

# Lecture 6: Ch 11 Strategic Cost Mgt & Ch 12 ABM

## IE618 Eng Cost & Production Economics

Spring 2014

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# Chapter 11 Objectives

1. Explain what strategic cost management is and how it can be used to help a firm create a competitive advantage.
2. Discuss value-chain analysis and the strategic role of activity-based customer and supplier costing.
3. Tell what life-cycle cost management is and how it can be used to maximize profits over a product's life cycle.
4. Identify the basic features of JIT purchasing and manufacturing.
5. Describe the effect JIT has on cost traceability and product costing.

# Strategic Cost Management: Basic Concepts

**Strategic Decision Making:** choosing among alternative strategies with the goal of selecting a strategy for long term growth and survival

**Strategic Cost Management:** use of cost data to develop and identify superior strategies that will help produce a sustainable competitive advantage

# Strategic Cost Management: Basic Concepts

## Competitive Advantage

- creating better customer value for the same or lower cost than offered by competitors

OR

- Creating equivalent value for lower cost than offered by competitors

## Customer Value

- The difference between customer realization (what a customer receives) and customer sacrifice (what the customer gives up)

# Strategic Cost Management: Basic Concepts

A cost leadership strategy happens when the same or better value is provided to customers at a lower cost than a company's competitors.

Example: A company might redesign a product so that fewer parts are needed, lowering production costs and the costs of maintaining the product after purchase.

# Strategic Cost Management: Basic Concepts

A differentiation strategy strives to increase customer value by increasing what the customer receives (customer realization).

Example: A retailer of computers might offer an on-site repair service, a feature not offered by other rivals in the local market.

# Strategic Cost Management: Basic Concepts

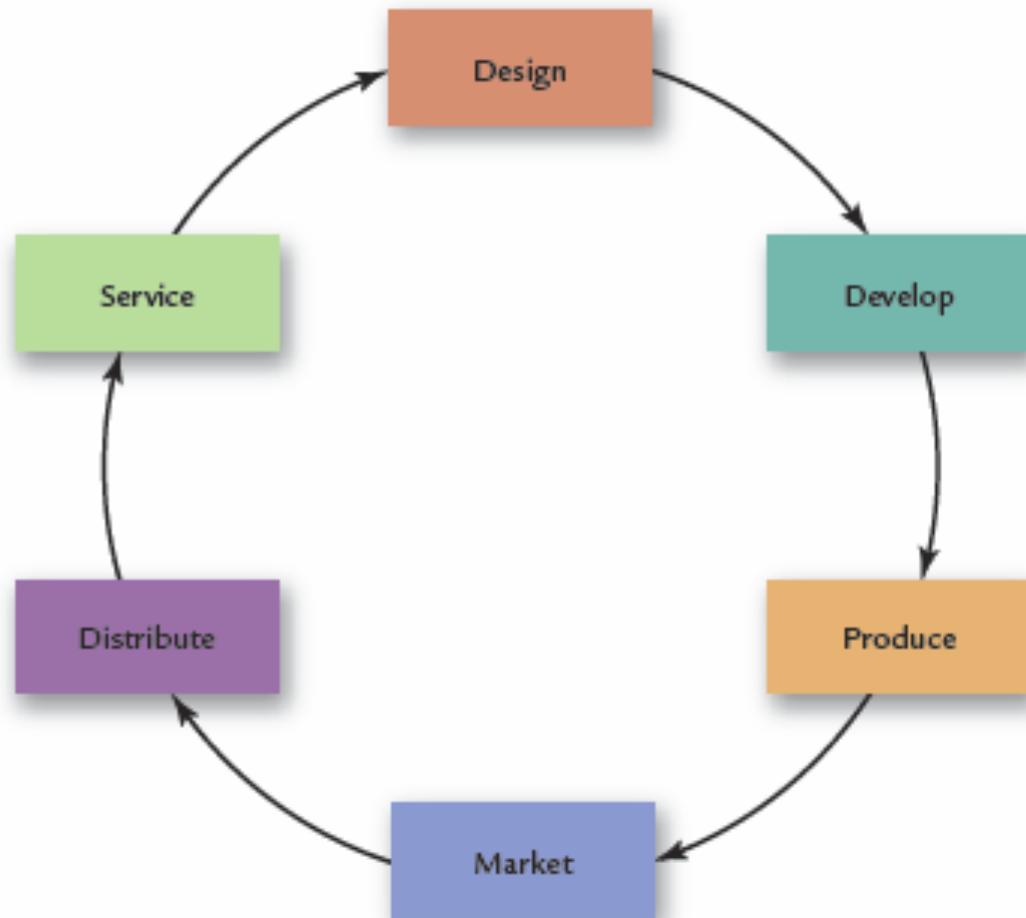
A focusing strategy happens when a firm selects or emphasizes a market or customer segment in which to compete.

Strategic positioning: the process of selecting the optimal mix of these three general strategic approaches.

# Value Chain Analysis

(EXHIBIT 11.5)

Internal Value Chain



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Identifying and exploiting internal and external linkages with the objective of strengthening a firm's strategic position

Objective 2

# Value-Chain Analysis

## Internal Linkage Analysis Example

Consider new product design to reduce number of parts from 20 down to 8 for total qty of 10,000 units.

| <i>Activities</i> | <i>Activity Driver</i>       | <i>Activity</i> | <i>20 part Current</i> | <i>8 part Expected</i> |
|-------------------|------------------------------|-----------------|------------------------|------------------------|
|                   |                              | <i>Capacity</i> | <i>Demand</i>          | <i>Demand</i>          |
| Material usage    | Number of parts              | 200,000         | 200,000                | 80,000                 |
| Assembling parts  | Direct labor hours           | 10,000          | 10,000                 | 5,000                  |
| Purchasing parts  | Number of orders             | 15,000          | 12,500                 | 6,500                  |
| Warranty repair   | Number of defective products | 1,000           | 800                    | 500                    |

Additionally, the following activity cost data are provided:

# Value-Chain Analysis

## Internal Linkage Analysis Example

**Material usage:** \$3 per part used; no fixed activity cost.

**Assembly:** \$12 per direct labor hour; no fixed activity cost

**Purchasing:** Three salaried clerks, each earning a \$30,000 annual salary; each clerk is capable of processing 5,000 purchase orders annually. Variable activity costs: \$0.50 per purchase order processed for forms, postage, etc.

**Warranty:** Two repair agents, each paid a salary of \$28,000 per year; each repair agent is capable of repairing 500 units per year. Variable activity costs: \$20 per product repaired.

