

# Chapter 2

An Introduction to Cost Terms and **Purposes**

# Chapter 2 learning objectives

1. Define and illustrate a cost object
2. Distinguish between direct costs and indirect costs
3. Explain variable costs and fixed costs
4. Interpret unit costs cautiously
5. Distinguish inventoriable costs period costs
6. Illustrate the flow of inventoriable and period costs

# Chapter 2 learning objectives, concluded

7. Explain why product costs are computed in different ways for different purposes
8. Describe a framework for cost accounting and cost management

# Basic Cost Terminology

- Cost—a sacrificed or forgone resource to achieve a specific objective.
- Actual cost—a cost that has occurred.
- Budgeted cost—a predicted cost.
- Cost object—anything for which a cost measurement is desired.

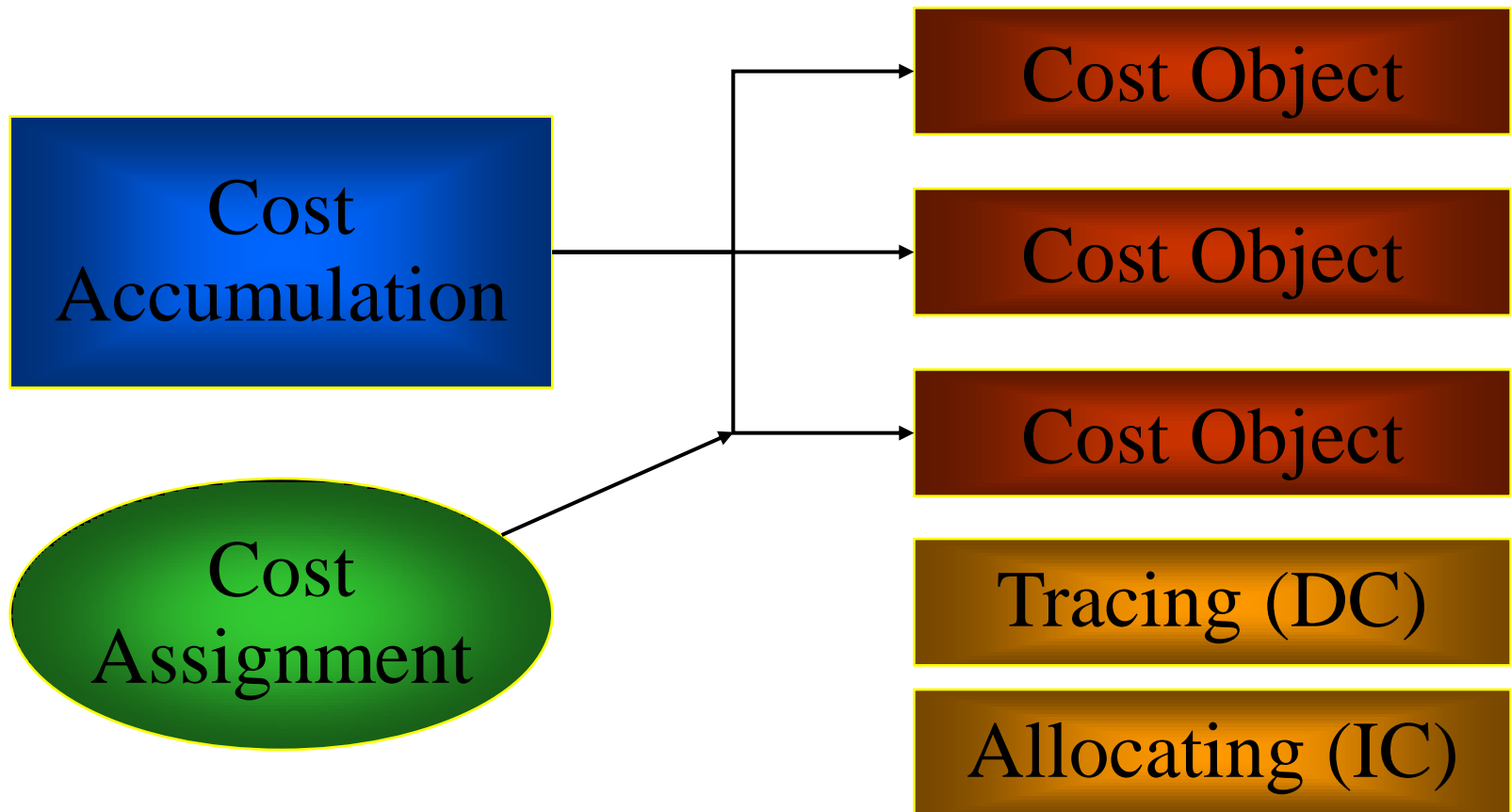
# Cost Object Examples at BMW

Cost Object	Illustration
Product	A BMW X6 sports activity vehicle
Service	Telephone hotline providing information and assistance to BMW dealers
Project	R&D project on DVD system enhancement in BMW cars
Customer	Herb Chambers Motors, a dealer that purchases a broad range of BMW vehicles
Activity	Setting up machines for production or maintaining production equipment
Department	Environmental, Health and Safety department

