

# **Activity Based Costing**

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# **Costing: Some Key Issues**

## Direct and indirect costs

**Direct costs** can be specifically and exclusively identified with a given cost object – hence they can be accurately traced to cost objects

For example, the cost of materials that make a product or the wages of the workers that can be specifically linked to a particular product

**Indirect costs (overheads)** cannot be directly traced to a cost object

For example, supervisor costs, materials procurement, materials handling, production scheduling, warehouse costs, etc

# Generating Relevant Cost Information

Management and cost accounting system is required to generate **relevant** cost information:

**In particular, many indirect costs are relevant for decision-making:**

- The cost of many joint resources (e.g. support function costs) fluctuate according to the demand for them.
- Product introduction, discontinuation, redesign decisions determine the demand for support function resources and thus future costs.
- Costs of support functions are difficult to trace directly to cost objects.

**What is the appropriate basis to allocate indirect costs?**

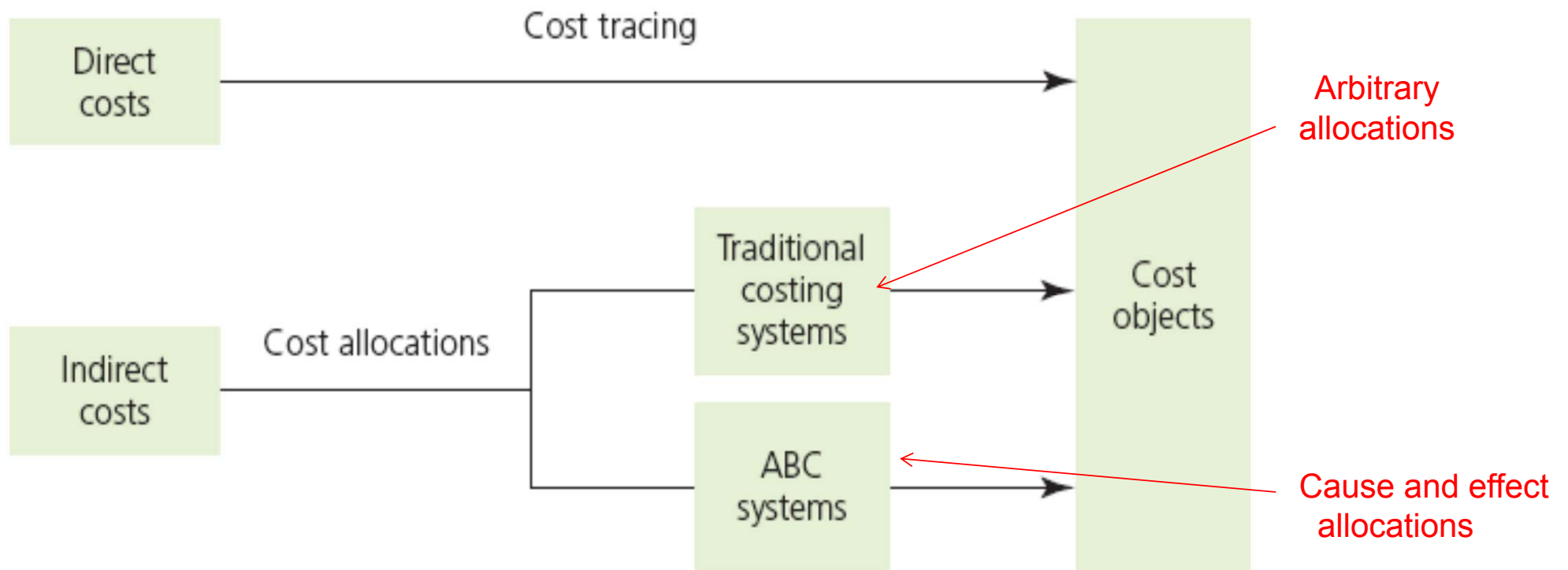
# Indirect costs

- Indirect costs assigned to cost objects (for example, products) using cost allocations.
- Cost allocation is therefore process of assigning costs to cost objects that involve the use of surrogate rather than direct measures - i.e. where a direct measure doesn't exist
- Surrogates known as allocation bases or cost drivers (for example, machine hours, direct labour hours).
- For accurate cost assignment, allocation bases should be significant determinants of the costs (i.e. cause-and-effect allocations)

# Assignment of direct and indirect costs

- Allocation bases that are not significant determinants of the costs are called arbitrary allocations (result in inaccurate cost assignment).
- Traditional costing systems use arbitrary allocations to a significant extent whereas more recent (ABC) systems rely mainly on cause-and-effect allocations (see figure on next slide).