# Value-Chain Analysis

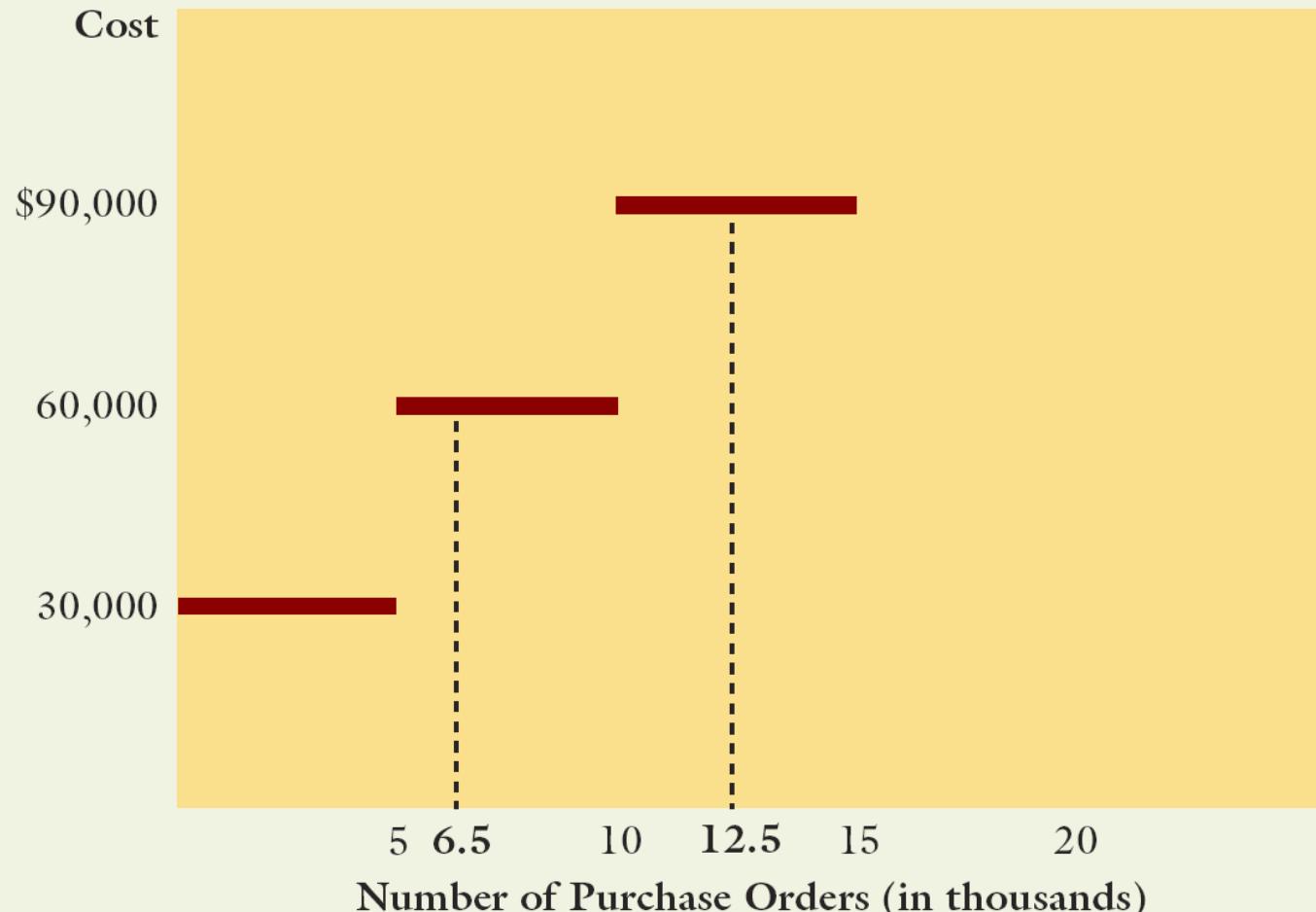
## Internal Linkage Analysis Example

### Cost Reduction from Exploiting Internal Linkages

|                                       |                          |
|---------------------------------------|--------------------------|
| Material usage                        | \$ 360,000               |
| $(200,000 - 80,000) \times \$3$       |                          |
| Labor usage                           | 60,000                   |
| $(10,000 - 5,000) \times \$12$        |                          |
| Purchasing                            | 33,000                   |
| $[\$30,000 + \$0.50(12,500 - 6,500)]$ |                          |
| Warranty repair                       | 34,000                   |
| $[\$28,000 + \$20(800 - 500)]$        |                          |
| Total                                 | <u><u>\$ 487,000</u></u> |
| Units                                 | 10,000                   |
| Unit savings                          | \$ 48.70                 |

# Value-Chain Analysis

## Step-Cost Behavior: Purchasing Activity



# Value-Chain Analysis

Consider 2 components from 2 different suppliers

|                     |                                 | Data for Supplier Costing Example |             |
|---------------------|---------------------------------|-----------------------------------|-------------|
| I. Activity Costs   |                                 |                                   |             |
| Activity            | Component Failure/Late Delivery | Process Failure                   |             |
| Reworking products  | \$200,000                       |                                   | \$40,000    |
| Expediting products | 50,000                          |                                   | 10,000      |
| II. Supplier Data   |                                 |                                   |             |
|                     |                                 | Fielding Electronics              | Oro Limited |
|                     |                                 | X1Z                               | Y2Z         |
| Unit purchase price | \$10                            | \$26                              | \$12        |
| Units purchased     | 40,000                          | 20,000                            | 5,000       |
| Failed units        | 800                             | 190                               | 5           |
| Late shipments      | 30                              | 20                                | 0           |

# Value-Chain Analysis

## External Linkage Analysis Example

Reworking rate =  $\$200,000 \div 1,000$   
=  $\$200$  per failed component

$(800 + 190 + 5 + 5)$

Expediting rate =  $\$50,000 \div 50$   
=  $\$1,000$  per late delivery

$(30 + 20)$

# Value-Chain Analysis

| Supplier Costing     |                      |                 |                 |
|----------------------|----------------------|-----------------|-----------------|
|                      | Fielding Electronics | Oro Limited     |                 |
|                      | X1Z                  | Y2Z             | X1Z             |
| Purchase cost:       |                      |                 |                 |
| \$10 × 40,000        | \$400,000            |                 |                 |
| \$26 × 20,000        |                      | \$520,000       |                 |
| \$12 × 5,000         |                      |                 | \$60,000        |
| \$28 × 5,000         |                      |                 | \$140,000       |
| Reworking products:  |                      |                 |                 |
| \$200 × 800          | 160,000              |                 |                 |
| \$200 × 190          |                      | 38,000          |                 |
| \$200 × 5            |                      |                 | 1,000           |
| \$200 × 5            |                      |                 | 1,000           |
| Expediting products: |                      |                 |                 |
| \$1,000 × 30         | 30,000               |                 |                 |
| \$1,000 × 20         |                      | 20,000          |                 |
| Total costs          | \$590,000            | \$578,000       | \$61,000        |
| Units                | ÷ 40,000             | ÷ 20,000        | ÷ 5,000         |
| Total unit cost      | <u>\$ 14.75</u>      | <u>\$ 28.90</u> | <u>\$ 12.20</u> |
|                      |                      |                 | <u>\$ 28.20</u> |

15 Note: higher first cost, higher quality supplier is the lower total cost supplier

# Value-Chain Analysis

Big customer claims competitor price  
is \$0.50 less than ours...so??

|                               | One Large<br>Customer | Ten Smaller<br>Customers |
|-------------------------------|-----------------------|--------------------------|
| Units purchased               | 500,000               | 500,000                  |
| Orders placed                 | 2                     | 200                      |
| Manufacturing cost            | \$ 3,000,000          | \$ 3,000,000             |
| Order-filling cost allocated* | \$ 303,000            | \$ 303,000               |
| Order cost per unit           | \$ 0.6060             | \$ 0.6060                |

- *Order-filling capacity is purchased in blocks of 45 (225 capacity), each block costing \$40,400; variable order-filling activity costs are \$2,000 per order; thus, the cost is*  

$$[(5 \times \$40,400) + (202 \times \$2,000)] = \$606,000$$
- Activity driver: units purchased
- Realize that number of orders is more appropriate cost driver, so  

$$\$606 \text{ k} / 202 = \$3 \text{ k per order}$$
 and larger customer cost now \$6k and  
 reduce by \$0.59 per unit + 20% markup = \$0.71

