Activity-Based Costing: A Tool to Aid Decision Making

121. Cosgrove Company manufactures two products, Product K-7 and Product L-15. Product L-15 is of fairly recent origin, having been developed as an attempt to enter a market closely related to that of Product K-7. Product L-15 is the more complex of the two products, requiring 2.0 hours of direct labor time per unit to manufacture compared to 1.0 hour of direct labor time for Product K-7. Product L-15 is produced on an automated production line.

Overhead currently is applied to the products on the basis of direct labor-hours. The company estimated it would incur $510,000 in manufacturing overhead costs and produce 10,000 units of Product L-15 and 40,000 units of Product K- 7 during the current year. Unit costs for materials and labor are:

10,000 × 2 hrs = 40,000 hours + 20,000 hrs. = 60,000 hrs.

	Product K-7	Product L-15
Direct material	$11	$24
Direct labor	$6	$12

$510,000 / 60,000 hrs = $8.50 per hour

Required:

a. Compute the predetermined overhead rate under the current method, and determine the unit product cost of each product for the current year. → next page.

b. The company is considering the use of activity-based costing as an alternative to its traditional costing method for manufacturing overhead. Data relating to the company's activity cost pools for the current year are given below:

ABC POHRs

	Numerator	Denominator		
		Total Activity		
Activity Cost Pool	Total Cost	Product K-7	Product L-15	Total
Machine setups required	$204,000	800	1,600	2,400
Purchase orders issued	43,500	500	100	600
Machine-hours required	105,000	7,000	10,500	17,500
Maintenance requests issued	157,500	650	850	1,500
	$510,000			

$85.00 per setup
72.50 per order
6.00 per hour
105.00 per request.

Using the data above, determine the unit product cost of each product for the current year. → p. 2 & 3

c. What items of overhead cost make Product L-15 so costly to produce according to the activity-based costing system? What influence might the activity-based costing data have on management's opinions regarding the profitability of Product L-15?

a. The company expects to work 60,000 direct labor-hours during the current year, computed as follows:

Product K-7: 40,000 units × 1 hour	40,000	hours
Product L-15: 10,000 units × 2 hours	20,000	hours
Total direct labor-hours	60,000	hours

Using these hours as a base, the predetermined overhead using direct labor-hours would be:
Predetermined overhead rate = Estimated overhead cost ÷ Estimated direct labor-hours
= $510,000 ÷ 60,000 hours = $8.50 per hour

Using this overhead rate, the unit product cost of each product would be:

	Product K-7	Product L-15
Direct materials	$11.00	$24.00
Direct labor	6.00	12.00
Manufacturing overhead:		
Product K-7, 1.0 hour	8.50	
Product L-15, 2.0 hours		17.00
Total unit product cost	$25.50	$53.00

b. The activity rates for each activity cost pool are as follows:

	Total Cost	Total Activity		Activity Rate	
Machine setups	$204,000	2,400	setups	$85.00	per setup
Purchase orders	$43,500	600	orders	$72.50	per order
Machine-hours	$105,000	17,500	hours	$6.00	per hour
Maintenance requests	$157,500	1,500	requests	$105.00	per request

The overhead cost charged to Product K-7 is:

	Activity Rate		Activity		ABC Cost
Machine setups	$85.00	per setup	800	setups	$ 68,000
Purchase orders	$72.50	per order	500	orders	36,250
Machine-hours	$6.00	per hour	7,000	hours	42,000
Maintenance requests	$105.00	per request	650	requests	68,250
Total overhead cost					$214,500

The overhead cost charged to Product L-15 is:

	Activity Rate		Activity		ABC Cost
Machine setups	$85.00	per setup	1,600	setups	$136,000
Purchase orders	$72.50	per order	100	orders	7,250
Machine-hours	$6.00	per hour	10,500	hours	63,000
Maintenance requests	$105.00	per request	850	requests	89,250
Total overhead cost					$295,500

Overhead cost per unit:
Product K-7: $214,500 ÷ 40,000 units = $5.3625 per unit
Product L-15: $295,500 ÷ 10,000 units = $29.5500 per unit

Using activity based costing, the unit product cost of each product would be:

	Product K-7	Product L-15
Direct materials	$11.0000	$24.00
Direct labor	6.0000	12.00
Manufacturing overhead	5.3625	29.55
Total unit product cost	$22.3625	$65.55

c. Product L-15 accounts for 20% of the company's total product, but requires two-thirds of the total machine set-ups and sixty percent of the machine-hours worked in addition to more than half of the maintenance requests. These factors are concealed when direct labor-hours are used to assign overhead cost to product. Activity-based costing, however, assigns a larger amount of overhead cost to Product L-15. Indeed, Product L-15 may be less profitable than the company has been led to believe under the traditional direct labor approach.

