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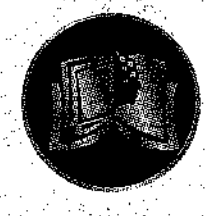

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P R E S E N T S

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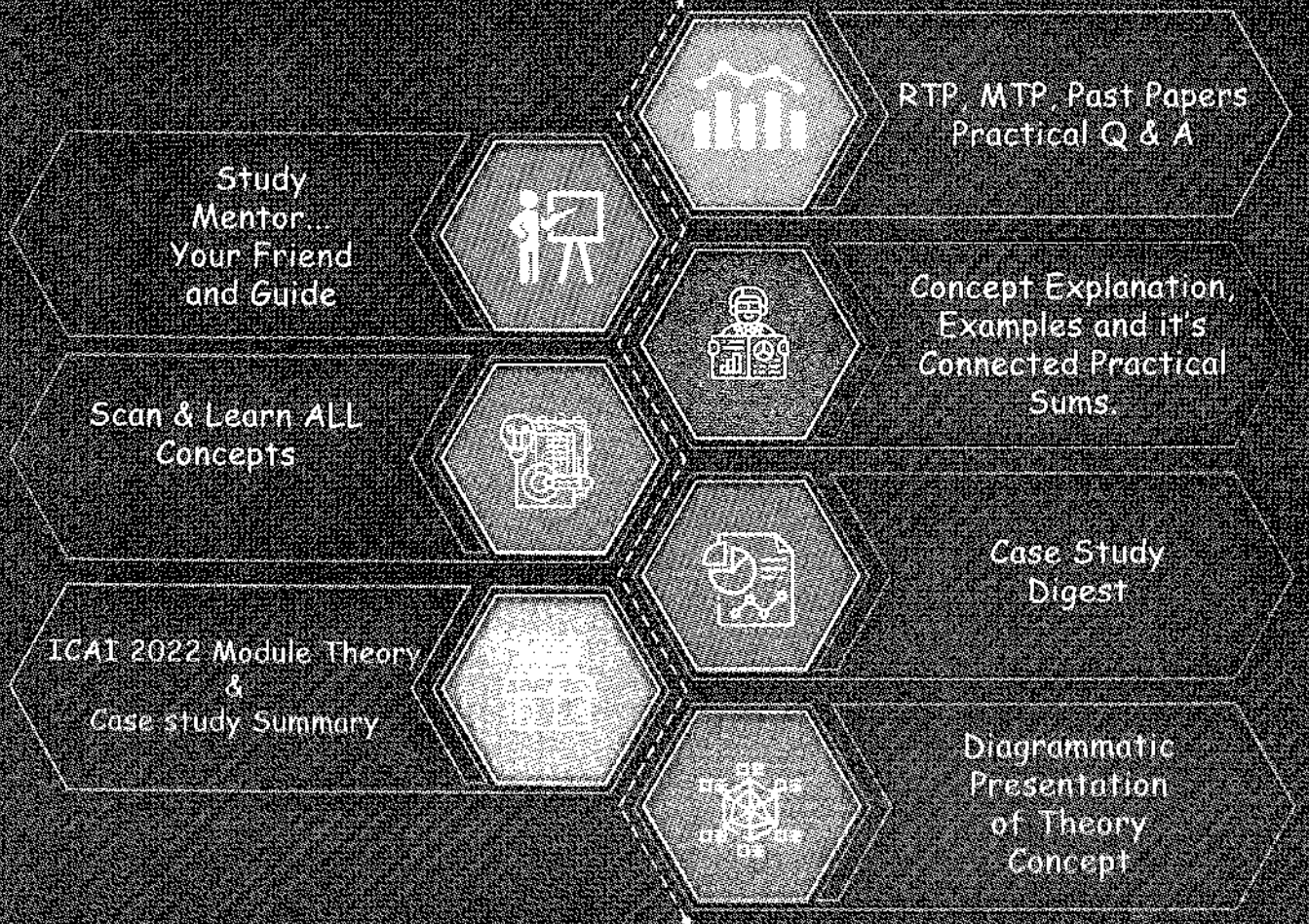
PREFACE

"Believe in your infinite potential. Your only limitations are those you set upon yourself."
"Great things happen to those who don't stop believing, trying, learning, and being grateful."
We, the OPTIMISED Team are super excited to explain a lot of FEATURES that we have introduced in the book which will make COSTING INTERESTING, Connect you to Real LIFE BUSINESS SOLUTIONS and MOST IMPORTANTLY ENSURE you to get HIGHEST MARKS IN THE SUBJECT.



It is a SUMMARISED aide in explaining concepts in an apprehensive manner in ICAI MATERIAL LANGUAGE. Being a member of Teaching Panel for almost a Decade now, it becomes an easy approach to understand and step in the shoes of CA Students and think accordingly. This book has been developed in a manner which is Student friendly, Understandable, and Helpful. Remember that ICAI expects you to think from a practical Business view point and answer ANALYTICALLY for the Exams.

Theory, Case Studies and Master Sums have been combined in the book to establish a FLOW while studying.
"Whether it's a Relationship or Education, All Bands are built on Trust. Without it, You have Nothing"
Have a Memorable Journey with OPTIMISED MAGIC BOOK and Do write to me on sankalpoptimised@gmail.com or Watsapp on 9819201473 as it gives me Immense Pleasure to Stay Connected and Learn with you. Waiting to Hear from You Soon.....

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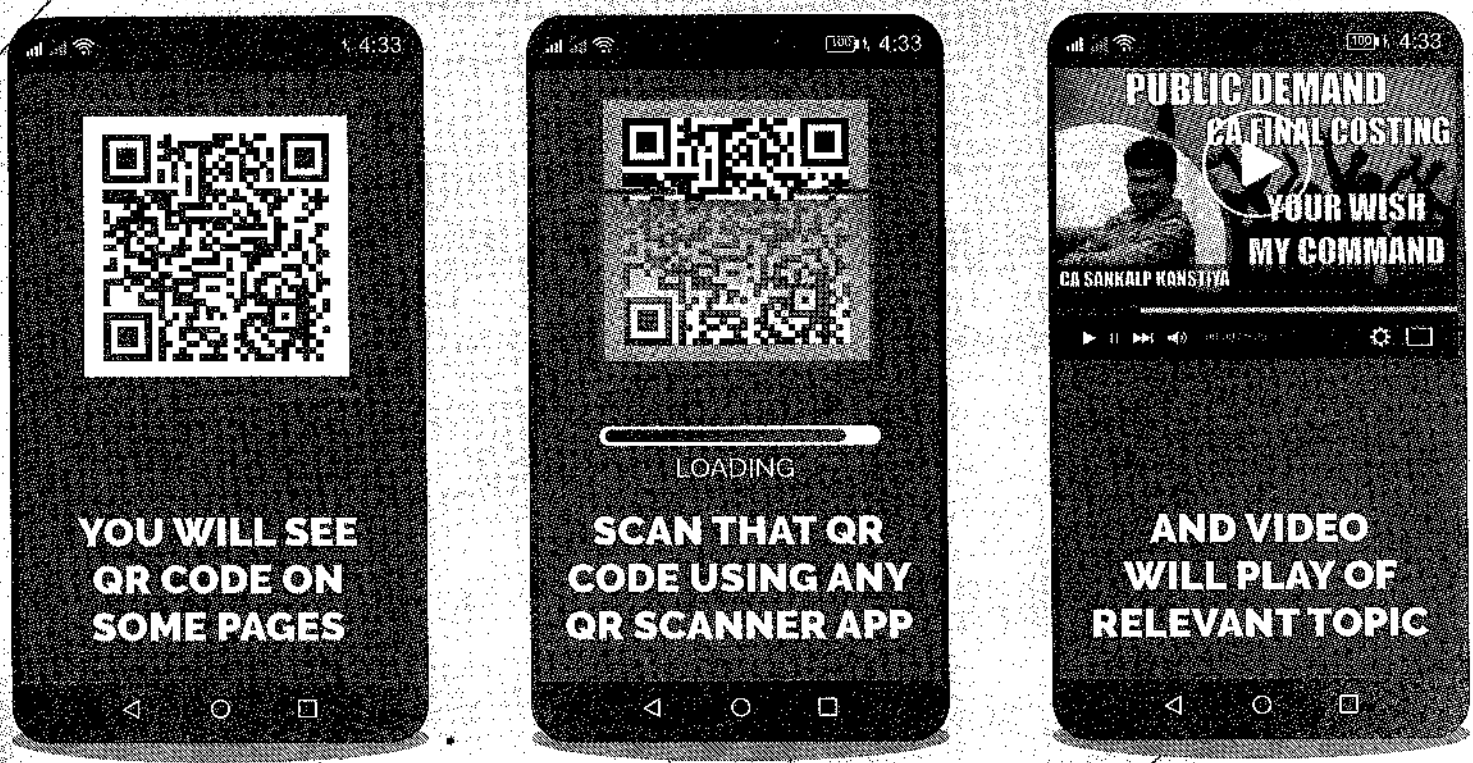

STUDY MENTOR

- We all know that every Subject of CA FINAL Syllabus is Vast and covers a lot of aspects such that it becomes very difficult to keep a track of all the concepts and Sums.
- Through Study Mentor, All the CONCEPTS, SUMS are Put in one place with Page Numbers so that we can keep a TRACK of how much we are done with and it serves as a MOTIVATION to COMPLETE MORE REVISIONS.
- A Small Tick Mark or Date can be Put and Important ones can be HIGHLIGHTED so that it will work as a Ready Referencer during the Exams.
- UTILISE your NEW FRIEND in the BEST MANNER. USE AUDIT TICKS..MORE THE TICKS, BETTER THE PREPARATION!!!

CASE STUDY SUMMARY

- As we all know, Case Studies play a very important role in our SCMPE preparation as 1st Compulsory Question of 20 Marks is on Case Studies.
- All ICAI Case Studies have been explained in Detail and also with a SUMMARY like : (ISSUES, CONCEPT, EXPLANATION & CONCLUSION) for Ease of Understanding and Remembrance.

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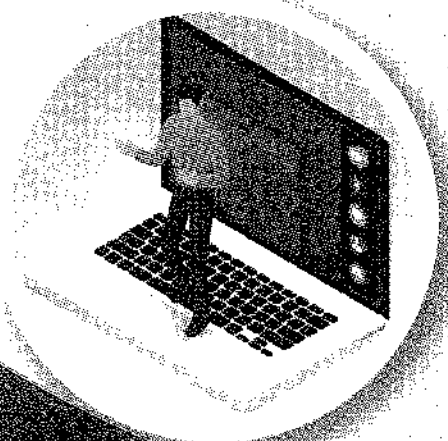

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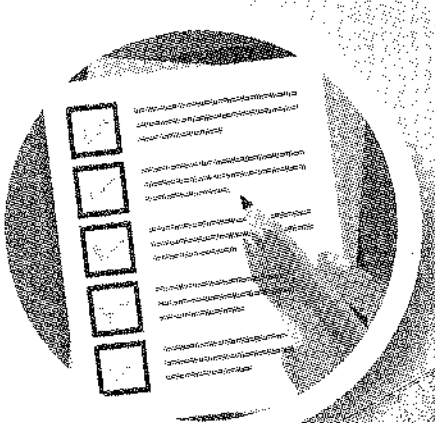

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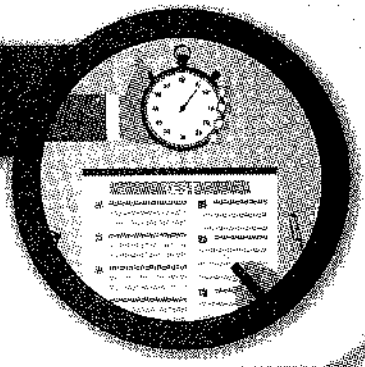

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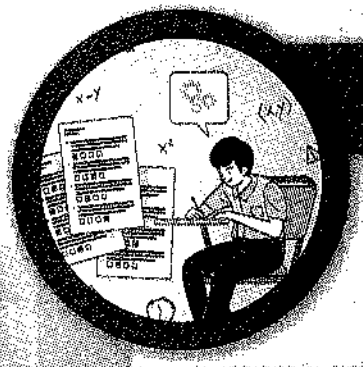

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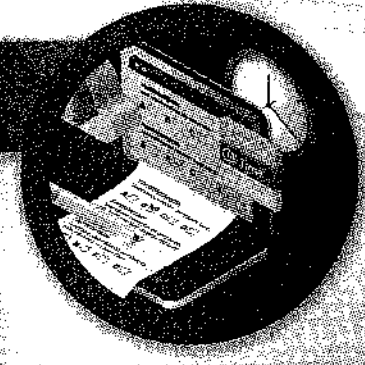

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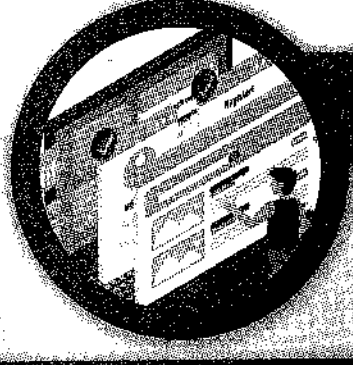

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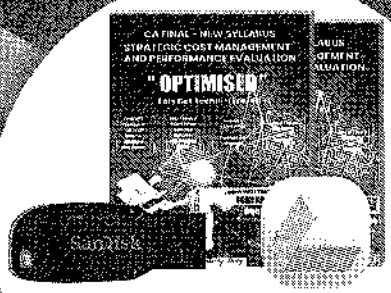

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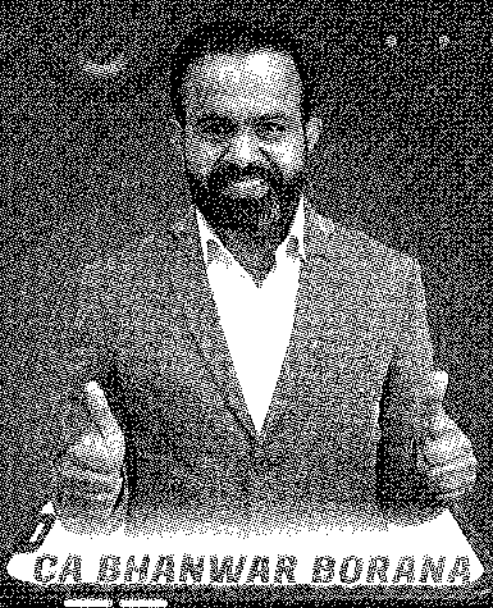

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Introduction to Strategic Cost Management

SCAN AND REVISE

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MENTOR

1 Traditional Cost Management

Involves allocation of costs & overheads to production.

