Accounting For Decision Making

Topic 7

Costing products and services

Goals for this session…

- Explain why managers need estimates of the costs of both responsibility centres and products;
- Describe the basic principles for estimating responsibility centre and product costs;
- Explain the problems that arise in estimating the indirect costs of responsibility centres and products;
- Describe how to estimate a product's indirect costs using a business-wide overhead rate or departmental overhead rates and evaluate these approaches;
- Explain how to use activity-based costing to assign costs to products;
- Calculate the costs of products using activity-based costing; and
- Assess when it is appropriate to use activity-based product costing.

Why worry about Product Costs???

- Managers can use product cost information to…
  - Decide on what price to charge
  - Assess product or service profitability
  - Decide what to produce & how much to produce
  - Make outsourcing decisions
  - Plan future costs
  - Control costs
  - Reimburse cost contracts
  - Value inventory & COGS (for Balance Sheets & Income Statements)

Some definitions…

- *cost object* - items which are assigned a separate measure of cost (includes services/ products, customers)
- *direct costs* - can be identified with, or traced to, a particular cost object in an economic manner
- *indirect costs* - cannot be identified with or traced to a cost object in an economic manner
- *direct product costs* - manufacturing costs that can be traced to products in an economic manner

Product and Service costs

- ***direct material*** - cost of materials used to produce a product, where the cost can be traced to each product *in an economic manner*

- ***direct labour*** - costs of salaries, wages and labour on-costs for personnel *who work directly* on the manufactured product

- ***manufacturing overhead*** - *all other* costs of manufacturing

Overhead costs

- indirect materials and indirect labour
- costs of depreciation, insurance of factory, utilities and support departments
- costs of support departments
  - do not work directly on the product or service but are essential to the production process
- idle time and overtime premium

Cost Drivers

- A cost driver is a factor that **causes overhead costs** to be incurred

- In choosing an overhead cost driver, try to find the factor that **causes costs to vary**

Eg:

- *Labour cost or labour hours*
- *Machine hours*
- *Material cost*
- *Units produced*
- *Number of set-ups*

Allocating Indirect Costs…

The Aim:

To include in the product cost, the cost of the ***Indirect*** resources consumed by the product

The Method:

- Use a **business-wide** (aka **plant-wide**) overhead rate

- This involves:
  - **Identifying a cost driver** for overhead and estimating the cost driver volume for the coming year
  - Preparing an **overhead budget** for the coming year
  - **Calculating a** budgeted (**pre-determined**) **overhead rate** per unit of cost driver
  - Allocating (applying) indirect costs to products or services **using the budgeted rate** multiplied by the amount of cost driver used by each product or service

$$\frac{\text{Annual Budgeted Overhead for the Organisation.}}{\text{Annual Estimated Usage of the Cost Driver for the Organisation.}}$$

Overhead allocation ~ Plant-wide Rate…

- *What is the cost of a Batch of 4,200 Units of component?*

Direct materials 4,200 kg @ $50/kg	$210,000
Direct Labour 5,000 hours @ $28/hr	$140,000
Actual Machine Hours Worked	1060
Budgeted Overhead	$12.4m
Budgeted Machine Hours	125,000

Overhead Rate:

$$\frac{\text{Budgeted Overhead}}{\text{Budgeted Level of Cost Driver}} = \frac{\text{Budgeted Overhead}}{\text{Budgeted Machine Activity}}$$

$$= \frac{\$12.4m}{125{,}000hrs} = \$99.20/hour$$

Cost of the Batch is:

Direct Materials 4,200 kg @ $50/kg	$210,000
Direct Labour 5,000 hours @ $28/hr	$140,000
Prime Cost*	$350,000
Overhead	
1060 hours @ $99.20/hour	$105,152
Batch Cost	*$455,152*

(Unit Cost = Batch Cost / No of kgs = $455,152 / 4,200kg = *$108.37 per kg)*

* On the other hand, direct labour and manufacturing overhead costs are the costs incurred to convert the direct materials to finished goods. Direct labour and manufacturing overhead together are therefore called *conversion* costs.

