

MGT705 – Advanced Cost and Management Accounting

Lecture 1 – 45 Slides

Advertising	80000
Miscellaneous (office)	<u>8000</u>
	<u>276000</u>

Budgeted cash flows are as follows:

(All Rs 000s)	Q1	Q2	Q3	Q4
Receipts from customers	1000	1200	1120	985
Payments:				
Materials	400	480	440	548
Payments for wages	400	440	480	646
Other costs and expenses	120	100	72	14

You are **required** to prepare a master budget for the year 20X0 and the following budgets:

1. Sales budget
2. Production budget
3. Direct materials usage budget
4. Direct materials purchase budget
5. Direct labor budget
6. Factory overhead budget
7. Selling and administration budget
8. Cash budget

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Sales budget

- The sales budget shows the quantities of each product that the company plans to sell and the intended selling price.
- It provides the prediction of total revenue from which cash receipts from customers will be estimated.
- It also provides the basic data for constructing budgets for production costs, selling and distribution and administrative expenses.

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- The sales budget is therefore the foundation for all other budgets. If sales budget is not accurate, other budgets will be unreliable.

Assume market analysis show this result:

Product	Units sold	Price	Revenue
Alpha	8500	400	3400,000
Beta	1600	560	<u>896,000</u>
			<u>4296000</u>

- This will be supported by detailed budgets showing territories, monthly details by product.

Detailed monthly budget for 4 territories

Month	North		South		East		West		Total	
	units	value	units	value	units	value	units	value	units	value
January Alpha										
Beta	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Total										
Feb										
Mar										
Apr										
May										
Jun										
Jul										
Aug										
Sep										
Oct										
Nov										
Dec										
Total Alpha	3000	1200	2500	1000	1000	400	2000	800	8500	3400
Beta	500	280	600	336	200	112	300	168	1600	896

Annual Production budget

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	<u>Dept 1</u>	<u>Dept 2</u>
	<u>Alpha</u>	<u>Beta</u>
Units to be sold	8500	1600
Planned closing stock	<u>1870</u>	<u>90</u>
Total units required	10370	1690
Less planned opening stock	<u>170</u>	<u>85</u>
Units to be produced	<u>10200</u>	<u>1605</u>

The total production for each dept should also be analyzed on a monthly basis.

Direct materials usage budget

- The supervisors of depts 1 and 2 will prepare estimates of the materials required to meet the production budget.

	<u>Department 1</u>			<u>Department 2</u>		
	Units	price	total	units	price	total
Material X	102000	7.20	734400	12840	7.20	92448
Material Y	51000	16	<u>816000</u>	14445	16	<u>231120</u>
			1550400			323568

Working

Material X - 10200 units at 10 units per unit of alpha = 102000

- 1605 units at 8 units per unit of beta = 12840

Material Y - 10200 units at 5 units per unit of alpha = 51000

- 1605 units at 9 units per unit of beta = 14445.

Direct materials purchase budget

- The objective is to purchase materials at the right time and at the planned purchase price.
- It is necessary to take into account the planned raw material stock levels.

	<u>Material X</u>	<u>Material Y</u>
Quantity necessary for production	114840	65445
Planned closing stock	<u>10200</u>	<u>1700</u>

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	125 040	67145
Less: planned opening stock	<u>8500</u>	<u>8000</u>
Total units to be purchased	116540	59145
Planned unit purchase price	7.20	16
Total purchases	839088	946320

For detailed planning and control it will be necessary to analyze the annual budget on a monthly basis.

Factory overhead budget

- Anticipated activity
 - 102000 direct labor hrs (dept 1 – 10200 X 10hrs)
 - 24 075 direct labor hrs (dept 2 – 1605 X 15 hrs)

	Variable overhead rate		Overheads	
	Dept 1	Dept 2	Dept 1	Dept 2
Controllable overheads:				
Indirect material	1.20	.80	122400	19260
Indirect labor	1.20	1.20	122400	28890
Power (variable portion)	0.60	0.40	61200	9630
Maintenance (var portion)	0.20	0.40	20400	9630
Non-controllable overheads:				
Depreciation			100000	80000
Supervision			100000	40000
Power (fixed portion)			40000	2000
Maintenance (fixed portion)			45600	3196
Total overhead			612000	192606
Departmental overhead rate			6.00	8.00

Selling and Administration budget

- In practice separate budgets would be prepared for selling and for administration

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<u>Selling:</u>			
Salaries	74000		
Commission	60000		
Car expenses	22000		
Advertising	80000	236000	
<u>Administration:</u>			
Stationery	4000		
Salaries	28000		
Miscellaneous	8000	<u>40000</u>	
		276000	

Master budget

- When all the budgets have been prepared, the budgeted profit and loss account and balance sheet provide the overall picture of the planned performance for the budget period.

<u>Budgeted profit and loss account for the year ending 20X0</u>			
Sales (schedule 1)		4296000	
Opening stock of raw material	189200		
Purchases (schedule 4)	1785408		
Less closing stock of raw material	<u>(100640)</u>		
Cost of raw material consumed	1873968		
Direct labor	1512900		
Factory overhead (schedule 6)	<u>804606</u>		
Total manufacturing cost	4191474		
Add opening stock of finished goods	99076		
Less closing stock of finished goods	<u>(665984)</u>		

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Cost of sales	<u>3624566</u>
Gross profit	671434
Selling and administration expenses	<u>276000</u>
Budgeted operating profit for the year	<u>395434</u>

Inventory valuation

	Alpha		Beta	
	units	Rs	Units	Rs
Direct materials				
X	10	72.00	8	57.80
Y	5	80.00	9	144.00
Direct labor	10	120.00	15	180.00
Factory Overheads:				
Dept 1	10	60.00		
Dept 2		_____ 15		<u>120.00</u>
		332.00		501.60

Closing stock:

Alpha 1870 units @ 332 = 620840

Beta 90 units @ 501.60 = 45144

665984

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Budgeted Balance Sheet

Fixed assets:

Land		170000
Buildings and Equipment	1292000	
Less depreciation	435000	<u>857000</u>
		1027000

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Current assets:

Raw material stock	100640
Finished goods stock	665984
Debtors	280000
Cash	<u>199170</u>
	1245794

Current Liabilities:

Creditors	307884	<u>937910</u>	
			1964910
Represented by			=====
120000 ord shares Rs 10 each	1200000		
Reserves	369476		
Profit and Loss account	395434	1964910	
			=====

Workings

- depn: $255000 + 180000 \text{ (sch 6)} = 435000$
- Debtors: $289000 \text{ (o/bal)} + 4296000 \text{ (sales)} - 4305000 \text{ (cash recd)} = 280000$
- Cash – closing bal per budget
- Creditors: $248800 \text{ (o/bal)} + 1785408 \text{ (purchases)} + 141660 \text{ indirect materials} - 1876984 \text{ (cash paid)} = 307884$

Cash Budgets

- Cash budgets help a firm to identify cash balances that are surplus to its requirements, these can be invested in the short term.
- They also identify cash deficiencies which need to be arranged to meet the requirements.
- The overall aim should be to attain maximum cash availability and earn maximum return on idle funds.