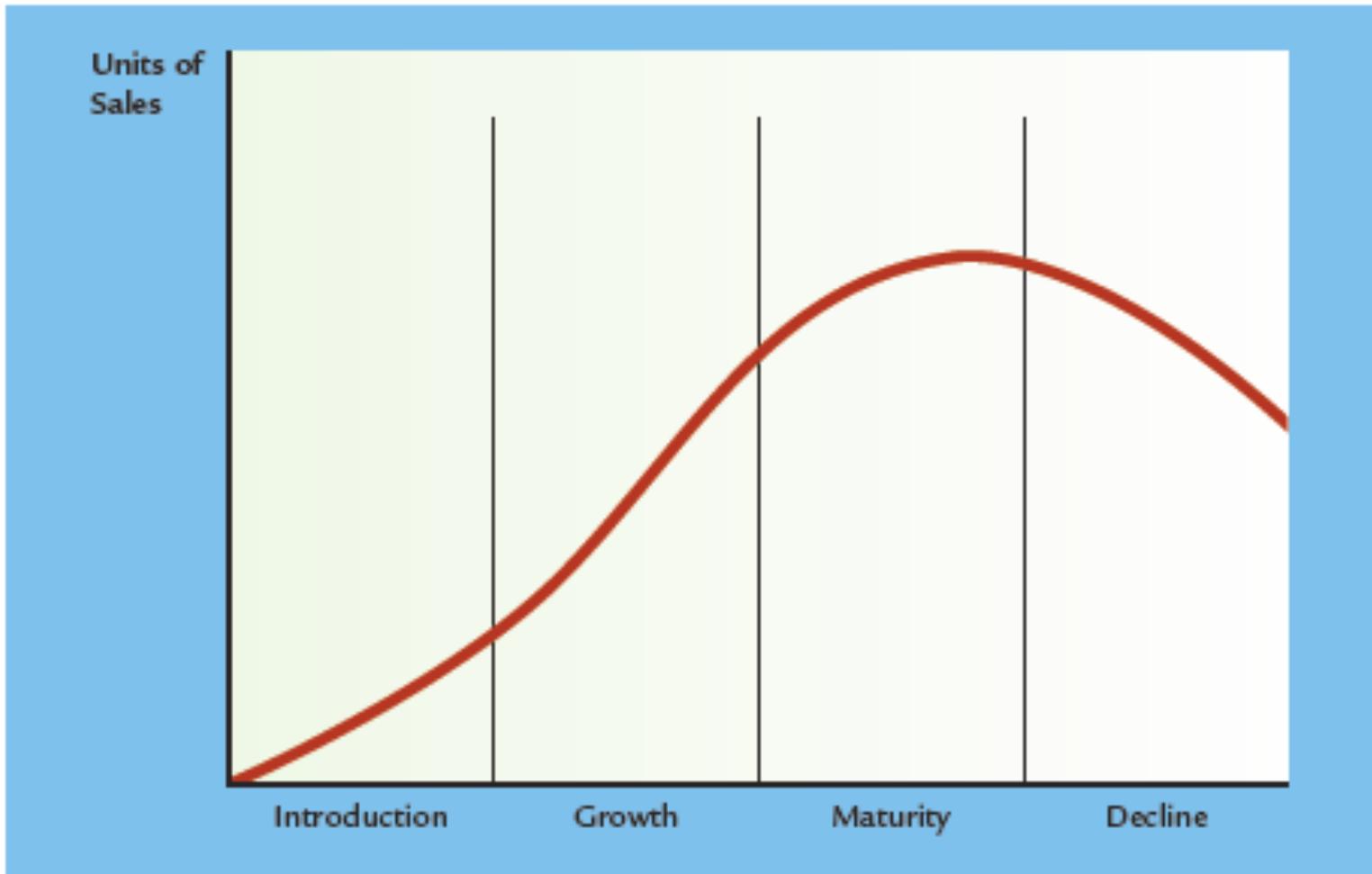
# Life Cycle Cost Management

## Product Life Cycle

- the time a product exists - from conception to abandonment
- Revenue producing life: the time a product generates revenue for a company
- Consumable life: the length of time a product serves the needs of a customer

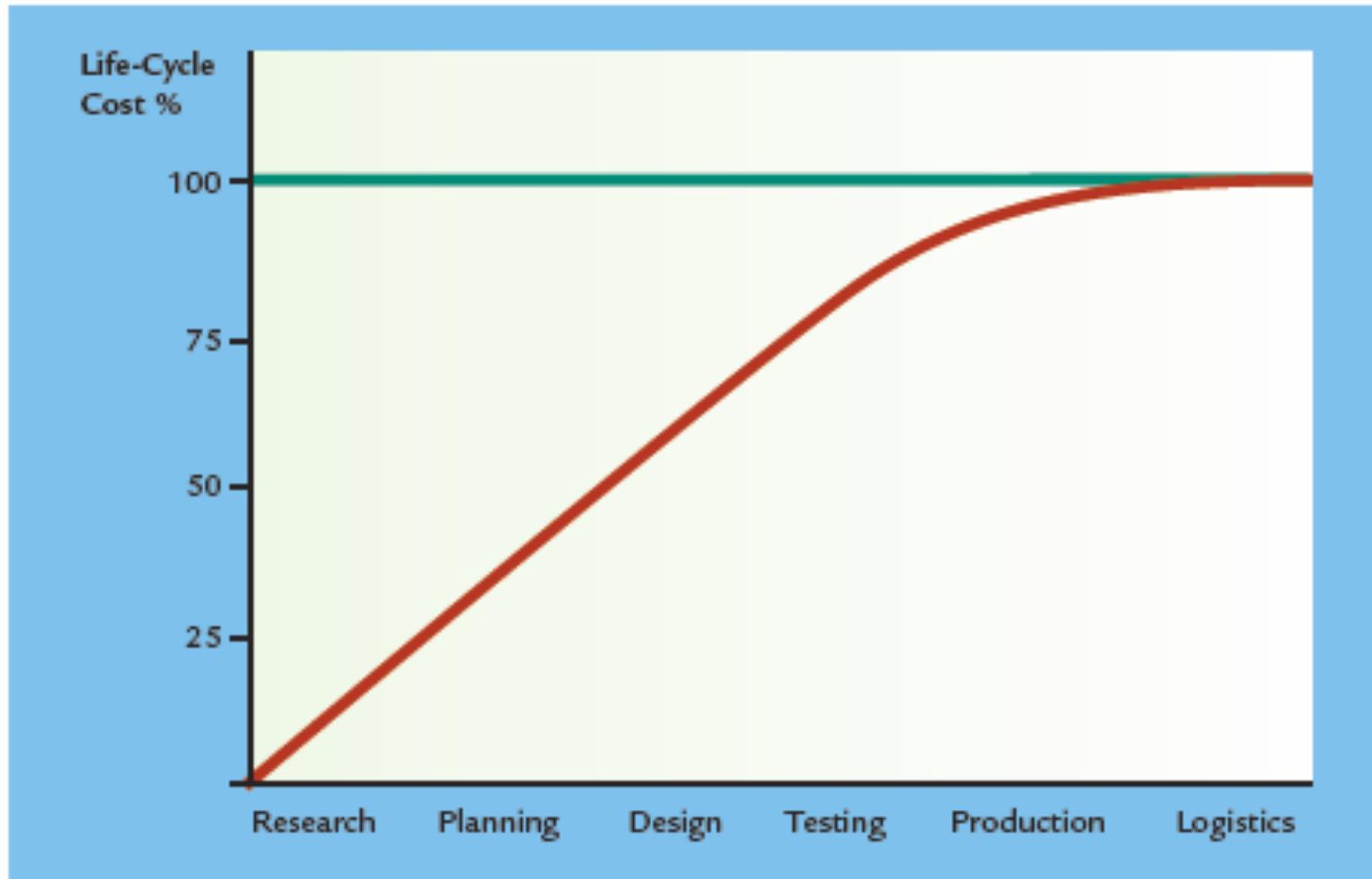
# Life Cycle Cost Management

General Pattern of Product Life Cycle: Marketing Viewpoint



# Life Cycle Cost Management

Product Life Cycle: Production Viewpoint



# Life-Cycle Cost Management

Design engineers are considering two new product designs that reduce direct materials and direct labor content. Data for both unit-based and ABC systems are provided below.

*Unit-based system:*

Variable conversion activity rate: \$40 per direct labor hour

Material usage rate: \$8 per part

*ABC system:*

Labor usage: \$10 per direct labor hour

Material usage (direct materials): \$8 per part

Machining: \$28 per machine hour

Purchasing activity: \$60 per purchase order

Setup activity: \$1,000 per setup hour

Warranty activity: \$200 per returned unit (usually requires extensive rework)

Customer repair cost: \$10 per repair hour

## Activity and Resource Information (annual estimates)

|                        | Design A      | Design B     |
|------------------------|---------------|--------------|
| Units produced         | 10,000        | 10,000       |
| Direct material usage  | 100,000 parts | 60,000 parts |
| Labor usage            | 50,000 hours  | 80,000 hours |
| Machine hours          | 25,000        | 20,000       |
| Purchase orders        | 300           | 200          |
| Setup hours            | 200           | 100          |
| Returned units         | 400           | 75           |
| Repair time (customer) | 800           | 150          |

# Life-Cycle Cost Management

| 1.                            | Design A             | Design B             |
|-------------------------------|----------------------|----------------------|
| Direct materials <sup>a</sup> | \$ 800,000           | \$ 480,000           |
| Conversion cost <sup>b</sup>  | 2,000,000            | 3,200,000            |
| Total manufacturing costs     | \$2,800,000          | \$3,680,000          |
| Units produced                | ÷ 10,000             | ÷ 10,000             |
| Unit cost                     | <u><u>\$ 280</u></u> | <u><u>\$ 368</u></u> |

