



# Fundamentals of Cost Accounting

## 7e

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## FUNDAMENTALS OF COST ACCOUNTING, SEVENTH EDITION

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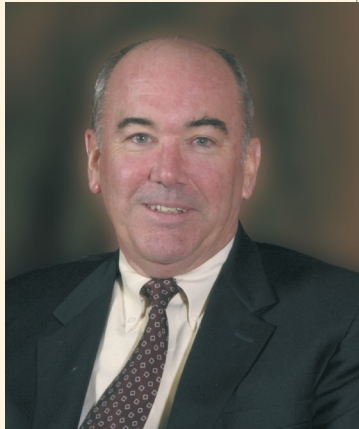
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# About the Authors



Courtesy of William Lanen

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William (Bill) Lanen is the KPMG Professor of Accounting Emeritus at the **University of Michigan**. He was previously on the faculty of the **Wharton School** at the **University of Pennsylvania**. He received his AB from the **University of California–Berkeley**, his MS from **Purdue University**, and his PhD from the **Wharton School**. He has taught cost accounting to undergraduates, MBA students, and executives, including in global programs in Europe, South America, Australia, Africa, and Asia. Bill has also served as the director of the Office of Action-Based Learning at the Ross School of the University of Michigan. His research focuses primarily on performance evaluation and reward systems.



Courtesy of Shannon Anderson

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Courtesy of Michael Maher

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## Dedication

To my wife, Donna, and my children, Cathy and Tom, for encouragement, support, patience, and general good cheer throughout the years and to my colleagues in accounting around the world for their insights into both teaching and practice.

Bill

I dedicate this book to extraordinary public school teachers who shaped my early development, to the staff and students of The Summer Science Program of 1980, who changed my aspirations, and to my first and most influential teachers, Max and Nina Weems. I am grateful to my partner, Randy Anderson, and to my sons, Evan and David Anderson, for decades of teamwork, support, and fun.

Shannon

I dedicate this book to my wife, Kathleen; our children and their significant others; and our eight beautiful grandchildren.

Michael



# Step into the Real World

The updates and features in *Fundamentals of Cost Accounting* 7e prepare students for application beyond the classroom.

## 5

Chapter Five

## Cost Estimation

**LEARNING OBJECTIVES**

*After reading this chapter, you should be able to:*

- LO 5-1** Explain the reasons for estimating fixed and variable costs.
- LO 5-2** Estimate costs using a variety of methods, specifically engineering estimates, account analysis, and statistical analysis.
- LO 5-3** Use regression analysis to estimate costs, interpret regression analysis results, and critically evaluate the fit between the data used and the regression model employed.
- LO 5-4** Incorporate the effects of learning and expected improvements when estimating costs.
- LO 5-5** Evaluate and explain the advantages and disadvantages of alternative cost estimation methods.
- LO 5-6** (Appendix A) Use Microsoft Excel to perform a regression analysis.
- LO 5-7** (Appendix B) Explain and apply the mathematical relationship describing the learning phenomenon.

### The Decision

“I’ve read several books on cost analysis and worked through decision analysis problems in some of the college classes I am taking in the evening. I own my own business and I realize that there is one important thing that we always take for granted in doing those problems. We are always given the data. Now I know that doing the analysis once you have the data is the easier part. But once I have the data, there are still questions

I want to answer. How are the costs determined? How do I know if they are fixed or variable?”

Joseph Kim owns JK Renovations, a network of home renovation centers located throughout the West. Joseph is thinking about opening a new center and has asked you to help him make a decision. He especially wants your help estimating the costs to use in the analysis.

### Why Estimate Costs?

When managers make decisions, they need to compare the costs (and benefits) among alternative actions. Therefore, managers need to estimate the costs associated with each alternative. We saw in Chapter 4 that good decisions require good information about costs; the better these estimates, the better the decisions managers will make. In this chapter, we discuss how to estimate the cost data required for decision making. Cost estimates can be an important element in helping managers make decisions that add value to the company.

Joseph Kim recognizes the importance of data and analysis for managing a business and is looking for ways to estimate costs more accurately. Although we focus on cost estimation in this chapter, analytic techniques and data are used for estimation in many facets of a business. Their use is also not limited to new businesses or businesses in high tech-

**LO 5-1**  
Explain the reasons for estimating fixed and variable costs.

## Chapter Opening Vignettes

Do your students sometimes wonder how this course connects with their future? Each chapter opens with *The Decision*, a vignette in which a decision maker needs cost accounting information to make a better decision. This sets the stage for the rest of the chapter and encourages students to think of concepts in a business context.

### Engineering Analysis and the Construction of Healthcare Projects Business Application

As an illustration of the engineering method of cost estimation, a healthcare trade organization provides a list of factors to consider when building a new hospital or medical office. The approach is what we have called the engineering method, where

Cost estimators and contractors typically develop detailed take-offs of materials and labor. . . .<sup>1</sup>

The factors considered include building type (new construction or renovation), size (square footage), and soft costs (fees, contingencies, furniture, and so on). In fact, as is frequently the case, so-called rules-of-thumb have developed among experienced cost analysts:

A soft cost multiplier of 1.35 to 1.45 times the costs of construction is typical [for soft costs].<sup>2</sup>

Later in the chapter, we discuss the role of “learning” in cost estimation. There, the focus is on adjusting the cost

estimates to take account of the experience gained by employees, for example, as they spend time working with a new process. In the same way, cost estimation is a process, and cost analysts performing this task also “learn” and the result is a better estimate.

The model becomes more accurate with numbers from each completed project, but there are still some outliers, and it takes years of industry experience to anticipate those and ensure cost-estimating success.<sup>3</sup>

Sources:  
1. Gunn, Thomas, “Key Considerations When Cost Estimating a Healthcare Project,” *Healthcare Facilities Today*, January 23, 2018. (<https://www.healthcarefacilitiestoday.com/posts/key-considerations-when-cost-estimating-a-healthcare-project-17446>)  
2. Ibid.  
3. Ibid.

## Business Application

Do your students need help connecting theory to application? The *Business Application* examples tie in to *The Decision* chapter-opening vignettes and are drawn from contemporary news reports and the authors’ own experiences. They illustrate how to apply cost accounting methods and tools.

“[This text] helps students connect theory to real business application.”

—Hyunpyo Kim  
Shippensburg University

Key Takeaways

Do your students understand the key concepts covered in the chapter? All chapters end with a Key Takeaways feature that summarizes the primary concepts and tools in the chapter.

Key Takeaways

1. Decision making requires an understanding of cost behavior; that is, which costs are fixed and which are variable. We can use a variety of methods to determine this, including

a. Engineering estimates, where costs are estimated from detailed specification about the inputs required.

b. Account analysis, where cost behavior is inferred by looking at past account information.

c. Statistical analysis, where costs are estimated by analyzing past cost data and related activity.
2. Regression analysis is a statistical method to estimate costs using past data on costs and activities to identify relationships and provide a predictive model. Regression analysis uses all information and not just select data points. It also provides statistics that can be used to assess how well the model fits the data. There are potential problems that can arise with regression that a cost analyst needs to consider, including

a. Nonlinear relationships, where variable costs are not proportional to activity.

b. Influential observations (outliers) that can distort the relation because of unusual events such as labor strikes, weather disasters, or supply disruptions.

c. Changes in the underlying process caused, for example, by a change in the production process or input mix.

A scatter diagram of the data used in the model can be used to screen for these problems.

3. The learning phenomenon is the systematic relationship with a process and the time taken to complete the process, whether producing a product or providing a service. Failure to incorporate learning in the cost estimates when learning exists risks overstating the costs of future production.

SUMMARY

Accurate cost estimation is important to most organizations for decision-making purposes. Although no estimation method is completely accurate, some are better than others. The usefulness of a cost estimation method depends to a great extent on the user's knowledge of the business and the costs being analyzed.

The following summarizes the key ideas tied to the chapter's learning objectives:

**LO 5-1** Explain the reasons for estimating fixed and variable costs. The behavior of costs, not the accounting classification, is the important distinction for decision making. Cost estimation focuses on identifying (estimating) the fixed and variable components of costs.

**LO 5-2** Estimate costs using a variety of methods, specifically engineering estimates, account analysis, and statistical analysis. Cost estimates can be developed by identifying all activities and resources required to make a product or provide a service.

**(LO 5-1, 2) 5-28. Methods of Estimating Costs: Engineering Estimates**

Ferdinand Construction (FC) manages the design and construction of hospitals. Ferdinand has developed several formulas that it uses to quote jobs. These include costs of basic construction but exclude equipment and furniture. These estimates are also dependent on the purpose of the hospital (teaching hospitals are more costly to build) and location (downtown hospitals are more costly to build). Both of these are based on the building costs. The estimated costs also depend on whether the hospital has few or many stories (high-rise buildings are more expensive). The following are the cost estimates for one region in the Northeast:

End-of-Chapter Material

Being able to assign end-of-chapter material with confidence is important. The authors have tested the end-of-chapter material over time to ensure quality and consistency with the chapter content. In the seventh edition, the authors have updated virtually all exercises and problems and have added several new items.



This icon denotes questions that present ethical issues in accounting.

“This book is well written and relatable.”

—John Fortune  
Indiana University



# What's New in the Seventh Edition?

We remain committed in the seventh edition to the same goal we have had for the previous six editions—to offer a cost accounting text that lets the student see the development of cost accounting tools and techniques as a natural response to decision making. We continue to emphasize the intuition behind concepts and work to minimize the need to “memorize.” We believe that students who develop this intuition will, first, develop an appreciation of what cost accounting is about and, second, have an easier time understanding new developments that arise during their careers. Each chapter clearly establishes learning objectives, highlights numerous real-world examples, and identifies where ethical issues arise and how to think about these issues. We include examples throughout the text that illustrate how data visualization tools can be used to either illustrate the concepts or support decision making. Each chapter includes at least two end-of-chapter items that require using data analytic and data visualization tools and are based on the examples in the text.

We present the material from the perspective of both the preparer and the user of the information. We do this so that both accounting majors and those students planning other careers will appreciate the issues in preparing and using the information. The opening vignettes tie to one of the *Business Application* features in the chapter to highlight the relevance of cost accounting to today's business problems. All chapters end with *Key Takeaways* that summarize the core concepts of the chapter.

The end-of-chapter material has increased by about 10 percent overall. In addition, names and data for virtually all existing exercises and problems are changed from previous editions. We have also added video walkthroughs in Connect for select end-of-chapter material.

Finally, we have retained the clear writing style that is frequently cited as a strength of the text.

## Chapter-Specific Changes

### 1 Cost Accounting: Information for Decision Making

- New section on “Critical Thinking and Data Analytics.”
- Illustration of data visualization using Microsoft Excel, Tableau, and Microsoft PowerBI.
- One new *Business Application*.
- Updated discussion and examples on Trends in Cost Accounting.
- Two new exercises.
- Two new problems.

### 2 Cost Concepts and Behavior

- One new and one updated *Business Application*.
- Two new exercises.
- Four new problems.

### 3 Fundamentals of Cost-Volume-Profit Analysis

- One new and one updated *Business Application*.
- New section on “Data Analytics and CVP Analysis.”
- Five new exercises.
- Three new problems.

### 4 Fundamentals of Cost Analysis for Decision Making

- Two new *Business Applications*.
- Seven new exercises.
- Five new problems.

### 5 Cost Estimation

- Three new *Business Applications*.
- Revised discussion of the learning effect.
- Ten new exercises.



## 6 Fundamentals of Product and Service Costing

- One new *Business Application*.
- Eleven new exercises.
- Two new problems.

