

Activity Based Costing & CPA Questions

**Chartered Accountancy
Corporate Level**
Advanced Management Accounting (AMA)

Sunanda Abeykoon
ACA, CIMA Finalist

ACTIVITY BASED COSTING / CUSTOMER PROFITABILITY ANALYSIS

Exercise 01

Heycarb makes and sells two products, Max and Doublemax. The direct costs of production are Rs.12 for one unit of Max and Rs.24 per unit of Doublemax.

Information relating to annual production and sales is as follows:

	Max	Doublemax
Annual production and sales	24,000 Units	24,000 Units
Direct labour hours per unit	1.00	1.50
Number of orders	10	140
Number of batches	12	240
Number of setups per batch	1	3
Special parts per unit	1	4

Information relating to production overhead costs is as follows:

Activity	Cost driver	Annual cost Rs.
Setup costs	Number of setups	73,200.00
Special parts handling	Number of special parts	60,000.00
Other material handling	Number of batches	63,000.00
Order handling	Number of orders	19,800.00
Other overheads	-	<u>216,000.00</u>
		<u>432,000.00</u>

Other overhead costs do not have an identifiable cost driver, and in an ABC system, these overheads would be recovered on a direct labour hours basis.

You are required to:

- Calculate the production cost per unit of Max and of Doublemax if the company uses traditional absorption costing and the overheads are recovered on a direct labour hours basis.
- Calculate the production cost per unit of Max and of Doublemax if the company uses ABC.

- (c) Comment on the reasons for the differences in the production cost per unit between the two methods.
- (d) What are the implications for management of using an ABC system instead of an absorption costing system?

Exercise 02

Beckley Hill (BH) is a private hospital carrying out two types of procedures on patients. Each type of procedure incurs the following direct costs:

Procedure A B

	\$	\$
Surgical time and materials	1,200	2,640
An aesthesia time and materials	800	1,620

BH currently calculates the overhead cost per procedure by taking the total overhead cost and simply dividing it by the number of procedures, then rounding the cost to the nearest 2 decimal places. Using this method, the total cost is \$2,475.85 for Procedure A and \$4,735.85 for Procedure B.

Recently, another local hospital has implemented activity-based costing (ABC). This has led the finance director at BH to consider whether this alternative costing technique would bring any benefits to BH. He has obtained an analysis of BH's total overheads for the last year and some additional data, all of which is shown below:

Cost	Cost driver	\$
Administrative costs	Administrative time per procedure	1,870,160
Nursing costs	Length of patient stay	6,215,616
Catering costs	Number of meals	966,976
General facility costs	Length of patient stay	8,553,600
Total overhead costs		<u>17,606,352</u>

Procedure	A	B
No. of procedures	14,600	22,400
Administrative time per procedure (hours)	1	1.5
Length of patient stay per procedure (hours)	24	48
Average no. of meals required per patient	1	4

Required:

- (a) Calculate the full cost per procedure using activity-based costing. (6 marks)
- (b) Making reference to your findings in part (a), advice the finance director as to whether activity-based costing should be implemented at BH. (4 marks) (Total 10 marks)

Exercise 03

ST is a distribution company which buys a product in bulk from manufacturers, repackages the product into smaller packs and then sells the packs to retail customers. ST's customers vary in size and consequently the size and frequency of their orders also varies. Some customers order large quantities from ST each time they place an order. Other customers order only a few packs each time.

The current accounting system of ST produces very basic management information that reports only the overall company profit. ST is therefore unaware of the costs of servicing individual customers. However, the company has now decided to investigate the use of Customer Profitability Analysis (CPA).

ST would like to see the results from a small sample of customers before it decides whether to fully introduce CPA. The information for two customers, and for the whole company, for the previous period was as follows.

	<i>Customer</i>		<i>Company</i>
	<i>B</i>	<i>D</i>	
Factory contribution (Rs Mn)	75	40.5	450
Number of			
Packs sold ('000)	50	27	300
Sales visits to customers	24	12	200
Orders placed by customers	75	20	700
Normal deliveries to customers	45	15	240
Urgent deliveries to customers	5	0	30

<i>Activity</i>	<i>costs Rs Mn</i>
Sales visits to customers	50
Processing orders placed by customers	70
Normal deliveries to customers	120
Urgent deliveries to customers	60

Required

- (a) **Prepare** a CPA for each of the two customers based upon
 - (i) number of packs sold and
 - (ii) activity based costing
- (b) **Explain** how ST could use CPA to increase its profits.

Exercise 04

PNC is a distribution company which buys a product in bulk from manufacturers, repackages the product into smaller packs and then sells the packs to retail customers.

PNC's customers vary in size and consequently the size and frequency of their orders also varies. Some customers order large quantities from PNC each time they place an order. Other customers order only a few packs each time.

