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5TH EDITION

Managerial Accounting

TOOLS FOR BUSINESS DECISION MAKING

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chapter

4

Activity-Based Costing

Managerial Accounting
Fifth Edition
Weygandt • Kimmel • Kieso

study objectives

1. Recognize the difference between traditional costing and activity-based costing.
2. Identify the steps in the development of an activity-based costing system.
3. Know how companies identify the activity cost pools used in activity-based costing.
4. Know how companies identify and use cost drivers in activity-based costing.
5. Understand the benefits and limitations of activity-based costing.
6. Differentiate between value-added and non-value-added activities.
7. Understand the value of using activity levels in activity-based costing.
8. Apply activity-based costing to service industries.

preview of chapter 4

Activity-Based Costing

Traditional Costing and ABC

- Traditional costing systems
- Need for a new approach
- Activity-based costing

Example of ABC versus Traditional Costing

- Identify and classify activities and allocate overhead to cost pools
- Identify cost drivers
- Compute overhead rates
- Assign overhead costs to products
- Comparing unit costs

ABC: A Closer Look

- Benefits
- Limitations
- When to use ABC
- Value-added versus non-value-added activities
- Classification of activity levels

Activity-Based Costing in Service Industries

- Traditional costing example
- ABC example

Managerial Accounting Basics

Managerial accounting, also called **management accounting**, is a field of accounting that provides economic and financial information for managers and other internal users.

Managerial accounting applies to all types of businesses.

- Corporations
- Proprietorships
- Partnerships
- Not-for-profit

Traditional Costing and Activity-Based Costing

Traditional Costing Systems

- Allocates overhead using a single predetermined rate.
 - **Job order costing:** direct labor cost is assumed to be the relevant activity base.
 - **Process costing:** machine hours is the relevant activity base.
- Assumption was satisfactory when direct labor was a major portion of total manufacturing costs.
 - Wide acceptance of a high correlation between direct labor and overhead costs.

Traditional Costing and Activity-Based Costing

The Need for a New Approach

- Tremendous change in manufacturing and service industries.
- Decrease in amount of direct labor usage.
- Significant increase in total overhead costs.
- Inappropriate to use plant-wide predetermined overhead rates when a lack of correlation exists.
- Complex manufacturing processes may require multiple allocation bases; this approach is called **Activity-Based Costing (ABC)**.

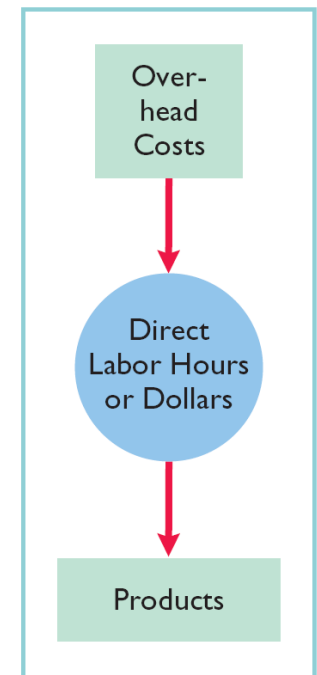


Illustration 4-1
Traditional one-stage costing system

Traditional Costing and Activity-Based Costing

Activity-Based Costing

- Allocates overhead to multiple activity cost pools, and
- Assigns the activity cost pools to products or services by means of cost drivers.

Traditional Costing and Activity-Based Costing

Activity-Based Costing

- **Activity:** any event, action, transaction, or work sequence that incurs cost when producing a product or providing a service.
- **Activity Cost Pool:** the overhead cost attributed to a distinct type of activity For example: ordering materials or setting up machines
- **Cost Drivers:** any factor or activity that have a direct cause-effect relationship with the resources consumed.

Traditional Costing and Activity-Based Costing

Activity-Based Costing

- ABC allocates overhead costs in two stages:

Stage 1: Overhead costs are allocated to activity cost pools.

Stage 2: The overhead costs allocated to the cost pools is assigned to products using cost drivers.

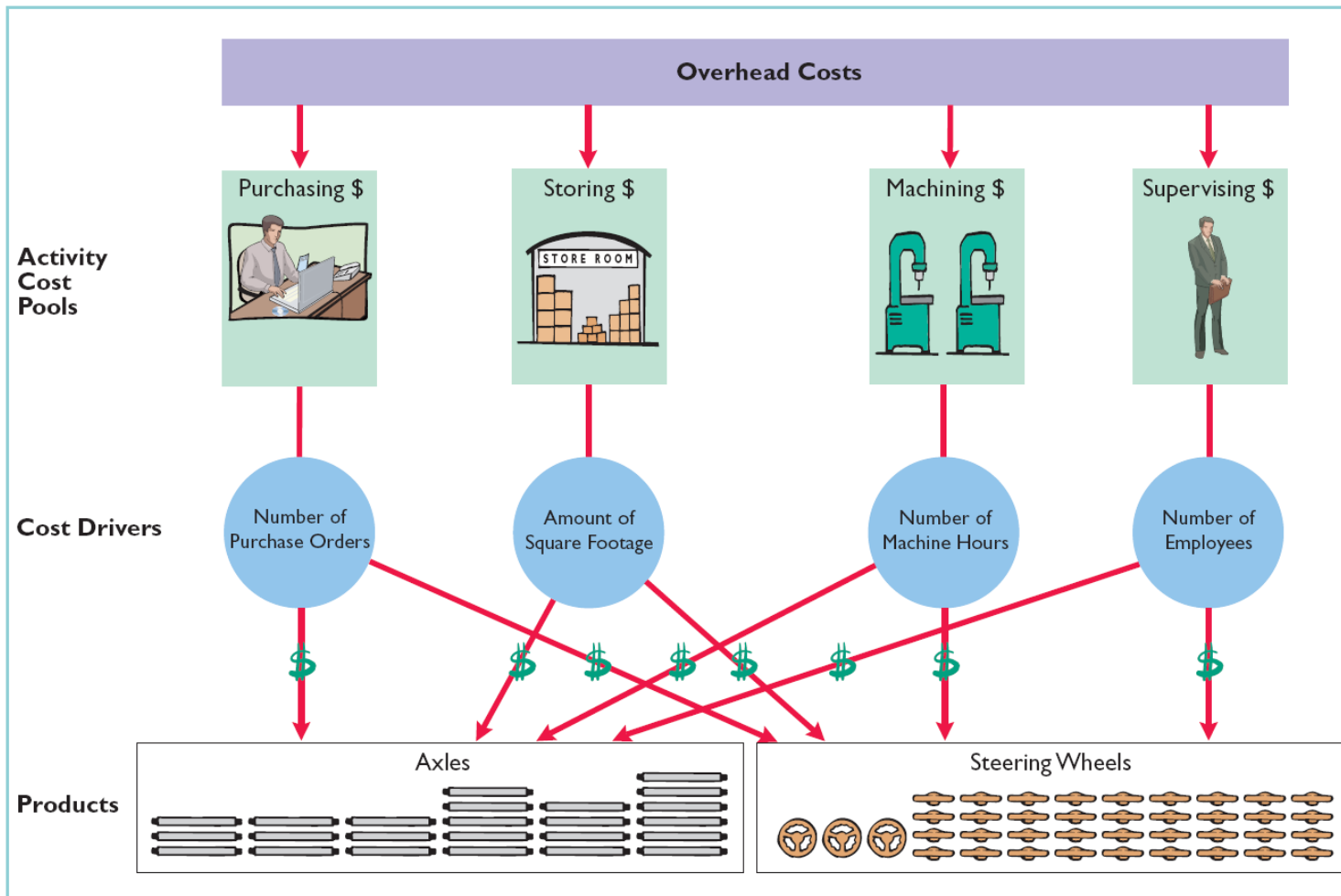
- The more complex a product's manufacturing operation, the more activities and cost drivers likely to be present.

