

Chapter 2

Building Blocks of Managerial Accounting

LEARNING OBJECTIVES:

When your students have finished studying this chapter, they should be able to:

1. Distinguish among service, merchandising, and manufacturing companies.
2. Describe the value chain and its elements.
3. Distinguish between direct and indirect costs.
4. Identify the inventoriable product costs and period costs of merchandising and manufacturing firms.
5. Prepare the financial statements for service, merchandising, and manufacturing companies.
6. Describe costs that are relevant and irrelevant for decision making.
7. Classify costs as fixed or variable and calculate total and average costs at different volumes.

OVERVIEW

This chapter examines different cost classifications. Managers and management accountants need to have a common understanding of concepts to ensure the right type of information is provided for the decision being made. They must have a clear understanding of the situation and the types of costs that are relevant.

Section One: Distinguishes the three types of sectors: service, manufacturing and merchandising. The handling of inventories and costs for both merchandising and manufacturing firms are covered (product and period costs). The three levels of inventory of manufacturers are identified.

Section Two: Describes the different components of the value chain and how these components are coordinated.

Section Three: Describes a cost object and distinguishes between indirect and direct costs explaining the difference between traced and allocated. Also, describes factors influencing costs.

Section Four: Describes the three manufacturing cost categories, Direct Materials, Direct Labour and Factory Overhead. Prime costs and Conversion costs are defined and explained.

- Section Five:** Describes and explains product and period costs for the preparation of financial statements. This section also demonstrates the flow of costs through inventory accounts facilitated by preparation of the schedule of cost of goods manufactured.
- Section Six:** Defines relevance and provides examples of when costs are relevant for decision making. Sunk costs are also presented.
- Section Seven:** The behavior of variable and fixed costs is discussed. Variable costs change in proportion to changes in the cost driver, whereas fixed costs in total are unaffected by cost-driver activity.

CHAPTER 2: OUTLINE

1. Distinguish among service, merchandising, and manufacturing companies. {LO. 1}

Service

- in business to sell intangible services
- Generally, do not have inventory. If there is inventory it is generally for supplies and used in operations (not to make profit).
- Example: health care, insurance, banking, consulting

Merchandising

- resell tangible products they buy from suppliers.
- Wholesalers: buy products in bulk from manufacturers, mark up the prices and then sell these products to retailers.
- Retailers: buys products from their suppliers and sells them to consumers (i.e. you and me)
- They have inventory

Manufacturing

- use labour, plant, and equipment to convert raw materials into new finished products.
- Typically sell products to retailers or wholesalers at a price that is high enough to cover their costs and generate a profit.

While merchandising companies have a single inventory item (finished goods inventory) listed on their balance sheets, manufacturing companies have the following categories:

Direct-Materials Inventory – materials on hand and awaiting use in the production process.

Work-In-Process Inventory – goods undergoing the production process but not yet fully completed. Costs include appropriate amounts of the three major manufacturing costs (i.e., direct material, direct labor, and factory overhead).

Finished-Goods Inventory – goods fully completed but not yet sold.

TEACHING TIPS: {LO1}

TIP #1:Exhibit 2-2 provides a summary of the three types of companies, provides examples of each, and indicates the type of inventory they have.

TIP# 2:Students need to understand that manufacturing companies have a broad range of production activities that require tracking in three kinds of inventory: raw materials (RM), work in process (WIP), and finished goods (FG). Students should understand that all three of these inventories are assets.

TIP #3:Have students work in teams or with a partner and complete **E2-33B Identify types of companies and their inventories** (5 minutes). Call on a student to report the answers.

2. Describe the value chain and its elements. {LO. 2}

- a. Research and development - researching and developing new or improved products or services and the processes for producing them.
- b. Design – detailed engineering of products and services and the processes for producing them.
- c. Production or purchases – resources used to produce a product or service or to purchase finished merchandise intended for resale.
- d. Marketing – promotion and advertising of products or services.
- e. Distribution – delivery of products or services to consumers.
- f. Customer service – support provided for customers after sale.

Coordinating activities across the value chain

Most of the value chain activities occur in the above order. However, each element is not worked on independently without considering other elements. For example, managers consider the customer service they are able to provide to customers and how the product could be marketed in the R & D phase.

3. Distinguish between direct and indirect costs. {LO. 3}

Cost - a sacrifice or giving up of resources for a particular purpose.

Cost Object - is something for which managers want a separate measurement of the cost of (e.g., a product, a department, a sales region, a program, or something else for which decisions are made).