Overhead allocation ~ Departmental Rates

- Accuracy of estimates of indirect costs of products and services can be **improved** by moving from a single, business-wide (plant-wide) overhead rate to **departmental overhead rates**

Departmental rate:

recognises that OH in different departments may be driven by different cost drivers

$$= \frac{\text{Annual Budgeted Overhead for the Dept.}}{\text{Annual Estimated Usage of the Cost Driver for the Dept.}}$$

An example
~ Plant-wide vs Departmental Overhead costing

Aurora Telecommunications Ltd manufactures 2 different fax machines for the business market. Cost estimates for the 2 models for the year 2014 are as follows:

	Basic System	Advanced System
Direct Material	$400	$800
Direct Labour (20 hours @ $15/hour)	300	300
Manufacturing O/H	400	400
TOTAL	$1,100	$1,500

The predetermined overhead rate used by Aurora is $20 per direct labour hour.

Each model of fax machine requires 20 hours of direct labour.

The basic system requires 5 hours in Department A & 15 hours in Department B.

The advanced system requires 15 hours in Department A & 5 hours in Department B.

The budgeted overhead costs in these 2 production departments are as follows:

	Department A	Department B
Variable Cost	**$16/direct labour hr**	**$4/direct labour hr**
Fixed Cost	**$200,000**	**$200,000**

The firm's management expects to operate at a level of 20,000 direct labour hours in each department during 2014.

Required:

1. ***Show how the company's plant-wide predetermined overhead rate was calculated.***

2. ***Calculate the departmental overhead rate for each Department.***

3. ***Calculate the product cost of each model using the Departmental overhead rate calculated in 2.***

1. Show how the company's plant-wide predetermined overhead rate was calculated.

	Department A	Department B
Variable overhead A 20,000 × $16 B 20,000 × $4	$320,000	$ 80,000
Fixed overhead	$200,000	200,000
Total overhead	$520,000	$280,000
Grand total of budgeted overhead (A + B):	$800,000	

Predetermined overhead rate = $\frac{\text{total budgeted overhead}}{\text{total budgeted direct labour hours}}$

= $\frac{\$800,000}{40,000}$ = ***$20 per hour***

2. Departmental overhead rates:

$$\frac{\text{Annual Budgeted Overhead for the Dept.}}{\text{Annual Estimated Usage of the Cost Driver for the Dept.}}$$

	Department A	*Department B*
Budgeted overhead (from requirement 1)	$520,000	$280,000
Budgeted direct labour hours	20,000	20,000
Predetermined overhead rates	$\frac{\$520,000}{20,000}$	$\frac{\$280,000}{20,000}$
	$26 per direct labour hour	**$14 per direct labour hour**

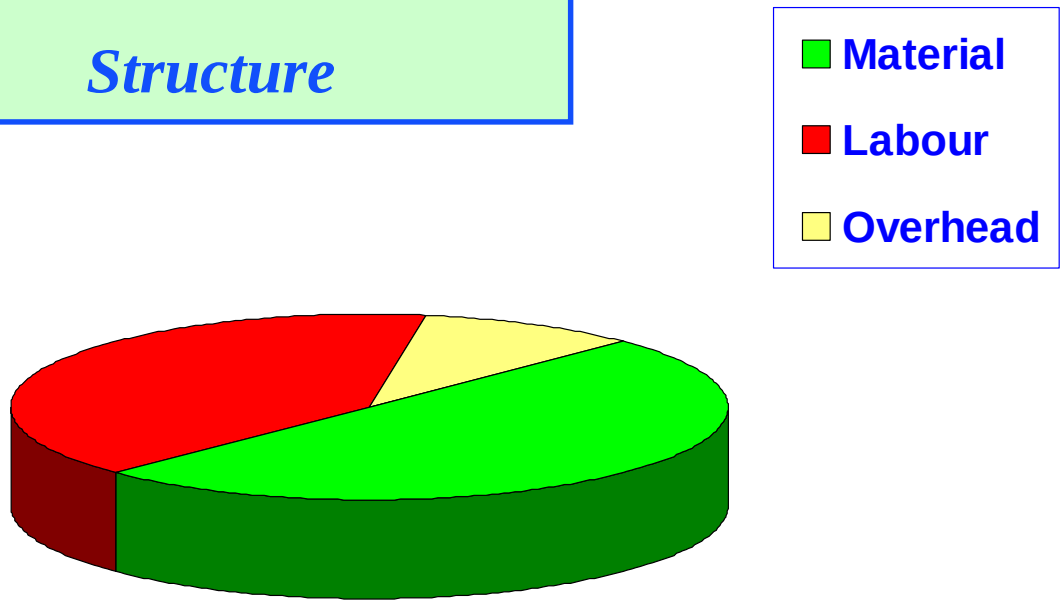
3. New product costs: (Allocating O/H using Departmental Rates)