Learning Objective: 06-01 Understand activity-based costing and how it differs from a traditional costing system.
Learning Objective: 06-03 Compute activity rates for cost pools.
Learning Objective: 06-04 Assign costs to a cost object using a second-stage allocation.
Level: 3 Hard

131. Murri Corporation has an activity-based costing system with three activity cost pools-Processing, Setting Up, and Other. The company's overhead costs, which consist of factory utilities and indirect labor, are allocated to the cost pools in proportion to the activity cost pools' consumption of resources. Costs in the Processing cost pool are assigned to products based on machine-hours (MHs) and costs in the Setting Up cost pool are assigned to products based on the number of batches. Costs in the Other cost pool are not assigned to products. Data concerning the two products and the company's costs and activity-based costing system appear below:

Factory utilities (total)	$29,000
Indirect labor (total)	$7,000
	36,600

Distribution of Resource Consumption Across Activity Cost Pools

	Processing	Setting Up	Other
Factory utilities 29,000 ×	× 0.40	× 0.10	× 0.50
Indirect labor 7,600 ×	× 0.50	× 0.20	× 0.30

Proc	SU	Other	Total
11,600	2900	14,500	29000
3500	1400	2100	7000
15,100	4300	16,600	36,000
÷ 10,000 MH	÷ 1000 Batches		
$1.51 per MH	$4.30 per batch		ABC rates

	MHs	Batches
Product X7	2,900	700
Product L4	7,100	300
Total	10,000	1,000

	Product X7	Product L4
Sales (total)	$54,000	$85,100
Direct materials (total)	$19,100	$33,500
Direct labor (total)	$26,300	$35,000

Required:

a. Assign overhead costs to activity cost pools using activity-based costing.
b. Calculate activity rates for each activity cost pool using activity-based costing.
c. Determine the amount of overhead cost that would be assigned to each product using activity-based costing.
d. Determine the product margins for each product using activity-based costing.

a. Assign overhead costs to activity cost pools by applying the percentages in the Distribution of Resource Consumption Across Activity Cost Pools table to the respective costs. For example, the first entry in the table is computed as follows: 0.40 × $29,000 = $11,600.

	Activity Cost Pools			
	Processing	Setting Up	Other	Total
Factory utilities	$11,600	$2,900	$14,500	$29,000
Indirect labor	3,500	1,400	2,100	7,000
Total	$15,100	$4,300	$16,600	$36,000

b. The activity rates for each activity cost pool are computed as follows:

	Total Cost	Total Activity	Activity Rate
Processing	$15,100	10,000 MHs	$1.51 per MH
Setting up	$4,300	1,000 batches	$4.30 per batch

c. The overhead cost charged to Product X7 is:

	Activity Rate		Activity		ABC Cost
Processing	$1.51 per MH	×	2,900 MHs	=	$4,379 ✓
Setting up	$4.30 per batch	×	700 batches	=	3,010 ✓
Total overhead cost					$7,389

The overhead cost charged to Product L4 is:

	Activity Rate		Activity		ABC Cost
Processing	$1.51 per MH	×	7,100 MHs	=	$10,721 ✓
Setting up	$4.30 per batch	×	300 batches	=	1,290 ✓
Total overhead cost					$12,011

d. Determine product margins:

	Product X7		Product L4	
Sales		$54,000		$85,100
Direct materials	$19,100		$33,500	
Direct labor	26,300		35,000	
Processing	4,379		10,721	
Setting up	3,010	52,789	1,290	80,511
Product margin		$1,211 ✓		$4,589 ✓

Learning Objective: 06-02 Assign costs to cost pools using a first-stage allocation.
Learning Objective: 06-03 Compute activity rates for cost pools.
Learning Objective: 06-04 Assign costs to a cost object using a second-stage allocation.
Learning Objective: 06-05 Use activity-based costing to compute product and customer margins.
Level: 2 Medium