

# Activity Based Costing

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# Activity Based Costing (ABC)



# Structure

1. Traditional Costing System
2. Need for Activity Based Costing System
3. History Behind Activity Based Costing System
4. ABC – What is it?
5. ABC – Who is involved in it?
6. ABC – When do we use it?
7. ABC – Objectives
8. Worked Example – Traditional Costing Vs ABC
9. ABC – Benefits and Limitations

# Traditional Costing Systems

- Product Costs

- Direct labor
- Direct materials
- Factory Overhead

Appear in the P&L when goods are sold, prior to that time they appear in the balance sheet as inventory.

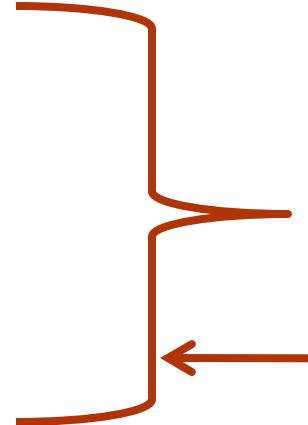
- Period Costs

- Administrative expense
- Sales expense

Appear in the P&L in the period incurred.

# Traditional Costing Systems

- Product Costs
  - Direct labor
  - Direct materials
  - Factory Overhead
- Period Costs
  - Administrative expense
  - Sales expense



Direct labor and direct materials are easy to trace to products.

The problem comes with factory overhead.

# Traditional Costing Systems

- Typically used one rate to allocate overhead to products.
- This rate was often based on direct labor cost or direct labor hours.
- This made sense, as direct labor was a major cost driver in early manufacturing plants.
- Manufacturing processes and the products they produce are now more complex.
- This results in over-costing or under-costing.
  - Complex products are not allocated an adequate amount of overhead costs.
  - Simple products get too much.

# Need for ABC

Today's businesses are working in an increasingly complex environment.

Use of Advanced Technology



Product Life Cycle



Product Complexity



Channels of Distribution



Quality Requirements

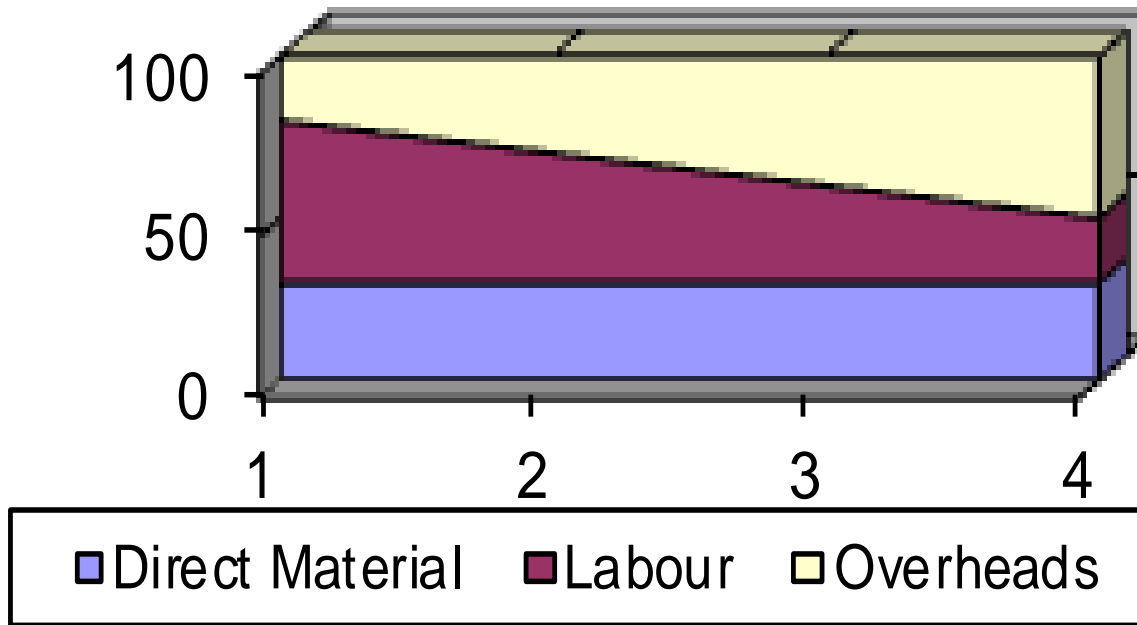


Product Diversity



# Need for ABC

## Composition of Cost



As the business grows overhead takes a larger pie in the total cost of the product and hence it is important to charge it accurately and more scientifically