The current accounting system of PNC produces very basic management information that reports only the overall company profit. PNC is therefore unaware of the costs of servicing individual customers. However, the company has now decided to investigate the use of Customer Profitability Analysis (CPA).

PNC would like to see the results from a small sample of customers before it decides whether to fully introduce CPA.

The information for two customers, and for the whole company, for the previous period was as follows:

	Customer B	Customer D	Total for company
Factory contribution Rs.000	75.00	40.50	450.00
Number of ;			
Packs sold (000)	50.00	27.00	300.00
Sales visit to customer	24.00	12.00	200.00
Orders placed by customers	75.00	20.00	700.00
Normal deliveries to customers	45.00	15.00	240.00
Urgent deliveries to customer	5.00	-	30.00

	Rs.000
Sales visit to customer	50.00
Orders placed by customers	70.00
Normal deliveries to customers	120.00
Urgent deliveries to customer	60.00

Required

- (1) Prepare a Customer Profitability Analysis for each of the two customers. **(6 marks)**
- (2) Explain how PNC could use Customer Profitability Analysis to increase its profits. **(4 marks) (Total = 10 marks)**

Question 01

Apollo (Pvt) Ltd (APL) sells a range of clothing, electronic and furniture products through a chain of department stores. It operates an activity-based costing system for product costing. The following is the activity related information, for each product category.

Cost driver	Clothing items	Electronic items	Furniture items
Number of pallets delivered	600	120	80
Number of customers	20,000	12,000	8,000
Number of inventory items	1,000	100	30

The actual overhead cost and expected increase in the year 2019, are given below.

Cost pool	Cost driver	Actual Overhead Cost Rs.000 for 2018	Expected increase in overhead cost for 2019
Customer service	Number of customers	6,000	5%
In-store merchandising	Number of inventory items	6,328	12%
Warehouse receiving	Number of pallets delivered	9,000	10%

Required:

- Assess** the budgeted departmental overhead cost for clothing items for the year 2019, using the activity-based costing system. (4 marks)
- Explain** activity-based management and how it could be applied for APL, in a competitive environment. (3 marks)
- Explain** how proper working capital management could improve the profitability of a company such as APL. (3 marks)

Question 02

Colombo Health Care (CHC) is a large private hospital which provides a wide range of services to its customers. The services range from simple laboratory tests to doctor channeling to nursing care services to in-patient services to complex surgeries and many more.

A comparison of the prices of similar services among similar hospitals has revealed that some of their services are comparatively expensive while some others are cheaper. CHC does not evaluate product profitability as indirect costs are not identified with specific products/services. Indirect costs form a significant proportion of the total costs. There is no system to identify costs of providing each of the services thus making pricing an arbitrary exercise.

The patients are very conscious about the price while expecting the highest level of quality. The hospitals existing in the market strive hard to offer their services with high quality at competitive prices. Some of the existing hospitals are in the process of upgrading their facilities and expanding their activities while there have been a few investments in state of the art hospitals of which construction is rapidly taking place.

The hospital building is owned by the parent company of CHC for which a significant amount of rent is paid monthly. Apart from employee and doctor remuneration and building maintenance, rent is the third largest expenditure item of CHC.

At a recent management meeting, the management discussed, the ability and appropriateness of using activity based costing (ABC) in CHC.

Required:

- Discuss** the features that may exist in CHC which would encourage the application of activity based approaches to cost analysis. (6 marks)
- Discuss** the features that may obstruct the application of activity based costing. (4 marks)

Question 03

DB Engineering (Pvt) Ltd (DBE) is carrying out a business that provides a range of building services. It has recently bid for two construction jobs, EXE and WYE. The price determination of these jobs was as follows.

	Job EXE Rs.Mn	Job WYE Rs.Mn
Total direct cost (Material, Labour Etc..)	400	800
Common site overhead (15% of total direct cost)	60	120
Total job cost	460	920
10% profit mark-up	46	92
Price	506	1,012

The clients of the company have indicated that the offered prices were higher than the other bids. The management considers applying the activity-based costing approach and reviewing the bids. The following additional information is provided.

Common site overhead type	Expected annual overhead cost Rs.Mn	Cost driver	Expected total no. of activities per annum
Project supervision	30	No. of site visits	2,000
Planning and monitoring	100	No. of meetings	500
Labour related overhead	200	No. of man hours	8,000,000

The following information is relevant to jobs EXE and WYE during their expected job completion period.

	Job EXE	Job WYE
Expected job completion period	2 years	2.5 years
No. of site visits for the job	120	250
No. of planning and monitoring meetings for the job	50	190
No. of man hours for the job	300,000	1,400,000

Required:

- (a) **Assess** the cost of each job based on the activity-based costing approach. (5 marks)
- (c) **Advise** the management on discounts that can be offered for each job. (3 marks)
- (d) **Differentiate** the activity-based costing approach from the traditional absorption costing method. (2 marks)

Question 04

Precitech (Pvt) Ltd (PPL) is an industrial tools manufacturing company. The following statement has been made by the production manager at the meeting held to discuss the product profitability of its drills plant.