	Basic System	Advanced System
Direct material	$ 400	$ 800
Direct labour	300	300
Manufacturing overhead:		
Department A: Basic system 5 × $26 Advanced system 15 × $26	130	390
Department B: Basic system 15 × $14 Advanced system 5 × $14	210	70
Total	**$1,040**	**$1,560**

Product Cost using Plant-Wide Rate $1,100 $1,500

The need for a different overhead allocation method…

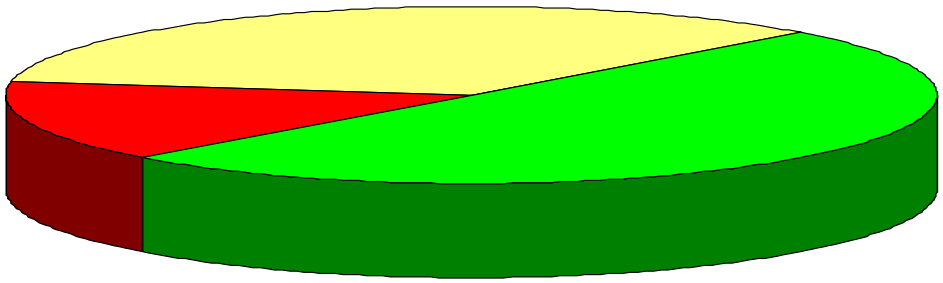
Traditional Cost Structure



… indirect costs form a <u>small</u> proportion of total product cost

… to address contemporary cost structures

Contemporary Cost Structure



… indirect costs form a <u>significant</u> proportion of total product cost

Activity Based Costing (ABC)