Direct Costs – a cost that can be easily traced to the cost object; identified specifically and exclusively with a given cost objective in an economically feasible way.

Indirect Costs - not identified specifically and exclusively with a given cost objective in an economically feasible way

Managers prefer to classify many costs as direct whenever it is "economically feasible" because it gives them greater confidence in their costs of products and services (i.e., less subjectivity). A particular cost can be direct for one cost objective but indirect for others.

TEACHING TIPS {LO 3}

TIP #1 Determining if costs are direct or indirect depends on the cost object. Use Exhibit 2-4 to demonstrate this concept. Also consider the following example: ABC Entertainment Store sells DVD's and CD's. The store subscribes to a monthly DVD magazine which discusses the most current titles. If the cost object is the entire DVD product line, the cost of the magazine subscription can be classified as a direct cost. However, if the cost object is a single DVD (pick a current popular movie to explain to students), the magazine subscription cost can no longer be directly traced to that single DVD. It would be classified as an indirect cost of the single DVD.

4. Identify the inventoriable product costs and period costs of merchandising and manufacturing firms. {LO. 4}

Direct-Materials Costs – the primary raw materials that are physically identified as a part of the finished product and that may be traced to the manufactured goods in an economically feasible way.

Direct-Labour Costs - the cost of compensating employees who physically convert raw materials into the finished product; the labor costs that can be traced specifically and exclusively to the manufactured goods in an economically feasible way

Manufacturing Overhead Costs (Indirect Manufacturing Costs or Manufacturing Overhead) - include all costs other than direct material or direct labor that are associated with the manufacturing process (e.g., power, supplies, indirect labor, supervisory salaries, property taxes, rent, insurance, and depreciation); has three components: indirect materials, indirect labour, and other indirect manufacturing costs.

Product Costs - costs (e.g., direct materials, direct labor, and factory overhead) initially identified with goods produced or purchased for resale (i.e., inventory) and become expenses (i.e., cost of goods sold) only when the inventory is sold.

Period Costs - costs (called operating expenses, or selling, general and administration expenses) that are deducted as expenses during the current period without going through the inventory stage.

Prime costs – include Direct Materials Costs and Direct Labour Costs.

Conversion costs - include Direct Labour Costs and Manufacturing Overhead Costs.

TEACHING TIPS: {LO4}

TIP #1:EXHIBIT 2-6 depicts total costs, inventoriable product costs, and period costs.

TIP #2:EXHIBIT 2-9 summarizes the accounting treatment for inventoriable and period costs for each type of sector. Note that manufacturing companies have three categories of product costs while only one is present for merchandisers.

TIP #3:Break down manufacturing overhead into three sub-categories to help students remember what types of costs are classified as overhead. The following subcategories can be used: (1) indirect materials (i.e. lubricant for machines), (2) indirect labor (i.e. factory supervisor), and (3) other (all other costs needed to run the factory such as power).

TIP #4:After discussing product costs (DM, DL, MOH), period costs, prime costs and conversion costs, have students complete **E2-37B Classify and calculate a manufacturer's costs** (10 minutes) in teams and report their answers.

5. Prepare the financial statements for service, merchandising, and manufacturing companies. {LO. 5}

- a. Service company – simplest income statement as they do not sell products, thus there is no cost of goods sold.
- b. Merchandising companies – income statement includes cost of goods sold (CoGS), which is generally the largest cost on the income statement. Cost of goods sold is the cost of the the products that the company purchases from its suppliers.

Cost of goods sold = beginning finished goods inventory + purchases – ending inventory

- c. Manufacturing companies – income statement includes cost of goods sold, however the calculation is different from a merchandising firm as a manufacturing company makes their goods instead of buying them. Before the company can determine the cost of products sold (to include on the income statement), they must first determine the cost of all the finished products during the period, referred to as cost of goods manufactured.

- i. Cost of goods manufactured (CoGM) – summarizes the cost of activities that take place in a manufacturing plant over the period.

CoGM = direct materials used + direct labor + manufacturing overhead + beginning work in process – ending work in process

Essentially, CoGM is the cost of all the products that left the production factory during the period and were transferred to the finished goods warehouse (or retail store).

CoGS = beginning finished goods inventory + CoGM – ending finished goods inventory

Typically, manufacturing and merchandising companies treat selling and administrative expenses in the same manner, but the detail of COGS differs.

