Chapter 2
Cost Concepts and Behavior

Learning Objectives

1. Explain the basic concept of "cost."
2. Explain how costs are presented in financial statements.
3. Explain the process of cost allocation.
4. Understand how material, labor, and overhead costs are added to a product at each stage of the production process.
5. Define basic cost behaviors, including fixed, variable, semivariable, and step costs.
6. Identify the components of a product's costs.
7. Understand the distinction between financial and contribution margin income statements.

Chapter Outline

I. WHAT IS A COST?
- ♦ Cost versus expenses

II. PRESENTATION OF COSTS IN FINANCIAL STATEMENTS
- A. Service organizations
- B. Retail and wholesale companies
- C. Manufacturing companies
- D. Direct and indirect manufacturing (product) costs
- E. Prime costs and conversion costs
- F. Nonmanufacturing (period) costs

III. COST ALLOCATION
- ♦ Direct versus indirect costs

IV. DETAILS OF MANUFACTURING COST FLOWS

V. HOW COSTS FLOW THROUGH THE STATEMENTS
- A. Income statements
- B. Cost of goods manufactured and sold
- C. Direct materials
- D. Work in process
- E. Finished goods inventory
- F. Cost of goods manufactured and sold statement

VI. COST BEHAVIOR
- ♦ Fixed versus variable costs

VII. COMPONENTS OF PRODUCT COSTS
- ♦ Unit fixed costs can be misleading for decision making

VIII. HOW TO MAKE COST INFORMATION MORE USEFUL FOR MANAGERS
- A. Gross margin versus contribution margin income statements
- B. Developing financial statements for decision making

IX. SUMMARY

Key Concepts

LO1 Explain the basic concept of "cost."

♦ The cost accounting system records and maintains the use of economic resources by the organization.

• The financial statements prepared by the firm for external reporting use information from the cost accounting system.

• Cost accounting systems also provide information to help managers make better decisions. Managers need to understand the common terms ("the language") used in cost accounting.

• A case in point is the calculation of product cost of e-books vs. paper books (see In Action box for information).

♦ **Cost** represents a sacrifice of resources (typically cash or a line of credit). The price of each item purchased measures the sacrifice made to acquire it.

• Cost may be recorded as an asset (such as prepaid rent for an office space) or an expense (such as phone bills). Some costs may never be recorded (such as lost sales) in the financial accounting system.

• **Expense** is a cost charged against (i.e., deducted from) revenue in an accounting period.

• Cost initially recorded as an asset becomes an expense when the asset has been consumed (e.g., the prepaid rent becomes rent expense after the office space has been used for a period of time). Generally accepted accounting principles (GAAP) and regulations such as tax laws govern when and how costs are to be treated as expenses.

• Cost accounting focuses on costs; expenses are referred to only in the context of external financial reporting (in this text).

• The two major categories of costs are

(1) Outlay cost: a past, present, or future cash outflow, such as tuition, books, and fees paid for a college education, and

(2) Opportunity cost: the foregone benefit from the best (forgone) alternative course of action, such as the time and income sacrificed to get a college education.

Example 1: A developer plans to buy a parcel of land and construct an office building on top of it. He narrows his search to four possible lots in adjacent states with convenient access to highways. The expected returns from Lots A, B, C and D are, $120,000, $190,000, $160,000, $210,000, respectively.

The developer chooses to buy Lot D in the hope of realizing the highest return from the money invested. The opportunity cost of the decision is the best alternative foregone, $190,000 from Lot B.

• Managers tend to overlook or ignore opportunity costs while making decisions because

(1) It is difficult to consider all alternatives, and
(2) Typical accounting system only records outlay costs but not opportunity costs,

• Opportunity costs are relevant for managerial decisions and should be captured in a well-designed cost accounting system.

LO2 Explain how costs are presented in financial statements.

♦ Information generated by the cost accounting system is used to help managers make decisions that improve firm value. It is a means to an end.

• Such information is best (in terms of relevancy) for various decisions but not necessarily most accurate.

• How the cost information is used in decision making and the costs of preparing and using such information should also be considered.

♦ **Operating profit** is the excess of operating revenues over the operating costs necessary to generate those revenues.

• Operating costs consist of

(1) Cost of goods (or services) sold, whose format varies with different types of business under consideration, and
(2) Marketing and administrative costs. Marketing costs include the salaries of salespeople while administrative costs include the salaries of top executives.

• Gross margin is the difference between revenues and cost of goods (or services) sold.

• Operating profit adjusted for interest, income taxes, extraordinary items, and other adjustments determines net income, in compliance with GAAP or other regulations.

• A typical income statement has the following format:

Company name
Income statement
The period of time covered

Sales revenue	xx
Less: Cost of goods (or services) sold	(xx)
Gross margin	*xx*
Less: Marketing and administrative costs	(xx)
Operating profit	*xx*
Less: Interest, income taxes, extraordinary items, and other adjustments	(xx)
Net income	*xx*

♦ Service organizations provide customers an intangible product, such as advice and analysis. Labor costs and/or costs of information technology represent the most significant cost category for service organizations.

