

# CHAPTER 2

## BASIC MANAGEMENT ACCOUNTING CONCEPTS

### QUESTIONS FOR WRITING AND DISCUSSION

1. Product costing accuracy means assigning the cost of the resources consumed by a cost object to that cost object.
2. A cost object is any item for which costs are measured and assigned, including such things as products, plants, projects, departments, and activities.
3. An activity is a basic unit of work performed within an organization. Examples include material handling, inspection, purchasing, billing, and maintenance.
4. A direct cost is a cost that can be traced to a cost object. An indirect cost is a cost that cannot be traced to cost objects.
5. Traceability is the ability to assign a cost directly to a cost object in an economically feasible way using a causal relationship. Tracing is the assignment of costs to cost objects using either an observable measure of the cost object's resource consumption or factors that allegedly capture the causal relationship.
6. Allocation is the assignment of indirect costs to cost objects based on convenience or assumed linkages.
7. Drivers are factors that cause changes in resource usage, activity usage, costs, and revenues. Resource drivers measure the demands placed on resources by activities and are used to assign the cost of resources to activities. Example: time used to assign the cost of supervision to individual activities. Activity drivers measure the demands placed on activities by cost objects and are used to assign the cost of activities to cost objects. Example: number of inspection hours used to assign the cost of inspection to individual products.
8. Direct tracing is the process of assigning costs to cost objects based on physically observable causal relationships. Driver tracing is assigning costs using drivers, which are causal factors. The driver approach relies on identification of factors that allegedly capture the causal relationship. Direct tracing relies on physical observation of the causal relationship and, therefore, is more reliable.
9. Driver tracing is the use of drivers to trace costs to cost objects. Often, this means that costs are first traced to activities using resource drivers and then to cost objects using activity drivers.
10. A tangible product is a good that is made by converting raw materials through the use of labor and capital inputs.
11. A service is a task or activity performed for a customer or an activity performed by a customer using an organization's products or facilities.
12. Services differ from tangible products on four important dimensions: intangibility, perishability, inseparability, and heterogeneity. Intangibility means that buyers of services cannot see, feel, taste, or hear a service before it is bought. Perishability means that services cannot be stored. Inseparability means that producers of services and buyers of services must be in direct contact (not true for tangible products). Heterogeneity means that there is a greater chance of variation in the performance of services than in the production of products.
13. Three examples of product cost definitions are value-chain, operating, and traditional definitions. The value-chain definition includes cost assignments for all value-chain activities. Operating product costs include all costs except for research and development. Traditional product costs include only production costs. Different costs are needed because they serve different managerial objectives.
14. The three cost elements that determine the cost of making a product are direct materials, direct labor, and overhead.
15. The income statement for a service firm does not need a supporting cost of goods manufactured schedule. Because services cannot be stored, the cost of services pro-

duced equals the cost of services sold (not necessarily true for a manufacturing firm).

16. There are six essential differences. Activity-based cost management systems use more drivers; are tracing intensive instead of allocation intensive; use broad, flexible product cost definitions; focus on managing activities instead of managing costs; emphasize systemwide performance over individual unit performance; and use both nonfinancial and financial performance measures. Functional-based cost management systems emphasize only financial measures.

17. For companies that have increased decision error costs and decreased measurement costs, a move to an activity-based cost management system is called for. Factors that affect the decision to move to an activity-based cost management system include more powerful and cheaper computing capabilities, increased competition, more focused production by competitors, deregulation, and JIT manufacturing.

## EXERCISES

### 2-1

- a. Driver tracing – the miles driven is an appropriate driver for the cost of gas, oil, and wear and tear on tires, etc.
- b. Direct tracing – the receipt for the lunch will be submitted for reimbursement.
- c. Direct tracing – Mandy will have a receipt for the stamps and photocopying services purchased.
- d. Allocation – Jed will probably add up the costs for a week or a month and divide that total by the number of jobs. If the lawns differ significantly in mowing area, he could divide by the number of hours worked (direct labor hours) and get a cost per labor hour.

### 2-2

#### Possible drivers:

- a. Number of statements
- b. Pounds of laundry
- c. Number of sales orders
- d. Number of purchase orders
- e. Number of inspections (also inspection hours)
- f. Assembly hours
- g. Hours of care
- h. Processing hours (number of returns less desirable)
- i. Number of parts (number of purchase orders)
- j. Hours of therapy

### 2-3

- a. Direct tracing
- b. Allocation
- c. Direct tracing
- d. Direct tracing
- e. Allocation
- f. Allocation
- g. Driver tracing – number of employees
- h. Direct tracing
- i. Direct tracing

- j. Allocation
- k. Driving tracing – number of phones
- l. Direct tracing
- m. Allocation

**2–4**

- |                             |                 |
|-----------------------------|-----------------|
| a. Marketing                | i. Servicing    |
| b. Servicing                | j. Producing    |
| c. Designing                | k. Developing   |
| d. Producing                | l. Designing    |
| e. Distributing             | m. Marketing    |
| f. Producing                | n. Distributing |
| g. Marketing                | o. Producing    |
| h. Designing and developing |                 |

**2–5**

- a. Value-chain. The price needs to cover all product costs, including the costs of developing, selling, and servicing.
- b. Traditional. This approach is mandated for external reporting.
- c. Value-chain. Product mix decisions should consider all costs, and the mix that is the most profitable in the long run should be selected.
- d. Operating. The designs should be driven by the effect they have on production, marketing, and servicing costs. Thus, the operating product cost definition is the most relevant.
- e. Traditional. This approach is mandated for external reporting.
- f. Operating. Research and design costs are not relevant for a price decision involving an existing product. Production, marketing, and servicing costs are relevant, however.
- g. Operating. Any special order should cover its costs which potentially include production, marketing, and servicing costs.
- h. Value-chain. This is a strategic decision that involves activities and costs throughout the entire value chain.