SO1 Recognize the difference between traditional costing and activity-based costing.

Traditional Costing and Activity-Based Costing

Activity-Based Costing

Illustration 4-2
Activities and related cost drivers

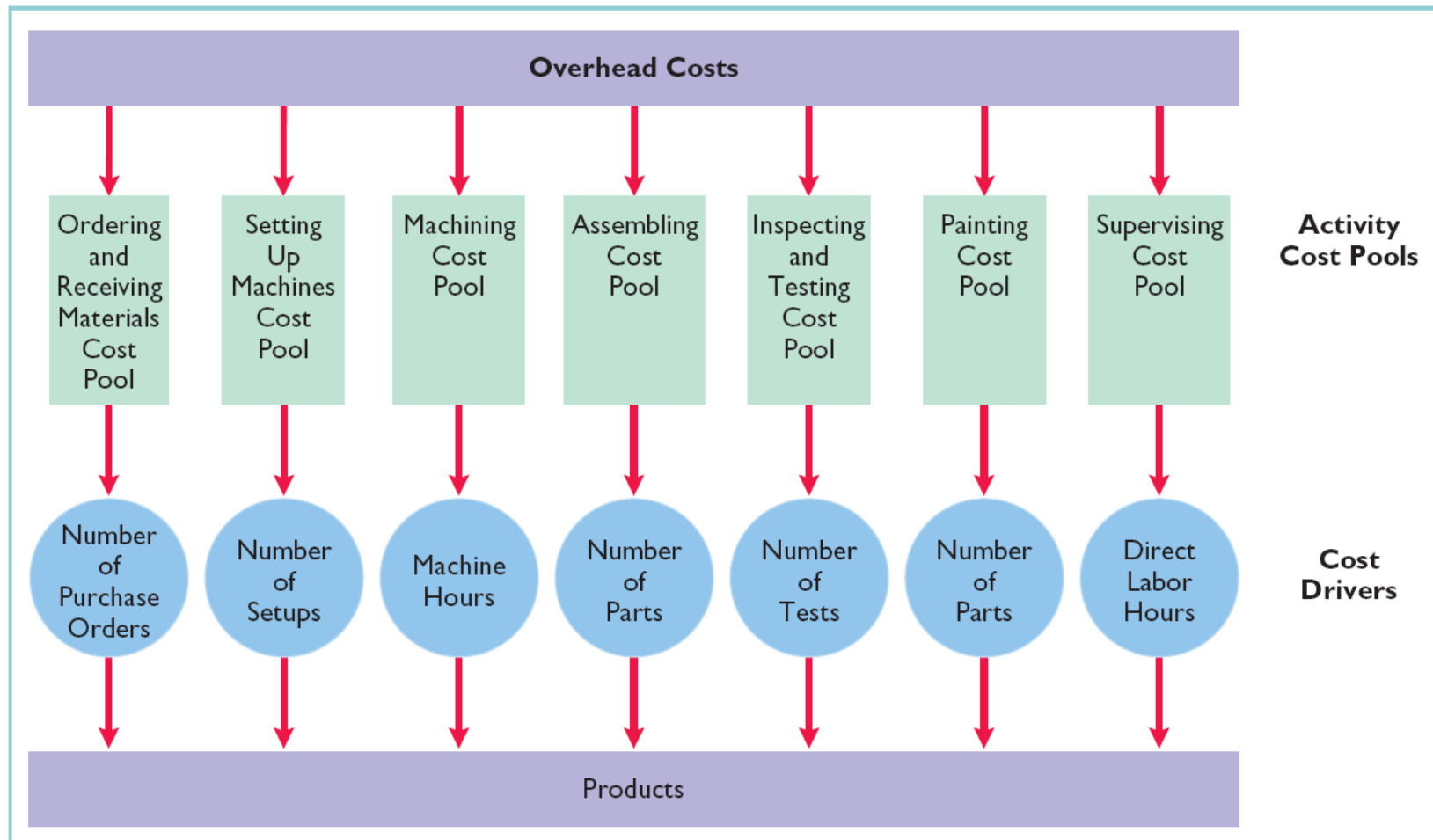


Traditional Costing and Activity-Based Costing

Activity-Based Costing

Illustration 4-3

ABC system design—Lift Jack Company



Traditional Costing and Activity-Based Costing

Do it!

