Management Accountancy

Unit 7
Activity Based Costing

Structure

- Concepts, Need, Objectives and Limitations
- Limitations of Traditional Costing System
- Procedures of Absorption of Overhead under ABC
- Activity Based Management

After the completion of this unit, you should be able to:

- Understand the concept of Activity Based Costing (ABC)
- Describe the need, objectives and limitations of ABC
- List out the limitations of Traditional Costing System
- Know about Activity Based Management

7.1 Introduction

Conventional costing system assigns overhead costs to the product using a single pre-determined overhead rate based on a single activity. Such an assignment of overhead cost can produce distorted product costs. In the conventional costing system, the production volume is emphasized more than the activity for an absorption of overhead. The conventional costing system is applicable for traditional production system where the material and labour costs occupy much higher proportion of total product cost. However, manufacturing methods, organisation and cost patterns have changed dramatically. The significance of direct material and direct labour costs have diminished and that of overhead cost has increased. In such a scenario, conventional costing system cannot provide accurate overhead charge. For making overhead allocation more realistic, Activity-Based Costing has been developed.

Activity-Based Costing is a new practice in the process of attribution of costs to products. It has been developed through the efforts of Harvard Business School, specially Prof. Robert S. Kaplan and Robin Kooper. They drew attention towards the weakness of traditional product costing system and wrote a series of articles on Activity-Based Costing. The first article on ABC was first published in 1988.

Activity-Based Costing System allocates the overhead on the basis of activity involved. It does not assign costs on the basis of product volume. It is not an alternative costing system to unit costing or job costing or process costing. It is an approach to developing the cost numbers used in those costing systems. Activity-Based Costing assumes that product demand activities and the cost are required for activities. The costs should be assigned to products based on individual products consumption or demand for each activity. It is a system that focuses on activities as the fundamental cost objects.

On the basis of above discussion it can be stated that Activity-Based Costing is a cost accumulation and allocation system that traces costs to product according to the activities performed on them. The following summary is presented for clearing the Activity-Based Costing:

(i) Activity is required for production.
(ii) Direct costs and overhead costs are required for performing production work.

(iii) Those costs are related with activity.
(iv) The overhead cost is charged by showing the relationship between overhead and the activities that cause them.
(v) The overhead allocation on the basis of activity leads to correct, accurate and realistic allocation to product.

7.2 Advantages/Need of Activity Based Costing System

The main advantages of the ABC system are as follows:

(i) In advanced manufacturing technology, overhead supports a significant proportion of total cost. Activity-based costing may be highly useful for the purpose of finding realistic product cost.
(ii) Overhead costs are requied for manufacturing as wellas non-manufacturing activities. ABC is concderned with all activities and is found to extremely useful for the purpose of corect allocation of all the overhead costs.
(iii) In traditional costing system overhead is allocated on the strength of the production unit. However, activity-based costing system is allocated on the basis of activities. It recognizes that activities cause cost, not products and that it is the product which consume activities.
(iv) Activity-based costing system is more helpful in the control and reduction of cost because this system can easily identify the costs and activities which do not add value to the products.
(v) Activity-based costing is flexible enough to trace cost for different activities.
(vi) It classifies cost into long-run and short-run variable costs. This classification is relevant to strategic decision making.
(viii)ABC provides useful financial and non-financial measures. The cost driver rate is the example of financial measure and transaction volume the example of non-financial measure.