	Q1	Q2	Q3	Q4	Total
Opening balance	34000	114000	294000	421984	34000
Receipts from debtors	<u>1000000</u>	<u>1200000</u>	<u>1120000</u>	<u>985000</u>	<u>4305000</u>
	<u>1034000</u>	<u>1314000</u>	<u>1414000</u>	<u>1406984</u>	<u>4339000</u>
Payments:					

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Purchase of material	400000	480000	440000	547984	1867984	Payment of wages
	400000	440000	480000	646188	1966188	
Other costs and expenses	120000	100000	72016	13642	305658	
	920000	1020000		992016	1207814	4139830
Closing balance	114000	294000	421984	199170	199170	

Final Review

- The budgeted profit and loss account, balance sheet and cash flow will be submitted to the budget committee for review.
- Financial ratios such as return on capital employed, working capital, liquidity and gearing ratios will be reviewed.
- In the example ROCE is 20% but the working capital ratio is 4:1, so management should consider ways of reducing investment in working capital, before finally approving the budget.

Activity based budgeting

- For those indirect costs and support activities where consumption of resources does not vary with output of products, conventional budgets merely serve as authorization for certain levels of spending for each item of expense.
- Performance reporting normally implies little more than checking whether the budget has been exceeded.
- With conventional budgeting indirect costs and support activities are prepared on an incremental basis. This means current budgeted allowance for existing activities is taken as the starting point.
- The base is then adjusted for changes which are expected to occur. This is called incremental budgeting.

Incremental approach to budgeting

- In incremental budgeting the expense may be based on the previous budgeted allowance plus an increase to cover higher prices.
- The major disadvantage of the incremental approach is that the majority of expenditure associated with the base activity remains unchanged.
- Past inefficiencies and waste is perpetuated.
- To manage costs more effectively, organizations that have implemented Activity Based Costing have also adopted activity based budgeting (ABB)

Activity based budgeting

- The aim of ABB is to authorize supply of only those resources that are needed to perform required activities to meet the production volume.
- In ABB cost objects are the starting point. Their budgeted output determines the necessary activities, which are then used to estimate the resources required.

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Stages in ABB

- ABB involves the following stages:
 - Estimate the production and sales volume by individual products and customers.
 - Estimate the demand for organizational activities
 - Determine the resources required to perform the organizational activities.
 - Estimate for each resource, the quantity required to meet demand.
 - Take action to adjust the capacity of resources to match projected supply.
- The first stage is identical to conventional budgeting.
- Next ABB extends conventional budgeting to support activities such as ordering, receiving, scheduling production and processing customer orders.
- Estimates of quantities of activity cost drivers must be derived for each activity. E.g. number of Pos, number of receipts, number of set-ups and number of customer orders processed
- Third stage is to estimate the resources required for performing quantity of activity drivers demanded. E.g if orders processing is estimated at 5000 and each order takes 30 minutes processing time, then 2500 labor hours of customer order processing must be supplied.
- The final stage is to compare the quantity of resource required with the resources currently committed.
- Where necessary, additional spending must be authorized in the budget to acquire additional resources.
- Alternatively, if the demand for resources is less, the budget process should result in action to reduce resources no longer needed.

Budgeting in non-profit organizations

- Budgeting in non-profit organizations normally begins with managers of various activities calculating the costs of maintaining ongoing activities.
- Then costs of further development of services are added.
- The available resources should be sufficient to cover total costs of such services.
- One difficulty encountered is that precise objectives are not defined in a quantifiable way.
- Actual accomplishments are difficult to measure.
- In most situations output cannot be measured in monetary terms.
- In profit oriented organizations output can be measured in sales revenue terms.
- The effect is that budgets in non-profit organizations tend to be concerned mainly with input of resources.
- There is not the same emphasis on what is intended to be achieved for a given input of resources.

Line item budgets

- A line item budget is where the expenditures are expressed in considerable detail, but the activities being undertaken are given little attention.
- Line item budget shows the nature of the spending but not the purpose.
- Compliance with these budgets provides no assurance that resources are used wisely, effectively or efficiently in financing various activities.

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Example – preparation of cash budget

- The management of Kader Bux Ltd has been informed that the union of direct workers intends to call a strike. The accountant has been asked to advise management on the effect the strike will have on cash flow.

The following budget data was made available:

	Week 1	week 2	Week 3
Sales	400 units	500 units	400 units
Production	600 units	400 units	nil

The strike will commence beginning of week three, and will continue for at least 4 weeks.

Sales at 400 units per week will continue during the strike period until stocks of finished goods are exhausted.

Kader Bux Ltd...

- Production will stop at the end of week 2. The current stock of finished goods is 600 units
- Selling price of the product is Rs 60 and manufacturing cost is made up as follows:
 - Direct material 15
 - Direct wages 7
 - Variable overheads 8
 - Fixed overheads 18
 - Total 48

Direct wages are regarded as variable cost.

- The company operates full-absorption costing and the fixed overhead absorption rate is based on budgeted fixed overheads of Rs 9000 per week.
- Included in the fixed overheads is Rs 700 for depreciation of equipment.
- During the period of the strike direct wages and variable overheads would not be incurred and the cash expended on fixed overheads would be reduced by Rs 1500 per week.
- The current stock of raw material are worth Rs 7500, it is intended that these stocks should increase to Rs 11000 by the end of week 1 and then remain at this level during the period of the strike. All direct materials are paid for 1 week after they have been received.
- Direct wages are paid one week in arrear.
- All relevant overheads are paid immediately as the expense is incurred.
- All sales are on credit, 70% of sales value is received in cash at the end of the first week, and balance at the end of the second week.
- The current amount outstanding to suppliers is Rs 8000 and direct wage accruals amount to Rs 3200. Both of these will be paid in week 1.
- The current balance owing from debtors is Rs 31200 of which Rs 24000 will be received during week 1, and the remaining during week 2.
- The current balance of cash in hand and at bank is Rs 1000.

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Required : (a)

- (i) prepare a cash budget for weeks 1 to 6 showing the balance of cash at the end of each week together with a suitable analysis of receipts and payments during each week.
- (ii) comment upon any matters arising from the cash budget which you consider should be brought to the management's attention.
- (b) explain why reported profit figure for a period does not normally represent the amount of cash generated in that period.

Solution - Kader Bux Ltd

Cash Budget for week 1 – 6							
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	
Receipts from debtors	24000	24000	28200	25800	19800	5400	
Payments :							
To material suppliers	8000	12500	6000	-	-	-	
To direct workers	3200	4200	2800	-	-	-	
For variable overheads 4800	3200	-	-	-	-	-	
For fixed overheads	8300	8300	6800	6800	6800	6800	
Total payments	24300	28200	15600	6800	6800		
Net movement	-300	-4200	12600	19000	13000	-	1400
Opening bal (wk 1 given)	1000	700	-3500	9100	28100	41100	
Closing balance	700	-3500	9100	28100	41100	39700	

Workings :							
	week 1	week 2	week 3	week 4	week 5	week 6	
Debtors							
Units sold	400	500	400	300	-	-	
Sales	24000	30000	24000	18000	-	-	
Cash received (70%)	16800	21000	16800	12600	-	-	
(30%)			7200	9000	7200	5400	
given	24000	7200					

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Total receipts	24000	24000	28200	25800	19800	5400	
Sales in week = opening stock (600 units) + production in weeks 1 and 2 (1000 units) less sales in weeks 1 to 3 (1300 units) = 300 units							
Creditors	Week 1	week 2	week 3	week 4	week 5	week 6	
Materials consumed							
@ Rs 15	9000	6000	-	-	-	-	
Increase in stocks	3500						
Materials purchased	12500	6000					
Payment to suppliers	8000	12500	6000				(given)
Wages							
Wages consumed							
@ Rs 7	4200	2800	-	-	-	-	
Wages paid	3200	4200	2800	-	-	-	(given)
Variable overhead payments = budgeted production X budgeted cost per unit.							
Fixed overhead payments for weeks 1-2 = fixed overheads (9000) less depn (700)							
Fixed overheads for weeks 3-6 = 8300 (normal) less 1500 per week.							

