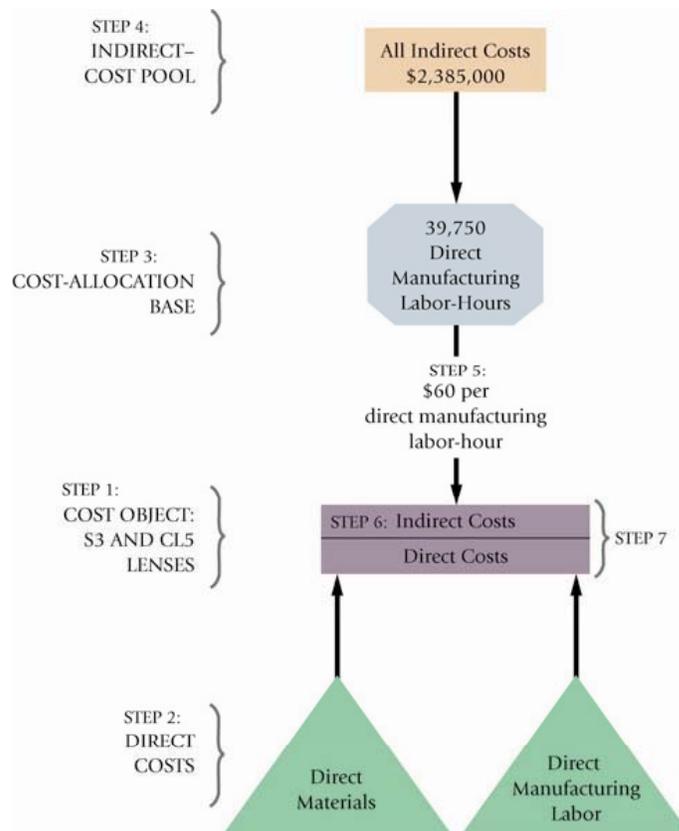


Chapter 5: Activity-Based Costing (ABC) & Activity-Based Management (ABM)