# Basic Cost Terminology, concluded

- Cost accumulation—the collection of cost data in an organized way by means of an accounting system.
- Cost assignment—a general term that encompasses the gathering of accumulated costs to a cost object in two ways:
  - Tracing accumulated costs with a direct relationship to the cost object and
  - Allocating accumulated costs with an indirect relationship to a cost object.

# Cost and Cost Terminology



# Direct and Indirect Costs

## Direct Costs

**Example:** Paper on which *Sports Illustrated* magazine is printed

## Indirect Costs

**Example:** Lease cost for Time-Warner building housing the senior editors of its magazine

Tracing

## COST OBJECT

**Example:** *Sports Illustrated* magazine

Allocating

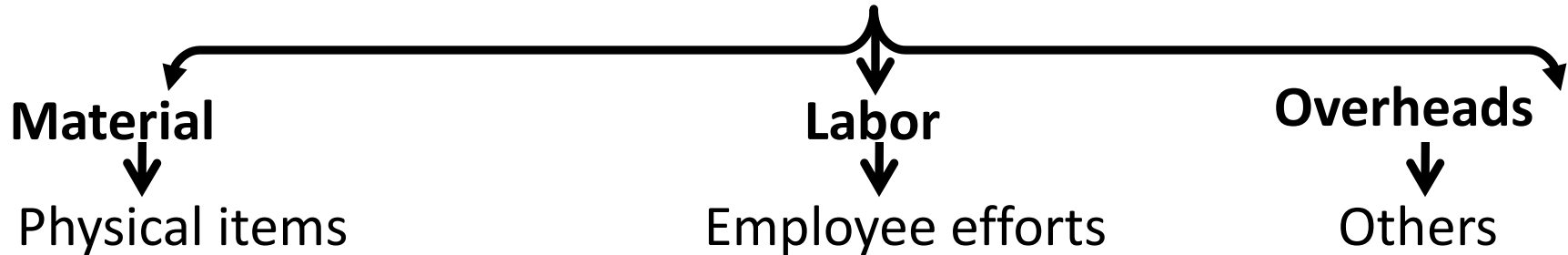


# Cost Classification

- Cost may be classified according to:
  - (1) The nature of cost.
  - (2) The relationship with cost object.
  - (3) The cost behavior.

# Cost Classification by Nature

Cost can be classified according to its nature into:



**Example.** Black Knight Company manufactures six types of hand-painted chess pieces in a two-step process. The first step takes place in Woodworking Department where saws, lathes, and milling machines are used to create the pieces. In Painting Department the wooden fabricated pieces are hand painted. After they dry, the pieces are packed and shipped to customers. Black Knight two departments, Woodworking and painting, are in a single factory building.