## 7 Job Costing

- New section on “Choosing the Time Period for Computing the Predetermined Overhead Rate” using graphs to illustrate the effect of different choices.
- One new *Business Application*.
- One new exercise.
- Six new problems.

## 8 Process Costing

- Four new exercises.
- Two new problems.

## 9 Activity-Based Costing

- Data visualizations illustrating the effect of alternative costing methods.
- Two new *Business Applications*.
- Four new exercises.
- Three new problems.

## 10 Fundamentals of Cost Management

- Five new *Business Applications*.
- Eight new exercises.
- Two new problems.

## 11 Service Department and Joint Cost Allocation

- New visualizations illustrating the effect of alternative costing methods.
- One new *Business Application*.
- Two new exercises.
- Two new problems.

## 12 Fundamentals of Management Control Systems

- Data visualizations illustrating the effect of alternative allocation methods.
- Three new *Business Applications*.
- Two new exercises.
- Four new problems.

## 13 Planning and Budgeting

- New appendix on zero-based budgeting.
- Three new *Business Applications*.
- Two new exercises.
- Two new problems.

## 14 Business Unit Performance Measurement

- Data visualizations to illustrate the sensitivity of EVA results to the assumed cost-of-capital.
- Three new *Business Applications*.
- Four new exercises.
- Two new problems.

## 15 Transfer Pricing

- Material previously in an appendix moved into text.
- Data visualizations to illustrate the choice of the appropriate transfer price.
- One new and one updated *Business Application*.
- One new exercise.
- Two new problems.

## 16 Fundamentals of Variance Analysis

- Data visualizations to illustrate the relative importance of different variances.
- One new *Business Application*.
- Two new exercises.
- Two new problems.

## 17 Additional Topics in Variance Analysis

- New section on “Monitoring Variances with Charts.”
- One new and one updated *Business Application*.
- Three new exercises.
- Three new problems.

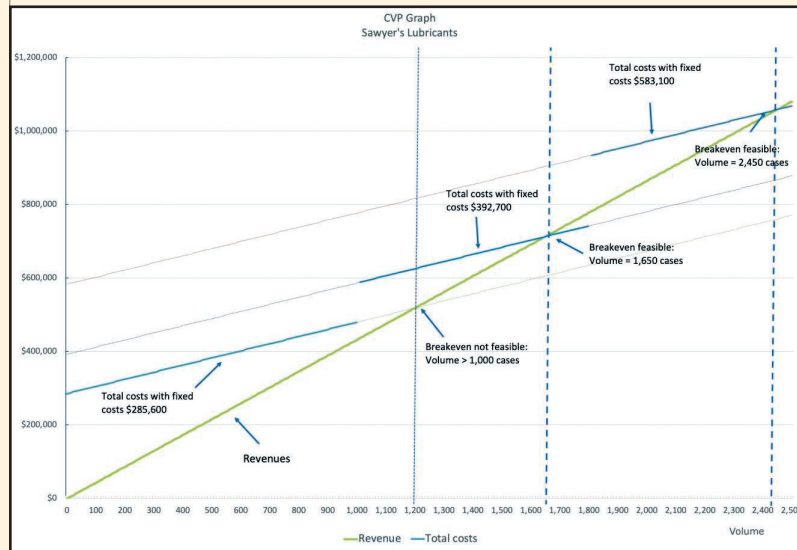


### 18 Performance Measurement to Support Business Strategy

- New section on “Using the Balanced Scorecard to Monitor Performance,” with data visualizations.
- Two new *Business Applications*.
- Three new exercises.
- Three new problems.

### Appendix Capital Investment Decisions: An Overview

- New example for illustrating the principles of capital investment analysis.
- Additional discount rates added to present value tables.
- Revised exercises and problems.



### New! Data Visualizations Based on Chapter Concepts

Throughout the text, students are introduced to how data visualizations can be used to communicate the results of their analyses to decision makers. End-of-chapter material allows the students to develop their own visualizations based on their analysis of the problem.



### New! Integrated Excel connect

Integrated Excel assignments pair the power of Microsoft Excel with the power of Connect. A seamless integration of Excel within Connect, Integrated Excel questions allow students to work in live, auto-graded Excel spreadsheets—no additional logins, no need to upload or download files. Instructors can choose to grade by formula or solution value, and students receive instant cell-level feedback via integrated Check My Work functionality.

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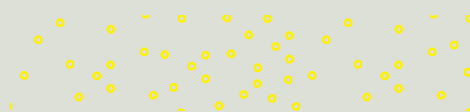
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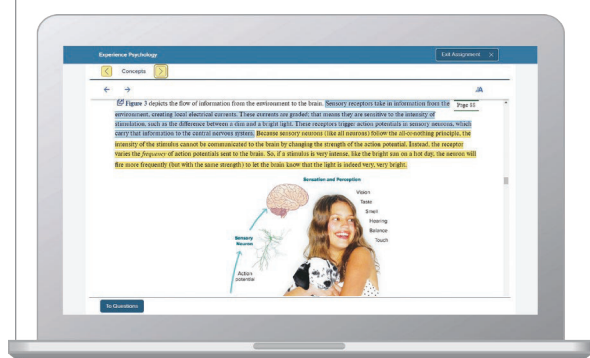
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- Jordan Cunningham,  
Eastern Washington University



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# Fundamentals of Cost Accounting

7e

# 1

## Chapter One

# Cost Accounting: Information for Decision Making

### LEARNING OBJECTIVES

*After reading this chapter, you should be able to:*

- LO 1-1** Describe the way managers use accounting information to create value in organizations.
- LO 1-2** Distinguish between the uses and users of cost accounting and financial accounting information.
- LO 1-3** Explain how cost accounting information is used for decision making and performance evaluation in organizations.
- LO 1-4** Identify current trends in cost accounting, including data analytics and data visualization.
- LO 1-5** Understand ethical issues faced by accountants and ways to deal with ethical problems that you face in your career.

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## The Decision

*“I opened this bakery shortly after I graduated from a local culinary school. I have always enjoyed baking, and owning my own bakery will allow me to experiment a bit. So far, the financial returns from the store have been sufficient for me to survive, but I am not sure if they will be enough for me to continue.*

*I took some courses at the local community college last year hoping to learn some business skills that will help me really take control and increase the store's value. One thing I need to do is develop a better understanding of my costs. This semester I'm taking a cost accounting class. I know a little bit about the subject, but I know there is a lot more to learn. I'm curious, though, how this class*

*will help me. I need to decide whether to expand the business or fold. If I expand the business, I need some help on managing my costs and remaining profitable.*

*I need to decide soon whether to expand or to close down and maybe go to work as a pastry chef in one of the local restaurants.”*

Adam Mercer is the owner and founder of The AM Bakery, which he opened three years ago. The bakery has been marginally profitable, but Adam knows he must make a decision soon. Should he expand the business and work on making it financially viable, or should he abandon it and look for a job baking for someone else?

Adam wants to add value in his business. Like all managers, he wants the business to succeed financially. Like you, he is now studying cost accounting as one of the disciplines that he will use to do this. Adam knows that the world is a fast-changing place. He wants to learn not only what is current but also a way to think about problems that he can apply throughout his career. To do this, he knows that he must develop an intuition about the subject. He does not want to just learn a few facts that he is sure to soon forget. After developing this intuition, he can evaluate the merits of new cost accounting methods that he encounters throughout his career.

In this chapter, we give an overview of cost accounting and illustrate a number of the business situations we will study to put the topic in perspective. The examples we use and the description of how they apply to larger organizations (or to not-for-profit organizations or government agencies) are discussed in more detail in individual chapters. The examples also illustrate how the discipline of cost accounting can make a person a more valuable part of any organization.

### Understanding Costs in a Small Business

### Business Application

Opening a small business is always risky. Based on information from the U.S. Bureau of Labor Statistics, about one-half of all new businesses fail within the first five years, and this rate has been relatively constant over the past 20 years. Understanding the costs and other financial issues is a large

part of the problem: “. . . over half of businesses discontinue operations because of lack of profits or financial funding.”

Source: Speights, Keith, “What Percentage of Businesses Fail in Their First Year?” *USA Today*, May 21, 2017.

## Value Creation in Organizations

### Why Start with Value Creation?

We start our discussion with the concepts of value creation and the value chain because in cost accounting our goal is to assist managers in achieving the maximum value for their organizations. Measuring the effects of decisions on the value of the organization is one of the fundamental services of cost accounting. As providers of information (accountants) or as the users of information (managers), we have to understand how the information can and will be used to increase value. We can then come back to questions about how to design accounting systems that accomplish this goal.

#### LO 1-1

Describe the way managers use accounting information to create value in organizations.



**value chain**

Set of activities that transforms raw resources into the goods and services that end users purchase and consume.

**value-added activities**

Those activities that customers perceive as adding utility to the goods or services they purchase.

**Value Chain**

The **value chain** is the set of activities that transforms raw resources into the goods and services end users (households, for example) purchase and consume. It also includes the treatment or disposal of any waste generated by the end users. As an example, the value chain for gasoline stretches from the search and drilling for oil, through refining the oil into gasoline, to the distribution of gasoline to retail outlets such as convenience stores, and, finally, to the treatment of the emissions produced by automobiles or the waste oil recycled at a service station.

In much of our discussion about cost accounting, we will be concerned with the part of the value chain that comprises the activities of a single organization (a firm, for example). However, an important objective of modern cost accounting is to ensure that the entire value chain is as efficient as possible. It is necessary for the firm to coordinate with vendors and suppliers and with distributors and customers to achieve this objective. In the gasoline example, ExxonMobil must work with suppliers of drilling equipment to ensure the equipment is available when needed. It also needs to work with owners of its On the Run franchises to ensure that gasoline is delivered to the stations as needed.

The cost accounting system provides much of the information necessary for this coordination. Therefore, at times we will also consider where in the value chain it is most efficient to perform an activity.

The **value-added activities** that the firms in the chain perform are those that customers perceive as adding utility to the goods or services they purchase. The value chain comprises activities from research and development (R&D) through the production process to customer service. Managers evaluate these activities to determine how they contribute to the final product's service, quality, and cost.

Exhibit 1.1 identifies the individual components of the value chain and provides examples of the activities in each component, along with some of the costs associated with these activities. Although the list of value chain components in Exhibit 1.1 suggests a sequential process, many of the components overlap. For example, the R&D and design processes might take place simultaneously. Feedback from production workers

**Exhibit 1.1** The Value Chain Components, Example Activities, and Example Costs

Component	Example Activities	Example Costs
<ul style="list-style-type: none"> <li>Research and development (R&amp;D)</li> </ul>	<ul style="list-style-type: none"> <li>The creation and development of ideas related to new products, services, or processes.</li> </ul>	<ul style="list-style-type: none"> <li>Research personnel</li> <li>Patent applications</li> <li>Laboratory facilities</li> </ul>
<ul style="list-style-type: none"> <li>Design</li> </ul>	<ul style="list-style-type: none"> <li>The detailed development and engineering of products, services, or processes.</li> </ul>	<ul style="list-style-type: none"> <li>Design center</li> <li>Engineering facilities used to develop and test prototypes</li> </ul>
<ul style="list-style-type: none"> <li>Purchasing</li> </ul>	<ul style="list-style-type: none"> <li>The acquisition of goods and services needed to produce a good or service.</li> </ul>	<ul style="list-style-type: none"> <li>Purchasing department personnel</li> <li>Vendor certification</li> </ul>
<ul style="list-style-type: none"> <li>Production</li> </ul>	<ul style="list-style-type: none"> <li>The collection and assembly of resources to produce a product or deliver a service.</li> </ul>	<ul style="list-style-type: none"> <li>Machines and equipment</li> <li>Factory personnel</li> </ul>
<ul style="list-style-type: none"> <li>Marketing and sales</li> </ul>	<ul style="list-style-type: none"> <li>The process of informing potential customers about the attributes of products or services that leads to their sale.</li> </ul>	<ul style="list-style-type: none"> <li>Advertising</li> <li>Focus group travel</li> <li>Product placement</li> </ul>
<ul style="list-style-type: none"> <li>Distribution</li> </ul>	<ul style="list-style-type: none"> <li>The process for delivering products or services to customers.</li> </ul>	<ul style="list-style-type: none"> <li>Trucks</li> <li>Fuel</li> <li>Website creation, hosting, and maintenance</li> </ul>
<ul style="list-style-type: none"> <li>Customer service</li> </ul>	<ul style="list-style-type: none"> <li>The support activities provided to customers for a product or service.</li> </ul>	<ul style="list-style-type: none"> <li>Call center personnel</li> <li>Returns processing</li> <li>Warranty repairs</li> </ul>

on existing products might be incorporated in the development of new models of a product. Companies such as Apple solicit “feature requests” from customers for new versions of software.