Horngrén 13e

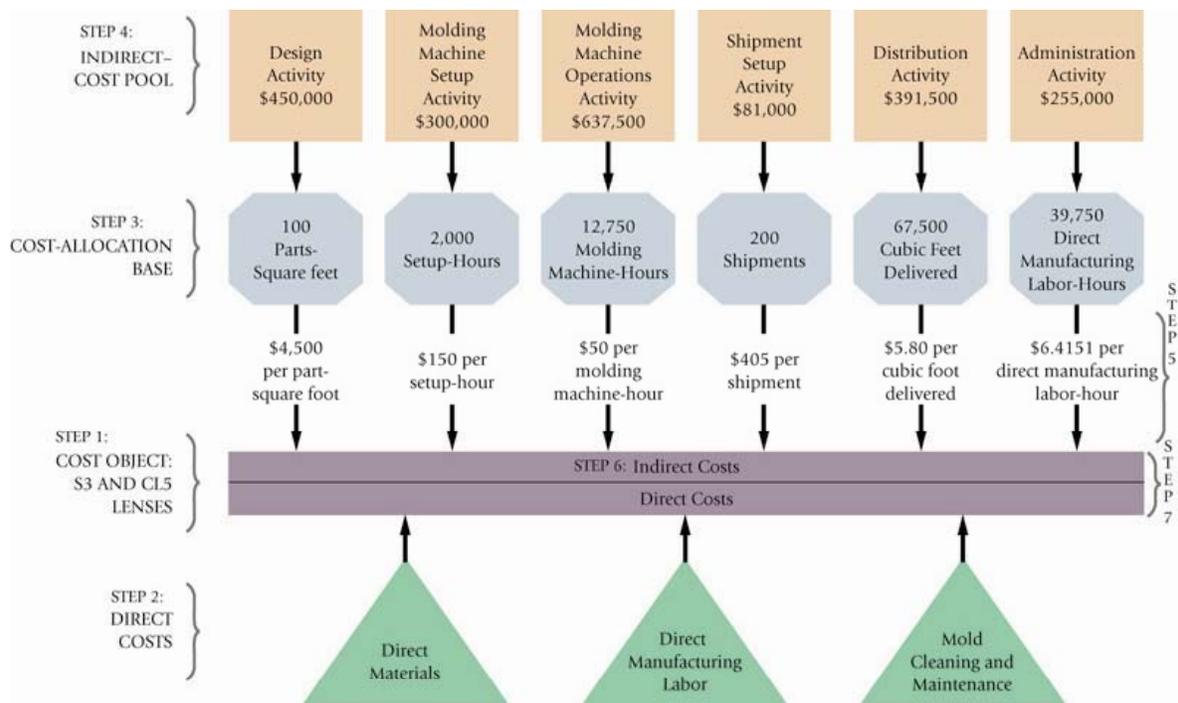
5-1

A SIMPLE COSTING SYSTEM



5-2

AN ACTIVITY-BASED COSTING SYSTEM



5-3

ABC's 7 Steps

- Step 1:** Identify the products that are the **chosen cost objects**.
- Step 2:** Identify the **direct costs** of the products.
- Step 3:** Select the **activities and cost-allocation bases** to use for allocating indirect costs to the products.
- Step 4:** Identify **the indirect costs** associated with each cost-allocation base (activity).
- Step 5:** Compute the **rate per unit** of each cost-allocation base (activity) used to allocate indirect costs to the products.
- Step 6:** Compute the indirect **costs allocated** to the products.
- Step 7:** Compute the **total costs of the products** by adding all direct and indirect costs assigned to the products.

5-4

COST HIERARCHIES

In an ABC system, costs are categorized on the basis of the different types of cost drivers utilized. ABC systems commonly use a cost hierarchy having four levels. These cost drivers differ in their relationship between the indirect cost and the product or service.

Output unit-level costs are the costs of activities performed on each individual unit of a product or service.

- These costs increase as the number of units produced increases.

Batch-level costs are the costs of activities related to a group of units of products or services rather than the individual unit.

- Set-up costs are an example of batch level costs, as this cost is incurred once for each batch, regardless of the size of the batch.

5-5

COST HIERARCHIES

Product-sustaining costs (service-sustaining costs) are the costs of activities undertaken to support individual products or services regardless of the number of units or batches produced.

- Design costs are an example of this type of cost.

Facility-sustaining costs are the costs of activities that cannot be traced to individual products or services but support the organization as a whole.

- Examples of this type of cost include general administration, rent, and building security.
- These costs usually lack a cause-and-effect relationship between the cost and the allocation base.

5-6

- **Activity-based costing improves costing systems in three ways:**

1. *It increases the number of cost pools used to accumulate overhead costs.* Rather than accumulate all overhead costs in a single, company-wide pool (or in departments), costs are accumulated by activity.
2. *It changes the bases used to assign overhead cost to products.* Rather than assigning costs on the basis of a measure of volume (such as direct labor-hours or machine-hours), costs are assigned on the basis of the activities that generate the costs.
3. *It changes the nature of many overhead costs.* Costs that were formerly indirect (depreciation, power, inspection) are traced to specific activities.

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ACTIVITY-BASED COSTING EXAMPLE

Sarver Company manufactures 4,000 units of Product A and 20,000 units of Product B each year. The company currently has a traditional cost system in which direct labor-hours is used to assign overhead cost to products. The predetermined overhead rate is:

$$\frac{\text{Manufacturing overhead cost}}{\text{Direct labor-hours}} = \text{_____} =$$

Product A requires 2.5 DLH and Product B requires 2.0 DLH. According to the current cost system, the unit product costs are:

	<u>Product A</u>	<u>Product B</u>
Direct materials	\$36.00	\$30.00
Direct labor	17.50	14.00
Manufacturing overhead		
.....		
.....		
Unit product cost.....	_____	_____
	=====	=====

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Suppose, however, that overhead costs are actually caused by the five activities listed below rather than by direct labor hours.