<sup>a</sup> \$8 × 100,000; \$8 × 60,000

<sup>b</sup> \$40 × 50,000; \$40 × 80,000

# Life-Cycle Cost Management

| 2.                               | Design A               | Design B               |
|----------------------------------|------------------------|------------------------|
| Direct materials                 | \$ 800,000             | \$ 480,000             |
| Direct labor <sup>a</sup>        | 500,000                | 800,000                |
| Machining <sup>a</sup>           | 700,000                | 560,000                |
| Purchasing <sup>b</sup>          | 18,000                 | 12,000                 |
| Setups <sup>b</sup>              | 200,000                | 100,000                |
| Warranty <sup>b</sup>            | 80,000                 | 15,000                 |
| Total product costs              | <u>\$2,298,000</u>     | <u>\$1,967,000</u>     |
| Units produced                   | <u>÷ 10,000</u>        | <u>÷ 10,000</u>        |
| Unit cost                        | <u>\$ 230*</u>         | <u>\$ 197*</u>         |
| Post-purchase costs <sup>c</sup> | <u><u>\$ 8,000</u></u> | <u><u>\$ 1,500</u></u> |

<sup>a</sup> \$10 × 50,000; \$10 × 80,000; \$28 × 25,000; \$28 × 20,000

<sup>b</sup> \$60 × 300; \$60 × 200; \$1,000 × 200; \$1,000 × 100; \$200 × 400; \$200 × 75

<sup>c</sup> \$10 × 800; \$10 × 150

\* Rounded to the nearest dollar.

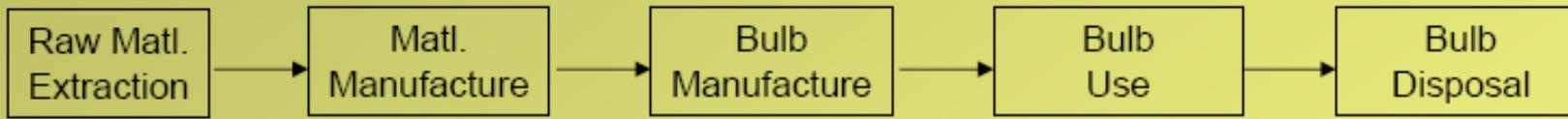
# LCA Example: Comparison of Light Bulbs

## ❖ Life Cycle Assessment

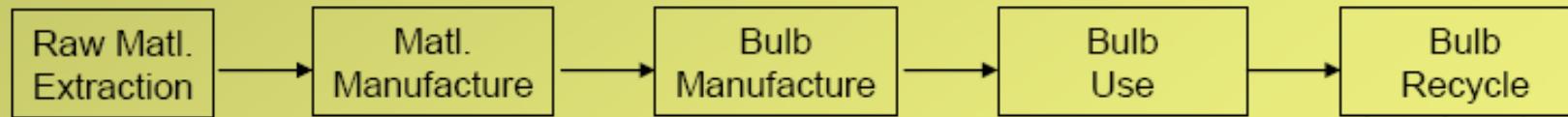
- Comparison of light bulb systems
- System boundaries
- Goal and scope: cost and energy



### Incandescent Bulb



### Fluorescent Bulb



Hg      Glass filler      Scrap metal

# LCA Example: Comparison of Light Bulbs

- ❖ **Life Cycle Assessment**
  - Comparison of light bulb systems
  - System data:



|  | Fluorescent Bulb | Incandescent Bulb |
|--|------------------|-------------------|
| <b>Light Output, (lumens)</b>          | 1,700            | 1,690             |
| <b>Life (hr)</b>                       | 8,000            | 750               |
| <b>Energy Use Rate (Watt)</b>          | 26               | 100               |
| <b>Purchase Cost (\$/bulb)</b>         | 4.22             | 0.25              |
| <b>Energy Cost (\$/kWh)</b>            | 0.12             | 0.12              |
| <b>Disposal/Recycle Cost (\$/bulb)</b> | 0.4              | 0.0               |

Data for light, life, and energy use rate from General Electric.

Purchase cost based on Wal-Mart price.

Energy cost is from Dr. Shonnard's UPPCO bill, Aug. 2004

Disposal / Recycle cost from Mike Kimmel, CleanLites Recycling, Inc., Mason, MI 48854

# LCA Example: Comparison of Light Bulbs

## ❖ Light Bulb Systems

### □ Functional unit and equivalence

Functional Unit Definition: The comparison is based on bulb light output and lifetime of service. Both bulbs provide equivalent light output. The *fluorescent* bulb lasts 8,000 hours while the *incandescent* bulb lasts 750 hours.



|      |   |       |        |
|------|---|-------|--------|
| data | light output of incandescent bulb                 | 1690  | lumens |
| data | light output of fluorescent bulb                  | 1700  | lumens |
| data | lifetime of incandescent bulb                     | 750   | hr     |
| data | lifetime of fluorescent bulb                      | 8000  | hr     |
| ans. | equivalence incandescent bulbs / fluorescent bulb | 10.67 |        |

$$\text{Functional Equivalence} = 8000 \text{ hr} / 750 \text{ hr} = 10.67$$

# LCA Example: Comparison of Light Bulbs

## ❖ Light Bulb Systems

### □ Life cycle costs

Most of the cost is during bulb use



| data | cost of one fluorescent bulb            |             | 4.22         | \$      |
|------|---|-------------|--------------|---------|
| data | cost of one incandescent bulb           |             | 0.25         | \$      |
| data | number of incandescent bulbs            |             | 10.67        |         |
| data | cost of electricity                     |             | 0.12         | \$/kWhr |
| data | cost of recycle of one fluorescent bulb |             | 0.4          | \$      |
| data | lifetime of bulb(s) operation           |             | 8000         | hr      |
| data | fluorescent bulb elec. usage rate       |             | 26           |         |
| data | incandescent bulb elec. usage rate      |             | 100          |         |
|      |   | Fluorescent | Incandescent |         |
| ans. | Purchase (\$)                           | 4.22        | 2.67         |         |
|      | Use (\$)                                | 24.96       | 96.00        |         |
|      | Recycle/Disposal (\$)                   | 0.4         | 0            |         |
|      | Total (\$)                              | 29.58       | 98.67        |         |

$$\text{Fluorescent Use (\$)} = 8000 \text{ hr} \times 26 \text{ Watts} / 1000 \text{ W/kW} \times 0.12 \text{ \$/kWhr} = \$24.96$$

# LCA Example: Comparison of Light Bulbs

## ❖ Light Bulb Systems

### □ Production energy assessment

|  |              |           |
|--|--------------|-----------|
| packaging: 4.5 g cardboard                           | 0.117        | MJ/bulb   |
| packaging: 33 g plastic                              | 3.925        | MJ/bulb   |
| bulb: 50 g white glass                               | 0.604        | MJ/bulb   |
| bulb: 40 g steel                                     | 1.013        | MJ/bulb   |
| bulb: 10 g plastic                                   | 1.189        | MJ/bulb   |
| <b>Total Energy per Fluorescent Bulb, Production</b> | <b>6.849</b> | <b>MJ</b> |



Energy inventory  
provided by  
modules in  
SimaPro6.0

|  |              |                |
|--|--------------|----------------|
| packaging: 5.25 g cardboard                              | 0.171        | MJ/bulb        |
| bulb: 20 g white glass                                   | 0.242        | MJ/bulb        |
| bulb: 10 g steel   | 0.253        | MJ/bulb        |
| <b>Total Energy per Incandescent Bulb, Production</b>    | <b>0.666</b> | <b>MJ/bulb</b> |
| <b>Total Energy 10.67 Incandescent Bulbs, Production</b> | <b>7.104</b> | <b>MJ</b>      |

*Note: bulb assembly is not included in this analysis- no data*

Production Energy for 1 kg of steel=8.7GJ/t (secondary) & 31.3GJ/t (Primary)

Assume avg of 25 GJ/t; so, Energy for steel production=0.025 MJ/g

# LCA Example: Comparison of Light Bulbs

## ❖ Light Bulb Systems

- Use cycle energy assessment



|  |         |        |
|--|---------|--------|
| Data: efficiency of electricity generation       | 35      | %      |
| Data: conversion of kWh to MJ                    | 3.6     | MJ/kWh |
| Data: conversion of W to kWh                     | 1,000   | W/kWh  |
| Data: incandescent bulb usage rate               | 100     | Watts  |
| Data: fluorescent bulb usage rate                | 26      | Watts  |
| Data: lifetime of fluorescent bulb               | 8,000   | hr     |
| Total Energy per Fluorescent Bulb, Use stage     | 2,139.4 | MJ     |
| Total Energy 10.67 Incandescent Bulbs, Use stage | 8,228.6 | MJ     |

**>99% of bulb energy is consumed during use**

*Note: bulb recycle and disposal are not included in this analysis – no data*

$$\text{Fluorescent Use (MJ)} = 8000 \text{ hr} \times 26 \text{ Watts} / 1000 \text{ W/kW} \times 3.6 \text{ MJ/kWh} / 0.35 = 2,139.4$$

# LCA Example: Comparison of Light Bulbs

**Fluorescent Bulb superior to Incandescent Bulb**  
for equivalent source of light

Lower Lifecycle Cost: Save 70% over lifetime.

