. There is a new exhibit to present these concepts. The chapter also ties the Chipset strategy decision to the general discussion of strategy.

The new Chapter 13 makes significant revisions to the sections on target pricing and target costing, cost-plus pricing, and life-cycle budgeting. The chapter presents new material on carbon tax, cap-and-trade auctions, and the Sustainability Accounting Standards Board (SASB). New examples have been added when discussing predatory pricing, dumping, and collusive pricing.

Chapter 14 was completely rewritten in the fifteenth edition. The current revision makes a number of changes to improve the clarity of the writing and to motivate different concepts. The section on cost-hierarchy-based operating income has been rewritten and the section on fully allocated customer profitability has been streamlined.

Chapter 15 was also heavily revised in the fifteenth edition. The current revision makes several significant changes to clarify concepts and improve exposition. The sections on single-rate and dual-rate methods, budgeted versus actual costs, and the choice of allocation bases have all been substantially rewritten. The Concepts in Action box uses updated federal cases on contract disputes centered around cost allocation.

Chapter 16 provides a discussion of the rationale for joint-cost allocation and the merits and demerits of various joint-cost allocation methods. It includes a new opening vignette and a new real-world example to highlight the controversies that can result from using inappropriate methods of joint-cost allocation.

Chapters 17 and 18 provide a managerial lens on the estimation of equivalent units and the choice between the FIFO and weighted-average costing methods, both in the chapter content and in the new vignettes and real-world examples. The exhibits have been reformatted to make clear how various components are added to get the total costs. Chapter 18 emphasizes, with illustrative examples, the theme of striving for zero waste and a sustainable environment.

Chapter 19 focuses on quality and time. The sections on control charts, weighing the costs and benefits of improving quality, and evaluating a company's quality performance have been rewritten. This revision also makes major changes to and reorganizes the section on bottlenecks and time drivers.

Chapter 20 emphasizes the importance of choosing the correct products to sell, deeply understanding customers, and pricing smartly as ways to manage inventory. It discusses the role of big data and better demand forecasts in reducing demand uncertainty and safety stocks and in implementing materials requirements planning (MRP) systems. The section on the cost of a prediction error has been revised to link to Exhibit 20-1. The section on lean accounting has been rewritten and simplified.

Chapter 21 focuses on the role of capital budgeting in supporting the choice of sustainable long-term projects. The new opening vignette looks at the financing of residential solar panels, the integrated example deals with the purchase of a new hybrid-engine bus, and various examples throughout the chapter and in the new Concepts in Action illustrate how companies incorporate sustainability in their capital budgeting decisions.

Chapter 22 has been revised to reflect the most recent developments in the controversial use of transfer prices for tax minimization by multinational corporations, with several real-world examples. The revision also highlights the changing regulatory environment across the world and provides updated information on the use of tools such as advance pricing agreements.

Chapter 23 describes the use of environmental, social, and ethical objectives by companies as part of top management's pay structures, with new examples of companies that embed sustainability targets into compensation systems. It discusses the latest SEC regulations on disclosure of executive compensation and the impact of Dodd-Frank "say on pay" rules.

Hallmark Features of *Cost Accounting*

- Exceptionally strong emphasis on managerial uses of cost information
- Clarity and understandability of the text
- Excellent balance in integrating modern topics with traditional coverage
- Emphasis on human behavior aspects
- Extensive use of real-world examples
- Ability to teach chapters in different sequences
- Excellent quantity, quality, and range of assignment material

The first thirteen chapters provide the essence of a one-term (quarter or semester) course. There is ample text and assignment material in the book's twenty-three 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. Because every instructor has a unique way of organizing his or her course, we utilize 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 Chapter 4 to Chapter 17 without interruption in the flow of material. Other instructors may want their students to delve into activity-based costing and budgeting and more decision-oriented topics early in the course. These instructors may prefer to postpone discussion of process costing.

Resources

In addition to this textbook and MyAccountingLab, a companion website is available for students at www.pearsonhighered.com/horngren.

The following resources are available for instructors in MyAccountingLab and on the Instructors Resource Center at www.pearsonhighered.com/horngren.

- Solutions Manual
- Test Bank in Word and TestGen, including algorithmic questions
- Instructors Manual
- PowerPoint Presentations
- Image Library

Acknowledgments

We are indebted to many people 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 materials we present is the work of skillful and valued team members developing some excellent end-of-chapter assignment material. Tommy Goodwin provided outstanding research assistance on technical issues and current developments. We would also like to thank the dedicated and hard-working supplement author team and Integra. The book is much better because of the efforts of these colleagues.

In shaping this edition and past editions we would like to thank all the reviewers and colleagues who have worked closely with us and the editorial team.