<u>Activity Center</u>	<u>Estimated Overhead Cost</u>
Machine setups	
Quality inspections	
Production orders	
Machine-hours worked	
Material receipts	_____
Total	=====

Also suppose the following activity data have been estimated:

<u>Activity Center</u>	<u>Expected Activity</u>		
	<u>Total</u>	<u>Product A</u>	<u>Product B</u>
Machine setups			
Quality inspections			
Production orders			
Machine-hours worked			
Material receipts			

These data can be used to develop overhead rates for each of the five activities:

<u>Activity Center</u>	<u>Estimated Overhead Costs</u>	<u>Expected Activity</u>	<u>Overhead Rate</u>
Machine setups			
Quality inspections			
Production orders			
Machine-hours worked			
Material receipts			

<i>Product A</i>			
<i>Activity Center</i>	<i>Overhead Rate</i>	<i>Activity</i>	<i>Amount</i>
Machine setups.....			
Quality inspections.....			
Production orders.....			
Machine-hours worked.....			
Material receipts			
Total overhead (a).....			_____
Number of units (b).....			_____
Overhead per unit (a) + (b)...			=====

<i>Product B</i>			
<i>Activity Center</i>	<i>Overhead Rate</i>	<i>Activity</i>	<i>Amount</i>
Machine setups.....			
Quality inspections.....			
Production orders.....			
Machine-hours worked.....			
Material receipts			
Total overhead (a).....			_____
Number of units (b).....			_____
Overhead per unit (a) + (b)...			=====

ACTIVITY-BASED COSTING EXAMPLE (cont'd)

Product costs computed using the two different methods can now be contrasted:

Product costs using activity-based costing:

	<i>Product A</i>	<i>Product B</i>
Direct materials.....		
Direct labor.....		
Manufacturing overhead	_____	_____
Unit product cost	=====	=====

Product costs using the old costing system:

	<i>Product A</i>	<i>Product B</i>
Direct materials.....		
Direct labor.....		
Manufacturing overhead	_____	_____
Unit product cost	=====	=====

- **Adopting activity-based costing usually results in shifting overhead costs from high volume to low volume products.**
- **The per unit costs of the low volume products increase and the per unit costs of the high volume products decrease.**
- **The effects are not symmetrical—there is a bigger dollar effect on the per unit costs of the low volume products.**

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Learning Objective 1: Explain how broad averaging undercosts and overcosts products or services . . . this problem arises when reported costs of products do not equal their actual costs

Production-cost cross-subsidization results from

- a. allocating indirect costs to multiple products.
- b. assigning traced costs to each product.
- c. assigning costs to different products using varied costing systems within the same organization.
- d. assigning broadly averaged costs across multiple products without recognizing amounts of resources used by which products.

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Learning Objective 2: Present three guidelines for refining a costing system . . . classify more costs as direct costs, expand the number of indirect-cost pools, and identify cost drivers

In refining a cost system

- a. total direct costs are unchanged because they can be traced in an economically feasible way to the product and traced costs are more accurate.
- b. the costs are grouped in homogeneous pools of the same or similar amounts.
- c. the criterion of cause and effect is used to relate indirect costs to a factor that systematically links to a cost object.
- d. the organization looks for cost-allocation bases that will provide a uniform spreading of indirect costs to each product.

True or False

Indirect labor and distribution costs would most likely be in the same activity-cost pool.

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True or False

Indirect labor and distribution costs would most likely be in the same activity-cost pool.

Answer: False

Indirect labor and distribution costs would not be in the same activity-cost pool because their cost drivers are very dissimilar. A cost driver of indirect labor would include direct labor hours, while a cost driver of distribution costs would include cubic feet of cargo moved.

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Learning Objective 3: Distinguish between simple and ABC systems ... unlike simple systems, ABC systems calculate costs of individual activities to cost products

Learning Objective 5: Cost products or services using ABC . . . use cost rates for different activities to compute indirect costs of a product

Learning Objective 6: Explain how ABC systems are used in ABM . . . such as pricing decisions, product-mix decisions, and cost reduction

[EXERCISE]

Brilliant Accents Company manufactures and sells three styles of kitchen faucets: Brass, Chrome, and White. Production takes 25, 25, and 10 machine hours to manufacture 1,000-unit batches of brass, chrome and white faucets, respectively. The following additional data apply:

	<u>BRASS</u> 30,000	<u>CHROME</u> 50,000	<u>WHITE</u> 40,000
Projected sales in units			
<u>PER UNIT data:</u>			
Selling price	\$40	\$20	\$30
Direct materials	\$ 8	\$ 4	\$ 8
Direct labor	\$15	\$ 3	\$ 9
Overhead cost based on direct labor hours (traditional system)	\$12	\$ 3	\$ 9
<u>Hours per 1000-unit batch:</u>			
Direct labor hours	40	10	30
Machine hours	25	25	10
Setup hours	1.0	0.5	1.0
Inspection hours	30	20	20

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[EXERCISE] Total overhead costs and activity levels for the year are estimated as follows:

<u>Activity</u>	<u>Overhead costs</u>	<u>Activity levels</u>
Direct labor hours		2,900 hours
Machine hours		2,400 hours
Setups	\$465,500	95 setup hours
Inspections	\$405,000	2,700 inspection hours
	<u>\$870,500</u>	

Required:

- Using the traditional system, determine the operating profit per unit for the brass style of faucet.
- Determine the activity-cost-driver rate for setup costs and inspection costs.
- Using the ABC system, for the brass style of faucet
 - compute the estimated overhead costs per unit.
 - compute the estimated operating profit per unit.
- Explain the difference between the profits obtained from the traditional system and the ABC system. Which system provides a better estimate of profitability? Why?

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[SOLUTION]

- Traditional system:
Operating profit per unit for Brass faucets is $\$5 = \$40 - (\$8 + 15 + 12)$.
- The activity-cost-driver rate for setup costs is $\$4,900$ per setup hour = $\$465,500/95$,
and for inspection costs is $\$150$ per inspection hour = $\$405,000/2700$.
- ABC system:
Overhead costs per unit for Brass faucets are \$9.40 per unit.
30,000 units in projected sales / 1000 units per batch = 30 batches;
30 batches x 1 setup hour per batch = 30 setup hours;
30 batches x 30 inspection hours per batch = 900 inspection hours.

 $30 \text{ setup hours} \times \$4,900 = \$147,000/30,000 \text{ units} = \$4.90/\text{unit}$
 $900 \text{ inspection hours} \times \$150 = \$135,000/30,000 \text{ units} = \$4.50/\text{unit}$
Overhead costs for Brass faucets $(\$4.90 + \$4.50) = \$9.40$ per unit.

Operating profit per unit for Brass faucets is $\$7.60 = \$40 - (\$8 + 15 + 9.40)$.
- Traditional system: Operating profit per unit for Brass faucets is $\$5.00$.
ABC system: Operating profit per unit for Brass faucets is $\$7.60$.

Because the products do not all require the same proportionate shares of the support resources of setup hours and inspection hours, the ABC system provides different results than the traditional system which allocates overhead costs on the basis of direct labor hours. The ABC system considers some important differences in overhead resource requirements and thus provides a better picture of the profitability from each faucet style provided that the activity measures are fairly estimated.

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Learning Objective 4: Describe a four-part cost hierarchy . . . a four-part cost hierarchy is used to categorize costs based on different types of cost drivers—for example, costs that vary with each unit of a product versus costs that vary with each batch of products

Advertising of a specific product is an example of

- a. unit-level costs.
- b. batch-level costs.
- c. product-sustaining costs.
- d. facility-sustaining costs.

The MOST likely example of an output unit-level cost is

- a. general administrative costs.
- b. paying suppliers for orders received.
- c. engineering costs.
- d. machine depreciation.

The MOST likely example of a batch-level cost is

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Learning Objective 7: Compare ABC systems and department costing systems
... ABC systems are a refinement of department costing systems into more-focused and homogenous cost pools

Which of the following statements is more representative of activity-based costing in comparison to a department-costing system?

- a. The use of multiple cost-allocation bases
- b. The use of indirect-cost rates for significant resource use
- c. The use of activities having a cause-and-effect relationship
- d. The use of multiple cost pools

Learning Objective 8: Evaluate the costs and benefits of implementing ABC systems . . . measurement difficulties versus more accurate costs that aid in decision making

A significant limitation of activity-based costing is the

- a. attention given to indirect cost allocation.
- b. many necessary calculations.
- c. operations staff's attitude toward the accounting staff.
- d. use it makes of technology.

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