Less Energy Consumption: Save 75% over lifetime.

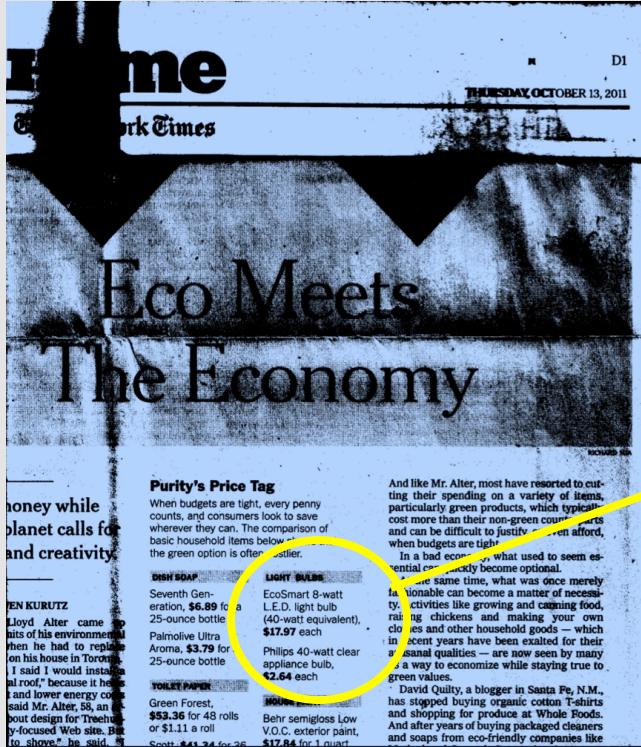


# LCA Example: Comparison of Light Bulbs

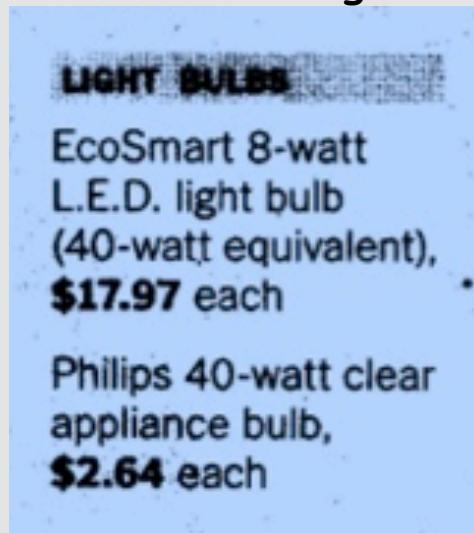
## L.E.D Bulb superior to Incandescent Bulb for equivalent source of light

Lower Lifecycle Cost: Save ??% over lifetime.

Less Energy Consumption: Save ??% over lifetime.



Is NYTimes conclusion correct or misleading?



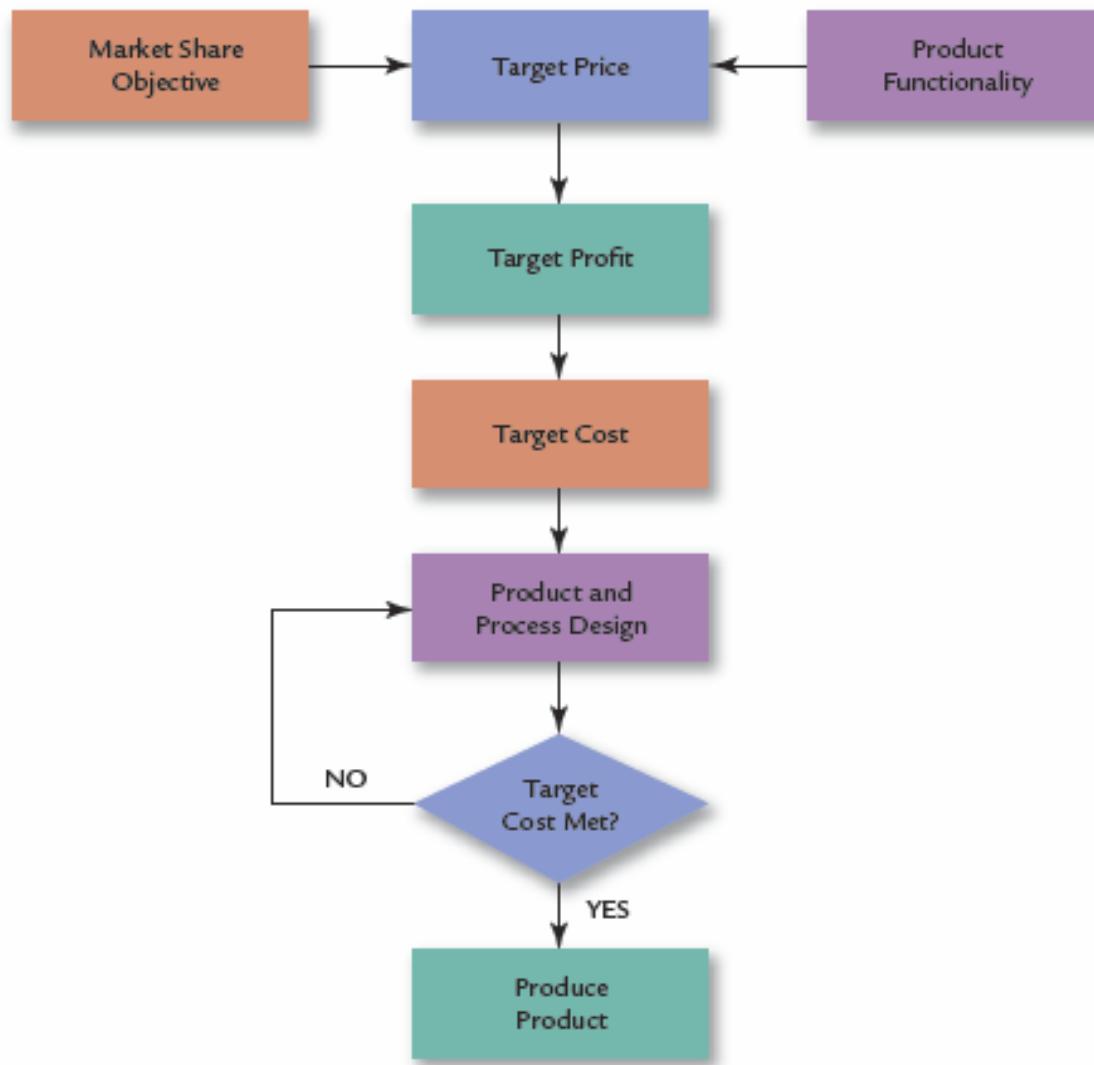
# Life Cycle Cost Management

## Target Costing

- Useful tool for establishing cost reduction goals during the design stage
- Target cost: difference between the sales price needed to capture a predetermined market share and the desired per unit profit
- The sales price must reflect product functionality – if the target cost is less than what is currently achievable, then the company must find cost reductions to move the actual cost toward the target cost
  - Reverse engineering
  - Value analysis
  - Process improvement

