Chapter 07
Activity-Based Costing: A Tool to Aid Decision Making

Exercise 7-1 (10 minutes)

a.	Various individuals manage the parts inventories.	Product-level
b.	A clerk in the factory issues purchase orders for a job.	Batch-level
c.	The personnel department trains new production workers.	Organization-sustaining
d.	The factory's general manager meets with other department heads, such as marketing, to coordinate plans.	Organization-sustaining
e.	Direct labor workers assemble products.	Unit-level
f.	Engineers design new products.	Product-level
g.	The materials storekeeper issues raw materials to be used in jobs.	Batch-level
h.	The maintenance department performs periodic preventative maintenance on general-use equipment.	Organization-sustaining

Some of these classifications are debatable and may depend on the specific circumstances found in particular companies.

Exercise 7-2 (15 minutes)

	Travel	*Pickup and Delivery*	*Customer Service*	*Other*	*Totals*
Driver and guard wages	$336,000	$378,000	$ 84,000	$ 42,000	$ 840,000
Vehicle operating expense	202,500	13,500	0	54,000	270,000
Vehicle depreciation	105,000	15,000	0	30,000	150,000
Customer representative salaries and expenses	0	0	153,000	27,000	180,000
Office expenses	0	10,000	14,000	16,000	40,000
Administrative expenses	0	17,000	187,000	136,000	340,000
Total cost	$643,500	$433,500	$438,000	$305,000	$1,820,000

Each entry in the table is derived by multiplying the total cost for the cost category by the percentage taken from the table below that shows the distribution of resource consumption:

	Travel	*Pickup and Delivery*	*Customer Service*	*Other*	*Totals*
Driver and guard wages	40%	45%	10%	5%	100%
Vehicle operating expense	75%	5%	0%	20%	100%
Vehicle depreciation	70%	10%	0%	20%	100%
Customer representative salaries and expenses	0%	0%	85%	15%	100%
Office expenses	0%	25%	35%	40%	100%
Administrative expenses	0%	5%	55%	40%	100%

Exercise 7-3 (10 minutes)

Activity Cost Pool	*Estimated Overhead Cost*	*Expected Activity*			*Activity Rate*
Caring for lawn	$77,400	180,000	square feet of lawn	$0.43	per square foot of lawn
Caring for garden beds–low maintenance	$30,000	24,000	square feet of low maintenance beds	$1.25	per square foot of low maintenance beds
Caring for garden beds–high maintenance	$57,600	18,000	square feet of high maintenance beds	$3.20	per square foot of high maintenance beds
Travel to jobs	$4,200	15,000	miles	$0.28	per mile
Customer billing and service	$8,700	30	customers	$290	per customer

The activity rate for each activity cost pool is computed by dividing its estimated overhead cost by its expected activity.

Exercise 7-4 (10 minutes)

J78

Activity Cost Pool		*Activity Rate*		*Activity*	*ABC Cost*
Supporting direct labor.....	$7	per direct labor-hour	1,000	direct labor-hours	$ 7,000
Machine processing.....	$3	per machine-hour	3,200	machine-hours	9,600
Machine setups.....	$40	per setup	5	setups	200
Production orders	$160	per order	5	order	800
Shipments.....	$120	per shipment	10	shipment	1,200
Product sustaining	$800	per product	1	product	800
Total overhead cost					$19,600

W52

Activity Cost Pool		*Activity Rate*		*Activity*	*ABC Cost*
Supporting direct labor.....	$7	per direct labor-hour	40	direct labor-hours	$ 280
Machine processing.....	$3	per machine-hour	30	machine-hours	90
Machine setups.....	$40	per setup	1	setups	40
Production orders	$160	per order	1	orders	160
Shipments.....	$120	per shipment	1	shipments	120
Product sustaining	$800	per product	1	product	800
Total overhead cost					$1,490

Exercise 7-5 (15 minutes)

Sales ($1,650 per standard model glider × 10 standard model gliders + $2,300 per custom designed glider × 2 custom designed gliders).....		$21,100
Costs:		
Direct materials ($462 per standard model glider × 10 standard model gliders + $576 per custom designed glider × 2 custom designed gliders)	$5,772	
Direct labor ($19 per direct labor-hour × 28.5 direct labor-hours per standard model glider × 10 standard model gliders + $19 per direct labor-hour × 32 direct labor-hours per custom designed glider × 2 custom designed gliders)	6,631	
Supporting direct labor ($18 per direct labor-hour × 28.5 direct labor-hours per standard model glider × 10 standard model gliders + $18 per direct labor-hour × 32 direct labor-hours per custom designed glider × 2 custom designed gliders)	6,282	
Order processing ($192 per order × 3 orders).....	576	
Custom designing ($261 per custom design × 2 custom designs)	522	
Customer service ($426 per customer × 1 customer)	426	20,209
Customer margin		$ 891

