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Methods = Direct, step, Phys Quant, NRV,

Ch. 11: Service Dept. and Joint Cost Allocation

1. Harry Dorffman owns and operates Harry's Abstracting Service. Harry's two revenue generating operations (Abstracting Services and Closing Services) are supported by two service departments: Clerical and Custodial. Costs in the service departments are allocated in the following order using the designated allocation bases.
Clerical: number of transactions processed (Total 75)
Custodial: square footage of space occupied
Average and expected activity levels for next month are as follows:

	Number of Transactions		Square Footage		Expected Costs
Abstract services	50	75 trans	1,800	4000 sq ft.	
Closing services	25		2,200		
Clerical			~~1,600~~		$40,000
Custodial	~~5~~				10,000

Required:
Use the direct method to allocate the service department costs to the revenue generating departments. Provide the total costs for the revenue departments.

service depts | revenue operations

	Clerical	Custodial	Abstracting	Closing
Direct Method =	$40,000	$10,000		
(1) Clerical	($40,000)		$26,667	$13,333
50/75 ; 25/75 transactions				
(2) custodial		($10,000)	$4500	$5500
1800/4000 ; 2200/4000 sq. ft.				
Total Cost.			$31,167	$18,833

1. Harry Dorffman owns and operates Harry's Abstracting Service. Harry's two revenue generating operations (Abstracting Services and Closing Services) are supported by two service departments: Clerical and Custodial. Costs in the service departments are allocated in the following order using the designated allocation bases.
Clerical: number of transactions processed
Custodial: square footage of space occupied
Average and expected activity levels for next month are as follows:

	Number of Transactions	Square Footage	Expected Costs
Abstract services	50	1,800	
Closing services	25	2,200	
Clerical		1,600	$40,000
Custodial	5		10,000

Required:
Use the direct method to allocate the service department costs to the revenue generating departments. Provide the total costs for the revenue departments.

Abstract: $31,167; Close: $18,833

		Clerical	Cust	Abstract	Close
Dept	Allocation	$40,000	$10,000		
Cleric to Abstr	50/75	-26,667		26,667	
Cleric to Close	25/75	-13,333			13,333
Cust to Abstr	1,800/4,000		- 4,500	4,500	
Cust to Close	2,200/4,000		-5,500		5,500
		0	0	$31,167	$18,833

Feedback:

AACSB: Analytic
AICPA: FN-Measurement
Bloom's: Application
Difficulty: Medium
Learning Objective: 2
Topic Area: Direct Method

2. Harry Dorffman owns and operates Harry's Abstracting Service. Harry's two revenue generating operations Abstracting Services and Closing Services are supported by two service departments: Clerical and Custodial. Costs in the service departments are allocated in the following order using the designated allocation bases.

Clerical: number of transactions processed

Custodial: square footage of space occupied

Average and expected activity levels for next month are as follows:

	Number of Transactions	Square Footage	Expected Costs
Abstract services	50	1,800	
Closing services	25	2,200	
Clerical		1,600	$40,000
Custodial	5		10,000

80 75 4000 5600

Required:

a. Use the step method to allocate the service department costs to the revenue generating departments. Assume Clerical costs are allocated before Custodial costs and round all calculations to the nearest whole dollar. Provide the total costs for the revenue departments.

b. Use the step method to allocate the service department costs to the revenue generating departments but now assume Custodial costs are allocated before Clerical costs. Provide the total costs for the revenue departments.

	Clerical	Custodial	Abstracting	Closing
Step Method =	40,000	10,000		
(1) clerical 5/80 ; 50/80 ; 25/80	(40,000)	2,500	25,000	12,500
step		12,500	5,625	6,875
(2) custodial 1800/4000 ; 2200/4000	0	0		
		Total Costs	$30,625	$19,375

	Custodial 10,000	Clerical 40,000	Abstracting	Closing
(1) Custodial 1,600/5600 ; 1,800/5,600 ; 2,200/5,600	(10,000)	2,857	3,214	3,929
step		42,857		
(2) clerical 50/75 ; 25/75		(42,857)	28,571	14,286
	0	0	$31,785	$18,215
			Total Costs	

2. Harry Dorffman owns and operates Harry's Abstracting Service. Harry's two revenue generating operations Abstracting Services and Closing Services are supported by two service departments: Clerical and Custodial. Costs in the service departments are allocated in the following order using the designated allocation bases.
Clerical: number of transactions processed
Custodial: square footage of space occupied
Average and expected activity levels for next month are as follows:

	Number of Transactions		Square Footage	Expected Costs
Abstract services	50	80	1,800	
Closing services	25		2,200	
Clerical			1,600	$40,000
Custodial	5			10,000

Required:
a. Use the step method to allocate the service department costs to the revenue generating departments. Assume Clerical costs are allocated before Custodial costs and round all calculations to the nearest whole dollar. Provide the total costs for the revenue departments.
b. Use the step method to allocate the service department costs to the revenue generating departments but now assume Custodial costs are allocated before Clerical costs. Provide the total costs for the revenue departments.

a. Abstract: $30,625; Close: $19,375
b. Abstract: $31,785; Close: $18,215

Feedback: AACSB: Analytic;AICPA: FN-Measurement;Bloom's: Application;Difficulty: Medium;Learning Objective: 3;Topic Area: Step Method

a.

Dept	Allocation	Clerical $40,000	Cust $10,000	Abstract	Close
Cleric to Cust	5/80	-2,500	2,500		
Cleric to Abstr	50/80	-25,000		25,000	
Cleric to Close	25/80	-12,500			12,500
Cust to Abstr	1,800/4,000		-5,625	5,625	
Cust to Close	2,200/4,000		-6,875		6,875
		0	0	$30,625	$19,375

b.

Dept	Allocation	Clerical $40,000	Cust $10,000	Abstract	Close
Cust to Cleric	1,600/5,600	2,857	-2,857		
Cust to Abstr	1,800/5,600		-3,214	3,214	
Cust to Close	2,200/5,600		-3,929		3,929
Cleric to Abstr	50/75	-28,571		28,571	
Cleric to Close	25/75	-14,286			14,286
		0	0	$31,785	$18,215

3. Harry Dorffman owns and operates Harry's Abstracting Service. Harry's two revenue generating operations (Abstracting Services and Closing Services) are supported by two service departments: Clerical and Custodial. Costs in the service departments are allocated in the following order using the designated allocation bases.

Clerical: number of transactions processed

Custodial: square footage of space occupied

$\Rightarrow \$40{,}000 + \left(\frac{1600}{5600} \times \text{Custodial}\right) = \text{Clerical}$

$\Rightarrow \$10{,}000 + \left(\frac{5}{80} \times \text{Clerical}\right) = \text{Custodial}$

Average and expected activity levels for next month are as follows:

	Number of Transactions		Square Footage		Expected Costs	
Abstract services	50	80	1,800	5600		
Closing services	25		2,200			
Clerical			1,600		$40,000	50,000
Custodial	5				10,000	

Required:

Use the reciprocal method to allocate the service department costs to the revenue generating departments. Provide the total costs for the revenue departments.

Clerical Custodial Abstracting Closing

Reciprocal Method:

40,000 10,000

Clerical:

$\frac{5}{80} \times 43{,}636.36 \Rightarrow (2727) \Rightarrow 2{,}727$

$\frac{50}{80} \times 43{,}636.36 \Rightarrow (27{,}273) \Rightarrow 27{,}273$

$\frac{25}{80} \times 43{,}636.36 \Rightarrow (13{,}636) \Rightarrow 13{,}636$

3,636 → (3636)

Custodial:

$\frac{1600}{5600} \times 12{,}727.27 \Rightarrow 3{,}636$

$\frac{1800}{5600} \times 12{,}727.27 \Rightarrow (4091)$ 4091

$\frac{2200}{5600} \times 12{,}727.27 \Rightarrow (5000)$ 5000

0 0 $31,364 $18,636 50,000

Clerical =

$$1C = 40{,}000 + \left(\frac{1600}{5600} \times \left[10{,}000 + \frac{5}{80}C\right]\right)$$

Total Service Cost + Cost allocated to the service dept.

$1C = 40{,}000 + 2{,}857.142 + 0.0178571C$

$.9821429C = 42{,}857.142$

Clerical = 43,636.36 ⟹ $10{,}000 + \left(\frac{5}{80} \times 43{,}636.36\right) = \text{Custodial}$

$12,727.272 = Custodial

3. Harry Dorffman owns and operates Harry's Abstracting Service. Harry's two revenue generating operations (Abstracting Services and Closing Services) are supported by two service departments: Clerical and Custodial. Costs in the service departments are allocated in the following order using the designated allocation bases.
Clerical: number of transactions processed
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Average and expected activity levels for next month are as follows:

	Number of Transactions	Square Footage	Expected Costs
Abstract services	50	1,800	
Closing services	25	2,200	
Clerical		1,600	$40,000
Custodial	5		10,000

Required:
Use the reciprocal method to allocate the service department costs to the revenue generating departments. Provide the total costs for the revenue departments.