**Required:** Indicate whether each of the following cost it is a material, labor, or expense.

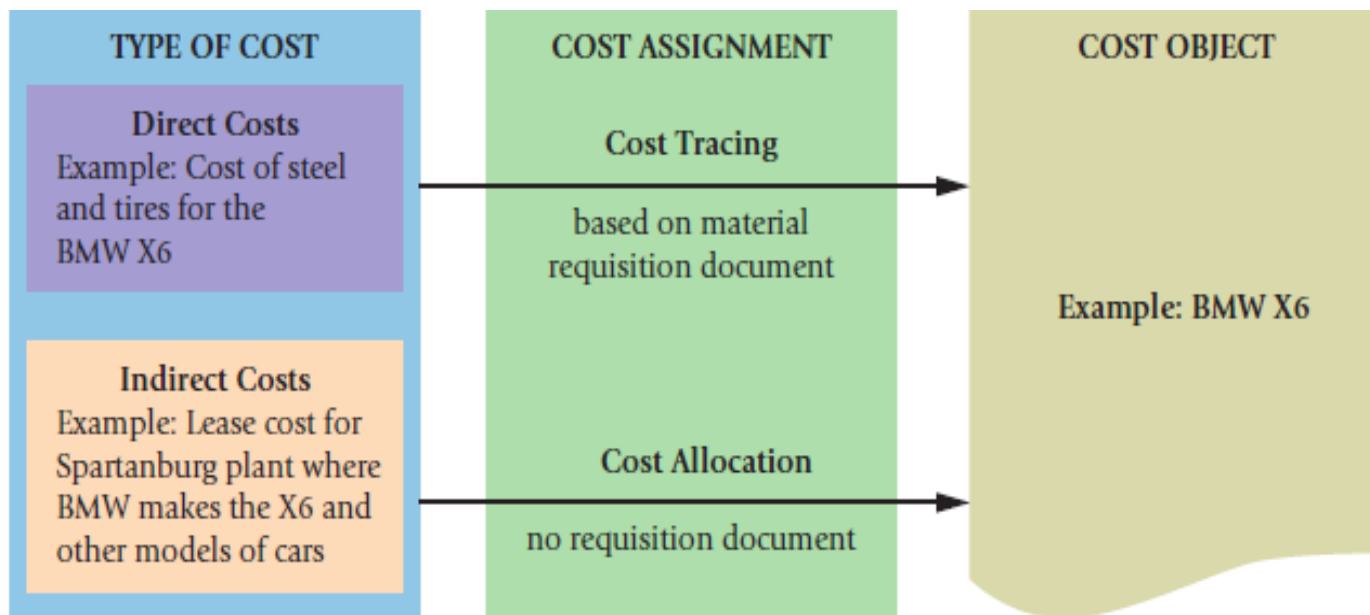
Cost Item	Material	Labor	Overheads
Wood			
Paint			
Packing materials			
Depreciation on machinery and molds			
Rent on factory			
Insurance on factory			
Factory utilities			
Painters			
Painting department manager			
Woodworking Department manager			
Material handlers			
Custodian in factory (employee)			
Night guard in factory (security company)			
Machinist (running the milling machine)			
Machine maintenance personnel			
Maintenance supplies for the factory			
Cleaning supplies for the factory			

<b>Cost Item</b>	<b>Material</b>	<b>Labor</b>	<b>Overheads</b>
<b>Wood</b>	✓		
<b>Paint</b>	✓		
<b>Packing materials</b>	✓		
<b>Depreciation on machinery and molds</b>			✓
<b>Rent on factory</b>			✓
<b>Insurance on factory</b>			✓
<b>Factory utilities</b>			✓
<b>Painters</b>		✓	
<b>Painting department manager</b>		✓	
<b>Woodworking Department manager</b>		✓	
<b>Material handlers</b>		✓	
<b>Custodian in factory</b>		✓	
<b>Night guard in factory (security company)</b>			✓
<b>Machinist (running the milling machine)</b>		✓	
<b>Machine maintenance personnel</b>		✓	
<b>Maintenance supplies for the factory</b>	✓		
<b>Cleaning supplies for the factory</b>	✓		

# Direct and Indirect Costs

- Direct costs can be conveniently and economically traced (tracked) to a cost object.
- Indirect costs cannot be conveniently or economically traced (tracked) to a cost object. Instead of being traced, these costs are allocated to a cost object in a rational and systematic manner.

# Cost assignment to a cost object (bmw example)



# Cost Examples

- Direct Costs
  - Parts (steel or tires for a car, as an example)
  - Assembly line wages
- Indirect Costs
  - Electricity
  - Rent
  - Property taxes
  - Plant administration expenses

**Example.** For the Black Knight Company manufactures , Indicate whether each cost it is a direct or indirect, assuming "units of production of each kind of chess piece" is the cost object.

<b>Cost Item</b>	<b>Direct Cost</b>	<b>Indirect Cost</b>
Wood		
Paint		
Packing materials		
Depreciation on machinery and molds		
Rent on factory		
Insurance on factory		
Factory utilities		
Painters		
Painting department manager		
Woodworking Department manager		
Material handlers		
Custodian in factory (employee)		
Night guard in factory (Security company)		
Machinist (running the milling machine)		
Machine maintenance personnel		
Maintenance supplies for the factory		
Cleaning supplies for the factory		



# Factors Affecting Direct/Indirect Cost Classification

- **The materiality of the cost in question:** The smaller the amount of a cost, the less likely that it economically to trace that cost to a particular cost object.
- **The available information-gathering technology:** Improvement in information-gathering technology make it is possible to consider more and more costs as direct costs
- **Design of operations:** Classifying cost as direct is easier if a company's facility is used totally for a specific cost object, such as a specific product or a particular customer.

