

Cost Accounting 2

Dr. Sameh Salim

جامعة مدينة السادات —
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Lecture 5

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6

Allocating the indirect manufacturing costs of the production centers to the production units

- The aim of allocating indirect manufacturing costs, whether they are **joint or private** for production centers and service centers, is to charge the units of **the final product** with their share of the production centers costs that benefited from them.

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Allocating the indirect manufacturing costs of the production centers to the production units

- ❑ **Allocation rates** used to charge the production units with their share of the indirect costs.
- ❑ **Allocation rates** express the unit's share from cost of manufacturing services that the production center performs for the units that pass through it.



6

Allocating the indirect manufacturing costs of the production centers to the production units

□ There are two methods for determining allocation rates are used to determine the share of each production unit from the costs of any production center:

1

Single-Rate
method (Total
Allocation rate
per center)

2

Dual-Rate
method (Variable
& Fixed costs
rates)

6

Allocating the indirect manufacturing costs of the production centers to the production units

1

Single-Rate method (Total Allocation rate per center)

- The total allocation rate** is determined by dividing the total cost of the production center, whether these costs are variable or fixed (after charged with its share from the costs of the various service centers) by the appropriate allocation base.

Example (8)

□ Assuming one of the products passes through three production centers A, B, and C, and the actual production of this product is 20,000 units. If you know the following:

	A	B	C
1) Total indirect manufacturing costs	10000	120000	15000
2) Machine hours	5000		
3) Direct labor hours		3000	
4) Direct material cost			10000

Example (8)

□ The unit of the product required *three hours of machines operating in Center (A), two hours of direct labor in Center (B), and the value of 6 pounds for direct materials in Center (C).*

Required:

Determine the production share of the indirect manufacturing costs.

Solution

1

In order to determine the production share of the indirect manufacturing costs, the allocation rates for each center are first determined

the production share of the indirect manufacturing costs is determined using the allocation rates

1

(A) $= (10000/5000) = 2 \text{ pounds / machine operating hour.}$

(B) $= (12000/3000) = 4 \text{ EGP / direct labor hour.}$

(C) $= (15000/10000) = 1.5 \text{ pounds / pounds of direct materials.}$

Solution

1

In order to determine the production share of the indirect manufacturing costs, the allocation rates for each center are first determined

The production share of indirect manufacturing costs is determined as follows:

2

(A) $= 20000 \times 2 \times 3 = 120,000 \text{ pounds.}$

(B) $= 20,000 \times 4 \times 2 = 160,000 \text{ pounds.}$

(C) $= 20,000 \times 1,5 \times 6 = 180,000 \text{ pounds.}$

2

Dual-Rate Method:

In order to achieve a high degree of accuracy and fairness in Allocating (Charging) the indirect manufacturing costs on production, an independent Allocating (Charging) must be done for each item separately

Each center has two rates for Allocating (Charging) the indirect manufacturing costs, one for the variable items and the other for the other items.

The following steps can be followed in order to determine both the variable allocation rate and the fixed allocation rate:

The indirect costs are aggregated for each center with the separation between the variable and the fixed items.

1

Preparing the indirect manufacturing costs allocation statement with the division of each cost center's column into variable and fixed

2

Both the fixed and variable costs of the service centers are allocated to the benefiting production centers

3

4

Allocation rate is determined for the items of variable and fixed costs for each production center.

A

Dual-Rate method (variable allocation rate of variable indirect manufacturing costs)

Example (9)

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□ Assuming that one of the manufacturing enterprises consists of two production centers (A, B) and two service centers (X, Y), and the total private and general costs (variable and fixed) for those centers are as follows:

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A

Dual-Rate method (variable allocation rate of variable indirect manufacturing costs)

Example (9)

	production centers				service centers				Total	
	A		B		X		Y			
	variable	Fixed	variable	Fixed	variable	Fixed	variable	Fixed		
Special costs	12000	7000	20000	10000	8000	5000	8000	6000	76000	
general costs	<u>13000</u>	<u>6000</u>	<u>16000</u>	<u>7000</u>	<u>10000</u>	<u>4000</u>	<u>7000</u>	<u>4000</u>	<u>67000</u>	
Total costs	25000	13000	36000	17000	18000	9000	15000	10000	143000	

A

Dual-Rate method (variable allocation rate of variable indirect manufacturing costs)

Example (9)

- If we assume that the needs of the production centers (A and B) from the services of the service center (X) are *300 and 600 service units* respectively, and the actual needs of the production centers from the service center (Y) are *150 and 350 service units* respectively.

