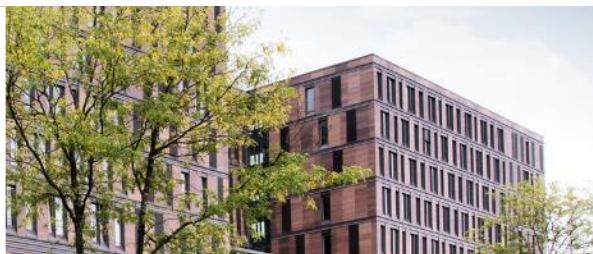


Prof. Dr. Timo Vogelsang

MANAGERIAL ACCOUNTING (WINTER 2023)



SESSION 5

ABC EXAMPLE (E5-29)

- Rainbow Spray Paints, Inc. has used a traditional costing system to apply Quality Control costs to all products at 16% of D/L cost. Monthly direct labor cost for enamel paint line is \$98,000.
- Management is considering to implement ABC and gathered the following information for the enamel paint product line:

Activity Cost Pool	Cost Driver	Pool Rates	Quantity of Driver
Incoming mat. inspection	Type of mat.	\$23.00/type	24 types
In-process inspection	Number of units	\$.28/unit	35,000 units
Product certification	Per order	\$144.00/order	50 orders

1. Calculate quality control cost to be assigned to the enamel paint line under (a) traditional costing and (b) ABC.
2. Does traditional costing over- or undercost the paint line with respect to quality control costs? By how much?

ABC EXAMPLE (E5 – 29)

1. a. Quality-control costs assigned to the enamel paint line under the traditional system:

$$\text{Quality-control costs} = 16\% \times \text{direct-labor cost}$$

$$\begin{aligned} \text{Quality-control} \\ \text{costs assigned to} \\ \text{enamel paint line} &= 16\% \times \$98,000 \\ &= \$15,680 \end{aligned}$$

ABC EXAMPLE (E5 – 29)

1. b. Quality-control costs assigned to the enamel paint line under activity-based costing:

Activity	Pool Rate	Quantity for Enamel Paint	Assigned Cost
Incoming material inspection.....	\$23.00 per type	24 types	\$ 552
In-process inspection28 per unit.....	35,000 units ..	9,800
Product certification	144.00 per order ...	50 orders.....	<u>7,200</u>
Total quality-control costs assigned			<u>\$17,552</u>

ABC EXAMPLE (E5 – 29)

2. Does traditional costing over or under cost the paint line with respect to quality control costs? How much?
 - The traditional product-costing system *undercosts* the enamel paint product line, with respect to quality-control costs, by \$1,872 (\$17,552– \$15,680).

ACTIVITY-BASED COSTING

P5-69

MADISON ELECTRIC PUMP CORPORATION:

- 3 models: Regular, Advanced, and Deluxe
- Job order costing, OH applied based on DL hours
- Target price: 110% of costs, regular sold at discount (\$220)

	Regular Model	Advanced Model	Deluxe Model
Annual sales(units)	20,000	1,000	10,000
Direct Material	\$ 20	\$ 50	\$ 84
Direct Labor	20 (1h at \$ 20)	40 (2h at \$ 20)	40 (2h at \$ 20)
Manufacturing OH	170 (1h at \$ 170)	340 (2h at \$ 170)	340 (2h at \$ 170)
Total product cost	\$ 210	\$ 430	\$ 464
Target price	\$ 231	\$ 473	\$ 510.40

P5-69

OVERHEAD BUDGET

Depreciation, machinery	\$2,960,000
Maintenance, machinery	\$240,000
Depreciation, taxes, and insurance for factory	\$600,000
Engineering	\$700,000
Purchasing, receiving, and shipping	\$500,000
Inspection and repair of defects	\$750,000
Material Handling	\$800,000
Miscellaneous manufacturing overhead costs	\$590,000
Total	\$7,140,000

ACTIVITY-BASED COSTING

P5-69

- The following activity cost pools and cost drivers were identified

Activity Cost Pool	Cost Driver	Regular Model	Advanced Model	Deluxe Model
I: Depreciation, machinery Maintenance, machinery	Machine time	39%	13%	48%
II: Engineering Inspection and repair of defects	Engineering hours	47%	6%	47%
III: Purchasing, receiving, and shipping Material handling	Number of material orders	47%	8%	45%
IV: Depreciation, taxes, and insurance for factory Miscellaneous manufacturing overhead	Factory space usage	42%	15%	43%

P5-69

- Calculate product costs based on ABC!
- Compare target prices!
- Memo to explain differences and provide recommendations!