Most organizations operate under the assumption that each of the value chain components adds value to the product or service. Before product ideas are formulated, no value exists. Once an idea is established, however, value is created. When research and development of the product begins, value increases. As the product reaches the design phase, value continues to increase. Each component adds value to the product or service.

You may have noticed that administrative functions are not included as part of the value chain. They are included instead in every business function of the value chain. For example, human resource management is involved in hiring employees for all business value chain functions. Accounting personnel and other managers use cost information from each business function to evaluate employee and departmental performance. Many administrative areas cover each value chain business function.

### Supply Chain and Distribution Chain

Firms buy resources from suppliers (other companies, employees, and so on). These suppliers form the **supply chain** for the firm. Firms also sell their products to distributors and customers. This is the **distribution chain** of the firm. At times in our discussion, we will consider the companies and individuals supplying to or buying from a firm and the effect of the firm’s decisions on these suppliers and customers. We can think of these suppliers and customers as being on the firm’s *boundaries*. Thus, the supply chain and distribution chain are the parts of the value chain outside the firm.

The value chain is important because it creates the value for which the customer is willing to pay. The customer is not particularly concerned with how work is divided among firms producing the product or providing the service. Therefore, one decision firms must make is where in the value chain a value-added component is performed most cost effectively. Suppose, for example, that some inventory is necessary to provide timely delivery to the customer. Managers need accounting systems that will allow them to determine whether the firm or its supplier can hold the inventory at the lower cost.

#### supply chain

Set of firms and individuals that sells goods and services to the firm.

#### distribution chain

Set of firms and individuals that buys and distributes goods and services from the firm.

## Choosing Where to Operate in the Supply Chain

## Business Application

Customers are concerned with the total experience (including cost, delivery time, and so on) of producing and supplying a product or service. They are usually not concerned about which firm in the supply chain incurred the cost for or delivered the product or service. Therefore, companies think about not only reducing their own costs but also reducing costs and improving performance in the entire chain. Sometimes, a company might choose to have other firms produce parts used in its final product or deliver the service (outsourcing). Other times, the same company might decide to do this work internally (in-sourcing).

For example, Amazon has recently begun to develop its own delivery and logistics service instead of relying on UPS or the Post Office. Why? Cost is one reason. Another is control over the process. “Amazon’s move into airplanes, hubs, and delivery vans is a way to provide a better customer experience.”

Source: Hyken, Shep, “Look Out FedEx and UPS – Is Amazon Going to Disrupt the Shipping Industry?” Forbes.com, January 17, 2019. (<https://www.forbes.com/sites/shephyken/2019/01/17/look-out-fedex-and-ups-is-amazon-going-to-disrupt-the-shipping-industry/#70b034c17621>)

### Using Cost Information to Increase Value

How can cost information add value to the organization? The answer to this question depends on whether the information provided improves managers’ decisions. Suppose a production process is selected based on cost information indicating that the process would be less costly than all other options. Clearly, the information adds value to the process and its products. The measurement and reporting of costs is a valuable activity. Suppose cost information is received too late to help managers make a decision. Such information would not add value.

### Accounting and the Value Chain

If you have taken a financial accounting course, you focused, for the most part, on preparing and interpreting financial statements for the firm as a whole. You were probably not concerned with what stage in the value chain produced profits. In cost accounting, as we will see, we need to understand how the individual stages contribute to value and how to work with other managers to improve performance. Although financial accounting and cost accounting are related, there are important differences.

## Accounting Systems

### LO 1-2

Distinguish between the uses and users of cost accounting and financial accounting information.

#### financial accounting

Field of accounting that reports financial position and income according to accounting rules.

All accounting systems are designed to provide information to decision makers. However, it is convenient to classify accounting systems based on the primary user of the information. Investors (or potential investors), creditors, government agencies, tax authorities, and so on, are outside the organization. Managers are *inside* the organization. The classification of accounting systems into financial and cost (or managerial) systems captures this distinction between decision makers.

### Financial Accounting

**Financial accounting** information is designed for decision makers who are not directly involved in the daily management of the firm. These users of the information are often external to the firm. The information, at least for firms that are publicly traded, is public and typically available on the company's website. The managers in the company are keenly interested in the information contained in the financial accounting reports generated. However, the information is not sufficient for making operational decisions.

Individuals making decisions using financial accounting data are often interested in comparing firms, deciding whether, for example, to invest in Bank of America or Wells Fargo. An important characteristic of financial accounting data is that it be *comparable* across firms. That is, it is important that when an investor looks at, say, revenue for Bank of America, it represents the same thing that revenue for Wells Fargo does. As a result, financial accounting systems are characterized by a set of rules that define how transactions will be treated.

### Cost Accounting

#### cost accounting

Field of accounting that measures, records, and reports information about costs.

**Cost accounting** information is designed for managers. Because the managers are making decisions only for their own organization, there is no need for the information to be comparable to similar information in other organizations. Instead, the important criterion is that the information be relevant for the decisions that managers operating in a particular business environment with a particular strategy make. Cost accounting information is commonly used in developing financial accounting information, but we are concerned primarily with its use by managers to make decisions.

This book is about accounting for costs; it is for those who currently (or will) use or prepare cost information. The book's perspective is that managers (you) add value to the organization by the decisions they (you) make. From a different perspective, accountants (you) add value by providing good information to managers making the decision. The better the decisions, the better the performance of your organization—whether it is a manufacturing firm, bank, not-for-profit hospital, government agency, school club, or, yes, even a business school. We have already identified some of the decisions managers make and will discuss many of the current trends in cost accounting. We do this to highlight the theme we follow throughout: The cost accounting system is not designed in a vacuum. It is the result of the decisions managers in an organization make and the business environment in which they make them.

**Exhibit 1.2** Comparison of Financial and Cost Accounting

Financial Accounting		Cost Accounting
<ul style="list-style-type: none"> <li>• Users of the information (decision makers)</li> <li>• Important criteria</li> <li>• Who establishes or defines the system?</li> <li>• How to determine accounting treatment</li> </ul>	<ul style="list-style-type: none"> <li>• External (investors, creditors, and so on)</li> <li>• Comparability, decision relevance (for investors)</li> <li>• External standard-setting group (FASB in the United States)</li> <li>• Standards (rules)</li> </ul>	<ul style="list-style-type: none"> <li>• Internal (managers)</li> <li>• Decision relevance (for managers), timeliness</li> <li>• Managers</li> <li>• Relevance for decision making</li> </ul>

Exhibit 1.2 summarizes some of the major differences between financial and cost accounting.

### Cost Accounting, GAAP, and IFRS

The primary purpose of financial accounting is to provide investors (for example, shareholders) or creditors (for example, banks) information regarding company and management performance. The financial data prepared for this purpose are governed by **generally accepted accounting principles (GAAP)** in the United States and **international financial reporting standards (IFRS)** in many other countries. GAAP and IFRS provide consistency in the accounting data used for reporting purposes from one company to the next. This means that the cost accounting information used to compute cost of goods sold, inventory values, and other financial accounting information used for external reporting must be prepared in accordance with GAAP or IFRS. Although GAAP and IFRS are converging, differences remain. For the reasons discussed in the next paragraph, these differences are not important for our discussion, but you should remain aware of them.

In contrast to cost data for financial reporting to shareholders, cost data for managerial use (that is, within the organization) need not comply with GAAP or IFRS. Management is free to set its own definitions for cost information. Indeed, the accounting data used for external reporting are often entirely inappropriate for managerial decision making. For example, managerial decisions deal with the future, so estimates of future costs are more valuable for decision making than are the historical and current costs that are reported externally. Unless we state otherwise, we assume that the cost information is being developed for internal use by managers and does not have to comply with GAAP or IFRS.

This does not mean there is no “right” or “wrong” way to account for costs. It does mean that the best, or correct, accounting for costs is the method that provides relevant information to decision makers so that they can make the best decision.

### Customers of Cost Accounting

To management, customers are the most important participants in a business. Without customers, the organization loses its ability and its reason to exist; customers provide the organization’s focus. There are fewer and fewer markets in which managers can assume that they face little or no competition for the customer’s patronage.

Cost information itself is a product with its own customers. The customers are managers. At the production level, where products are assembled or services are performed, information is needed to control and improve operations. This information is provided frequently and is used to track the efficiency of the activities being performed. For example, if the average defect rate is 1 percent in a manufacturing process and data from the cost accounting system indicate a defect rate of 2 percent on the previous day, shop-floor

#### generally accepted accounting principles (GAAP)

Rules, standards, and conventions that guide the preparation of financial accounting statements for firms registered in the United States.

#### international financial reporting standards (IFRS)

Rules, standards, and conventions that guide the preparation of the financial accounting statements in many other countries.

employees would use this information to identify what caused the defect rate to increase and to correct the problem.

At the middle management level, where managers supervise work and make operating decisions, cost information is used to identify problems by highlighting when some aspect of operations is different from expectations. At the executive level, financial information is used to assess the company's overall performance. This information is more strategic in nature and typically is provided on a monthly, quarterly, or annual basis. Cost accountants must work with the users (or customers) of cost accounting information to provide the best possible information for managerial purposes.

Many proponents of improvements in business have been highly critical of cost accounting practices in companies. Many of the criticisms—which we discuss throughout the book—are warranted. The problem, however, is more with the misuse of cost accounting information, not the information itself. The most serious problems with accounting systems appear to occur when managers attempt to use accounting information that was developed for external reporting for decision making. Making decisions often requires different information from that provided in financial statements to shareholders. It is important that companies realize that different uses of accounting information require different types of accounting information.

## Key Financial Players in the Organization

All managers in the organization, not just financial professionals, use cost accounting information. Because our focus is on cost accounting and decision making, we will often be viewing a decision from an operational manager's perspective. For example, we might look at a pricing decision or a sourcing decision that a marketing or production manager has to make.