Indicate whether the following statements are **true** or **false**.

1. A traditional costing system allocates overhead by means of multiple overhead rates.

2. Activity-based costing allocates overhead costs in a two-stage process.

3. Direct material and direct labor costs are easier to trace to products than overhead.

Solution on
notes page

Traditional Costing and Activity-Based Costing

Do it!

Indicate whether the following statements are **true** or **false**.

4. As manufacturing processes have become more automated, more companies have chosen to allocate overhead on the basis of direct labor costs.
5. In activity-based costing, an activity is any event, action, transaction, or work sequence that incurs cost when producing a product.

Solution on
notes page

Example of ABC Versus Traditional Costing

- ABC allocates overhead costs in two stages:

Stage 1: Overhead costs are allocated to activity cost pools.

Stage 2: The overhead costs allocated to the cost pools is assigned to products using cost drivers.

- The more complex a product's manufacturing operation, the more activities and cost drivers likely to be present.

Example of ABC Versus Traditional Costing

Illustration:

- Atlas Company produces two automobile antitheft devices:
 - The Boot: a high volume item with sales totaling 25,000 per year
 - The Club: a low volume item with sales totaling 5,000 per year
- Each product requires 1 hour of direct labor
 - Total annual direct labor hours (DLH) 30,000 (25,000 + 5000)
 - Direct labor cost \$12 per unit for each product
- Expected annual manufacturing overhead costs \$900,000
- Direct materials cost:
 - The Boot - \$40 per unit
 - The Club - \$30 per unit

Required: Calculate unit costs under ABC.

Example of ABC Versus Traditional Costing

Illustration:

| <u>Manufacturing costs</u> | <u>Products</u> | |
|----------------------------|----------------------|----------------------|
| | <u>The Boot</u> | <u>The Club</u> |
| Direct materials | <input type="text"/> | <input type="text"/> |
| Direct labor | <input type="text"/> | <input type="text"/> |
| Overhead | <input type="text"/> | <input type="text"/> |
| Total unit cost | <input type="text"/> | <input type="text"/> |

* Overhead rate =

Overhead =

Example of ABC Versus Traditional Costing

Activity-based costing involves the following **four steps**.

1. Identify and classify the major activities and allocate manufacturing overhead costs to the appropriate cost pools.
2. Identify the cost driver that has a strong correlation to the costs in the cost pool.
3. Compute the overhead rate for each pool.
4. Assign overhead costs for each costs to products using the overhead rates.

Example of ABC Versus Traditional Costing

Identify and Classify Activities and Allocate Overhead to Cost Pools (Step 1)

Overhead costs are assigned directly to the appropriate activity cost pool.

Illustration 4-4

| <u>Activity Cost Pools</u> | <u>Estimated Overhead</u> |
|----------------------------|--------------------------------|
| Setting up machines | \$300,000 |
| Machining | 500,000 |
| Inspecting | 100,000 |
| Total | <u><u>\$900,000</u></u> |

Example of ABC Versus Traditional Costing

Identify Cost Drivers (Step 2)

The cost driver must accurately measure the actual consumption of the activity by the various products.

Illustration 4-5

| <u>Activity Cost Pools</u> | <u>Cost Drivers</u> | <u>Expected Use of Cost Drivers per Activity</u> |
|----------------------------|-----------------------|--|
| Setting up machines | Number of setups | 1,500 setups |
| Machining | Machine hours | 50,000 machine hours |
| Inspecting | Number of inspections | 2,000 inspections |

Example of ABC Versus Traditional Costing

Compute Overhead Rates (Step 3)

Next, the company computes an **activity-based overhead rate** per cost driver.

Illustration 4-6

$$\frac{\text{Estimated Overhead per Activity}}{\text{Expected Use of Cost Drivers per Activity}} = \text{Activity-Based Overhead Rate}$$

Illustration 4-7

| Activity Cost Pools | Estimated Overhead | Expected Use of Cost Drivers per Activity | Activity-Based Overhead Rates |
|---------------------|--------------------|---|-------------------------------|
| Setting up machines | \$300,000 | 1,500 setups | \$200 per setup |
| Machining | 500,000 | 50,000 machine hours | \$10 per machine hour |
| Inspecting | 100,000 | 2,000 inspections | \$50 per inspection |
| Total | <u>\$900,000</u> | | |

Example of ABC Versus Traditional Costing

Assign Overhead Cost to Products (Step 4)

In assigning overhead costs, it is necessary to know the expected use of cost drivers for each product. Because of its low volume, The Club requires more set-ups and inspections than The Boot.

Illustration 4-8

| Activity Cost Pools | Cost Drivers | Expected Use of Cost Drivers per Activity | Expected Use of Cost Drivers per Product | |
|---------------------|-----------------------|---|--|----------|
| | | | The Boot | The Club |
| Setting up machines | Number of setups | 1,500 setups | 500 | 1,000 |
| Machining | Machine hours | 50,000 machine hours | 30,000 | 20,000 |
| Inspecting | Number of inspections | 2,000 inspections | 500 | 1,500 |

Example of ABC Versus Traditional Costing

Assign Overhead Cost to Products (Step 4)

To assign overhead costs, Atlas multiplies the activity-based overhead rates per cost driver (Ill. 4-7) by the number of cost drivers expected to be used per product (Ill. 4-8).

Illustration 4-9

| Activity Cost Pools | The Boot | | | | |
|------------------------------------|--|---|-------------------------------|---|---------------|
| | Expected Use of Cost Drivers per Product | × | Activity-Based Overhead Rates | = | Cost Assigned |
| Setting up machines | 500 | | \$200 | | \$100,000 |
| Machining | 30,000 | | \$10 | | 300,000 |
| Inspecting | 500 | | \$50 | | 25,000 |
| Total costs assigned [(a)] | | | | | \$425,000 |
| Units produced [(b)] | | | | | 25,000 |
| Overhead cost per unit [(a) ÷ (b)] | | | | | \$17 |

Example of ABC Versus Traditional Costing

Assign Overhead Cost to Products (Step 4)

To assign overhead costs, Atlas multiplies the activity-based overhead rates per cost driver (Ill. 4-7) by the number of cost drivers expected to be used per product (Ill. 4-8).