• Exhibit 2.2 shows the income statement of a typical service company. *Cost of services sold* includes costs of billable hours plus the cost of other items billed to clients. Operating costs not included in the costs of services billable to clients are part of *marketing and administrative costs*, such as the costs of developing project proposals for new business.

♦ Retail and wholesale companies sell but do not make a tangible product, such as food, clothes, or a book.

• Exhibit 2.3 shows an income statement for a merchandising company. **Cost of goods sold** represents the expense assigned to products sold during a period and keeps track of the tangible goods the company buys and sells.

• A typical income statement for a merchandising company has the following format:

Company name
Income statement
The period of time covered

Sales revenue	xx
Less: Cost of goods sold	(xx)
Gross margin	*xx*
Less: Marketing and administrative costs	(xx)
Operating profit	*xx*

• The cost of goods sold statement accounts for the inventories, purchases, and sales of tangible goods. The typical format follows:

Company name
Cost of goods sold statement
The period of time covered

Cost of goods in beginning inventory		xx
Plus: Cost of goods purchased		
Merchandise cost	xx	
Transportation-in costs	xx	
Total costs of goods purchased		xx
Cost of goods available for sale		xx
Less: Cost of goods in ending inventory		(xx)
Cost of goods sold		*xx*

• Total costs of goods purchased includes both the merchandise cost and the transportation-in costs. Total costs of goods purchased are added to the beginning inventory to determine the cost of goods that the company could have sold – the cost of goods *available* for sale. After subtracting the cost of goods still available (i.e., left unsold) at the end of the period, the company comes up with the cost of goods sold during the period and inserts the number into the income statement to determine gross margin.

• The gross margin reflects the ability to price the products; the marketing and administrative costs reflect relative efficiency in operating the business.

♦ Manufacturing companies make the goods for sale and need to know the different costs associated with making them. These companies monitor costs based on not only the relative magnitude but also the ability to control them.

• **Product** (**manufacturing) costs** are those assigned to the manufacture of products and recognized (i.e., expensed) for financial reporting when sold. Product costs follow the product through inventory.

· **Direct manufacturing costs** are product costs that can be feasibly identified with units of production, including

- **Direct materials** are those that can be identified directly with the product at reasonable cost, including purchased parts and transportation-in. Direct materials are often called raw materials.

- **Direct labor** represents labor costs that can be identified with the product at reasonable cost. Direct labor of workers transforms the materials into a finished product.

- **Prime costs** = Direct materials + Direct labor.

Companies with relatively low manufacturing overhead tend to focus on managing prime costs.

· **Indirect manufacturing costs** are all product costs except direct costs, often referred to in total as manufacturing overhead.

- **Manufacturing overhead** represents all other costs of transforming the materials into a finished product, including

(1) *Indirect materials* (materials not a part of the finished product but are necessary to manufacture it, such as lubricants, polishing and cleaning materials, etc.),
(2) *Indirect labor* (the cost of workers who do not work directly on the product, yet are required so that the factory can operate, such as supervisors, maintenance workers, inventory storekeepers, etc.), and
(3) *Other manufacturing costs* (expenses incurred to keep the factory running, such as depreciation of the factory building and equipment, taxes and insurance on the factory assets, heat, light, power, etc.)

- In practice, manufacturing overhead is also called *factory burden*, *factory overhead*, *burden*, *factory expense*, or just *overhead*.

- **Conversion costs** = Direct labor + Manufacturing overhead.

Conversion costs are the costs that convert direct materials into the final product. Companies with high direct labor and/or manufacturing overhead tend to emphasize more about conversion costs.

· Exhibit 2.4 summarizes the relationship between prime costs, conversion costs, and the three elements of manufactured product costs: direct materials, direct labor, and manufacturing overhead.

• **Period (nonmanufacturing) costs** are all other costs recognized for financial reporting when incurred, including marketing and administrative costs.

· **Marketing costs** are the costs required to obtain customer orders and provide customers with finished products, including advertising, sales commissions, and shipping costs.

· **Administrative costs** are the costs required to manage the organization and provide staff support, including executive and clerical salaries, costs for legal, financial, data processing, accounting services, and building space for administrative personnel.

· For financial accounting purposes, nonmanufacturing costs are expensed in the period incurred; for managerial purposes, however, these costs (especially advertising and commissions) may be assigned to products.

• The distinction between manufacturing and nonmanufacturing costs is not always clear-cut. Companies need to develop guidelines and follow them consistently.

• Service companies often have costs that are mostly indirect. Managing indirect costs is extremely important in these firms if they are to remain profitable.

• Most firms are made up of activities that combine features of all three types of activities (service, retailing, and manufacturing).