As a financial or operational manager in an organization, you will work closely with many financial professionals. See Exhibit 1.3 for a list of the typical financial titles in organizations and examples of their activities. If you work in the accounting or finance

**Exhibit 1.3** Key Financial Managers in an Organization

Title	Major Responsibilities and Primary Duties	Example Activities
<ul style="list-style-type: none"> <li>Chief financial officer (CFO)</li> </ul>	<ul style="list-style-type: none"> <li>Manages entire finance and accounting function</li> </ul>	<ul style="list-style-type: none"> <li>Signs off on financial statements</li> <li>Determines policy on debt versus equity financing</li> </ul>
<ul style="list-style-type: none"> <li>Treasurer</li> </ul>	<ul style="list-style-type: none"> <li>Manages liquid assets</li> <li>Conducts business with banks and other financial institutions</li> <li>Oversees public issues of stock and debt</li> </ul>	<ul style="list-style-type: none"> <li>Determines where to invest cash balances</li> <li>Obtains lines of credit</li> </ul>
<ul style="list-style-type: none"> <li>Controller</li> </ul>	<ul style="list-style-type: none"> <li>Plans and designs information and incentive systems</li> </ul>	<ul style="list-style-type: none"> <li>Determines cost accounting policies</li> <li>Maintains the accounting records</li> </ul>
<ul style="list-style-type: none"> <li>Internal auditor</li> </ul>	<ul style="list-style-type: none"> <li>Ensures compliance with laws, regulations, and company policies and procedures</li> <li>Provides consulting and auditing services within the firm</li> </ul>	<ul style="list-style-type: none"> <li>Ensures that procurement rules are followed</li> <li>Recommends policies and procedures to reduce inventory losses</li> </ul>
<ul style="list-style-type: none"> <li>Cost accountant</li> </ul>	<ul style="list-style-type: none"> <li>Records, measures, estimates, and analyzes costs</li> <li>Works with financial and operational manager to provide relevant information for decisions</li> </ul>	<ul style="list-style-type: none"> <li>Evaluates costs of products and processes</li> <li>Recommends cost-effective methods to distribute products</li> </ul>



function in an organization, you are likely to have one of these jobs. If you are an auditor or consultant, you will work with many of these financial managers. If you work in marketing, operations, or management, these financial managers will be on one of many teams working with you.

Whatever your job, you will work in cross-functional teams of people from many areas such as engineering, production, marketing, finance, and accounting. Consider a project to identify a new design for an airplane. Cross-functional teams add value to decision making by

- Bringing a variety of expertise and perspectives to the problem.
- Ensuring that the product is appropriate for its customer base (requiring interaction between engineering and marketing).
- Giving production a chance to formulate an efficient production process (requiring interaction between engineering and production).
- Obtaining financing for the project (requiring interaction among all groups, including finance and accounting).
- Determining whether the project is economically feasible (requiring interaction among all functions).

## Our Framework for Assessing Cost Accounting Systems

Individuals form organizations to achieve some common goal. Although the focus in this book is on economic organizations, such as the firm, most of what we discuss applies equally well to social, religious, or political organizations. The ability of organizations to remain viable and achieve their goals, whether profit, community well-being, or political influence, depends on the decisions made by managers of the organization.

Throughout the text, we emphasize that it is individuals (people) who make decisions. This theme and the following framework give us a common basis we can use to assess alternative accounting systems:

- Decisions determine the performance of the organization.
- Managers use information from the accounting system to make decisions.
- Owners evaluate organizational and managerial performance with accounting information.

### The Manager's Job Is to Make Decisions

Why do organizations employ people? What do they do to add value? For *line employees*, those directly involved in production or who interact with customers, the answer to this question is clear. They produce the product or service and deal with the customer. The job of managers, however, is more difficult to describe because it tends to be varied and ambiguous. The common theme among all managerial jobs, however, is decision making. Managers are paid to make decisions.

### Decision Making Requires Information

Accounting systems are important because they are a primary source of information for managers. We describe here some common decisions that managers make. Many, if not most, decisions require information that is likely to come from the accounting system. Our concern with the accounting system is whether it is providing the “best” information to managers. The decisions managers make will be only as good as the information they have.

### Finding and Eliminating Activities That Don't Add Value

How do managers use cost information to make decisions that increase value? In their quest to improve the production process, companies seek to identify and eliminate

#### LO 1-3

Explain how cost accounting information is used for decision making and performance evaluation in organizations.

**nonvalue-added activities**

Activities that do not add value to the good or service.

**cost-benefit analysis**

Process of comparing benefits (often measured in savings or increased profits) with costs associated with a proposed change within an organization.

**nonvalue-added activities**, which often result from the current product or process design. If a poor facility layout exists and work-in-process inventory must be moved during the production process, the company is likely to be performing nonvalue-added activities.

Why do managers want to eliminate nonvalue-added activities? An important concept in cost accounting is that *activities cause costs*. Moving inventory is a nonvalue-added activity that causes costs (for example, wages for employees and costs of equipment to move the goods). Reworking defective units is another common example of a nonvalue-added activity. In general, if activities that do not add value to the company can be eliminated, then costs associated with them will also be eliminated. At the same time, the value to the customer is not affected, leading to an overall increase in value to the organization.

A well-designed cost accounting system also can identify nonvalue-added activities that cross boundaries in the value chain. For example, many companies such as Alaska Airlines, Hyatt Hotels, and National Car Rental allow customers to purchase tickets and reserve rooms and cars directly using the company website. This change has eliminated the need for as many dedicated telephone agents. Not only does this save clerical costs, but it reduces the chances of costly errors in the details of the reservation.

A major activity of managers is evaluating proposed changes in the organization. Ideas often sound reasonable, but if their benefits (typically measured in savings or increased profits) do not outweigh the costs, management will likely decide against them. The concept of considering both the costs and benefits of a proposal is **cost-benefit analysis**. Managers should perform cost-benefit analyses to assess whether proposed changes in an organization are worthwhile. The concept of cost-benefit analysis applies equally to deciding whether to implement a new cost accounting system. The benefits from an improved cost accounting system come from better decision making. If the benefits do not exceed the cost of implementing and maintaining the new system, managers will not implement it.

### Identifying Strategic Opportunities Using Cost Analysis

Using the value chain and other information about the costs of activities, companies can identify strategic advantages in the marketplace. For example, if a company can eliminate nonvalue-added activities, it can reduce costs without reducing the value of the product to customers. By reducing costs, the company can lower the price it charges customers, giving it a cost advantage over competitors. Or the company can use the resources saved from eliminating nonvalue-added activities to provide better service to customers.

Alternatively, a company can identify activities that customers value and which the company can provide at lower cost. Many logistics companies, such as Owens & Minor, a healthcare services provider, offer their customers consulting services and inventory management.

The idea here is simple. Look for activities that do or do not add value. If your company can save money by eliminating those that do not, then do so. You will save your company money. Implement those activities that do. In both cases, you will make the organization more competitive.

### Owners Use Cost Information to Evaluate Managers

We have seen that it is important that managers make good decisions if they are to increase organizational value, but how will we know if they make good decisions? If managers own the organization, it is their money and resources that are at risk. We can assume that they will make decisions that are in their own interest. In other words, the interest of the organization and the owner-manager can be assumed to be the same, or *aligned*. However, most large organizations, especially businesses, are not owned by the managers but by a large number of shareholders. Most of these shareholders are not involved in



managing the business. Therefore, there is a second role of the accounting system in addition to aiding managerial decision making. It is to provide information, perhaps indirectly through financial reports, to the owners of the organization about the performance of the organization and the manager.

## Cost Data for Managerial Decisions

This book covers many topics on the use of cost data for managers. The following sections provide examples of these topics.

### Costs for Decision Making

One of the most difficult tasks in calculating the financial consequences of alternatives is estimating how costs (or revenues or assets) among the alternatives will differ. For example, The AM Bakery has been making and selling a variety of baked goods through a small store. One of Adam's customers, who works at a local office park, suggests to Adam that he expand his operation and sell the bakery offering at the morning and afternoon break times at the office park using a food truck. The key is to determine which would be more profitable—remain the same size or expand operations by adding a new distribution channel.

Now Adam has the difficult task of estimating how revenues and costs will change if he expands into this new distribution channel. He uses his work experience and knowledge of the company's costs to estimate cost changes. He identifies **cost drivers**, which are factors that cause costs. For example, to make scones requires labor. Therefore, the number of scones made is a cost driver that causes, or drives, labor costs. To estimate the effect of adding a food truck channel, Adam estimates how much additional product he would have to make. Based on that estimate, he determines the additional costs and revenues to the company that selling additional merchandise will generate.

Do we "know" how this decision will affect the firm? We do not, of course. These are *estimates* that require making many assumptions and forecasts, some of which may not be realized. This is what makes this type of analysis both fun and challenging. In business, nobody knows for certain what will happen in the future. In making decisions, however, managers constantly must try to predict future events. Cost accounting has more to do with estimating future costs than recording past costs. For decision making, information about the past is a means to an end; it helps you predict what will happen in the future.

To complete the example, assume that Adam estimates that his revenues would increase by 50 percent; ingredients and labor would increase by 45 percent; and utilities would increase 20 percent. Rent per month would not change. Adam knows that he will need a strong marketing campaign to create awareness, so he plans to triple his marketing budget. The new channel would require a lease for a truck at \$900 per month, and he would incur truck operating expenses of \$150 per month. Adam enters the data into a spreadsheet to estimate how profits would change if he were to add the new channel. See Columns 1 and 2 of Exhibit 1.4 for the present and estimated costs, revenues, and profits for the business. The costs shown in Column 3 are the differences between those in Columns 1 and 2.

We refer to the costs and revenues that appear in Column 3 as **differential costs** and **differential revenues**. These are the costs and revenues, respectively, that change in response to a particular course of action. The costs in Column 3 of Exhibit 1.4 are differential costs because they differ if Adam decides to sell bakery goods off the food truck.

The analysis shows a \$1,790 increase in operating profits if Adam adds this new selling option. Based on this analysis, Adam decides to expand his bakery business. Note that only differential costs and revenues affect the decision. For example, rent does not change, so it is irrelevant to the decision.

In Chapters 2 through 11, we discuss methods to estimate and analyze costs, as well as how accounting systems record and report cost information.

#### cost drivers

Factors that cause, or "drive," costs.

#### differential costs

With two or more alternatives, costs that differ among or between alternatives.

#### differential revenues

Revenues that change in response to a particular course of action.

**Exhibit 1.4**Differential Costs,  
Revenues, and Profits

	A	B	C	D	E	F	G	H	I
1	<b>THE AM BAKERY</b>								
2	Projected Income Statement								
3	For a Representative Week								
4									
5			(1)			(2)			(3)
6						Alternative			
7			Status Quo:			Original Bakery			
8			Original Bakery			Plus Food			
9			Sales Only			Truck Sales			Difference
10	Sales revenue		\$11,200			\$16,800	(a)		\$5,600
11	Costs								
12	Ingredients (Flour, butter, and so on)		\$2,700			\$3,915	(b)		\$1,215
13	Labor		3,100			4,495	(b)		1,395
14	Utilities		500			600	(c)		100
15	Rent		900			900	(d)		0
16	Marketing		25			75	(e)		50
17	Truck lease		0			900	(f)		900
18	Truck operating costs		0			150	(f)		150
19	Total costs		\$7,225			\$11,035			\$3,810
20	Operating profits		\$3,975			\$5,765			\$1,790
21									
22	(a) 50 percent higher than status quo.								
23	(b) 45 percent higher than status quo.								
24	(c) 20 percent higher than status quo.								
25	(d) No additional rent required.								
26	(e) 300 percent higher than status quo.								
27	(f) New costs for food trucks only.								

**Business Application****Reducing Costs by Making Small Changes**

It is not just small businesses that think about costs. With increased energy and labor costs and strong competition pressuring prices, even large companies look for any edge they can find. For example, United Airlines found that by reducing the weight of the paper used to print its in-flight magazine and safety cards found in the seat back pockets, it is saving "170,000 gallons of fuel each year, or \$290,000 in annual fuel costs." Previously it had dropped the sale of duty-free items

sold on board. The reduced weight resulted in fuel savings of \$2.3 million. Of course, these changes are advantageous only if they do not materially affect the customer experience on the flight.

Source: Martin, Hugo, "United Airlines Saves 170,000 Gallons of Fuel by Using Lighter Paper on Inflight Magazine," *Los Angeles Times*, January 22, 2018.

**responsibility center**

Specific unit of an organization assigned to a manager who is held accountable for its operations and resources.