7.3 Objectives of Activity Based Costing System

(i) To assign overhead cost on activity basis
(ii) To identify available resources and resource-consuming activities
(iii) To determine more accurate total cost of production or service
(iv) To rectify the inaccurate cost information and to supply accurate cost of management
(v) To assist management for planning and forecasting
(vi) To help management in taking decision for the better result

7.4 Limitations of Activity Based Costing

The limitations of the activity-based costing system are as follows:

(i) Activity-based costing is more complex than the traditional costing system. In it numerous cost pools and multiple cost drivers are brought into use. Consequently, it will be more expensive to the organisation and so may not be affordable for small organisations.
(ii) Activity-based costing is more useful to the organisations whee overhead costs are related to activities rather than unity. If most of the overheads are related to units, the tranditional system of costing will be more useful.
(iii) Activity-based costing was originally developed for defense-related organisations where pricing is done on a cost-plus basis. Hence, it may be complicaed for the firms that rely on market-based pricing.
(iv) It required total commitment and support from top level management
(v) For the successful implementation of ABC positie attitude and employee support are most necessary.
(vi) The concept of activity-based costing was recently developed and is still in its primary stage of development. So, its applicability is still doubted.

7.5 Limitations of Traditional Costing System

(i) Charging Overhead on Basis of Units

(ii) Emphasizing Production Unit, not Activity
(iii) High Proportion of Direct Cost in Total Cost
(iv) Single Cost Driver

7.6 Activity-Based Costing : Computation Method

Activity-Based Costing starts with the detailed activities required to produce a product or service and computes a product cost using the following four steps :

Step 1:	Identify the major activities that take place in the organization.
Step 2:	Determine the cost driver for each major activity.
Step 3:	Create a cost centre/cost pool for each major activity.
Step 4:	Trace the cost of activities to the product.

Step 1: Identify the Major Activities that take Place in the Organisation

To identify the major activities in the organisation is the starting point of Activity-Based Costing System. Material handling, purchasing, receiving, despatch, machining, assembly, etc. are the examples of the major activities. Some of the examples of activity are presented in table format below :

Activities	Examples
1. Machine-related	Machining Cost Centre
2. Direct Labour related	Assembly Departments
3. Various support activities	Ordering, Receiving, Material handling, Product scheduling, Packing and dispatching.

Step 2: Determine the Cost Driver for each Major Activity

Cost is influenced by different factors. After identification of the major activities, those influencing factors should also be identified. The factors which determine the cost of an activity is known as 'Cost Driver'. The behaviour of cost must be understood for appropriate identification of cost drivers.

The term cost driver can be defined as activities or transactions which are significant determinant of cost. The examples of cost drivers are number of purchase orders, number of order delivered, number of set ups and so on.

Step 3: Create a Cost Centre/Cost Pool for each Major Activity

A cost centre must be created for each activity. It is also termed as cost pool. A collection of overhead costs that are logically related to the activity and for which cost variations can be explained in a single cost driver is known as cost pool.

The examples of cost centre and cost drivers are presenting in the following ways :

Cost Pool	Cost Driver
Customer Order Processing	No. of orders No. of customers No. of orders by size No. of customer visits
Production Control	No. of engineering changes No. of machine/layout changes No. of parts operational No. of personnel No. of schedule changes Delivery performance No. of production batches No. of set-ups No. of works orders
	No. of parts No. of deliveries No. of material movement No. of stock discrepancies

Material Planning/Inventory Control	No. of shortages No. of on-time movements No. of schedule movements No. of receipts Material weight/volume
Engineering Support	No. of set-ups No. of engineering changes No. of product changes No. of production hours No. of defects No. of tool changes No. of change notices No. of breakdowns
Inspection and Quality Control	No. of inspections No. of rejects Checking frequency No. of parts No. of suppliers No. of receipts No. of product changes Batch sizes No. of customers
General Accounting	No. of suppliers/customers Frequency of despatches Frequency of deliveries No. of invoices No. of accounting reports No. of purchase/sales orders No. of payroll No. of accounting changes

Step 4: Trace the Cost of Activities to Product According to a Products Demands for Activities

The overhead cost is traced on the basis of number of cost driver demanded by the product. For example, the total ordering cost for a period is Rs. 1,00,000. The number of orders during the period is 200 times. In that case, the cost per order will be Rs. 500 (dividing Rs. 1,00,000 by 200 times). For a particular product, if the number of orders is 20 times, then the total ordering cost for the product will be Rs. 10,000 (Rs. 500 × 20 times).