NOTE: a specific cost may be both a direct cost of one cost object and an indirect cost of another cost object. So, the direct/indirect classification depends on **the choice of the cost object.**

For example, the salary of an Assembly Department supervisor at Toyota is **direct cost** if the cost object is the **Assembly Department**, but it is **indirect cost** if the cost object is **a product** such as Corolla or Yaris.

**EXAMPLE. At** Black Knight Company , If the cost object were "Woodworking Department" rather than output, which costs above would now be direct instead of indirect costs?

<b>Cost Item</b>	<b>Direct Cost</b>	<b>Indirect Cost</b>
Depreciation on machinery and molds		
Rent on factory		
Insurance on factory		
Factory utilities		
Painting department manager		
Woodworking Department manager		
Material handlers		
Custodian in factory		
Night guard in factory		
Machinist (running the milling machine)		
Machine maintenance personnel		
Maintenance supplies for the factory		
Cleaning supplies for the factory		

# Cost Behavior

- Variable costs—change in total in proportion to changes in the related level of activity or volume of output produced.
- Fixed costs—remain unchanged in total, for a given time period, despite changes in the related level of activity or volume of output produced.
- Costs are fixed or variable only with respect to a specific activity or a given time period.

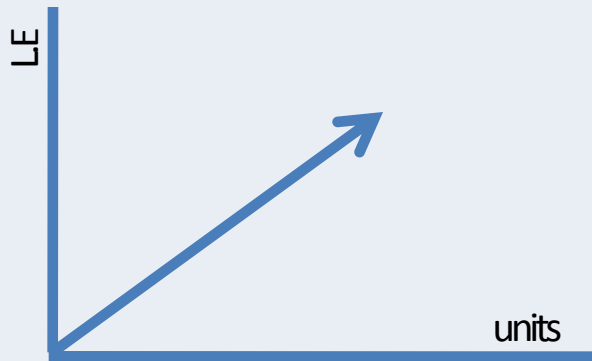
## Variable Cost (Raw Materials)

units	Cost Per Unit	Total Variable Cost
0	10	0
100	10	1000
500	10	5000

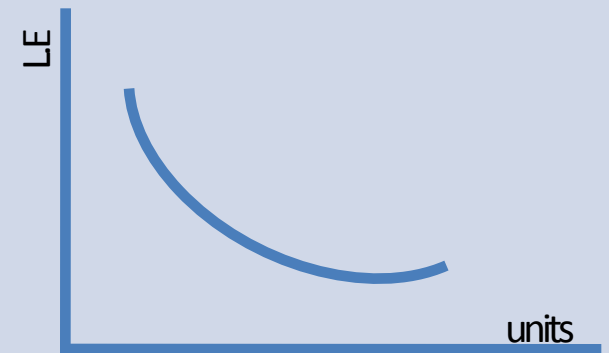
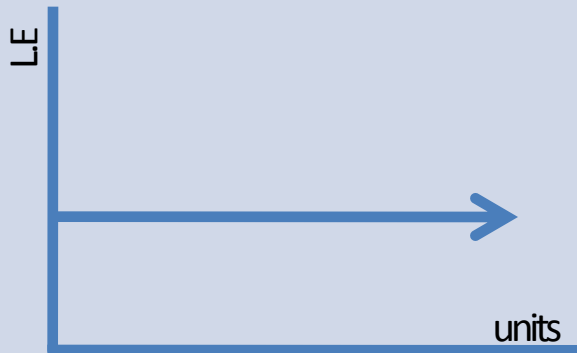
## Fixed Cost (Factory Rent)