**Costs for Control and Evaluation**

An organization of any but the smallest size divides responsibility for specific functions among its employees. These functions are grouped into organizational units. The units, which may be called *departments*, *divisions*, *segments*, or *subsidiaries*, specify the reporting relations within the firm. These relations are often shown on an organization chart. The organizational units can be based on products, geography, or business function. We use the general term **responsibility center** to refer to these units. The manager assigned to lead the unit is accountable for, that is, has responsibility for, the unit's operations and resources.

For example, the chief of internal medicine is responsible for the operations of a particular part of a hospital. The president of GM North America is responsible for most of the company's operations in North America. The president of a company is responsible for the entire company.

Consider The AM Bakery. When he first opened the store, Adam managed the entire operation himself. As the enterprise became more successful, he added a new distribution channel using food trucks. He then hired two managers: Ed Walsh to manage the original retail store and Ady Joss to manage the food truck channel. Adam, as president, oversaw the entire operation. See the top part of Exhibit 1.5 for the company's organization chart.

<div style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 200px;">Adam Mercer President</div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; text-align: center; width: 40%;"> Ed Walsh Vice President Bakery Sales </div> <div style="border: 1px solid black; padding: 5px; text-align: center; width: 40%;"> Ady Joss Vice President Food Truck Sales </div> </div> </div>				
	A	B	C	D
1	<b>THE AM BAKERY</b>			
2	Income Statement			
3	For the Month Ending August 31			
4		Sales Channel		
5		Bakery	Food Trucks	Total
6	Sales revenue	\$52,200	\$28,000	\$80,200
7	Channel costs			
8	Ingredients (flour, butter, and so on)	\$12,500	\$6,100	\$18,600
9	Labor (Note a)	15,200	7,000	22,200
10	Utilities	2,400	550	2,950
11	Rent	3,600	0	3,600
12	Marketing	200	225	425
13	Truck lease	0	3,900	3,900
14	Truck operating cost	0	700	700
15	Total channel costs	33,900	18,475	52,375
16	Channel margin (Note b)	\$18,300	\$9,525	\$27,825
17	General and administrative costs			
18	Corporate office operations (Note c)			5,400
19	Other			2,900
20	Total general and administrative costs			\$8,300
21	Operating profit			\$19,525
22				
23	Notes:			
24	a. Includes channel managers' salaries, but excludes the president's (Adam's) salary.			
25	b. The difference between revenues and costs attributable to a specific channel.			
26	c. Includes the general manager's salary.			

**Exhibit 1.5**

Responsibility Centers,  
Revenues, and Costs

Exhibit 1.5 also includes the company income statement, along with the statements for the two centers. Each manager is responsible for the revenues and costs of his or her center. The Total column is for the entire company. Note that the costs at the bottom of the income statement are not assigned to the centers; they are the costs of running the company. These costs are not the particular responsibility of either Ed or Ady. Consider the other (administrative) costs. Adam, not Ed or Ady, is responsible for designing the administrative systems (e.g., accounting and payroll), so Adam manages this cost as part of his responsibility to run the entire organization. Ed and Ady, on the other hand, focus on managing ingredient and labor costs (other than their own salaries) and responsibility center revenues.

**Budgeting** You have probably had to budget—for college, a vacation, or living expenses. Even the wealthiest people budget to make the best use of their resources.

**budget**

Financial plan of the revenues and resources needed to carry out activities and meet financial goals.

(For some, budgeting could be one reason for their wealth.) Budgeting is very important to the financial success of individuals and organizations.

Each responsibility center in an organization typically has a **budget** that is its financial plan for the revenues and resources needed to carry out its tasks and meet its financial goals. Budgeting helps managers decide whether their goals can be achieved and, if not, what modifications are necessary.

Managers are responsible for achieving the targets set in the budget. The resources that a manager actually uses are compared with the amount budgeted to assess the responsibility center's and the manager's performance. For example, managers in an automobile dealership compare the daily sales to a budget every day. (Sometimes that budget is the sales achieved on a comparable day in the previous year.) Every day, managers of American Airlines compare the percentage of their airplanes' seats filled (the *load factor*) to a budget. Every day, managers of hotels and hospitals compare their occupancy rates to their budgets. By comparing actual results with budgets, managers can do things to change their activities or revise their goals and plans.

As part of the planning and control process, managers prepare budgets containing expectations about revenues and costs for the coming period. At the end of the period, they compare actual results with the budget. This allows them to see whether changes can be made to improve future operations. See Exhibit 1.6 for the type of statement used to compare actual results with the planning budget for The AM Bakery.

For instance, Ed observes that the bakery responsibility center sold merchandise as budgeted but that actual costs were higher than budgeted. Costs that appear to need follow-up are those for flour, fruit, and nuts. Should Ed inquire whether there was waste in using flour? Did the cost of nuts per pound rise unexpectedly? Was the company buying fruit from the best source? Was there theft of some ingredients? As we will see, even costs that are lower than expected (like oil) should be evaluated. For example, is lower-quality oil being purchased? These are just a few questions that the information in Exhibit 1.6 would prompt.

We discuss developing budgets and measuring the performance of managers and responsibility centers in Chapters 12 through 18.

### Different Data for Different Decisions

One principle of cost accounting is that different decisions often require different cost data. "One size fits all" does *not* apply to cost accounting. Each time you face a cost

**Exhibit 1.6**

Budget versus Actual Data

	A	B	C	D
1	<b>THE AM BAKERY</b>			
2	Bakery Sales			
3	Actual and Budgeted Costs			
4	For the Month Ending August 31			
5		Actual	Budgeted	Difference
6	Ingredients			
7	Flour	\$ 3,900	\$ 3,700	\$ 200
8	Butter	3,500	3,400	100
9	Oil	1,700	1,800	(100)
10	Fruit	1,300	1,000	300
11	Nuts	900	800	100
12	Chocolate	800	800	-
13	Other	400	300	100
14	Total ingredients	\$ 12,500	\$ 11,800	\$ 700
15	Labor			
16	Channel manager	4,500	4,500	-
17	Other	10,700	10,900	(200)
18	Utilities	2,400	2,300	100
19	Rent	3,600	3,600	-
20	Marketing	200	100	100
21	Total bakery costs	\$ 33,900	\$ 33,200	\$ 700
22				
23	Revenues	\$ 52,200	\$ 52,200	-
24				

information problem in your career, you should first learn how the data will be used. Are the data needed to value inventories in financial reports to shareholders? Are they for managers' use in evaluating performance? Are the data to be used for decision making? The answers to these questions will guide your selection of the most appropriate accounting data.

### Self-Study Questions

1. Suppose that the ingredients, labor, and utilities for The AM Bakery (Exhibit 1.4) were differential and increased proportionately with sales revenue. Adam plans to increase marketing costs to \$60 per week with the new channel. Rent would not change. The truck expenses would be as given in Exhibit 1.4 with the new channel. What would have been the impact on profits of adding the new distribution channel?
2. For what decisions would estimated cost information be useful if you were a hospital administrator? The director of a museum? The marketing vice president of a bank?

*The solutions to these questions are at the end of the chapter.*

## Trends in Cost Accounting and Business Decisions

Cost accounting continues to experience dramatic changes. Developments in information technology (IT) have nearly eliminated manual bookkeeping. Emphasis on cost control is increasing in banks, hospitals, manufacturing industries (from computers to automobiles), airlines, school districts, and many other organizations that have traditionally not focused on it. Cost accounting has become a necessity in virtually every organization, including fast-food outlets, professional organizations, and government agencies.

### Cost Accounting in the Value Chain

One reason for this rapid change is that managers at each stage of the value chain require information on the performance of products, services, suppliers, customers, and employees. Managers of the activities and cost accountants must work together at each stage to make decisions that increase firm value. Because these processes themselves have undergone great change in recent years, cost accountants and cost accounting methods must continuously adapt to changes in all business areas.

Exhibit 1.7 summarizes how cost accounting methods have developed with various management practices. Together, the management practices and cost accounting methods support business decision makers in their daily activities. Some examples of these methods and practices are also identified in Exhibit 1.7

### Creating Value in the Organization

These trends in the way organizations do business create exciting times in cost accounting and excellent future opportunities for you to make important contributions to organizations. Keep in mind that these new methods are not ends in themselves. They are tools to help you add value to organizations and their employees, customers, shareholders, and communities.

### Enterprise Resource Planning

We have seen how cost accounting is used throughout the value chain. It is important that the information be consistent in all components of the chain.

As the cost of information technology falls and the value of information increases, managers have adopted **enterprise resource planning (ERP)** systems. ERP systems are

#### LO 1-4

Identify current trends in cost accounting, including data analytics and data visualization.

#### enterprise resource planning (ERP)

Information technology that links the various systems of the enterprise into a single comprehensive information system.

**Exhibit 1.7** Cost Accounting Methods Used in the Value Chain

Stage in the Value Chain	Cost Accounting Method/ Management Practice	Example(s)
Research and development (R&D)	Life-cycle costing	Catepillar, Inc.: Provides a life-cycle costing template for customers to use when considering equipment purchases.
Design	Activity-based costing (ABC)	IKEA: Designing flat-pack products to reduce storage and transportation costs.
Purchasing	Performance measures	Raytheon Technologies: Supplier metrics.
	Benchmarking	Sainsbury (UK): Web portal for suppliers to monitor their performance.
Production	Just-in-time (JIT)	Starbucks: Redesign flow to reduce bottlenecks in service times.
	Lean accounting	University of Utah Health Systems: Using detailed cost information to understand cost of services.
Marketing	Customer relationship management (CRM)	Harrah's: Using customer profitability measures to determine complimentary services (comps).
	Cost of customer	Alaska Airlines: Determine breakpoints in status levels to optimize benefits offered.
Distribution	Outsourcing	UPS & FedEx: Providing consulting services to customers about optimal distribution practices.
	Differential costing	Sysco: Consulting to restaurants on menu design in addition to supplying ingredients.
Customer Service	Total quality management (TQM)	Hyundai: Determining optimal warranty policies for new cars.]

integrated information systems that link various activities in an organization. Typical systems include modules for production, purchasing, human resources, finance, and sales. By integrating these systems, managers hope to avoid lost orders, duplication of effort, and costly studies to determine the current state of the enterprise.

Because all of the company's systems are integrated, the potential for ERP to provide information on costs of products and services is large. Implementation problems and the scale of the task in large firms (enterprises) have kept many companies from realizing that potential so far. However, with the increased emphasis on internal control from the Sarbanes-Oxley Act (discussed later in the chapter), ERP systems will become even more valuable.

### **Critical Thinking and Data Analytics**

The development of ERP systems and the reduced costs of information processing have also generated a discussion about how more general frameworks could be applied to these business issues and assist managers making decisions. These frameworks may be referred to by different names, but a common one is **critical thinking**. For our purposes, critical

#### **critical thinking**

A systematic process used to analyze a business issue or decision.



thinking is a systematic process used to analyze a business issue or decision. It includes answering the following questions:

1. What are the relevant questions (what decisions do I need to make)?
2. What are the data relevant to the analysis and where do I find them?
3. What are the appropriate tools for analyzing data?
4. How can I effectively and persuasively communicate the results of my analysis?

**1. What are the relevant questions (what decisions do I need to make)?** Determining the relevant question to ask seems an obvious and often easy first step in an analysis. It is often neither. It is common for analysts to focus too quickly on a particular problem or issue and work on solving that. But if the problem is actually a symptom of something else, then the solution might not solve the underlying problem.

For example, it might seem that in a service business with financial difficulties, the relevant question is, “How can I reduce costs?” The solution could be to reduce customer representatives that handle customer questions. This could lead to loss of sales because unhappy customers have to wait to have their questions answered. A different question might be, “How can I more effectively use the customer representatives to increase sales?” Although this might seem obvious when both questions are listed together, it is easy to focus on costs when facing declining profits.