Abstract: $31,364; Close: $18,636

Feedback: Clerical = $40,000 + (1,600/5,600 × Custodial) = 43,636.36
Custodial = $10,000 + (5/80 × Clerical)
Clerical = $43,636.36; Custodial = $12,727.27

a.

Dept	Allocation	Clerical $40,000	Cust $10,000	Abstract	Close
Cleric to Cust	5/80	-2,727	2,727		
Cleric to Abstr	50/80	-27,273		27,273	
Cleric to Close	25/80	-13,636			13,636
Cust to Cleric	1,600/5,600	3,636	-3,636		
Cust to Abstr	1,800/5,600		-4,091	4,091	
Cust to Close	2,200/5,600		-5,000		5,000
		0	0	$31,364	$18,636

AACSB: Analytic;AICPA: FN-Measurement;Bloom's: Application;Difficulty: Hard;Learning Objective: 4;Topic Area: Reciprocal Method

4. Albertville Corp has three operating departments (Fabricating, Assembly, and Finishing) and two service departments (Custodial and Administrative). The following information has been provided:

service operating

	Custodial	Admin	Fabricating	Assembly	Finishing	Total
Dept Costs	$250,000	$400,000	--	--	--	
# employees	10	--	80	100	60	250
Sq ft	--	15,000	30,000	35,000	20,000	100,000

Allocations are based on the following:

Custodial:	Square feet
Administrative:	Number of employees

Required:

Albertville has been approached by ServiceMaster to outsource the custodial service. *Assuming all costs are variable*, what is the relevant cost of the custodial department to compare with the ServiceMaster bid?

$$\text{Custodial} = \#250{,}000 + \left(\frac{10}{250} \times \text{Admin}\right)$$

$$\text{Admin} = \#400{,}000 + \left(\frac{15{,}000}{100{,}000} \times \text{Cust}\right)$$

$$\text{Cust} = 250{,}000 + \frac{10}{250} \times \left[400{,}000 + \left(\frac{15{,}000}{100{,}000} \times \text{Cust}\right)\right]$$

$$1\,\text{Cust} = 250{,}000 + 16{,}000 + 0.006\,\text{Cust}$$

$$-0.006\,\text{Cust} \qquad -0.006\,\text{Cust}$$

$$0.9994\,\text{Cust} = 266{,}000$$

$$\text{Cust} = \$266{,}159.69 \Longrightarrow$$

$$\text{Admin} = 400{,}000 + \left(\frac{15{,}000}{100{,}000} \times 266{,}\right)$$

$$\text{Admin} = \$439{,}923.95$$

4. Albertville Corp has three operating departments (Fabricating, Assembly, and Finishing) and two service departments (Custodial and Administrative). The following information has been provided:

	Custodial	Admin	Fabricating	Assembly	Finishing
Dept Costs	$250,000	$400,000	--	--	--
# employees	10	--	80	100	60
Sq ft	--	15,000	30,000	35,000	20,000

Allocations are based on the following:

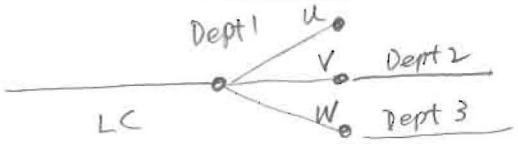
Custodial:	Square feet
Administrative:	Number of employees

Required:
Albertville has been approached by ServiceMaster to outsource the custodial service. *Assuming all costs are variable*, what is the relevant cost of the custodial department to compare with the ServiceMaster bid?