P5-69

Pool I:

Depreciation, machinery					\$2,960,000	
Maintenance, machinery					<u>240,000</u>	
Total					<u>\$3,200,000</u>	
Regular:	$(\$3,200,000 \times 39\%)$	\div	20,000	=	\$ 62.40	
Advanced:	$(\$3,200,000 \times 13\%)$	\div	1,000	=	\$416.00	
Deluxe:	$(\$3,200,000 \times 48\%)$	\div	10,000	=	\$153.60	

Pool II:

Engineering					\$ 700,000	
Inspection and repair of defects					<u>750,000</u>	
Total					<u>\$1,450,000</u>	
Regular:	$(\$1,450,000 \times 47\%)$	\div	20,000	=	\$ 34.08	
Advanced:	$(\$1,450,000 \times 6\%)$	\div	1,000	=	\$ 87.00	
Deluxe:	$(\$1,450,000 \times 47\%)$	\div	10,000	=	\$ 68.15	

P5-69

Pool III:					
Purchasing, receiving, and shipping					\$ 500,000
Material handling					<u>800,000</u>
Total					<u>\$1,300,000</u>
Regular:	$(\$1,300,000 \times 47\%)$	\div	20,000	$=$	\$ 30.55
Advanced:	$(\$1,300,000 \times 8\%)$	\div	1,000	$=$	\$104.00
Deluxe:	$(\$1,300,000 \times 45\%)$	\div	10,000	$=$	\$ 58.50

Pool IV:					
Depreciation, taxes, and insurance for factory					\$ 600,000
Miscellaneous manufacturing overhead					<u>590,000</u>
Total					<u>\$1,190,000</u>
Regular:	$(\$1,190,000 \times 42\%)$	\div	20,000	$=$	\$ 24.99
Advanced:	$(\$1,190,000 \times 15\%)$	\div	1,000	$=$	\$178.50
Deluxe:	$(\$1,190,000 \times 43\%)$	\div	10,000	$=$	\$51.17

P5-69

	Regular Model	Advanced Model	Deluxe Model
Direct material	\$ 20.00	\$ 50.00	\$ 84.00
Direct labor	20.00	40.00	40.00
Machinery depreciation and maintenance ^a	62.40	416.00	153.60
Engineering, inspection and repair of defects ^b	34.08	87.00	68.15
Purchasing, receiving, shipping, and material handling ^c	30.55	104.00	58.50
Factory depreciation, taxes, insurance, and miscellaneous overhead costs ^d	<u>24.99</u>	<u>178.50</u>	<u>51.17</u>
Total ABC Product Cost	<u>\$192.02</u>	<u>\$875.50</u>	<u>\$455.42</u>
Target Price	<u>\$211.22</u>	<u>\$963.05</u>	<u>\$500.96</u>

P5-69

- Comparison of Target Prices

Target Prices	Regular	Advanced	Deluxe
Volume-based System	\$ 231	\$ 473	\$ 510.40
Activity-based System	\$ 211.22	\$ 963.05	\$ 500.96
Difference between two systems	\$ 19.78	(\$ 490.05)	\$ 9.44

P5-69

Memo to president explaining differences

- Traditional costing system overcosted the Regular and Deluxe models, while the Advanced model was undercosted.
- Overcosting for the Regular model caused uncompetitive pricing, reducing sales and profits.
 - Current Profit: \$10/Regular unit (\$220 sales price - \$210 cost)
 - ABC Profit: \$19.20/Regular unit (\$211.22 sales price - \$192.02 cost), which is also more in line with what competitors charge
- Current pricing sells the Advanced model at a loss, while recording a profit.