# History behind ABC

- ABC became practiced in the early 1980's but it has really become a force in industry in the mid to late 1990's
- Most current approaches to ABC are based on concepts developed by the Computer Aided Manufacturing-International (CAM-I) Project
- Since then ABC plans have been further developed and diversified down to mid and small size companies

# ABC – What is it?

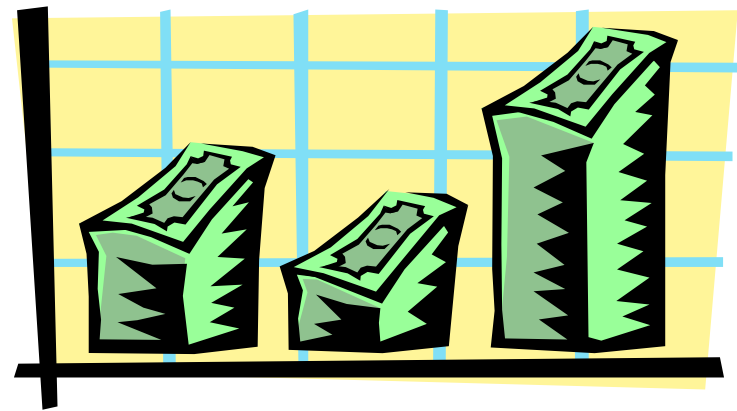
- ABC is the Activity Based Cost accounting method.
- ABC focuses on identifying all activities associated with making a product or doing a process.

# ABC – What is it? ....(contd.)

- Activity = Cost



- Identifying activities will yield a total cost system.



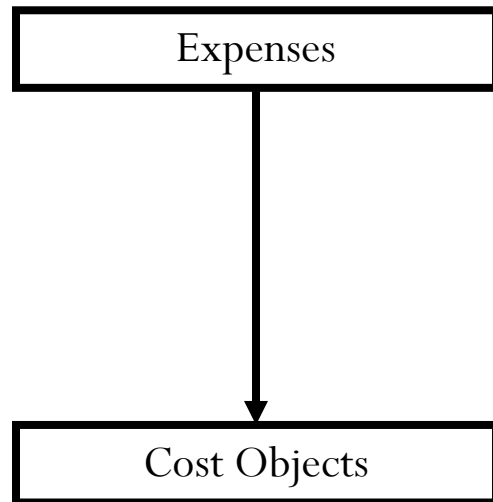
# ABC – What is it?

ABC System is based on activities, linking spending on resources to the products/services produced/delivered to customers. It uses a two-stage overhead allocation:

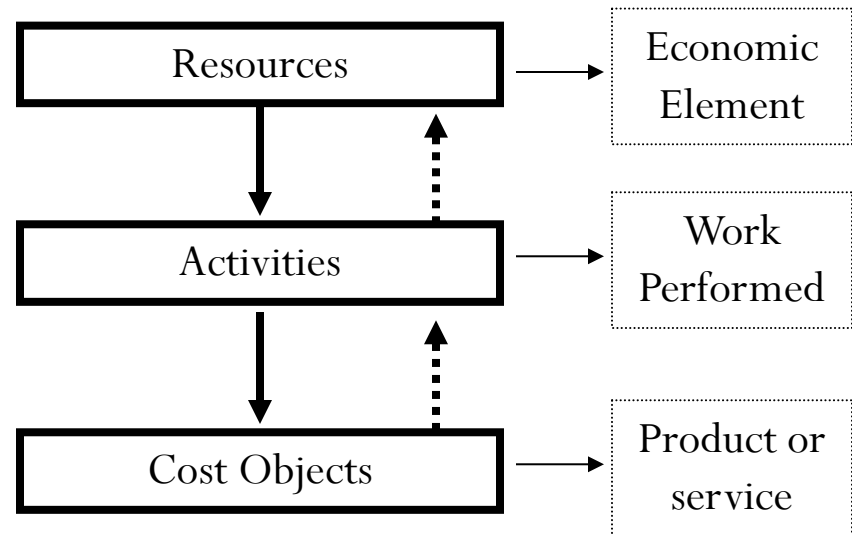
(i) Tracing costs to activities

(ii) Tracing costs from activities to products/jobs

## Conventional Costing



## Activity Based Costing



# Tracing Cost to Activities

This step is to identify major activities that cause/drive overhead costs to be incurred. Some of the activities are related to production volume (such as production runs, salary of supervisors and so on) but others are not (such as inspection/handling of materials, setting up equipment and so on). The cost of resources consumed in performing these activities are grouped into cost pools.

# Tracing Cost to Activities

<b>Common Activities</b>	<b>Associated Costs</b>	<b>Cost Driver</b>
Processing purchase order for materials	Labour costs for workers determining order quantities, contacting vendors, and preparing purchase orders	Number of purchase orders processes
Handling material	Labour costs for workers handling material, depreciation of equipment used to move material	Number of material requisitions
Inspecting incoming material	Labour costs for workers performing inspections, depreciation of equipment used to test strength of materials, tolerances, etc.	Number of receipts
Setting up equipment	Labour costs for workers involved in setups, depreciation of equipment used to adjust equipment	Number of setups
Producing goods using manufacturing equip.	Depreciation on manufacturing equipment	Number of machine-hours
Supervising assembly workers	Salary of assembly supervisors	Number of assembly labour-hours
Inspecting finished goods	Labour cost for finished goods inspections, depreciation of equipment used to test whether finished goods meet customer specifications, etc.	Number of inspections
Packing customer orders	Labour cost for packing workers, cost of packing materials, etc.	Number of boxes packed

# Tracing Costs from Activities to Products

The next step is to assign costs to products/jobs using cost drivers as a measure of activity. Cost drivers represent the quantity of activities used to produce individual products.

They identify the linkage between activities and cost objects and serve as quantitative measures of the output of activities. In fact, they are the central innovation of ABC system. Three types of cost drivers are:

- (I) Transaction
- (II) Duration
- (III) Intensity (Direct charging)

# Tracing Costs from Activities to Products

## **Transaction Drivers**

Transaction drivers are used to count the frequency of an activity/the number of times an activity is performed.

## **Duration Drivers**

Duration drivers represents the amount of time required to perform an activity.

## **Intensity Drivers**

Intensity drivers are used to charge directly for the resources used each time an activity is performed.



# Preparation of ABC product profitability report

## **Activity Cost Driver Rate**

The next step is to compute the Activity Cost Driver Rate (ACDR).

The ACDR is the amount determined dividing the activity expenses by the total quantity of the activity cost driver.

## **Activity-Based Costing Products Profitability Report**

Finally, ABC Products Profitability Report is prepared. It combines activity expenses assigned to each product with their direct (labour and material) costs.

The activity expenses assigned to a product is arrived at multiplying the ACDR by the quantity of each activity cost driver used by each product.

# Who is involved in it?

- Engineers
- Accountants
- Management
- Factory workers
- Supply Chain Management personnel
- Sales