• In many of the firms which are usually considered to be of manufacturing type, virtually all employees are engaged in service-related activities (see In Action box “A New Manufacturing Mantra”).

• Many service firms are adopting cost management practices that were originally developed in manufacturing.

LO3 Explain the process of cost allocation.

♦ **Cost allocation** is the process of assigning indirect costs to product, services, people, business units, etc. Cost allocation is necessary when several departments share facilities or services.

• **Cost object** is any end to which a cost is assigned. Examples include a unit of product or service, a department, or a customer.

• **Cost pool** is the collection of costs to be assigned to the cost objects. Examples are department costs, rental costs, or travel costs a consultant incurs to visit multiple clients.

• **Cost allocation rule** refers to the method or process used to assign costs in the cost pool to the cost objects. There is often no "right" way to allocate costs.

• **Cost flow diagram** is a diagram or flowchart illustrating the cost allocation process. Exhibit 2.5 shows an example of cost flow diagram.

• Fundamental approach to cost allocation:

(1) Identify the cost objects,
(2) Determine the cost pools, and
(3) Select a cost allocation rule.

• Cost flow diagrams help managers understand

(1) How a cost system works, and

(2) The likely effects on the reported costs of different cost objects from changes in the cost allocation rule.

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Demonstration Problem 1

Kahn Industry, Inc. has three divisions. The following information was available for last quarter.

	Division A	Division B	Division C	Company
Revenues	$200,000	$320,000	140,000	$660,000
Cost of goods (or services) sold	160,000	240,000	100,000	500,000
Gross margin	$40,000	$80,000	$40,000	$160,000
Marketing and administrative costs	18,000	20,000	12,000	50,000
Operating profit	$22,000	$60,000	$28,000	$110,000
Interest				10,000

Income taxes (30%)	30,000
Net income	$70,000

The CEO of Kahn Industry wanted to allocate the interest cost of $10,000 to the three divisions.

Required:

1. Identify the cost object(s) and the cost pool.
2. Allocate the interest cost based on each division's (1) revenues, (2) gross margin, and (3) operating profit.
3. Draw a cost flow diagram for (1) above.

Solution:

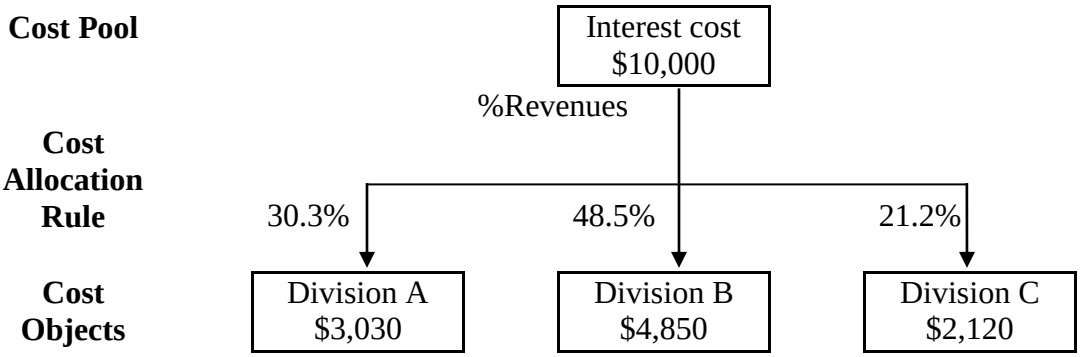
1. The cost objects are the three divisions; the cost pool is the interest cost incurred for the company as a whole.

2.

	Division A	Division B	Division C	Total
(1) Revenues	$200,000	$320,000	$140,000	$660,000
Allocation rule	30.3%[a]	48.5%[b]	21.2%[c]	100%
Allocation	$3,030	$4,850	$2,120	$10,000
(2) Gross margin	$40,000	$80,000	$40,000	$160,000
Allocation rule	25%	50%	25%	100%
Allocation	$2,500	$5,000	$2,500	$10,000
(3) Operating profit	$22,000	$60,000	$28,000	$110,000
Allocation rule	20.0%	54.5%	25.5%	100%
Allocation	$2,000	$5,450	$2,550	$10,000

[a] $200,000 ÷ $660,000 = 0.303, or 30.3%.
[b] $320,000 ÷ $660,000 = 0.485, or 48.5%.
[c] $140,000 ÷ $660,000 = 0.212, or 21.2%.

3.



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♦ **Direct cost** is any cost that can be directly (unambiguously) related to a cost object at reasonable cost; **indirect cost** is any cost that *cannot* be directly related to a cost object.

• A cost may be direct to one cost object and indirect to another.

• Whether a cost is considered direct or indirect also depends on the costs of linking it to the cost object. Even though the information technology is such that almost all costs can be traced directly to cost objects, cost-benefit consideration will dictate whether it is economically feasible to do so.