Focuses on Cost control & Cost reduction only.

Based on Variance analysis & corrective action.

1.1 Drawbacks of Traditional Cost Management

- Reactive Approach.
- Short-Term Outlook.
- Excessive Focus on Cost Reduction.
- Limited Focus on Revision and Improvisation.
- Ignore Dynamics of Marketing & Economics.
- Ignores Competition Market Growth & Customer Requirement.

2 Strategic Cost Management

Focus on continuous improvement to deliver superior quality products.

Include all aspects of " Purchase, Production, Design, Manufacturing, Delivery and Service."

2.1 Objective of Business

- Earn Profits
- Value for Shareholders
- Distinctive Competitive Advantage

» How to achieve »

2.2 SCM is focused on

- Cost Leadership
- Product Differentiation
- Sustainable Competitive Advantage

2.3 Strategic Cost Management Framework

Process of combining decision making structure with Cost information. » Aims at reducing cost while strengthening business position.

As a part of production and distribution, every company is liable to incur huge amount of cost which if managed efficiently & effectively, can be avoided. This management of cost is termed as SCM and can be explained with following case study:

Case 1 - Manufacturing Company

Issue:

- Does not carry regular preventive maintenance.
- Repair when machine breakdown.

Traditional approach:

- Lack of regular prevention reduces life of machinery.
- Focus is on cost reduction and cost saving.
- Short term approach.

SCM approach:

- Should do regular preventive maintenance & increase machine life.
- It is important to look at cost management with strategic focus to avoid loss of market share.

vodafone

Case study 2- Telecom Industry

Issue:

- Overcrowding of customers and other centres.
- Longer waiting time for customers due to close down of centres for cost cutting.

Explanation

- Both customer and employees (key stakeholders) are not happy with company's decision.
- This impacts reputation & brand image of company & impacts sales and profitability in long run.
- SCM focuses on expansion of centres.

2.4 Four Stages of Strategic Cost Management

- **Formulation**: Formulating Strategies.
- **Communication**: Communicating those strategies throughout the organization.
- **Implementation**: Developing and carrying out tactics to implement the strategies.
- **Control**: Developing and Implementing controls to monitor the success of objetives.

2.5 Necessity of Strategic Cost Management

- Cost Analysis with strategic position of company.
- Cost Data is analysed to gain competitive advantage.
- Clear Understanding of Company's Cost Structure.
- Managerial Use of Cost Information.
- Overall Recognition of Cost Relationships.

2.6 Difference between TCM & SCM

Basis	Traditional Cost Management	Strategic Cost Management
Focus	Internal	Both internal & External
Cost Analysis Objective	Three objectives: • Score keeping, • Attention directing • Problem solving.	Cost leadership strategy, or product differentiation strategy , along with 3 objectives.
Cost Driver Concept	Based on volume.	Separate cost driver for each activity.
Management Responsibility	Follower/Reactive.	Leader/Proactive.
Time Span	Short term concept.	Long term concept.
Primary Objective	Cost Reduction.	Cost containment -cost reduction & value improvement at the same time.
Risk Related Approach	Risk-averse	Risk taking and ability to adapt itself with changing environment.

Student Notes

2.7 Components of SCM

Strategic Positioning Analysis

Analysing Company's performance within industry.

Impact of external & internal environment on overall strategy.

Factors affecting

- Organisation Culture, Values & System.
- Internal Environment (Employee Resources & Competencies).
- External Environment (Porter's 5 Forces).

Focus on Current strategy with future intent.

Better value creation than rivals.

Cost Driver Analysis

Structural

Organizational factors that determine the economic structure driving the cost of firm's products.

Reflects long term decisions.

Eg: Use of Technology, Expansion of Business.

Executional

Capture firm's operational decisions on how best to employ its resources to achieve its goals & objectives.

Determined by Management Policy, Style & Culture.

Eg: Workforce Participation, TQM, Plant - Layout.

Focus on those cost drivers of Strategic Importance.

Value Chain Analysis

Process by which a firm identifies & analyses activities that add value to final product.

Identify & eliminate non-value added activities.

- Helps to obtain Cost Leadership.
- Improves Product Differentiation.
- Internal Processes / activities performed to design, produce, Market, deliver and support the product.

Represents a coherent framework of thinking about managerial accounting.

3 Value Chain Analysis

Internal processes or activities a company performs to design, produce, market, deliver & support its product.

Primary Activities

Transforming **inputs** into **outputs**

(Raw Material) (Finished Goods)

Inbound Logistics (Supply to Factory)	Operations (WIP)	Outbound Logistics (Finished Goods)	Marketing & Sales	Service
• Material handling, storing & distributing inputs to Process. • Supplier Relationship is the key.	Transforming inputs into final product. ⩔ Machining, packaging, testing, Equipment Maintenance.	Collecting, storing & distributing products from factory line to end consumer. ⩔ Finished goods warehousing, order processing, scheduling.	Makes customer aware of product. ⩔ Advertising, promotion, distribution channel selection, pricing policy, etc. ⩔ Demand Creation & Customer Solicitation.	After sale services. ⩔ Installation, repairs and parts replacement.

Secondary Activities

Supports primary activities

Procurement	Technological Development	Human Resource Management	Firm infrastructure
Purchasing RM, supplies & other consumables as inputs for primary activities.	Technical knowledge, equipment, hardware, software, etc. used in transformation of input to output.	Selection, recruitment, placement, training, appraisal, rewards, etc.	Planning, finance, accounting, legal, government affairs & quality management.

Analysis	Impact
Inbound logistic	• High inventory storage cost. (JIT)
Operations	• Use of advanced machinery.
Outbound logistic	• High transportation cost.(Scheduling of delivery operations.)
Marketing and sales	• Development of online sales and proper supply chain.
After sales	• Establish customer care centres.

Criticism of VCA

- Difficult to apply in service industry.
- Time consuming and expensive.
- Ignores non-financial factors.
- Complicated, since in-depth analysis of each process is required.

4 Strategic Frameworks for Value Chain Analysis

- Industry Structure Analysis
- Core Competencies Analysis
- Segmentation Analysis

5 Industry Structure Analysis

(Porter's 5 Forces Analysis)

(Information about an industry structure to evaluate its potential attractiveness.)

Bargaining power of buyers

- Ability of buyer to push the price down.
- Depends on Buyer concentration and high volume purchase by buyers.
- Cost of switching suppliers is low.
- High no. of alternative suppliers.

Eg: FMCG Industries.

Bargaining power of suppliers

- High when input is important to buying firm.
- Very few suppliers .
- Alternative is not available.
- Eg: Operating system of microsoft.

Threat of substitute products/ services

- When multiple & close substitutes are available in market, customers are likely to switch suppliers easily.
- Resort to competitive pricing to retain its customers.

Cos. Should focus on Brand Building & Customer Loyalty.

- Eg: Paper industry from E-book market.

Threat of new entrants

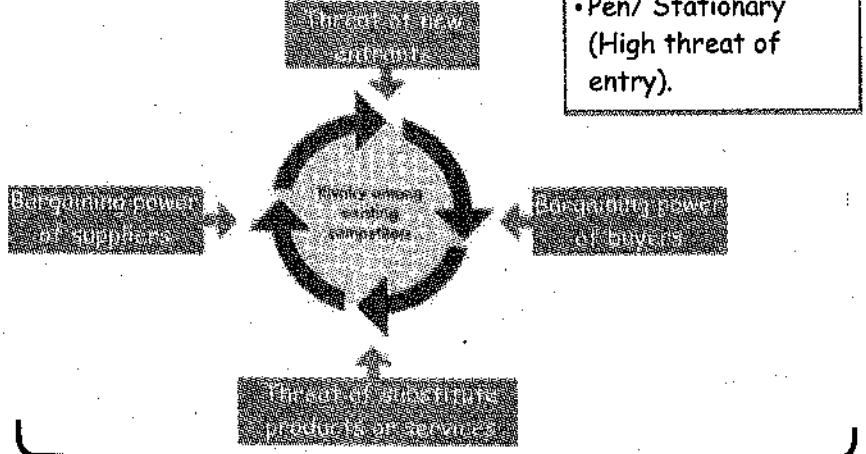
- Depends on barriers to entry & perceived profitability in industry.
- Industry with huge Capital/ Sophisticated Technology might not have high threat of new firms.
- Legislation restricts newer firms.
- Eg: Airline (Low threat of entry)
- Pen/ Stationary (High threat of entry).

Intensity of competition, rivalry amongst firm's

- In highly competitive market, firms resort to "cut throat competition" to win more customers.

Intensity is high:

- When firms are of equal size.
- Extra capacity exists in industry.
- Difficulty in differentiation.
- High exit barriers.
- High fixed cost.
- Eg: Soft drinks. (Coca Cola, Pepsi).



Higher the above components, higher the competition in industry.

6 Core Competencies Analysis

Process of **identifying** a company's fundamental **strengths and attributes** that are special & serve to differentiate it from its competitors. (Eg: Google search engine)

CC = Distinctive / Unique skill or Technological know - how that creates customer value.

Function of collective skill set of **people, organization, structure, resources & technological knowhow.**

Competitive advantage could result from *Cost Leadership* or *Product Differentiation.*

*** Test for identifying Core Competence**

- End Product benefits.
- Access to a wide variety of markets.
- Difficult for competitors to imitate (Google search engine).
- Loss of Core Competency results in disaster for firms (eg: Nokia because of smartphones; Bajaj auto because of motorbikes).

6.1 Stems of Core competencies

Resources

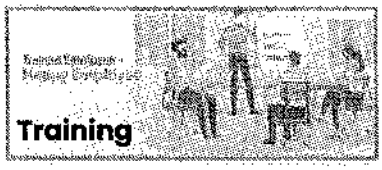
Factors that enable company to create value for customers.

- **Tangible** (Land, Building, Machine, Money) (Second formula used by soft drink cos. Like Coca - Cola)
- **Intangible** (Employee skill, Brand, Technology)

Capabilities

Company's ability to coordinate resources & put them to productive use.

It comes from organisational structure, processes & control system.



6.2 Application of VCA to core competencies for competitive advantage

Validate core competencies in the current business. (Eg: Tesla: Driverless cars)	Leverage competence to the value chains of other existing businesses. (Eg: Cross selling)	Use core competencies to reconfigure the value chain of existing businesses. (Eg: IKEA Furniture Industry)	Use Core Competencies to create new value chains. (Eg: Fedex, Disney)

7 Segmentation Analysis

Single Industry = Collections of different market segments.
Eg: Motor Vehicle Industry = Tyre, Glass, Battery, Metals.

Reveal competitive advantages & disadvantages of different segments & helps to decide whether:

To exit the segment.	To enter a segment.	To reconfigure one or more segments.	To embark on cost reduction program.

7.1 Steps of Segmentation Analysis

Identify segmentation variables & categories	Construct a segmentation matrix	Analyse segment attractiveness	Identify key success factors for each segment	Analyse attractiveness of broad versus narrow segment scope
Multiple segments depending upon the nature and complexity of industry.	Create a matrix based on the nature of products (Textile, Hotel, Paper), geopraphies (East, West, North, South) Distribution channel. (Wholesale, retail, direct).	Used to evaluate profitability & performance of each of the segment.	Each segment identified must be assessed with relevant measure of performance. (Quality, Service, Delivery)	Relates to diversification of single and multiple products.

8 Superior Performance & Competitive Advantage

Strategies

Cost leadership	Differentiation Advantage	Focus Strategy
(Provide better products at lower costs)	(Provide customer with unique features)	(Concentrate on specific segmented product line agreement market)

8.1 Two criteria's to survive & prosper in an industry

- Supply Must be as per what customers Demand
- Survive Competition

8.2 Differentiation Advantage (Product Differentiation)

- Customers perceive product which offers high quality, involves fewer risks and outperforms competitor's product.
- Techniques include- *Superior Quality, Superior Innovation and Superior Customer Responsiveness.*

8.3 Low-cost Advantage (Cost Leadership)

- Company must lower its cost to gain competitive advantage or match with competitor's price & increase its productivity.
- Sources include access to *low cost raw materials, innovative process technology, superior operating management, etc.*

8.4 Differentiation Advantage can be achieved by:

- Producing products which are superior to competitors by virtue of design, knowhow, performance, etc.
- Offering superior after-sales service by outstanding distribution.
- Expanding the product range
- Superior packaging of the product.
- Making brand strength.

8.5 Low-cost Advantage can be achieved by:

- Reduce costs by copying rather than creating designs, using cheaper materials and other cheaper resources, reducing labour costs and increasing labour productivity.
- Attaining economies of scale by high-volume sales.
- Gaining learning and experience curve benefits.
- Use high-volume purchasing to get discounts for bulk purchase.
- Locating in areas where cost advantage exists or government support is possible.

9 The Value Chain Approach For Assessing Competitive Advantage

- Internal Cost Analysis
- Internal Differentiation Analysis
- Vertical Linkage Analysis

9.1 Internal Cost Analysis

Identify the firm's value creating processes	Determine the portion of the total cost of the project or service attributable to each value creating process	Identify the cost drivers for each processes.	Identify the links between processes.	Evaluate the opportunities for achieving relative cost advantage
To understand their true contribution to firm's competitive advantage.	Use estimate to assign cost. ⇩ Cost of support activities must be allocated.	Identify factors/ cost determinants for each value creating process.	Individual activities are inter-dependent & linkages between various activity impacts total costs.	Such approach might lead to forceful reduction of cost in certain areas which might impact the sales.
Eg: Procurement process.	Eg: New ERP system reduce logistic cost but increase IT cost.	Eg: Ordering cost.	Eg: Mobile.	Eg: Reduce cost under all head by 15%..

9.2 Internal Differentiation Analysis

Identify the customer's value creating processes	Evaluate differentiation strategies for enhancing customer value	Determine the best sustainable differentiation strategies.
Identify various activity in value chain to deliver product or services to its customer. Eg: Apple earphones without wire.	Evaluate various strategies to enhance customer value. Brand Image: Apple/Google Superior Features, Marketing Channels, Customer Service, Quality Product, Brand Image.	Identify activities which could enhance differentiation. As per availability of resources. Eg: Starbucks provide variety of coffees in eco-friendly glasses.