The method for computing the cost under Activity-Based Costing can be outlined as follows :

Step 1:	To find out the cost traced to activities.
Step 2:	To determine the cost driver for each activity.
Step 3:	To find out the cost driver rate : $\text{Cost Driver Rate} = \frac{\text{Cost Traced to Activities}}{\text{Number of Cost Drivers}}$
Step 4:	To find out cost traced to product. Cost Traced to Product = Cost Driver Rate × No. of Cost Drivers Used.

ILLUSTRATION 1

Two products x and y are made using similar equipment and method. The data for last period are :

Items	Cost (Rs.)	Cost Drivers
Volume Related	13,200	Machine hours

Purchase Related	12,000	Number of order
Materials Handling	2,600	Number of Movement
Maintenance	7,500	Maintenance hours
Quality Control	2,750	No. of Inspection

Output and related activities are as follows:

	Product X	**Product Y**
Production Units	400	1,000
Machine hours per unit	4	5
No. of Purchase order	10	20
No. of Movements	5	8
Maintenance hours	20	30
No. of Inspections	10	15

Required: Cost Driver Rate

SOLUTION

WORKING NOTES

Calculation of Total Cost Driver:

(i) Machine Hours = (400 x 4) + (1,000 x 5) = 1,600 + 5,000 = 6,600

(ii) No. of Orders = 10 + 20 = 30

(iii) No. of Movement = 5 + 8 = 13

(iv)Maintenance Hours = 20 + 30 = 50

(v) No. of Inspections = 10 + 15 = 25

Calculation of Cost Driver Rate

Activities	**Cost**	**Cost Driver**	**Total Cost Driver**	**Cost Drivers Rate**
Volume Related	13,200	Machine hours	6,600	Rs. 2
Purchase Related	12,000	No. of order	30	Rs. 400
Materials	2,600	No. of Movement	13	Rs. 200
Handling	7,500	Maintenance	50	Rs. 150
Maintenance	2,750	hours	25	Rs. 110
Quality Control		No. of Inspection		

ILLUSTRATION 2

Nepal Company manufactures two products namely A and B products, using the same plant process. The following relates to a product period:

Products	**A**	**B**
Output (Units)	500	5,000
Machine Hour Per Unit	5	5
No. of Purchase Order	50	200

The costs of the activities are as follows:

Repair	Rs. 55,000
Purchase Related	Rs. 1,00,000

Required: Overhead cost per unit by ABC

SOLUTION

WORKING NOTES

Calculation of Total Cost Driver:

(i) Machine Hours = (500 x 5) + (5,000 x 5) + 25,000 = 27,500
(ii) No. of Orders = 50 + 200 = 250

Calculation of Cost Driver Rate

Activities	Cost	Cost Driver	Total Cost Driver	Cost Drivers Rate
Repair	55,000	Machine Hrs.	27,500	Rs. 2
Purchase	1,00,000	No. of Order	250	Rs. 400

Cost Statement

Activities	Cost Driver Rate	Product A		Product B	
		No.	Cost Traced	No.	Cost Traced
Repair	Rs. 2	2,500	5,000	25,000	50,000
Purchase Related	Rs. 400	50	20,000	200	80,000
Total Cost			**25,000**		**1,30,000**
Output Units			**500**		**5,000**
Cost per unit			**Rs. 50**		**Rs. 26**

ILLUSTRATION 3
Company A produces two products: P_1 and P_2. Both are produced on the same equipment and use similar processes. The products differ by volume. The information for input, output and the cost of activities are given below :

	Product P_1	**Product P_2**
Output in Units	1,000	10,000
Machine Hour per Unit	2	2
Direct Labour Hour per Unit	4	4
No. of Purchase Orders	80	160
No. of Set-ups	40	60

The Cost of the Activities is as follows:
Volume Related Rs. 1,10,000
Purchasing Related Rs. 1,20,000
Set-up Related Rs. 2,10,000
Total Rs. 4,40,000