## Cost allocations and cost tracing



## Traditional costing system

### Assigning indirect costs using blanket overhead rates

Some firms use a single overhead rate (i.e. blanket or plant-wide) for the organization as a whole.

#### *Example*

Total overheads	=	£900 000
Direct labour (or machine hours)	=	60 000
Overhead rate	=	£15 per hour



## Traditional Costing System

Assume that the company has 3 separate departments and costs and hours are analysed as follows:

	Dept. A	Dept. B	Dept. C	Total
Overheads	£200 000	£600 000	£100 000	£900 000
Direct labour hours	20 000	20 000	20 000	60 000
Overhead rate per DLH	£10	£30	£5	£15

Product Z requires 20 hours (all in department C)

Blanket overhead rate charge = £300 (20 hrs × £15)

Separate departmental overhead rate charge = £100 (20 hrs × £5)

Separate departmental rates should be used since product Z only consumes overheads in department C.

- A blanket overhead rate can only be justified if all products consume departmental overheads in approximately the same proportions:

Product X spends 1 hour in each department and product Y spends 5 hours in each department (Both blanket and departmental rates would allocate £45 to X and £225 to Y).

- If a diverse range of products are produced consuming departmental resources in different proportions separate departmental (or cost centre) rates should be established.

## Cost centre overhead rates

- Where a department/organisation contains a number of different centres (each with significant overhead costs) and products consume overhead costs for each centre in different proportions, separate overhead rates should also be established for each centre within a department.
- The terms cost centres or cost pools are used to describe allocation to which overhead costs are *initially* assigned.
- Frequently cost centres/cost pools will consist of departments but they can also consist of smaller segments within departments.

## The two-stage allocation process

To establish departmental or cost centre overhead rates a two-stage allocation procedure is required:

Stage 1 – Assign overheads initially to cost centres.