$267,606

Feedback: Custodial = $250,000 + (10/(10 + 80 + 100 + 60) × Admin)
Admin = $400,000 + (15,000/(15,000 + 30,000 + 35,000 + 20,000) × Custodial)
Custodial = $267,606

AACSB: Analytic;AICPA: FN-Decision Making;Bloom's: Analysis;Difficulty: Medium;Learning Objective: 5;Topic Area: The Reciprocal Method and Decision Making



5. Daz Manufacturing Company buys Liquid Charcoal for $.80 a gallon. At the end of processing in department 1, the liquid charcoal splits off into Products U, V, and W. Product U is sold at the split-off point, with no further processing. Products V and W require further processing before they can be sold; Product V is processed in Department 2, and Product W is processed in Department 3. Following is a summary of costs and other related data for the most recent accounting period:

	Department 1	Department 2	Department 3
Cost of liquid charcoal	$104,000		
Direct labor	16,000	45,000	65,000
Manufacturing overhead	10,000	27,000	49,000
	$130,000	72,000	114,000

	Products U	V	W	Total
Gallons sold	20,000	30,000	50,000	130,000
Gallons on hand end of period	15,000	0	15,000	
Sales in dollars	$30,000	$96,000	$142,000	
Price / gallon sold	$1.50	$3.20	$2.84	

Physical Quantities · 35,000 · 30,000 · 65,000 · physical Quant. (gallons).

There were no beginning inventories and there was no liquid charcoal on hand at the end of the period. All gallons on hand in ending inventory were complete as to processing. Daz uses the estimated net realizable value method of allocating joint costs.

Required:

a. Determine the product cost for U, V and W, assuming the physical quantity method is used to allocate joint costs.

b. Determine the product cost for U, V and W, assuming the net realizable value method is used to allocate joint costs.

Physical Quantities — of the $130,000 common to all in Dept. 1.

Dept 1

(a) U: $\frac{35,000}{130,000} \times \$130,000 = \$35,000$

V: $\frac{30,000}{130,000} \times \$130,000 = \$30,000$

W: $\frac{65,000}{130,000} \times \$130,000 = \$65,000$

$\$130,000$

(b) NRV ⇒

U: 35,000 gal × $1.50 = $52,500
V: 30,000 gal × $3.20 = $96,000
W: 65,000 gal × $2.84 = $184,600
} $333,100

U: 52,500/333,100 × $130,000 = $20,489
V: 96,000/333,100 × $130,000 = $37,466
W: 184,600/333,100 × $130,000 = $72,045
} $130,000

5. Daz Manufacturing Company buys Liquid Charcoal for $.80 a gallon. At the end of processing in department 1, the liquid charcoal splits off into Products U, V, and W. Product U is sold at the split-off point, with no further processing. Products V and W require further processing before they can be sold; Product V is processed in Department 2, and Product W is processed in Department 3. Following is a summary of costs and other related data for the most recent accounting period:

	Department		
	1	2	3
Cost of liquid charcoal	$104,000		
Direct labor	16,000	45,000	65,000
Manufacturing overhead	10,000	27,000	49,000

	Products		
	U	V	W
Gallons sold	20,000	30,000	50,000
Gallons on hand end of period	15,000	0	15,000
Sales in dollars	$30,000	$96,000	$142,000

There were no beginning inventories and there was no liquid charcoal on hand at the end of the period. All gallons on hand in ending inventory were complete as to processing. Daz uses the estimated net realizable value method of allocating joint costs.
Required:
a. Determine the product cost for U, V and W, assuming the physical quantity method is used to allocate joint costs.
b. Determine the product cost for U, V and W, assuming the net realizable value method is used to allocate joint costs.

35,000 30,000
a. U: ~~$30~~,000; V: ~~$35~~,000; W: $65,000
b. U: $30,000; V: $35,000; W: $65,000

Feedback: Joint Cost = $104,000 + 16,000 + 10,000 = $130,000
a. U: [(20,000 + 15,000)/(20,000 + 15,000 + 30,000 + 50,000 + 15,000)] × $130,000 = $35,000
V: [30,000/(20,000 + 15,000 + 30,000 + 50,000 + 15,000)] × $130,000 = $30,000
W: [(50,000 + 15,000)/(20,000 + 15,000 + 30,000 + 50,000 + 15,000)] × $130,000 = $65,000
b. Selling Prices: U:$30,000/20,000 = $1.50; V: $96,000/30,000 = $3.20; W: $142,000/50,000 = $2.84;
Net realizable values: U: (20,000 + 15,000) × $1.50 = $52,500; V: $96,000; W: (50,000 + 15,000) × $2.84 = $184,600; Total NRV = $333,100
U: (52,500/333,100) × $130,000 = $20,489
V: (96,000/333,100) × $130,000 = $37,466
W: (184,600/333,100) × $130,000 = $72,045

AACSB: Analytic;AICPA: FN-Measurement;Bloom's: Analysis;Difficulty: Medium;Learning Objective: 7;Learning Objective: 8
Topic Area: Joint Cost Allocation Methods