units	Total Fixed Cost	Cost Per Unit
0	5000	$\infty$
100	5000	50
500	5000	10

Total Cost



Cost Per Unit



# Cost Behavior, cont'd

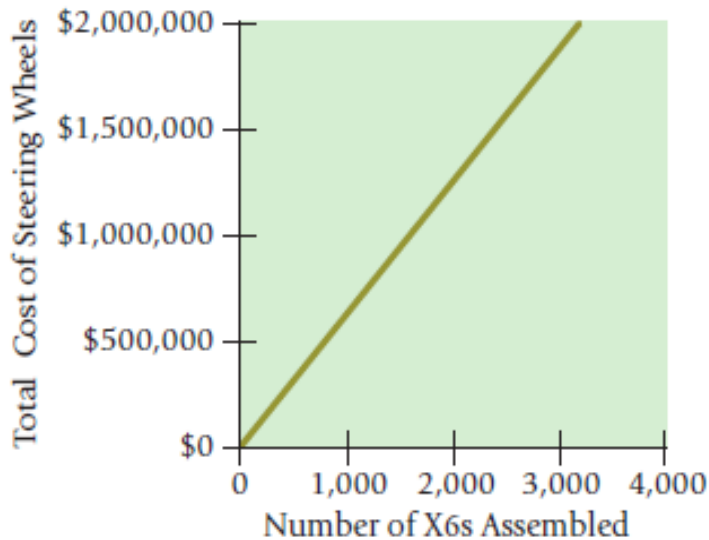
- Variable costs are constant on a per-unit basis. If a product takes 5 pounds of materials each, it stays the same per unit regardless if one, ten, or a thousand units are produced.
- Fixed costs per unit change inversely with the level of production. As more units are produced, the same fixed cost is spread over more and more units, reducing the cost per unit.

# Cost Behavior Summarized

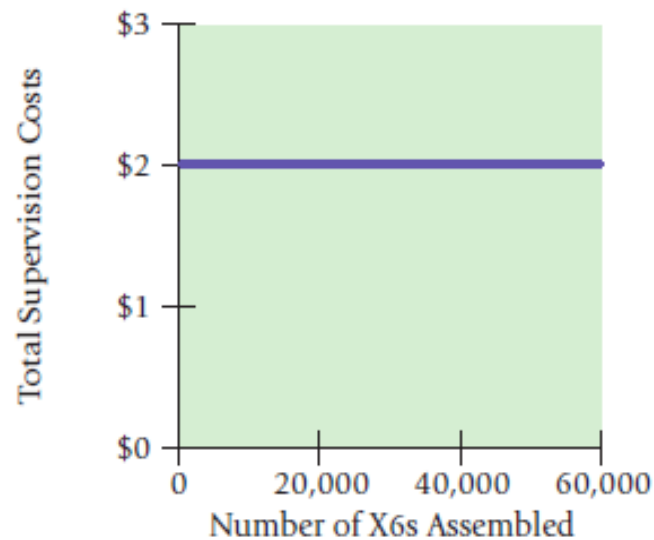
Variable Costs	<p><b><u>Total Dollars</u></b> Change in proportion with output More output = More cost</p>	<p><b><u>Cost Per Unit</u></b> Unchanged in relation to output</p>
Fixed Costs	<p>Unchanged in relation to output</p>	<p>Change inversely with output More output = lower cost per unit</p>

# Graphs of variable and fixed costs

**PANEL A: Variable Cost of Steering Wheels at \$60 per BMW X6 Assembled**



**PANEL B: Supervision Costs for the BMW X6 assembly line (in millions)**





**EXAMPLE. For the** Black Knight Company, Indicate whether each cost item is a variable or fixed

<b>Cost Item</b>	<b>Variable Cost</b>	<b>Fixed Cost</b>
Wood		
Paint		
Packing materials		
Depreciation on machinery and molds		
Rent on factory		
Insurance on factory		
Factory utilities		
Painters		
Painting department manager		
Woodworking Department manager		
Material handlers		
Custodian in factory		
Night guard in factory		
Machinist (running the milling machine)		
Machine maintenance personnel		
Maintenance supplies for the factory		
Cleaning supplies for the factory		

Cost Item	Variable Cost	Fixed Cost
Wood	✓	
Paint	✓	
Packing materials	✓	
Depreciation on machinery and molds		✓
Rent on factory		✓
Insurance on factory		✓
Factory utilities	✓	✓
Painters	✓	
Painting department manager		✓
Woodworking Department manager		✓
Material handlers		✓
Custodian in factory		✓
Night guard in factory		✓
Machinist (running the milling machine)		✓
Machine maintenance personnel		✓
Maintenance supplies for the factory	✓	
Cleaning supplies for the factory		✓

# Other Cost Concepts

- Cost driver—a variable, such as the level of activity or volume, that causally affects costs over a given time span.
- Relevant range—the band or range of normal activity level (or volume) in which there is a specific relationship between the level of activity (or volume) and the cost in question.
  - For example, fixed costs are considered fixed only within the relevant range.