**2-6**

1. The two products that Holmes sells are playhouses and the installation of playhouses. The playhouse itself is a tangible product, and the installation is a service.
2. Holmes could assign the costs to production and to installation, but if the installation is a minor part of its business, it probably does not go to the trouble.
3. The opportunity cost of the installation process is the loss of the playhouses that could have been built by the two workmen who were pulled off the production line.

**2-7**

| Costs                                     | Product Cost     |              |           | PERIOD COST     |                        |
|---|------------------|--------------|-----------|-----------------|------------------------|
|   | Direct Materials | Direct Labor | Overhead  | Selling Expense | Administrative Expense |
| Direct materials                          | \$216,000        |              |           |                 |                        |
| Factory rent                              |                  |              | \$ 24,000 |                 |                        |
| Direct labor                              |                  | \$120,000    |           |                 |                        |
| Factory utilities                         |                  |              | 6,300     |                 |                        |
| Supervision in the factory                |                  |              | 50,000    |                 |                        |
| Indirect labor in the factory             |                  |              | 30,000    |                 |                        |
| Depreciation on factory equipment         |                  |              | 9,000     |                 |                        |
| Sales commissions                         |                  |              |           | \$ 27,000       |                        |
| Sales salaries                            |                  |              |           | 65,000          |                        |
| Advertising                               |                  |              |           | 37,000          |                        |
| Depreciation on the headquarters building |                  |              |           |                 | \$ 10,000              |
| Salary of the corporate receptionist      |                  |              |           |                 | 30,000                 |
| Other administrative costs                |                  |              |           |                 | 175,000                |
| Salary of the factory receptionist        |                  |              | 28,000    |                 |                        |
| Totals                                    | \$216,000        | \$120,000    | \$147,300 | \$129,000       | \$215,000              |

|                            |                         |
|----------------------------|-------------------------|
| <b>2. Direct materials</b> | <b>\$216,000</b>        |
| <b>Direct labor</b>        | <b>120,000</b>          |
| <b>Overhead</b>            | <b>147,300</b>          |
| <b>Total product cost</b>  | <b><u>\$483,300</u></b> |

3. Total period cost = \$129,000 + \$215,000 = \$344,000

4. Unit product cost = \$483,300/30,000 = \$16.11

2-8

|                     |                  |
|---------------------|------------------|
| 1. Direct materials | \$560,000        |
| Direct labor        | 96,000           |
| Overhead            | <u>220,000</u>   |
| Total product cost  | <u>\$876,000</u> |

2. Product cost per unit = Total product cost/Number of units  
= \$876,000/10,000 = \$87.60

|                     |                  |
|---------------------|------------------|
| 3. Direct materials | \$560,000        |
| Direct labor        | <u>96,000</u>    |
| Total prime cost    | <u>\$656,000</u> |

4. Prime cost per unit = Total prime cost/Number of units  
= \$656,000/10,000 = \$65.60

|                       |                  |
|-----------------------|------------------|
| 5. Direct labor       | \$ 96,000        |
| Overhead              | <u>220,000</u>   |
| Total conversion cost | <u>\$316,000</u> |

6. Conversion cost per unit = Total conversion cost/Number of units  
= \$316,000/10,000 = \$31.60

2-9

|                                   |              |
|-----------------------------------|--------------|
| 1. Beginning inventory, January 1 | 150          |
| Purchases                         | 1,000        |
| Ending inventory, January 31      | <u>(614)</u> |
| Calendars given out               | <u>536</u>   |

2. Cost of calendars given out = 536 × \$0.50 = \$268

3. Cost of ending inventory = 614 × \$0.50 = \$307

2-10

1. **Sterling Company**  
**Statement of Cost of Goods Manufactured**  
**For the Month Ended February 28, 20XX**

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|                                      |                |                   |
|--------------------------------------|----------------|-------------------|
| <b>Direct materials:</b>             |                |                   |
| Beginning inventory .....            | \$ 73,000      |                   |
| Add: Purchases .....                 | <u>301,800</u> |                   |
| Materials available .....            | \$ 374,800     |                   |
| Less: Ending inventory .....         | <u>56,000</u>  |                   |
| Direct materials used.....           |                | \$ 318,800        |
| Direct labor .....                   |                | 210,400           |
| Manufacturing overhead .....         |                | <u>478,590</u>    |
| Total manufacturing costs added..... |                | \$ 1,007,790      |
| Add: Beginning work in process ..... |                | <u>80,400</u>     |
| Total manufacturing costs .....      |                | \$ 1,088,190      |
| Less: Ending work in process .....   |                | <u>103,000</u>    |
| Cost of goods manufactured .....     |                | <u>\$ 985,190</u> |