A

Dual-Rate method (variable allocation rate of variable indirect manufacturing costs)

Example (9)

Required:

- 1. Determine the allocation rate of variable costs in service centers.**
- 2. Allocate the variable costs of service centers to production centers.**



A

Dual-Rate method (variable allocation rate of variable indirect manufacturing costs)

Solution

1- Determining the allocation rate of variable costs in service centers:

A- Service Center (X):

- Variable cost allocation rate = $18000/900 = 20$ EGP / unit.

B - Service Center (Y):

- Variable cost allocation rate = $15000 / 500 = 30$ pounds / unit

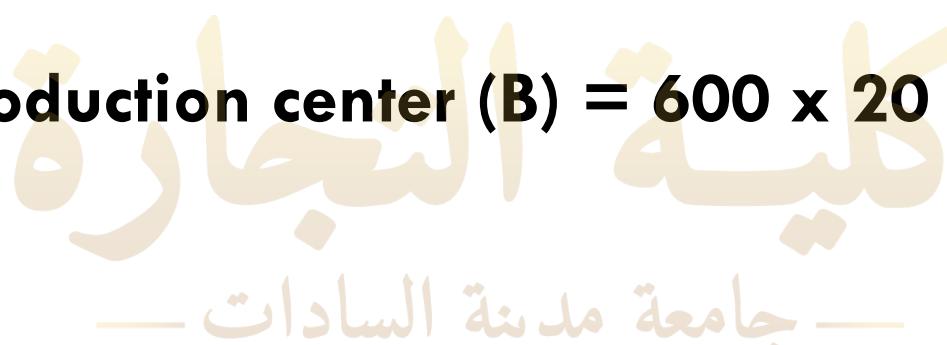
A

Dual-Rate method (variable allocation rate of variable indirect manufacturing costs)

2- allocation of variable costs of service centers to production centers:

A- allocation of the variable costs of the service center (X) to the two production centers (A and B):

- The share of production center (A) = $300 \times 20 = 6,000$ pounds.
- The share of production center (B) = $600 \times 20 = 12,000$ pounds.



A

Dual-Rate method (variable allocation rate of variable indirect manufacturing costs)

2- allocation of variable costs of service centers to production centers:

B- allocation of the variable costs of the service center (Y) to the two production centers (A and B):

- The share of production center (A) = $150 \times 30 = 4500$ pounds.
- The share of production center (B) = $350 \times 30 = 10500$ pounds.

B

Dual-Rate method (Fixed allocation rate of fixed indirect manufacturing costs)

**Fixed
costs**

represent costs associated with the components of the **production capacity** of the enterprise.

**That
means**

costs of capacity and willingness to produce a certain volume of production specified in advance.

B

Dual-Rate method (Fixed allocation rate of fixed indirect manufacturing costs)

The problem here is that often the cost center does not provide the target services and thus the center has unused capacity,

Which expresses the difference between what the service center can provide in terms of services and what it actually provided in terms of services to the beneficiary centers.

Who bears the cost of that unused capacity?

1

The production centers and then the costs of a product

2

Or charged over the period and then the cost of a period is carried to the Income statement

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B

Dual-Rate method (Fixed allocation rate of fixed indirect manufacturing costs)

1

Actual capacity
Method:

Under this method,
the total fixed items
of the service center
are divided among
the total quantity
that the beneficiary
centers actually used

B

Dual-Rate method (Fixed allocation rate of fixed indirect manufacturing costs)

Planned
Maximum
capacity
Method

2

The fixed costs of one service center can be allocated on the basis of those maximum planned needs for beneficiary centers, not on the basis of actual needs, as is the case in the previous method.

Example (10)