• For labor and materials, the direct-indirect distinction is based on the cost object of the units being produced.

LO4 Understand how material, labor, and overhead costs are added to a product at each stage of the production process.

♦ **Work in process** is a product in the production process but not yet complete; **finished goods** are products fully completed but not yet sold.

• Any production process involves three basic steps:

(1) Acquisition of direct materials,
(2) Transformation of direct materials in the assembly line, and
(3) Completion of finished goods.

• For manufacturing companies, there are three inventory accounts in a cost accounting system:

(1) Direct Materials Inventory,
(2) Work-in-process Inventory, and
(3) Finished Goods Inventory.

• Each inventory account is likely to have the following structure (in T-account):

Inventory Account
(Direct materials, Work in process, or Finished goods)

Beginning inventory *Debit: Additions*	*Credit: Withdrawals*
Ending inventory	

The inventory amounts at the end of an accounting period (i.e., Ending inventory) for direct materials, work in process, and finished goods will appear on the balance sheet as part of the current assets.

• **Inventoriable costs** are costs added (debited) to inventory accounts.

• Cost flows in the inventory accounts can be traced with physical flows to determine the use of resources in the factory to produce the finished goods.

• Exhibit 2.6 illustrates a simplified version of a production process.

• The adoption of just-in-time (JIT) inventory methods will streamline the production process by sending direct materials from the receiving department to the assembly line immediately with minimal inspection and storage.

♦ Exhibit 2.7 shows an income statement and Exhibit 2.8 a cost of goods manufactured and sold statement for a manufacturing company.

• One way to track cost flows among inventory accounts is by looking at the information through a series of T-accounts. The cost flows coincide with the physical flows of goods in and out of their respective storage areas.

Direct materials inventory		Work-in-process inventory		Finished goods inventory	
Beginning inventory	Less: *Direct materials put into production* →	Beginning inventory		Beginning inventory	
Add: Purchases		Add: *Direct materials*	Less: *Cost of goods manufactured* →	Add: *Cost of goods manufactured*	Less: Cost of goods sold
Ending inventory		Add: Direct labor		Ending inventory	
		Add: Manufacturing overhead			
		Ending inventory			

• A typical cost of goods sold statement for a manufacturing company is more complicated than that of a merchandising firm and has the following structure:

Company name
Cost of goods manufactured and sold statement
The period of time covered

Beginning work-in-process inventory		xx
Manufacturing costs		
Direct materials		
Beginning direct materials inventory	xx	
Add: Purchase of direct materials	xx	
Direct materials available	xx	

Less: Ending direct materials inventory	(xx)		
Direct materials put into production		xx	
Direct labor		xx	
Manufacturing overhead		xx	
Total manufacturing costs			xx
Total cost of work-in-process			xx
Less: Ending work-in-process inventory			(xx)
Cost of goods manufactured			xx
Add: Beginning finished goods inventory			xx
Finished goods available for sale			xx
Less: Ending finished goods inventory			(xx)
Cost of goods sold			xx

The three shaded areas deal with direct materials, work in process, and finished goods, respectively, and conclude with cost of goods sold.

• Cost of goods manufactured and sold statement is prepared through the internal reporting system and is for managerial use only.

• Total manufacturing costs are the sum of direct materials, direct labor, and manufacturing overhead incurred during the period. Managers in production and operations give careful attention to these costs.

• Total cost of work in process (i.e., the sum of beginning work-in-process inventory and total manufacturing costs) provides a measure of the resources that have gone into production.

• Cost of goods manufactured represents the cost of goods finished during the period and transferred out of the work-in-process inventory account. Managers usually compare cost of goods manufactured with a target number to see whether production departments are successful in meeting it.

• Beginning finished goods inventory and cost of goods manufactured together determine the cost of finished goods available for sale. The available finished goods either are sold and become cost of goods sold, or remain in warehouse as part of the ending finished goods inventory.

• The actual formats of financial statements vary a lot in practice. For managerial purposes, it is important that the format be tailored to what users want.

• The level of detail and frequency of the reporting also shape how the information should be presented.

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Demonstration Problem 2

The account balances are listed below for Eagle Manufacturing Company for the month of March.

Finished goods inventory, March 31	$29,000
Direct materials purchases	70,000
Indirect labor	21,000
Direct labor	48,000
Work-in-process inventory, March 31	73,000
Factory supervisory salaries	12,000
Direct materials inventory, March 1	12,000
Factory utilities expense	4,000
Direct materials inventory, March 31	21,000
Work-in-process inventory, March 1	54,000
Factory depreciation expense	5,000
Finished goods inventory, March 1	33,000

Required:

Prepare a cost of goods manufactured and sold statement for Eagle Manufacturing Company for the month ended March 31.