**2. What are the data relevant to the analysis and where do I find them?** Perhaps the most difficult step in the analysis is identifying and finding the data relevant to the decision. Data include both quantitative data, such as sales revenue, and qualitative data, such as employee satisfaction. Recently, the term *big data* has been used to describe information for analyzing business decisions. **Big data** has many definitions, but for our purposes, it refers to data (information) that may be defined by the sheer amount of data (individual clicks on a website), the speed at which the data are generated and made available (real-time aircraft movements), or the variety of data available (customer purchasing behavior). Our focus in this text is primarily on generating information for decision making. When we do analyze the data, we want to consider the following:

- Do the data measure the concepts appropriately for the questions we are considering? A common theme in the text is that information generated to answer one question (product costs for pricing, for example) might not be appropriate for other decisions (which products to drop).
- Are the data likely to be available? One important difference between financial accounting and cost accounting is that most cost accounting data are considered proprietary. That means that if you want to benchmark your organization’s costs with a competitor, those costs are unlikely to be readily available.
- Are the data comparable? Do data that use similar terms represent the same thing? As you know from financial accounting, firms may calculate depreciation expense in different ways. You want to consider whether these data are appropriate for your analysis.

**3. What are the appropriate tools for analyzing data?** **Data analytics** is the systematic evaluation of information to address a decision problem. The analysis should use methods appropriate for the data and provide useful information for the decision-making problem. There are various tools that can be used for this including spreadsheets (Microsoft Excel, Apple Numbers, Google Sheets, and so on), statistical software (SAS, SPSS, Stata, R, and so on), or other analysis software (Mathematica, MATLAB, and so on). This text is not about data analytics in this sense, however. We focus on computing numbers and measures that are useful for business decisions. For the most part, we do not consider explicitly the inherent uncertainty associated with the environment in which business decisions are made. The information generated by the cost accounting system is

#### **big data**

The volume and speed with which information is generated and made available.

#### **data analytics**

Systematic evaluation of information to address a decision problem.

**data visualization**

How the results of the data analysis are summarized and presented.

often used in data analytics, and by understanding the basics of both cost accounting and data analytics, you will be in a better position to provide useful information.

**4. How can I effectively and persuasively communicate the results of my analysis?** Once the analysis has been completed and a tentative decision reached, it is important to be able to communicate the decision and the analysis to the decision maker. In one sense, this can be done by providing a transcript of your work. This includes the approaches you followed, the data you used, the analysis techniques employed, and so on. **Data visualization** refers to how the results of the analysis are summarized and presented to decision makers. Although the visualization might be textual (consisting of words and numbers), we generally think of data visualization in terms of graphical presentations.

At one extreme, the analyst could present a listing of the data collected. This would be an accurate representation, but generally not effective. The decision maker is looking to the analyst to summarize the data in a way that explains what the analyst is recommending. The result is often a graph of some sort that highlights results of the analysis.

There are many data visualization tools that can be used to summarize the results of the analysis. These include spreadsheet software, such as Microsoft Excel, as well as more specialized software such as Tableau and Microsoft Power BI. This text is not about data visualization, although there will be exhibits that highlight various results and you can consider whether there are different ways to present the results that would be more or less effective.

### Applying the Framework

We can illustrate the concepts of critical thinking, data analytics, and data visualization with an example. Understand that this example is simplified because we want to highlight the different elements of the critical thinking framework, not the analysis technique.

The AM Bakery has grown to 30 stores organized in six districts with four to six stores in a district. Adam Mercer, the owner of The AM Bakery, must decide which district manager to promote to oversee corporate operations. Although he will take many things into consideration, an important factor will be district profitability. He asked Emily Cho, a local consultant, to determine the most profitable district.

The decision to be made is clear (who is the best manager) and the question for Emily is to identify the most profitable district. She collects monthly financial information on the 30 stores for the previous calendar year and decides that she will use district profits to answer the question. (Problem 1-55 asks you to think about measures you would use to answer the question.) The data she has collected are summarized in Exhibit 1.8.

Emily is preparing a presentation for Adam, and her first thought is to show him the table in Exhibit 1.8. Thinking about that, she decides she should highlight

**Exhibit 1.8**

Annual Financial Results  
by District

	A	B	C
1	<b>THE AM BAKERY</b>		
2	<b>Annual Revenue and Profit by District</b>		
3			
4	<b>District</b>	<b>Annual Revenue</b>	<b>Annual Profit</b>
5	District 1	\$ 3,926,503	\$ 1,050,686
6	District 2	3,749,256	1,165,390
7	District 3	5,568,574	1,769,757
8	District 4	3,690,913	1,217,799
9	District 5	6,159,927	2,212,114
10	District 6	4,927,492	2,056,521
11		<u>\$ 28,022,665</u>	<u>\$ 9,472,267</u>
12			

her conclusion, so Adam can focus on her conclusion. Her new visual is shown in Exhibit 1.9

The graphic shown in Exhibit 1.9 does not provide more (or less) information, but it highlights the data the analyst wants to present. This is an example of data visualization. Emily decides to experiment with other visualizations, as shown in Exhibit 1.10.

	A	B	C
1	<b>THE AM BAKERY</b>		
2	<b>Annual Revenue and Profit by District</b>		
3			
4	<b>District</b>	<b>Annual Revenue</b>	<b>Annual Profit</b>
5	District 1	\$ 3,926,503	\$ 1,050,686
6	District 2	3,749,256	1,165,390
7	District 3	5,568,574	1,769,757
8	District 4	3,690,913	1,217,799
9	District 5	6,159,927	2,212,114
10	District 6	4,927,492	2,056,521
11		<u>\$ 28,022,665</u>	<u>\$ 9,472,267</u>

### Exhibit 1.9

Annual Financial Results  
by District: Highlighted  
Results

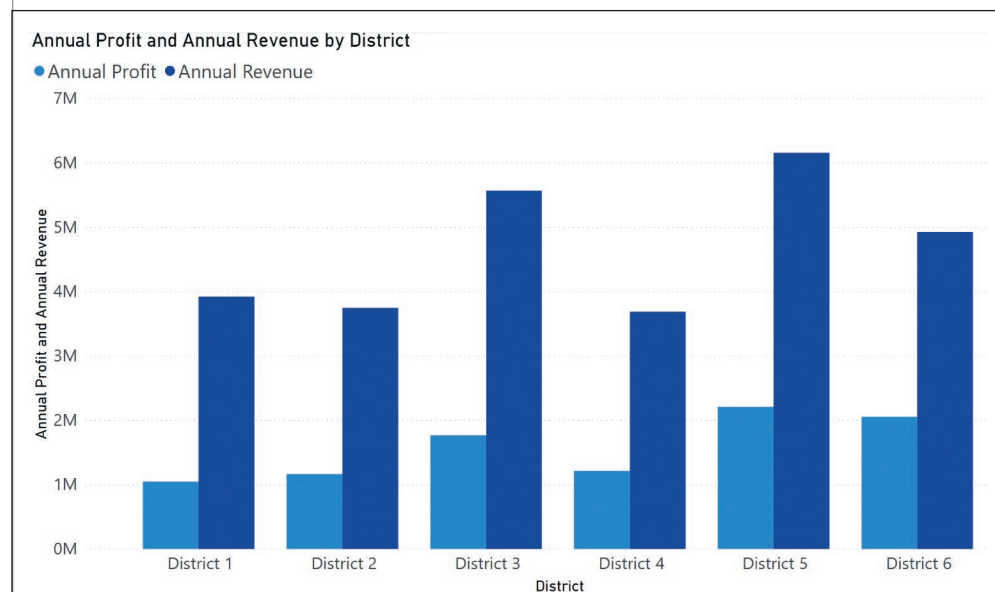
**Panel A:** Heat Map Created Using Microsoft Excel

	A	B	C
1	<b>THE AM BAKERY</b>		
2	<b>Annual Revenue and Profit by District</b>		
3			
4	<b>District</b>	<b>Annual Revenue</b>	<b>Annual Profit</b>
5	District 1	\$ 3,926,503	\$ 1,050,686
6	District 2	3,749,256	1,165,390
7	District 3	5,568,574	1,769,757
8	District 4	3,690,913	1,217,799
9	District 5	6,159,927	2,212,114
10	District 6	4,927,492	2,056,521
11		<u>\$ 28,022,665</u>	<u>\$ 9,472,267</u>

### Exhibit 1.10

Annual Financial Results  
by District: Alternative  
Visualizations

**Panel B:** Bar Chart Created Using Microsoft Power BI



(Continued)

**Exhibit 1.10**

(Continued)

**Panel C:** Scatter Plot Created Using Tableau

Tableau Software



Exhibit 1.10 Panel A presents a heat map prepared using Microsoft Excel with values color-coded to highlight high (green) and low (red) results. Exhibit 1.10 Panel B presents a bar chart prepared using Microsoft Power BI to indicate graphically the difference in profits among districts. Finally, Exhibit 1.10 Panel C presents a scatter plot prepared using Tableau of profits and revenues to highlight the relation among districts and between revenue and profits.

Although the graphics in Exhibit 1.10 were prepared using different software applications, any of these graphics could have been prepared in any of the applications. The choice of application depends primarily on what is available to the analyst and the source of data that will be used. These are also not the only, and maybe not the best, visualizations for this decision.

This discussion introduces the idea and some of the terms of the critical-thinking framework. As you pursue your studies and your career, you will be able to learn more. You will find that applying the framework—especially in identifying the question, finding the data, and presenting visualizations that are persuasive—is as much an art as a science. Continued practice applying the framework will make you a more effective analyst and decision maker.

**Self-Study Question**

3. Consider the Business Application “Choosing Where to Operate in the Supply Chain,” earlier in the chapter. At a

very general level, how would you answer the four questions in the critical thinking framework?

*The solution to this question is at the end of the chapter.*

## Choices: Ethical Issues for Accountants

We have discussed decisions that you will make in using or preparing cost accounting information. Now, we alert you to ethical issues that you will have to face. The sooner you are aware of these issues, the better you will be able to deal with them in your career. The design of cost systems is ultimately about the assignment of costs to various activities, products, projects, corporate units, and people. How that is done affects prices, reimbursement, and pay. As you know from current events, the design of the cost accounting system has the potential to be misused to defraud customers, employees, or shareholders. As a user or preparer of cost information, you need to be aware of the implications of the way in which information is used. Most important, you need to be aware of when the system has the potential for abuse.

### LO 1-5

Understand ethical issues faced by accountants and ways to deal with ethical problems that you face in your career.

### What Makes Ethics So Important?

Accountants report information that can have a substantial impact on the careers of managers. Managers are generally held accountable for achieving financial performance targets. Failure to achieve them can have serious negative consequences for the managers, including losing their jobs. If a division or company is having trouble achieving financial performance targets, accountants may find themselves under pressure by management to make accounting choices that will improve performance reports.

As a professional accountant, manager, or business owner, you will face ethical situations on an everyday basis. Your personal ethical choices can affect not only your own self-image but also others' perception of you. Ultimately, the ethical decisions you make directly influence the type of life you are likely to lead. You should confront ethical dilemmas bearing in mind the type of life that you want to lead.

In an attempt to influence the accounting profession, many of its professional organizations such as the Institute of Management Accountants (IMA), Institute of Internal Auditors (IIA), and the American Institute of Certified Public Accountants (AICPA) have developed codes of ethics to which their members are expected to adhere. Similarly, businesses such as Johnson & Johnson generally use these codes as a public statement of their commitment to certain business practices with respect to their customers and as a guide for their employees.