2. **Sterling Company**  
**Statement of Cost of Goods Sold**  
**For the Month Ended February 28, 20XX**

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|  |               |                   |
|--|---------------|-------------------|
| Beginning finished goods inventory.....    | <u>62,000</u> |                   |
| Add: Cost of goods manufactured.....       | \$ 985,190    |                   |
| Cost of goods available for sale .....     |               | \$ 1,047,190      |
| Less: Ending finished goods inventory..... | <u>95,240</u> |                   |
| Cost of goods sold.....                    |               | <u>\$ 951,950</u> |

2-11

1.

**Asher, Inc.**  
**Income Statement: Absorption Costing**  
**For the Year Ended December 31, 20XX**

|  |                    |                            |
|--|--------------------|----------------------------|
| Sales (800,000 × \$32) .....                   |                    | <b>\$ 25,600,000</b>       |
| Less: Cost of goods sold (800,000 × \$27)..... |                    | <u>21,600,000</u>          |
| Gross margin.....                              |                    | <b>\$ 4,000,000</b>        |
| Less operating expenses:                       |                    |                            |
| Commissions (800,000 × \$1.60).....            | <b>\$1,280,000</b> |                            |
| Administrative expenses .....                  | <b>500,000</b>     |                            |
| Advertising expenses .....                     | <u>90,000</u>      | <u>1,870,000</u>           |
| Income before income taxes.....                |                    | <u><u>\$ 2,130,000</u></u> |

Since there are no beginning or ending work-in-process inventories, the unit cost multiplied by the units produced gives the cost of goods manufactured. Since there are no beginning or ending finished goods, the cost of goods sold is the same as the cost of goods manufactured. A supplemental schedule is not necessary.

**2-11 Concluded**

2. A cost of goods sold calculation is now necessary (shown as part of the income statement below). There are 850,000 units available for sale, and if the 50,000 units @ \$25 in beginning inventory are sold, that leaves 50,000 @ \$27 in the ending inventory.

| <b>Radwin, Inc.</b><br><b>Income Statement: Absorption Costing</b><br><b>For the Year Ended December 31, 20XX</b> |                   |                            |
|---|-------------------|----------------------------|
| Sales (800,000 × \$32) .....  |                   | <b>\$25,600,000</b>        |
| Less cost of goods sold:  |                   |                            |
| Beginning finished goods(50,000* \$25).....   | \$ 1,250,000      |                            |
| Cost of goods manufactured(800,000*\$27)..  | <u>21,600,000</u> |                            |
| Cost of goods available for sale .....  | \$22,850,000      |                            |
| Less: Ending finished goods(50,000*\$27)....  | <u>1,350,000</u>  | <u>21,500,000</u>          |
| Gross margin .....  |                   | <b>\$ 4,100,000</b>        |
| Less operating expenses:  |                   |                            |
| Commissions (800,000 × \$1.60).....   | \$ 1,280,000      |                            |
| Administrative expenses .....   | 500,000           |                            |
| Advertising expenses .....  | <u>90,000</u>     | <u>1,870,000</u>           |
| Income before income taxes .....  |                   | <b><u>\$ 2,230,000</u></b> |

A finished goods inventory, with a FIFO assumption, increased income before income taxes by \$100,000. This occurred because 50,000 units from the beginning finished goods inventory were assumed to be sold. These units cost \$2 less than the current units (\$25 versus \$27), creating the \$100,000 increase in income before income taxes.

2-12

1. **Mellon Company**  
**Statement of Cost of Goods Manufactured**  
**For the Year Ended December 31, 2008**  
**(in thousands of dollars)**

|   |               |                  |
|---|---------------|------------------|
| <b>Direct materials:</b>                |               |                  |
| Beginning inventory .....               | \$ 10,400     |                  |
| Add: Purchases .....                    | <u>76,000</u> |                  |
| Materials available .....               | \$ 86,400     |                  |
| Less: Ending inventory .....            | <u>28,500</u> |                  |
| Direct materials used .....             |               | \$ 57,900        |
| Direct labor .....                      |               | 52,500           |
| <b>Manufacturing overhead:</b>          |               |                  |
| Supplies .....                          | \$ 5,300      |                  |
| Insurance .....                         | 1,050         |                  |
| Supervision .....                       | 9,675         |                  |
| Material handling .....                 | <u>11,000</u> |                  |
| Total overhead costs .....              |               | <u>27,025</u>    |
| Total current manufacturing costs ..... |               | \$ 137,425       |
| Add: Beginning work in process .....    |               | <u>47,500</u>    |
| Total manufacturing costs .....         |               | \$ 184,925       |
| Less: Ending work in process .....      |               | <u>42,000</u>    |
| Cost of goods manufactured .....        |               | <u>\$142,925</u> |