Illustration 4-9

| Activity Cost Pools | The Club | | | | |
|------------------------------------|--|---|-------------------------------|---|---------------|
| | Expected Use of Cost Drivers per Product | × | Activity-Based Overhead Rates | = | Cost Assigned |
| Setting up machines | 1,000 | | \$200 | | \$200,000 |
| Machining | 20,000 | | \$10 | | 200,000 |
| Inspecting | 1,500 | | \$50 | | 75,000 |
| Total costs assigned [(a)] | | | | | \$475,000 |
| Units produced [(b)] | | | | | 5,000 |
| Overhead cost per unit [(a) ÷ (b)] | | | | | \$95 |

Example of ABC Versus Traditional Costing

Comparing Unit Costs

Illustration 4-10

| <u>Manufacturing Costs</u> | <u>Products</u> | |
|----------------------------|--------------------|--------------------|
| | <u>The Boot</u> | <u>The Club</u> |
| Direct materials | \$40 | \$30 |
| Direct labor | 12 | 12 |
| Overhead | 30* | 30* |
| Total unit cost | <u><u>\$82</u></u> | <u><u>\$72</u></u> |

*Predetermined overhead rate \times Direct labor hours = $\$30 \times 1 \text{ hr.} = \30

A likely consequence of the differences in assigning overhead is that Atlas has been **overpricing The Boot** and possibly losing market share to competitors. It also has been **sacrificing profitability** by **underpricing The Club**.

Example of ABC Versus Traditional Costing

Comparing Unit Costs

Under ABC, overhead costs are shifted from the high volume product (The Boot) to the low volume product (The Club) because:

- Low volume products often require more special handling.
- Assigning overhead using ABC will usually increase the cost per unit of low volume products.

Example of ABC Versus Traditional Costing

Do it!

Lift Jack Company has seven activity cost pools and two products. It expects to produce 200,000 units of its automobile scissors jack and 80,000 units of its truck hydraulic jack. Having identified its activity cost pools and the cost drivers for each cost pool, Lift Jack Company accumulated the following data relative to those activity cost pools and cost drivers.

| Annual Overhead Data | | | Expected Use of Cost Drivers per Product | | |
|------------------------|--------------------|--------------------|---|----------------|-----------------|
| Activity Cost Pools | Cost Drivers | Estimated Overhead | Expected Use of Cost Drivers per Activity | Scissors Jacks | Hydraulic Jacks |
| Ordering and receiving | Purchase orders | \$ 200,000 | 2,500 orders | 1,000 | 1,500 |
| Machine setup | Setups | 600,000 | 1,200 setups | 500 | 700 |
| Machining | Machine hours | 2,000,000 | 800,000 hours | 300,000 | 500,000 |
| Assembling | Parts | 1,800,000 | 3,000,000 parts | 1,800,000 | 1,200,000 |
| Inspecting and testing | Tests | 700,000 | 35,000 tests | 20,000 | 15,000 |
| Painting | Parts | 300,000 | 3,000,000 parts | 1,800,000 | 1,200,000 |
| Supervising | Direct labor hours | 1,200,000 | 200,000 hours | 130,000 | 70,000 |
| | | <u>\$6,800,000</u> | | | |

Example of ABC Versus Traditional Costing

Do it!

Lift Jack Company has seven activity cost pools and two products. It expects to produce 200,000 units of its automobile scissors jack and 80,000 units of its truck hydraulic jack. Having identified its activity cost pools and the cost drivers for each cost pool, Lift Jack Company accumulated the following data relative to those activity cost pools and cost drivers.

Using the previous data, do the following:

- a. Prepare a schedule showing the computations of the activity-based overhead rates per cost driver.
- b. Prepare a schedule assigning each activity's overhead cost to the two products.
- c. Compute the overhead cost per unit for each product.
- d. Comment on the comparative overhead cost per unit.

Example of ABC Versus Traditional Costing

Do it!

Annual Overhead Data

Expected Use of Cost Drivers per Product

| Activity Cost Pools | Cost Drivers | Estimated Overhead | Expected Use of Cost Drivers per Activity | Expected Use of Cost Drivers per Product | |
|------------------------|--------------------|--------------------|---|--|-----------------|
| | | | | Scissors Jacks | Hydraulic Jacks |
| Ordering and receiving | Purchase orders | \$ 200,000 | 2,500 orders | 1,000 | 1,500 |
| Machine setup | Setups | 600,000 | 1,200 setups | 500 | 700 |
| Machining | Machine hours | 2,000,000 | 800,000 hours | 300,000 | 500,000 |
| Assembling | Parts | 1,800,000 | 3,000,000 parts | 1,800,000 | 1,200,000 |
| Inspecting and testing | Tests | 700,000 | 35,000 tests | 20,000 | 15,000 |
| Painting | Parts | 300,000 | 3,000,000 parts | 1,800,000 | 1,200,000 |
| Supervising | Direct labor hours | 1,200,000 | 200,000 hours | 130,000 | 70,000 |
| | | <u>\$6,800,000</u> | | | |

a. Prepare a schedule showing the computations of the activity-based overhead rates per cost driver.

| Activity Cost Pools | Estimated Overhead | ÷ | Expected Use of Cost Drivers per Activity | = | Activity-Based Overhead Rates |
|------------------------|--------------------|---|---|---|-------------------------------|
| Ordering and receiving | | | | | |
| Machine setup | | | | | |
| Machining | | | | | |
| Assembling | | | | | |
| Inspecting and testing | | | | | |
| Painting | | | | | |
| Supervising | | | | | |
| | | | | | |

Solution on notes page

Do it!