Problem 7-17 (45 minutes)

1. Under the traditional direct labor-dollar based costing system, manufacturing overhead is applied to products using the predetermined overhead rate computed as follows:

$$\text{Predetermined overhead rate} = \frac{\text{Estimated total manufacturing overhead cost}}{\text{Estimated total direct labor dollars}}$$

$$= \frac{\$508,625}{\$162,500} = \$3.13 \text{ per DL\$}$$

The product margins using the traditional approach would be computed as follows:

	EX300	*TX500*	*Total*
Sales	$1,200,000	$500,000	$1,700,000
Direct materials	366,325	162,550	528,875
Direct labor	120,000	42,500	162,500
Manufacturing overhead applied @ $3.13 per direct labor-dollar	375,600	133,025	508,625
Total manufacturing cost	861,925	338,075	1,200,000
Product margin	$ 338,075	$161,925	$ 500,000

Note that all of the manufacturing overhead cost is applied to the products under the company's traditional costing system.

Problem 7-17 (continued)

2. The first step is to determine the activity rates:

Activity Cost Pools	*(a) Total Cost*	*(b) Total Activity*	*(a) ÷ (b) Activity Rate*
Machining	$198,250	152,500 MHRs	$1.30 per MHR
Setups	$150,000	375 setup hrs.	$400 per setup hr.
Product sustaining .	$100,000	2 products	$50,000 per product

*The Other activity cost pool is not shown above because it includes organization-sustaining and idle capacity costs that should not be assigned to products.

Under the activity-based costing system, the product margins would be computed as follows:

	EX300	*TX500*	*Total*
Sales	$1,200,000	$500,000	$1,700,000
Direct materials	366,325	162,550	528,875
Direct labor	120,000	42,500	162,500
Advertising expense....	50,000	100,000	150,000
Machining	117,000	81,250	198,250
Setups	30,000	120,000	150,000
Product sustaining	50,000	50,000	100,000
Total cost.....	733,325	556,300	1,289,625
Product margin.....	$ 466,675	$(56,300)	$ 410,375

Problem 7-17 (continued)

3. The quantitative comparison is as follows:

	EX300		*TX500*		*Total*
	(a)	*(a) ÷ (c)*	*(b)*	*(b) ÷ (c)*	*(c)*
Traditional Cost System	*Amount*	*%*	*Amount*	*%*	*Amount*
Direct materials	$366,325	69.3%	$162,550	30.7%	$ 528,875
Direct labor	120,000	73.8%	42,500	26.2%	162,500
Manufacturing overhead	375,600	73.8%	133,025	26.2%	508,625
Total cost assigned to products	$861,925		$338,075		1,200,000
Selling and administrative					550,000
Total cost					$1,750,000
Activity-Based Costing System					
Direct costs:					
Direct materials	$366,325	69.3%	$162,550	30.7%	$ 528,875
Direct labor	120,000	73.8%	42,500	26.2%	162,500
Advertising expense	50,000	33.3%	100,000	66.7%	150,000
Indirect costs:					
Machining	117,000	59.0%	81,250	41.0%	198,250
Setups	30,000	20.0%	120,000	80.0%	150,000
Product sustaining	50,000	50.0%	50,000	50.0%	100,000
Total cost assigned to products	$733,325		$556,300		1,289,625
Costs not assigned to products:					
Selling and administrative					400,000
Other					60,375
Total cost					$1,750,000

Problem 7-17 (continued)

The traditional and activity-based cost assignments differ for three reasons. First, the traditional system assigns all $508,625 of manufacturing overhead to products. The ABC system assigns only $448,250 of manufacturing overhead to products. The ABC system does not assign the $60,375 of Other activity costs to products because they represent organization-sustaining costs. Second, the traditional system uses one unit-level activity measure, direct labor dollars, to assign 73.9% of all overhead to the EX300 product line and 26.1% of all overhead to the TX500 product line. The ABC system assigns 59.0% of Machining costs to the EX300 product line and 41.0% to the TX500 product line. The ABC system assigns 20.0% of Setup costs (a batch-level activity) to the EX300 product line and 80.0% to the TX500 product line. The ABC system assigns 50% of Product sustaining costs (a product-level activity) to each product line. Third, the traditional system does not trace any advertising expenses to the two products. The ABC system traces $50,000 of advertising to the EX300 and $100,000 of advertising to the TX500 product line.