2. **Mellon Company**  
**Statement of Cost of Goods Sold**  
**For the Year Ended December 31, 2008**  
**(in thousands of dollars)**

|   |                  |
|---|------------------|
| Beginning finished goods inventory .....    | \$ 20,055        |
| Add: Cost of goods manufactured .....       | <u>142,925</u>   |
| Cost of goods available for sale .....      | \$162,980        |
| Less: Ending finished goods inventory ..... | <u>10,750</u>    |
| Cost of goods sold .....                    | <u>\$152,230</u> |

3. Prime cost = Direct materials + Direct labor = \$57,900 + \$52,500 = \$110,400

Conversion cost = Direct labor + Overhead = \$52,500 + \$27,025 = \$79,525

2-13

|                                   |                   |
|-----------------------------------|-------------------|
| 1. Beginning inventory, materials | \$ 14,000         |
| Add: Purchases                    | 175,000           |
| Less: Ending inventory, materials | <u>(17,300)</u>   |
| Materials used in production      | <u>\$ 171,700</u> |

2. Prime cost = \$171,700 + \$30,960 = \$202,660

3. Conversion cost = \$30,960 + \$145,000 = \$175,960

|                     |                  |
|---------------------|------------------|
| 4. Direct materials | \$ 171,700       |
| Direct labor        | 30,960           |
| Overhead            | <u>145,000</u>   |
| Cost of services    | <u>\$347,660</u> |

5. **Muffle-Man  
Income Statement  
For the Month of April**

|                                       |              |                  |
|---------------------------------------|--------------|------------------|
| Sales revenues .....                  |              | \$ 410,000       |
| Cost of services sold .....           |              | <u>347,660</u>   |
| Gross margin .....                    |              | \$ 62,340        |
| Less operating expenses:              |              |                  |
| Advertising and selling expense ..... | \$ 25,000    |                  |
| Franchise fees (3 × \$3,000) .....    | <u>9,000</u> | <u>34,000</u>    |
| Income before income taxes .....      |              | <u>\$ 28,340</u> |

6. Muffle-Man produces and sells a service (replacing mufflers—a task performed for a customer) that uses mufflers as direct materials. Remington produces and sells a tangible product (mufflers). Services differ from tangible products on four dimensions: intangibility, perishability, inseparability, and heterogeneity. Intangibility means that buyers of services cannot see, feel, hear, or taste, a service *before* it is bought. Perishability means that services cannot be stored for future use by a consumer. Inseparability means that producers of services and buyers of services must usually be in direct contact for an exchange to take place. Heterogeneity means that there is a greater chance of variation in the performance of services than in the production of products.

## 2-14

1. Unit cost =  $\$3,615,000/3,000,000$   
= \$1.205 per pound

The other value-chain costs would be treated as period costs. Research and development would be classified as an administrative cost, and marketing, distribution, and service costs would be classified as selling costs.

2. Operating unit cost =  $\$4,005,000*/3,000,000$   
= \$1.335 per pound

$$*\$3,615,000 + \$300,000 + 0.25(\$360,000)$$

This cost includes manufacturing, distribution, packaging, and commissions. This unit cost is especially important for strategic design and tactical profitability analysis. For example, if design engineers know the operating costs and why these costs are being incurred, then design activity can focus on reducing these costs.

3. Value-chain unit cost =  $\$4,455,000*/3,000,000$   
= \$1.485 per pound

$$*\$3,615,000 + \$300,000 + 0.25(\$360,000) + 0.25(\$1,800,000)$$

This unit cost is very important for pricing decisions, product mix decisions, and strategic profitability analysis. For example, a product's price must cover all of its attributable costs and not just its manufacturing costs. If a product's price cannot do this, then it signals the need to reduce costs or increase prices or perhaps even to quit producing the product.

4. Only one product is produced in the electrolyte plant. Thus, all costs incurred within the plant are directly traceable to the product (manufacturing, distribution, and packaging costs). Product sales is the basis for assigning commissions and research and development costs. It is probably a good consumption measure for commissions, but has a dubious relationship with R&D. Thus, we can classify the commission assignment as driver tracing and the R&D assignment as allocation. It may be possible to improve the assignment by assigning the R&D cost based on the time chemical engineers spend on each product line (try to find a driver that really measures the cause-and-effect relationship). Another possibility is to make the cost directly traceable by decentralizing the R&D function.

- Given the description provided, we can conclude that Cariari uses a functional-based accounting system. First, evidence exists that product costs are only determined by production costs. Apparently, the financial accounting system is driving the type of product cost information being produced. Second, only direct labor hours, a unit-level driver, are used to assign overhead costs. Since many overhead costs are likely to be caused by nonunit-level drivers, this also suggests a strong reliance on allocation for cost assignment. Third, the company attempts to control costs by encouraging departmental managers to meet budgeted levels of expenditures. The focus is on departmental performance rather than systemwide performance. Further, departmental performance is measured only by financial instruments. An ABM system emphasizes controlling costs by managing activities and their causes; it also uses nonfinancial measures of performance.
- Setup cost per direct labor hour =  $\$100,000/100,000$   
= \$1.00 per DLH

Setup cost assigned:

|                     | <u>Automatic Model</u> | <u>Manual Model</u> |
|---------------------|------------------------|---------------------|
| \$1.00 × 30,000 DLH | \$ 30,000              | \$ —                |
| \$1.00 × 70,000 DLH | —                      | <u>70,000</u>       |
| Total               | \$ 30,000              | \$ 70,000           |
| Units produced      | ÷ 60,000               | ÷ 40,000            |
| Setup cost per unit | <u>\$ 0.50</u>         | <u>\$ 1.75</u>      |

It is not direct tracing because there is no exclusive physical association. If direct labor hours is a causal factor that measures the consumption of setup resources, then it could be classified as driver tracing. However, there appears to be little association between direct labor hours and setup cost consumption. The automatic model uses more setup resources and less direct labor hours than the manual model uses, respectively. Thus, this assignment should be classified as allocation.