| Annual <u>Activity Cost Pools</u> | <u>Expected Use of Cost Drivers per Activity</u> | <u>Expected Use of Cost Drivers per Product</u> | |
|--------------------------------------|--|---|------------------------|
| | | <u>Scissors Jacks</u> | <u>Hydraulic Jacks</u> |
| Ordering and receiving | 2,500 orders | 1,000 | 1,500 |
| Machine setup | 1,200 setups | 500 | 700 |
| Machining | 800,000 hours | 300,000 | 500,000 |
| Assembling | 3,000,000 parts | 1,800,000 | 1,200,000 |
| Inspecting and testing | 35,000 tests | 20,000 | 15,000 |
| Painting | 3,000,000 parts | 1,800,000 | 1,200,000 |
| Supervising | 200,000 hours | 130,000 | 70,000 |

b. Prepare a schedule assigning each activity's overhead cost to the two products.

| <u>Activity Cost Pools</u> | <u>Scissors Jacks</u> | |
|----------------------------|---|--------------------------------------|
| | <u>Expected Use of Cost Drivers per Product</u> | <u>Activity-Based Overhead Rates</u> |
| Ordering and receiving | 1,000 | |
| Machine setup | 500 | |
| Machining | 300,000 | |
| Assembling | 1,800,000 | |
| Inspecting and testing | 20,000 | |
| Painting | 1,800,000 | |
| Supervising | 130,000 | |
| Total assigned costs | | |

Do it!

Annual

Expected Use of
Cost Drivers per Product

| Activity Cost Pools | Expected Use of Cost Drivers per Activity | Scissors Jacks | Hydraulic Jacks |
|------------------------|---|----------------|-----------------|
| Ordering and receiving | 2,500 orders | 1,000 | 1,500 |
| Machine setup | 1,200 setups | 500 | 700 |
| Machining | 800,000 hours | 300,000 | 500,000 |
| Assembling | 3,000,000 parts | 1,800,000 | 1,200,000 |
| Inspecting and testing | 35,000 tests | 20,000 | 15,000 |
| Painting | 3,000,000 parts | 1,800,000 | 1,200,000 |
| Supervising | 200,000 hours | 130,000 | 70,000 |

b. Prepare a schedule assigning each activity's overhead cost to the two products.

Hydraulic Jacks

| Expected Use of Cost Drivers per Product | × | Activity-Based Overhead Rates | = | Cost Assigned |
|--|---|-------------------------------|---|---------------|
| 1,500 | | | | |
| 700 | | | | |
| 500,000 | | | | |
| 1,200,000 | | | | |
| 15,000 | | | | |
| 1,200,000 | | | | |
| 70,000 | | | | |
| | | | | |

Example of ABC Versus Traditional Costing

Do it!

c. Compute the overhead cost per unit for each product.

| | <u>Scissors Jack</u> | <u>Hydraulic Jack</u> |
|------------------------|----------------------|-----------------------|
| Total costs assigned | <u>\$3,520,000</u> | <u>\$3,280,000</u> |
| Total units produced | <u>200,000</u> | <u>80,000</u> |
| Overhead cost per unit | <u>\$17.60</u> | <u>\$41.00</u> |

d. Comment on the comparative overhead cost per unit.

These data show that the total overhead assigned to 80,000 hydraulic jacks is nearly as great as the overhead assigned to 200,000 scissors jacks. However, the overhead cost per hydraulic jack is \$41. It is only \$17.60 per scissors jack.



Service Company Insight

Traveling Light

Have you flown on an airplane since the \$15 baggage fees have been implemented? Did the \$15 fee make you so mad that you swore that the next time you flew, you would pack fewer clothes so you could use a carry-on bag instead? That is exactly how the airlines hoped that you would react. Baggage handling is extremely labor-intensive. All that tagging, sorting, loading on carts, loading in planes, unloading, and sorting again, add up to about \$9 per bag. You've also got equipment costs: sorters, carts, conveyors, tractors, and storage facilities. That's about another \$4 per bag. Finally, you've got the additional fuel cost of a 40 pound item—about \$2 in fuel for a 3-hour flight. These costs add up to \$15 (\$9 + \$4 + \$2). Coincidence? Probably not. Since airlines have implemented their baggage fees, fewer customers are checking bags. Not only does this save the airlines money, it also increases the amount of space available for hauling cargo. An airline can charge at least \$80 for hauling a small parcel for same-day delivery service.

Source: Scott McCartney, "What It Costs an Airline to Fly Your Luggage," *Wall Street Journal Online*, November 25, 2008.

? Why do airlines charge even higher rates for heavier bags, bags that are odd shapes (e.g., ski bags), and bags with hazardous materials in them?



Activity-Based Costing: A Closer Look

Benefits of ABC

More accurate product costing through:

- Use of more cost pools to assign overhead costs
- Enhanced control over overhead costs
- Better management decisions

Activity-Based Costing: A Closer Look

Limitations of ABC

- Can be expensive to use
- Some arbitrary allocations continue



Service Company Insight

Using ABC to Aid in Employee Evaluation

Although most publicized ABC applications are in manufacturing companies or large service firms, very small service businesses can apply it also. **Mahany Welding Supply**, a small family-run welding service business in Rochester, New York, used ABC to determine the cost of servicing customers and to identify feasible cost-reduction opportunities.

Application of ABC at Mahany Welding's operations provided information about the five employees who were involved in different activities of revenue generation—i.e., delivery of supplies (rural versus city), welding services, repairs, telephone sales, field or door-to-door sales, repeat business sales, and cold-call sales. Managers applied activity cost pools to the five revenue-producing employees using relevant cost drivers. ABC revealed annual net income (loss) by employee as follows:

| | | | |
|-------------|----------|-------------|------------|
| Employee #1 | \$65,431 | Employee #4 | \$(10,957) |
| Employee #2 | \$35,154 | Employee #5 | \$(46,180) |
| Employee #3 | \$13,731 | | |

This comparative information was an eye-opener to the owner of Mahany Welding—who was Employee #5!

Source: Michael Krupnicki and Thomas Tyson, "Using ABC to Determine the Cost of Servicing Customers," *Management Accounting* (December 31, 1997), pp. 40–46.



What positive implications does application of ABC have for the employees of this company?

Activity-Based Costing: A Closer Look

When to Use ABC

Factors to consider:

1. Product lines differ in volume and manufacturing complexity.
2. Product lines are numerous and diverse.
3. Overhead costs constitute a significant portion of total costs.
4. The manufacturing process or the number of products has changed significantly.
5. Production or marketing managers are ignoring data provided by the existing system.