.....***EVERYONE!***

# ABC Terms

## Activity

- work performed within an organization

## Resource

- financial input consumed by activities

## Resource Driver

- any measure of the quantity of resources consumed by activities

## Activity Driver

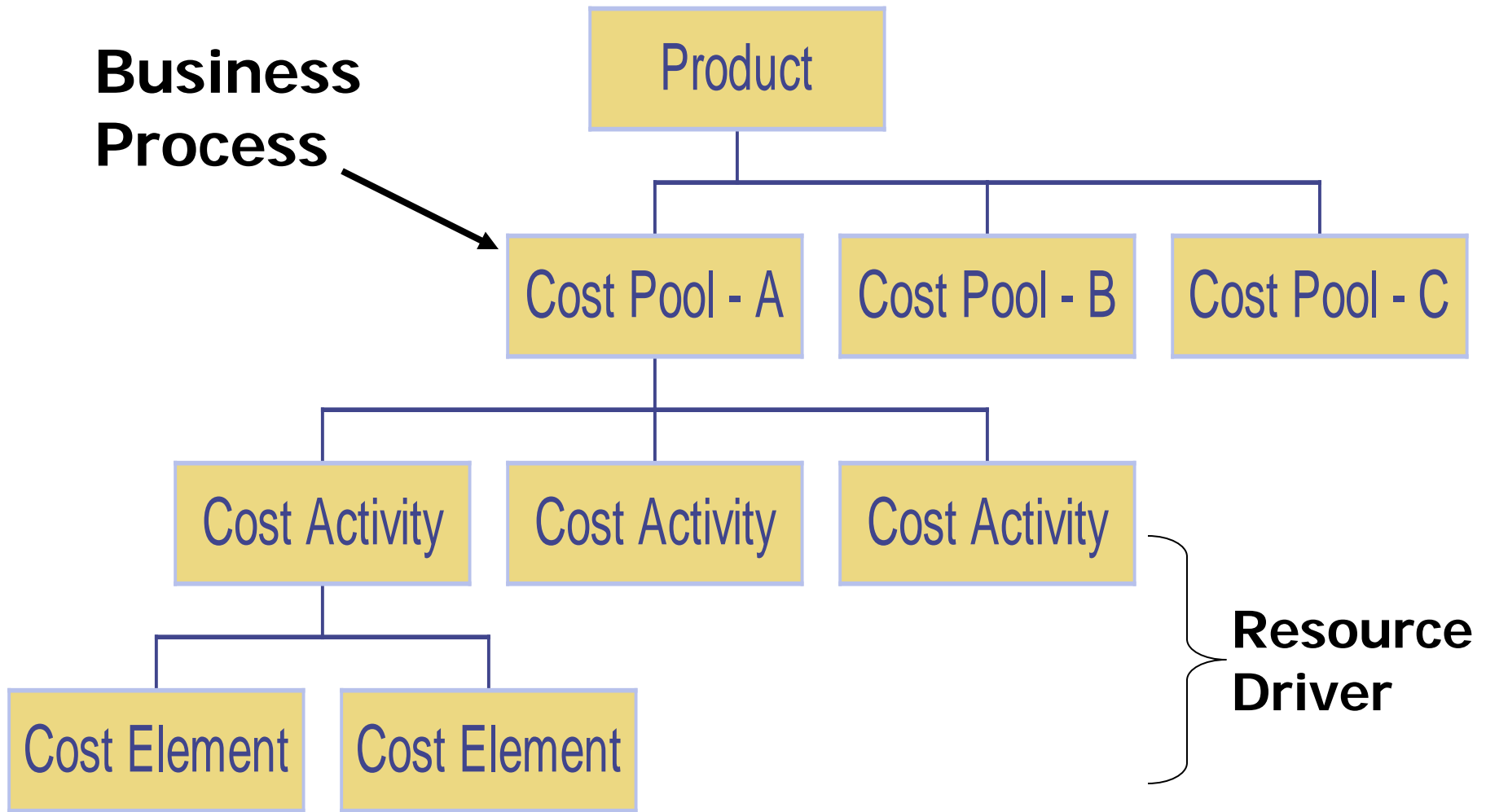
- any measure of the frequency and intensity imposed by a cost object

## Cost object

- any customer, service, process that requires a separate cost measurement

# ABC Costs

**Business  
Process**



# ABC – When do we use it?

*When one or more of the following conditions are present:*

- Product lines differ in volume and manufacturing complexity.
- Product lines are numerous and diverse, and they require different degrees of support services.
- Overhead costs constitute a significant portion of total costs.