9.3 Vertical Linkage Analysis

⇩

It includes all upstream & downstream activities throughout the industry.

⇩

A company must identify & evaluate the opportunities for sustainable competitive advantages after carrying out industry value chain analysis.

Example - A company manufactures cars using various components like chassis, steering wheel, tyres, axles etc.

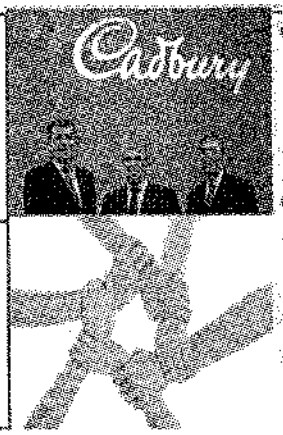
- The Company does not manufactures all the components in-house and purchases from third party suppliers.
- The Company focuses on assembly line which is its core competency.
- However, certain parts, which are critical to the car are manufactured in-house. This is a strategic choice to gain a competitive advantage.

10 Vision, Mission & Objectives of SCM

Mission Statement	A statement of the company's reason to be. It seeks to answer the question - "Why does the company exist?". Includes organisation value and major goals should be customer focussed.
Vision	What the company would like to achieve.
Objectives	Is a precise and measurable future state that the company wants to achieve. It's purpose to specify what needs to be done in order to attain the company's mission or vision.

What kind of products/services will the company offer? (Chocolates)	Which is the primary market for its offering? (Youth)
What type of customers does the company seek to target? (All Age Groups)	What is the area of operations (Geographies)? (Around the Globe)

Key Questions



- Mission: Financial Scorecard, judiciously reinforced by our Priorities, Commitments and Culture.
- Vision: to be the World's biggest and best Confectionary Company
- Core Values: Performance, Quality, Respect, Integrity and Responsibility

11 VALUE SHOP MODEL OR SERVICE CHAIN MODEL

(Value chain analysis for service sector.)

Approach designed to solved customer problems rather than creating value by producing output.
It aims to cater to service sector companies. Best applies telecommunication company.

INFRASTRUCTURE
⇩
HUMAN RESOURCE MANAGEMENT
⇩
TECHNOLOGY DEVELOPMENT
⇩
PROCUREMENT

Primary Activities

- Problem finding and acquisition.
- Problem solving.
- Choosing among solution.
- Executive and control evaluation.

Secondary Activities

- Same as porter's value chain.

12 Role of Management Accountant

Traditionally

Considered expert on cost analysis, cost estimation, cost behaviour, standard costing, profitability analysis, distribution channel, profit variance analysis, and financial analysis.

Today's environment

Accountant must also have skills of ABC, benchmarking, re-engineering, target costing, life cycle costing, EVA, TQM, & VCA.

⇩

To focus on SWOT analysis.

CASE STUDIES

13 CASE STUDY 1 -VCA - Style-inn Fabric & Clothing - Case Study Digest CS #4

ISSUES

- Style-inn Fabric & Clothing (SFC) : Cloth fabrics manufacturers but designs of fabric are old fashioned.
- Management team believe in integration and diversification & does forward integration by acquiring SDC.
- SDC is targeting price sensitive income group & SFC acquires one of cloth retail chain 'Paridhaan'.
- The sale & profit are not growing at same old rate & top and bottom line witness the slowdown.
- Retail stores find it difficult to make reasonable amount of sale. Also, buying power of retailers is high.

CONCEPT

- Draw Value Chain and Explain briefly
- meaning of competitive advantage and how it can be attained? Explain
- Identify strategy SDC opted to gain competitive advantage.
- Discuss 'value chain effect' of forward integration (acquisition of SDC) on SFCs competitive ability and cost competency'.
- Evaluate possible acquisition of cloth retail chain 'Paridhaan' by SFC.

EXPLANATION

i) Value chain

Suggested by Michael E Porter*) describe those activities of organisation, those add value to input before it become output.

- It assesses and explains current competitive advantage while identifying cost drivers.
- Creates value for its customer either by offering differentiation or cost competitiveness.

ii) Competitive Advantage

Ability to generate more economic value than competitor

- There are three generic strategies **(Cost Leadership, Differentiation & Focus Strategy)**

iii) Strategy at SDC

- SDC targeting the customers of age group from 40 to 60 years and price sensitive income, hence strategy opted as **Cost Focus.**

iv) Value Chain Effect at SFC

Acquisition of SDC by SFC is forward vertical integration.

- Ensures increase in profit.
- Effective control over market pricing.
- Brand building.
- Now garment manufacturer (SDC) to retailer (SFC).
- Scope of value addition to end user increases but more complex value system.

Effect of forward integration on competitive ability and cost competency.

- Two production lines.
- Increase warehouse cost.
- High carrying cost.

(v) Impact of acquisition of Paridhaan by SFC

Benefits

- Full control over production, pricing & marketing, resulting in differentiation strategy.
- Helps to understand customer specification.
- Reduce competition from other brands.

Drawbacks

- Will result into operating & financial risk.
- May not be able to attract requisite number of clients.
- May have to complement its product with another manufacturer.

CONCLUSION

SFC should acquire Paridhan to reduce competition understand customer needs and create a strong brand.

14 CASE STUDY 2 -Value Chain & Value Shop - Pariksha Commerce Test Ltd - Case Study Digest CS #10

ISSUES

- Pariksha Commerce Test Ltd. - provides service of test series.
- Due to printer breakdown, TSC (Test Series Centre) applied new aproach of mailing question papers
- Further to reduce advertisement cost, TSC dropped the contract with Ms. Takshi Sharma, famous film star.
- Further, to reduce cost, now we have 22 members instead of 57 members for question paper preparation & 30 members instead of 68 members for support & counselling.
- Our advertisement cost was comparatively higher than other companies working in education field as well as with our previous years.

CONCEPT

(i) Approach whether Traditional Cost or the Strategic Cost Management System? EXPLAIN.
(ii) General limitations of cost management system and correlate them by identifying the problems.
(iii) EXPLAIN the differences and similarities of Value Chain Analysis and Value Shop Model and IDENTIFY which model can be applied in the organization.

EXPLANATION

(i)

Traditional Cost Management	Strategic Cost Management
TCM system involves allocation of costs and overheads to the production and focuses largely on managing costs through cost control or cost reduction.	SCM is the application of CM techniques to improve the strategic position, reduce costs and maintain effective control of costs.

The SCM techniques should be such that they improve the strategic position of a busines apart from focusing on managing costs.

(ii) **Limitations of the Traditional Cost Management System**

- The **focus is on managing costs** approached via responsibility centres or product cost issues.
- TCM system has **internal focus** and does not look at the **external factors.**
- A broad cost reduction programme could lead to **inferior quality,** driving away customers leading to lower sales and profit.
- The **expectations of modern customer** are quite different.
- TCM **relies on accounting data**
- TCM **is a reactive approach**
- It has a **short-term outlook**
- **Limited focus** on improvisation.

(iii) Value Chain Analysis & Value Shop Model

Value Chain Analysis	Value Shop Model
• A process by which a firm identifies and analyses various activities that add value to the final product. • It helps a firm obtain cost leadership or improve product differentiation. • The various activities classified into Primary (RM to Finished Goods) and Secondary (Support activities) activities.	• It aims to serve companies from service sector. • In value shop principle, no value addition takes place, only deals with the problem, figure-out the main area requires its service and finally comes with the solution. • Problem finding and acquisition, Problem solving, Choosing among solutions, Execution and control/evaluation.

CONCLUSION	It is advisable to apply Value Shop Model in the PCT, as priority should be given to solve problems faced by the students. Satisfaction of students is only way to grow.

15 CASE STUDY 3 -Value Chain & Value Shop - Safe and Wise Advisory Limited (Case Study Digest CS #13)

ISSUES

Facts

- **Safe and Wise Advisory Limited (SWAL)** - financial planning & risk advisory firm
- SWAL is engaged in selling third party products be it financial products or insurance products.

CONCEPT

Porter's five forces model

(i) ASSESS the competitive environment of life-assurance business of SWAL (including 'sub-agency office' division).

(ii) EVALUATE the case for holding the 'sub-agency office' division, backed by financial viability among other criteria.

EXPLANATION

(i) The five forces which are enumerated by this model are:

a) Bargaining power of suppliers

No. of suppliers will decide the dominance they possess in term of bargaining power regarding the price of good and service.

In case of 'sub-agency office' division following factors will affect the suppliers' power

- Control over Value Chain
- Substitution among the brand
- Importance of product
- Supply of other factors

b) Bargaining power of customers (buyers)

Following factors affect the bargaining power of customers of SWAL's 'sub-agency' division

- Number of buyers
- Standardised products
- Switching cost.

c) Threat of new entrants

- In case of 'sub-agency office' division, there are some major barriers to entry
  - Less number of new life-assurance licenses by regulator due to tough regulations
  - Less number of new insurance agent due to no new authorisation by insurance companies
  - Learning curve and economies of scale

d) Threat of substitute products

Substitution means the product from some other industry which can render the same function which life assurance is rendering. The threat of substitute product is quite low.

e) Level of rivalry among current competitors in the industry

Following factor is affecting the competitive rivalry

- Number of competitors and respective market size
- Slow market growth
- Lack of differentiation
- Exit barriers

(ii) Case for holding the 'sub-agency office' division

- Contribution to the group
- Profitability (Margins are positive)
  - ✓ Operating profit (EBIT/ Revenue)
  - ✓ operating profit shrink from 12.4% to 6.43% in three years

- ✓ **Return on capital employed (ROCE) [EBIT / (Equity + Long Term Debt)]**
  ROCE shrink from 15.5% to 7.69% in three years due to change in capital structure
- Liquidity - Current ratio (Current Assets / Current Liabilities)
- Gearing (Debt / Equity)
- Client's demography
- Resistance from employees
- Legal aspect in term of pre-closure of lease
- Loosing USP

CONCLUSION	In nutshell, the life assurance market has matured in recent years, and result in low growth potential and lower profitability but still yielding positive numbers. Hence, sale of 'sub-agency' division will adversely hit the revenue as well as profitability.

16 CASE STUDY 4 -VCA - S-MART (Case Study Digest CS #13)

VIDEO STARTS AT 13:52

ISSUES	Mapping of value chain activities of S-MART (Reference Dmart based on its business)

EXPLANATION

Primary Activities

1.Inbound: It involves arranging inbound movement of materials or finished goods from suppliers to the manufacturing plants or retail stores. Own fleet of trucks for transport. JIT System for minimum inventory level.

2.Operations: These include planning and dispatch, distribution management, transportation, warehousing, and order fulfillment. 100 stores all self owned & No Franchisee / Agent Model.

3.Outbound: Operations involve those activities which are concerned with conversion of inputs into outputs in case of manufacturing companies. No warehouse required as the products are directly delivered to the customer from the store shelves.

4.Marketing sales: Marketing and sales are the means whereby consumers and customers are made aware of the product which is ultimately sold to them. Focus on customer loyalty by offering high quality products. No huge spend on marketing.

5.Service: In case of retail stores, service would encompass a superior experience at the stores and managing return of products by the customers. Superior experience by managing return of products.

Secondary Activities

1.Procurement

Procurement refers to the processes of acquiring various products and include activities like identifying sources of these products, vendor selection, placing an order, purchase of products etc. 500 Vendors Adv. Payment/ Preferential pricing.

2.Technology Development -

It includes activities like process automation, an Enterprise Resource Planning (ERP) system, inventory management systems etc. Process automation SAP/R3 ERP for management of various funds.

3. Human Resource Management -

This involves areas of recruiting, managing, training, developing and rewarding people within an organisation. Low Employee T/O High motivation.

4. Infrastructure -

This includes not only the physical infrastructure but also all departments of management, finance, legal which are required to keep the company's store operational. Finance legal. Etc.

17 CASE STUDY 5 -Porter's 5 Forces & Transfer Price (ICAI Module CS #4)

VIDEO STARTS AT 22:10 MIN

ISSUES	Combination of porters 5 forces within internal divisions & connection of transfer price.

CONCEPT	Competitive advantage depend on bargaining power of buyer and supplier. So, Internal transfer should always be @ fair price. (i) EXPLAIN, how the forces applied in a relationship between supplier and buyer led Michael Porter to reach a conclusion that companies compete with their buyers and suppliers. (ii) DISCUSS, the issues of negotiating and agreeing transfer prices between divisions within a large, complex organization. Make references to Michael Porter's model, and your arguments in part (i) where appropriate.

EXPLANATION	In effect, division concerned will be competing with one another like Buyer & Supplier during negotiation. The Transfer Pricing agreed will effect the profitability of each of the divisions. If bonuses are paid to managers as per divisional performance the Transfer Pricing will determine the level of bonus paid. Then, managers may have personal interest in enduring negotiations that may destroy value in the company. Accordingly the principle of Goal Congruence is very important in internal transfer pricing, so that it is a win-win situation for both the divisions and the company as a whole.

CONCLUSION	When bargaining power of any one division is very high; it affects the balance in negotiation.