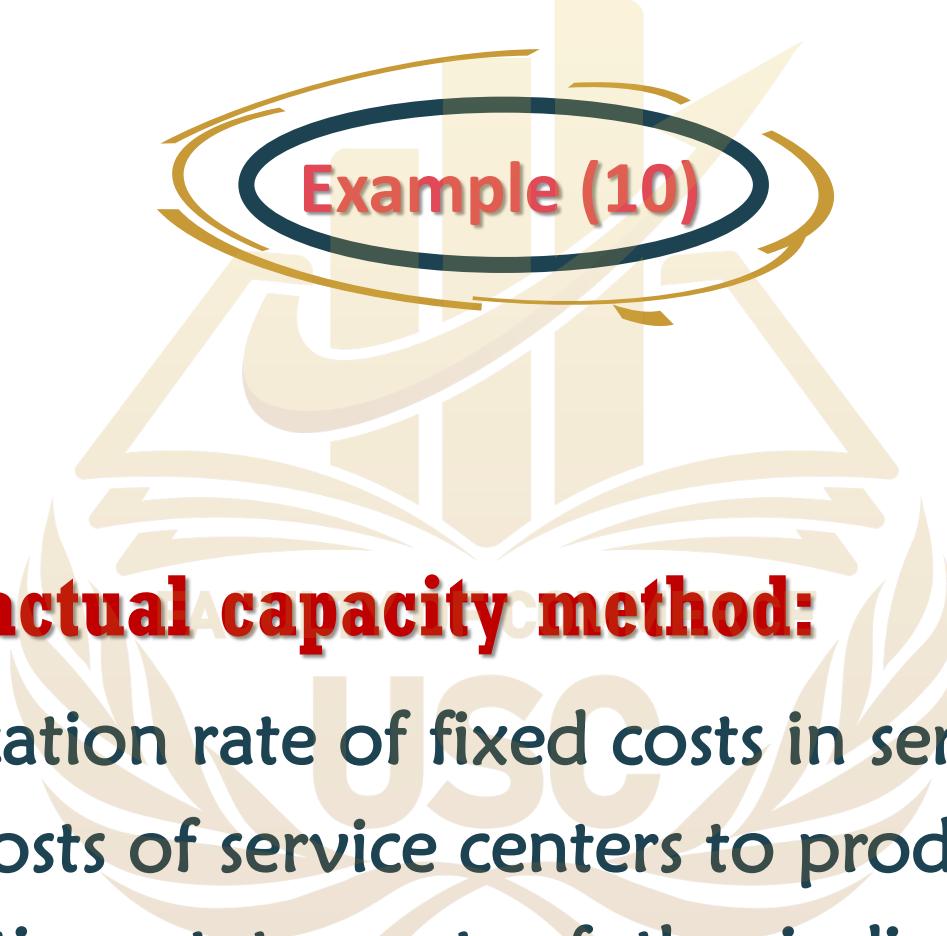
□ Assuming that one of the manufacturing enterprises consists of two production centers (A, B) and two service centers (X, Y), and the total private and general costs (variable and fixed) for those centers are as follows:

Example (10)

	production centers				service centers				Total	
	A		B		X		Y			
	variable	Fixed	variable	Fixed	variable	Fixed	variable	Fixed		
Special costs	12000	7000	20000	10000	8000	5000	8000	6000	76000	
general costs	<u>13000</u>	<u>6000</u>	<u>16000</u>	<u>7000</u>	<u>10000</u>	<u>4000</u>	<u>7000</u>	<u>4000</u>	<u>67000</u>	
Total costs	25000	13000	36000	17000	18000	9000	15000	10000	143000	

Example (10)

- ❑ If we assume that the needs of the production centers (A and B) for the services of the service center (X) are 300 and 600 service units respectively, and the actual needs of the production centers from the service center (Y) are 150 and 350 service units respectively.



Example (10)

Required:

❑ According to the "actual capacity method":

1. Determine the allocation rate of fixed costs in service centers.
2. Allocate the fixed costs of service centers to production centers.
3. Prepare the allocation statement of the indirect variable and fixed manufacturing costs of the service centers to the production centers.