# Multiple Classifications of Costs

- Costs may be classified as:
  - Direct/Indirect, and
  - Variable/Fixed
- These multiple classifications give rise to important cost combinations:
  - Direct and variable
  - Direct and fixed
  - Indirect and variable
  - Indirect and fixed

# A Cost Caveat

- Unit costs should be used cautiously. Because unit costs change with a different level of output or volume, it may be more prudent to base decisions on a total cost basis.
  - Unit costs that include fixed costs should always reference a given level of output or activity.
  - Unit costs are also called average costs.
  - Managers should think in terms of total costs rather than unit costs for many decisions.

# Examples of the Multiple Classifications of Costs

		Assignment of Costs to Cost Object	
		Direct Costs	Indirect Costs
Cost-Behavior Pattern	Variable Costs	<ul style="list-style-type: none"> <li>• Cost object: BMW X6s produced</li> <li>Example: Tires used in assembly of automobile</li> </ul>	<ul style="list-style-type: none"> <li>• Cost object: BMW X6s produced</li> <li>Example: Power costs at Spartanburg plant. Power usage is metered only to the plant, where multiple products are assembled.</li> </ul>
	Fixed Costs	<ul style="list-style-type: none"> <li>• Cost object: BMW X6s produced</li> <li>Example: Salary of supervisor on BMW X6 assembly line</li> </ul>	<ul style="list-style-type: none"> <li>• Cost object: BMW X6s produced</li> <li>Example: Annual lease costs at Spartanburg plant. Lease is for whole plant, where multiple products are produced.</li> </ul>

# Different Types of Firms

- Manufacturing-sector companies purchase materials and components and convert them into finished products.
- Merchandising-sector companies purchase and then sell tangible products without changing their basic form.
- Service-sector companies provide services (intangible products) like legal advice or audits.

# Types of inventory

- Direct materials—resources in-stock and available for use
- Work-in-process (or progress)—products started but not yet completed, often abbreviated as WIP
- Finished goods—products completed and ready for sale
  
- Note: Merchandising-sector companies hold only one type of inventory: merchandise inventory



# Commonly used classifications of manufacturing costs

- Also known as inventoriable costs
  - Direct materials—acquisition costs of all materials that will become part of the cost object.
  - Direct labor—compensation of all manufacturing labor that can be traced to the cost object.
  - Indirect manufacturing—factory costs that are not traceable to the product in an economically feasible way. Examples include lubricants, indirect manufacturing labor, utilities, and supplies.