## ABC – When do we use it? ...(contd.)

- The manufacturing process or number of products has changed significantly - for example, from labor intensive to capital intensive automation.
- Production or marketing managers are ignoring data provided by the existing system and are instead using “bootleg” costing data or other alternative data when pricing or making other product decisions.

# ABC – Objectives

- The primary objective of ABC is to assign costs that reflect / mirror the physical dynamics of the business
- Provides ways of assigning the costs of indirect support resources to activities, business processes, customers, products.
- It recognises that many organisational resources are required not for physical production of units of product but to provide a broad array of support activities.

# Illustration – Traditional Costing System

## Montex Pen Total and Product Profitability (Amt. in Rs.)

Particulars	Blue Pens	Black Pens	Red Pens	Purple Pens	Total
	(1)	(2)	(3)	(4)	(5)
Production/Sales volume	25,000	20,000	4,500	500	50,000
Unit sale price	45	45	46.5	49.5	
Sales (a)	11,25,000	9,00,000	2,09,250	24,750	22,59,000
Material costs	3,75,000	3,00,000	70,200	8,250	7,53,450
Direct labour costs	1,50,000	1,20,000	27,000	3,000	3,00,000
Overheads (300% of Direct Labour)	4,50,000	3,60,000	81,000	9,000	9,00,000
Total costs (b)	9,75,000	7,80,000	1,78,200	20,250	19,53,450
Total operating income [(a) – (b)]	1,50,000	1,20,000	31,050	4,500	3,05,550
Return on sales (%)	13.3	13.3	14.8	18.2	13.5



# Illustration – Activity Based Costing

Let us now do a step-wise cost allocation of overhead costs and prepare ABC Products Profitability Report for the Montex Pen Manufacturing Company as per data provided in previous example

(A) The total overheads (aggregating Rs 9,00,000) were comprised of the following:

Expense category	Expenses (Rs)
Indirect labour	3,00,000
Fringe benefits	2,40,000
Computer system expenses	1,50,000
Machinery	1,20,000
Maintenance	60,000
Energy	30,000
<b>Total</b>	<b>9,00,000</b>

# Illustration – Activity Based Costing

## Step 1

The activities and activity expenses of the Company are summarised below:

Overhead cost items	Cost driver				Total expenses (Rs.)
	Handle production runs	Set up	Support machines	Run machine products	
Indirect labour and 1/2 fringe benefits	50%	40%	10%	—	<b>4,20,000</b>
Computer expenses	80%	—	20%	—	<b>1,50,000</b>
Machine depreciation	—	—	—	100%	<b>1,20,000</b>
Maintenance	—	—	—	100%	<b>60,000</b>
Energy Activity	—	—	—	100%	<b>30,000</b>
<b>Expenses (Rs.)</b>	<b>3,30,000<sup>1</sup></b>	<b>1,68,000<sup>2</sup></b>	<b>72,000<sup>3</sup></b>	<b>2,10,000<sup>4</sup></b>	<b>7,80,000</b>

**1**  $(Rs\ 4,20,000 \times 0.50) + (Rs\ 1,50,000 \times 0.80) = Rs\ 2,10,000 + Rs\ 1,20,000 = Rs\ 3,30,000$

**2**  $(Rs\ 4,20,000 \times 0.40) = Rs\ 1,68,000$

**3**  $(Rs\ 4,20,000 \times 0.10) + (Rs\ 1,50,000 \times 0.20) = Rs\ 42,000 + Rs\ 30,000 = Rs\ 72,000$

**4**  $(Rs\ 1,20,000 + Rs\ 60,000 + Rs\ 30,000) \times 1.00 = Rs\ 2,10,000$

# Illustration – Activity Based Costing

Step 2

Activity Cost Driver	Products				
	Blue Pens	Black Pens	Red Pens	Purple Pens	Total@
Direct labour-hour/unit	0.02	0.02	0.02	0.02	1,000
Machine-hour/unit	0.20	0.20	0.20	0.20	10,000
Production runs	70.00	65.00	50.00	15.00	200
Setup time/run	4.00	2.40	5.60	5.60	—
Total setup time (hour)	280.00	156.00	280.00	84.00	800
Number of products	1.00	1.00	1.00	1.00	4

@Total labour and machine-hours are obtained by multiplying the unit amounts by the quantity of each type of pen sold, that is, 25,000 blue, 20,000 black, 4,500 red and 500 purple pens.