Solution

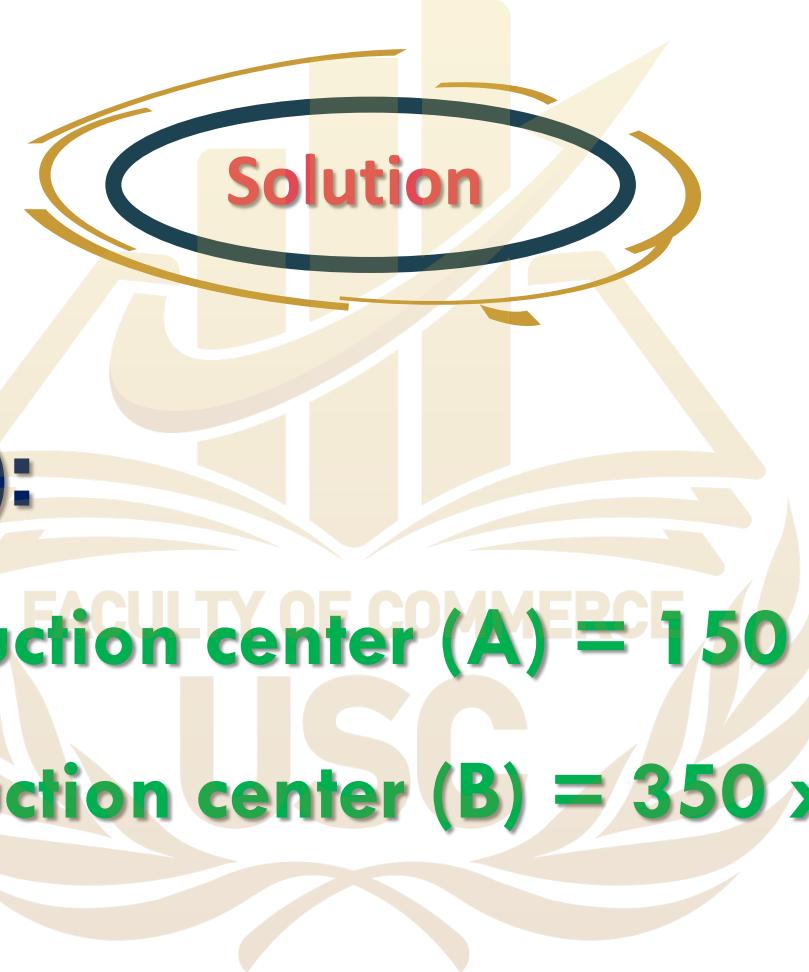
1- Determine the allocation rate for fixed costs:

- A. Service Center X = $9000/900 = \text{EGP } 10 / \text{service unit.}$
- B. Service Center (Y) = $10000/500 = 20 \text{ pounds} / \text{unit of service.}$

2- Determining the share of each production center from fixed costs:

A - Service Center X:

- A. The share of production center (A) = $300 \times 10 = 3000 \text{ pounds.}$
- B. The share of the production center (B) = $600 \times 10 = 6000 \text{ pounds.}$



B - Service Center (Y):

- A. The share of production center (A) = $150 \times 20 = 3000$ pounds.
- B. The share of production center (B) = $350 \times 20 = 7000$ pounds.

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Allocation of indirect manufacturing costs statement:

	production centers				service centers				Total	
	A		B		X		Y			
	variable	Fixed	variable	Fixed	variable	Fixed	variable	Fixed		
Total private costs	12000	7000	20000	10000	8000	5000	8000	60000	76000	
Total general costs	13000	6000	16000	7000	10000	4000	7000	40000	67000	
Total costs of the center	25000	13000	36000	17000	18000	9000	15000	10000	143000	
<i>Cost distribution of service centers:</i>										
<u>Service Center (X)</u>										
Variable costs	6000		12000							
Fixed costs	3000		6000							
<u>Service Center (Y)</u>										
Variable costs	4500		10500							
Fixed costs	3000	-	7000							
Total indirect costs in production centers	41500	13000	71500	17000					143000	

Example (11)

Ezz manufacturing Company consists of two production centers (cutting and assembly), and two service centers (material handling center and power center).

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The following is an analysis of the services performed from the service centers:

	Beneficiary centers			
	Material Handling	Power	Cutting	Assembly
Material Handling Center		20%	50%	30%
Power Center	50%	-	10%	40%

If you know that, the total indirect manufacturing costs in the two services centers (material handling, power) are 10,000 and 4,000 pounds, respectively.

Required:

**Distribute the costs of the two service centers to the two production centers,
by the following methods:**

- 1. The direct allocation method.**
- 2. The step-down allocation method, noting that the power center is the
most important center according to the relative importance, followed
by the material handling center.**
- 3. The reciprocal method.**



Solution

First: Direct allocation Method:

1.Distributing the indirect manufacturing costs of the material handling center to the production centers (based on the given percentages):

- Cutting Center = $10000 \times 50\% / 80\% = 6250$
- Assembly Center = $10000 \times 30\% / 80\% = 3750$

2- Distributing the indirect manufacturing costs of the power center to the production centers (based on the given percentages):

- Cutting center = $4000 \times 10\% / 50\% = 800$
- Assembly center = $4000 \times 40\% / 50\% = 3200$