- ii. Flow of costs through inventory accounts – all product costs (raw materials, direct labor, and manufacturing overhead) of a manufacturing company flow from the balance sheet (through inventory accounts) and eventually are expensed on the income statement once the goods are sold (expensed as cost of goods sold).
- d. Balance sheet comparisons - while merchandising companies have a single inventory item listed on their balance sheets, manufacturing companies have three (raw materials, work in progress, finished goods)

TEACHING TIPS: {LO5}

- TIP #1:** Students can never review too many financial statements. The coverage of the management accountant's role in service, merchandising and manufacturing companies is a great time to review the income statement. This can be done by reviewing **Exhibits 2-11, 2-12, and 2-13** and by contrasting the differences. Emphasize the logical flow of all three types of income statements.
- TIP #2:** The schedule of cost of goods manufactured summarizes the activities that take place in a manufacturing plant over the period (Exhibit 2-15). Emphasize that the schedule of cost of goods manufactured must be prepared before the income statement as it's needed to compute cost of goods sold for a manufacturer (Exhibit 2-13). Work through an example (E2-26A) of a schedule and the cost of goods sold calculation on the board. When presenting the CoGM Schedule, break it down into four parts to help students remember the sections needed (1. Direct materials, 2. Direct Labor, 3. Factory Overhead and 4. Analysis of WIP Inventory accounts).
- TIP #3:** Use **Exhibits 2-14 and 2-16** to explain the logical flow of costs in a manufacturing environment. Point out that the first two inventories (RM and WIP) show up on the schedule, while the third inventory (FG) shows up on the income statement (as part of the cost of goods sold calculation). It may be helpful to show the flow of costs through use of T-accounts (rather than using numbers, write descriptions in the T-account). This will set a good foundation when journal entries for a manufacturing company are presented in the chapter on job-costing.

6. Describe costs that are relevant and irrelevant for decision making. {LO 6}

Controllable vs. uncontrollable costs

Controllable – management is able to influence or change them.

Uncontrollable – costs that are “locked in” due to previous decisions.

Relevant and irrelevant costs

Relevant information is the predicted future costs and revenues that will differ among alternatives. Although past data may be helpful in predicting future costs and revenues, past data is irrelevant in making future decisions.

- i. Differential cost – difference in cost between two alternatives (relevant cost).
- ii. Sunk cost – costs that have already been incurred. Future decisions cannot change past costs. Thus, sunk costs are classified as irrelevant and not considered in decision making.

7. Classify costs as fixed or variable and calculate total and average costs at different volumes. {LO. 7}

Variable and fixed costs refer to how cost behaves with respect to changes in a particular cost driver.

Fixed Costs:

- stay constant in total over a wide range of activity levels.
- Examples include real estate taxes, real estate insurance, many executive salaries, and space rentals.
- See **EXHIBIT 2-19** for a graph of fixed cost behavior within the relevant range.

Variable Costs:

- a cost that changes in direct proportion to changes in the cost driver. Each unit costs the same, however, as activity increases, total cost increases.
- Examples include the costs of materials, merchandise, parts, supplies, commissions, and many types of labor.
- See **EXHIBIT 2-20** for a graph of variable cost behavior within a relevant range.

Relevant Range - the limits (i.e. time period and/or activity) of cost-driver activity within which a specific relationship between costs and the cost driver is valid.

TEACHING TIPS {LO7}:

TIP #1: Describe variable and fixed costs with an example familiar to students. You can use the costs required to operate their vehicle. Explain how each liter of gas costs the same, however, the more kilometers driven, their total cost of gas will increase (given the same price of gas). The cost of gas is considered a variable cost. On the other hand, their insurance company provides a yearly insurance rate. Regardless of whether they drive 10km, 100km or 1000km, the cost of insurance stays constant, making it a fixed cost.

TIP #2: Explain the concept of relevant range and fixed costs. For example, a clothing manufacturing company, has the capacity to make 1000 shirts each month. The relevant range for cost classification is 0 to 1000 shirts. In this range, fixed costs remain constant. However, if the company wants to double production, they will need to purchase more sewing machines and have to rent a bigger factory. Once the company operates outside the relevant range, total fixed costs will increase.

TIP #3: Use the following chart to summarize variable and fixed costs. The understanding and ability to differentiate between these costs will remain crucial for subsequent topics.