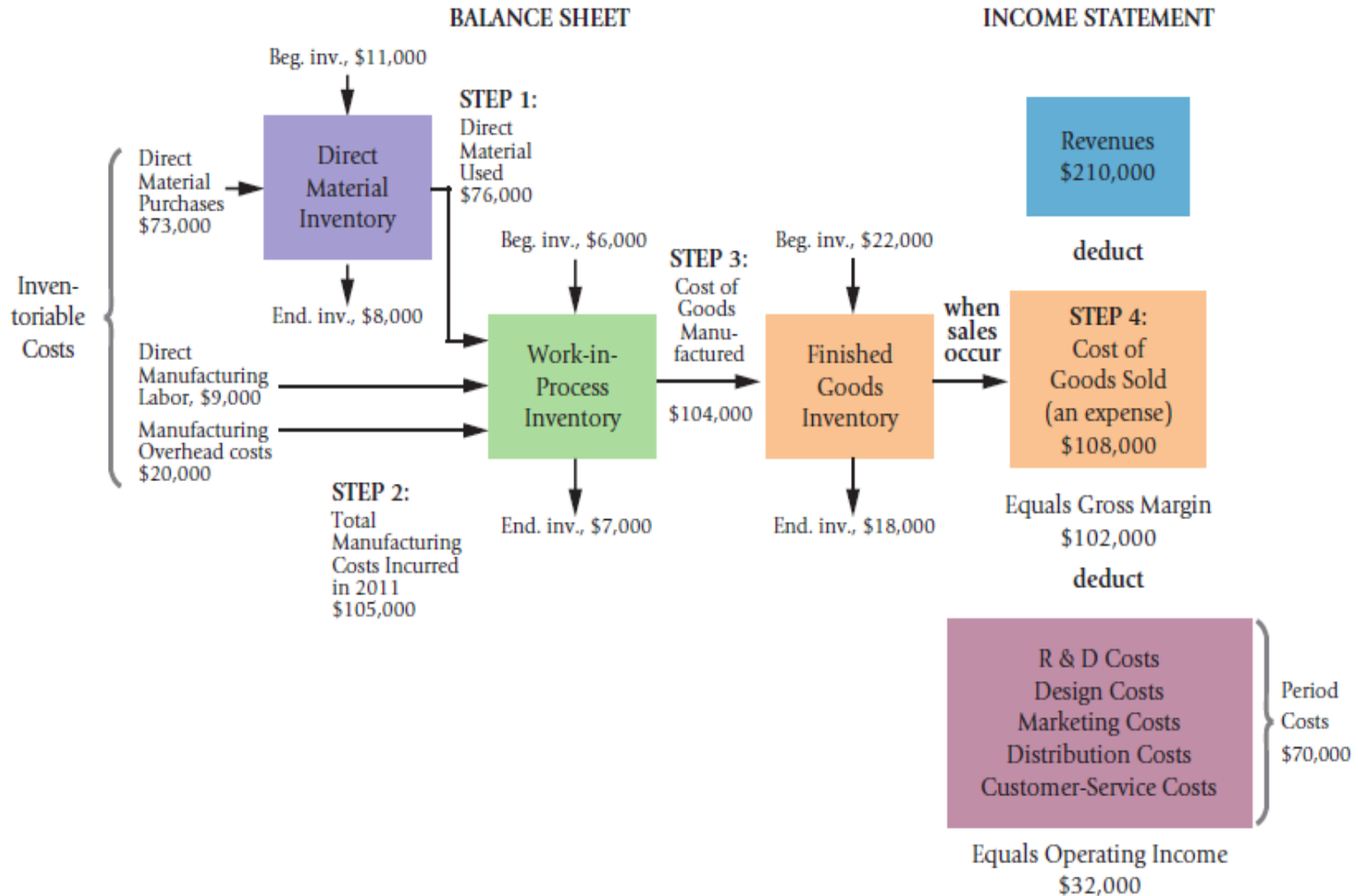
# Inventoriable costs vs. period costs

- ◎ Inventoriable costs are all costs of a product that are considered assets in a company's balance sheet when the costs are incurred and that are expensed as cost of goods sold only when the product is sold. For manufacturing companies, all manufacturing costs are inventoriable costs.
- ◎ Period costs are all costs in the income statement other than cost of goods sold. They are treated as expenses of the accounting period in which they are incurred.

# Cost Flows

- The Cost of Goods Manufactured and the Cost of Goods Sold section of the Income Statement are accounting representations of the actual flow of costs through a production system.
  - Note how inventoriable costs to through the balance sheet accounts of work-in-process and finished goods inventory before entering the cost of goods sold in the income statement.

# Cost flows illustrated



# Multiple-step income statement, part one

	A	B	C	D
1	<b>PANEL A: INCOME STATEMENT</b>			
2	<b>Cellular Products</b>			
3	<b>Income Statement</b>			
4	<b>For the Year Ended December 31, 2014 (in thousands)</b>			
5	Revenues		\$210,000	
6	Cost of goods sold:			
7	Beginning finished goods inventory, January 1, 2014	\$ 22,000		
8	Cost of goods manufactured (see Panel B)	<u>104,000</u>		
9	Cost of goods available for sale	126,000		
10	Ending finished goods inventory, December 31, 2014	<u>18,000</u>		
11	Cost of goods sold		<u>108,000</u>	
12	Gross margin (or gross profit)		102,000	
13	Operating costs:			
14	R&D, design, mktg., dist., and cust.-service cost	70,000		
15	Total operating costs		<u>70,000</u>	
16	Operating income		<u>\$ 32,000</u>	
17				

STEP 4 {

# Multiple-step income statement, part two

18	<b>PANEL B: COST OF GOODS MANUFACTURED</b>					
19	Cellular Products					
20	Schedule of Cost of Goods Manufactured <sup>a</sup>					
21	For the Year Ended December 31, 2014 (in thousands)					
22	Direct materials:					
23	Beginning inventory, January 1, 2014		\$11,000			
24	Purchases of direct materials		<u>73,000</u>			
25	Cost of direct materials available for use		84,000			
26	Ending inventory, December 31, 2014		<u>8,000</u>			
27	Direct materials used			\$ 76,000		
28	Direct manufacturing labor			9,000		
29	Manufacturing overhead costs:					
30	Indirect manufacturing labor		\$ 7,000			
31	Supplies		2,000			
32	Heat, light, and power		5,000			
33	Depreciation—plant building		2,000			
34	Depreciation—plant equipment		3,000			
35	Miscellaneous		<u>1,000</u>			
36	Total manufacturing overhead costs			<u>20,000</u>		
37	Manufacturing costs incurred during 2014			105,000		
38	Beginning work-in-process inventory, January 1, 2014			<u>6,000</u>		
39	Total manufacturing costs to account for			111,000		
40	Ending work-in-process inventory, December 31, 2014			<u>7,000</u>		
41	Cost of goods manufactured (to income statement)			<u>\$104,000</u>		
42	<sup>a</sup> Note that this schedule can become a schedule of cost of goods manufactured and sold simply by including the beginning and ending finished goods inventory figures in the supporting schedule rather than in the body of the income statement.					