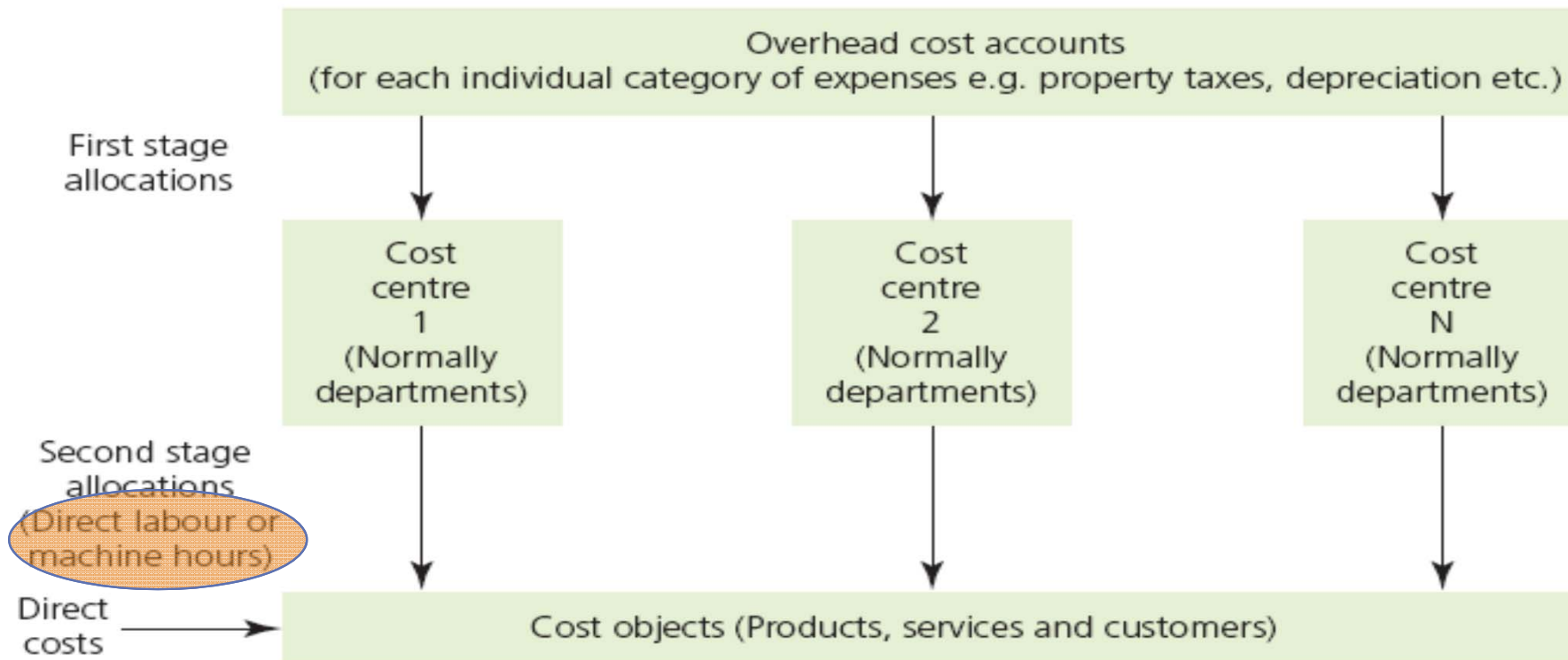
Stage 2 – Allocate cost centre overheads to cost objects  
(e.g.products)using second stage allocation bases/cost drivers.

Applying the **two-stage** allocation process requires the following **4 steps**:

1. Assigning all manufacturing overheads to production and service cost centres.
  2. Reallocating the costs assigned to service cost centres to production cost centres.
  3. Computing separate overhead rates for each production cost centre.
  4. Assigning cost centre overheads to products or other chosen cost objects.
- Steps 1 and 2 comprise stage one and steps 3 and 4 relate to the second stage of the two-stage allocation process.
  - Note that in **step 3** above traditional costing systems mostly use either direct labour hours or machine hours as the allocation bases.

An illustration of the two-stage allocation process for traditional and activity-based costing systems

### (a) Traditional costing systems



# **Activity Based Costing**

## Traditional costing systems:

- Designed decades ago
- Narrow range of products
- Direct labour and materials were the dominant factory costs
- Relatively small overhead costs
- High information processing costs



## Contemporary organizations:

- Wide range of products, increased complexity
- Direct labour represents only a small fraction of total costs
- Overhead costs are of considerable importance
- Information processing costs are no longer a barrier to introducing more sophisticated cost systems

# Cost systems - comparison

## **Traditional costing systems:**

- Use unsophisticated methods to allocate indirect costs to cost objects (direct labour hours or machine hours)

## **ABC systems:**

- Use sophisticated methods to allocate indirect costs to cost objects.
- ABC systems can more accurately measure resources consumed by cost objects by using different types of cost drivers that cause activity resource consumption and by assigning activity costs to cost objects

## Consider two factories A & B:

### Factory A

Annual output = 1,000,000 units of X

### Factory B

Annual output = 100,000 units of X plus total of 900,000 of 199 variations of X

Factory A and B have:

- Same number of units
- Same direct labour hours
- Same machine hours

## **BUT, factory B will require**

- More machine setters
- More production planners
- More material controllers
- More material handlers
- More inspectors