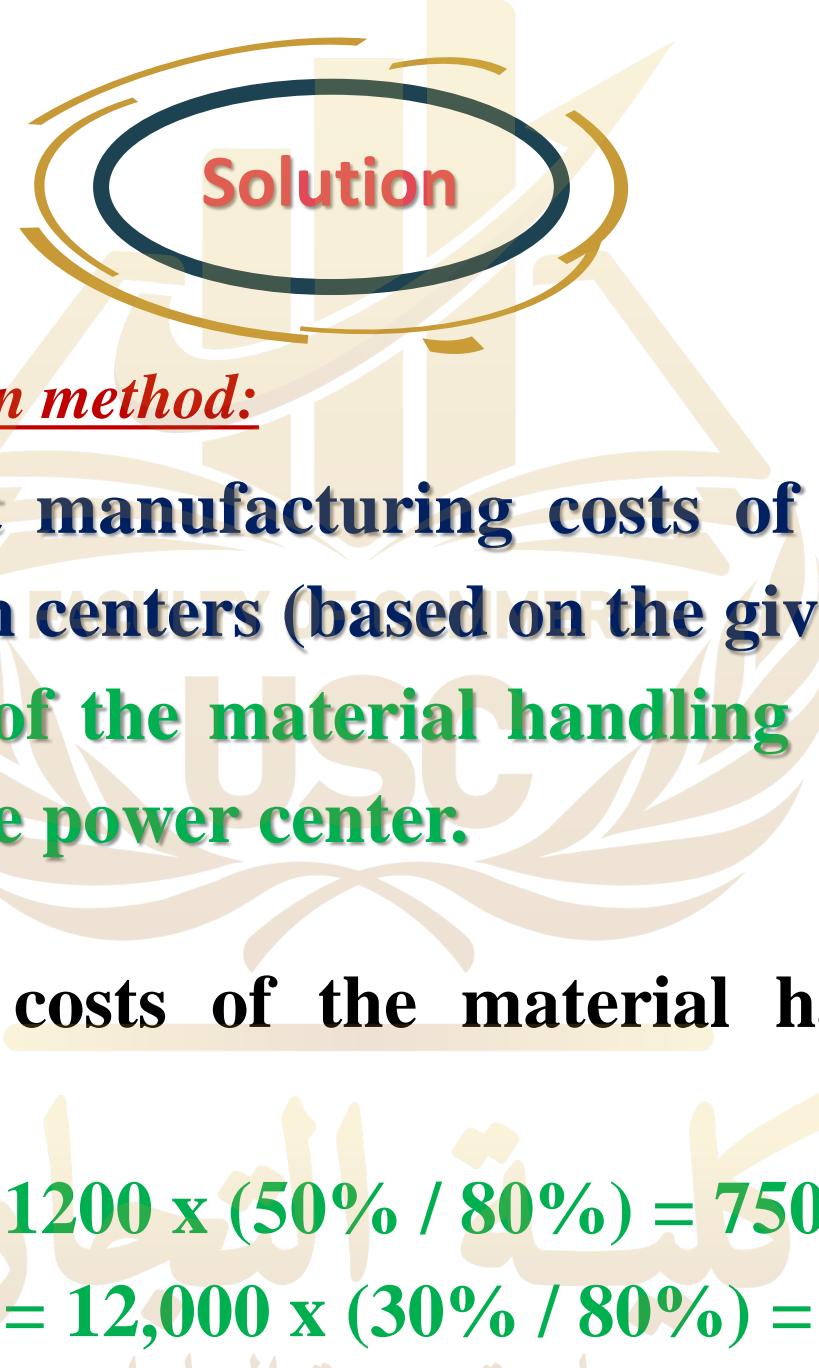


Solution

Second: the step-down distribution method:

1. Allocating the indirect manufacturing costs of the power center to the two production centers and the material handling services center (based on the given percentages):

- Cutting center = $4000 \times (10\% / 100\%) = 400$ pounds
- Assembly center = $4000 \times (40\% / 100\%) = 1600$ pounds
- Material Handling Center = $4000 \times (50\% / 100\%) = 2000$