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Srikant M. Datar
Madhav V. Rajan

In memory of Charles T. Horngren 1926–2011

Chuck Horngren revolutionized cost and management accounting. He loved new ideas and introduced many new concepts. He had the unique gift of explaining these concepts in simple and creative ways. He epitomized excellence and never tired of details, whether it was finding exactly the right word or working and reworking assignment materials.

He combined his great intellect with genuine humility and warmth and a human touch that inspired others to do their best. He taught us many lessons about life through his amazing discipline, his ability to make everyone feel welcome, and his love of family.

It was a great privilege, pleasure, and honor to have known Chuck Horngren. Few individuals will have the enormous influence that Chuck had on the accounting profession. Fewer still will be able to do it with the class and style that was his hallmark. He was unique, special, and amazing in many, many ways and, at once, a role model, teacher, mentor, and friend. He will be deeply missed.

Srikant M. Datar
Harvard University

Madhav V. Rajan
Stanford University

To Our Families

Swati, Radhika, Gayatri, Sidharth (SD)

Gayathri, Sanjana, Anupama (MVR)

The Manager and Management Accounting

1

All businesses are concerned about revenues and costs.

Managers at companies small and large must understand how revenues and costs behave or risk losing control of the performance of their firms. Managers use cost accounting information to make decisions about research and development, production planning, budgeting, pricing, and the products or services to offer customers. Sometimes these decisions involve tradeoffs. The following article shows how understanding costs and pricing helps companies like Coca-Cola increase profits even as the quantity of products sold decreases.

FOR COCA-COLA, SMALLER SIZES MEAN BIGGER PROFITS

Can selling less of something be more profitable than selling more of it? As consumers become more health conscious, they are buying less soda. "Don't want to drink too much?" Get a smaller can. "Don't want so many calories?" Buy a smaller can. "Don't want so much sugar?" Just drink a smaller can. In 2015, while overall sales of soda in the United States declined in terms of volume, industry revenue was higher. How, you ask? Soda companies are charging more for less!

Coca-Cola has been the market leader in selling smaller sizes of soda to consumers. Sales of smaller packages of Coca-Cola—including 8-packs of 12-ounce bottles and 7.5-ounce cans—rose 15% in 2015. Meanwhile, sales of larger bottles and cans fell. The price per ounce of Coke sold in smaller cans is higher than the price per ounce of Coke sold in bulk. The resulting higher profits from the sales of smaller sizes of soda made up for the decrease in total volume of soda sold. If these trends toward buying smaller cans continue, Coca-Cola will be selling less soda, but making more money, for years to come.

By studying cost accounting, you will learn how successful managers and accountants run their businesses and prepare yourself for leadership roles in the firms you work for. Many large companies, including Nike and the Pittsburgh Steelers, have senior executives with accounting backgrounds.

urbanbuzz/Alamy Stock Photo

Sources: Mike Esterl, "Smaller Sizes Add Pop to Soda Sales," *The Wall Street Journal*, January 27, 2016 (http://www.wsj.com/articles/smaller-sizes-add-pop-to-soda-sales-1453890601); Trefis, "How Coke Is Making the Most Out of Falling Soda Volumes," January 5, 2016 (http://www.trefis.com/stock/ko/articles/327882/how-coke-is-making-the-most-out-of-falling-soda-volumes/2016-01-05).

LEARNING OBJECTIVES

1. Distinguish financial accounting from management accounting
2. Understand how management accountants help firms make strategic decisions
3. Describe the set of business functions in the value chain and identify the dimensions of performance that customers are expecting of companies
4. Explain the five-step decision-making process and its role in management accounting
5. Describe three guidelines management accountants follow in supporting managers
6. Understand how management accounting fits into an organization's structure
7. Understand what professional ethics mean to management accountants

Financial Accounting, Management Accounting, and Cost Accounting

LEARNING OBJECTIVE 1

Distinguish financial accounting

...reporting on past performance to external users

from management accounting

...helping managers make decisions

As many of you have already learned in your financial accounting class, accounting systems are used to record economic events and transactions, such as sales and materials purchases, and process the data into information helpful to managers, sales representatives, production supervisors, and others. Processing any economic transaction means collecting, categorizing, summarizing, and analyzing. For example, costs are collected by category, such as materials, labor, and shipping. These costs are then summarized to determine a firm's total costs by month, quarter, or year. Accountants analyze the results and together with managers evaluate, say, how costs have changed relative to revenues from one period to the next. Accounting systems also provide the information found in a firm's income statement, balance sheet, statement of cash flow, and performance reports, such as the cost of serving customers or running an advertising campaign. Managers use this information to make decisions about the activities, businesses, or functional areas they oversee. For example, a report that shows an increase in sales of laptops and iPads at an Apple store may prompt Apple to hire more salespeople at that location. Understanding accounting information is essential for managers to do their jobs.