Throughout this book, we include discussions of ethical issues. Our aim is to make you aware of potential problems that you and your colleagues will face in your careers. Many accountants, managers, and business owners have found themselves in serious trouble because they did many small things, none of which appeared seriously wrong, only to find that these small things added up to big trouble. If you know the warning signs of potential ethical problems, you will have a chance to protect yourself and set the proper moral tone for your company and your profession at the same time.

### IMA Code of Ethics

The IMA Code of Ethics discusses the steps cost accountants should take when faced with an ethical conflict. Essentially, these steps are

- **DISCUSS** the conflict with your immediate superior or, if the conflict involves your superior, the next level in authority. This might require contacting the board of directors or an appropriate committee of the board, such as the audit committee or the executive committee;
- **CLARIFY** the relevant issues and concepts by discussions with a disinterested party or by contacting an appropriate and confidential ethics hotline;
- **CONSULT** your attorney about your rights and obligations.



Unethical behavior often leads to illegal activities as managers attempt to improve reported results. See the **Business Application** item on revenue and expense recognition for an example and the text in this section for some approaches to handling ethical problems.

Photodisc/Getty Images



The IMA code of conduct is available on its website at

<https://www.imanet.org/-/media/b6fbbeb74d964e6c9fe654c48456e61f.ash>

In its “Statement of Ethical Professional Practice,” the IMA states that management (and cost) accountants have a responsibility to maintain the highest levels of ethical conduct. They also have a responsibility to maintain professional competency, refrain from disclosing confidential information, and maintain integrity and objectivity in their work. These standards recommend that accountants faced with ethical conflicts follow the established policies that deal with them. If the policies do not resolve the conflict, accountants should consider discussing the matter with superiors, potentially as high as the audit committee of the board of directors. In extreme cases, the accountant could have no alternative but to resign.

### ***The Sarbanes-Oxley Act of 2002 and Ethics***

When the public perception of widespread ethical problems in business exists, the result is often legislation making certain conduct not only unethical but also illegal. In the late 1990s and early 2000s, the investing and consuming public became aware of several practices, including manipulation of accounting results, designed to increase the compensation of managers at several firms. These practices came to light with the failure of many of these businesses when the “tech bubble” burst in early 2000.

The U.S. Congress passed legislation in 2002 that was intended to address some of the more serious problems of corporate governance. The legislation, termed the *Sarbanes-Oxley Act of 2002*, has many provisions and affects both companies and accounting firms. For our purposes, some of the important provisions concern those in Title III and Title IV that deal with corporate responsibility and enhanced financial disclosure, respectively. The CEO and CFO are responsible for signing financial statements and stipulating that the financial statements do not omit material information. The requirement that these officers sign the company’s financial statements makes it clear that the “buck stops” with the CEO and CFO and that they are personally responsible for the financial statements. They cannot legitimately claim that lower-level managers or employees misled them about the financial statements, as was stated by defendant executives in many fraud trials in the past. Top executives take this sign-off very seriously, especially knowing that misrepresentation of their company’s financial reports could mean substantial prison time. They must further disclose that they have evaluated the company’s internal controls and that they have notified the company’s auditors and the audit committee of the board of any fraud that involves management.

Section 404 of Title IV requires managers to attest to the adequacy of their internal controls. Good internal controls assure that financial records accurately and fairly reflect transactions and that expenditures are in accordance with the authorization of company management and directors. Further, good internal controls help protect against the unauthorized purchase, use, or sale of company assets.

An example of an internal control is the requirement that two people, not just one, sign checks. Requiring two people to sign checks reduces the probability that someone will divert the company’s cash to personal use.

Sarbanes-Oxley is important for managers who design cost information systems. Whether the cost information is used for pricing decisions or performance evaluation, the manager must be aware of the potential that the resulting information could be misleading or support fraudulent activity. Compliance with Sarbanes-Oxley does not, however, mean that the manager has met all of his or her ethical responsibilities. Sarbanes-Oxley is a law; ethics is based on behavior. The IMA guidelines suggest you answer the following questions when faced with an ethical dilemma:

- Will my actions be fair and just to all parties affected?
- Would I be pleased to have my closest friends learn of my actions?

Consider the *Business Application* discussion of accounting choices. You as the manager or cost accountant need to be aware of the powerful incentives created by performance



## Accounting Decisions at Tesco: Choices and Consequences

## Business Application

An accounting scandal at British retailer Tesco in 2014 led to fraud charges being filed against three former employees. At the time of the fraud, Tesco suspended eight managers thought to be involved in a scheme to book revenues early and delay reporting of expenses. Such a practice would lead to overstating profits and making company performance look better than it actually was.

Although criminal charges have been filed, the company did not believe that the managers benefited personally. Some managers resigned before the scandal broke feeling "... 'compromised' as a financial professional." Others were "too scared

to speak out because they're worried about losing their jobs and paying their mortgages."

Tesco paid a fine of \$162 million and compensation to shareholders as a result of the activities.

**Sources:** Jolly, David, and Chad Bray, "3 Former Tesco Executives Charged with Fraud over Accounting Scandal," *New York Times*, September 9, 2016; "Tesco Agrees to Pay \$162 Million Fine over Accounting Scandal," *Fortune*, March 28, 2017; Colson, Thomas, "The Current Environment Has Broken Me": Tesco Accounting Scandal 'Compromised' Staff and Sparked Resignations," *Business Insider*, October 3, 2017.

measurement and compensation systems and how those incentives could lead to unethical (or even illegal) conduct. For example, imagine the pressure you would feel to remain silent about unfavorable accounting implications of actions that your boss (the CEO) wanted to take. You would probably find it difficult to tell your boss about these implications, especially when he or she would stand to benefit personally from the actions.

## Self-Study Question

4. What are the three essential steps a cost accountant should take when faced with an ethical conflict?

*The solution to this question is at the end of the chapter.*

## Cost Accounting and Other Business Disciplines

Finally, keep in mind that cost accounting does not exist in a vacuum. The boundary between what is cost accounting and what belongs in another discipline is often blurred. This is natural because in the "real world," problems are generally multidisciplinary. Production managers use cost accounting data to make scheduling and inventory decisions requiring concepts from operations. We will look to some concepts from organizational behavior because changes in the cost accounting system must be implemented by individuals in the organization who will react in different ways. Marketing issues arise when we use cost accounting data to evaluate pricing decisions. Throughout the book, we will venture into these other disciplines as a matter of course.

## Key Takeaways

1. Cost accounting identifies where value is being added (or lost) throughout the value chain.
2. The critical thinking framework includes
  - a. Defining the question.
  - b. Identifying the data
  - c. Applying data analytics.
  - d. Presenting effective data visualizations.
3. Cost accountants are often confronted with ethical issues. Professional guidelines provide advice on how to deal these issues.

## SUMMARY

This chapter discusses the use of cost accounting in its two primary managerial uses: decision making and performance evaluation. The following list summarizes key ideas tied to the chapter's learning objectives. For example, LO 1-1 refers to the first learning objective in the chapter.

- LO 1-1** Describe the way managers use accounting information to create value in organizations. Managers make decisions to increase the value of the organization using information from the accounting system. Cost information helps identify value-increasing alternatives and activities that do not add value to the product or service.
- LO 1-2** Distinguish between the uses and users of cost accounting and financial accounting information. Financial accounting information provides information to users (decision makers) who are not involved in the operations and strategy of the firm. These users are often external to the firm. While cost accounting information is often used in the financial accounting system, its primary role is to aid managers inside the firm in making operational and strategic decisions.
- LO 1-3** Explain how cost accounting information is used for decision making and performance evaluation in organizations. Cost accounting information can be used for decision making by assessing differential costs associated with alternative courses of action. Accounting information also can be used to evaluate performance by comparing budget amounts to actual results.
- LO 1-4** Identify current trends in cost accounting, including data analytics and data visualization. Cost accounting changes with changes in information technology and the adoption of new operational techniques. A critical thinking framework is increasingly important for analyzing business decisions.
- LO 1-5** Understand ethical issues faced by accountants and ways to deal with ethical problems that you face in your career. Ethical standards exist for management accountants. These standards are related to competence, confidentiality, integrity, and objectivity.

## KEY TERMS

big data, 17	enterprise resource planning (ERP), 15
budget, 14	financial accounting, 6
cost accounting, 6	generally accepted accounting principles (GAAP), 7
cost-benefit analysis, 10	international financial reporting standards (IFRS), 7
cost drivers, 11	nonvalue-added activities, 10
critical thinking, 16	responsibility center, 12
data analytics, 17	supply chain, 5
data visualization, 18	value-added activities, 4
differential costs, 11	value chain, 4
differential revenues, 11	
distribution chain, 5	

## REVIEW QUESTIONS

- 1-1.** Explain why it is important to consider the concepts of value and value creation in a textbook about cost accounting.
- 1-2.** Explain the differences between financial accounting and cost accounting. Why are these differences important?
- 1-3.** Place the letter of the appropriate accounting cost in Column 2 in the blank next to each decision category in Column 1.

Column 1	Column 2
___ Providing cost information for financial reporting	A. Costs for performance evaluation
___ Identifying the best store in a chain	B. Costs for inventory valuation
___ Determining which plant to use for production	C. Costs for decision making

- 1-4. Distinguish among the value chain, the supply chain, and the distribution chain.
- 1-5. Who are the customers of cost accounting?
- 1-6. How can cost accounting information, together with a classification of activities into those that are value-added and those that are nonvalue-added, help managers improve an organization's performance?
- 1-7. Identify three key financial managers in an organization and their major responsibilities.
- 1-8. What are the four questions of the critical thinking framework?
- 1-9. Does the passage of Sarbanes-Oxley mean that codes of ethics are no longer necessary?

## CRITICAL ANALYSIS AND DISCUSSION QUESTIONS

- 1-10. Explain how cost accounting supports value creation in the organization.
- 1-11. As the owner of a wholesale firm that only sells to retailers, should you be interested in the efficiency of your customers (the retailers)? Why?
- 1-12. You are considering lending a car to a friend so she can drive to Aspen. What costs would you ask her to reimburse? How would your answer change, if at all, if you decided to go along? Identify the possible options and explain your choices.
- 1-13. How does cost accounting help determine an organization's strategy? What problems might arise from a faulty cost accounting system?
- 1-14. Would you support a proposal to develop a set of "generally accepted" accounting standards for measuring executive performance that would be used to determine compensation? Why or why not?
- 1-15. How would cost accounting information help managers in a not-for-profit organization? Is it as important as in a publicly traded, for-profit firm?
- 1-16. Goodyear Tire and Rubber Company manufactures a well-known automotive tire. They are produced in Goodyear plants and sold to consumers in many outlets including auto parts retail chains such as Pep Boys. Both Goodyear and Pep Boys need to calculate the cost of a tire for, among other things, determining the cost of goods sold and inventory balances for financial statements. What are some important differences in determining the cost of tires for the two companies?
- 1-17. Hostess Brands makes a variety of baked goods just like The AM Bakery. In what ways are the cost accounting issues the same? In what ways are they different?
- 1-18. What potential conflicts might arise between marketing managers and the controller's staff? How might these potential conflicts be resolved with a minimum of interference from the chief executive officer?
- 1-19. Refer to the Business Application discussion of supply chain costs. A colleague says, "We don't have to worry about other firms in the supply chain. If every firm in the chain minimizes its own cost, we can minimize the total cost and give the customer the best value." Do you agree?
- 1-20. Refer to the Business Application discussion of accounting choices. In the case of Tesco, managers made choices about the timing of revenues and expenses that led to fraud charges. In order to avoid that, perhaps accountants should always assume the worst-case outcome. Then they will not be accused of misleading investors. What do you think about this approach?
- 1-21. Why does a cost accountant need to be familiar with new developments in information technology?
- 1-22. Will studying cost accounting increase the chances that The AM Bakery will succeed? How? Will it guarantee success? Explain.
- 1-23. Many companies, especially in the travel industry (airlines, hotels, and so on), have so-called loyalty programs offering members benefits that depend on the frequency of purchases, miles traveled, or amount of money spent, among other measures. One example is an upgrade to a better seat or to a better room for the same price as a regular seat or regular room. Such upgrades are generally based on availability, meaning the hotel or airline does not believe it will sell the room or seat. What, if anything, does such an upgrade cost the hotel or airline? Would these costs show up in the accounting records? Explain.