# Life Cycle Cost Management

Target-Costing Model



Objective 3

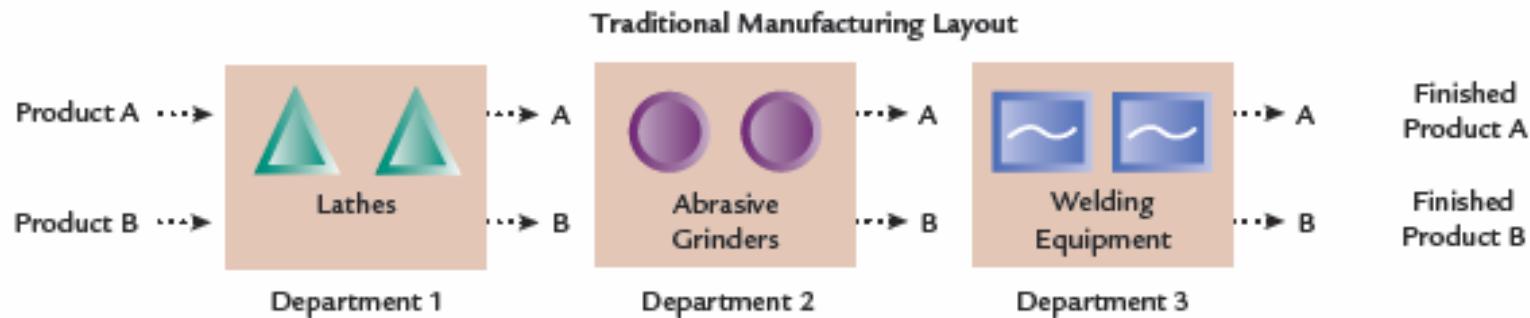
# Just-in-Time (JIT) Manufacturing and Purchasing

- JIT manufacturing is a demand-pull system
- Object is to eliminate waste by producing a product only when it is needed and only in the quantities demanded by the customers
- Demand pulls products through the manufacturing process
- No production takes place until a signal from a succeeding process indicates a need to produce
- Parts and materials arrive just in time to be used in production
- JIT purchasing requires suppliers to deliver parts and materials just in time to be used in production.

# Just-in-Time (JIT) Manufacturing and Purchasing

(EXHIBIT 11.11)

Plant Layout Pattern: Traditional versus JIT



Each product passes through departments that specialize in one process. Departments process multiple products.

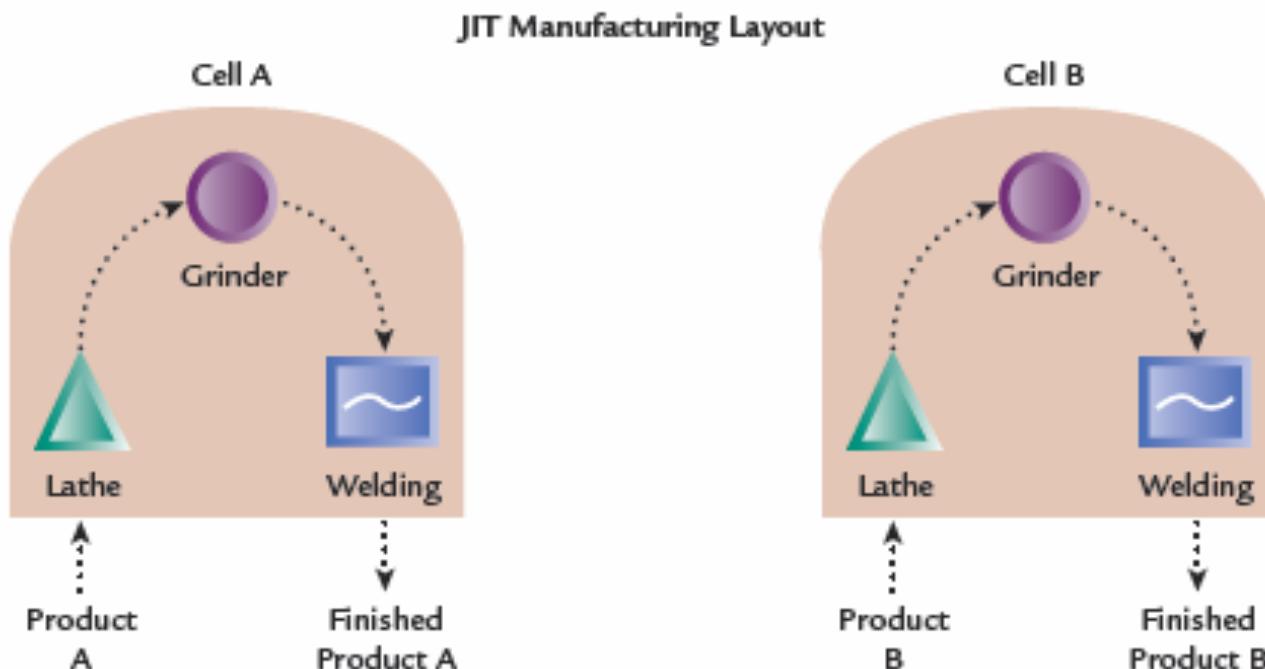
*(continued)*

Objective 4

# Just-in-Time (JIT) Manufacturing and Purchasing

EXHIBIT 11.11

Plant Layout Pattern: Traditional versus JIT



Notice that each product passes through its own cell. All machines necessary to process each product are placed within the cell. © Each cell is dedicated to the production of one product or one subassembly.

# Just-in-Time (JIT) Manufacturing and Purchasing

(EXHIBIT 11.12)

## Comparison of JIT Approaches with Traditional Manufacturing and Purchasing

| JIT                              | Traditional                      |
|----------------------------------|----------------------------------|
| 1. Pull-through system           | 1. Push-through system           |
| 2. Insignificant inventories     | 2. Significant inventories       |
| 3. Small supplier base           | 3. Large supplier base           |
| 4. Long-term supplier contracts  | 4. Short-term supplier contracts |
| 5. Cellular structure            | 5. Departmental structure        |
| 6. Multiskilled labor            | 6. Specialized labor             |
| 7. Decentralized services        | 7. Centralized services          |
| 8. High employee involvement     | 8. Low employee involvement      |
| 9. Facilitating management style | 9. Supervisory management style  |
| 10. Total quality control        | 10. Acceptable quality level     |
| 11. Buyers' market               | 11. Sellers' market              |
| 12. Value-chain focus            | 12. Value-added focus            |

# Chapter 12

# Activity-Based Management

# Chapter 12 Objectives

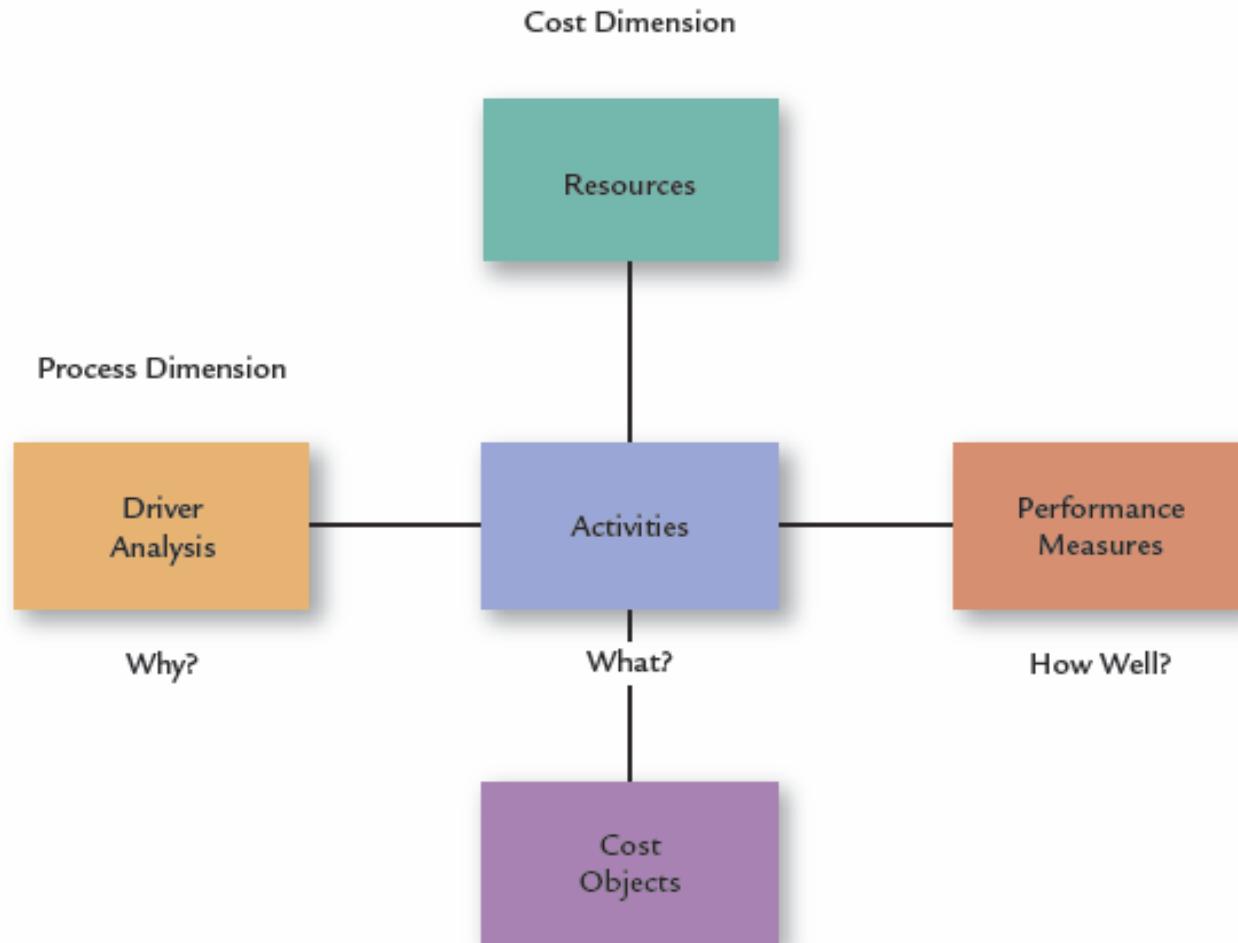
1. Describe how activity-based management and activity-based costing differ.
2. Define process value analysis.
3. Describe activity-based financial performance measurement.
4. Discuss the implementation issues associated with an activity-based management system.
5. Explain how activity-based management is a form of responsibility accounting, and tell how it differs from financial-based responsibility accounting.