Individual managers often require the information in an accounting system to be presented or reported differently. Consider, for example, sales order information. A sales manager at Porsche may be interested in the total dollar amount of sales to determine the commissions paid to salespeople. A distribution manager at Porsche may be interested in the sales order quantities by geographic region and by customer-requested delivery dates to ensure vehicles get delivered to customers on time. A manufacturing manager at Porsche may be interested in the quantities of various products and their desired delivery dates so that he or she can develop an effective production schedule.

To simultaneously serve the needs of all three managers, Porsche creates a database, sometimes called a data warehouse or infobarn, consisting of small, detailed bits of information that can be used for multiple purposes. For instance, the sales order database will contain detailed information about a product, its selling price, quantity ordered, and delivery details (place and date) for each sales order. The database stores information in a way that allows different managers to access the information they need. Many companies are building their own enterprise resource planning (ERP) systems. An ERP system is a single database that collects data and feeds them into applications that support a company's business activities, such as purchasing, production, distribution, and sales.

Financial accounting and management accounting have different goals. As you know, **financial accounting** focuses on reporting financial information to external parties such as investors, government agencies, banks, and suppliers based on Generally Accepted Accounting Principles (GAAP). The most important way financial accounting information affects managers' decisions and actions is through compensation, which is often, in part, based on numbers in financial statements.

Management accounting is the process of measuring, analyzing, and reporting financial and nonfinancial information that helps managers make decisions to fulfill the goals of an organization. Managers use management accounting information to:

1. develop, communicate, and implement strategies,
2. coordinate product design, production, and marketing decisions and evaluate a company's performance.

Management accounting information and reports do not have to follow set principles or rules. The key questions are always (1) how will this information help managers do their jobs better, and (2) do the benefits of producing this information exceed the costs?

Exhibit 1-1 summarizes the major differences between management accounting and financial accounting. Note, however, that reports such as balance sheets, income statements, and statements of cash flows are common to both management accounting and financial accounting.

Cost accounting provides information for both management accounting and financial accounting professionals. **Cost accounting** is the process of measuring, analyzing, and reporting financial and nonfinancial information related to the costs of acquiring or using

EXHIBIT 1-1 Major Differences Between Management and Financial Accounting

	Management Accounting	Financial Accounting
Purpose of information	Help managers make decisions to fulfill an organization's goals	Communicate an organization's financial position to investors, banks, regulators, and other outside parties
Primary users	Managers of the organization	External users such as investors, banks, regulators, and suppliers
Focus and emphasis	Future-oriented (budget for 2017 prepared in 2016)	Past-oriented (reports on 2016 performance prepared in 2017)
Rules of measurement and reporting	Internal measures and reports do not have to follow GAAP but are based on cost-benefit analyses	Financial statements must be prepared in accordance with GAAP and be certified by external, independent auditors
Time span and type of reports	Varies from hourly information to 15 to 20 years, with financial and nonfinancial reports on products, departments, territories, and strategies	Annual and quarterly financial reports, primarily on the company as a whole
Behavioral implications	Designed to influence the behavior of managers and other employees	Primarily reports economic events but also influences behavior because manager's compensation is often based on reported financial results

resources in an organization. For example, calculating the cost of a product is a cost accounting function that meets both the financial accountant's inventory-valuation needs and the management accountant's decision-making needs (such as deciding how to price products and choosing which products to promote). However, today most accounting professionals take the perspective that cost information is part of the management accounting information collected to make management decisions. Thus, the distinction between management accounting and cost accounting is not so clear-cut, and we often use these terms interchangeably in the book.

Businesspeople frequently use the term *cost management*. Unfortunately, the term does not have an exact definition. In this book we use **cost management** to describe the activities managers undertake to use resources in a way that increases a product's value to customers and achieves an organization's goals. In other words, cost management is not only about reducing costs. Cost management also includes making decisions to incur additional costs—for example, to improve customer satisfaction and quality and to develop new products—with the goal of enhancing revenues and profits. Whether or not to enter new markets, implement new organizational processes, and change product designs are also cost management decisions. Information from accounting systems helps managers to manage costs, but the information and the accounting systems themselves are not cost management.

DECISION POINT

How is financial accounting different from management accounting?