Cost	In Total	Per Unit
Fixed Cost	Remains Constant regardless of activity	Inverse relationship with activity (decreases as activity increases)
Variable Cost	Increases as activity increases	Remains Constant

CHAPTER 2: STUDENT SUMMARY HANDOUT

1. The three most common types of companies
 - a. Service
 - b. Merchandising
 - i. Retailers
 - ii. Wholesalers
 - c. Manufacturing
 - i. Raw materials
 - ii. Work in process
 - iii. Finished goods
2. Value Chain
 - a. Research and Development
 - b. Design
 - c. Production or Purchases
 - d. Marketing
 - e. Distribution
 - f. Customer Service
3. Cost Objects
 - a. Direct Costs
 - b. Indirect Costs
4. Costs for internal decision making and external reporting
 - a. Total costs for internal decision making
 - b. Inventoriable product costs for external reporting
 - i. Specified inventoriable costs
 - ii. Period costs (operating expenses)
5. Inventoriable Product Costs for Merchandising Companies
 - a. Cost of the merchandise itself
 - b. Freight-in and any import duties
6. Inventoriable Product Costs for Manufacturing Companies
 - a. Direct Materials
 - b. Direct Labour
 - c. Manufacturing Overhead
 - i. Indirect materials
 - ii. Indirect labour
 - iii. Other indirect manufacturing costs
 - d. Prime and Conversion costs
 - e. Additional labour compensation costs

- 7. Income Statements
 - a. Service Companies
 - b. Merchandising Companies
 - c. Manufacturing Companies
 - i. Calculating Cost of Goods Manufactured
 - ii. Flow of costs through the accounts
- 8. Comparing Balance Sheets
- 9. Other Cost Terms
 - a. Controllable versus uncontrollable costs
 - b. Relevant and irrelevant costs
 - c. Fixed and variable costs
 - d. Calculating total and average costs

CHAPTER 2: ASSIGNMENT GRID

Assignment	Topic(s)	Learning Objective(s)	Estimated Time in Minutes(s)	Level of Difficulty	Available in Excel Templates
<i>Short Exercises</i>					
S2-1	Identify type of company from balance	1	5	Easy	
S2-2	Identify types of companies & inventories	1	5	Easy	
S2-3	Label value chain functions	2	5	Easy	
S2-4	Classify costs by value chain	2	5	Easy	
S2-5	Classify costs as either direct or indirect	3	5	Easy	
S2-6	Classify inventoriable product costs and period costs	4	5	Easy	
S2-7	Classify a manufacturer's cost	4	5	Easy	
S2-8	Classify costs incurred by a dairy processing company	4	5	Easy	
S2-9	Determine total manufacturing overhead	4	5	Easy	
S2-10	Compute Cost of Goods Sold for a merchandiser	5	5	Easy	
S2-11	Prepare a retailer's income statement	5	5	Easy	
S2-12	Calculate direct materials used	5	5	Easy	
S2-13	Compute Cost of Goods Manufactured	5	5	Easy	
S2-14	Consider relevant information	6	5	Easy	
S2-15	Classify costs as fixed or variable	7	5	Easy	
<i>Exercises (Set)</i>					
E2-16A	Identify types of companies and their inventories	1	5	Easy	
E2-17A	Classify costs along the value chain for a retailer	2	10	Easy	
E2-19A	Classify costs along the value chain for a	2 & 3	10	Easy	

Assignment	Topic(s)	Learning Objective(s)	Estimated Time in Minutes(s)	Level of Difficulty	Available in Excel Templates
	manufacturer				
E2-20A	Classify costs as direct or indirect	3	5	Easy	X
E2-21A	Define cost terms	3 & 4	10	Easy	
E2-22A	Classify and calculate a manufacturer's costs	3 & 4	10	Easy	
E2-23A	Prepare the current assets section of the balance sheet	5	10	Medium	X
E2-24A	Prepare a retailer's income statement	5	10	Medium	X
E2-25A	Compute direct materials used and cost of goods manufactured	5	10	Medium	
E2-26A	Compute cost of goods manufactured and cost of goods sold	5	10	Medium	
E2-27A	Continues E2-26A: Prepare income statement	5	10	Medium	
E2-28A	Work backwards to find missing amounts	5	10	Medium	
E2-29A	Determine whether information is relevant	6	5	Easy	
E2-30A	Describe other cost terms	6 & 7	5	Easy	
E2-31A	Classify costs as fixed or variable	7	10	Medium	X
E2-32A	Compute total and average costs	7	10	Medium	
Exercises (Set)					
E2-33B	Identify types of companies and their inventories	1	5	Easy	
E2-34B	Classify costs along the value chain for a retailer	2	10	Easy	
E2-36B	Classify costs along the value chain for a manufacturer	2 & 3	10	Easy	
E2-37B	Classify costs as direct or indirect	3	5	Easy	
E2-38B	Define cost terms	3 & 4	10	Easy	
E2-39B	Classify and calculate a manufacturer's costs	3 & 4	10	Easy	

