

B292 – Calculation Exercises – FINAL – (Part3)

Question

Alfa company makes four products which involve ordering materials, setting up machinery and handling production runs. The indirect costs of these activities are as follows.

	\$
Ordering	20,000
Set-up	40,000
Handling	54,000
<u>Total</u>	<u>114,000</u>

Other information relating to the products is as follows:

Products	Number of units	Number of orders	Set-ups	Handling hours
X1	2,000	10	200	60
Y2	800	40	300	60
Z3	3,200	50	600	120
W4	4,000	100	500	120

Required:

1. Prepare a schedule of each activity costs per unit and calculate the indirect cost to be allocated to each of the four products.
2. Define Activity based management (ABM). Explain how ABM might be implemented in an organization and give examples?

Suggested Answers

1-

Products	Number of units	Number of orders	Set-ups	Handling hours
X1	2,000	10	200	60
Y2	800	40	300	60
Z3	3,200	50	600	120
W4	4,000	100	500	120
<u>Total</u>	<u>10,000</u>	<u>200</u>	<u>1,600</u>	<u>360</u>

The cost of each activity will be as follows:

Ordering: $\$20,000 \div 200 = \100 per purchase order

Set-up: $\$40,000 \div 1,600 = \25 per set-up

Handling: $\$54,000 \div 360 = \150 per handling hour

	X1 (\$)	Y2 (\$)	Z3 (\$)	W4 (\$)	Total (\$)
Ordering	1,000	4,000	5,000	10,000	20,000
Set-up	5,000	7,500	15,000	12,500	40,000
Handling	9,000	9,000	18,000	18,000	54,000
<u>Total</u>	<u>15,000</u>	<u>20,500</u>	<u>38,000</u>	<u>40,500</u>	<u>114,000</u>
Number of units	2,000	800	3,200	4,000	
<u>Cost per unit</u>	<u>7.5</u>	<u>25.625</u>	<u>11.875</u>	<u>10.125</u>	

The activity components costs per unit are as follows:

	X1 (\$)	Y2 (\$)	Z3 (\$)	W4 (\$)
Ordering	0.5	5	1.5625	2.5
Set-up	2.5	9.375	4.6875	3.125
Handling	4.5	11.25	5.625	4.5
<u>Total</u>	<u>7.5</u>	<u>25.625</u>	<u>11.875</u>	<u>10.125</u>

2-

Activity based management (ABM) describes the management and control of organizational performance using activity based costing information. The aim is to control causes of costs directly. Managing cost drivers will manage costs in the long term. ABM extends ABC by analyzing the management of activities, instead of simply analyzing the costs of activities.

ABM represents the set of actions that management can take to increase profitability, using activity based costing information. The actions can include:

- Making operational improvements to high cost processes,
- Modifying product mix or prices,
- Restructuring customer relationships.

Question

Orange Company manufactures chairs. The following unitary **standards** have been set by the production- engineering staff and the controller:

Direct Material:	Direct Labor:
Quantity, 2 SQM	Quantity, 0.3 hour
Price, \$5 per SQM	Price, \$10 per hour

Actual costs incurred in the production of 10,000 chairs were as follows:

Direct Material:	\$89,300 for 19,000 SQM
Direct Labor:	\$48,000 for 4,000 hours

Required:

1. Using the variance formulas to compute the direct-material and labor variances. Indicate whether each variance is favorable or unfavorable.
2. Discuss why, giving examples, these variances may have occurred.

Suggested Answers

Materials Variances:

Materials price variance = actual usage (standard price per SQM - actual price per SQM)

$$= 19,000 \text{ SQM } (\$5 - \$4.7^*) / \text{SQM}$$

$$= \$5,700 \text{ (F).}$$

$$* \text{ Actual price per kg} = \$4.7 = \$89,300 \div 19,000 \text{ SQM}$$

This has arisen because the actual price is less than the standard price and is therefore a favorable variance.

There are many possible reasons. Among the most likely are:

- The price of the materials fell
- Errors in estimating the price of materials when the budgets were set

- A reduced price was charged by the supplier because the amount purchased increased
- A different supplier was found who charged a lower price for the same or better quality of material
- The supplier charged a lower price for a poorer quality of material
- A different supplier was found who charged a lower price for a poorer quality of material.