LEARNING OBJECTIVE 2

Understand how management accountants help firms make strategic decisions

...they provide information about the sources of competitive advantage

Strategic Decisions and the Management Accountant

A company's **strategy** specifies how the organization matches its own capabilities with the opportunities in the marketplace. In other words, strategy describes how an organization creates value for its customers while distinguishing itself from its competitors. Businesses follow one of two broad strategies. Some companies, such as Southwest

Airlines and Vanguard (the mutual fund company), follow a cost leadership strategy. They profit and grow by providing quality products or services at low prices and by judiciously managing their costs. Other companies such as Apple and the pharmaceutical giant Johnson & Johnson follow a product differentiation strategy. They generate profits and growth by offering differentiated or unique products or services that appeal to their customers and are often priced higher than the less-popular products or services of their competitors.

Deciding between these strategies is a critical part of what managers do. Management accountants work closely with managers in various departments to formulate strategies by providing information about the sources of competitive advantage, such as (1) the company's cost, productivity, or efficiency advantage relative to competitors or (2) the premium prices a company can charge over its costs from distinctive product or service features. **Strategic cost management** describes cost management that specifically focuses on strategic issues.

Management accounting information helps managers formulate strategy by answering questions such as the following:

- *Who are our most important customers, and what critical capability do we have to be competitive and deliver value to our customers?* After Amazon.com's success selling books online, management accountants at Barnes & Noble outlined the costs and benefits of several alternative approaches for enhancing the company's information technology infrastructure and developing the capability to sell books online. A similar cost–benefit analysis led Toyota to build flexible computer-integrated manufacturing plants that enable it to use the same equipment efficiently to produce a variety of cars in response to changing customer tastes.
- *What is the bargaining power of our customers?* Kellogg Company, for example, uses the reputation of its brand to reduce the bargaining power of its customers and charge higher prices for its cereals.
- *What is the bargaining power of our suppliers?* Management accountants at Dell Computers consider the significant bargaining power of Intel, its supplier of microprocessors, and Microsoft, its supplier of operating system software, when considering how much it must pay to acquire these products.
- *What substitute products exist in the marketplace, and how do they differ from our product in terms of features, price, cost, and quality?* Hewlett-Packard, for example, designs, costs, and prices new printers after comparing the functionality and quality of its printers to other printers available in the marketplace.
- *Will adequate cash be available to fund the strategy, or will additional funds need to be raised?* Procter & Gamble, for example, issued new debt and equity to fund its strategic acquisition of Gillette, a maker of shaving products.

DECISION POINT

How do management accountants support strategic decisions?

The best-designed strategies and the best-developed capabilities are useless unless they are effectively executed. In the next section, we describe how management accountants help managers take actions that create value for their customers.

LEARNING OBJECTIVE 3

Describe the set of business functions in the value chain and identify the dimensions of performance that customers are expecting of companies

. . . R&D, design, production, marketing, distribution, and customer service supported by administration to achieve cost and efficiency, quality, time, and innovation

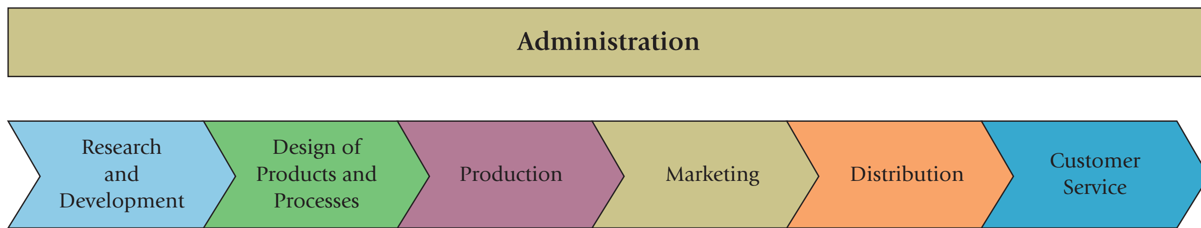
Value-Chain and Supply-Chain Analysis and Key Success Factors

Customers demand much more than just a fair price; they expect quality products (goods or services) delivered in a timely way. The entire customer experience determines the value a customer derives from a product. In this section, we explore how a company goes about creating this value.

Value-Chain Analysis

The **value chain** is the sequence of business functions by which a product is made progressively more useful to customers. Exhibit 1-2 shows six primary business functions: research

EXHIBIT 1-2 Different Parts of the Value Chain



and development (R&D), design of products and processes, production, marketing, distribution, and customer service. We illustrate these business functions with Sony Corporation's television division.