Required: Find out the until production cost by using:
(i) Conventional Costing by using Machine Hours
(ii) Activity Based Costing and
(iii) Comparison of Conventional Costing and Activity Based Costing

SOLUTION:
(i) Calculation of Unit of Production Cost by using Conventional Costing
Step 1: Total Machine Hour = (1,000 x 2) + (10,000 x 2) = 2,000 + 20,000 = 22,000
Step 2: Total Overhead Cost = Rs. 4,40,000
Step 3: Overhead Rate per Machine Hour = $\frac{4,40,000}{22,000}$ = Rs. 20
Step 4: Overhead Cost Per Unit and Total Overhead Cost
Cost per Unit by using Machine Hour P_1 = 2 Hr. x Rs. 20 = Rs. 40
P_2 = 2 Hr. x Rs. 20 = Rs. 40
Total Cost for P_1 = 1,000 units x Rs. 40

= Rs. 40,000

Total Cost for P_2 = 10,000 units x Rs. 40

= Rs. 4,00,000

(ii) Activity Based Costing:

Step 1: Calculation of Cost Driver Rates

Activities	Cost (Rs.)	Cost Driver	Total Cost Driver	Cost Drivers Rate (Rs.)
Volume Related	1,10,000	Machine Hour	22,000	Rs. 5
Purchase Related	1,20,000	No. of Orders	240	Rs. 500
Set-up Related	2,10,000	No. of Set-ups	100	Rs. 2,100

WORKING NOTES:

Calculation of Total Cost Drivers:

Volume Related = (1,000 units x 2 hrs) + (10,000 units x 2 hrs) = 22,000 hrs.

Purchase Related = 80 + 160 = 240 Orders

Set-up Related = 40 + 60 = 100 Set-ups

Step 2: Cost Statement by Using ABC System

Activities	Cost Driver Rate	Product P_1		Product P_2	
		No.	Cost Traced	No.	Cost Traced
Volume Related	Rs. 5	2,000	10,000	20,000	1,00,000
Purchase Related	Rs. 500	80	40,000	160	80,000
Set-up Related	Rs. 2,100	40	84,000	60	1,26,000
Total Cost			**1,34,000**		**3,06,000**
Output Units			**1,000**		**10,000**
Cost per unit			**Rs. 134**		**Rs. 30.60**

(iii) Comparison of Coventional Product Costing and Activity Based Costing :

Product	Conventional Costing	Activity Based Costing
P_1	Rs. 40	Rs. 134
P_2	Rs. 40	Rs. 30.60

7.7 Activity Based Management

Activity Based Management (ABM) is a cost accounting term. Under ABM the current activities and company goals are adjusted by using past production activities and costs. It is an approach to management that aims to maximize the value adding activities. Those activities which are necessary for the performance of the process and which represent the activity that is valued by external or internal customer is known as value adding activities. Polishing a furniture by furniture making company is an example of value adding activity. Non-value added activities are those activities which are considered not to contribute to customer value or to the organization needs. Such activities represent work that is not valued by the internal or external customers. The functions of set up, scheduling repair and maintenance, supervision etc are the example of non-value added activities.

Activity Based Management is used to determine the profitability of every aspect of a business so that those areas can be upgraded or eliminated. It includes aspect like pricing and product mix decision, cost reduction process improvement and product design decisions.

7.8 Objectives of Activity Based Management

(i) To identify and enhance value added activities

(ii) To reduce or to eliminate non-value added activities

(iii) To improve efficiency and profitability by redesigning processes

7.9 Benefits of Activity Based Management

(i) It make possible to identify the most and least profitable customers, products and channels.

(ii) It makes easy to determine the true contribution to and detractors from financial performance.

(iii) By applying ABM the management can predict accurately about the costs, profit, sales valume, resource cost

(iv) The poor performance can be easily identified.

(v) Cost reduction is more possible.

(vi) It also assists management on effective decision making.

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