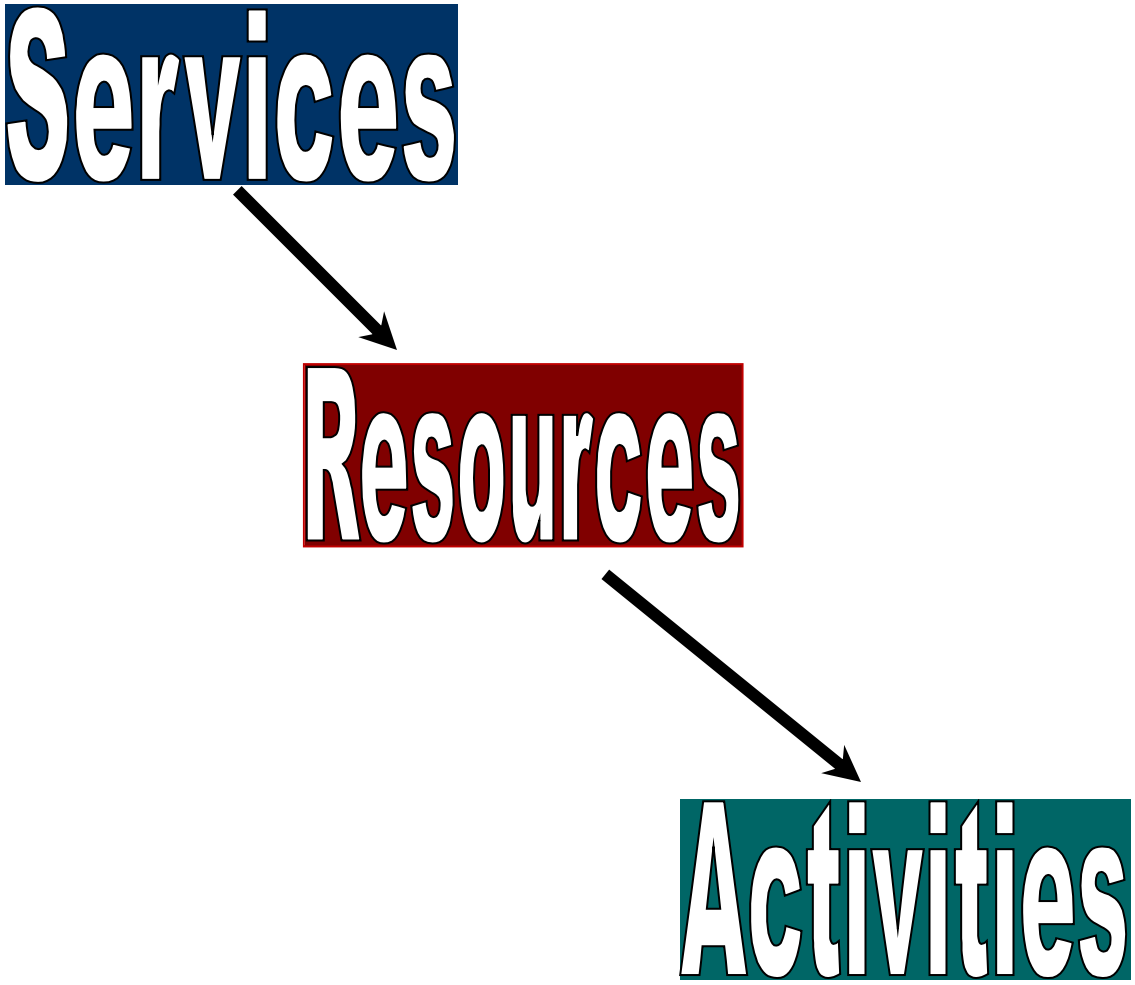
"A discipline that focuses on the *management of activities* as the route to continuously improving the *value* received by customers and the *outcomes obtained* by providing it"

Activity Based Costing

Is a system designed to provide:

- "accurate estimates" of the costs of services
- useful information for cost management
- the opportunity to focus on value sources other than costs