Solution:

Eagle Manufacturing Company
Cost of goods manufactured and sold statement
For the month of March

Beginning work-in-process inventory			$54,000
Manufacturing costs			
Direct materials			
Beginning direct materials inventory	$12,000		
Add: Purchase of direct materials	70,000		
Direct materials available	$82,000		
Less: Ending direct materials inventory	(21,000)		
Direct materials put into production		$61,000	
Direct labor		48,000	
Manufacturing overhead			
Indirect labor	$21,000		
Factory supervisory salaries	12,000		
Factory utilities expense	4,000		
Factory depreciation expense	5,000		
Total manufacturing overhead		42,000	
Total manufacturing costs			151,000
Total cost of work-in-process			$205,000

Less: Ending work-in-process inventory	(73,000)
Cost of goods manufactured	$132,000
Add: Beginning finished goods inventory	33,000
Finished goods available for sale	$165,000
Less: Ending finished goods inventory	(29,000)
Cost of goods sold	$136,000

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LO5 Define basic cost behaviors, including fixed, variable, semivariable, and step costs.

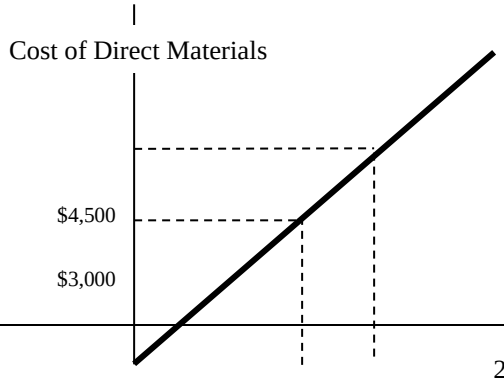
♦ Cost behavior deals with the way costs respond to changes in activity levels, which in Chapter 1 were referred to as cost drivers (i.e., factors that "drive" costs).

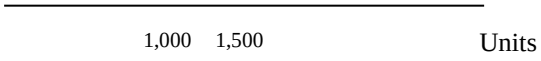
• Managers need to know how costs behave to make informed decisions about products, to plan, and to evaluate performance.
• Exhibit 2.9 illustrates the four cost behavior patterns to be discussed: fixed costs, variable costs, semivariable costs, and step costs.

• **Fixed costs** are costs that are unchanged as volume changes within the relevant range of activity. Examples: much of manufacturing overhead, many nonmanufacturing costs.

• **Variable costs** are costs that change in direct proportion with a change in volume within the relevant range of activity. Examples: for manufacturing companies, direct materials, certain manufacturing overhead, direct labor in some cases; for merchandising businesses, cost of the product, some marketing and administrative costs; for service organizations, certain types of labor, supplies, copying and printing costs.

Example 2: The following graph shows a variable cost relationship between activity (units of production) and the resulting cost of direct materials used.





When the production volume is increased from 1,000 units to 1,500 units, it represents a 50 percent increase in activity (i.e., $\frac{1,500-1,000}{1,000} \times 100\% = 50\%$). There is a corresponding 50 percent increase in direct materials costs as well (i.e., $\frac{\$4,500 - \$3,000}{\$3,000} \times 100\% = 50\%$). This example demonstrates the direct and proportionate relationship between activity and variable costs.

• **Relevant range** refers to the activity levels within which a given total fixed costs or unit variable cost will be unchanged.

• A **semivariable cost** is a cost that has both fixed and variable components; also called *mixed cost*. Examples: electric utility costs, phone charges.

• A **step cost** is a cost that increases with volume in steps; also called *semifixed cost*. Examples: supervisors' salaries as each supervisor has a limited span of control, maintenance costs for a fleet of delivery trucks as the volume of business increases.

• Four aspects of cost behavior complicate the task of classifying costs into fixed or variable categories.

(1) Not all costs are strictly fixed or variable.
(2) Some costs increase with volume in "steps."
(3) The cost relations are valid only within a relevant range of activity.
(4) The classification also depends on the measure of activity used.

LO6 Identify the components of a product's costs.

♦ Some cost concepts are determined by the rules of financial accounting. Some are more useful for managerial decision making.

• **Full cost** is the sum of all costs of manufacturing and selling a unit of product (including both fixed and variable costs).

• **Full absorption cost** is the sum of all variable and fixed manufacturing costs. Full absorption cost is used to compute a product's inventory value under GAAP.

• Exhibit 2.11 illustrates the product cost components for a company.