1. **Research and development (R&D)**—generating and experimenting with ideas related to new products, services, or processes. At Sony, this function includes research on alternative television signal transmission and on the picture quality of different shapes and thicknesses of television screens.
2. **Design of products and processes**—detailed planning, engineering, and testing of products and processes. Design at Sony includes deciding on the component parts in a television set and determining the effect alternative product designs will have on the set's quality and manufacturing costs. Some representations of the value chain collectively refer to the first two steps as technology development.[1]
3. **Production**—procuring, transporting, and storing ("inbound logistics") and coordinating and assembling ("operations") resources to produce a product or deliver a service. The production of a Sony television set includes the procurement and assembly of the electronic parts, the screen and the packaging used for shipping.
4. **Marketing (including sales)**—promoting and selling products or services to customers or prospective customers. Sony markets its televisions at tradeshows, via advertisements in newspapers and magazines, on the Internet, and through its sales force.
5. **Distribution**—processing orders and shipping products or services to customers ("outbound logistics"). Distribution for Sony includes shipping to retail outlets, catalog vendors, direct sales via the Internet, and other channels through which customers purchase new televisions.
6. **Customer service**—providing after-sales service to customers. Sony provides customer service on its televisions in the form of customer-help telephone lines, support on the Internet, and warranty repair work.

In addition to the six primary business functions, Exhibit 1-2 shows an administration function, which includes accounting and finance, human resource management, and information technology and supports the six primary business functions. When discussing the value chain in subsequent chapters of the book, we include the administration function within the primary functions. For example, included in the marketing function is the function of analyzing, reporting, and accounting for resources spent in different marketing channels, whereas the production function includes the human resource management function of training frontline workers. Each of these business functions is essential to companies satisfying their customers and keeping them satisfied (and loyal) over time.

To implement their corporate strategies, companies such as Sony and Procter & Gamble use **customer relationship management (CRM)**, a strategy that integrates people and technology in all business functions to deepen relationships with customers, partners, and distributors. CRM initiatives use technology to coordinate all customer-facing activities (such

[1] M. Porter, *Competitive Advantage* (New York: Free Press, 1998).

as marketing, sales calls, distribution, and after-sales support) and the design and production activities necessary to get products to customers.

Different companies create value in different ways. Lowe's (the home-improvement retailer) does so by focusing on cost and efficiency. Toyota Motor Company does so by focusing on quality. Fast response times at eBay create quality experiences for the online auction giant's customers, whereas innovation is primarily what creates value for the customers of the biotech company Roche. The Italian apparel company Gucci creates value for its customers through the prestige of its brand. As a result, at different times and in different industries, one or more of the value-chain functions are more critical than others. For example, a company such as Roche emphasizes R&D and the design of products and processes. In contrast, a company such as Gucci focuses on marketing, distribution, and customer service to build its brand.

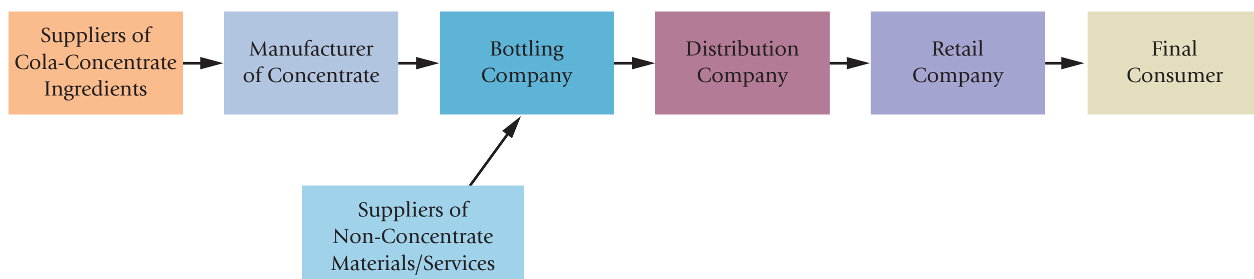
Exhibit 1-2 depicts the usual order in which different business-function activities physically occur. Do not, however, interpret Exhibit 1-2 to mean that managers should proceed sequentially through the value chain when planning and managing their activities. Companies gain (in terms of cost, quality, and the speed with which new products are developed) if two or more of the individual business functions of the value chain work concurrently as a team. For example, a company's production, marketing, distribution, and customer service personnel can often reduce a company's total costs by providing input for design decisions.

Managers track costs incurred in each value-chain category. Their goal is to reduce costs to improve efficiency or to spend more money to generate even greater revenues. Management accounting information helps managers make cost–benefit tradeoffs. For example, is it cheaper to buy products from a vendor or produce them in-house? How does investing resources in design and manufacturing increase revenues or reduce costs of marketing and customer service?

Supply-Chain Analysis

The parts of the value chain associated with producing and delivering a product or service—production and distribution—are referred to as the *supply chain*. The **supply chain** describes the flow of goods, services, and information from the initial sources of materials and services to the delivery of products to consumers, regardless of whether those activities occur in one organization or in multiple organizations. Consider Coke and Pepsi: Many companies play a role in bringing these products to consumers as the supply chain in Exhibit 1-3 shows. Part of cost management emphasizes integrating and coordinating activities across all companies in the supply chain to improve performance and reduce costs. For example, to reduce materials-handling costs, both the Coca-Cola Company and Pepsi Bottling Group require their suppliers (such as plastic and aluminum companies and sugar refiners) to frequently deliver small quantities of materials directly to their production floors. Similarly, to reduce inventory levels in the supply chain, Walmart requires its suppliers, such as Coca-Cola, to directly manage its inventory of products to ensure the right amount of them are in its stores at all times.