“We apply standard absorption costing for product valuation. The total budgeted indirect production cost is absorbed to products based on the machine time utilised by each product. Since the full cost is absorbed to all the products, no products can be undervalued. Therefore the prices of the products are accurate”.

PPL operates a semi-automated production system, partially supported with manual processes. PPL produces several types of drills in this plant. The following details have been extracted from the budget for the next year for the Heavy Duty Drill (HDD).

- The standard costs per unit of HDD are;
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	Rs.
Cost of materials	3,000.00
Cost of labour (Rs300 per labour hour)	600.00
Variable production overhead	400.00

- The indirect production cost is budgeted as Rs. 30 million for the entire plant.
- Budgeted production and sales of HDD for the next year is 10,000 units.
- The utilization of activities are projected as follows.

Cost driver	For HDD	Total for the plant	Indirect production cost item	Composition of indirect production cost for the plant
No. of material orders	1,200	3,000	Material ordering cost	20%
Labour hours	20,000	40,000	Labour related cost	40%
Machine hours	100	500	Machine related cost	40%

You are working as the management accountant of PPL.

Required:

(a) **Criticize** the statement of the production manager based on the principles of Activity Based Costing (ABC). (No mathematical computations are expected) (4 marks)

(b) **Assess** the unit standard cost of HDD based on the existing absorption costing system and the ABC system in order to support your answer to (a) above. (6 marks)

Question 05

City Agencies (CA) is the sole agent in Sri Lanka for several multinational pharmaceutical manufacturers. CA imports drugs and sells them to retail customers (pharmacies and supermarkets). CA's customers vary in size and consequently the size and frequency of their orders also vary.

The current management information system of CA, which is predominantly a financial accounting and reporting system, produces only very little management information. It hardly produces any product-wise or customer-wise decision support management information. CA is therefore unaware of the costs of servicing individual customers.

The new Financial Controller, who recently joined CA, has decided to perform Customer Profitability Analysis (CPA). He has initially planned to see the results from a sample of two customers before deciding whether to fully introduce CPA.

The information for these two customers, and for the whole company, for the year 2014/15 is as follows:

	Customer		Company
	AH	LW	
Contribution Rs. 000	1,500	810	9,000
No. of packs sold Rs. 000	50	27	300
No. of sales visit to customer	24	12	200
No. of orders placed by customer	75	20	700
No. of normal deliveries to customer	45	15	240
No. of urgent deliveries to customer	5	-	30

Activity	Total cost for the period Rs. 000
Sales visit to customers	1,000
Processing orders	1,400
Normal deliveries	2,400
Urgent deliveries	1,200

Required :

- Prepare** a Customer Profitability Analysis for each of the two customers. (5 marks)
- Demonstrate** how CA could use this Customer Profitability Analysis to increase its profits. (5 marks)

Question 06

Wild Leopard is a hotel that provides eco-tourism experience to foreign tourists in Sri Lanka. The hotel provides two types of luxury tented chalets; Standard and Deluxe. The monthly operating overhead cost of the company is Rs. 1.8 million. The company identifies 60% of these costs with the operation cost center and the balance with the maintenance cost center. Costs of the operation center are absorbed based on the expected occupancy level of room nights. Maintenance costs are absorbed as 31% of the direct costs of each chalet.

Under normal circumstances, the company estimates an occupancy level of 80 room nights for a standard chalet and 50 room nights for a deluxe chalet per month.

The management wishes to change the current absorption costing system to the Activity Based Costing system for computing the cost per room night. The following information is available.

- The company has allocated the operating overhead cost to the activities as given below.

Activity	Cost Rs.	Cost Driver
Luggage Delivery	50,000.00	No. of deliveries
Reception and billing	350,000.00	No. of bills
Restaurant operation	800,000.00	No. of kitchen order tickets
Swimming pool maintenance	460,000.00	No. of guests
Handling pickups and drop off	140,000.00	No. of pickups and drop off

- Estimated volumes of cost drivers for two types of chalets are given below.

Cost Driver	Standard	Deluxe
No. of deliveries	120	70
No. of bills	80	50
No. of kitchen order tickets	75	45
No. of guests	160	110
No. of pick ups / drop off	120	75

- Direct cost per room, per night for a standard chalet is Rs.12,500 while a deluxe chalet is Rs.17,000.

Required:

- Compute** the total operating cost (i.e direct cost plus operating overhead cost) per room night of each chalet under Absorption Costing and Activity Based Costing. (07 marks)
- Discuss** the benefits of applying Time Driven ABC method instead of traditional ABC method by Wild Leopard Company. (03marks) **(Total 10marks)**