**EXERCISES****connect**

All applicable Exercises are included in Connect.

**(LO 1-1)****1-24. Value Chain and Classification of Costs**

Pfizer Inc., a pharmaceutical firm, incurs many types of costs in its operations.

**Required**

For each cost in the following table, identify the stage in the value chain where this cost is incurred.

Cost	Stage in the Value Chain
____ Salaries for employees to develop most efficient dropper to administer drug	1. Customer service
____ Cost of chemicals to make the drug	2. Design
____ Cost to visit doctors to explain the value of the drug	3. Research and development
____ Expenses to deliver products to customers	4. Marketing
____ Laboratory experiments to evaluate drug effectiveness	5. Production
____ Employee costs to work with hospitals to ensure adequate supplies	6. Distribution

**(LO 1-1)****1-25. Value Chain and Classification of Costs**

Tesla, Inc., incurs many types of costs in its automobile operations.

**Required**

For each cost in the following table, identify the stage in the value chain where this cost is incurred.

Cost	Stage in the Value Chain
____ Engineering cost to develop optimal batteries	1. Production
____ Costs for employees to develop grill logo	2. Customer service
____ Costs to assemble cars	3. Design
____ Costs to attend the Detroit Auto Show	4. Marketing
____ Costs to ship cars to sales centers for customer delivery	5. Distribution
____ Call center to handle maintenance calls from customers with problems on the road	6. Research and development

**(LO 1-1)****1-26. Supply Chain and Supply Chain Costs**

Marquette Company manufactures and sells kits that homeowners can buy and assemble into office and home furniture.

Marquette and one of its customers, Goulburn Furnishings, have a dispute about inventory. Goulburn orders 100,000 units annually of one of the desk models sold by Marquette. Because demand fluctuates, Goulburn wants Marquette to keep a six-week inventory for unexpected demand. Marquette operates with a zero-inventory policy as a way of remaining competitive, though it has never been able to completely avoid holding inventory.

After an analysis of costs, you determine that inventory storage costs per kit are \$25 at Marquette and \$10 at Goulburn.

**Required**

How do you suggest the two companies settle their dispute?

**(LO 1-2)****1-27. Accounting Systems**

Five Below is a discount retailer.

**Required**

For each of the following decisions, indicate whether the decision maker would be more likely to get information from the financial (F) or cost (C) accounting system of Five Below (in addition, perhaps, to other information).

- A retailing competitor wants to compare her company's financial performance to Five Below.
- A labor organization representing workers at Five Below stores is deciding whether Five Below is profitable enough to negotiate for pay raises.
- An advertising manager at Five Below is deciding what media to use for commercials based on the profitability of different demographic groups.
- A marketing manager at Five Below is trying to determine whether to enter a new geographic location.
- An investor is deciding whether to purchase stock in Five Below.

**1-28. Accounting Systems**

John Deere Company manufactures farm equipment. Managers at assembly plants must make many decisions, and for this, they use cost accounting information.

**Required**

For each of the following managers, identify a decision that they might make for which cost accounting data would be useful:

- Quality supervisor
- Purchasing manager
- Personnel manager
- Maintenance supervisor
- Plant manager

(LO 1-2)

**1-29. Cost Data for Managerial Purposes**

As an analyst at Delta Air Lines, you are asked to help the operations staff. Operations has identified a new method of loading baggage that is expected to result in a 30 percent reduction in labor time but no changes in any other costs. The current labor cost to load bags is \$2 per bag. Other costs are \$1 per bag.

**Required**

- What differential costs should the operations staff consider for the decision to use the new method next year? What would be the cost savings per bag using it?
- Describe how management would use the information in requirement (a) and any other appropriate information to proceed with the contemplated use of the new baggage loading method.

(LO 1-3)

**1-30. Cost Data for Managerial Purposes**

Lessing Toy and Hobby (LTH) is a chain of hobby and craft stores in the Southeast. LTH operates multiple stores and is organized into two divisions: Northern and Southern. Individual stores are placed in one or the other division based on geography. Recent demographic changes in the Northern Division area have led to declining foot traffic and sales in the LTH stores. Senior corporate executives have been asking whether the chain should close those stores and focus on the stores in the Southern Division. The most recent income statement for the Northern Division follows.

(LO 1-3)

**LESSING TOY & HOBBY**  
**Northern Division**  
**For the Year Ending January 31**  
**(\$000)**

Sales revenue .....	\$12,040
Costs	
Cost of goods sold .....	\$ 6,020
Advertising .....	490
Administrative salaries .....	810
Sales commissions .....	1,624
Rent and occupancy expense .....	2,058
Allocated corporate support .....	1,330
Total costs .....	\$12,332
Net loss before tax benefit .....	\$ (292)
Tax benefit at 25% .....	(73)
Net loss .....	\$ (219)

The CEO has asked for your thoughts on the decision to close the Northern Division stores. If the Northern Division is eliminated and the stores closed, neither total corporate support costs nor operations or costs of the Southern Division stores are expected to change.

**Required**

What revenues and costs are probably differential for the decision to close the Northern Division stores? What will be the effect on LTH's income if the Northern Division stores are closed? Is there any other information you would like to have before making your recommendation?

(LO 1-3)

**1-31. Cost Data for Managerial Purposes**

Swain Athletic Gear (SAG) operates six retail outlets in a large Midwest city. One is in center city on Cornwall Street and the others are scattered around the perimeter of the city. Management at SAG is concerned about declining sales and profitability of the Cornwall store and believes that outlet has been a drag on profits in recent years. The most recent income statement for the Cornwall store follows.

**SWAIN ATHLETIC GEAR**  
**Cornwall Street Store Income Statement**  
**For the Year Ending February 28**

Sales revenue.....	\$12,300,000
Costs	
Cost of goods sold .....	\$ 5,289,000
Advertising.....	1,421,000
Store administrative salaries .....	975,000
Sales commissions .....	1,056,000
Leases and utilities.....	2,100,000
Allocated corporate support .....	1,622,000
Total costs .....	<u>\$12,463,000</u>
Net loss before tax benefit.....	\$ (163,000)
Tax benefit at 25% .....	<u>(40,750)</u>
Net loss.....	<u>\$ (122,250)</u>

The CFO at SAG has asked for your advice on closing the Cornwall Street store. If the Cornwall Street store is closed, neither total corporate support costs nor operations or costs of the other stores are expected to change.

**Required**

What revenues and costs are probably differential for the decision to close the Cornwall Street store? What will be the effect on SAG's income if the Cornwall Street store is closed? Is there any other information you would like to have before making your recommendation?

(LO 1-3)

**1-32. Cost Data for Managerial Purposes**

One of the major activities of the City Art Museum (CAM) is a Neighborhood Outreach Program, which was developed both as a public service and to market the museum and its other programs. One of the Outreach offerings, which is popular with both city and suburban residents, is the weekly Evening Lecture Series. The Series provides lectures on local art and history in various locations throughout the greater metropolitan area.

**CITY ART MUSEUM**  
**Neighborhood Outreach: Evening Lecture Series**  
**For the Year Ending June 30**

Sales revenue.....	\$386,000
Costs	
Advertising.....	\$ 15,000
Lecturer fees and expenses .....	195,000
Operating costs (staff).....	26,000
Space rental .....	12,000
Food and beverage expenses.....	25,000
Allocated museum overhead .....	143,000
Total costs .....	<u>\$416,000</u>
Net loss.....	<u>(\$ 30,000)</u>



A new museum director has been hired with the goal to make the museum more self-sustaining and less reliant on donations and government grants. One of the director's first actions was to ask the museum staff to put together detailed financial information on the individual activities. The result, shown in the accompanying table, indicates that the series operates at a loss.

The director is considering canceling the program if the loss cannot be eliminated. After discussions with various staff, the director concludes that raising the fees for attending the lectures is not possible given current economic conditions in the area. The director has asked you for your recommendation.

If the Series is cancelled, the total museum overhead is not expected to change. However, the other costs, which are directly related to the program (lecturer fees, space rental, and so on) would be saved. Dropping the Series will not affect the costs or operations of any of the other Outreach programs.

#### **Required**

What revenues and costs are probably differential for the decision to drop the Evening Lecture Series? What will be the net effect on the museum's contribution (profit) if the Series is cancelled? Is there any other information you would like before making your recommendation for the director?

#### **1-33. Cost Data for Managerial Purposes**

Refer to the information in Exercise 1-32. The museum director is considering a proposal by the head of the Neighborhood Outreach Program to keep the Evening Lecture Series but expand it by offering a Weekend Lecture Series as well. The Weekend Series would be offered in a single location downtown near the museum itself.

The program head estimates that the attendance of the combined Series (Evening and Weekend) would be double that of the current Evening Series. The revenue of the combined Series would be 90 percent higher because of some price discounts that would be offered. Because the Weekend Series would be new, a more intensive advertising campaign would be required. The director estimates that advertising costs for the combined Series would be 150 percent higher than their current level. Lecturer fees and expenses will increase by only 75 percent because of the larger rooms used on the weekend. Staff operating costs will increase by 25 percent. Rental costs for the Weekend Series will be \$12,000 annually. Total food and beverage costs will increase by 60 percent with the new Series. The larger program will require an increase in museum overhead of \$8,000. Allocated museum overhead for the combined Series will be \$35,000 annually.

#### **Required**

- Given these estimates, what will the contribution of the expanded lecture series be?
- Are there other factors the director should consider before making a decision?

#### **1-34. Cost Data for Managerial Purposes—Budgeting**

Refer to Exhibit 1.6, which shows budgeted versus actual costs. Assume that The AM Bakery is preparing a budget for the month ending October 31. Management prepares the budget by starting with the *actual* results for August 31 that appear in Exhibit 1.6. Next, management considers what the differences in costs will be between August and October.

Management expects revenue in October to be 20 percent more than in August, and it expects all ingredient costs (e.g., flour, butter, and so on) to be 20 percent higher in October than in August. Management expects "other" labor costs to be 25 percent higher in October than in August, partly because more labor will be required in October and partly because employees will receive a pay raise. The manager will receive a pay raise that will increase his salary from \$4,500 in August to \$5,000 in October. Rent, utilities, and marketing costs are not expected to change.

#### **Required**

Prepare a budget for The AM Bakery for October.

#### **1-35. Cost Data for Managerial Purposes—Budgeting**

Refer to the information in Exercise 1-30. The managers of Lessing Toy & Hobby (LTH) have decided to keep the stores in the Northern Division open, in spite of the dwindling demand in the area. They want to forecast what the income will be in the coming year, using the income statement in Exercise 1-30 as the base. The cost analyst at LTH estimates sales in the coming year will only be 85 percent of the current year sales. Cost of goods sold is estimated to be 90 percent of the current year. The managers have decided to increase advertising next year by 10 percent above the current year, but will cut administrative salaries in the Northern Division by 30 percent. They also expect to lower rent and occupancy costs by 15 percent. Allocated corporate overhead, based on information from the CFO, is expected to be \$1.2 million.

(LO 1-3)

(LO 1-3)

(LO 1-3)