Activity-Based Costing: A Closer Look

Value-Added Versus Non-Value-Added Activities

Activity-Based Management (ABM):

An extension of ABC from a product costing system to a management function that focuses on reducing costs and improving processes and decision making.

- **Value-added activities**
- **Non-value-added activities**

Activity-Based Costing: A Closer Look

Value-Added Versus Non-Value-Added Activities

An activity that **increases the worth** of a product or service such as:

Manufacturing Company

Engineering design

Machining services

Assembly

Painting

Packaging

Service Company

Performing surgery

Legal research

Delivering packages

Activity-Based Costing: A Closer Look

Value-Added Versus Non-Value-Added Activities

An activity that **adds cost** to, or **increases the time spent** on, a product/service without increasing its market value such as:

Manufacturing Company

- Repair of machines
- Storage of inventory
- Moving of inventory
- Building maintenance
- Inspections
- Inventory control

Service Company

- Taking appointments
- Reception
- Bookkeeping and billing
- Traveling
- Ordering supplies
- Advertising



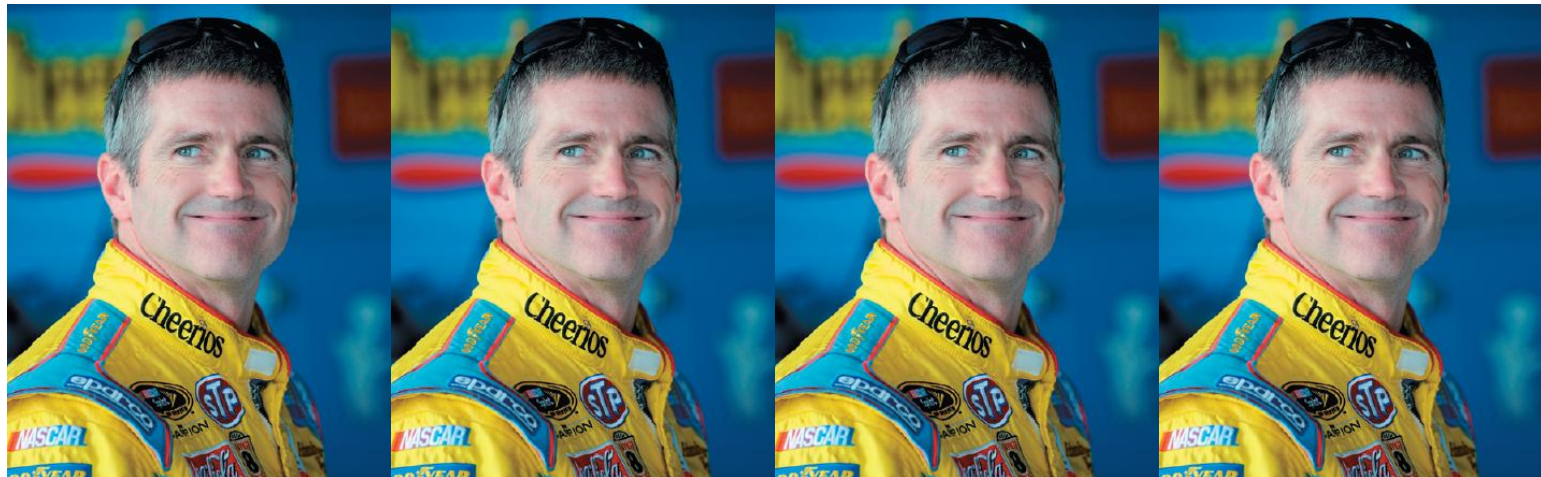
Management Insight

What Does NASCAR Have to Do with Breakfast Cereal?

Often the best way to improve a process is to learn from observing a different process. Production-line technicians from giant food producer **General Mills** were flown to North Carolina to observe first-hand how race-car pit crews operate. In a NASCAR race, the value-added activity is driving toward the finish line; any time spent in the pit is non-value-added. Every split second saved in the pit increases the chances of winning. From what the General Mills technicians learned at the car race, as well as other efforts, they were able to reduce setup time from 5 hours to just 20 minutes.



What are the benefits of reducing setup time?



Activity-Based Costing: A Closer Look

Do it!

Classify each of the following activities within a dental practice as value-added (VA) or non-value-added (NVA).

1. Ordering supplies.

2. Taking appointments.

3. Completing continuing education requirements.

4. Explaining dental-hygiene techniques to patients.

5. Completing insurance documents.

6. Examining patients.

Activity-Based Costing: A Closer Look




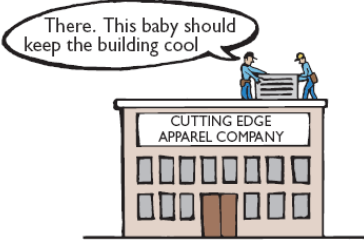
Classification of Activity Levels

ABC activities levels:

1. Unit-level activities
2. Batch-level activities
3. Product-level activities
4. Facility-level activities

Activity-Based Costing: A Closer Look

Classification of Activity Levels

| Four Levels | Types of Activities | Examples of Cost Drivers |
|---|---|---|
| Unit-Level Activities  | <u>Machine-related</u> Drilling, cutting, milling, trimming, pressing <u>Labor-related</u> Assembling, painting, sanding, sewing | Machine hours Direct labor hours or cost |
| Batch-Level Activities  | Equipment setups Purchase ordering Inspection Material handling | Number of setups or setup time Number of purchase orders Number of inspections or inspection time Number of material moves |
| Product-Level Activities  | Product design Engineering changes | Number of product designs Number of changes |
| Facility-Level Activities  | Plant management salaries Plant depreciation Property taxes Utilities | Number of employees managed Square footage Square footage Square footage |

Activity-Based Costing: A Closer Look

Do it!