EXHIBIT 1-3 Supply Chain for a Cola Bottling Company



Key Success Factors

Customers want companies to use the value chain and supply chain to deliver ever-improving levels of performance when it comes to several (or even all) of the following:

- **Cost and efficiency**—Companies face continuous pressure to reduce the cost of the products they sell. To calculate and manage the cost of products, managers must first understand the activities (such as setting up machines or distributing products) that cause costs to arise as well as monitor the marketplace to determine the prices customers are willing to pay for the products. Management accounting information helps managers calculate a target cost for a product by subtracting from the "target price" the operating income per unit of product that the company wants to earn. To achieve the target cost, managers eliminate some activities (such as rework) and reduce the costs of performing other activities in all value-chain functions—from initial R&D to customer service (see Concepts in Action: Trader Joe's Recipe for Cost Leadership). Many U.S. companies have cut costs by outsourcing some of their business functions. Nike, for example, has moved its manufacturing operations to China and Mexico, and Microsoft and IBM are increasingly doing their software development in Spain, Eastern Europe, and India.
- **Quality**—Customers expect high levels of quality. **Total quality management (TQM)** is an integrative philosophy of management for continuously improving the quality of products and processes. Managers who implement TQM believe that every person in the value chain is responsible for delivering products and services that exceed customers' expectations. Using TQM, companies design products or services to meet customer needs and wants, to make these products with zero (or very few) defects and waste, and to minimize inventories. Managers use management accounting information to evaluate the costs and revenue benefits of TQM initiatives.
- **Time**—Time has many dimensions. Two of the most important dimensions are new-product development time and customer-response time. New-product development time is the time it takes for companies to create new products and bring them to market. The increasing pace of technological innovation has led to shorter product life cycles and more rapid introduction of new products. To make new-product development decisions, managers need to understand the costs and benefits of a product over its life cycle, including the time and cost of developing new products.

  Customer-response time describes the speed at which an organization responds to customer requests. To increase the satisfaction of their customers, organizations need to meet their promised delivery dates as well as reduce their delivery times. Bottlenecks are the primary cause of delays. For example, a bottleneck can occur when the work to be performed on a machine exceeds its available capacity. To deliver the product on time, managers need to increase the capacity of the machine to produce more output. Management accounting information can help managers quantify the costs and benefits of doing so.
- **Innovation**—A constant flow of innovative products or services is the basis for the ongoing success of a company. Many companies innovate in their strategies, business models, the services they provide, and the way they market, sell, and distribute their products. Managers rely on management accounting information to evaluate alternative R&D and investment decisions and the costs and benefits of implementing innovative business models, services, and marketing plans.
- **Sustainability**—Companies are increasingly applying the key success factors of cost and efficiency, quality, time, and innovation to promote **sustainability**—the development and implementation of strategies to achieve long-term financial, social, and environmental goals. The sustainability efforts of the Japanese copier company Ricoh include energy conservation, resource conservation, product recycling, and pollution prevention. By designing products that can be easily recycled, Ricoh simultaneously improves sustainability and the cost and quality of its products.

CONCEPTS IN ACTION

Trader Joe's Recipe for Cost Leadership

BirchTree/Alamy Stock Photo

Trader Joe's has a special recipe for cost leadership: delivering unique products at reasonable prices. The grocery store chain stocks its shelves with low-cost, high-end staples (cage-free eggs and sustainably harvested seafood) and affordable luxuries (Speculoos cookie butter and Sriracha and roasted garlic BBQ sauce) that are distinct from what traditional supermarkets offer. Trader Joe's can offer these items at everyday low prices by judiciously managing its costs.

At Trader Joe's, customers swap selection for value. The company has relatively small stores with a carefully selected, constantly changing mix of items. While typical grocery stores carry 50,000 items, Trader Joe's sells only about 4,000 items. In recent years, it removed nonsustainable items from its shelves, including genetically modified items. About 80% of the stock bears the Trader Joe's brand, and management seeks to minimize costs of these items. The company purchases directly from manufacturers, which ship their items straight to Trader Joe's warehouses to avoid third-party distribution costs. With small stores and limited storage space, Trader Joe's trucks leave the warehouse centers daily. This encourages precise, just-in-time ordering and a relentless focus on frequent merchandise turnover.