(ii) Comments for Management

- Finance will be required to meet the cash deficit in week 2, but lowering of budgeted material stocks at end of week 1 would reduce the borrowing at end of week 2.
- Surplus cash after week 2 should be invested on short-term basis.
- After week 6 there will be no cash receipts, only outflows of Rs 6800 per week. The closing balance of Rs 39700 at the end of week 6 will be sufficient for a further 5 to 6 weeks (39700/6800)

(b) Profits and cash-flows

- According to the matching concept, revenues and expenses may not be attributed to the same period as the related cash flows.
- Some items of expense do not affect cash flow e.g. depreciation.

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Zero-based budgeting

- Zero-based budgeting (also known as priority based budgeting) emerged to overcome the limitations of incremental budgets.
- This approach requires that all activities are justified and prioritized before a decision is taken to allocate resources.
- Zero-based budgeting also focuses on programs and activities instead of line items of traditional budgeting.
- ZBB works on the premise that each year's budget should be compiled as if the programs were being launched for the first time.
- All funds are allocated on the basis of cost-benefit or similar analysis.
- It questions long standing assumptions and serves as a tool for systematically examining any unproductive projects.
- It is best suited for discretionary costs such as advertising, research and development and training.

ZBB involves the following three stages:

- A description of each organizational activity
- Evaluation and ranking of decisions in order of priority
- Allocation of resources based on order of priority upto the spending cut-off level.

Benefits of ZBB

- Benefits of ZBB over traditional methods are being claimed as follows:
 - ZBB avoids the deficiencies of incremental budgeting and represents a move towards the allocation of resources on need basis. The level of funding is not taken for granted.
 - ZBB takes a questioning attitude rather than one that assumes current practices represent value for money.
 - ZBB focuses attention on output in relation to value for money.

ZBB – lack of success

- The main reason for its lack of success would appear to be that its too costly and time-consuming.
- The process of identifying decisions and determining their purpose, cost and benefits is extremely time-consuming.
- Frequently there is insufficient information available to evaluate and rank decisions.
- Organizations tend to approximate the principles of ZBB rather than applying the full scale approach. E.g. applied to some areas of the organization selectively.

Transfer pricing

- Financial means for evaluating divisional performance
- Established transfer price is a cost to the receiving division and revenue to the supplying division
- Transfer price will affect profitability of both divisions
- Transfer pricing can also apply to cost centers i.e. support / service centers, sometimes there is no need for a profit element to be included.

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Purpose of transfer pricing

- To provide information that motivates divisional managers to make good economic decisions.
- To provide information useful for evaluating managerial performance, and economic performance of divisions and cost centers.
- To intentionally move profits between divisions or locations.
- To encourage divisional autonomy.

Information for good economic decisions

- Goods transferred from one division to another are known as intermediate products, whereas those sold to the outside world are known as final products.
- Transfer prices are used to determine the values of intermediate products.
- It can also be used for decisions on whether the product should be sold or processed further. This is done on incremental cost basis.
- Managers must take care not to treat transfer price as incremental cost.

- For example assume the incremental cost of an intermediate product is Rs 100 and additional cost of further processing is Rs 60.
- The incremental cost of the final product will therefore be Rs 160.
- Also assume there is temporary excess capacity, and that the market price of the final product is Rs 200.
- The correct decision would be to convert intermediate product to final product.
- If the transfer price was based on full cost plus profit margin and set at Rs 150, the incremental cost of the final product would be Rs 210 (150 + 60).

- The manager would decide not to purchase the intermediate product for further processing, as the incremental cost is more than the selling price. This would be an incorrect decision.
- The problem would be overcome if transfer price is set at the incremental cost which is Rs 100 in this example.

Evaluating divisional performance

- The price at which goods are transferred from one division to another, will influence the division's reported profits.
- An unsound transfer price will result in a misleading performance measure.
- The divisional manager may feel the transfer price is affecting his performance unfairly.
- This may have negative motivational consequences.

Conflict of objectives

- No single transfer price will perfectly serve all four specified purposes. They often conflict and managers are forced to make trade-offs.
- The decision-making and the performance evaluation may conflict with each other.
- E.g. sometimes in the short-term, the transfer price for optimal economic decision is the marginal cost. Very often this will equal variable cost.

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- The supplying division will fail to recover its fixed overheads and may report a loss.
 - Further, as shown, transfer price satisfactory for divisional performance (Rs 150) leads to incorrect decisions from a company wide perspective.
-

LECTURE # 23

Topic: Alternative transfer pricing methods

- There are five different types of transfer pricing methods which can be used by companies.
- Market-based transfer prices: these are listed prices of identical or similar products.
- Marginal cost transfer prices, mostly variable cost in the short run. Interpreted as direct costs and variable indirect costs.
- Full cost transfer prices, include cost of all resources committed to a product in the long run
- A cost-plus transfer price, a mark-up is added to enable supplying division to make a profit.
- Negotiated transfer prices, by managers of supplying and receiving divisions.

Market based transfer prices

- Where perfectly competitive market for an intermediate product exists, it is optimal for both decision making and performance evaluation to set transfer price at the competitive market price.
- Perfect competition exists where the product is homogeneous and no individual buyer or seller can affect price.
- When transfers are recorded at market price, divisional performance is likely to represent real economic contribution to the company profits. Profits are likely to be similar as if the divisions were separate companies.

The effect of selling expenses

- In practice company profits will be different when the intermediate product is acquired internally or externally.
- Selling expenses will be incurred when selling intermediate product in the external market.
- Companies modify the market prices to allow a margin to account for selling expenses

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Other market imperfections

- Markets are unlikely to be perfectly competitive.
- Also, transferred products may have special characteristics. Market price is appropriate only when quality, delivery and discounts are identical.
- It may be possible to purchase intermediate product in the market at a temporary low price. If supplying division has excess capacity, incorrect decisions may arise from the market price rule.

Example

- A supply division has spare capacity and produces intermediate product at an incremental cost of Rs 1000; transfer price of this product is set at the external market price Rs 1600.
- Suppose a supplier sells in the market at a temporary distress price of Rs 1500, the receiving division will prefer to purchase from the external supplier.
- The relevant cost for the company of making the product is Rs1000; hence the market price rule can motivate the manager to take decisions not in the best interest of the company.

Market imperfections

- These complications arise as markets are not perfectly competitive.
- Many companies use adjusted market-based transfer price to reflect temporary imperfection of markets.
- Such transfer prices are perceived as being fair by the divisional managers for performance evaluation.
- Also divisional autonomy is unlikely to be undermined.