Morgan Toy Company manufactures six primary product lines in its Morganville plant. As a result of an activity analysis, the accounting department has identified eight activity cost pools. Each of the toy products is produced in large batches, with the whole plant devoted to one product at a time. Classify each of the following activities as either unit-level, batch-level, product-level, or facility-level:

| | |
|--|--------------------------|
| | a. Engineering design, |
| | b. Machine setup, |
| | c. Inventory management, |
| | d. Plant cafeteria, |

- Engineering design,
- Machine setup,
- Inventory management,
- Plant cafeteria,

Activity-Based Costing: A Closer Look

Do it!

Morgan Toy Company manufactures six primary product lines in its Morganville plant. As a result of an activity analysis, the accounting department has identified eight activity cost pools. Each of the toy products is produced in large batches, with the whole plant devoted to one product at a time. Classify each of the following activities as either unit-level, batch-level, product-level, or facility-level:

e. Inspections after each setup,

f. Polishing parts,

g. Assembling parts,

h. Health and safety.

Activity-Based Costing in Service Industries

Overall objective: Identify key cost-generation activities and keep track of quantity of activities performed for each service provided.

- General approach is to identify activities, cost pools, and cost drivers.
- Labeling of activities as value-added or non-value-added.
- A larger proportion of overhead costs are company-wide costs that cannot be directly traced to specific services provided by the company.

Activity-Based Costing in Service Industries

Traditional Costing Example

The public accounting firm of Check and Doublecheck prepares the following condensed annual budget.

| CHECK AND DOUBLECHECK, CPAs Annual Budget | | |
|---|------------------|--------------------------|
| Revenue | | \$2,000,000 |
| Direct labor | \$ 600,000 | |
| Overhead (expected) | <u>1,200,000</u> | |
| Total costs | | <u>1,800,000</u> |
| Operating income | | <u><u>\$ 200,000</u></u> |
| $\frac{\text{Estimated overhead}}{\text{Direct labor cost}} = \text{Predetermined overhead rate}$ | | |
| $\frac{\$1,200,000}{\$600,000} = 200\%$ | | |

Illustration 4-14

Activity-Based Costing in Service Industries

Traditional Costing Example

Under traditional costing Check and Doublecheck would compute applied overhead and operating income as:

Illustration 4-15

CHECK AND DOUBLECHECK, CPAs Plano Molding Company Audit

| | | |
|------------------------------------|----------------|-------------------------|
| Revenue | | \$260,000 |
| Less: Direct professional labor | \$ 70,000 | |
| Applied overhead (200% × \$70,000) | <u>140,000</u> | <u>210,000</u> |
| Operating income | | <u><u>\$ 50,000</u></u> |

Activity-Based Costing in Service Industries

Activity-Based Costing Example

Check and Doublecheck distributes its estimated annual overhead costs of \$1,200,000 to several activity cost pools.

CHECK AND DOUBLECHECK, CPAs
Annual Overhead Budget

Illustration 4-16

| Activity Cost Pools | Cost Drivers | Estimated Overhead | Expected Use of Cost Drivers per Activity | Activity-Based Overhead Rates |
|---|---------------------------|--------------------|---|-------------------------------|
| Secretarial support | Direct professional hours | \$210,000 | 30,000 | \$7 per hour |
| Direct labor fringe benefits | Direct labor cost | 240,000 | \$600,000 | \$0.40 per \$1 labor cost |
| Printing and photocopying | Working paper pages | 20,000 | 20,000 | \$1 per page |
| Computer support | CPU minutes | 200,000 | 50,000 | \$4 per minute |
| Telephone and postage | None (traced directly) | 71,000 | N/A | Based on usage |
| Legal support | Hours used | 129,000 | 860 | \$150 per hour |
| Insurance (professional liability, etc.) | Revenue billed | 120,000 | \$2,000,000 | \$0.06 per \$1 revenue |
| Recruiting and training | Direct professional hours | 210,000 | 30,000 | \$7 per hour |
| | | <u>\$1,200,000</u> | | |

Activity-Based Costing in Service Industries

Activity-Based Costing Example

Assigning overhead in a service industry

Illustration 4-17

| Activity Cost Pools | Cost Drivers | Actual Use of Drivers | Activity-Based Overhead Rates | Cost Assigned |
|---|---------------------------|-----------------------|-------------------------------|------------------|
| Secretarial support | Direct professional hours | 3,800 | \$7.00 | \$ 26,600 |
| Direct labor fringe benefits | Direct labor cost | \$70,000 | \$0.40 | 28,000 |
| Printing and photocopying | Working paper pages | 1,800 | \$1.00 | 1,800 |
| Computer support | CPU minutes | 8,600 | \$4.00 | 34,400 |
| Telephone and postage | None (traced directly) | | | 8,700 |
| Legal support | Hours used | 156 | \$150.00 | 23,400 |
| Insurance (professional liability, etc) | Revenue billed | \$260,000 | \$0.06 | 15,600 |
| Recruiting and training | Direct professional hours | 3,800 | \$7.00 | 26,600 |
| | | | | <u>\$165,100</u> |

Activity-Based Costing in Service Industries

Activity-Based Costing Example

Comparison of traditional costing with ABC in a service company.

Illustration 4-18

| CHECK AND DOUBLECHECK, CPAs Plano Molding Company Audit | | | | |
|--|----------------------------|-------------------------|----------------|-------------------------|
| | <u>Traditional Costing</u> | | <u>ABC</u> | |
| Revenue | | \$260,000 | | \$260,000 |
| Expenses | | | | |
| Direct professional labor | \$ 70,000 | | \$ 70,000 | |
| Applied overhead | <u>140,000</u> | | <u>165,100</u> | |
| Total expenses | | <u>210,000</u> | | <u>235,100</u> |
| Operating income | | <u>\$ 50,000</u> | | <u>\$ 24,900</u> |
| Profit margin | | 19.2% | | 9.6% |

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Where Does the Time Go?

Some Facts

- ❖ The average worker wastes about 2.1 hours per eight-hour workday. This does not include lunch and scheduled breaks. According to human resources managers, companies assume that employees will waste about one hour per day.
- ❖ The top time-wasting activities cited by employees are surfing the Internet, socializing with coworkers, and conducting personal business.