# Other Cost Considerations

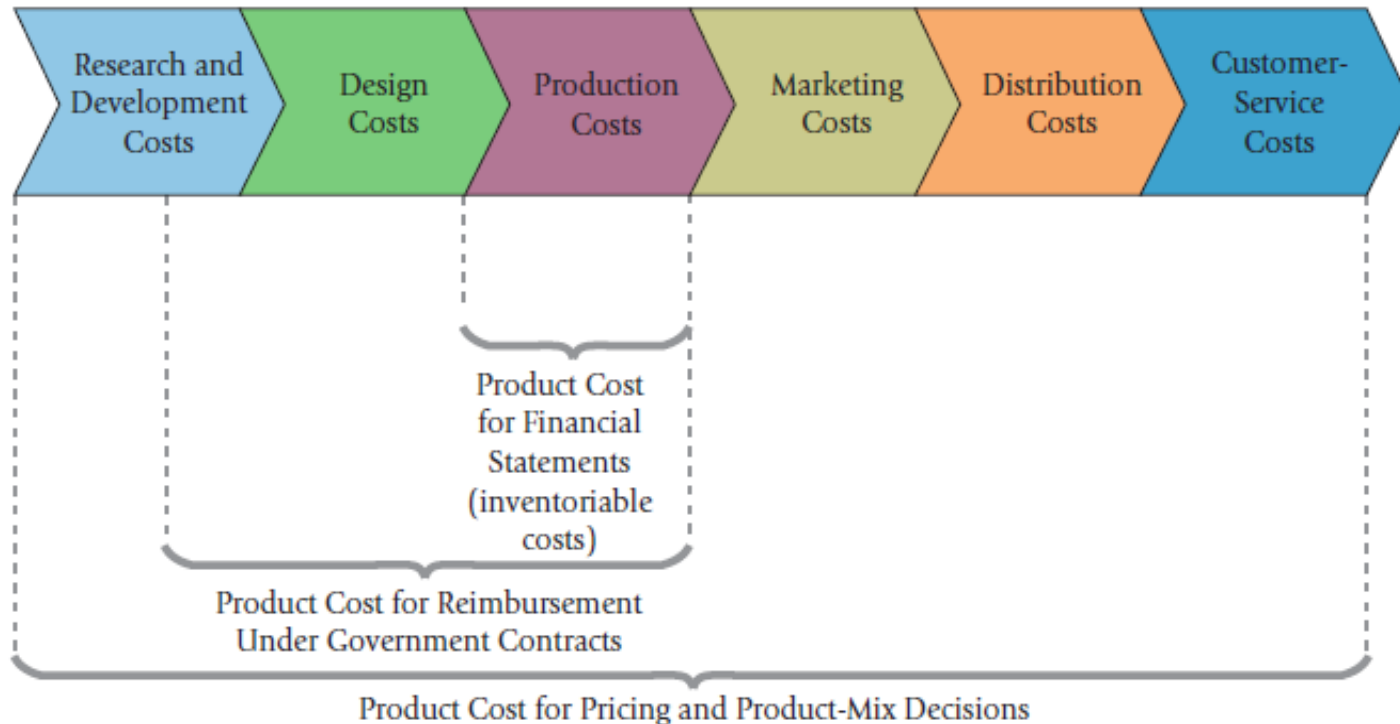
- Prime cost is a term referring to all direct manufacturing costs (materials and labor).
- Conversion cost is a term referring to direct labor and indirect manufacturing costs.
- Overtime labor costs are considered part of indirect overhead costs.

# Different product Costs for Different purposes

- Pricing and product-mix decisions—decisions about pricing and maximizing profits
- Contracting with government agencies—very specific definitions of allowable costs for “cost plus profit” contracts
- Preparing external-use financial statements—GAAP-driven product costs only




# Different product Costs for Different purposes



# A framework for cost accounting and cost management

The following three features of cost accounting and cost management can be used for a wide range of applications (for helping managers make decisions):

1. Calculating the cost of products, services, and other cost objects
2. Obtaining information for planning and control, and performance evaluation
3. Analyzing the relevant information for making decisions



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