Simple Assumption



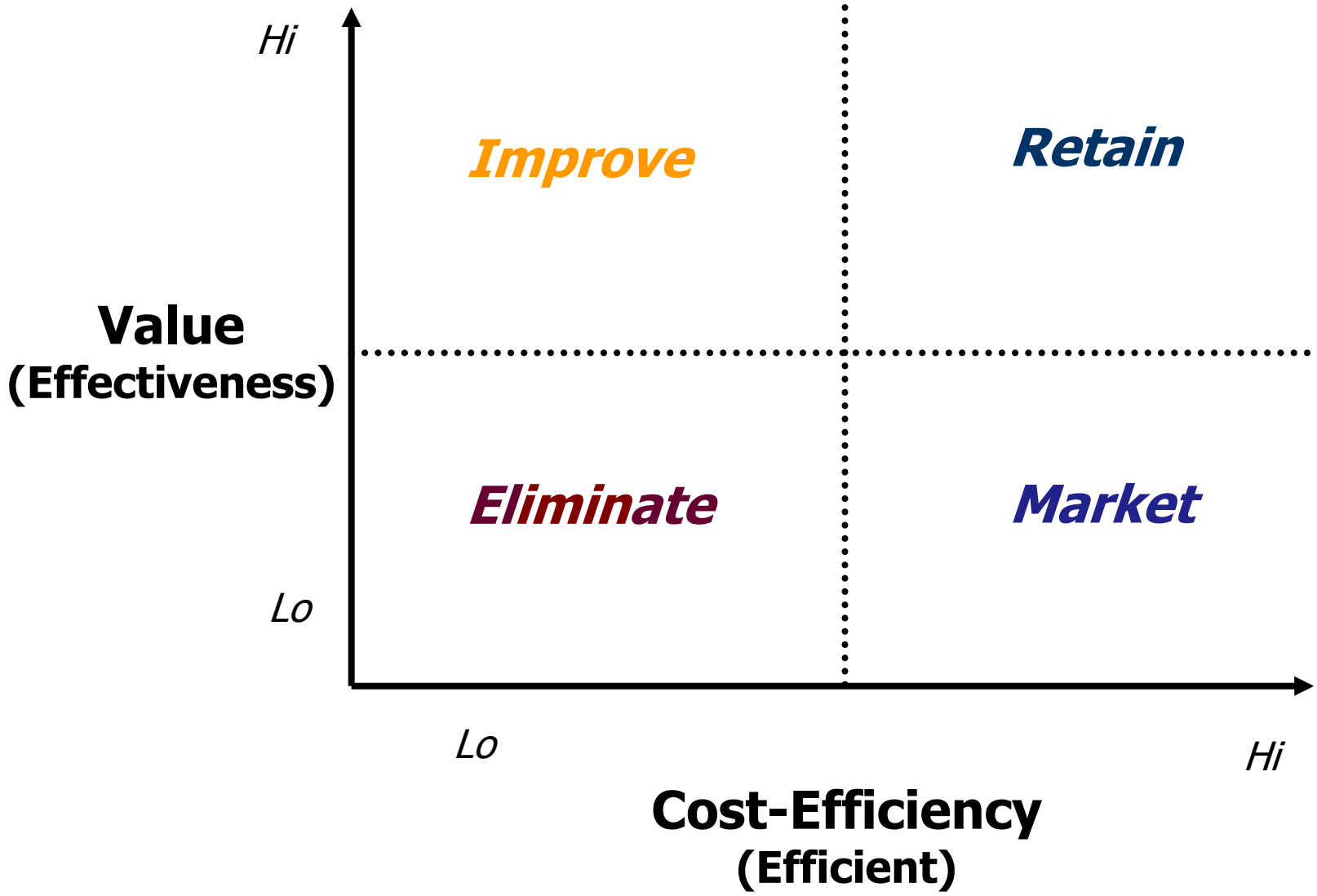
Identifying Organisations that need ABC...

- Indirect costs form a significant part of total product cost
- Diversified product range
- Production personnel dispute the output of the existing cost accounting system
- Cannot compete with industry competitors on price

Using ABC to improve value

- Determine the real causes of these costs
- Identify the major opportunities for cost reduction
- Develop a program to eliminate the causes, and, therefore, the costs
- Introduce performance measures to monitor the effectiveness of cost reduction efforts

The aim of ABC...



Why is this man so cross?

Conventional Overhead Allocation vs. ABC

CONVENTIONAL	*ABC*
• Costs collected by category - Labour costs, Rent, Power, etc	• Collects costs by activity
• Allocated to Cost Centres or Products - Person-hours worked, floor space used, capacity utilisation etc	• Allocates these costs using cost drivers (the factors which cause costs to be incurred)

COST OF PRODUCT ~ Conventional & ABC Comparison...

Conventional Allocation...

	Total	Product A	Product B
Direct Labour	250	50	200
Direct Material	300	200	100
Prime Cost	550	250	300
Overheads [a]	750	150	600
TOTAL	1,300	400	900

[a] (Overhead Allocation based on Direct Labour cost of units produced:

- Product A : $\frac{50}{250} \times 750 = 150$
- Product B : $\frac{200}{250} \times 750 = 600$)

ABC Allocation...