18 CASE STUDY 6 -Competitive/ Differentiation Advantage - BA Airlines (ICAI RTP Nov 20, Q.1)

ISSUES	Competitive advantage, differentiation strategy & cost leadership for Airline industry. (BA Airlines, RTP Nov 20, Question 1)

EXPLANATION

Cost of creating value

- Supply what customers want to buy
- Relative Low Cost Advantage
  (Total costs should undercut its average competitor)
  Eg : One plus mobile, Indigo Airline

Cost Leadership

- Charge Lower price than competitor
- Gain Market Share
- Maintain Profitability
- Eg :Internet Ticket Selling
- NO Printed Tickets
- NO Free meals
- Fast Turnaround time

Value to Customer

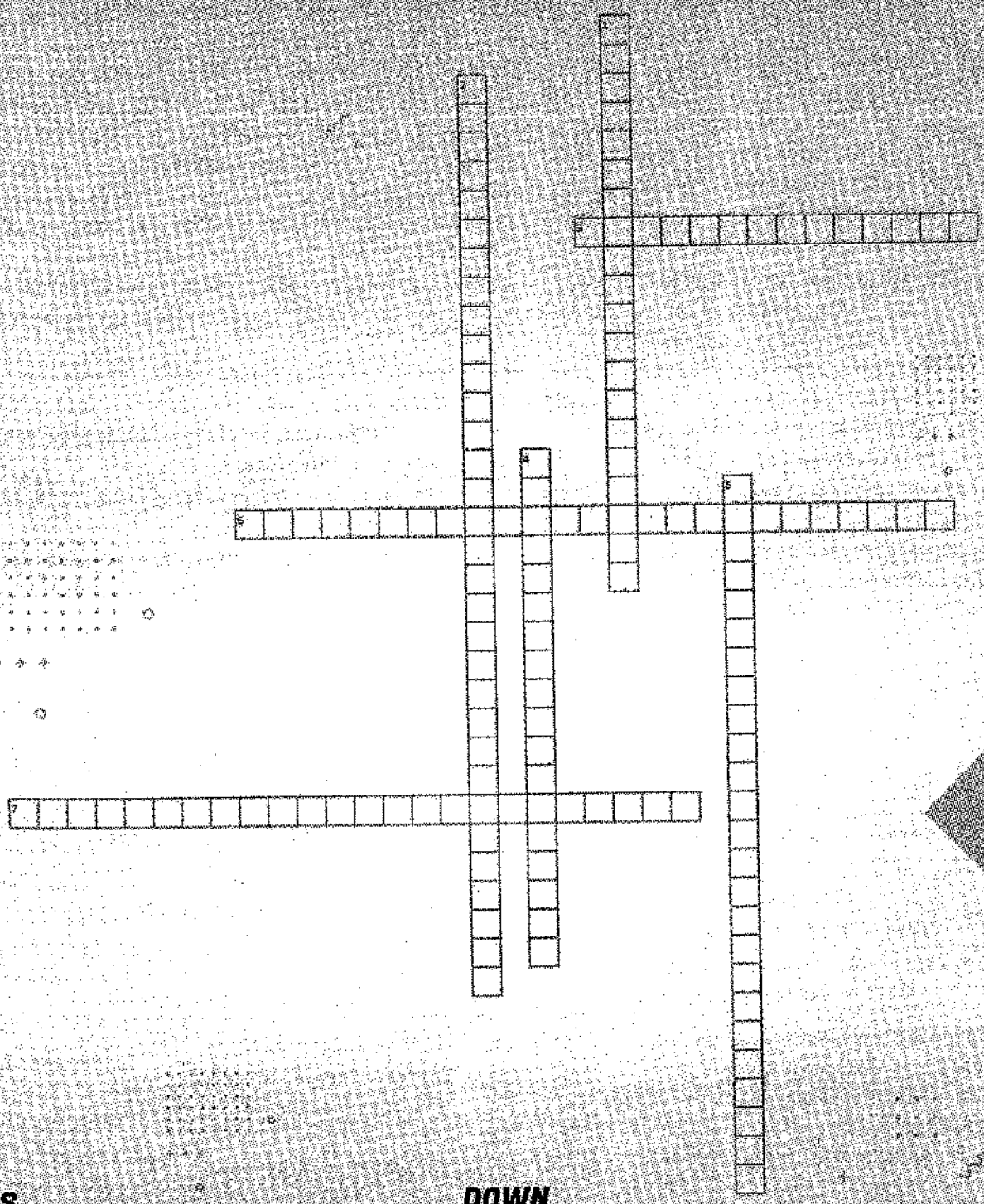
- Survive competition
- Differentiation Advantage
- (Provides Premium & Superior Products)

Differentiation Advantage:

- When customers perceive business offering is of higher quality
- Provide unique customer value/ clean and comfortable aircraft
- Provide value-add services (flight entertainment) ontime running of aircrafts

GAME OF CONCEPTS

CHAPTER 1



ACROSS

3. Service chain model
6. Involves allocation of costs & overheads to production
7. Competitive advantage

DOWN

1. Collections of different market segments
2. Process of combining decision making structure with cost information
4. Activities a company performs to design, produce,market,deliver & support its product
5. Porter's 5 forces analysis

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• ANSWERS ARE UPLOADED ON WEBUCATE APP ON PLAY STORE.

• WINNERS NAME WILL BE UPLOADED ON WEBUCATE APP.

APP CODE

Modern Business Environment

SCAN AND REVISE

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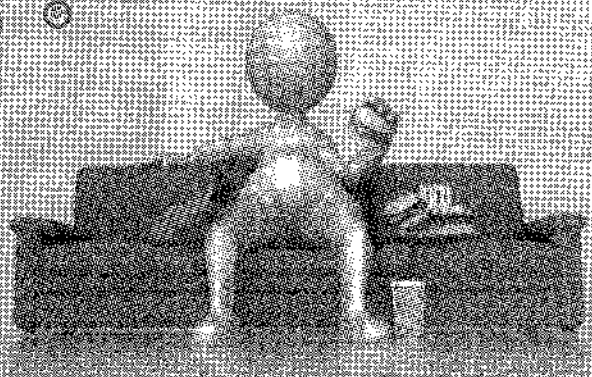


STUDY MENTOR

1 Modern Business Environment

1.1 Business Model	Method of doing business to generate revenue.
1.2 E-Commerce	Type of business model that enables a firm to conduct business over internet.

1.3 Business Environment from Seller's market to Buyer's market

Basis	Seller's Market	Buyer's Market
1.Price	"Cost Plus" Approach	Competitive Pricing
2.Response Time	Determined by Suppliers	JIT by Suppliers
3.Quality	Determined by service/ product provider	Better than customer's expectations
4.Performance	Dictated to the Customer	Effective & Efficient

1.4 Today's Business

Challenges

- To satisfy their customers through exceptional performance of their processes

Remedies

- Cost of Quality
- Total Quality Management
- Supply Chain Management

1.5 Characteristics of MBE

(Influenced by macro economic, technological, political, social changes)

- Globalisation of the world economy.
- Fierce Competition among organisations within and across countries.
- Using new managerial methods.
- Global excess capacities in production, services, and in some areas of development.
- Availability and accessibility of data and knowledge.
- Timely availability of materials and services.
- Ease of global travel and transportation.

2 Quality Management

Cost of Quality

Cost of performing activities to check failure in meeting in quality specifications.

Quality = 1) Conformance to customer specification, 2) Satisfy Customer Expectation, 3) Value for Money.

2.1 Components of COQ

Cost of Conformance (Cost of Good Quality)		Cost of Non-Conformance (Cost of Poor Quality)	
Prevention Costs	Appraisal Costs	Internal Failure Cost	External Failure Cost
• Cost incurred to avoid Poor quality of products & services or minimize no. of defects.	• Control process ensuring high quality standards & performance requirements.	• Incurred to remedy defects discovered before product/ service is delivered to customer.	• Incurred to correct defects discovered by customers.
• Planned & incurred before actual operation. Associated with design, implementation & maintenance of quality management system.	• Associated with supplier's & customer's evaluation of purchased materials, processes, products & services to ensure that they are as per specifications.	• Cost incurred to correct deficiencies caused by error in products & inefficiencies in processes. • IFC occurs when product not as per design, quality & standards.	• Occurs when Product/ Service that fail to reach design quality standard are not detected until after transfer to customer, causing dissatisfaction.
• **For Eg:** Quality Planning/ Engineering, Design Review, Training, Audit, Supplier evaluation.	• **For Eg:** Field Testing, Package inspection, Test Equipment, Product/ Process acceptance.	• **For Eg:** Scrap/ Rework, Re-design, Re-Test, Downtime.	• **For Eg:** Warranties, Complaints, Customer Support, Lost market share.

Higher prevention and appraisal costs = Lower defects & Lower internal and external failure.

2.2 Cost of Quality

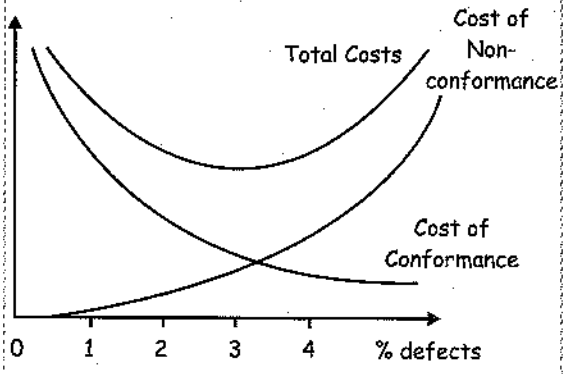
= Cost of Control (Prevention + Appraisal) +
Cost of Failure of Control (Internal + External Failure)

The best approach will be to calculate COQ as a % of total cost which allows comparison of COQ across projects or companies.

2.3 Optimal Cost of Quality

An increased expenditure in prevention and appraisal is likely to result in a substantial reduction in failure costs. Because of the trade off, there may be an **optimum operating level** in which the combined costs are at a minimum.

Optimal Cost of Quality



2.4 Steps of Application of Prevention Appraisal Failure (PAF) Model

1. Gather some basic information about the number of failures in the system
2. Apply some assumptions to that data in order to quantify the data
3. Chart the data based on the four elements listed above and study it
4. Allocate resources to combat the weak spots
5. Do this study on a regular basis and evaluate your performance

3 Total Quality Management (Continuous improvement of internal processes)

TQM is aimed at embedding awareness of quality in all organizational processes to meet & exceed customer satisfaction level. It requires company to maintain quality standard in all aspects of its business and ensuring that ***things are done right the first time and that defects and waste are eliminated***. TQM is a comprehensive management system which:

Focuses
- on meeting owner's/ customer's needs, by providing quality services at a reasonable cost.
- on continuous improvement.
- on the way tasks are accomplished.

- Emphasizes teamwork.
- Views organization as an internal system with a common aim.
- Recognizes role of everyone in the organization.

TQM's objective is to eradicate waste and increase efficiency.

3.1 Principles of Total Quality Management

Employee Involvement
Every person in an organisation has a responsibility for quality of products & services.

Centred on Process
TQM system will fail without clear focus & process - led thinking. Effective monitoring of every single step is essential.

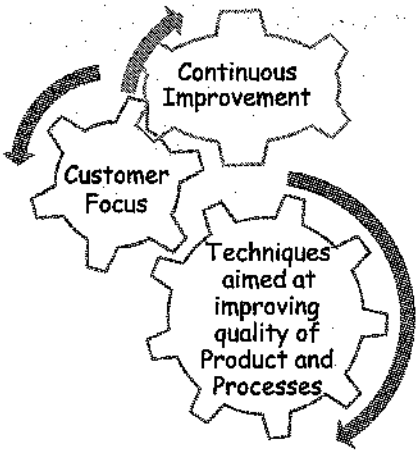
Integrated System
TQM is a joint effort of Management, Employees and Suppliers.

Customer Focus
Quality is determined by customer. Customer satisfaction is only way of knowing if measures are successful.

Communication
Effective communication is essential for implementing significant changes for business improvement.

Continuous Improvement
To meet & exceed customer satisfaction level, constantly seeking new ways to be more competitive and deliver high quality products.

3.2 Fundamentals of TQM



- **TQM**
  - **Total**
    - Entire Organisation
      - Supply Chain
        - Product Life Cycle (Introduction, Growth, Maturity, Decline.)
  - **Quality**
    - Improving quality of Products & Services
      - By meeting or exceeding Customer Expectations
  - **Management**
    - Planning
    - Organising
    - Staffing
    - Direction
    - Control

3.3 6 C's of TQM

1 Commitment

- A clear commitment from the top level must be provided so that quality improvement becomes part of everyone's job.
- Delegating to single person is not sufficient.

2 Culture

- Culture followed needs to be modernized on continuous basis to encourage employee's feedback.
- Focus on training and quality.

3 Continuous Improvement

- A continuous process ; not a program.
- Constant improvement required in related policies, procedures & controls laid by management.
- Continuous search of proficiency to do task better.

4 Co-operation

- TQM is directly related to Total Employee Involvement (TEI).
- It is used in development of improved strategies and associated performance measure.

5 Customer Focus

- Focus equally on internal & external customers.
- Perfect service with zero defects in all that is acceptable at either internal or external levels.

6 Control

- Control for monitoring & measuring the performance of business.
- Helps to rectify deficiencies.

4 TQM by Deming (Father of Quality Control)

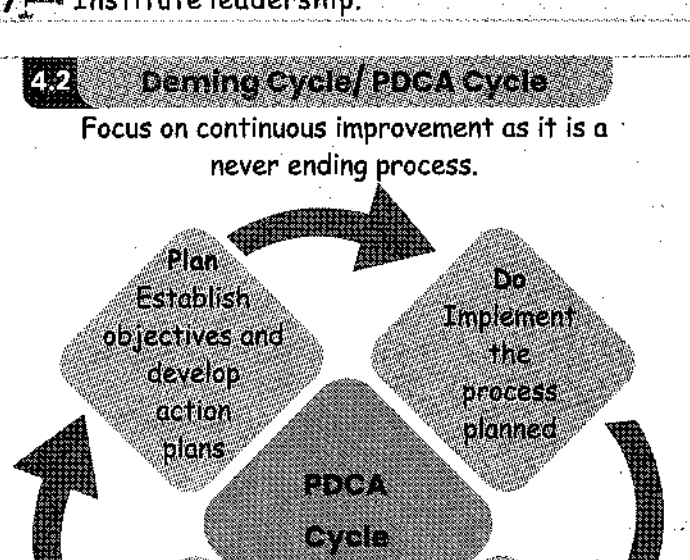
- **Philosophy Of deming**
  - **Quality issues on account of**
    - 15% Defects due to workers
    - 85% Process/systems/ poor management
      - Correct system problems to create an environment that promotes quality

4.1 Deming 14 Points

1. Create a constant purpose towards improvement. (Long Term)
2. Adopt the new philosophy. (Management should also adopt.)
3. Stop depending on inspections. (No need if variations reduced.)
4. Use a single supplier for any one item. (One supplier zero defect.)
5. Improve constantly and forever. (Strive to reduce variation.)
6. Use training on the job. (Inadequate training introduce variations.)
7. Institute leadership.
8. Eliminate fear. (Prevents workers from acting in organisation's best interest.)
9. Break down barriers between departments. (Employees)
10. Get rid of unclear slogans. (Improve processes)
11. Eliminate management by objectives. (Production targets reduce quality.)
12. Remove barriers to pride of workmanship. (Reduce worker's satisfaction.)
13. Implement education and self-improvement.
14. Make "transformation" everyone's job.

4.2 Deming Cycle/ PDCA Cycle

Focus on continuous improvement as it is a never ending process.