- Setup hours is a more likely cause-and-effect measure of resource consumption. The use of setup hours obtains an assignment rate of \$10 per setup hour ( $\$100,000/10,000$  setup hours) and the following assignment:

|                            | <u>Automatic Model</u> | <u>Manual Model</u> |
|----------------------------|------------------------|---------------------|
| \$10.00 × 7,000 setup hrs. | \$ 70,000              | \$ —                |
| \$10.00 × 3,000 setup hrs. | —                      | <u>30,000</u>       |
| Total                      | \$ 70,000              | \$ 30,000           |
| Units produced             | ÷ 60,000               | ÷ 40,000            |
| Setup cost per unit        | <u>\$ 1.17</u>         | <u>\$ 0.75</u>      |

The assignment is compatible with an ABM approach and not an FBM approach (setup hours is a nonunit-level driver).

**2–16**

1. d
2. e
3. a
4. c
5. e

## PROBLEMS

2-17

1. Nursing hours required per year:  $4 \times 24 \text{ hours} \times 364 \text{ days}^* = 34,944$

*\*Note:* 364 days = 7 days  $\times$  52 weeks

Number of nurses =  $34,944 \text{ hrs.} / 2,000 \text{ hrs. per nurse} = 17.472$

Annual nursing cost =  $(17 \times \$45,000) + \$22,500$   
= \$787,500

Cost per patient day =  $\$787,500 / 10,000 \text{ days}$   
= \$78.75 per day (for either type of patient)

2. Nursing hours act as the driver. If intensive care uses half of the hours and normal care the other half, then 50 percent of the \$787,500 total cost is assigned to each patient category. Thus, the cost per patient day by patient category is as follows:

Intensive care =  $(\$787,500 \times 0.50) / 2,000 \text{ days}$   
= \$196.88 per day

Normal care =  $(\$787,500 \times 0.50) / 8,000 \text{ days}$   
= \$49.22 per day

The cost assignment reflects the actual usage of the nursing resource and, thus, should be more accurate. Patient days would be accurate only if intensive care patients used the same nursing hours per day as normal care patients.

3. The salary of the nurse assigned only to intensive care is a directly traceable cost. To assign the other nursing costs, the hours of additional usage would need to be measured. Thus, both direct tracing and driver tracing would be used to assign nursing costs for this new setting.

## 2-17 Concluded

4. It would be very difficult to use direct tracing for laundry costs. Segregating laundry by patient is possible but impractical. For one thing, the amount of laundry for each patient likely would not justify running separate loads. Furthermore, if we add to this the fact that laundry also operates to service other areas such as surgery and the emergency room, then the impracticality becomes even more evident. Driver tracing is recommended. A measure of usage such as pounds of laundry is more feasible. Total laundry costs divided by total pounds of laundry provides a rate that can be used to assign the laundry cost. For the two patient types, the pounds used by each type would be needed so that the rate can be applied. In a practical sense, a sample could be taken and the average pounds per patient type per day could be used to assign the cost to avoid repetitive weighing.

## 2-18

- |      |       |
|------|-------|
| 1. c | 6. d  |
| 2. a | 7. h  |
| 3. e | 8. g  |
| 4. j | 9. f  |
| 5. i | 10. b |

## 2-19

- |      |       |
|------|-------|
| 1. m | 9. f  |
| 2. c | 10. h |
| 3. g | 11. e |
| 4. l | 12. j |
| 5. o | 13. b |
| 6. d | 14. i |
| 7. k | 15. a |
| 8. n |       |

**Functional-based management accounting system:**

| <b>Action</b> | <b>Justification</b>                                    |
|---------------|---|
| a             | Performance; organizational subunit; managing costs     |
| b             | Rewards manager for subunit performance                 |
| d             | Emphasizes performance of organizational subunit        |
| g             | Emphasis on controlling costs                           |
| j             | Reward based on controlling costs (subunit performance) |
| l             | Emphasis on controlling costs                           |
| o             | Emphasis on subunit performance; controlling costs      |

**Activity-based management accounting system:**

| <b>Action</b> | <b>Justification</b>                                   |
|---------------|--|
| c             | Activity-based cost used as input for activity control |
| e             | Emphasis on activity analysis                          |
| f             | Emphasis on managing activities (activity analysis)    |
| h             | Managing activities                                    |
| i             | Driver analysis  |
| k             | Driver analysis; activity management                   |
| m             | Nonfinancial measure of performance                    |
| n             | Driver analysis; activity performance                  |