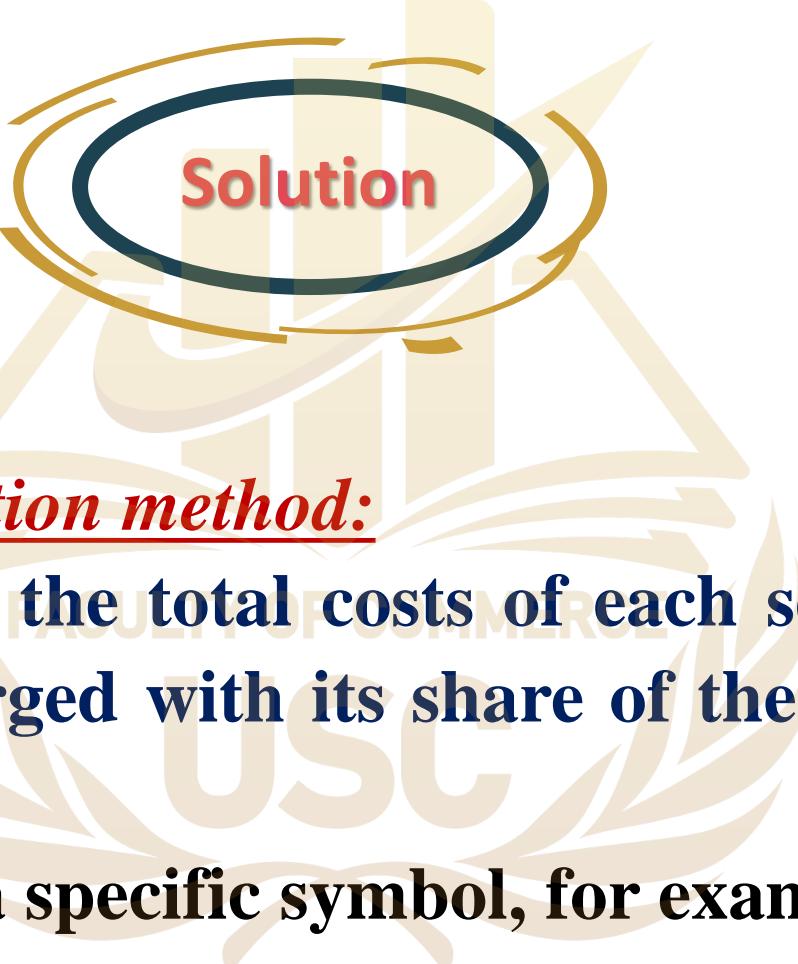


Solution

Second: the step-down allocation method:

2- Allocating the indirect manufacturing costs of the material handling center to the production centers (based on the given percentages):

- **Calculating the cost of the material handling center after adding its share of the cost of the power center.**
 $= 10,000 + 2,000 = 12,000$
- **Allocating the total costs of the material handling center to the production centers:**
 - **Cutting Center** = $1200 \times (50\% / 80\%) = 7500$
 - **Assembly Center** = $12,000 \times (30\% / 80\%) = 4,500$



Solution

Third: the reciprocal allocation method:

According to this method, the total costs of each service center are first calculated after being charged with its share of the costs of other service centers, as follows:

1. Each service center has a specific symbol, for example:

We denote the material handling center by the symbol (X), and the center of the power by the symbol (Y).

Solution

2- Setting an equation to determine the total cost of each center, as follows:

$$X = 10,000 + 50\% Y$$

$$Y = 4000 + 20\% X$$

Substituting in one of the two equations for the value of X or Y, we get:

$$X = 10,000 + 50\% (4,000 + 20\% X)$$

$$X = 10,000 + 2,000 + 0.1 X$$

$$X - 0.1 X = 12,000$$

$$0.9 X = 12,000$$

$$X = 12,000 / 0.9 = 13,333$$

Solution

Therefore, by substituting in the equation for y for the value of X, then:

$$Y = 4000 + 20\% X$$

$$Y = 4000 + 20\% (1333)$$

$$Y = 4000 + 2667$$

$$Y = 6667$$

Thus, it is clear that the total costs of the material handling center are 1333, and the cost of the power center is 6667. This is after charging each center with its share of the cost of the other center, and therefore the cost of each service center must now be distributed among the production centers according to the given percentages.

Solution

3- Distributing the cost of material handling service center:

- Cutting Center = $13333 \times (50\% / 100\%) = 6666$
- Assembly Center = $13333 \times (30\% / 100\%) = 4000$
- Power Center = $13333 \times (20\% / 100\%) = 2667$

4- Distributing the cost of the power center:

- Cutting Center = $2667 \times (10\% / 100\%) = 266.7$
- Assembly center = $2667 \times (40\% / 100\%) = 1066.8$
- Power Center = $2667 \times (50\% / 100\%) = 1333.5$



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The End
Thank You

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