P5-69

Strategic recommendations

- Adopt ABC
- Lower price of regular model should to the \$212
 - Regain competitive position in the market, gain market share
- The price of the advanced model should be set near the target price of \$963.05.
 - If the advanced model does not sell at this price, consider discontinuing (but consider the extent to which sales in the regular model and deluxe model markets depend on the firm's offering a complete product line.
- A slight price reduction should be considered for the deluxe model (from \$510.40 down to \$500.96).
 - Analyze first if this would increase demand, otherwise keep old price

P5-66

FiberCom manufactures fiber optic cables and wants to perform a customer profitability analysis for the customers **Caltex and Trace**.

When assessing customer profitability, customer service costs such as sales activity, order frequency, special handling, etc. are considered. Hence, under a customer profitability analysis parts of the period costs are allocated to customers.

CUSTOMER PROFITABILITY

P5-66

For a customer profitability analysis for the customers Caltex and Trace, the following ABC info was collected:

Customer Activities	Cost Driver Base	Cost Driver Rate
Sales activity	Sales visits	\$2,000
Order taking	Purchase orders	400
Special handling	Units handled	100
Special shipping	Shipments	1,000

Customer Activities	Caltex Computer	Trace Telecom
Sales activity	8 visits	6 visits
Order taking	15 orders	20 orders
Special handling	800 units handled	600 units handled
Special shipping	18 shipments	20 shipments

P5-66

Furthermore, the following information on the customers Caltex and Trace is available:

	Caltex Computer	Trace Telecom
Sales revenue	\$380,000	\$247,600
Cost of goods sold	160,000	124,000
General selling costs	48,000	36,000
General administrative costs	38,000	32,000

Prepare a customer profitability analysis for Caltex and Trace using the ABC information.

P5-66

Customer profitability analysis for Caltex and Trace

	Caltex Computer	Trace Telecom
Sales revenue	\$380,000	\$247,600
Cost of goods sold	<u>160,000</u>	<u>124,000</u>
Gross margin	<u>\$220,000</u>	<u>\$123,600</u>
Selling and administrative costs:		
General selling costs	\$ 48,000	\$ 36,000
General administrative costs	38,000	32,000
Customer-related costs:		
Sales activity	16,000	12,000
Order taking	6,000	8,000
Special handling	80,000	60,000
Special shipping	<u>18,000</u>	<u>20,000</u>
Total selling and administrative costs	<u>\$206,000</u>	<u>\$168,000</u>
Operating income	<u>\$ 14,000</u>	<u>\$ (44,400)</u>

E5-26

- Precision Lens Company manufactures lenses and mirrors. During a profitability review they estimate the following:

	Mirrors	Lenses
– Units produced	30	30
– D/L hours per unit	250	250
– Material moves	4	16
– Total budgeted material handling cost is \$90,000		

- Using DL hours, how much cost allocated to mirrors and lenses per unit?
- Using ABC, what cost allocated to each unit (cost driver of material handling costs is material moves)?

E5-26

1. Material-handling cost per mirror:

$$\frac{\$90,000}{[(30)(250) + (30)(250)]^*} \times 250 = \$1,500$$

*The total number of direct-labor hours.

An alternative calculation, since both types of product use the same amount of the cost driver, is the following:

$$\frac{\$90,000}{60^*} = \$1,500$$

*The total number of units (of both types) produced.

Material-handling cost per lens = \$1,500. The analysis is identical to that given for requirement (1).

E5-26

2. Material-handling cost per mirror:

$$\frac{\$90,000}{(4 + 16) \times 4} \times 4^\dagger = \$600$$

*The total number of material moves.

†The number of material moves for the mirror product line.

Material-handling cost per lens:

$$\frac{\$90,000}{(4 + 16) \times 16} \times 16^* = \$2,400$$

*The number of material moves for the lens product line.