2-21

|                       |                  |                   |
|-----------------------|------------------|-------------------|
| 1. Cost of services   |                  | \$13,550,000      |
| Less: Direct labor    | \$12,000,000     |                   |
| Overhead              | <u>1,100,000</u> | <u>13,100,000</u> |
| Direct materials used |                  | <u>\$450,000</u>  |

2. **Lebowski and Associates**  
**Statement of Cost of Services Sold**  
**For the Year Ended June 30, 2008**

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|                                      |                 |                      |
|--------------------------------------|-----------------|----------------------|
| Direct materials:                    |                 |                      |
| Beginning inventory .....            | \$ 200,000      |                      |
| Add: Purchases .....                 | <u>400,000</u>  |                      |
| Materials available .....            | \$ 600,000      |                      |
| Less: Ending inventory .....         | <u>150,000*</u> |                      |
| Direct materials used .....          |                 | \$ 450,000           |
| Direct labor .....                   |                 | 12,000,000           |
| Overhead .....                       |                 | <u>1,100,000</u>     |
| Total service costs added .....      |                 | \$ 13,550,000        |
| Add: Beginning work in process ..... |                 | <u>900,000</u>       |
| Total production costs .....         |                 | \$ 14,450,000        |
| Less: Ending work in process .....   |                 | <u>1,400,000</u>     |
| Cost of services sold .....          |                 | <u>\$ 13,050,000</u> |

\*Materials available less materials used

3. The dominant cost is direct labor (presumably the salaries of the 100 professionals). Although labor is the major cost of providing many services, it is not always the case. For example, the dominant cost for some medical services may be overhead (e.g., CAT scans). In some services, the dominant cost may be materials (e.g., funeral services).

2-21 Concluded

4. **Lebowski and Associates  
Income Statement  
For the Year Ended June 30, 2008**

|                                 |                   |                            |
|---------------------------------|-------------------|----------------------------|
| Sales.....                      |                   | <b>\$18,330,000</b>        |
| Cost of services sold.....      |                   | <u>13,050,000</u>          |
| Gross margin.....               |                   | <b>\$ 5,280,000</b>        |
| Less operating expenses:        |                   |                            |
| Selling expenses .....          | <b>\$ 600,000</b> |                            |
| Administrative expenses .....   | <u>500,000</u>    | <u>1,100,000</u>           |
| Income before income taxes..... |                   | <u><b>\$ 4,180,000</b></u> |

5. Services have four attributes that are not possessed by tangible products: (1) intangibility, (2) perishability, (3) inseparability, and (4) heterogeneity. Intangibility means that the buyers of services cannot see, feel, hear, or taste a service before it is bought. Perishability means that services cannot be stored. This property affects the computation in Requirement 1. Inability to store services means that there will never be any finished goods inventories, thus making the cost of services produced equivalent to cost of services sold. Inseparability simply means that providers and buyers of services must be in direct contact for an exchange to take place. Heterogeneity refers to the greater chance for variation in the performance of services than in the production of tangible products.

2-22

1.

**Kimmelman Company**  
**Statement of Cost of Goods Manufactured**  
**For the Year Ended December 31, 2008**

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|                                      |                |                     |
|--------------------------------------|----------------|---------------------|
| <b>Direct materials:</b>             |                |                     |
| Beginning inventory .....            | \$ 93,600      |                     |
| Add: Purchases .....                 | <u>675,000</u> |                     |
| Materials available .....            | \$768,600      |                     |
| Less: Ending inventory .....         | <u>133,600</u> |                     |
| Direct materials used .....          |                | \$ 635,000          |
| Direct labor .....                   |                | 400,000             |
| <b>Manufacturing overhead:</b>       |                |                     |
| Indirect labor .....                 | \$ 80,000      |                     |
| Rent.....                            | 84,000         |                     |
| Supplies.....                        | 14,600         |                     |
| Depreciation .....                   | 120,000        |                     |
| Utilities.....                       | <u>23,912</u>  |                     |
| Total overhead costs.....            |                | <u>322,512</u>      |
| Total manufacturing costs added..... |                | \$ 1,357,512        |
| Add: Beginning work in process ..... |                | <u>26,082</u>       |
| Total manufacturing costs .....      |                | \$ 1,383,594        |
| Less: Ending work in process .....   |                | <u>29,992</u>       |
| Cost of goods manufactured .....     |                | <u>\$ 1,353,602</u> |

2. Average unit cost =  $\$1,353,602 / 5,000 = \$270.72$

2-22 Concluded

3.