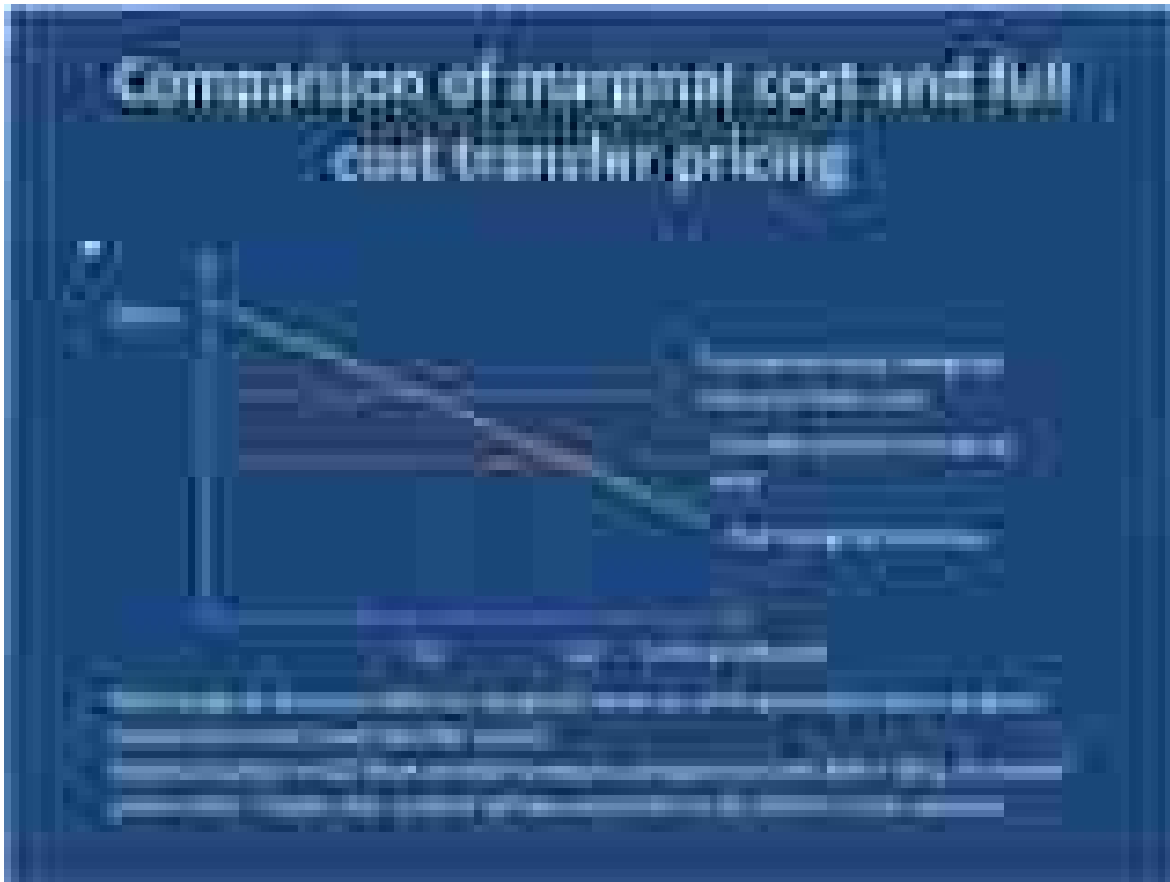
Marginal Cost Transfer Prices

- Marginal cost transfer prices can motivate both supplying and receiving managers to operate at output levels that will maximize overall company profits.
- Marginal cost is constant per unit throughout the relevant output range and equivalent to short-term variable cost.
- Variable cost is optimal only when the short-term perspective is adopted.

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Comparison of marginal cost and full cost transfer pricing



Marginal cost transfer pricing

- Surveys have shown that less than 10% of companies transfer goods at marginal cost.
- The major reason is that supplying division does not cover its full cost, and profits are understated, whereas receiving division is not charged with full cost and its profits are overstated.
- This is inaccurate information for evaluating performance.
- A further problem is that marginal costs may not remain constant over the entire range of output.
- Low usage of marginal cost transfer prices suggests that managers do not view product related decisions as short-term, and marginal cost is taken as short-term variable cost. A long run marginal cost is more appropriate.

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Full cost transfer prices

- Full cost transfer prices or full cost plus mark-up are widely used in practice.
- Managers view product related decisions as long-run decisions.
- They are preferable for performance evaluation.
- Transfer pricing above variable cost may be consistent with 'economist's marginal cost.
- E.g. the economist would argue that extra wear and tear caused by plant usage is part of marginal cost. The accountant allows for this in depreciation which is taken as fixed cost.
- The major problem with full cost transfer prices is that they are derived from traditional costing systems, which can provide poor estimates of long run marginal costs.
- Ideally full cost transfer prices should be derived from activity based costing systems.
- A further problem with full cost transfer prices is that they do not provide an incentive to the supplying division as they do not include a profit margin.

Cost plus mark-up transfer prices.

- Cost plus transfer prices attempt to meet the performance evaluation purpose of transfer pricing.
- Sometimes variable costs are used as the base cost and a mark-up added to cover fixed cost as well as profit margin. In such cases the full cost will be more inaccurate than traditional systems.
- A further problem arises when we extend our analysis beyond two divisions. If each division transfer product at cost plus 20%, then the mark-up can be enormous by the time mark-up is added by the final division.

Negotiated transfer prices

- Negotiated transfer prices are most suited where some market imperfection exists.
- Managers have the freedom to buy and sell outside the company and engage in a bargaining process.
- It is claimed that the friction and ill-feeling of centrally controlled transfer prices will be eliminated.
- It is important that managers have equal bargaining power. Unequal bargaining power can occur if transfers are a small proportion of business for one division and a larger proportion of the other division.

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- The situation may arise where divisional managers cannot agree on a mutually satisfactory transfer price. Central headquarter may then have to resolve the dispute.
- This raises behavioral problem with respect to morale and motivation, it also means at the time of performance evaluation, managers will be held responsible for decisions they did not make.
- Nevertheless the support and involvement of top management must be available to intervene to avoid sub-optimal decisions.

Limitations of negotiated transfer prices

- They depend on negotiating skills and bargaining power of managers, final outcome may not be optimal.
- They can lead to conflict between divisions.
- Managers may have unequal bargaining power.
- They are time-consuming where a large number of transactions are involved.

LECTURE # 24

An illustration of transfer pricing

- The Thar division and the Makran division are divisions within the Balochistan Group.
- One of the products manufactured by the Thar division is an intermediate product for which there is no external market.
- This intermediate product is transferred to the Makran division where it is converted into a final product for sale in the external market.
- One unit of the intermediate product is used in the production of the final product.

An illustration of transfer pricing:

- The expected units of the final product which the Makran division estimates it can sell at various prices is as follows:

– Selling price	Quantity sold
100	1000
90	2000
80	3000

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70	4000
60	5000
50	6000

An illustration of transfer pricing:

- The costs of each division are as follows:
- | | |
|-------------------------|---------------------------|
| Thar | Makran |
| Variable cost per unit | 11 7 |
| Fixed cost attributable | 60,000 90,000 |
- The transfer price of the intermediate product has been set at Rs 35 based on full-cost plus mark-up.