Some Facts

- ❖ Older people waste less time at work than younger people. Men and women waste about the same amount of time.
- ❖ The average worker earns \$19.13 per hour. If, as stated above, the average worker wastes about 1.1 hours more per day than employers expect, then the total lost salary dollars is about \$759 billion per year.
- ❖ A third (33%) of survey respondents said that they waste time at work because they do not have enough work to do. About a quarter (23%) of respondents said they waste time at work because they are not paid enough.

About the Numbers

A recent survey found that only about 11% of full-time students spend more than 25 hours a week preparing for class (which is about the number of hours that instructors say is needed to do well in college). About 44% of the students in the survey said that they spend less than 10 hours per week.

| How Students Spend Time Each Week (in hours) | First-Year Students | | Seniors | |
|--|---------------------|-----------|-----------|-----------|
| | Part-time | Full-time | Part-time | Full-time |
| Studying | 9 | 13 | 10 | 14 |
| Working on-campus | 2 | 3 | 3 | 4 |
| Working off-campus | 18 | 5 | 20 | 10 |
| Participating in co-curricular activities | 1 | 5 | 2 | 5 |
| Relaxing and socializing | 10 | 12 | 10 | 11 |
| Caring for dependents | 13 | 2 | 12 | 4 |
| Commuting to class | 5 | 4 | 5 | 5 |

What Do You Think?

Many “self-help” books and websites offer suggestions on how to improve your time management. Should you minimize the “non-value-added” hours in your life by adopting the methods suggested by these sources?

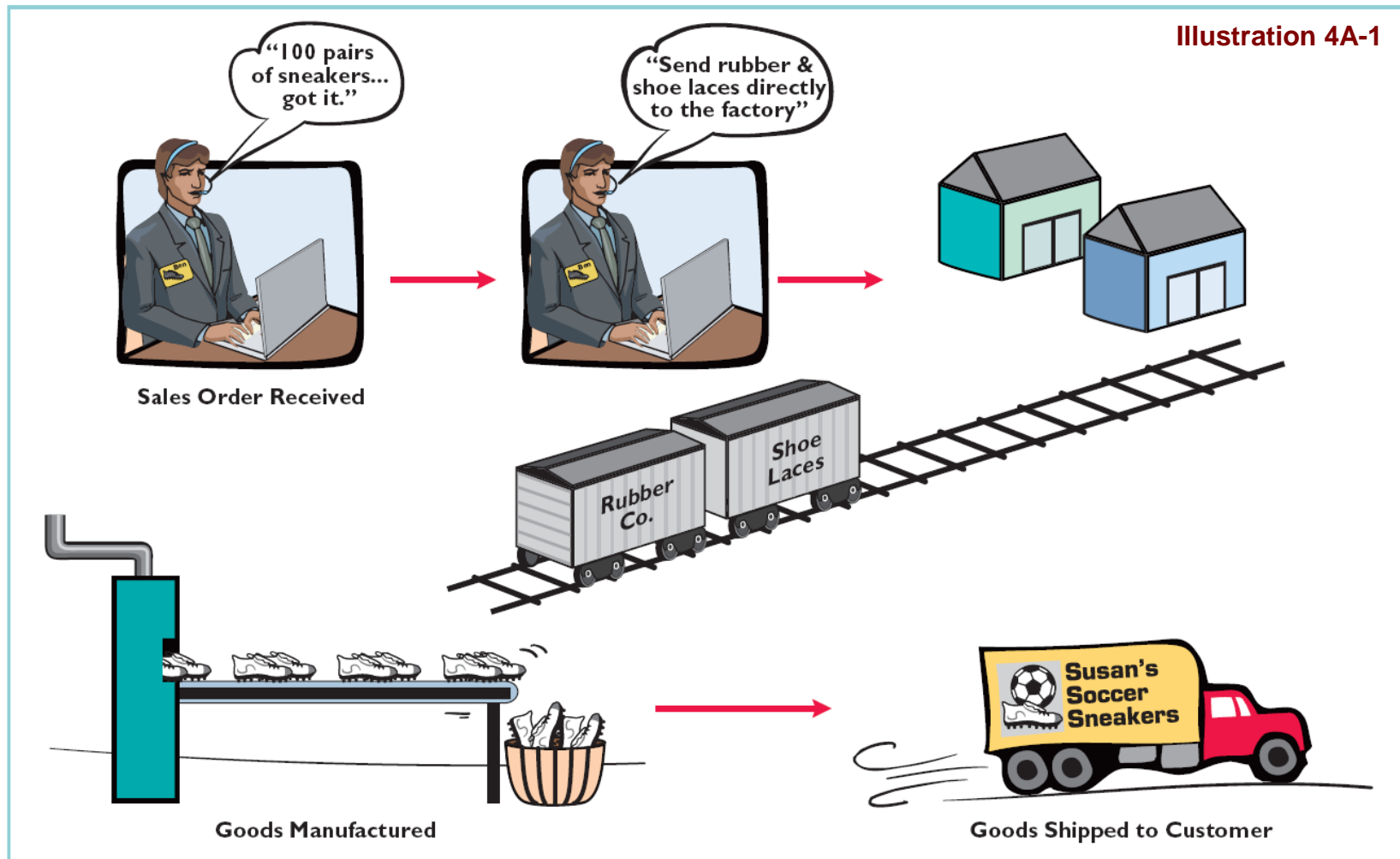
YES: There are a limited number of hours in a day. You should try to maximize your chances of achieving your goals by eliminating the time that you waste.

NO: Life is about more than working yourself to death. Being an efficiency expert doesn't guarantee that you will be happy. Schedules and daily planners are too constraining.

appendix

Just-in-Time Processing

JIT manufacturing is dedicated to having the right amount of materials, parts, or products just as they are needed.



Objective of JIT Processing

- To eliminate all manufacturing inventories.

Elements of JIT Processing

- Dependable suppliers.
- Multiskilled work force.
- Total quality control system.

Benefits of JIT Processing

- Significant reduction or elimination of manufacturing inventories.
- Enhanced product quality.
- Reduction or elimination of rework costs and inventory storage costs.
- Production cost savings from the improved flow of goods through the processes.

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