## **These extra overheads will mean**

- Overcosting of product X
- Undercosting of variations of X

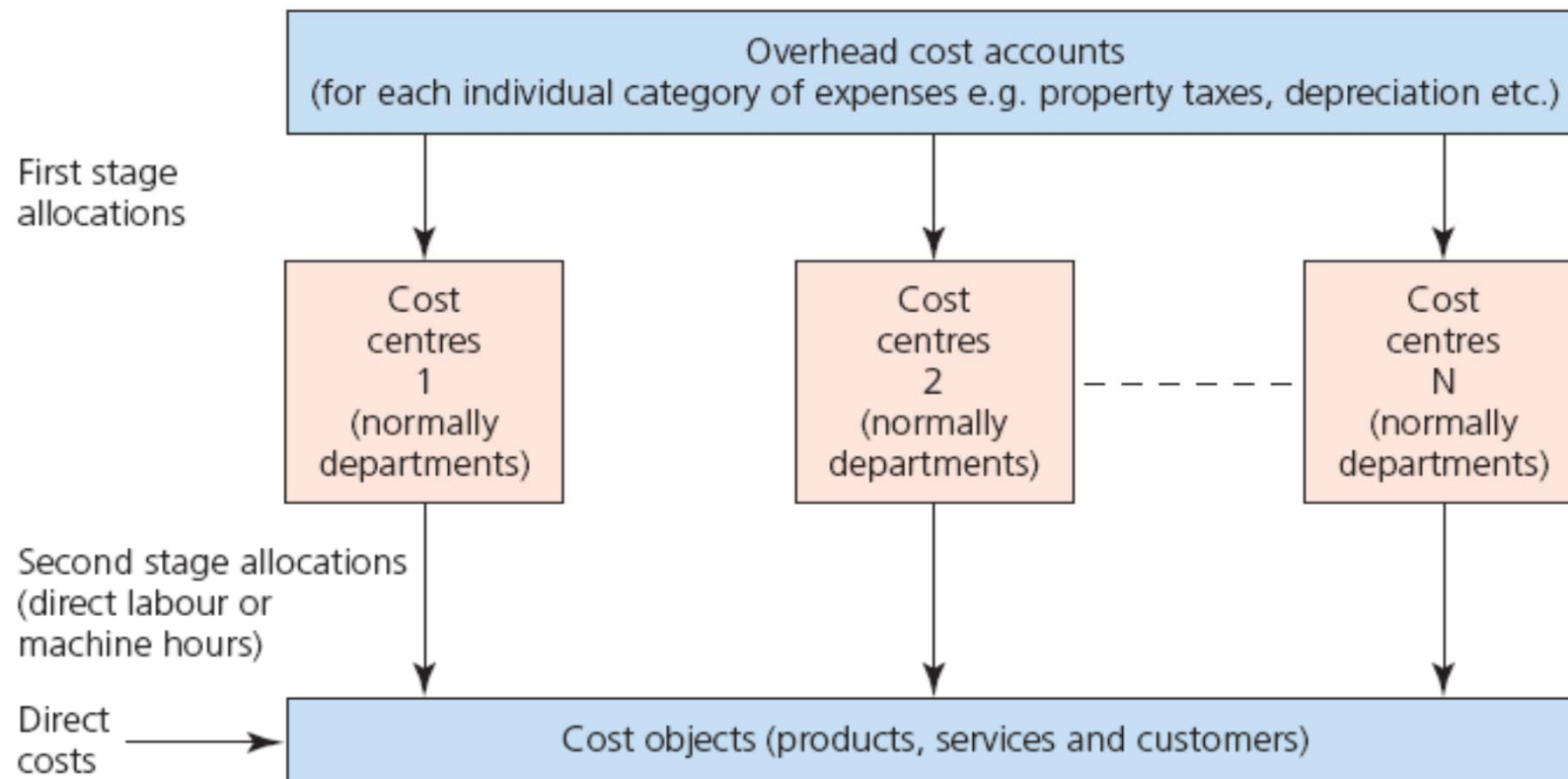
## **Consequences**

- Loose sales of product X
- Gain sales of variations of X at low price
- Reduced profitability