• On a per-unit basis,

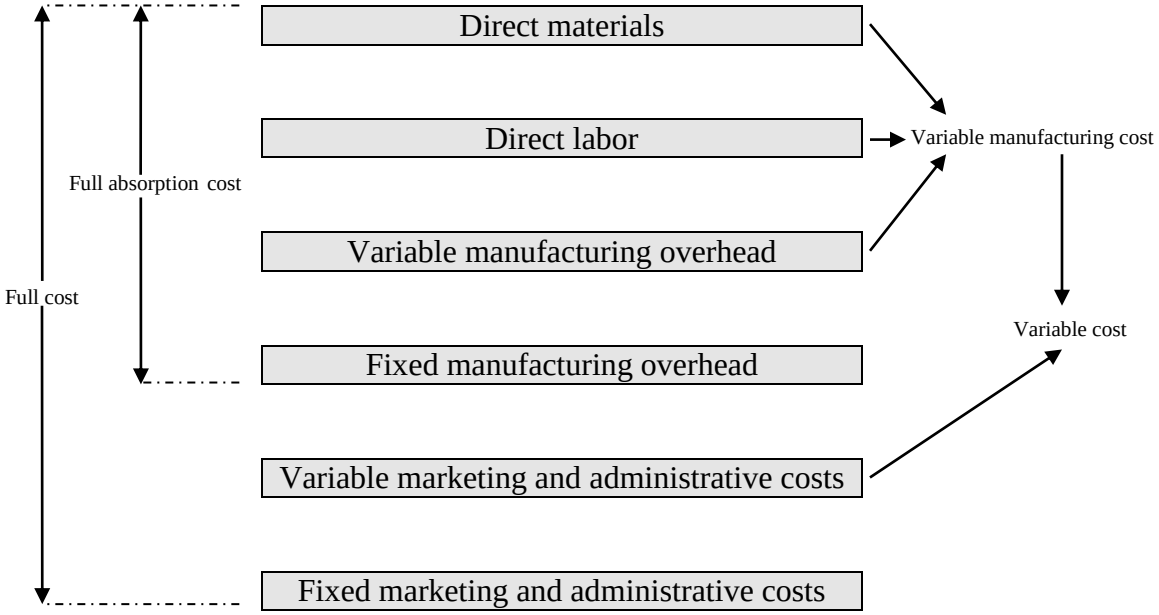
Full absorption cost = Direct materials + Direct labor + Variable and fixed manufacturing overhead.

Full cost = Full absorption cost + Variable and fixed marketing and administrative costs.

Variable manufacturing cost = Direct materials + Direct labor + Variable manufacturing overhead.

Variable cost = Variable manufacturing cost + Variable marketing and administrative cost.

• The diagram below demonstrates the relationship among various product cost components.



♦ Unit fixed costs can be misleading for decision making.

• Unit fixed costs are valid only at one volume of operation.

• When fixed costs are allocated to each unit, accounting records often make the costs appear as though they are variable.

• It is easy to interpret unit costs incorrectly and make incorrect decisions.

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Demonstration Problem 3

Gourmet Industry manufactures pasta machines. The accountant of the company provides the cost structure for each pasta machine produced as follows:

Variable manufacturing cost	$85
Fixed manufacturing cost $\left(= \frac{\text{Fixed manufacturing cost per year}}{\text{Units produced per year}} = \frac{\$120,000}{2,000}\right)$	60
	$145

The regular price for each pasta machine is $200. A regional restaurant chain wants to buy 150 pasta machines for $120 each. Gourmet Industry is also responsible for a one-time shipping cost of $850. Marketing, administrative, total fixed costs, and regular sales are not affected by the decision. Gourmet Industry has enough idle capacity to handle the order.

Required:

Determine if Gourmet Industry should accept the special order.

Solution:

By accepting the special order, Gourmet Industry will increase its operating profit by $4,400.

Revenues from special order ($120 × 150)	$18,000
Variable manufacturing cost ($85 × 150)	(12,750)
One-time shipping cost	(850)
Contribution of special order to operating profit	$4,400

The fixed manufacturing cost of $60 per unit will not affect the decision as the total fixed cost remains unchanged. Based on the analysis, Gourmet Industry should accept the special order.

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♦ **Gross margin** as reported in the external financial statements is the difference between revenue and cost of goods sold, or

Gross margin = Revenue - Cost of goods sold.

• Gross margin per unit = Sales price – Full absorption cost per unit.

• Cost of goods sold = Full absorption cost per unit × Number of units sold.

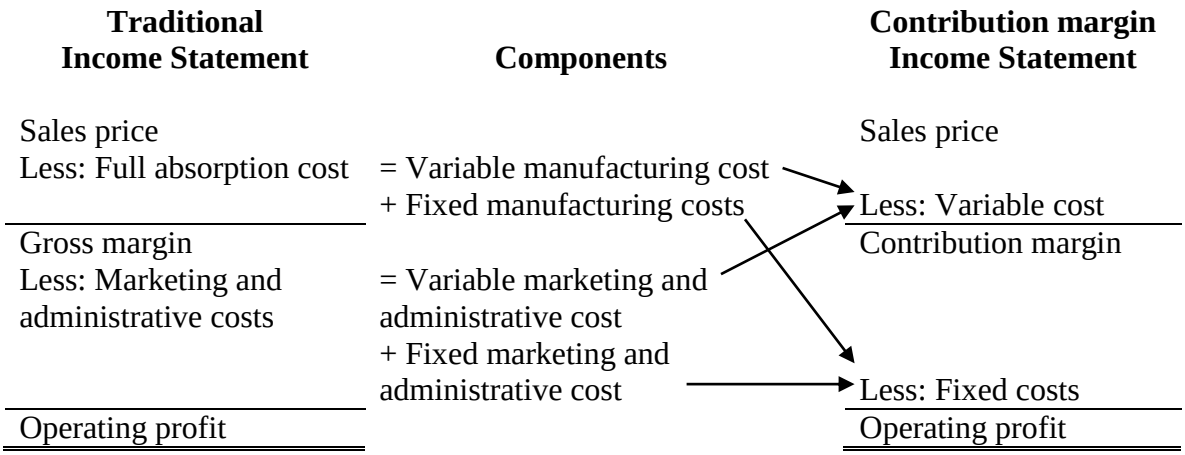
• The income statement format that emphasizes gross margin is referred to as the *traditional income statement*.