An illustration of transfer pricing:

- At transfer price of Rs 35, profit computation for each division will be:

Thar division (supplying division):

Output	Revenue	Variable Cost	Fixed cost	Profit
1000	35000	11000	60000	(36000)
2000	70000	22000	60000	(12000)
3000	105000	33000	60000	12000
4000	140000	44000	60000	36000
5000	175000	55000	60000	60000
6000	210000	66000	60000	84000

An illustration of transfer pricing

- Makran Division (receiving):**

Output	Revenue	variable	transfer	fixed cost	profit
2000	100000	7000	35000	90000	(32000)
2000	180000	14000	70000	90000	6000
3000	240000	21000	105000	90000	24000
4000	280000	28000	140000	90000	22000
5000	300000	35000	175000	90000	0
6000	300000	42000	210000	90000	(42000)

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An illustration of transfer pricing

- The supplying division maximizes profits at an output level of 6000 units whereas the receiving division maximizes profits at an output level of 3000 units.
- Receiving division will therefore purchase 3000 units from the supplying division.
- This is because Makran will expand output as long as net marginal revenue exceeds transfer price.
- Net marginal revenue = marginal revenue from sale less marginal cost of conversion (excl transfer price)

An illustration of transfer pricing

Units	Net marginal revenue
1000	93000 (100000 – 7000)
2000	73000 (80000 – 7000)
3000	53000 (60000 – 7000)
4000	33000 (40000 – 7000)
5000	13000 (20000 – 7000)
6000	-7000 (0 – 7000)

Faced with a transfer price of Rs 35000 per 1000 units, the Makran division will not expand output beyond 3000 units because the transfer price for each batch will exceed the net marginal revenue.

An illustration of transfer pricing

- Profits at different output levels for the company as a whole. Note these calculations do not incorporate transfer prices as they are inter-company items and will cancel out.

output	Revenues	variable cost	fixed	profit
1000	100000	18000	150000	(68000)
2000	180000	36000	150000	(6000)
3000	240000	54000	150000	36000
4000	280000	72000	150000	58000
5000	300000	90000	150000	60000
6000	300000	108000	150000	42000

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- The profit maximizing output for the company as a whole is 5000 units. Therefore the current transfer pricing system does not motivate divisional managers to operate at the optimum level for the company as a whole.

An illustration of transfer pricing

- To induce overall company optimality the transfer price must be set at the marginal cost of the supplying division, which is the unit variable cost of Rs 11 per unit.
- Therefore transfer price for a batch of 1000 units should be Rs 11000.
- Now the receiving division will expand output as long as net marginal revenue exceeds transfer price.
- Net marginal revenue at 5000 units is Rs 13000, the transfer price is Rs 11000, therefore expanding output to this level will increase profits.
- Setting the transfer price at the unit marginal cost of the supplying division will motivate managers to operate at the optimum output level for the company as a whole.
- It is not a suitable measure for divisional performance, as fixed costs are not recovered, and loss is reported.

An illustration of transfer pricing

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- It is not a suitable measure for divisional performance, as fixed costs are not recovered, and loss is reported.

An illustration of transfer pricing

- Consider a full cost transfer price with mark-up. Unit fixed cost has to be estimated at the planning stage using a pre-determined fixed overhead rate.

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- At 5000 units output level for the company, fixed cost per unit for the intermediate product will be Rs 12 per unit (60000 fixed cost / 5000 units), giving a full cost of Rs 23 (Rs 12 plus Rs 11 variable cost).
- If the transfer price is set at Rs 23 per unit (Rs 23000 per 1000 batch) receiving division will expend output as long as net marginal revenue exceeds transfer price.
- This will be 4000 units where the net marginal revenue is Rs 33000. At 5000 units net marginal revenue is Rs 13000 and manager will not choose to expand output to 5000.

An illustration of transfer pricing

- At 4000 units the revenue of the supplying division will be Rs 92000 (4000 x 23) but the cost shown for the Thar division will be Rs 104000 (60000 fixed cost + 44000 variable).
- Thar division will report a loss as fixed costs have not been fully recovered.
- Hence this transfer price is neither suitable for performance evaluation nor optimal output decisions.
- We can conclude from this illustration that to ensure overall company optimality the transfer price must be set at the marginal cost of the supplying division.

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LECTURE # 25

Domestic transfer pricing recommendations

1: Where a competitive market exists for the intermediate product, the market price (less any adjustments to reflect additional selling and distribution expense) should be used as the transfer price.

- If supplying division has spare capacity, receiving division should be instructed to purchase the agreed quantities from the supplying division to ensure overall optimality.

2. where no external market exists for the intermediate product, transfers should be made at the long run marginal costs.

- The long run marginal cost should consist of two elements: a short run marginal cost per unit of product and a fixed lump sum fee based on budgeted use of average capacity of the supplying division.
- This is to ensure the receiving division incorporates the full cost of the supplying division's resources.

3. Where an imperfect market for the intermediate product exists, and a small number of transactions are involved, a negotiated transfer pricing system is likely to be most suitable.

- Some external benchmarking is likely to be used to enable a meaningful bargaining process to take place.

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- 4. where cost based transfer prices are used, standard costs and not actual costs per unit should be used. If actual costs are used, supplying division will be able to pass on the cost of any inefficiencies to the receiving division.

International transfer pricing

- Supplying and receiving divisions may be located in different countries with different taxation rates, and the taxation rates in one country may be much lower than the other.
- It would be in the company's interest that most of the profits are located in the country with low tax rates.
- For example an organization manufactures products in country A which has a marginal tax rate of 25% and sells those products in country B where marginal tax rate is 40%. Company will use highest possible transfer price so that country B will have higher costs and lower profits. The opposite for country A.
- In many multi-national organizations, the taxation issues outweigh other transfer pricing issues and the dominant consideration is the minimization of global taxes.
- Taxation authorities are aware that companies can use the transfer pricing system to manipulate the taxable profits. The arms length principle is used:
 - Similar transactions involving unrelated parties
 - Deduction of profit from selling price
 - Cost-plus method.

Example

- X Ltd, a manufacturing company has two divisions: Division A and Division B.
- Division A produces one type of product, Xeno, which it transfers to division B and also sells externally. Division B has been approached by another company which has offered to supply 2500 units of Xeno for Rs 35 each.
- The following details are available:
- Sales revenue

_ Sales to division B @ Rs 40	400,000
_ External sales @ Rs 45	270,000

Less:

Variable cost @ Rs 22	352,000
Fixed costs	<u>100,000</u>
Profit	<u>218,000</u>

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if division B decides to buy from the other company, what will be impact of the profits of division A and on X Ltd, assuming external sales of Xeno cannot be increased.

Solution

- The loss of contribution in division A from lost sales of 2500 @ Rs 18 (40 – 22) = Rs 45000.
- The impact on the whole company is:
 - external purchase cost (2500x35) = 87500
 - incremental cost of manufacture (2500x22) = 55000
 - Additional cost to company = Rs 32,500

Example

Effects of transfer pricing on Division and Company profits

- Division A of a large organization manufactures a single standardized product. Some of the output is sold externally whilst the remainder is sold to Division B. In Division B it is a subassembly in an manufacture of that Division's product. The unit costs of Division A's product are as follows:

– Direct material	4
– Direct labor	2
– Direct expenses	2
– Variable manufacturing expenses	2
– Fixed manufacturing expenses	4
– Selling and packing exp – variable	<u>1</u>
	<u>15</u>

Example...

- Annually 10000 units of the product are sold externally at the standard price of Rs 30.
- In addition to external sales, 5000 units are transferred annually to Division B at an internal transfer charge of Rs 29 per unit.
- This transfer price is obtained by deducting variable selling and packing expense from the external price.
- Division B incorporates the transferred-in goods into a more advanced product.

Example...