	Total	Product A	Product B
Direct Labour	**250**	**50**	**200**
Direct Material	**300**	**200**	**100**
Prime Cost	**550**	**250**	**300**
Overheads:			
Purchasing	150	120	30
Sales	130	50	80
Warehousing	150	100	50
Planning	220	180	40
Accounts	100	80	20
Total Overheads	**750**	**530**	**220**
TOTAL	**1,300**	**780**	**520**
TOTAL (Conventional)	**1,300**	**400**	**900**

OBSERVATIONS...

- Under the Conventional Approach to costing, Product A received only 20% of the total overhead cost
- Under the ABC Approach however, it can be seen that Product A generated a lot more overhead activity
- Under ABC, Product A should receive 70% of the total overhead cost
- The difference in cost between the Conventional and ABC approach is +95% for Product A and -42% for Product B!
- WHAT ARE THE IMPLICATIONS HERE???

A new way of thinking...

- **ABC tells us more (than Conventional Accounting) by recording the cost of each of the *activities***

⇨ " Why does (this activity) cost so much?"

⇨ "How can it be improved?"

- **Helps us to see how to *improve the process* rather than how to *contain costs*.**

COST MANAGEMENT ~ Conventional Accounting Method

(Overhead) Cost categories	Annual Cost ($)
Indirect labour Cost	93,200
Telephones	4,400
Travel & Entertaining	8,100
Computer Costs	6,200
Occupancy Costs	8,300
Administrative Overhead	6,200
TOTAL	126,400

What does this information tell us???

ABC Method

Cost categories	% of time	Annual Cost ($)
Process Requisitions		
Clarify details	13%	16,430
Prepare specifications	2%	2,530
Obtain quotes	1%	1,265
Vendor queries	3%	3,790
Negotiate & select vendors	1%	1,265
Generate orders	5%	6,320
Generate change orders	11%	13,900
	36%	45,500
Expedite Orders		
Vendor queries	6%	7,590
Chase late orders	4%	5,055
Amend for changed quantities	9%	11,375
Process urgent supplies/stockouts	10%	12,640
	29%	36,660
Process receipts		
Check of goods received	1%	1,265
Follow up short deliveries	8%	10,110
Follow up backorders	2%	2,520
Cancel orders no longer required	1%	1,265
Prepare reports & administration	23%	29,080
	35%	44,240
TOTAL	100%	126,400

OBSERVATIONS...

- The Conventional method does not tell us much about what is happening
  - What can be changed to improve quality or efficiency?
  - What decisions or actions can we take based on this?
- The ABC Approach provides a much clearer picture of how time is spent & opportunities for improvement
  - 13% of time is spent on clarifying requisitions & 11% of time is spent on processing change orders.
  - How much time & $ could be saved if this was right first time?

- *Only 1% of the department's time is spent on negotiating & selecting vendors. Could quality, delivery & cost of materials be improved by spending more time here?*

- *10% of time is spent on urgent orders. Would better planning reduce time here & enable smoother production?*

- *23% of time is spent on reports & administration. Is this all necessary? Could it be better directed to other activities?*

Winning with ABC includes:

- Identifying opportunities for improvement
- Better product management decisions
- Driving process improvement decisions
- Outsourcing decisions
- More successful operations management
- Improving product development strategies and decisions
- Budgeting and planning

Conclusions

- ABC cannot be another fad!

- Need real commitment from top-management including:
  - training
  - resources - software, time
  - a champion

- Ensure that buy-in includes the highest echelons of the organisation.

Conclusions (cont.)

- Have a broad base of people involved - a back-up champion!
- Don't have too many new ideas going at the same time
- Build confidence through short-term success
- Take up the challenge to make ABC a long-run solution.

Winning with Long-term Commitment

"... managers who expect results must be prepared to stick with the technique for years and not expect miracles in weeks or months"

Hilmer and Donaldson, Management Redeemed, 1996, p.84

Today's case…

Case 24.1: Body Glove