E2-40B	Prepare the current assets section of the balance sheet	5	10	Medium	
E2-41B	Prepare a retailer's income statement	5	10	Medium	
E2-42B	Compute direct materials used and cost of goods manufactured	5	10	Medium	
E2-43B	Compute cost of goods manufactured and cost of goods sold	5	10	Medium	
E2-44B	Continues E2-43B: Prepare income statement	5	10	Medium	
E2-45B	Work backwards to find missing amounts	5	10	Medium	
E2-46B	Determine whether information is relevant	6	5	Easy	
E2-47B	Describe other cost terms	6 & 7	5	Easy	
E2-48B	Classify costs as fixed or variable	7	10	Medium	
E2-49B	Compute total and average costs	7	10	Medium	
Problems (Set)					
P2-50A	Classify costs along the value chain	2 & 4	10	Medium	
P2-51A	Prepare income statements	5	10	Difficult	
P2-52A	Fill in missing amounts	5	15	Medium	
P2-53A	Identify relevant information	6	15-20	Difficult	
P2-54A	Calculate the total and average costs	7	15	Difficult	
Problems (Set)					
P2-55B	Classify costs along the value chain	2 & 4	10	Medium	
P2-56B	Prepare income statements	5	10	Difficult	

Assignment	Topic(s)	Learning Objective(s)	Estimated Time in Minutes(s)	Level of Difficulty	Available in Excel Templates
P2-57B	Fill in missing amounts	5	15	Medium	
P2-58B	Identify relevant information	6	15-20	Difficult	
P2-59B	Calculate the total and average costs	7	15	Difficult	
Other					
Decision Case	Determine ending inventory balances	5	15	Medium	
Discussion and Analysis		All	60	Medium	
Application and Analysis		All	30-60	Medium	

Name

Date

Section

CHAPTER 2 TEN-MINUTE QUIZ

Circle the letter of the best response.

1. A portion of a company's inventory is shown below:

Sales		\$350,000
Cost of Goods Sold:		
Beginning Inventory	\$ 15,000	
Purchases	<u>250,000</u>	
Cost of Goods Available for Sale	<u>265,000</u>	
Less: Ending Inventory	<u>13,000</u>	
Cost of Goods Sold		<u>252,000</u>
Gross Profit		<u>\$ 98,000</u>

What type of company is illustrated?

- A. Service Corporation
 - B. Merchandising Corporation
 - C. Manufacturing Corporation
 - D. Not-for-profit Corporation
2. Which of the following is NOT a value chain activity?
- A. Research & Development
 - B. Production
 - C. Distribution
 - D. Quality Control
3. Which of the following is a direct cost in the production of tire jacks for a machine shop?
- A. Utilities
 - B. Taxes
 - C. Steel
 - D. Rent
4. Which of the following is an indirect cost in the construction cost of a home for a building company?
- A. Insurance
 - B. Paint
 - C. Lumber
 - D. Carpeting

5. Which of the following companies has all costs along the value chain accounted for as period costs?
 - A. Service Corporation
 - B. Merchandising Corporation
 - C. Manufacturing Corporation
 - D. None of the above
6. A manufacturer would treat direct materials, direct labour, and overhead as:
 - A. inventoriable product costs.
 - B. period costs.
 - C. both inventoriable product and period costs.
 - D. neither inventoriable product nor period costs.
7. Which of the following is NOT a relevant cost when buying new manufacturing equipment?
 - A. Sales tax
 - B. Cost of machine being replaced
 - C. Purchase price
 - D. Insurance on the machine
8. Which of the following is a fixed cost for a plant that manufactures iPods?
 - A. Plastic used to make the cases
 - B. Employee wages for assembly
 - C. Computer chip used in each iPod
 - D. Straight-line depreciation on stamping machine used to form iPod cases
9. Which of the following is a variable cost for a plant that manufactures iPods?
 - A. Advertising costs
 - B. Salary of payroll clerk
 - C. Straight line depreciation of warehouse building
 - D. Wire used for the headphones
10. Rocketspray's manufacturing costs for July are:
 - * Materials cost: \$4,000
 - * Labour cost: \$3,200
 - * Overhead: \$800
 - A. \$3
 - B. \$5
 - C. \$20
 - D. \$24

If Rocketspray's one plant employee manufactured 10 bottles per hour, and worked 8 hours per day for 20 days in July, what is the cost per bottle?

ANSWER KEY TO CHAPTER 2 QUIZ

1. B
2. D
3. C
4. A
5. A
6. A
7. B
8. D
9. D
10. B