- The unit costs of this product are as follows:

– Transferred-in item (from div A)	29
– Direct material and components	23
– Direct labor	3

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– Variable overheads	12
– Fixed overheads	12
– Selling and packing exp –var	<u>1</u>
	<u>80</u>

Example...

- Division B's manager disagrees with the basis used to set the transfer price.
- He argues that the transfers should be made at variable cost plus an agreed (minimal) mark-up.
- He claims that his division is taking output that Division A would be unable to sell at the price of Rs 30.
- Partly because of this disagreement, a study of the relationship between selling price and demand has recently been made by the sales director. The resulting report contains:

Example....

- Division A

– Selling price	20	30	40
– Demand	15000	10000	5000
- Division B

– Selling price	80	90	100
– Demand	7200	5000	2800
- The manager of division B claims that the study supports his case.
- He suggests that a price of Rs 12 would give Division A a reasonable contribution to its fixed overheads while allowing Division B to earn a reasonable profit.
- He also believes that it would lead to an increase in output and an improvement in the overall company profits.

Example...

- Required:
 - (a) to calculate the effect that the transfer pricing system has had on the company's profits, and
 - (b) to establish the likely effect on profits of a transfer price of Rs 12, as suggested by the manager of Division B.

Solution...

- The variable cost per unit of output for sales outside the company are Rs 11 for the intermediate product and Rs 49 (10A + 39B) for the final product.
 - Selling and packing expense are not incurred for internal transfers.
 - Optimal output of intermediate product for sale on external market:
- | | | | |
|----------------------|--------|--------|--------|
| • Selling price | 20 | 30 | 40 |
| • Unit contribution | 9 | 19 | 29 |
| • Demand (units) | 15000 | 10000 | 5000 |
| • Total contribution | 135000 | 190000 | 145000 |
- Optimal output is 10000 units at a selling price of Rs 30

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Solution...

- Optimal output for final product
- | | | | |
|--------------------|-------|--------|--------|
| Selling price | 80 | 90 | 100 |
| Unit contribution | 31 | 41 | 51 |
| Demand (units) | 7200 | 5000 | 2800 |
| Total contribution | 23200 | 205000 | 142800 |
- Optimal output is 7200 units at a selling price of Rs 80.
- Optimal output of Division B based on transfer price of Rs 29.

Solution...

- Division B will regard transfer price as variable cost. Therefore total variable cost will be Rs 68 (29+39) and division B will calculate contribution as follows:
 - | | | | |
|--------------------|-------|--------|-------|
| Selling price (Rs) | 80 | 90 | 100 |
| Unit contribution | 12 | 22 | 32 |
| Demand units | 7200 | 5000 | 2800 |
| Total contribution | 86400 | 110000 | 89600 |

The management of Division B will choose output level of 5000 units at a selling price of Rs 90. This is sub-optimal for the company as a whole.

Solution...

- Profits for the company as a whole are reduced from Rs 223000 (7200 units) to Rs 205000 (5000 units).
- The Rs 205000 profits would be allocated as follows:
- Division A Rs 95000 (5000 @ (29-10))
- Division B Rs 110000

Solution...

- (b) at a transfer price of Rs 12, the variable cost per unit produced in Division B will be Rs 51 (12+39).
- Division B will calculate the following contributions:
 - | | | | |
|--------------------|--------|--------|--------|
| Selling price | 80 | 90 | 100 |
| Unit contribution | 29 | 39 | 49 |
| Demand | 7200 | 5000 | 2800 |
| Total contribution | 208800 | 195000 | 137200 |

Solution...

- The manager of Division B will choose an output of 7200 units and sell at Rs 80. This is optimum level of output for the company as a whole.
- Division would obtain a contribution of Rs 14400 (7200x(12-10)) from internal transfer of the immediate product, and Division B would get a contribution of Rs 208,800.
- Total contribution for the company as a whole would be Rs 223200. Division A would also earn a contribution of Rs 190,000 from sale of intermediate product in the external market.

LECTURE # 26

Cost Management

- In some previous lectures features of traditional management accounting and mechanisms used to control costs were described.
- The focus was on comparing actual results with a pre-set standard (usually budget), and taking remedial action.
- The emphasis is on cost containment rather than cost reduction.
- Cost management focuses on cost reduction and continuous improvement rather than cost containment.
- Cost management consists of those actions that are taken by managers to reduce costs.
- Some of the actions are taken on the basis of information extracted from the accounting systems.
- Other actions are taken without the use of accounting information. They involve process improvements, where such opportunities have been identified.
- Ideally, the aim is to take action that will both reduce costs and enhance customer satisfaction.

Life-cycle costing

- Life-cycle costing estimates and accumulates costs over a product's entire life-cycle.
- This will determine whether profits earned from manufacturing, will cover costs incurred in the pre and post manufacturing stages.
- Life-cycle costing helps management to understand the cost consequences of developing a product.
- It helps identify areas in which cost reduction efforts are most likely to be effective.
- Most accounting systems report on a period by period basis, and product profits are not monitored over their life-cycles.
- Product life-cycle reporting involves tracing costs and revenues on a product by product basis over their life cycle.
- Three stages of a product life-cycle are
 - Planning and design stage
 - Manufacturing stage
 - Service and abandonment stage

Target costing

- We have looked at target costing as a mechanism for determining selling prices.
- As a cost management tool, target costing involves the following stages:

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- **Stage 1:** determine the target price which customers will be prepared to pay for the product.
 - **Stage 2:** deduct a target profit margin to determine target cost.
 - **Stage 3:** estimate actual cost of the product.
 - **Stage 4:** if estimated actual cost exceeds target cost, investigate ways of driving down the actual cost.
- The first stage requires market research to determine customer perceived value. This will be based on its differentiation value compared to competing products, and the price of competing products.
 - The target profit margin depends on the planned return on investment.
 - A major feature of target costing is that a team approach is adopted to achieve the target cost. Team members include designers, engineers, purchasing, manufacturing, marketing and management accounting personnel.
 - The aim during the product design process is to eliminate product functions that add cost, but which do not increase market price.
 - The major advantage of target costing is that it is deployed during the design and planning stage. This way it can have maximum effect in determining the level of locked-in costs.
 - If the target cost cannot be attained, the product should not be launched.
 - Design teams should not be allowed to achieve target costs by eliminating desirable product functionality.

Tear-down analysis

- Tear-down analysis (also known as reverse engineering) involves examining a competitor's product to identify opportunities for improvement and /or cost reduction.
- The competitor's product is dismantled to identify its functionality and design. This provides insight about the processes and the cost.
- The aim is to benchmark provisional product design with the design of competitors.

Value engineering

- Value engineering (known as value analysis) is a systematic examination of cost of a product.
- Aim is to devise means of achieving standard quality and reliability, at the target cost.
- This is achieved by:
 - Identifying improved product design with reduced cost,
 - Eliminating unnecessary functions that increase product cost for which customers are not prepared to pay.
- Value engineering requires the use of functional analysis. This involves decomposing the product into its elements or attributes.
- E.g in automobiles functions might consist of : style, comfort, reliability, attractiveness etc.
- Surveys are conducted to determine the price customers are willing to pay for the various attributes.
- Where cost of a function exceeds the value to the customer, either the function should be eliminated or modified.

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The need for accurate cost measurement systems

- Target costing should be supported by an accurate cost system.
- Cost drivers should be established that determine cost of the activities consumed.
- Arbitrary cost allocations should be avoided.
- Target costing exercise should result in reduction of cost to the organization and not only the product.