# The Relationship of Activity-Based Costing and Activity-Based Management

- **Continuous Improvement** is a process of improving performance by constantly searching for ways to eliminate waste.
- **Activity-based management (ABM)**: a systemwide, integrated approach that focuses management's attention on activities with the objectives of improving customer value and the profit achieved by providing this value
- **Activity-Based costing (ABC)** is the major source of information for activity based management.

# The Relationship of Activity-Based Costing and Activity-Based Management

The Two-Dimensional Activity-Based Management Model



ABC Objective:  
Improve accuracy of cost assignments

Process Value Analysis with Objective: Improve Customer value and Cost reduction

# Process Value Analysis

Driver analysis is the effort expended to identify the factors that are the root causes of activity costs.

Root Causes are identified by asking ‘why’ questions.

Activity Analysis is the process of identifying, describing, and evaluating the activities an organization performs.

Activity analysis should produce four outcomes:

- 1) What activities are performed
- 2) How many people perform the activities
- 3) The time and resources are required to perform the activities
- 4) An assessment of the value of the activities to the organization.

Activities can be Value Added or Non Value Added.

# Process Value Analysis

## **Value Added Activities:**

- Activities necessary to remain in business
- Activities that contribute to customer value and/or help meet an organization's needs

Some activities are discretionary but are also value added:

- The activity produces a change of state
- The change of state was not achievable by preceding activities
- The activity enables other activities to be performed

Value Added costs are the costs to perform value added activities with perfect efficiency.

# Process Value Analysis

## Non-Value Added Activities:

- All activities other than those essential to remain in business
- These activities fail to produce a change in the product's state or those activities that replicate work because it wasn't done correctly the first time

In manufacturing, five major activities are considered wasteful and unnecessary:

1. Scheduling
  - Uses resources to determine access to processes
2. Moving
  - Uses resources to move inventory among departments
3. Waiting
  - Uses resources while waiting for next process
4. Inspecting
  - Uses resources to ensure conformance to standards
5. Storing
  - Uses resources while goods are held in inventory

# Process Value Analysis

**Kaizen Costing:** characterized by constant, incremental improvements to existing processes and products.

**Activity management can reduce costs in four ways:**

1. Activity elimination
  - Focus on eliminating nonvalue-added activities
2. Activity selection
  - Choose among sets of competing strategies
3. Activity reduction
  - Decrease time and resources required by an activity
4. Activity sharing
  - Use economies of scale to increase efficiency

# Financial Measures of Activity Efficiency

- Reveal the current level of efficiency and the potential for increased efficiency
  - Value- and nonvalue-added activity costs
  - Trends in activity costs
  - Kaizen standard setting
  - Benchmarking
  - Activity flexible budgeting
  - Activity capacity management

# Formulas for Value-Added and Non-Value Added Processes

Value-added costs =  $SQ \times SP$

Non-value-added costs =  $(AQ - SQ)SP$

Where

$SQ$  = The value-added output level for an activity

$SP$  = The standard price per unit of activity output measure

$AQ$  = The actual quantity used of flexible resources or the practical activity capacity acquired for committed resources

Note: Identifying non-value added costs reveals the magnitude of waste the company is currently experiencing; and, therefore, the potential for improvement.

# Financial Measures of Activity Efficiency

| <u>Activity</u> | <u>Activity Driver</u> | <u>SQ</u> | <u>AQ</u> | <u>SP</u> |
|-----------------|------------------------|-----------|-----------|-----------|
| Purchasing      | Purchasing hours       | 20,000    | 23,000    | \$20      |
| Molding         | Molding hours          | 30,000    | 34,000    | 12        |
| Inspecting      | Inspection hours       | 0         | 6,000     | 15        |
| Grinding        | Number of units        | 0         | 5,000     | 6         |

Value-added standards  
call for elimination

Note: Grinding is rework,  
in this example

# Financial Measures of Activity

## Efficiency

### Solution:

1.

**Value- and Non-Value-Added Cost Report for the Year Ended 2013**

| Activity   | Value-Added Costs       | Non-Value-Added Costs   | Total Costs               |
|------------|-------------------------|-------------------------|---------------------------|
| Purchasing | \$400,000               | \$ 80,000               | \$ 480,000                |
| Molding    | 360,000                 | 48,000                  | 408,000                   |
| Inspecting | 0                       | 90,000                  | 90,000                    |
| Grinding   | 0                       | 30,000                  | 30,000                    |
| Total      | <u><u>\$760,000</u></u> | <u><u>\$248,000</u></u> | <u><u>\$1,008,000</u></u> |
|            | SQxSP                   | (AQ-SQ)xSP              | AQxSP                     |