Materials usage/quantity variance = standard price per kg (Standard quantity of actual output - actual quantity)

= \$5 (20,000* SQM – 19,000 SQM)

= \$ 5,000 (F).

* Standard quantity of actual output = 20,000 SQM = 10,000 chairs × 2 SQM per chair

This has arisen because the actual quantity is more than the standard quantity and is therefore an adverse variance.

The variances show that the material was bought for less than the standard price and that less material was used in manufacturing than was allowed for in the standard.

There are many possible reasons. Among the most likely are:

- A change in manufacturing process resulted in higher material wastage than expected.
- Poorer quality workers caused a higher than expected level of wastage of materials during production.
- Higher than expected pilferage of raw material stocks.
- Errors in calculating the usage rate when the budgets were set.
- Poorer quality materials than anticipated from the supplier.
- Poorer quality materials as a result of buying cheaper materials than anticipated.

Labor Variances:

Labor rate variance= actual number of hours worked (standard rate per hour - actual rate per hour)

= 4,000 hours (\$10 – \$12*)/hours

= \$ (8,000) (A).

* Actual rate per hour = \$12 = \$48,000 ÷ 4,000 hours

This has arisen because the actual rate is more than the standard rate and is therefore an adverse variance.

There are many possible reasons. Among the most likely are:

- The hourly wage rate rose unexpectedly
- Increased production levels resulted in overtime rates having to be paid
- Premium rates had to be paid to new workers.

Labor efficiency variance = standard rate per hour (Standard hours for actual output- actual number of hours worked)

= \$10 (3,000* hours – 4,000 hours)/hours

= \$(10,000) (A).

* Standard hours for actual output = 3,000 hours = 10,000 chairs × 0.3 hours

This has arisen because the actual productivity exceeds the standard and is therefore a favorable variance.

There are many possible reasons. Among the most likely are:

- A change in manufacturing process resulted in fewer labor hours being needed than anticipated.
- Higher quality material resulted in lower wastage levels and so resulted in fewer labor hours being required than anticipated.
- The workers worked faster than anticipated.

Question

Rami the owner of a toy shop, is preparing a sales budget for the next three months. After consulting with friends in the same business, he estimated June revenues to be \$20,000. He expects revenues to increase by \$2,000 per month in July and August. Rami also expects that 70% of sales to be cash and 30% of sales to be on credit. Sales on credit are expected to be collected as follows: 40% in the month of sale and 60% in the month following the month of sale.

Required:

What is the expected total cash collection for August?

The expected total cash collections for August:

		<i>August</i>
Sales		\$24,000**
July Sales collection	Cash sales	
	Credit sales = 30% x \$22,000 = \$6,600	60% x \$6,600 = \$3,960
August Sales collection	Cash sales = 70% x \$24,000	= \$16,800
	Credit sales = 30% x \$24,000 = \$7,200	40% x \$7,200 = \$2,880
Total cash Collection		<u>\$23,640</u>

**\$24,000 = \$20,000 + \$2,000 + 2,000

c- Company X uses 60,000 of component A. The company estimates the cost of placing an order at \$30 per order. Its annual holding cost is 15% of the purchase price of \$6 per unit.

Required:

1. Calculate the EOQ

$$EOQ = \sqrt{2DC/H}$$

D = annual demand = 60,000 components A per year

C = cost of placing order = \$30

H = cost of holding inventory = 15% x \$6 = \$0.9

EOQ = $\text{SQRT} ((2 \times 60000 \times 30) / (0.15 \times 6)) = \underline{2,000 \text{ units}}$

2. Calculate the ordering cost and the holding cost in case the company decided to use the EOQ.

Ordering cost

No of order at the EOQ: $60,000 / 2,000 = 30 \text{ orders}$

Ordering cost = $30 \times 30 = \$ 900$

Holding cost

$2,000 / 2 \times .90 = \$ 900$

(Holding cost/unit = $15\% \times 6 = \$.90$)

Question

Prestige Bears Ltd carries a wide assortment of luxury teddy bears for its customers. One item, KPS is very popular. In order to keep its stock under control, a decision is taken by management to order only the optimum economic quantity, for this item, each time. You have the following information.