An illustration of Target Costing

- The Micro Electronics Company manufactures cameras and video equipment. It is in the process of introducing a new state of the art combined digital video and still camera.
- The company has undertaken market research to ascertain customer perception and compare with competitors products.
- As a result, target selling price has been established and a life-time projected volume.
- Cost estimates have been prepared based on proposed product specifications.

An illustration of Target Costing

- The company has set a target profit margin of 30% of selling price.
- This has been deducted from the proposed selling price to determine the target cost.
- Following summary information has been presented to management
 - Projected lifetime sales volume 300,000 units
 - Target selling price Rs 800
 - Target profit margin (30%) Rs 240
 - Target cost (800 – 240) Rs 560
 - Projected cost Rs 700

An illustration of Target Costing

- The excess of the projected cost over the target cost results in an intensive target costing exercise.
- After completion of the target costing exercise, the projected cost is Rs 555, i.e. below target cost of Rs560.
- the analysis of the projected cost before and after the target costing exercise is as follows:

An illustration of Target Costing

	Before	after
Manufacturing cost		
direct materials (bought in)	390	325
direct labor	100	80
direct machining costs	20	20
ordering and receiving	8	2
quality assurance	60	50

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rework	15		6	
engineering and design	<u>10</u>	603	<u>8</u>	491

Non-manufacturing costs

marketing	40		25	
distribution	30		20	
After-sales services and warranty	<u>27</u>	<u>97</u>	<u>19</u>	<u>64</u>
Total cost		700		555

An illustration of Target Costing

- To achieve the target cost the company establishes a project team to undertake the intense target costing exercise.
- In response to the need to reduce projected cost, the team starts with purchasing a video camera from its main competitors and undertake a tear-down analysis.
- This process involves dismantling the cameras to provide insights into potential design improvements.
- Value engineering is also undertaken to identify new designs that will accomplish the same functions at a lower cost.

An illustration of Target Costing

- The outcome is a significant reduction in projected direct materials, labor and rework costs.
- Next the team engages in functional analysis.
- This process indicated several functions included in the prototype are not valued by customers.
- The functional analysis results in further cost reductions.
- The team now turn their attention to redesigning the production and support processes.
- They redesign the ordering and receiving process by reducing the number of suppliers and working closely with smaller suppliers.
- When projected cost is below the target cost, the exercise is concluded.

LECTURE # 27

Kaizen costing

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- Widely used by Japanese organizations as a mechanism for reducing and managing costs.
- Kaizen is the Japanese word for making small improvements to a process rather than through large innovations.
- Target costing is applied during the design stage whereas Kaizen costing is applied during the manufacturing stage.
- Kaizen costing focuses on the production process and cost reductions are derived primarily through increased efficiency of the production process.
- Kaizen costing relies heavily on employee empowerment. Workers are given responsibility to improve process and reduce costs.

Activity based management

- The terms activity based management (ABM) or activity based cost management (ABCM) are used to describe cost management applications of ABC.
- Three stages are required:
 - Identifying major activities that take place
 - Assigning costs to cost pools / centers for each activity
 - Determining the cost driver for each major activity.
- ABM focuses on managing a business on the basis of activities performed.
- ABM is based on the fact the activities consume costs, hence managing activities will manage costs.
- ABM provides information on what activities are performed, what they cost, why undertaken and how well performed.

Traditional vs ABM analysis

- Traditional analysis
- Salaries 320
- Stationery 40
- Travel 140
- Telephone 40
- Depreciation 40
- 580
- ABM analysis
- Preparing quotations 120
- Receiving cust orders 190
- Assessing credit 100
- Expediting 80
- Resolving custprobs90
- 580

Traditional budget and control reports analyze costs by type of expense. In contrast ABM analyzes costs by activities and thus provides management with information on why costs are incurred, and the output from the activity.

- To identify and prioritize the potential for cost reduction, organizations classify activities as either value-added or non value-added.
- Value-added is what customers perceive as useful and are prepared to pay for. E.g painting a car.

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- Non value added activities include inspecting, storing and moving raw material. Actions taken to carry these out efficiently will reduce costs.
- Care is needed as cost driver rates can encourage dysfunctional behavior. Rate can be improved by splitting the purchase orders, thus increasing number of orders. Ultimately this may increase costs.

Business process re-engineering

- Involves examining business processes and making substantial changes to how the organization currently operates.
- A business process is a collection activities linked together in a co-ordinated manner.
- E.g material handling is a business process consisting of scheduling production, storing materials, processing purchase orders, inspecting materials and paying suppliers.
- The aim is to improve key business processes by focusing on simplification, cost reduction, improve quality and enhance customer satisfaction.
- The process might be re-engineered by sending production schedule direct to nominated suppliers, and entering into contractual agreements to deliver materials according to production schedule.
- Quality guarantees and inspection prior to delivery can also be included.
- End result might be the elimination or reduction of storing, purchasing and inspecting activities.
- In BPR focus is on major changes rather than marginal improvements.

Cost of quality

- Quality has become one of the key competitive variables.
- TQM is a customer oriented process of continuous improvement that focuses on delivery of consistent high quality, on time.
- Companies discovered it was cheaper to produce items correctly the first time. It is a waste of resources to make sub-standard items, then detect and rework, or scrap them.
- Emphasis of TQM is to design and build in quality.
- Managers need to know the costs of quality and how they are changing over time.
- A cost of quality report should be prepared showing:

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- Prevention costs; i.e preventive maintenance, quality planning, training, extra cost of high quality material.
- Appraisal costs; cost of inspection at each stage, quality audits, and field tests.
- Internal failure costs; such as scrap, downtime, repair
- External failure costs; customer complaints, warranty replacements, damaged reputation.

Cost management and the value chain



- Value chain analysis is increasingly being used to manage costs more efficiently.
- Value chain is the linked set of value creating activities all the way from basic raw materials to the end-use product.
- A firm which performs value chain activities more efficiently and at a lower cost than its competitors, will gain an advantage.
- It is a system of inter-dependent activities in which performance of one activity affects the performance and cost of another.
- Each link is seen as the customer of the previous link. If each link satisfies the needs of its customer, then end-customer satisfaction should follow.

Benchmarking

- In order to identify the best way of performing activities and business processes, organizations are turning to benchmarking.
- This involves comparing key activities to world-class best practices.
- Benchmarking identifies an activity, such as customer order processing, that needs to be improved.
- It finds a non-rival organization, considered to represent world class best practice for this activity, and studies how it performs the activity.
- The objective is to find out how the activity can be improved, and implement the improvements.

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- Benchmarking is cost beneficial since an organization can save time and money avoiding mistakes that other companies have made.
- The overall aim is find and implement best practices.

Just-in-time Systems (JIT)

- JIT seeks to achieve the following goals:
 - Elimination of non-value added activities
 - Zero inventory
 - Zero defects
 - Batch size of one
 - Zero breakdowns
 - 100% on time delivery

Whether achieved or not, they set targets and create a climate for continuous improvement.