# A comparison of traditional and ABC systems

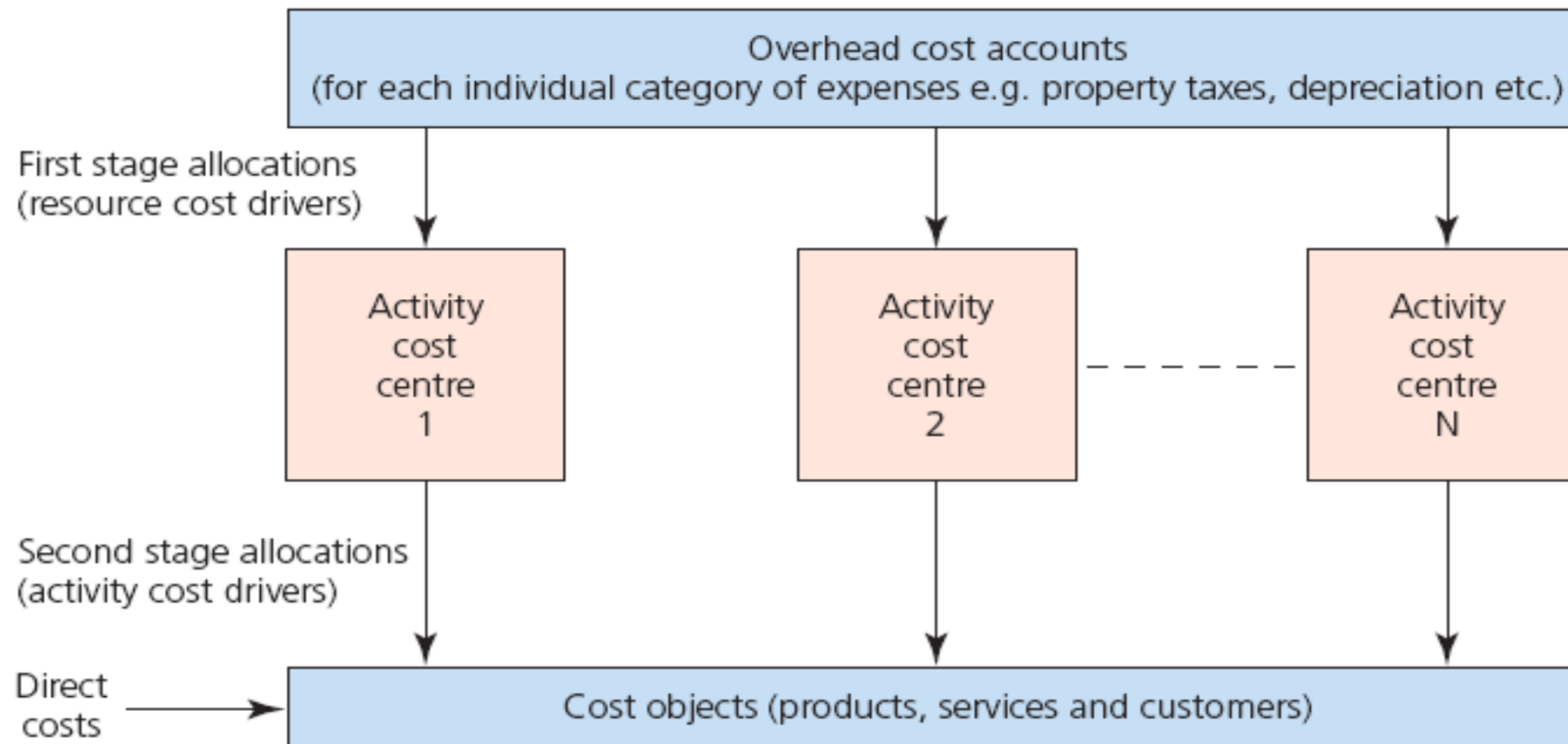
- Both systems use the two-stage allocation process.
- In the first stage traditional systems tend to allocate costs to departments whereas ABC systems allocate costs to activities: (ABC systems tend to have more cost centres/cost pools)
- In the second stage traditional systems rely on a small number of volume-based cost drivers (typically direct labour or machine hours) whereas ABC systems use many second stage cost drivers.
- ABC systems seek to use only cause-and-effect cost drivers whereas traditional systems often rely on arbitrary allocation bases.
- ABC systems tend to establish separate cost driver rates for support departments whereas traditional systems merge support and production centre costs.