# Illustration – Activity Based Costing

## Step 3

The activity cost driver rates and the activity expenses assigned to products are shown below:

Activity	Activity expenses	Activity cost driver	Activity cost driver quantity	Activity cost driver rate
Handle Production runs	3,30,000	Number of production runs	200	Rs 1,650 per run
Set up machines	1,68,000	Number of setup hours	800	Rs. 210 per setup Hour
Support products	72,000	Number of products	4	Rs. 18,000 per Product
Run machines	2,10,000	Number of machine-hours	10,000	Rs. 21 per machine-hour
<b>Total</b>	<b>7,80,000</b>			

# Illustration – Activity Based Costing

Step 4

Activity Expenses Assigned to Products									
Activity	ACDR	ACDQ for Blue	Activity Exp.: Blue	ACDQ for Black	Activity Exp.: Black	ACDQ for Red	Activity exp.: Red	ACDQ for purple	Activity Exp.: Purple
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Handle Production Run	1,650	70	1,15,500	65	1,07,250	50	82,500	15	24,750
Setup Machines	210	280	58,800	156	32,760	280	58,800	84	17,640
Support Products	18,000	1	18,000	1	18,000	1	18,000	1	18,000
Run Machines	2.10	5,000	1,05,000	4,000	84,000	900	18,900	100	210
<b>Note: ACDR = Activity Cost Driver Rate; ACDQ = Activity Cost Driver Quantity</b>									

# Illustration – Activity Based Costing

**Exhibit 3 Activity-Based Costing Products Profitability Report**

Particulars	Blue Pens	Black Pens	Red Pens	Purple Pens	Total
<b>Sales revenues</b>	<b>11,25,000</b>	<b>9,00,000</b>	<b>2,09,250</b>	<b>24,750</b>	<b>22,59,000</b>
Material cost	3,75,000	3,00,000	70,200	8,250	7,53,450
Direct labour cost	1,50,000	1,20,000	27,000	3,000	3,00,000
Overheads:					
<i>50% fringe benefit on direct labour</i>	<i>60,000</i>	<i>48,000</i>	<i>10,800</i>	<i>1,200</i>	<i>1,20,000</i>
<i>Handle production runs</i>	<i>1,15,500</i>	<i>1,07,250</i>	<i>82,500</i>	<i>24,750</i>	<i>3,30,000</i>
<i>Setup machines</i>	<i>58,800</i>	<i>32,760</i>	<i>58,800</i>	<i>17,640</i>	<i>1,68,000</i>
<i>Support products</i>	<i>18,000</i>	<i>18,000</i>	<i>18,000</i>	<i>18,000</i>	<i>72,000</i>
<i>Run machines</i>	<i>1,05,000</i>	<i>84,000</i>	<i>18,900</i>	<i>2,100</i>	<i>2,10,000</i>
Total	3,57,300	2,90,010	1,89,000	63,690	9,00,000
<b>Operating income</b>	<b>2,42,700</b>	<b>1,89,990</b>	<b>(76,950)</b>	<b>(50,190)</b>	<b>3,05,500</b>
<b>Return on sales(%)</b>	<b>21.7</b>	<b>21.1</b>	<b>(36.8)</b>	<b>(202.8)</b>	<b>13.5</b>

# ABC– Benefits and Limitations

- ① More accurate and informative product costs lead to better pricing decisions.
- ② The activities driving costs are more accurately measured.
- ③ Managers gain easier access to the relevant costs.

**Benefits**

**Major  
Limitation**

An ABC system is very expensive to develop and implement, and very time-consuming to maintain.

QUESTIONS?







*Thank You!*