Elimination of non value-added activities

- JIT is a philosophy of management dedicated to elimination of waste. Waste is anything that does not add value to the product.
- The lead time involved in manufacturing and selling a product consists of process time, inspection time, move time, and storage time. Of these, only process time actually adds value to the product.
- Research has shown that process time is less than 10% of total lead time in many organizations. Therefore 90% of lead time adds no value, and in JIT philosophy, related cost can be significantly reduced.
- JIT system is a mechanism for reducing non value-added costs and long run costs.
- The implementation of JIT production methods was considered to be one of the major factors of the success of the Japanese firms in international markets.
- The JIT approach involves a continuous commitment to the pursuit of excellence in all phases manufacturing operations.
- The aims of JIT are to produce at the required quality, in the required quantity , and at the required time.

LECTURE # 28

Business process re-engineering*

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Cost of quality*

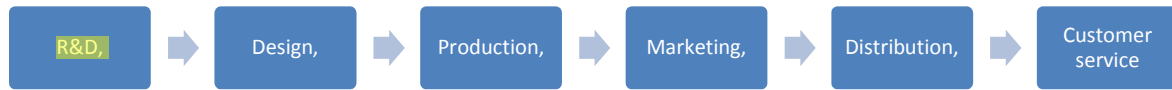
- Quality has become one of the key competitive variables.
- TQM is a customer oriented process of continuous improvement that focuses on delivery of consistent high quality, on time.
- Companies discovered it was cheaper to produce items correctly the first time. It is a waste of resources to make sub-standard items, then detect and rework, or scrap them.
- Emphasis of TQM is to design and build in quality.
- Managers need to know the costs of quality and how they are changing over time.
- A cost of quality report should be prepared showing:
 - Prevention costs;i.e preventive maintenance, quality planning, training, extra cost of high quality material.
 - Appraisal costs; cost of inspection at each stage, quality audits, and field tests.
 - Internal failure costs; such as scrap, downtime, repair

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- External failure costs; customer complaints, warranty replacements, damaged reputation.

Cost management and the value chain



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- Value chain is the linked set of value creating activities all the way from basic raw materials to the end-use product.
- A firm which performs value chain activities more efficiently and at a lower cost than its competitors will gain an advantage.
- It is a system of inter-dependent activities in which performance of one activity affects the performance and cost of another.
- Each link is seen as the customer of the previous link. If each link satisfies the needs of its customer, then end-customer satisfaction should follow.

Example - Traditional vs activity based budgets, and life-cycle costing

- The budget for the production, planning and development dept of Okarapl is currently prepared on traditional system.
- The analysis of costs by expense type for period ended 30 November 20X0 is as follows:

– Expense	budget %	Actual %
– Salaries	60	63
– Supplies	6	5
– Travel cost	12	12
– Technology cost	10	7
– Occupancy cost	12	13
– Total budget and actual costs for the dept for period ended November 30 are Rs 1,000,000 and Rs 1,060,000 respectively.		

Traditional and activity based budget, and life-cycle costing

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- The company now feels an Activity Based Budgeting approach should be used.
- A number of activities have been identified, and budget and actual cost should be attributed as follows:

	Budget %	Actual %
– Scheduling new products	20	16
– Scheduling existing products	40	34
– Remedial scheduling	5	12
– Special studies –specific orders	10	8
– Training	10	15
– Management and administration	15	15

Traditional and activity based budget statements, and life-cycle costing

- Required:
- (a) prepare two budget control statements for department and compare with actual, showing variances, using
 - traditional expense based analysis, and
 - Activity based analysis

Solution

- (a) Performance report – traditional:

Expense	Budget	Actual	variance
– Salaries	600000	667800	67800A
– Supplies	60000	53000	7000 F
– Travel cost	120000	127200	7200A
– Technology	100000	74200	25800F
Occupancy	120000	137800	17800A
	1000000	1060000	60000A

- Performance report – activity based**

Activity	Budget	Actual	Variance
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Scheduling new	200000	169600	30400F
Scheduling existing	400000	360400	39600F
Remedial	50000	127200	77200A
Special studies	100000	84800	15200F
Training	100000	159000	59000A
Mgt and admin	150000	159000	9000F
	<u>1000000</u>	<u>1060000</u>	<u>60000</u>

LECTURE # 29

Traditional and activity based budget statements, and life-cycle costing

- (b) Other activities have been identified and the budget quantified for the three months ended March 31, 20X1 is as follows:

Activity	cost driver	units	Cost(000)
Product design	hours	8000	2000
– Purchasing	P.Orders	4000	200
– Production	mach hours	12000	1500*
– Packing	volume(cu.m)	20000	400
– Distribution	weight (kg)	120000	600

*this includes depreciation provision of Rs 300k of which Rs 8000 applies to 3 mths for a new product (NPD)

Example cont...

- New product NPD is included in the above budget. The following additional information applies to NPD:
 - Estimated output over life-cycle: 5000 (4 yrs)
 - Product design requirement: 400 design hours
 - Output in qtr ended march 31, 20X1: 250 units

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- Equivalent batch size per purchase order: 50 units
- Production time .75 machhr; vol 4cu.m; wt 3kg.
- Prepare unit overhead cost for NPD using activity based approach which includes a share of life-cycle costs.

Solution

- (b) The cost driver rates are as follows:
 - Product design (Rs 2m/8000 hrs) = Rs 250 per hr
 - Purchasing (200,000/400) = Rs 50 per P.O
 - Production (excldepn) (1500,000 – 300,000) / 12000hrs = Rs 100 per machhr
 - Packing (400,000/20000) = Rs 20 per cu.m
 - Distribution (600,000 / 120,000) = Rs 5 per kg
- The activity-based overhead cost per unit is as follows:
 - Product design (400hrs at Rs 250 = 100,000 divided by life-cycle output of 5000 units)
= 20
 - Purchasing (5 Pos at 50 units per order costing Rs 250 for output of 250 units)
= 1
 - Production (.75 machhr at Rs 100) = 75
 - Depreciation (Rs 8000 / qtr for 4 years divided by life-cycle output of 5000 units=
=25.6
 - Packing (.4 cu m at Rs 20) = 8
 - Distribution (3 kg at Rs 5) = 15
 - Total cost 144.6

Benchmarking*

- In order to identify the best way of performing activities and business processes, organizations are turning to benchmarking.
- This involves comparing key activities to world-class best practices.
- Benchmarking identifies an activity, such as customer order processing, that needs to be improved.

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- It finds a non-rival organization, considered to represent world class best practice for this activity, and studies how it performs the activity.
- The objective is to find out how the activity can be improved, and implement the improvements.
- Benchmarking is cost beneficial since an organization can save time and money avoiding mistakes that other companies have made.
- The overall aim is find and implement best practices.

Just-in-time Systems (JIT)*

- JIT seeks to achieve the following goals:
 - Elimination of non-value added activities
 - Zero inventory
 - Zero defects
 - Batch size of one
 - Zero breakdowns
 - 100% on time delivery

Whether achieved or not, they set targets and create a climate for continuous improvement.

Elimination of non value-added activities

- JIT is a philosophy of management dedicated to elimination of waste. Waste is anything that does not add value to the product.
- The lead time involved in manufacturing and selling a product consists of process time, inspection time, move time, and storage time. Of these, only process time actually adds value to the product.
- Research has shown that process time is less than 10% of total lead time in many organizations. Therefore 90% of lead time adds no value, and in JIT philosophy, related cost can be significantly reduced.
- JIT system is a mechanism for reducing non value-added costs and long run costs.
- The implementation of JIT production methods was considered to be one of the major factors of the success of the Japanese firms in international markets.
- The JIT approach involves a continuous commitment to the pursuit of excellence in all phases of manufacturing operations.