### (a) Traditional costing systems



An illustration of the two-stage allocation process for traditional and activity-based costing systems

## (b) Activity-based costing systems



An illustration of the two-stage allocation process for traditional and activity-based costing systems

# The emergence of ABC systems

## **Traditional systems were appropriate when:**

1. Direct costs were the dominant costs
2. Indirect costs were relatively small
3. Information costs were high
4. There was a lack of intense global competition
5. A limited range of products was produced.



## Errors from relying on misleading product costs

Traditional costing systems use volume-based (e.g. direct labour and machine hours) second stage drivers but if volume bases are not the cause of indirect costs reported costs will be misleading.

## Errors from relying on misleading product costs

### *Example*

- Products HV (a high volume product) and LV (a low volume product) are two of several products produced by a company.
- HV is made in large batches and LV is made in small batches.
- Direct costs: HV £310,000; LV £40,000
- Sales Revenue: HV £600,000; LV £150,000
- HV consumes 30% of DLH's and LV consumes 5% (but each product consumes 15% of the batch-related indirect costs).
- The traditional system uses DLH's as the cost driver and the ABC system uses the number of batches processed.
- All overheads (total =£1m) are batch-related.

## Reported product costs:

	<i>Traditional system</i>		<i>ABC system</i>	
	Product HV	Product LV	Product HV	Product LV
	£	£	£	£
Direct costs	310 000	40 000	310 000	40 000
Overheads allocated	300 000 (30%)	50 000 (5%)	150 000 (15%)	150 000 (15%)
profits/ (losses)	(10 000)	60 000	140 000	(40 000)
Sales	600 000	150 000	600 000	150 000

- Traditional system reports misleading information —In the longer term overheads will not decline by £300 000 if HV is discontinued.
- ABC allocates on a cause-and-effect basis and shows high level of resources consumed by LV —The 2 costing systems report different messages (Traditional =Drop HV; ABC = Drop LV).
- Traditional system motivates the wrong strategy.

# Designing ABC systems

## **1. Identify the major activities that take place in an organization:**

- The activities chosen should be at a reasonable level of aggregation based on cost/benefit criteria.
- Choice of activities influenced by the total cost of the activity centre and the ability of a single cost driver to provide a satisfactory determinant of the cost of the activity.

## Designing ABC systems (contd.)

### **2. Assign costs to cost pools /cost centre for each activity:**

- Costs assigned to activity cost pools will include direct and indirect costs.
- Resource cost drivers used to assign indirect costs.
- Reliability of cost information will be reduced if arbitrary allocations are used to assign a significant proportion of costs to activities.

## Designing ABC systems (contd.)

### **3. Determine the cost driver for each major activity:**

- Drivers at this stage called activity drivers. They should:
  - (a) provide a good explanation of costs of each activity pool.
  - (b) be easily measurable
  - (c) the data should be easy to obtain and identifiable with the product.
- Activity cost drivers consist of transaction and duration drivers.
- The cost driver must be measurable so that it can be identified with individual products.

### **4. Assign the cost of activities to products:**

# Activity Hierarchies

## Unit-level activities:

1. Performed each time a unit of the product or service is produced.
2. Resources are consumed in proportion to the number of units produced or sold.
3. Examples —Direct materials and labour, energy costs and expenses consumed in proportion to machine processing time.

## Batch-related activities:

1. Performed each time a batch of goods is produced.
2. Costs vary with the number of batches made.
3. Examples include set-ups, purchase ordering and first-item inspection activities.