**Kimmelman Company  
Income Statement**

**For the Year Ended December 31, 2008**

|   |                     |                     |
|---|---------------------|---------------------|
| Sales (4,800* × \$650).....                 |                     | <b>\$ 3,120,000</b> |
| Less cost of goods sold:                    |                     |                     |
| Beginning finished goods inventory .....    | <b>\$ 160,000</b>   |                     |
| Add: Cost of goods manufactured .....       | <b>1,353,602</b>    |                     |
| Cost of goods available for sale .....      | <b>\$ 1,513,602</b> |                     |
| Less: Ending finished goods inventory ..... | <b>228,200</b>      | <b>1,285,402</b>    |
| Gross margin.....                           |                     | <b>\$ 1,834,598</b> |
| Less operating expenses:                    |                     |                     |
| Salary, sales supervisor .....              | <b>\$ 180,000</b>   |                     |
| Commissions, salespersons .....             | <b>360,000</b>      |                     |
| Administrative expenses .....               | <b>600,000</b>      | <b>1,140,000</b>    |
| Income before income taxes.....             |                     | <b>\$ 694,598</b>   |

\*600 + 5,000 – 800 = 4,800 units sold

2-23

|   |              |                        |
|---|--------------|------------------------|
| <b>1. Direct materials:</b>             |              |                        |
| Magazine (5,000 × \$0.40)               | \$ 2,000     |                        |
| Brochure (10,000 × \$0.08)              | <u>800</u>   | \$ 2,800               |
| <b>Direct labor:</b>                    |              |                        |
| Magazine [(5,000/20) × \$10]            | \$ 2,500     |                        |
| Brochure [(10,000/100) × \$10]          | <u>1,000</u> | 3,500                  |
| <b>Manufacturing overhead:</b>          |              |                        |
| Rent                                    | \$ 1,400     |                        |
| Depreciation [(\$40,000/20,000) × 350*] | 700          |                        |
| Setups                                  | 600          |                        |
| Insurance                               | 140          |                        |
| Power                                   | <u>350</u>   | <u>3,190</u>           |
| <b>Cost of goods manufactured</b>       |              | <u><b>\$ 9,490</b></u> |

\*Production is 20 units per printing hour for magazines and 100 units per printing hour for brochures, yielding monthly machine hours of 350 [(5,000/20) + (10,000/100)]. This is also monthly labor hours, as machine labor only operates the presses.

|                            |                        |
|----------------------------|------------------------|
| <b>2. Direct materials</b> | <b>\$ 2,800</b>        |
| <b>Direct labor</b>        | <b><u>3,500</u></b>    |
| <b>Total prime costs</b>   | <b><u>\$ 6,300</u></b> |
| <b>Magazine:</b>           |                        |
| Direct materials           | \$ 2,000               |
| Direct labor               | <u>2,500</u>           |
| <b>Total prime costs</b>   | <b><u>\$ 4,500</u></b> |
| <b>Brochure:</b>           |                        |
| Direct materials           | \$ 800                 |
| Direct labor               | <u>1,000</u>           |
| <b>Total prime costs</b>   | <b><u>\$ 1,800</u></b> |

Direct tracing was used to assign prime costs to the two products.

2-23 Continued

3. Total monthly conversion cost:

|              |                 |
|--------------|-----------------|
| Direct labor | \$ 3,500        |
| Overhead     | <u>3,190</u>    |
| Total        | <u>\$ 6,690</u> |

Magazine:

|  |              |                 |
|--|--------------|-----------------|
| Direct labor                           |              | \$ 2,500        |
| Overhead:                              |              |                 |
| Power (\$1 × 250)                      | \$ 250       |                 |
| Depreciation (\$2 × 250)               | 500          |                 |
| Setups (2/3 × \$600)                   | 400          |                 |
| Rent and insurance (\$4.40 × 250 DLH)* | <u>1,100</u> | <u>2,250</u>    |
| Total                                  |              | <u>\$ 4,750</u> |

Brochure:

|  |            |                 |
|--|------------|-----------------|
| Direct labor                           |            | \$ 1,000        |
| Overhead:                              |            |                 |
| Power (\$1 × 100)                      | \$ 100     |                 |
| Depreciation (\$2 × 100)               | 200        |                 |
| Setups (1/3 × \$600)                   | 200        |                 |
| Rent and insurance (\$4.40 × 100 DLH)* | <u>440</u> | <u>940</u>      |
| Total                                  |            | <u>\$ 1,940</u> |

\*Rent and insurance cannot be traced to each product so the costs are assigned using direct labor hours:  $\$1,540/350 \text{ DLH} = \$4.40$  per direct labor hour. The other overhead costs are traced according to their usage. Depreciation and power are assigned by using machine hours (250 for magazines and 100 for brochures):  $\$350/350 = \$1.00$  per machine hour for power and  $\$40,000/20,000 = \$2.00$  per machine hour for depreciation. Setups are assigned according to the time required. Since magazines use twice as much time, they receive twice the cost: Letting  $X$  = the proportion of setup time used for brochures,  $2X + X = 1$  implies a cost assignment ratio of 2/3 for magazines and 1/3 for brochures.

**2-23 Concluded**

|  |                                 |                        |
|--|---------------------------------|------------------------|
| <b>4. Sales [(5,000 × \$1.80) + (10,000 × \$0.45)] .....</b> |                                 | <b>\$13,500</b>        |
| <b>Less cost of goods sold .....</b>                         |                                 | <b><u>9,490</u></b>    |
| <b>Gross margin.....</b>                                     |                                 | <b>\$ 4,010</b>        |
| <b>Less operating expenses:</b>                              |                                 |                        |
| <b>Selling.....</b>  | <b>\$ 500<sup>a</sup></b>       |                        |
| <b>Administrative.....</b>                                   | <b><u>1,500<sup>b</sup></u></b> | <b><u>2,000</u></b>    |
| <b>Income before income taxes.....</b>                       |                                 | <b><u>\$ 2,010</u></b> |

<sup>a</sup>Distribution of goods is a selling expense.