4.3 Features of Total Employee Involvement

- Loyalty to the vision of the company through the pursuit of tough, visible goals;
- Recognition of satisfied customers and motivated employees as the true assets of a company;
- Delegation of decision making to allow direct & speedy response to customer needs;
- Decentralisation of management to make best use of the creative energy of the workforce.

5 Business Excellence Model

- BEM is a philosophy for developing & strengthening management system & processes of an organisation, to improve performance and create value for stakeholders.
- Helps in strengthening the internal communication and shows how a world class organisation should operate.

It aims to develop Quality Management principles »

- Increases Efficiency of operation
- Minimises Waste of goods/ services
- Increases Employee Loyalty
- Maintain High Standards of Business
- Outstanding practices in managing the organisation

BEM = Focus on Leadership, Strategy, Customer focus, Information management, People & Processes.

5.1 Five Business Excellence Models

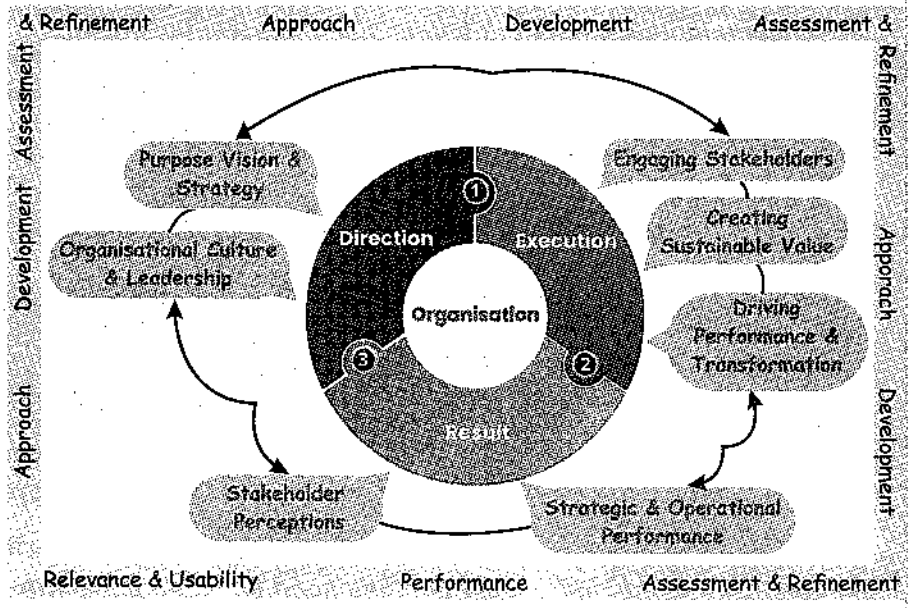
- EFQM Excellence Model
- Baldrige Criteria for Performance Excellence
- Singapore BE Framework
- Japan Quality Award Model
- Australian Business Excellence Framework

5.2 European Foundation Quality Model (EFQM)

Improves the competitiveness of organization, by

- Primary importance to customer needs
- Taking long term stakeholder view

New EFQM by ICAI Module 2022



5.3 EFQM Structure

(Deliver sustainable value & outstanding result.)

Direction	Execution	Result
(Why)	(How)	(What)
Purpose of organisation and strategy to operate.	Delivery Strategy.	Organisation achievability and its future.

5.4 The Radar, Logic Assessment Framework

R = Result A = Approach D = Deploy
A = Assess R = Refine

- Determine the RESULT it is aiming to achieve and; - Set the appropriate targets.
  - Compare internally and externally
- Plan and develop an integrated set of sound APPROACHES to deliver required result now and in the future.
- DEPLOY & introduce approaches in a systematic way to ensure full implementation
- ASSESS & REFINE approaches &deployment & analyse result achieved. Identify, priorities, plan & implement improvements.

5.5 EFQM + RADAR

- Wholistic view of current operations.
- Use core competencies.
- Drive transformation & achieve excellence in operations.
- Build ability & resilience in business operations.
- Brand Image & Reputation
- Set assessment tool for Business Excellence.

6 Theory of Constraints (By Goldratt & COX) (Anything which restricts production)

Focuses on revenue & cost management when faced with **bottlenecks** or **constraints**.

Bottlenecks — Demand is more than supply.
- **Bottleneck:** Fully utilized.
- **Non-Bottleneck:** Utilise only to extent of Bottleneck.

Constraints
- Lack of skilled employees.
- Lack of customer order.

Eg: Material, Labour, Machinery

6.1 Key Operational Measures

Throughput (T)
- Rate of generating money in an organization through Sales.
- Throughput = (Sales Revenue - Unit Level Variable Expenses)/ Time.
- Direct Labour Cost is viewed as a fixed unit level expenses and is not usually included.

⇩ **Measure Incoming Money.**
⇩ **Increase**

Investment (I)
- Money associated with turning materials into Throughput and do not have to be immediately expensed.
- Includes assets such as facilities, equipment, fixtures and computers.

⇩ **Measures money tiedup within system.**
⇩ **Minimum**

Operating Expense
- Money spent in turning Investment into Throughput and represents all other money that an organisation spends.
- Includes direct labour and all operating and maintenance expenses.

⇩ **Money leaving the system.**
⇩ **Decrease**

6.2 Throughput Accounting Ratio

$$\frac{\text{Throughput per Bottleneck Minute}}{\text{Factory Cost per Bottleneck Minute}} \quad \text{OR} \quad \frac{\text{Time Required}}{\text{Time Available}}$$

(Highest TA ratio is constraint)

6.3 Goldratt's Five-step Method for Improving Performance

Identify the Constraints	Exploit the Constraints	Subordinate & Synchronize to the Constraint	Elevate the Performance of the Constraint	Repeat the Process
Which restricts expanded output.	Decision regarding optimum mix of product.	Optimum production of bottleneck activity should determine production schedule of non-bottleneck activity.	Taking action to remove constraint. Involve: Replacing machine or providing additional training for slow workers.	Repeat if replaced by new constraint.

6.4 Advantages of TOC
- Reduction in inventory
- More productive machines.
- Ability to meet shorter lead times.
- More flexible.
- Better customer service.
- Better product mix.
- Better customer relationship.

6.5 Disadvantages of TOC
- Focus on short-term goals.
- Main emphasis on increasing sales and volume, not quality.
- Might result in loss of the overall picture while looking at specific constraints.
- Focuses on the push approach.
- Valid only if applied to the total supply chain process including management, production, resources & support
- Operating expenses under TOC/TA are regarded as fixed. Therefore, TOC & TA are basically the same thing as variable costing.

7 Supply Chain Management (End - to End Process)

A supply chain is a network of ***retailers, distributors, transports, storage facilities*** and ***suppliers*** who take part in production, delivery and sale of a product that convert and move goods from raw materials to end users, it describes the processes and organization involved in converting and conveying the goods from manufacturer to consumers.

Begins from supplier and ends on customer. Includes activities of Production planing, Purchasing, Material Management, Distribution, Customer Service, Forecasting.

7.1 Global Supply Chain Forum (GSCF) Framework for Supply Chain Management

"Integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders". Eight supply chain management processes:

- **Customer Relationship Management:** Customer Interaction & Improving business relation
- **Supplier Relationship Management:** Relationship with supplier
- **Customer Service Management:** Administer product & service agreements
- **Demand Management:** Understand customer requirements
- **Order Fulfilment:** Logistics network and customer orders
- **Manufacturing Flow Management:** Manage manufacturing flexibility in Supply chain
- **Product Development & Commercialisation:** Market new products
- **Return Management:** Return & Reverse logistics.

7.2 Types of Supply Chain - Push & Pull Model

Push Model (Produce in Advance)

Under **Push Model** stocks are produced on the basis of anticipated demand. Logistics are driven by long-term projections of customer demand.

Supplier	Manufacturer	Distributor	Retailer	Customer
Supply to Forecast	Production Based on Forecast	Inventory Based on Forecast	Stock Based on Forecast	Purchase What is Available

Pull Model (Just in Time)

Pull Model stocks are produced in response to the actual demand. Inventory is acquired on a need-basis.

Supplier	Manufacturer	Distributor	Retailer	Customer
Supply to Order	Produce to Order	Automatically Replenish Warehouse	Automatically Replenish Stock	Customer Orders

7.3 Steps in SCM Process

Plan
First step develop a plan to address customer. Production must be planned based on demand of products.

Develop (Procure)
Ensure that the parts/materials are received as and when required by the production team.

Make
Third step is making or manufacturing the products required by the customer.

Deliver
Foruth stage is to deliver products manufactured for the customers. This stage is concerned with logistics.

7.4 Benefits of Supply Chain

- Inventory Reduction
- Personnel Reduction,
- Productivity Improvement
- Information Visibility
- New/improved Processes
- Customer responsiveness
- Standardization.

8 Upstream Flow

The processes for managing relationships with suppliers.

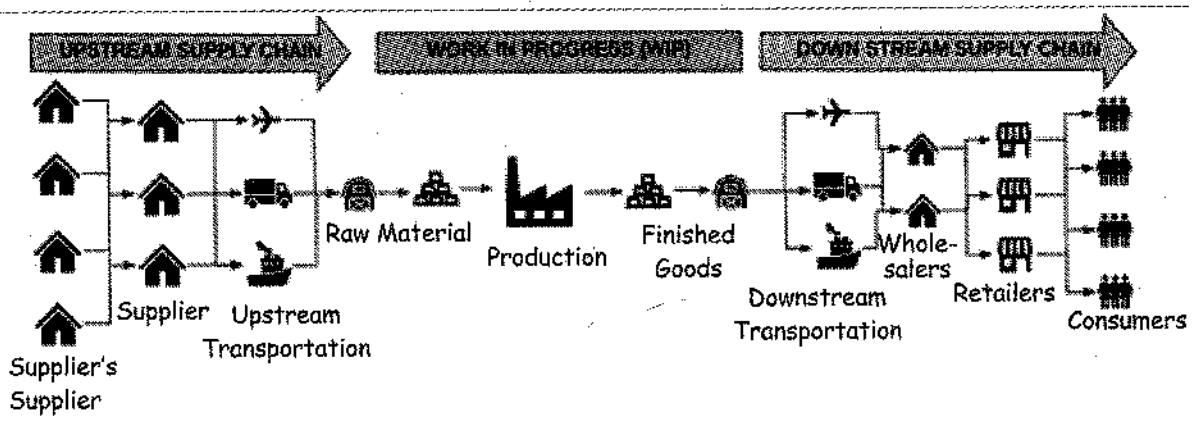
Relationship With Suppliers

(Innovative, Reliable, Agile)

1) Make Or Buy And Outsourcing
2) Number Of Suppliers (Bulk Purchase Discount)
3) Cost, Quality, And Speed Of Delivery
4) Supplier Strategy (Control over suppliers)
5) Sources (All Over The World).

Use of Information Technology

1) E-Sourcing (E-Invitation to tenders & request to submit their quotation).
2) E-Purchasing (Shopping through Amazon, E-Catalogue, E-Purchase order, Centralized purchase to decentralization, etc).
3) E-Payment (E-Invoicing & Fund Transfer).
4) E-Procurement (Less time and cost, quick order, best supplier, control over inventory, financial transparency) (Eg: India Mart)



9 Downstream Flow

The processes for distributing and delivering products to end customers.

Relationship Marketing

Refer Point No. 10 on Page:2.9

Customer's Relationship Management

Refer Point No. 11 on Page:2.9

Use of Information Technology

E-Sourcing
E-Purchasing
E-Payment

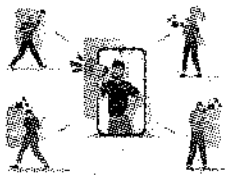
Brand Strategy

Use of Logo/ Specific color/ Any other means to make product distinctively visible.

10 Relationship Marketing

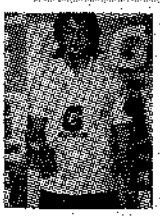
Customer Market

- Represent existing and prospective customers.
- Creating Brand Loyalty for Customer is our main goal.



Influence Market

- Keep existing customer & attract new customers.
- Ability to influence marketing environment like financial analysts, shareholders, government, consumers.



Referral Market

- Buying product after being reffered by friends and relatives;
- Referral market further be divided into 2 categories:
  - Customer recommendation of supplier.
  - Consultancy firm referral.

Supplier Market

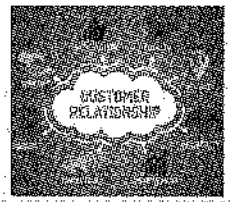
- Suppliers who supply crucial raw material and parts.
- Need to develop strategic alliance & maintain good relation with them for quality and speed of material.

Recruitment Market

- Includes commercial recruitment agencies & Universities for potential employees.

Internal Market

- Includes internal department and staff.
- Determine customer oriented corporate culture.



11 Customer Relationship Management

- To manage and analyse customer interaction and data throughout the life cycle with the main motive of improving business relation.
- Relation with customers, assisting in customer retention and driving sales growth.
- CRM is knowing the needs of customers and providing them with best possible solution.

11.1 Analysis of Customers and their Behaviour

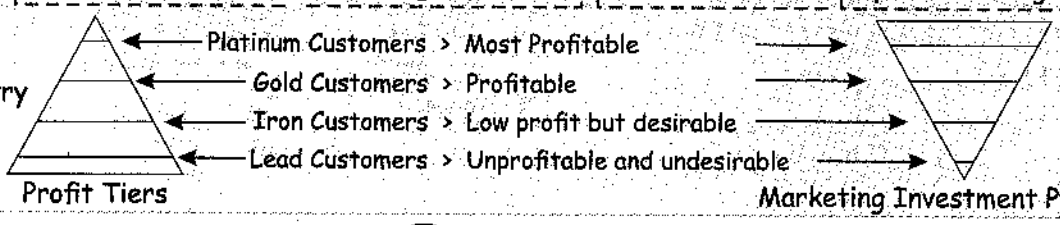
Based on geographical location or purchasing characteristics .
Also consider: quality, discount, serviceability, size.

12 Customer Account Profitability

CAP means to measure Profit at Customer Level by understanding the components of individual cost and linking it with specific customers. Following is the Five- Step Process.

1. Analyse the customer base & split it into the segments.
2. Calculate the annual revenues earned from the customers.
3. Calculate the annual cost of serving the segment.
4. Identify & retain quality customer
5. Re-Engineer/ Eliminate the unprofitable segments.