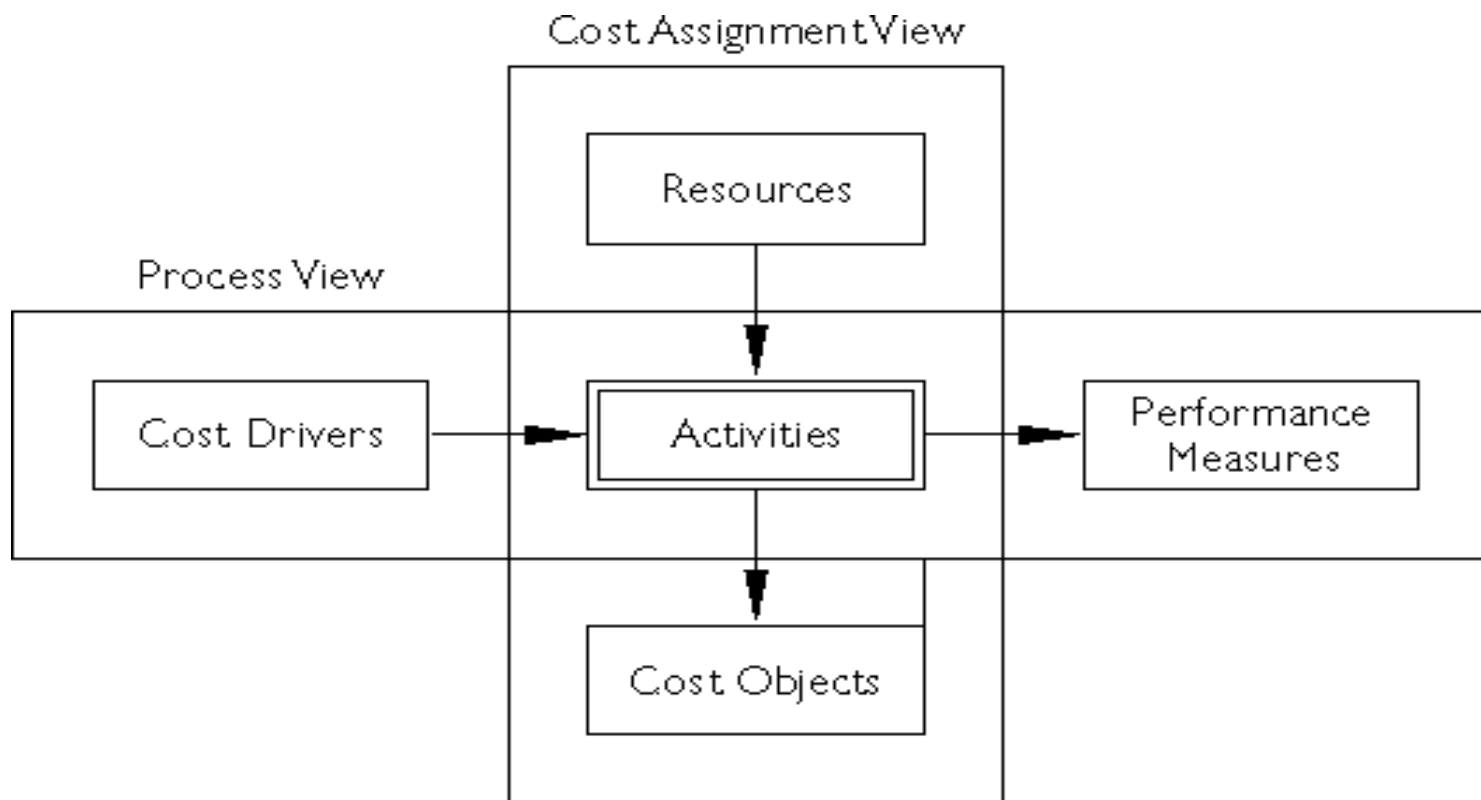
## Classification of activities contd.

### **Product/service sustaining activities:**

1. Performed to enable the production of individual products or services.
2. Examples include activities related to maintaining an accurate bill of materials, preparing engineering change notices.

### **• Facility-sustaining (or business-sustaining) activities:**

1. Performed to support the organization as a whole.
2. Examples include plant management, property costs and salaries of general administrative staff.
3. Common to all products and services –.not allocated to products/services.



## ABC cost management applications

ABC can be used for a range of cost management applications besides product costing.

## Criticisms of ABC

- ABC unit costs must be used with care —They can suggest an inappropriate degree of variability.
- The concept of unused capacity within the resource consumption model is questionable for physical resources.
- Reported costs may not significantly differ from a less costly traditional system if indirect costs are a low proportion of total costs.

**QUESTIONS?**