<sup>b</sup>A case could be made for assigning part of her salary to production. However, since she is responsible for coordinating and managing all business functions, an administrative classification is more convincing.

## MANAGERIAL DECISION CASES

2-24

| 1. | Production                 | Selling        | Administrative |
|----|----------------------------|----------------|----------------|
|    | (DL) Machine operators     |                | Utilities      |
|    | (DL) Other direct labor    |                | Rent           |
|    | (OH) Supervisory salaries  |                | CPA fees       |
|    | (DM) Pipe                  | Adm. Salaries* | Adm. Salaries* |
|    | (OH) Tires and fuel        | Advertising    |                |
|    | (OH) Depreciation          |                |                |
|    | (OH) Salaries of mechanics |                |                |

\* Adm. Salaries are split between Selling and Administrative because Jack spends his time equally between the selling and administrative functions.

2. Gateway Construction Company  
Income Statement  
For the Year Ended December 31, 2006

|                                 |              |              |
|---------------------------------|--------------|--------------|
| Sales (18,200 x \$165) .....    |              | \$ 3,003,000 |
| Cost of services sold:          |              |              |
| Direct materials.....           | \$ 1,401,340 |              |
| Direct labor.....               | 483,700      |              |
| Supervisory salaries .....      | 70,000       |              |
| Tires and fuel .....            | 418,600      |              |
| Depreciation, equipment.....    | 198,000      |              |
| Salaries of mechanics .....     | 50,000       | 2,621,640    |
| Gross margin.....               |              | \$ 381,360   |
| Administrative expenses:        |              |              |
| Utilities.....                  | \$ 24,000    |              |
| Rent, office building .....     | 24,000       |              |
| CPA fees .....                  | 20,000       |              |
| Administrative salaries* .....  | 57,000       | 125,000      |
| Selling expenses:               |              |              |
| Sales salaries* .....           | \$ 57,000    |              |
| Advertising .....               | 15,000       | 72,000       |
| Income before income taxes..... |              | \$ 184,360   |

\*1/2 x \$114,000

Average cost per equipment hour:  $\$2,621,640 / 18,200 = \$144.05$  (rounded)

## 2-24 Concluded

### 3. Traceable costs using equipment hours:

|                         |                     |
|-------------------------|---------------------|
| Machine operators       | \$ 218,000          |
| Other direct labor      | 265,700             |
| Pipe                    | 1,401,340           |
| Tires and fuel          | 418,600             |
| Depreciation, equipment | 198,000             |
| Salaries of mechanics   | <u>50,000</u>       |
| Total                   | <u>\$ 2,551,640</u> |

Machine operators, tires and fuel, and depreciation are all directly caused by equipment usage, which is measured by equipment hours. One can also argue that the maintenance required is also a function of equipment hours and so the salaries of mechanics can be assigned using equipment hours. Pipe and other direct labor can be assigned using equipment hours because their usage should be highly correlated with equipment hours. That is, equipment hours increase because there is more pipe being laid. As hours increase, so does the pipe usage. A similar argument can be made for other direct labor. Actually, it is not necessary to use equipment hours to assign pipe or other direct labor because these two costs are directly traceable to jobs.

Traceable cost per equipment hour =  $\$2,551,640/18,200$   
= \$140.20 per hour

**2–25**

- 1. Leroy should politely and firmly decline the offer. The offer includes an implicit request to use confidential information to help Jean win the bid. Use of such information for personal advantage is wrong. Leroy has a professional and personal obligation to his current employer. This obligation must take precedence over the opportunity for personal financial gain.**
- 2. If Leroy agrees to review the bid, he will likely use his knowledge of his current employer’s position to help Jean win the bid. In fact, an agreement to help probably would reflect a desire for the bonus and new job with the associated salary increase. Helping would likely ensure that Jean would win the bid. Leroy was concerned about the political fallout and subsequent investigation revealing his involvement—especially if he sent up a red flag by switching to his friend’s firm. An investigation may reveal the up-front bonus and increase the suspicion about Leroy’s involvement. There is a real possibility that Leroy could be implicated. Whether this would lead to any legal difficulties is another issue. At the very least, some tarnishing of his professional reputation and personal character is possible. Some risk to Leroy exists. The amount of risk, though, should not be a factor in Leroy’s decision. What is right should be the central issue, not the likelihood of getting caught.**
- 3. Leroy has a responsibility to refrain from disclosing confidential information acquired in the course of his work except when authorized, unless legally obligated to do so (II-1), and to refrain from using or appearing to use confidential information acquired in the course of his work for unethical or illegal advantage either personally or through a third party (II-3). He also has a responsibility to avoid actual or apparent conflicts of interest and advise all appropriate parties of any potential conflict (III-1); to refuse any gift, favor, or hospitality that would influence his actions (III-3); and to refrain from either actively or passively subverting the attainment of the organization’s legitimate and ethical objectives.**

## **RESEARCH ASSIGNMENTS**

**2–26**

**Answers will vary.**

**2–27**

**Answers will vary.**