Annual demand (units)	72,000
Purchase price per unit	\$ 200
Carrying/Holding costs per unit	\$ 6
Cost per order	\$ 375

Required:

1. Determine the EOQ using the equation method. Compute the ordering, holding and their total costs.
2. Develop the following table by using the Tabular method.
- 3.

4. Plot your answer to (1) on a graph displaying the order size and total costs.

No. of orders	1	10	20	30	90	120
Order size						
Average stock						
Carrying (Holding) costs						
Order costs						
Total costs						

5. Give examples of costs Included in annual carrying (holding) costs of stock when using the EOQ decision model.
6. Prestige Bears Ltd has been offered a 1 per cent discount on the cost if it places orders in quantities of 18,000. Discuss whether the company should accept the discount and place larger orders, show your workings.

1- Determine the EOQ:

a- Using the equation method:

$$EOQ = \sqrt{\frac{(2 \times \text{Demand} \times \text{Cost per order})}{\text{Holding cost per unit}}}$$

$$EOQ = \sqrt{\frac{(2 \times 72,000 \times 375)}{6}}$$

EOQ = 3,000 units per order

The economic order quantity is at the point where holding cost = order cost.

Cost of ordering = $[72,000/3,000] \times 375 = \$ 9,000$

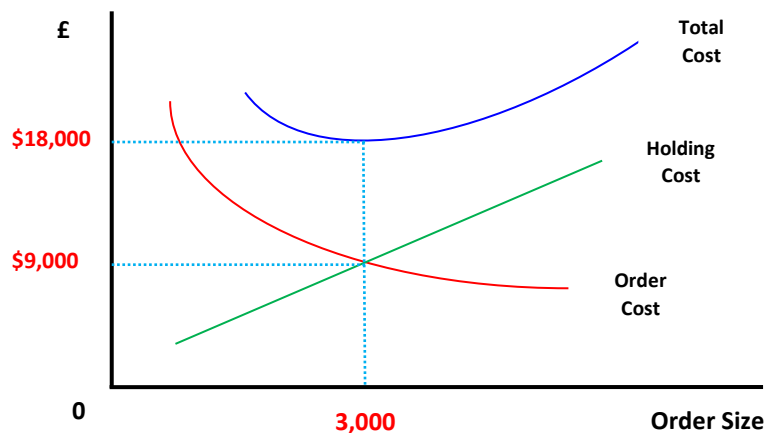
Cost of holding = $[3,000/2] \times 6 = \$ 9,000$

Total cost = £18,000

2-Using the Tabular method:

No. of orders	Order size	Average stock	Carrying (Holding) Costs (\$)	Ordering Costs (\$)	Total costs (\$)
1	72,000	36,000	$6 \times 36,000 = 216,000$	375	216,375
10	7,200	3,600	$6 \times 3,600 = 21,600$	3,750	25,350
20	3,600	1,800	$6 \times 1,800 = 10,800$	7,500	18,300
30	2,400	1,200	$6 \times 1,200 = 7,200$	11,250	18,450
90	800	400	$6 \times 400 = 2,400$	33,750	36,150
120	600	300	$6 \times 300 = 1,800$	45,000	46,800

3-EOQ graph:



4-Costs included in the carrying (holding) costs of stock are incremental costs for such items as insurance, rent, obsolescence, spoilage, and breakage plus the opportunity cost of capital (or required return on investment).

5- The total costs for Prestige Bears Ltd if it orders the EOQ of 3,000 units are:

Cost of buying the KPS = $\$200 \times 72,000 = \$14,400,000$

Cost of ordering = $[72,000/3,000] \times 375 = \$ 9,000$

Cost of holding = $[3,000/2] \times 6 = \$ 9,000$

Total Costs = **\$14,418,000**

The total costs for Prestige if it orders 18,000 units are:

Cost of buying the KPS = $\$200 \times 72,000 \times 0.99 = \$14,256,000$

Cost of ordering = $[72,000/18,000] \times 375 = \$ 1,500$

Cost of holding = $[18,000/2] \times 6 = \$ 54,000$

Total Costs = **\$14,311,500**

Ordering 18,000 units will, therefore, save $\$14,418,000 - \$14,311,500 = 106,500\$$ over a year. As expected, the holding cost increases (from 9,000 to 54,000), but this is more than compensated by the reduced cost of buying and ordering. Prestige should take the discount.