• **Contribution margin** per unit = Sales price – Variable costs per unit.
Contribution margin is the amount available to cover fixed costs and earn a profit.

• The income statement format that emphasizes contribution margin is referred to as the *contribution margin income statement*.

• Exhibit 2.12 highlights gross margin information while Exhibit 2.13 showcases contribution margin information. In both cases, the operating profit per unit remains the same.

• The interaction behind the calculations of gross margin per unit and contribution margin per unit is presented below.



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Demonstration Problem 4

The following information is available for each unit of the finished product produced and sold:

Sales price	$60
Variable manufacturing cost	20
Fixed manufacturing cost	12*
Variable marketing and administrative cost	6
Fixed marketing and administrative cost	4*

* The unit fixed manufacturing cost and fixed marketing and administrative cost are based on an estimated volume of 6,000 units produced and sold.

Required:

Determine full absorption cost, variable cost, full cost, gross margin, contribution margin, and operating profit per unit.

Solution:

Full absorption cost = $20 + $12 = $32.
Variable cost = $20 + $6 = $26.
Full cost = ($20 + $12 + $6 + $4) = $42.
Gross margin = $60 – $32 = $28.
Contribution margin = $60 – $26 = $34.
Operating profit (from Traditional income statement format) = $28 – $10 = $18.
Operating profit (from Contribution margin income statement format) = $34 - $16 = $18.
Operating profit (overall) = $60 - $42 = $18.

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LO7 Understand the distinction between financial and contribution margin income statements.

♦ Period costs can be determined once product costs are properly defined. Three approaches to determining product costs are available.

• *Full absorption costing (traditional income statement)*: As required by GAAP, all fixed and variable manufacturing costs are product costs. All other costs are period costs.

• *Variable costing (contribution margin income statement)*: Only variable manufacturing costs are product costs. All other costs are period costs.

• *Managerial costing*: Management determines which costs are associated with the product. Any new costs resulting from adding a product are considered product costs.

♦ Assume that all units produced are sold. A comparison of the first two income statement formats is shown below.

Traditional Income Statement	**Contribution margin Income Statement**
Sales revenue	Sales revenue
Less: Cost of goods sold (including variable and fixed *manufacturing costs*)	Less: Variable costs (including *variable* manufacturing, marketing and administrative costs)
Gross margin	Contribution margin
Less: Marketing and administrative costs (including variable and fixed *marketing and administrative costs*)	Less: Fixed costs (including *fixed* manufacturing, marketing and administrative costs)
Operating profit	Operating profit

• Exhibit 2.14 illustrates the differences between gross margin and contribution margin income statements.

• The product costs assigned to inventory are carried in the accounts as assets. When the goods are sold, the costs flow from inventory to the cost of goods sold account of the income statement.

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Demonstration Problem 5

(Continued from Demonstration Problem 4)

Required:

Prepare a traditional income statement and contribution margin income statement when 6,000 units are produced and sold.

Solution:

Traditional income statement		**Contribution margin income statement**	
Revenues	$360,000	Revenues	$360,000
Less: Cost of goods sold	(192,000)	Less: Variable cost	(156,000)
Gross margin	$168,000	Contribution margin	$204,000
Less: Marketing and administrative costs	(60,000)	Less: Fixed costs	(96,000)
Operating profit	$108,000	Operating profit	$108,000

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♦ The cost accounting system is designed to provide managers with relevant information for decision making. To that end, financial statements may be developed to serve special purposes.

• Case in point is the development of a value income statement that classifies costs into value-added and nonvalue-added categories. The goal is to make the most out of value-added activities while minimizing or even eliminating nonvalue-added activities to reduce costs.

• Exhibit 2.15 provides an example of the value income statement.

• Depending on the business and strategic environment of the firm, it is possible to construct financial statements around activities related to quality, environmental compliance, or new product development.

♦ A summary of cost terms and definitions is available in Exhibit 2.16.