Example of CAP
(CAP) : Banking Industry
Product: Credit Card



13 Customer Lifetime Value (CLV)

Customer Life time value is the present value of net profit that we derive from a customer over the entire lifetime of relationship with that particular customer. It is the net present value of the projected cash flows from a lifetime of customer relationship.

13.1 Components of CLV

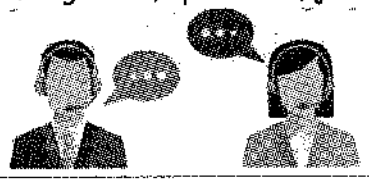
- **Customer Selection**
  Target Customer, its value and our reach strategy.
- **Customer Acquisition (New customer)**
  Advertisement, mail, search engine marketing, online PR etc.
- **Customer Retention (Keeping Existing Customer)**
  Satisfaction, responsiveness, after sales, reliability, personalisation.
- **Customer Extension**
  Resell (similar), Cross Sell (related), Up Sell (expensive).

14 Service Level Agreements (SLA)

Agreement between customer and service provider include many components, from a definition of services to the termination of agreement. ***(Practical Question on 2.11)***

15 Outsourcing (Contracting Out)

- Business practice used by companies to reduce costs or improve efficiency by shifting tasks, operations, jobs or processes to another party for a span of time.
- Contract given to third party at premises or outside.
- Outsourcing is often an integral part of downsizing or re-engineering.
- It is a cost saving measure having significant effect.
- Outsourcing can be done of manufacturing as well as services.



15.1 Advantages

- Saving Costs of operation & labour.
- Saving in investment, Technology, Infrasrructure.
- Flexibility in staffing & manpower management.

15.2 Disadvantages

- Control required on outsourced activities.
- Inexperienced workers lead to quality problems.
- Loss of sensitive data & loss of confidentiality.

16 Gain Sharing Arrangements (GSA) (Cost saving sharing)

GSA is an approach to the review and adjustment of an existing contract, or series of contracts, where the adjustment provides benefits to both parties.

- Fundamental form of GSA is where a suppliers performs its side of the contract with no guarantee of receiving payment.
- It is a win-win situation for both supplier and their customers.
- Risk in nature as supplier can be rewarded with large return; or walk away with nothing.
- Equivalent to supplier taking an Equity stake in customer.

Eg:

- Cost saving initiatives and GSA at Chiang International.
- Supplier deliver 3% minimum cost saving on controllable portion of cost.
- Cost saving - First year (idea by supplier) > retain by supplier.
  Second year > shared in 40 : 60 ratio.
  Third year > passed to Chiang International.
- Any cost saving by exclusively Chiang International idea does not required sharing with supplier.

17 Case Study 1 -Service Level Agreement - Red Star Limited - (ICAI Student Journal)

Red Star Limited (RSL) is the largest manufacturer of Air- Conditioners. RSL is not good at attending the customer calls due to lack of capabilities, but it is an important activity from the aspect of the value chain. Hence, in order to improve customer experience (downstream supply chain), RSL decided to hire Krishna Infotech & BPO Services (KIBS) for attending the calls of their existing and prospective customer.

Service level agreement (SLA) was duly entered and service level (SL) of 90/20 has been prescribed to keep a check on service quality. Invoice will be generated monthly, and SL will also be observed on monthly basis. For the first month along with the invoice, KIBS provide the following details to RSL-

- Total calls offered 5,120
- Calls answered within threshold time 4,850
- Short or Abandon calls within threshold time 115

CFO while authorising the payment queues generated by the account executive in ERP, come across the KIBS payment; he immediately seeks a copy of SLA from legal but not able to understand the technical aspects hence he decided to calls you (management accountant) to EXPLAIN few terms (including SL) and certain COMPUTATIONS.

Required

(i) What is the SLA threshold and what is the threshold time in this case?
(ii) Explain the significance of 90/20 SL.
(iii) Compute the SL level for the first month.
(iv) Whether KIBS attained the SL level to full the terms of SLA?
(v) For how many calls KIBS can bill to RSL?Required

Solution

(i) A service-level agreement (SLA) threshold is the activity response time specified in a service level agreement. In the current case, the SLA threshold is the number of seconds within which a call shall be responded to by a tele-caller at KIBS. The threshold time, in this case, is 20 seconds it is represented by a service level (SL) of 90/20.

(ii) A service-level agreement (SLA) defines the level of service you expect from a vendor, laying out the metrics by which service is measured. Service level basically measures the performance. Service level (SL) of 90/20 signifies that 90% of the calls shall be answered within 20 seconds.

Concept Insight

SLA is the document that outlines the wider service agreements between a service provider and its customer, whereas SL is the acceptable level of service performance regarding which agreement has been entered.
Mind it, both the SLA and SL are not the same

(iii) Service Level (SL) measure the performance and can be computed for voice calling BPO services using the following formula-.

$$SL = \frac{\text{Total calls answered within threshold time}}{(\text{Total calls offered - Short or abondon calls within threshold time})}$$

SL = 4,850/ (5,120 - 115)
SL = 4,850/ 5,005
SL = **96.90%**

(iv) Against the expected service level of 90%, KIBS attain the service level of 96.90% which means out of each 100 calls nearly 97 class are answered within 20 seconds (threshold time), whereas the requirement was minimum requirement is 90%; hence KIBS attain the SL level to full the terms of SLA.

(v) No, doubt SL used for measuring the performance which relies upon the calls answered within the threshold time, but the calls answered beyond threshold time also cause costs and resources at end of the BPO vendor (KIBS in this case) hence billing shall be for total calls responded/answered (rather only those which are answered in threshold time). Hence, in a given case, the KIBS can raise an invoice for 5,005 calls i.e., 5,120 (total calls offered) - 115 (short or abandon calls within threshold time).

18 Case Study 2 -Supply Chain Management - Sun Electronics - Croma (ICAI Module CS #6)

ISSUES

- Manufacture and Sells Electronic goods though 30 stores in india.
- Stores have to order to centralized team once in a month, and then goods are dispatched.
- Time taken 30-40 days to deliver to each store.
- Company facing quality related issue with vendors leading to delay in production.
- Holding period very high @ 45 days as compared to 15 days of industry average.
- Stock outs/obsolete are general problems faced on account of high level of investing.
- Company sell huge potential in E-commerce.
- Planning to go online. (E-commerce).

VIDEO STARTS AT 35th MINUTE

CONCEPT

- Implementation of Supply Chain Management System.
- SCM Process.
- E-commerce concept.
- Benefits of SCM.

EXPLANATION

Concept of SCM: Defined as Management of flow of products, services and information which begins from origin of products and ends at products consumption at consumer's end.

SCM Process

Plan	Develop	Make	Deliver
Production based on demand.	Proper supplier selection & Best quality Material.	Manufacture as per needs of the customer.	Logistics & Timely Delivery.

Proper SCM help to correlate the production and distribution of goods and services with demand of the product.

CONCLUSION

Benefits of SCM

Customer Service by providing Best Quality Products.	Delivery Mechanism (Procurement) with on Time delivery.	Reduced Inventory Holding Time & better working capital cycle.	Better Supplier Relationship.

ERP & Production Planning

Seamless procurement strategy by the supplier

E-Commerce & SCM

Have a well trained logistic team

Link production with customer order.

19 Case Study 3 -Supply Chain Management (SCM)- Memorable Travels - Tour operator (ICAI Module CS #7)

ISSUES

- Memorable Travels - Tour operator
- Advertise and promote their packages in newspapers and colorful brochures.
- A basic holiday package includes transport from the city to the destination, stay, food, attractions, or activities.
- Customer expectations from a holiday trip vary depending on their age group.
- Company wants to offer customized holiday packages that suit travelers' expectations.
- Recently, the management has noticed increase in the no. of complaints regarding these packages due to standard agreements with suppliers offering standard holiday packages.

CONCEPT

(i) Objective of incorporating the SCM framework into its business model.
(ii) Components of Memorable Travels' upstream supply chain.
(iii) Key processes in the business model of Memorable Travels.

EXPLANATION & CONCLUSION

(i) Memorable Travels is providing a service wherein it uses its assets, staff, and resources to provide customized travel packages to its customers.

- Consider how to utilize its assets and staff to design and manage its supply chain such that it meets the customers' demand in a cost-effective manner.

Uncertain Customer's demand due to

- Customization of holiday packages
- Sensitivity of travel to factors.

- Coordinate Business processes across organizations » to meet the customers' expectation.
- Ability to respond to its customers' demand defines its operational capacity.
- Helps to be more responsive and flexible & balance with its ability to maintain an effective SCM.

Effective Supply Chain

Memorable Travels — Customer

Get Required Level of Service

(ii) A basic holiday package would include transport from the city to the destination, stay, food, attractions, or activities. Possible components of upstream supply chain include partnerships with:

- -Transport providers.
- -Local food producers and restaurants.
- Lodging and accommodation providers.
- Providers of tourist attractions and activities.

(iii) Key processes in the business model of Memorable Travels would be:

Information Flow
- ✓ To understand customer's expectations.
- ✓ To share information with the suppliers.
- ✓ To establish clear SLA.
- ✓ To monitor performance of suppliers.
- ✓ To collect constructive feedback.

Supplier Relationship Management
- ✓ Identify needs of customers.
- ✓ Identify potential suppliers requisite quality.
- ✓ Drawb SLA after comprehensive negotiations.

Demand Management
- ✓ Focus on how to generate demand.
- ✓ Change marketing strategy from print based to online advertising.
- ✓ Manage variation in customers' expectations in a cost- effective way.
- ✓ Higher the capacity more the flexibility in its operations.

Capacity and Skills Management
- ✓ To develop ability to cater various expectations of customers.
- ✓ To develop assets and skilled staff.
- ✓ To enable this, the company has to invest in its organization, processes (accurate information), assets (IT infrastructure) and staff (skilled staff).
- ✓ Ability to develop pool of suppliers who provide good quality service.

Customer Relationship Management
- ✓ Understanding customer's needs to focus on efforts to meet those needs.
- ✓ CAP analysis should be prepared for each customer segment to ensure cost of maintaining CRM not exceeds revenue.

Service Delivery Management
- ✓ Agreements with suppliers will help to ensure that customer's expectations are met.
- ✓ Monitor & check service performance continuously for compliance.
- ✓ Any deviation from scope may have an impact on the payment settlement.

Cash Flow
- ✓ Monitor service delivery to ensure that payment is made only to the extent of the agreed quality of service.
- ✓ Periodic payments to suppliers should be made based on SLA.
- ✓ Monitor cash inflow from customers to avoid bad debts.
- ✓ Pricing for packages should be based on level of service offered.
- ✓ Proper co-ordination is required for smooth functioning of organization and its supply chain.

20 Case Study 4 - Outsourcing - Staywell Hotels (ICAI Module CS #8)

ISSUES

- Staywell Hotels - Hotel Industry.
- Provides accommodation, including amenities, for cost-conscious travellers.
- Also provide conference rooms for business meetings.
- The hotel provides free shuttle service to and from the airport.

CONCEPT

(i) Various primary activities of Staywell in its value chain.
(ii) Stage of product life-cycle.
(iii) Risks of outsourcing cleaning and food services for the luxury resort properties.

EXPLANATION & CONCLUSION

(i) The five Primary Activities of Michael Porter's Value Chain Model.

(1) Inbound Logistics

Receiving , handling of materials from the supplier and their storage. Food from vendor and crockery, bedding & laundry.

(2) Operations

- Converting inputs into production of output or service.
- Maintenance of hotel premises including guest rooms, conference rooms and common area.

(3) Outbound Logistics

- Storage and movement of end product from production line to the customer.
- Guest should get what they ordered for non-smoking room.
- Review of food items to remove the ones past expiry.

(4) Marketing and Sales

- Communicating , selling , and delivering the product or service to the customer.
- Free shuttle service, agreement with airline companies to accommodate guests.

(5) Service

- After sale service , handling customer complaints , customer support, training etc
- From front-desk, room service , catering , repair services, shuttle service would be included

(ii) Product Life-cycle Stage of Staywell Hotels "Budget Accommodation"

- Staywell Hotels ploughed in profits to expand its business offering to other cities as well.
- Intense competition indicates similar offering by rivals.
- Price wars have put pressure on profit margins.
- Hotel is in maturity stage as it plans to continue the segment due to its sizeable market share.
- It needs to improve its product offering to beat competition.
- Management's plans to foray into luxury resort indicates its future plans to sustain business.

(iii) Risks of Outsourcing Cleaning and Food Service under the Luxury Resort Model

RISK
- Dissatisfaction among guest as regards quality due to low cost.
- Negative impact due to online reviews on booking portals.
- Bankruptcy & shutdown of well performing vendors.

In luxury resort business, primary feature of this model is "good quality of service".

ENSURE
- That it can easily switch service providers.
- Required level of quality of service.

Alternatively have complete control over activities through in-house departments.

- Better service enhances guest experience
- Compare to out sourcing this might be costlier option.

Student Notes

MASTER SUMS

21 Question 1 (RTP Nov 18) (Total Quality Management)

Cool Air Private Ltd. manufactures electronic components for cars. Car manufacturers are the primary customers of these products. Raw material components are bought, assembled and the electronic car components are sold to the customers.

The market demand for these components is 500,000 units per annum. Cool Air has a market share of 100,000 units per annum (20% market share) for its products. Below are some of the details relating to the product:

Selling price	Rs.2,500per unit
Rawmaterial cost	Rs. 900 per unit
Assembly& machine cost	Rs. 500 per unit
Delivery cost	Rs. 100 per unit
Contribution	Rs.1,000 per unit

The customers due to defects in the product return 5,000 units each year. They are replaced free of charge by Cool Air. The replaced components cannot be repaired and do not have any scrap value. If these defective components had not been supplied, that is had the sale returns due to defective units been nil, customers' perception about the quality of the product would improve. This could yield 10% increase in market share for Cool Air, that is demand for its products could increase to 150,000 units per annum.

Required

(i) ANALYZE, the cost of poor quality per annum due to supply of defective items to the customers.

(ii) The company management is considering a proposal to implement an inspection process immediately before delivery of products to the customers. This would ensure nil sales returns. The cost of having such a facility would be Rs.2 crores per annum, this would include materials and equipment for quality check, overheads and utilities, salaries to quality control inspectors etc. ANALYZE the net benefit, if any, to the company if it implements this proposal.