# Financial Measures of Activity Efficiency

## Solution:

### 1. Trend Report: Non-Value-Added Costs

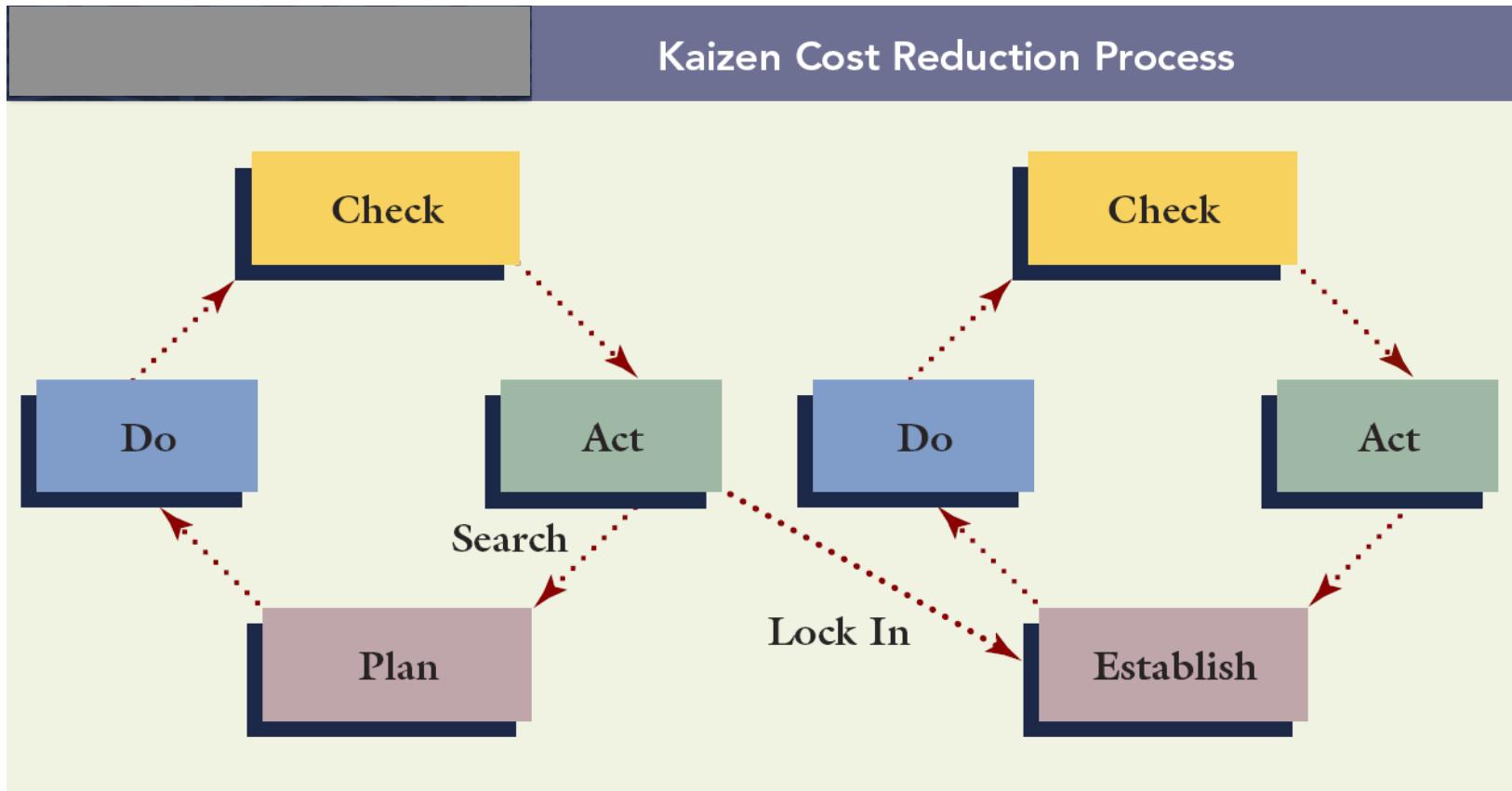
| Activity   | 2013                    | 2014*                   | Change                  |
|------------|-------------------------|-------------------------|-------------------------|
| Purchasing | \$ 80,000               | \$ 40,000               | \$ 40,000               |
| Molding    | 48,000                  | 24,000                  | 24,000                  |
| Inspecting | 90,000                  | 30,000                  | 60,000                  |
| Grinding   | 30,000                  | 15,000                  | 15,000                  |
| Total      | <u><u>\$248,000</u></u> | <u><u>\$109,000</u></u> | <u><u>\$139,000</u></u> |

\* Since the reductions for the purchasing and inspection were in multiples of 2,000, the cost savings is simply  $SP$  multiplied by the reduction in  $AQ$ .

# Financial Measures of Activity Efficiency

- Kaizen costing is concerned with reducing the costs of existing products and processes
  - Controlling this cost reduction process is accomplished through the repetitive use of two major subcycles
    - Kaizen (continuous improvement) cycle
    - Maintenance cycle

# Financial Measures of Activity Efficiency



# Financial Measures of Activity Efficiency

**Benchmarking**: a complimentary approach to kaizen costing and activity-based management

- uses best practices found within and outside the organization as the standard for evaluating and improving activity performance.

## Internal Benchmarking

Benchmarking against internal operations

## External Benchmarking

Benchmarking that involves comparison with others outside the organization

# Financial Measures of Activity Efficiency

**Activity Flexible Budgeting:** the prediction of what activity costs will be as activity output changes

Flexible Budget: Direct Labor Hours

|                  | Cost Formula            |                    | Direct Labor Hours      |                         |
|------------------|-------------------------|--------------------|-------------------------|-------------------------|
|                  | Fixed                   | Variable           | 10,000                  | 20,000                  |
| Direct materials | —                       | \$10               | \$100,000               | \$200,000               |
| Direct labor     | —                       | 8                  | 80,000                  | 160,000                 |
| Maintenance      | \$ 20,000               | 3                  | 50,000                  | 80,000                  |
| Machining        | 15,000                  | 1                  | 25,000                  | 35,000                  |
| Inspections      | 120,000                 | —                  | 120,000                 | 120,000                 |
| Setups           | 50,000                  | —                  | 50,000                  | 50,000                  |
| Purchasing       | 220,000                 | —                  | 220,000                 | 220,000                 |
| Total            | <u><u>\$425,000</u></u> | <u><u>\$22</u></u> | <u><u>\$645,000</u></u> | <u><u>\$865,000</u></u> |

# Financial Measures of Activity Efficiency

## Activity Flexible Budget

| DRIVER: DIRECT LABOR HOURS |                  |                |                   |                  |
|----------------------------|------------------|----------------|-------------------|------------------|
|                            | Formula          |                | Level of Activity |                  |
|                            | Fixed            | Variable       | 10,000            | 20,000           |
| Direct materials           | —                | \$10           | \$100,000         | \$200,000        |
| Direct labor               | —                | 8              | 80,000            | 160,000          |
| Subtotal                   | —                | <u>\$18</u>    | <u>\$180,000</u>  | <u>\$360,000</u> |
| DRIVER: MACHINE HOURS      |                  |                |                   |                  |
|                            | Fixed            | Variable       | 8,000             | 16,000           |
| Maintenance                | \$20,000         | \$5.50         | \$64,000          | \$108,000        |
| Machining                  | 15,000           | 2.00           | 31,000            | 47,000           |
| Subtotal                   | <u>\$35,000</u>  | <u>\$7.50</u>  | <u>\$95,000</u>   | <u>\$155,000</u> |
| DRIVER: NUMBER OF SETUPS   |                  |                |                   |                  |
|                            | Fixed            | Variable       | 25                | 30               |
| Inspections                | \$80,000         | \$2,100        | \$132,500         | \$143,000        |
| Setups                     | —                | 1,800          | 45,000            | 54,000           |
| Subtotal                   | <u>\$80,000</u>  | <u>\$3,900</u> | <u>\$177,500</u>  | <u>\$197,000</u> |
| DRIVER: NUMBER OF ORDERS   |                  |                |                   |                  |
|                            | Fixed            | Variable       | 15,000            | 25,000           |
| Purchasing                 | <u>\$211,000</u> | <u>\$1</u>     | <u>\$226,000</u>  | <u>\$236,000</u> |
| Total                      |                  |                | <u>\$678,500</u>  | <u>\$948,000</u> |

# Financial Measures of Activity Efficiency

## Activity-Based Performance Report\*

|                  | Actual Costs            | Budgeted Costs          | Budget Variance          |
|------------------|-------------------------|-------------------------|--------------------------|
| Direct materials | \$101,000               | \$100,000               | \$ 1,000 U               |
| Direct labor     | 80,000                  | 80,000                  | —                        |
| Maintenance      | 55,000                  | 64,000                  | 9,000 F                  |
| Machining        | 29,000                  | 31,000                  | 2,000 F                  |
| Inspections      | 125,500                 | 132,500                 | 7,000 F                  |
| Setups           | 46,500                  | 45,000                  | 1,500 U                  |
| Purchasing       | 220,000                 | 226,000                 | 6,000 F                  |
| <b>Total</b>     | <b><u>\$657,000</u></b> | <b><u>\$678,500</u></b> | <b><u>\$21,500 F</u></b> |

\* Activity levels of drivers: 10,000 direct labor hours, 8,000 machine hours, 25 setups, and 15,000 orders.

# Implementing Activity-Based Management

- Why ABM Implementations Fail
  - Lack of support of higher-level management
  - Failure to maintain support from higher level management
  - Resistance to change
  - Failure to integrate the new system

# Financial-Based Versus Activity-Based Responsibility Accounting

- Financial-based responsibility accounting system
  - Assigns responsibility to organizational units and expresses performance measures in financial terms.
- Activity-based responsibility accounting system
  - Assigns responsibility to processes and uses both financial and nonfinancial measures of performance

# Financial-Based Versus Activity-Based Responsibility Accounting

EXHIBIT 12.9

## Responsibility Assignments Compared

| Financial-Based Responsibility   | Activity-Based Responsibility  |
|--|--|
| <ol style="list-style-type: none"><li>1. Organizational units</li><li>2. Local operating efficiency</li><li>3. Individual accountability</li><li>4. Financial outcomes</li></ol> | <ol style="list-style-type: none"><li>1. Processes</li><li>2. Systemwide efficiency</li><li>3. Team accountability</li><li>4. Financial outcomes</li></ol> |