Matching

A. Administrative costs
B. Conversion costs
C. Cost allocation
D. Cost object
E. Cost pool
F. Direct cost
G. Full absorption cost
H. Indirect cost
I. Opportunity cost
J. Prime costs
K. Semivariable cost
L. Work in process

_____ 1. The foregone benefit from the best (forgone) alternative course of action.

_____ 2. The costs that convert direct materials into the final product.

_____ 3. The sum of all variable and fixed manufacturing costs.

_____ 4. The process of assigning indirect costs to product, services, people, business units, etc.

_____ 5. Any cost that *cannot* be directly related to a cost object.

_____ 6. Any end to which a cost is assigned.

_____ 7. The costs required to manage the organization and provide staff support.

_____ 8. Direct materials + Direct labor.

_____ 9. The collection of costs to be assigned to the cost objects.

_____ 10. A cost that has both fixed and variable components.

_____ 11. A product in the production process but not yet complete.

_____ 12. Any cost that can be directly (unambiguously) related to a cost object at reasonable cost.

Answers

1. I
2. B
3. G
4. C
5. H
6. D
7. A
8. J
9. E
10. K
11. L
12. F

Multiple Choice

1. Which of the following statements is correct?
   a. A cost is a sacrifice of resources.
   b. Cost and expense are the same.
   c. All assets will become expenses.
   d. There is no guidance as to when costs are to be treated as expenses.

2. Cost of goods sold statement for a retail business
   a. Includes transportation-in costs.
   b. Has a cost of goods manufactured section.
   c. Covers a period of time.
   d. Both a and c.

3. Period cost
   a. Is also known as manufacturing cost.
   b. Includes both marketing and administrative costs.
   c. Will be expensed when products are sold.
   d. Is part of cost of goods sold.

The following information is for questions 4 – 7.
A product is sold for $75 each with unit cost of direct materials $20, direct labor $15, variable manufacturing overhead $12, and fixed manufacturing overhead $10. The volume produced and sold is 6,000 units. Variable and fixed marketing and administrative costs are $4 and $3, respectively.

4. Which of the following statements is correct?
   a. Prime cost is $35.
   b. Conversion cost is $37.
   c. Inventoriable cost is $57.
   d. All of the above.

5. Cost of goods sold is
   a. $342,000.
   b. $201,500.
   c. $364,000.
   d. None of the above.

6. Which of the following statements is correct?
   a. Operating profit is $66,000.
   b. Gross margin is $108,000.

c. Contribution margin is $144,000.
d. All of the above.

7. Full absorption cost is
   a. The same as full cost.
   b. The same as inventoriable cost.
   c. $55.
   d. The sum of variable manufacturing cost and variable marketing and administrative cost.

8. Which of the following statements is incorrect?
   a. Within the relevant range, total fixed cost remains the same.
   b. Fixed cost per unit remains constant.
   c. Variable cost per unit remains constant.
   d. Semivariable cost is also called mixed cost.

9. Unit fixed cost
   a. Is treated as variable cost when allocated to each unit.
   b. Can be used for decision making under any circumstances.
   c. Is misleading as the total fixed cost does not change.
   d. Both a and c.

10. Value income statement
    a. Is developed for managerial decision making.
    b. Distinguishes between value-added and nonvalue-added activities.
    c. Is governed by GAAP.
    d. Both a and b.

11. Which of the following statements is correct?
    a. Cost object is any end to which a cost is assigned.
    b. Cost pool is the collection of costs to be assigned to the cost objects.
    c. Cost flow diagram is a diagram illustrating the cost allocation process.
    d. All of the above.

12. The annual operating expense of running a copy center is shared by the three departments that use its service: Human resource, Accounting, and Legal. Last year, the copy center incurred $30,000 while HR copied 20,000 pages, Accounting 30,000 pages, and Legal 50,000 pages. What was Accounting department's share of the copy center cost?
    a. $15,000.
    b. $6,000.
    c. $9,000.
    d. $7,500.

Answers

1. a LO1

2. d LO2

3. b LO2

4. d LO4

   Prime cost = $20 + $15 = $35.
   Conversion cost = $15 + $12 +$10 = $37.
   Inventoriable cost = $20 + $15 + $12 +$10 = $57.

5. a LO4

   $57 × 6,000 = $342,000.

6. d LO4, LO7

   Revenue = $75 × 6,000 = $450,000.
   Gross margin = $450,000 - $342,000 = $108,000.
   Operating profit = $108,000 – ($4 + $3) × 6,000 = $66,000.
   Contribution margin = ($75 - $20 - $15 - $12 - $4) × 6,000 = $144,000.

7. b LO6

8. b LO5

9. d LO6

10. d LO7

11. d LO3

12. c LO3

    Accounting department's share of usage = $\frac{30,000}{20,000+30,000+50,000} \times 100\% = 30\%$.

    Accounting department's share of cost = $30,000 × 30% = $9,000.