This winning combination of quality products and low prices has turned Trader Joe's into one of the hottest retailers in the United States. Its stores sell an estimated $13 billion annually, or $1,734 in merchandise per square foot, which is nearly double Whole Foods, its top competitor.

Sources: Beth Kowitt, "Inside the Secret World of Trader Joe's," *Fortune*, August 23, 2010 (http://archive.fortune.com/2010/08/20/news/companies/inside_trader_joes_full_version.fortune/index.htm); Christopher Palmeri, "Trader Joe's Recipe for Success," *Bloomberg Businessweek*, February 21, 2008 (http://www.bloomberg.com/bw/stories/2008-02-20/trader-joes-recipe-for-success); Allessandra Ran, "Teach Us, Trader Joe: Demanding Socially Responsible Food," *The Atlantic*, August 7, 2012 (http://www.theatlantic.com/health/archive/2012/08/teach-us-trader-joe-demanding-socially-responsible-food/260786/); Aaron Ahlburn and Keisha McDonnough, "Retail ShopTopic," *Retail Research*, September 2014, Jones Lang LaSalle, Inc. (http://www.us.jll.com/united-states/en-us/Research/JLL-ShopTopic-Grocery-share.pdf); "Trader Joe's Customer Choice Award Winners," Trader Joe's Co. press release, Monrovia, CA: January 4, 2016 (http://www.traderjoes.com/digin/post/trader-joes-customer-choice-award-winners).

The interest in sustainability appears to be intensifying among companies. General Electric, Poland Springs (a bottled-water manufacturer), and Hewlett-Packard are among the many companies incorporating sustainability into their decision making. Sustainability is important to these companies for several reasons:

- More and more investors care about sustainability. These investors make investment decisions based on a company's financial, social, and environmental performance and raise questions about sustainability at shareholder meetings.
- Companies that emphasize sustainability find that sustainability goals attract and inspire employees.
- Customers prefer the products of companies with good sustainability records and boycott companies with poor sustainability records.
- Society and activist nongovernmental organizations, in particular, monitor the sustainability performance of firms and take legal action against those that violate environmental laws. Countries with fast-growing economies, such as China and India, are now either requiring or encouraging companies to develop and report on their sustainability initiatives.

DECISION POINT

How do companies add value, and what are the dimensions of performance that customers are expecting of companies?

Management accountants help managers track the key success factors of their firms as well as those of their competitors. Competitive information serves as a *benchmark* managers use to continuously improve their operations. Examples of continuous improvement include Southwest Airlines' efforts to increase the number of its flights that arrive on time, eBay's efforts to improve the access its customers have to online auctions, and Lowe's efforts to

continuously reduce the cost of its home-improvement products. Sometimes, more fundamental changes and innovations in operations, such as redesigning a manufacturing process to reduce costs, may be necessary. To successfully implement their strategies, firms have to do more than analyze their value chains and supply chains and execute key success factors. They also have to have good decision-making processes.

Decision Making, Planning, and Control: The Five-Step Decision-Making Process

LEARNING OBJECTIVE 4

Explain the five-step decision-making process

. . . identify the problem and uncertainties; obtain information; make predictions about the future; make decisions by choosing among alternatives; implement the decision, evaluate performance, and learn

and its role in management accounting

. . . planning and control of operations and activities

We illustrate a five-step decision-making process using the example of the *Daily News*, a newspaper in Boulder, Colorado. Subsequent chapters of the book describe how managers use this five-step decision-making process to make many different types of decisions.

The *Daily News* differentiates itself from its competitors by using (1) highly respected journalists who write well-researched news articles, (2) color to enhance attractiveness to readers and advertisers, and (3) a Web site that delivers up-to-the-minute news, interviews, and analyses. The newspaper has the following resources to deliver on this strategy: an automated, computer-integrated, state-of-the-art printing facility; a Web-based information technology infrastructure; and a distribution network that is one of the best in the newspaper industry.

To keep up with steadily increasing production costs, Naomi Crawford, manager of the *Daily News*, needs to increase the company's revenues in 2017. As she ponders what she should do in early 2017, Naomi works through the five-step decision-making process.

1. **Identify the problem and uncertainties.** Naomi has two main choices:

   a. increase the selling price of the newspaper or
   b. increase the rate per page charged to advertisers.

   The key uncertainty is the effect any increase in prices or rates will have on demand. A decrease in demand could offset the price or rate increases and lead to lower rather than higher revenues. These decisions would take effect in March 2017.

