

Department Accounting and Finance

**Management Accounting**

BAIT 3 & BACC 3

Lecture Notes

## **Activity Based Costing (ABC) System**

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### **Learning aims**

Students should be able to

- Explain what is meant by the term cost driver
- identify appropriate cost drivers under activity-based costing (ABC)
- Calculate costs per driver and per unit using (ABC)
- Compare ABC and traditional methods of overhead absorption based on production units, labour hours or machine hours
- Understand Value-added and Non-value-added activities
- Understand Just in Time (JIT) Processing System

## **2.1 Introduction**

With the increasingly high level of automation in world class business, overhead costs (indirect costs) are today the main component of total costs. Absorption (traditional) costing has led to the incorrect apportionment of overhead costs if the overhead costs are shared by different products lines/departments in an organization, this will result a poor basis for decision making.

A more accurate apportionment of overhead costs is becoming necessary in the modern business environment where cost information is being used for decision making purposes, such as pricing, make-or-buy decisions etc.. This has led to the introduction of activity based costing (ABC), under which it is easier to trace overhead costs to individual products/departments and which provides a better apportionment of overhead costs and thus better costs information.

Hence ABC system is an overhead cost allocation system that apportions overhead costs to multiple activity cost pools and assigns the activity cost pools to products/services or departments by means of cost drivers that represent the activities used

## **2.2 The Need for Activity Based Costing System**

- Tremendous change in manufacturing and service industries
- Decrease in amount of direct labour usage
- Significant increase in total overhead costs
- Traditional costing fails to capture cause and effect relationship
- Traditional costing often fails to highlight inter-relationship among activities in different departments.
- Market place is very competitive
- Availability of computer has enhanced requirement for improvement in information-gathering technology for advanced decision making to gain competitive advantage

## **2.3 Categories of Activities Identified in ABC System**

There are four broad categories of activities identified in an activity-based costing system

**Unit-level activities:** are resources sacrificed on activities performed on each individual unit of product or service.

- Energy
- Machine maintenance, repairs (depreciation?)
- Labor

**Batch-level activities:** are resources sacrificed on activities that are related to a group of units of product or service

- Setup hours to run a batch
- Procurement costs of placing an order

**Product-sustaining activities:** are resources sacrificed on activities to support individual products or services.

- Design costs
- Engineering costs

**Facility-level (or general-operations-level) activities:** are resources sacrificed on activities that cannot be traced to individual products or services but support the organization as a whole.

- General administration
- Rent
- Building security

## 2.4 Basic Terms of Activity Based Costing System

- **Activity:** any event, action, transaction, or work sequence that incurs cost when producing a product or providing a service.
- **Activity Cost Pool:** the overhead cost attributed to a distinct type of activity  
For example: ordering materials or setting up machines
- **Cost Driver:** any factor or activity that has a direct cause-effect relationship with the resources consumed. In ABC cost drivers are used to assign activity cost pools to products or services. The following three factors are important in selecting the cost drivers for an ABC system:

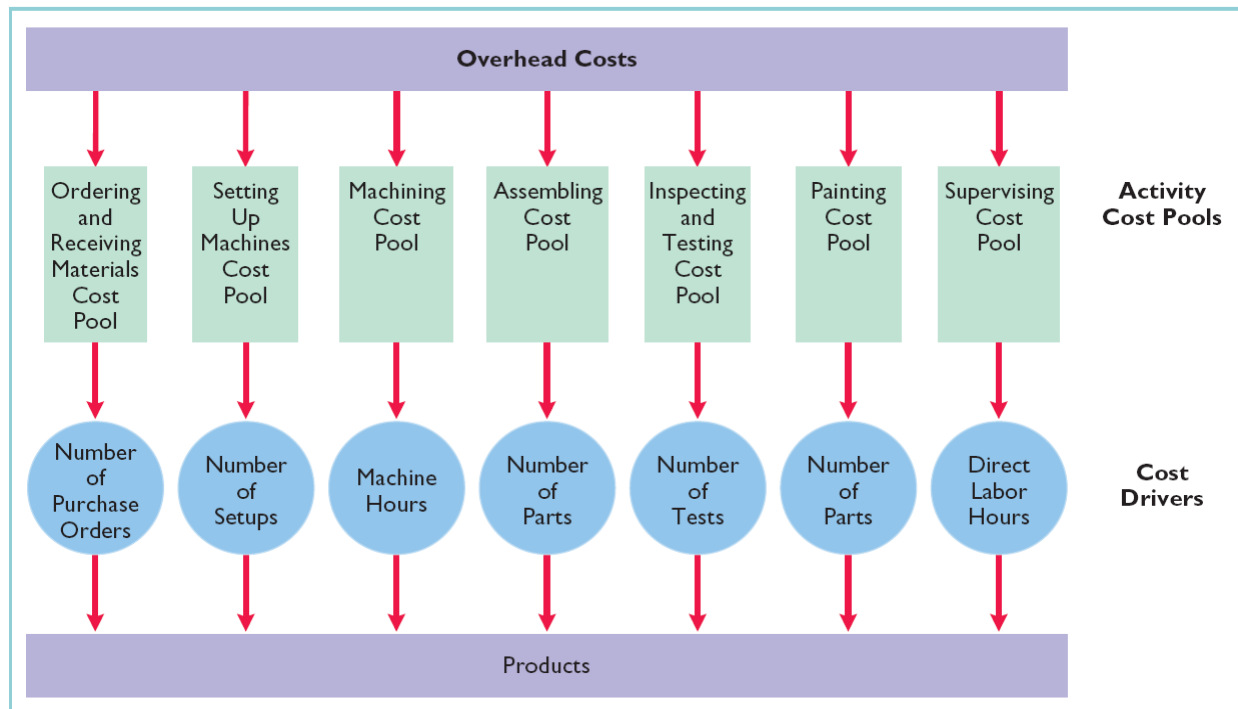
Degree of correlation between consumption of an activity and consumption of the cost driver

Cost of measurement of the cost driver.

Behavioral effects, that is, how the cost driver selected will affect the behavior of the individuals involved in the activity related to the cost driver.

The illustration below show how the cost drivers are selected from the cost pools

**Fig. 2.1 ABC system design**



Source: Lift Jack Company

## 2.5 The Main steps in implementing ABC system

In implementing activity-based costing in an organization involves the following four steps.

**Step 1: Identify and classify the major activities and allocate overhead costs to the appropriate cost pools.**

See the example below the Overhead costs are assigned directly to the appropriate activity cost pool

Activity Cost Pool	Estimated Overhead Costs (Shs)
Ordering Cost	300,000,000
Machining Cost	500,000,000
Inspection & quality control cost	100,000,000

**Step 2: Identify the cost driver that has a strong correlation to the costs in the cost pool.**

The cost driver must accurately measure the actual consumption of the activity by the various products

Activity cost pool	Cost driver	Expected use of cost driver
Ordering Costs	Number of orders	15,000
Machining Costs	Machine hours	500,000
Inspection costs	Number of inspections	20,000

**Step 3: Compute the overhead rate for each pool.**

The firm computes an activity-based overhead rate per cost driver by using the following formula:

$$\frac{\text{Estimated Overhead per Activity}}{\text{Expected Use of Cost Drivers per Activity}} = \text{Activity-Based Overhead Rate}$$

Activity cost pool	Overhead Costs (Shs)	÷ cost driver	ABC Overhead rate
Ordering Costs	300,000,000	15,000	Shs. 20,000 per order
Machining Costs	500,000,000	500,000	Shs.1,000 per machine hr.
Inspection costs	100,000,000	20,000	Shs. 5,000 per inspection

**Step 4: Assign overhead costs for each costs to products/departments using the overhead rates.**

In assigning overhead costs, it is necessary to know the expected use of cost drivers for each product/department. To assign overhead costs, firm multiplies the activity-based overhead rates per cost driver by the number of cost drivers expected to be used per product/department.