(iii) Quality control investigations reveal that defective production is entirely on account of inferior quality raw material components procured from a large base of 30 suppliers. Currently there is no inspection at the procurement stage to check the quality of these materials. The management has a proposal to have inspectors check the quality control at the procurement stage itself. Any defective raw material component will be replaced free of cost by the supplier. This will ensure that no product produced by Cool Air is defective. The cost of inspection for quality control (materials, equipment, salaries of inspectors etc.) would be Rs.4 crores per annum. ANALYZE the net benefit to the company if it implements this proposal? Please note that scenarios in questions (ii) and (iii) are independent and not related to each other.

(iv) Between inspection at the end of the process and inspection at the raw material procurement stage, ADVISE a better proposal to implement (a) in terms of profitability and (b) in terms of long term business strategy?

Solution:

(i) Customer demand for Cool Air's products is 100,000 units per annum. However, 5,000 defective units supplied are to be replaced free of charge by the company. Therefore, the total number of items supplied to customers per annum = 100,000 + 5,000 units = 105,000 units. The cost of replacement would include raw material cost, assembly & machining cost and delivery cost of 5,000 units = 5,000 units × (900+500+100) per unit = 5,000 units × Rs.1,500 per unit = Rs.75,00,000 per annum. Further, had the sale returns not happened, market share would have increased by 50,000 units. Contribution is Rs.1,000 per unit, for 50,000 units contribution would be Rs.5,00,00,000. Therefore, the cost of poor quality per annum = cost of replacement + contribution from lost sales = Rs.75,00,000 +Rs.5,00,00,000 = Rs.5,75,00,000 per annum.

(ii) Inspection at the end of the process would detect defects before delivery to the customers. This would ensure that the sale returns would be nil. Given in the problem, 5,000 units supplied are defective and would need to be replaced, in other words, they need to be manufactured again. In other words, inspection after production, before delivery to customers would not prevent production of defective units. However, compared to the current scenario, since these defective units have not yet been delivered to the customer, the cost for additional delivery of replaced products would be saved. This savings in the extra delivery cost = 5,000 units × Rs.100 per unit = Rs.5,00,000 per annum. Further, had the sale returns not happened, market share would have increased by 50,000 units. Contribution is Rs.1,000 per unit, for 50,000 units it would be Rs.5,00,00,000 per annum. Due to increase in sales from 100,000 units to 150,000 units there will be additional failure of units of 2500 units (50,000 x 5%) which will result into an additional cost of (2500 Units x Rs. 1400) = Rs. 3500,000.

Therefore, the total benefit from the inspection process before delivery to customers = savings on delivery costs + contribution from incremental sales - additional failure cost = Rs.5,00,000 + Rs.5,00,00,000 - 35,00,000 = Rs.4,70,00,000 per annum. The cost to the company to maintain good quality of its products through inspection = Rs.2,00,00,000 per annum.

Since the defective units have not been delivered to the customer, the cost would be net of delivery cost.

Therefore, Net Benefit = (50500,000 - 200,00,000 - 3500,000) = Rs.270,00,000

This part can also be analysed by taking 7,895 defectives on 1,50,000 good units. For 95,000 good units, gross production is 1,00,000 units. For, 1,50,000 good units, gross production would be 1,57,895 units (1,00,000/ 95,000x 150,000). Therefore , total defective units will be 7,895.

(iii) Inspection of raw material at the procurement stage could entirely eliminate defective production. The benefit would be two-fold, the current replacement cost for 5,000 units will no longer be incurred. Secondly, due to better customer perception, market share would increase, resulting in an increased contribution / revenue to the company. In other words, the cost of poor quality will be nil.

As explained in solution (i), the cost of poor quality per annum = cost of replacement + contribution from lost sales = Rs.75,00,000 + Rs.5,00,00,000 = Rs.5,75,00,000 per annum. This would be the benefit by implementing the proposal. Cool Air has to incur an inspection cost to ensure this highest standard of quality (0% defects) which would cost Rs.4,00,00,000 per annum. Therefore, the net benefit to the company would be Rs.1,75,00,000 per annum.

(iv) (a) The proposal to implement inspection immediately before delivering goods to the customers results in a net benefit of Rs.270,00,00/- per annum. Alternately, the proposal to implement inspection at the raw material procurement stage results in a net benefit of Rs.1,75,00,000 per annum. Therefore, from a profitability point of view, inspection immediately before delivery of goods to the customer would the preferred option.

(b) The drawback of inspection at the end of the production process is that (1) it cannot prevent production of defective goods and (2) information regarding the root cause of defective production, in this case, supply of defective raw materials will not get tracked. Therefore, inspection at the end of production does not contribute to resolving the root cause of defective production. On the other hand, inspection at the procurement stage can eliminate production of defective goods. This will ensure a much higher quality of production, better utilization of resources and production capacity. Therefore, from a long-term strategy point of view, inspection at the raw material procurement stage will be very beneficial.

Currently the cost of ensuring this highest quality of production (0% defects) is Rs.4 crores per annum. The cost of ensuring 100% quality is quite high, such that the net benefit to the company is lesser than the other proposal. However, due to its long-term benefit, Cool Air may consider some minimum essential quality control checks at the procurement stage. Although selective quality check might not ensure complete elimination of defective production, it can contribute towards reducing it. At the same time cost of selective quality check would not be so high as to override its benefits. To determine the extent of quality control inspection, Cool Air should determine its tolerance limit for defective production and do an analysis of the quality / cost trade-off.

22 Question 2 (RTP Nov 20 Question 4) (Theory of Constraints)

ZED produces two types of products Z and D at its manufacturing plant. Both the products are produced using the same materials, machinery , and skilled labour. Machine hours available for the year is 4 ,000 hours.

Information relating to products are as follows :

Particulars	Z	D
Selling Price per unit	16,000	4.000
Material Costs per unit	7 ,000	1.200
Machine Hours per unit	1.6 hrs	0.8hrs.
Maximum Annual Demand	2,000units	1,600 units
Online Booking (already accepted for)	400 units	1,200 units

Due to poor productivity levels , late order and declining profits over recent years , the CEO has suggested the introduction of throughput accounting in the company.

The total of all factory costs is 1,42,60,000 , excluding material.

Required

(i) Using throughput accounting , PREPARE statement to determine the optimum production mix and maximum profit for the next year.

(ii) CALCULATE the amount of profit lost due to acceptance of online booking of the products .

(iii) RECOMMEND the options to be followed in order to avoid any loss of profit.

(iv) LIST various ways through which price customization could be done.

(v) Given that products Z and D are respectively in 'maturity stage' and 'introduction stage' of their life cycle. STATE the most appropriate pricing policy that could be followed by the ZED for Z and D as per their life cycle.

Solution

(i) Statement Showing Machine Hours

Product	Maximum Demand	Machine Hours/Unit	Total Machine Hours
z	2,000 units	1.6	3,200
D	1,600 units	0.8	1,280
Total machine hours required to meet maximum demand			4,480
Machine hours available			4,000
Shortage of machine hours			480

'Machine hours' is the bottleneck activity.

Statement of Ranking

Particulars	Z	D
Selling Price per unit	Rs.16,000	Rs.4,000
Less:Material Costs per unit	Rs. 7,000	Rs.1,200
Throughput per unit	Rs.9,000	Rs.2,800
Machine Hour Required per unit	1.6	0 8
Throughput Return per hour	Rs. 9.000/1.6 = Rs. 5,625	Rs.2800/0.8 = Rs. 3.500
Throughput Accounting (TA) Ratio (throughput return per hour/cost per factory hour)	5,625/3,565 =1.58	3,500/3,565 =0.98
Ranking	I	II

Cost per factory hour = 1,42,60,000/ 4 ,000 hrs. = Rs. 3,565

Optimum Production Plan

Product	No of units	Machine hr. per unit	Total Machine hrs	T/P per hr	Total T/P
Z (online orders)	400	1.6	640	5,625	36,00,000
D (online orders)	1,200	0.8	960	3,500	33,60,000
Z	2,400/16 =1,500	1.6	2,400 (b/f)	5,625	1,35,00,000
Total					2,04,60,000
Less Total Factory Costs					1,42,60,000
Profit					Rs 6,200,00

(ii) Had there been no online booking first product Z should be produced = 2,000 units using 3,200 machine hours (2,000 x 1.6). Because of online booking already accepted for 1,200 units of product D, unfulfilled demand of product Z = 2,000 - 1,900 = 100 units.

Machine Hrs. Required for 100 units of Z (100x 1.6)	160hrs.
Throughput Lost for Product Z (160hrs.x 5,625)	Rs. 9,00,000
Throughput Return Earned for Product D (160hrs. x 3,500)	Rs.5,60,000
Throughput lost	Rs. 3,40,000

(iii) Recommendation

Option-1

Throughput accounting ratio is the throughput return earned in an hour divided by the factory cost (labour and overheads) incurred by the factory in one hour. Factory cost is generally fixed in nature. A ratio above 1 signifies that the throughput return is greater than the factory cost and therefore the product is profitable. Product Z has a throughput accounting ratio of 1.58 while Product D has a throughput accounting ratio of 0.98, this indicates that hourly return from Product A can cover the hourly factory cost, it is profitable. Product D does not yield enough hourly return to cover the hourly factory cost, it is not profitable. Therefore, ZED should consider ways of improving throughput accounting ratio of Product D (i.e. above 1.0). TA ratio could be improved by:

- Increasing the selling price of the Product D but the demand may fall.
- Reducing the material cost per unit as well as operating costs. However, there may be quality issues.
- Improving efficiency e.g . increase number of units that are made in each bottleneck hour.
- Raising up bottleneck so that more hours are available of bottleneck resource.

Option-2

ZED has to prioritize production of Product Z since it is more profitable than Product D. As per the throughput accounting ratio, Product D does not yield sufficient return per hour to cover the hourly overhead cost therefore, gets second priority over Product Z.

Since machine hours are the bottleneck, if production for entire 4,000 hours is focused on Product Z, return yielded would be sufficient to cover the factory overheads. However, Product Z has a maximum demand of 2,000 units, that requires 3,200 machine hours (2,000 units x 1.6 hours per unit of production. Remaining 800 machine hours can be devoted to Product D, during which 1,000 units can be produced (800 machine hours / 0.8 hours per unit). Maximum demand for Product D is 1,600 units. Therefore, the balance demand of 600 units of Product D will remain unsatisfied.

However, to meet unsatisfied demand of Product D, ZED may consider the option of sub-contracting either a part of whole of the production of Product D. This way it can meet the entire demand for Product D for 1,600 units. If it subcontracts the entire production of Product D, it can also scale down its in-house capacity. Sub-contracting decision requires suitable cost benefit analysis. Moreover, the risk associated with outsourcing like unsatisfactory quality and service or failure of supplier cannot be ignored.
Overall, to enhance profitability or avoid any type of loss of profit, ZED may consider the options recommended above with a long term perspective.

(Based on Theory of Chapter 7)

(iv) Pricing of a product is sometimes customized keeping taste, preference, and perceived value of a customer into consideration. Price customization is done in the following ways:

- **Based on product line:** When products are customized as per the customer's requirements, pricing can be adapted based on the customer 's specifications.
  Standard products can have a base price, to which the company can top-up charges to any additional customization.
- **Based on customer's past behavior:** Customers with good payment record have established their credit-worthiness. To sustain business, they may be extended additional discounts as compared to other customers.
- **Based on demographics:** Different pricing strategies may be adopted based on age or social status. For example, railway fare discounts for senior citizens or concessional price tickets for military personnel.
- **Based on time differential:** Different price for different time periods. If a customer extends a long-term contract, an additional discount may be extended since business is contracted for a longer period of time. Example, discounted price for data usage provided by a broadband service provider if subscription paid for six months or more.

Apart from the above accounting principles, other macro economic and legal factors should also be given importance while chalking out a pricing strategy.

(Based on Theory of Chapter 4)

(v) The life-cycle of a product has 4 stages namely Introductory stage, Growth stage, Maturity stage and Decline stage.

Product Z is given to be in the maturity stage. This third stage of product life cycle is characterized by an established market for the product. After rapid growth in sale volume in the previous stages, growth of sales for the product will saturate. Competition would be high due to large number of rivals in the market, this may lead to decreasing market share. Unit selling price may remain constant since the market is well established. Occasional offers may be used to tempt customers, otherwise this stage will mark consolidation of the market.

Product D is in the introduction stage, the first stage of product life cycle. Penetration pricing is adopted to charge a low price in the initial stage for penetrating the market as quickly as possible. For a new product this low price strategy will popularize the product. Once the market is established, the price may be increased. Penetration pricing will be suitable when:

(i) Demand for the product is elastic, more demand when prices are low.
(ii) Large scale production of the product yields economies of scale.
(iii) Threat of competition requires prices to be set low. It serves as an entry barrier to prospective competitors as well.

However, if Product D is a highly innovative product, it may adopt Skimming price policy. The product with unique features will differentiate it from other products leading to a revolutionary impact on market and customer behavior. Customers may not mind paying a premium for the unique product offering. Focus may be on promoting the product to gain market share. Skimming price policy may work when:

(i) There seem to be no competitors providing similar products.
(ii) Demand is inelastic.

Over time, competitors can reverse engineer and offer similar products. Therefore, the price may be lowered in the long run to retain market share.

23 Question 3 (RTP May 19) (Customer Lifetime Value)

Cineworld is a movie theater is located in a town with many colleges and universities around it. The town has a substantial student population, most of whom are avid movie goers. Business for Cineworld has been slow in the recent years due to the advent of streaming websites, that show the latest and popular movies online. However, the management of Cineworld continue to feel students would still enjoy the watching movies on big-screen, along with the facilities and ambience that only a movie theater can offer. Accordingly, they have framed a plan to attract students by offering discounts on movie tickets.

The average time a student spends at the college or university is 4 years, which i s the average duration of any course. For a nominal one-time subscription fee, Cineworld plans to offer students discounts on movie tickets for a period of 4 years. By attracting more footfalls, Cineworld targets to cross sell it food & beverages and souvenirs. This would help it sustain a reasonable revenue each year.