2. **Obtain information.** Gathering information before making a decision helps managers gain a better understanding of uncertainties. Naomi asks her marketing manager to talk to some representative readers to gauge their reaction to an increase in the newspaper's selling price. She asks her advertising sales manager to talk to current and potential advertisers to assess demand for advertising. She also reviews the effect that past increases in the price of the newspaper had on readership. Ramon Sandoval, management accountant at the *Daily News*, presents information about the effect of past increases or decreases in advertising rates on advertising revenues. He also collects and analyzes information on advertising rates competing newspapers and other media outlets charge.

3. **Make predictions about the future.** Based on this information, Naomi makes predictions about the future. She concludes that increasing prices would upset readers and decrease readership. She has a different view about advertising rates. She expects a marketwide increase in advertising rates and believes that increasing rates will have little effect on the number of advertising pages sold.

   Naomi recognizes that making predictions requires judgment. She looks for biases in her thinking. Has she correctly judged reader sentiment or is the negative publicity of a price increase overly influencing her decision making? How sure is she that competitors will increase their advertising rates? Is her thinking in this respect biased by how competitors have responded in the past? Have circumstances changed? How confident is she that her sales representatives can convince advertisers to pay higher rates? After retesting her assumptions and reviewing her thinking, Naomi feels comfortable with her predictions and judgments.

4. **Make decisions by choosing among alternatives.** When making decisions, a company's strategy serves as a vital guidepost for the many individuals in different parts of the organization making decisions at different times. Consistent strategies provide a common purpose for these disparate decisions. Only if these decisions can be aligned with its strategy will an organization achieve its goals. Without this alignment, the

company's decisions will be uncoordinated, pull the organization in different directions, and produce inconsistent results.

Consistent with a product differentiation strategy, Naomi decides to increase advertising rates by 4% to $5,200 per page in March 2017, but not increase the selling price of the newspaper. She is confident that the *Daily News*'s distinctive style and Web presence will increase readership, creating value for advertisers. She communicates the new advertising rate schedule to the sales department. Ramon estimates advertising revenues of $4,160,000 ($5,200 per page × 800 pages predicted to be sold in March 2017).

Steps 1 through 4 are collectively referred to as *planning*. **Planning** consists of selecting an organization's goals and strategies, predicting results under various alternative ways of achieving those goals, deciding how to attain the desired goals, and communicating the goals and how to achieve them to the entire organization. Management accountants serve as business partners in these planning activities because they understand the key success factors and what creates value.

The most important planning tool when implementing strategy is a *budget*. A **budget** is the quantitative expression of a proposed plan of action by management and is an aid to coordinating what needs to be done to execute that plan. For March 2017, the budgeted advertising revenue of the *Daily News* equals $4,160,000. The full budget for March 2017 includes budgeted circulation revenue and the production, distribution, and customer-service costs to achieve the company's sales goals; the anticipated cash flows; and the potential financing needs. Because multiple departments help prepare the budget, personnel throughout the organization have to coordinate and communicate with one another as well as with the company's suppliers and customers.

5. **Implement the decision, evaluate performance, and learn.** Managers at the *Daily News* take action to implement and achieve the March 2017 budget. The firm's management accountants then collect information on how the company's actual performance compares to planned or budgeted performance (also referred to as scorekeeping). The information on the actual results is different from the *predecision* planning information Naomi and her staff collected in Step 2, which enabled her to better understand uncertainties, to make predictions, and to make a decision. Allowing managers to compare actual performance to budgeted performance is the *control* or *postdecision* role of information. **Control** comprises taking actions that implement the planning decisions, evaluating past performance, and providing feedback and learning to help future decision making.

   Measuring actual performance informs managers how well they and their subunits are doing. Linking rewards to performance helps motivate managers. These rewards are both intrinsic (recognition for a job well done) and extrinsic (salary, bonuses, and promotions linked to performance). We discuss this in more detail in a later chapter (Chapter 23). A budget serves as much as a control tool as a planning tool. Why? Because a budget is a benchmark against which actual performance can be compared.

Consider performance evaluation at the *Daily News*. During March 2017, the newspaper sold advertising, issued invoices, and received payments. The accounting system recorded these invoices and receipts. Exhibit 1-4 shows the *Daily News*'s advertising revenues for March 2017. This performance report indicates that 760 pages of advertising (40 pages fewer than

EXHIBIT 1-4 Performance Report of Advertising Revenues at the *Daily News* for March 2017

	Actual Result (1)	Budgeted Amount (2)	Difference: (Actual Result − Budgeted Amount) (3) = (1) − (2)	Difference as a Percentage of Budgeted Amount (4) = (3) ÷ (2)
Advertising pages sold	760 pages	800 pages	40 pages Unfavorable	5.0% Unfavorable
Average rate per page	$5,080	$5,200	$120 Unfavorable	2.3% Unfavorable
Advertising revenues	$3,860,800	$4,160,000	$299,200 Unfavorable	7.2% Unfavorable