## 2.6 Benefits and Limitations of ABC

Implementing ABC can be a challenging task for any business and the process carries several advantages and disadvantages.

#### ❑ **Benefits of ABC**

- It assists the management to understand the behaviour of overheads costs and their relationship to products, services, customers and market segments
- It can be used to identify non-valued added activities and can help to better allocate resources to efficient and profitable activities
- The method also helps to fix the price of products or services that are excessive or incorrect
- It assists the management to allocate the resources to those activities that will increase shareholders value
- It links profitability analysis to operational decisions
- It ensures that the cost of non-value added activities is visible to the management
- It gives the right information for performance measurement because it focuses on activities rather than resources.
- The understanding of the cost driver for each activity gives better control over factors that cause costs
- It gives accurate information on profit margin and performance measurement for profit improvement

#### ❑ **Limitations of ABC**

- The ABC system is time consuming as analysis of activity, determining the cost of those activities and identification of appropriate cost drivers takes a significant amount of time
- Setting up an ABC system can be expensive, it requires establishment of activities in detail. This may be a complex and time taking job
- It is often difficult to identify an appropriate cost driver for an activity cost pool in order to apportion the cost.
- In ABC system some arbitrary allocations continue
- The ABC system may not justify the cost-benefit analysis. Cost incurred for the implementation and maintenance of the system may go beyond the benefits gained from it

### **2.7 Difference between ABC and Traditional (Absorption) Costing**

If the firm has more than one products/ departments, if the ABC system is used, therefore the apportionment of indirect costs among those products/ departments will be differ from the traditional (Absorption) system, instead of using single overhead absorption rate as calculated at the beginning using appropriate activity

such labour hours, machine hours, output etc. In ABC system the cost drivers which have identified will be used to apportion the overhead costs. Therefore ABC system provides more accurate of apportionment of overhead costs than traditional costing. However, the allocation of direct costs, such direct materials, direct labour, direct expenses and short run variable costs will be similar to traditional method.

## **2.8 When to Use ABC**

**Factors to consider:**

- Product lines differ in volume and manufacturing complexity.
- Product lines are numerous and diverse.
- Overhead costs constitute a significant portion of total costs.
- The manufacturing process or the number of products has changed significantly.
- Production or marketing managers are ignoring data provided by the existing system

## **2.9 Value-Added Versus Non-Value-Added Activities**

**Activity-Based Management (ABM):**

An extension of ABC from a product costing system to a management function that focuses on reducing costs and improving processes and decision making.

- Value-added activities
- Non-value-added activities

**Value-added activities:** An activity that increases the worth of a product or service such as:

**Manufacturing Company**

Engineering design

Machining services

- Assembly
- Painting
- Packaging

### **Service Company**

- Performing surgery
- Legal research
- Delivering packages

**Non-Value-Added Activities:** An activity that adds cost to, or increases the time spent on, a product/service without increasing its market value such as:

### **Manufacturing Company**

- Repair of machines
- Storage of inventory
- Moving of inventory
- Building maintenance
- Inspections Inventory control

### **Service Company**

- Taking appointments Reception
- Bookkeeping and billing Traveling Ordering supplies
- Advertising

## **2.10 Just-in-Time Processing**

### **Objective of JIT Processing**

To eliminate all manufacturing inventories

### **Elements of JIT Processing**

- Dependable suppliers.
- Multiskilled work force.
- Total quality control system.

### **Benefits of JIT Processing**

- Significant reduction or elimination of manufacturing inventories.
- Enhanced product quality.
- Reduction or elimination of rework costs and inventory storage costs.
- Production cost savings from the improved flow of goods through the processes.