Cineworld would attract attention to the plan by initially offering free tickets, food and beverage and gift vouchers. This one time initial expense, net of the one-time subscription fee collected, would cost Rs.5,000 per student. On subscription to the plan, the viewership and purchases of each student is expected to be as follows:

Particulars	Years 1 and 2	Years 3 and 4
Spend on movie tickets per year	2,000	1,500
Spend on food and beverage per year	4,000	3,000
Spend on souvenirs and accessories per year	2,250	750

Assumptions

1. Only 50% of the subscribers are expected to visit the theatres in years 3 and 4.
2. Across all years, only 75% of the subscribers who visit the theatre are expected to buy food and beverage.
3. Only 25% of the subscribers who visit are expected to buy souvenirs in years 1 and 2, and 10% of them in years 3 and 4.

Given that PVIFA of Rs.1 for 4 years at 10% = 3.169 and PVIFA of Rs.1 for 2 years at 10% = 1.735.

Required

CALCULATE the customer lifetime value per subscriber for the above plan.

Solution

Customer lifetime value per subscriber can be found by calculating the present value of the revenue that is generated over the period of 4 years. This netted out with the cost incurred to attract subscribers, would give the customer lifetime value per subscriber.

Sr. No.	Particulars	Revenue (per year)	PVIFA	PV of Revenue	Probability of Usage	Net Revenue
1	Net cost of attracting students(onetime expense)					5,000
2	Net revenue from movie tickets					
	Years 1-2	2,000	1.735	3,470	100%	3,470
	Years 3-4 (refer note 1)	1,500	1.434	2,151	50%	1,076
3	Sale of food and beverages					
	Years 1-2	4,000	1.735	6,940	75%	5,205

	Years 3-4 (refer note 2)	3,000	1.434	4,302	37.5%	1,613
4	Sale of souvenirs and accessories					
	Years 1-2	2,250	1.735	3,904	25%	976
	Years (refer note 3)	750	1.434	1,076	5%	54
5	Total revenue (Steps 2+3+4)					12,394
6	Net revenue from subscriptionplan (steps 5-1)					7,394

Note 1:

PVIFA (10%, 4 years) = 3.169 and PVIFA (10%, 2 years) is 1.735. Therefore , PVIF for years 3 and 4 = PVIFA (10%, 4 years) - PVIFA (10%, 2 years) = 3.169 - 1.735 = 1.434.

Note 2:

Only 50% of the subscribers are expected to attend in years 3 and 4. Out of those only 75% are expected to buy food and beverage. Therefore, only 38% of the subscribers (75% of 50% subscribers who visit) are expected to buy souvenirs in years 3 and 4.

Note 3:

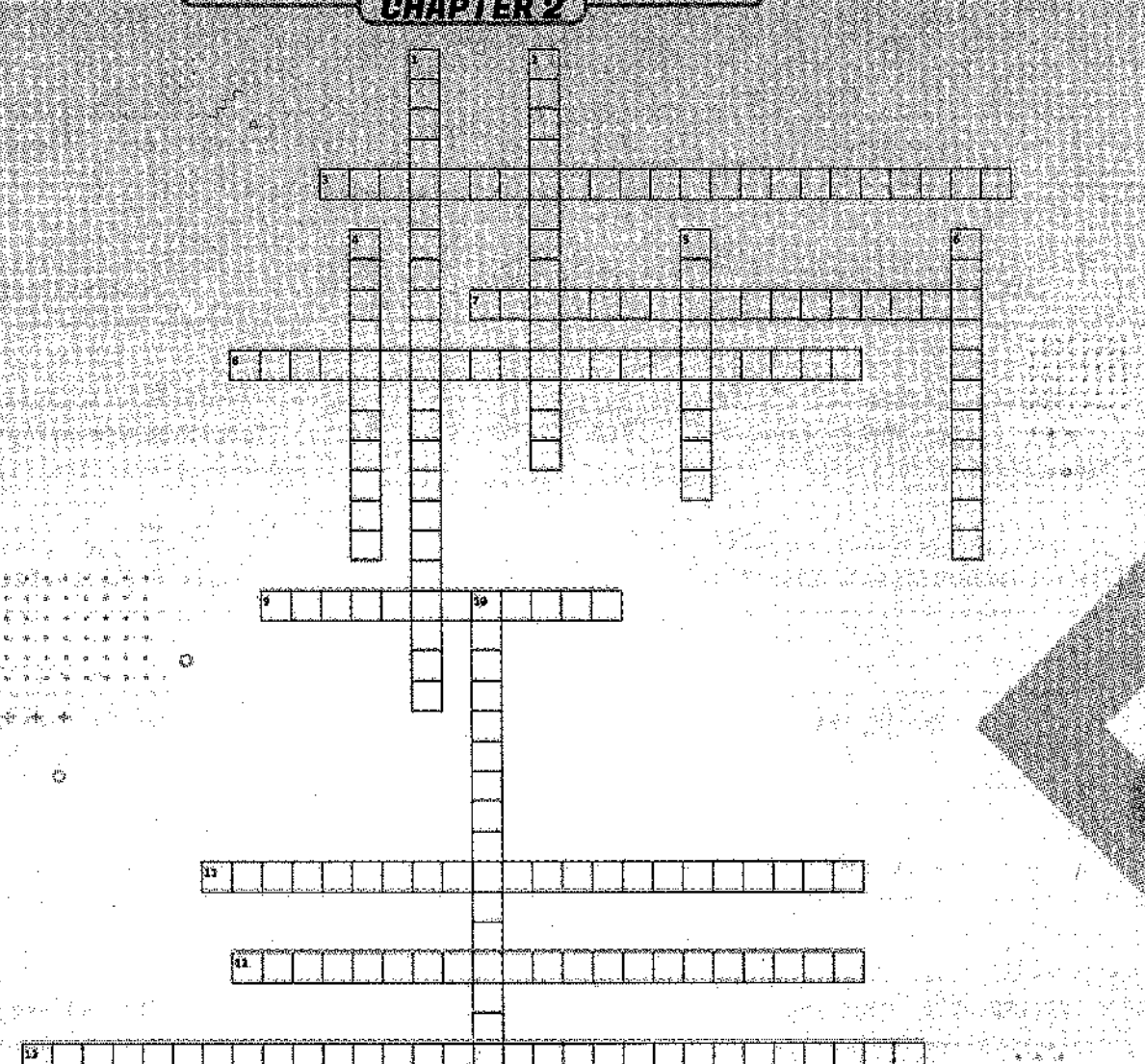
Only 50% of the subscribers are expected to attend in years 3 and 4. Out of those only 10% are expected to buy souvenirs. Therefore, only 5% of the subscribers (10% of 50% subscribers who visit) are expected to buy souvenirs in years 3 and 4

Present value of total revenue generated over the four -year period by a customer is Rs.12,393 while the corresponding expense is Rs.5,000. Therefore, the customer lifetime value per subscriber is Rs.7,393. Cineworld has to multiply this with the expected number of subscribers each year, to find out if this would be a profitable proposition.

Student Notes

GAME OF CONCEPTS

CHAPTER 2



ACROSS

3. Philosophy for developing & strengthening management system
7. Cost of performing activities to check failure inmeeting in quality specifications
8. NPV of the projected cash flows from a lifetime of customer relationship
9. Processes for managing relationships with suppliers
11. Comprehensive management system
12. Types of customer marketing
13. knowing the needs of customers and providing them with best best possible solution
14. Begins from supplier and ends on customer
15. Cost Save Sharing
16. To measure Profit at Customer Level

DOWN

1. Agreement between customer and service provider
2. Process for distributing and delivering products to end customers
4. Contracting Out
5. Father of Quality Control
6. Theory Of Constrainits
10. Method of doing business to generate revenue

UPLOAD 11 SOLVED CROSSWORD PUZZEL & UPLOAD THIS ON INSTAGRAM STORIES &
TAG US @ca_sankalp_kanstiya & YOU CAN WIN EXCITING GIFTS.
 # ANSWERS ARE UPLOADED ON WEBUCATE APP ON PLAY STORE.
 # WINNERS NAME WILL BE UPLOADED ON WEBUCATE APP.

APP CODE

Lean System & Innovation

SCAN AND REVISE

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MENTOR

1 LEAN SYSTEM

1.1 Requirements of Lean System

- Waste Minimization
- Without Sacrificing Productivity
- Optimizing Work Flow

→ By Removing Waste

→ Identify Activities

- Value Adding → Add
- Non - Value Adding → Remove

1.2 Principles of Lean System

- P — Perfect First Time Quality
- W — Waste Minimization
- C — Continuous Improvement
- F — Flexibility

1.3 Characteristics of Lean System

- Z_1 — Zero
  - Inventory
  - Waiting time
- C_2 — Continuous
  - Flow of Production.
  - Finding way of reducing process time.
- P — Pull Processing

1.4 7 Wastes of Lean System (TIMWOOD)

1 Transport

(Unnecessary movement of parts or machines between processes.)

- Eliminating the Need
- Improving Method of Transport

2 Inventory

(Having more than required) (RM, WIP, FG)

- Deteriorate Over Time
- Takes up Space

3 Motion

(Unnecessary movement of people)

- Improving Workplace Layout
- Practicing good housekeeping & workplace organisation
- Introducing low cost automation

4 Waiting

(For next production setup)

- Bad planning/ organization
- Lack of proper training / control

5 Over process

(Unnecessary work element)

- Increases Business Cost
- Unnecessary Processing & Procedures
- Not Required by customer

6 Over Production

(Producing ahead of demand)

- Poor planning/forecasting
- Obsolete if not required later

7 Defects

(Not right in first time)

- Poor Quality Products / Services
- Defective Parts

→ Rework

→ Customer Complaints

2 Techniques of Lean System

- L1 Just In Time
- L2 Kaizen Costing
- L3 5S
- L4 Total Productive Maintenance (TPM)
- L5 Cellular Manufacturing
- L6 Six Sigma

Lean 1

3 Just in Time (Pull System)

Streamline a Company's production process activities to systematically drive all waste out of process.

Just in Time	Just in Time Production	Just in Time Purchasing
Objective is to produce or to procure products or components as required by customer.	System driven by demand for FG, where components are produced only when needed.	System where RM purchases are made as per production schedule.

3.1 JIT SYSTEM / FLOW / PROCESS

1. Spare Parts/ Materials from suppliers on the exact date and at the exact time when they are needed. Investigate every supplier and ensure that they keep up with the delivery dates.
2. Straight delivery to the production floor for immediate use in manufactured products, so there is no time to inspect incoming parts for defects.
3. Visit engineering staff at supplier sites to examine supplier's processes, Provide them with engineering assistance to bring higher standard of product. Check shipping of high quality parts and higher standard of products.
4. Installation of EDI System that tells suppliers exactly how much of which parts are to be sent
5. Dropping off products at the specific machines that will use them first
6. Shorten the setup times.
   Eliminating the need for long production runs/ Streamlined flow of parts from machine to machine.
   Traditional system is to authorize large batch sizes, resulting in huge production and work in progress.
   In JIT; Train the Project team
   ↓
   Video Tape the setup
   ↓
   Examine the tape

   Eliminate step that contribute to a lengthy setup
7. Training to of Employees how to operate & multitude of different machine, perform limited maintenance

Major change required in workforce

Traditional Approach	Modern Approach
1 Employee 1 Machine ↓ Result into Machinery & worker develop a disregard for quality of their work.	Training classes for employees on how to operate different machines, spot product errors, understand the flow when to halt the production process to fix problem. ↓ Completely retrain the workforce to focus on wide range of activities. ↓ **Major Benefit:** Employees are allowed to stop their machines when they see a problem; either fix it on the spot or immediately call in a repair team.

8. Several alterations in the supporting accounting systems, Backflush Costing (Discussed in detail later)

3.2 Advantages

- Less space for stock
- Respond quickly to change in demand
- Closer relationship with supplier
- Capital availability for other priorities

3.3 Disadvantages

- Delayed production if delayed supplies
- Lost sales
- Increased cost (Ordering & Admin)
- Over dependence on supplier

3.4 Essentials of JIT

- Preventive Maintenance
- Defect free material
- TQM
- Demand Stability
- Good communication
- Vendor Reliability
- Low variety of goods

3.5 Aims of JIT

- Meeting customer demand timely
- Providing high quality products
- At lowest cost

3.6 Features

- Reduced material handling cost
- Reduced labour idle time
- Eliminates defects
- Faster response to customer demand
- Selection of suppliers

3.7 Impact of JIT System

Reduce Waste Cost	Better Product Prices	Low Overhead Costs
JIT reduces waste of assets, excessive inventory, defective product resulting in sharp drop in several aspects of product cost.	High product quality, timely delivery. Commands Premium Pricing.	Less material handling, quality inspection, warehouse space, lower rentals, etc. Cost declines.

3.8 Back Flushing (A/C System of JIT)

Reasons for development of Backflushing?

- Large no. of daily supply shipment leading to pile of accounts payable paperwork.
- Difficult to ensure actual delivery as supplier directly deliver to production facility.
- Single consolidated monthly payment to supplier.

$$\left(\text{No. of units produced} \times \text{Unit count listed in bill of material for each component}\right) + \text{Adjustment for scrap during production process} = \text{No. of raw material units removed from stock}$$

* No data entry until finished product is completed.

3.9 Issues in Backflushing

Production Reporting	Scrap Reporting	Lot Tracing	Inventory Accuracy
Production figure entered must be absolutely correct or else wrong components types will be substracted from stock.	Diligently track & record abnormal scrap else material fall outside back flushing system.	Difficult to track lot from which finished goods were produced.	Difficult to maintain accurate set of inventory records in warehouse leading to incorrect inventory balance at all times.

Note: Highly experienced staff is required for backflushing as inaccurate data can lead to inaccurate results.

3.10 JIT Issues

START AT 50 MINS

Different operating speed of 2 machines » Creates

- Inventory build up in front of slowest ones
- Pile of defective parts

3.11 Key Operational Measures

KANBAN CARD (Visual Card)

Used in Pull System of Inventory

⇩

Material is Supplied on consumption basis

It reduces the cycle time & enhances Predictability.

Notification card that a downstream machine sends to each machine authorizing production of just enough components.

KANBAN Size

Refers to quantity of raw material to be held for manufacturing.

KANBAN Size= (C) x (LT) x (L) x (SF)

C = Consumption
LT = Lead time
L = Location
SF = Smoothing factor

Pre-requisites of Kanban System

- Lot size equal to Kanban Size
- Supplier participate & agree upon kanban stocking program
- Supply material directly at point of use
- Consumption Pattern should be constant
- Storage requirement is met.
- Maintain information regarding quantity, storage, location, vendor.

Grouping machines into working cells

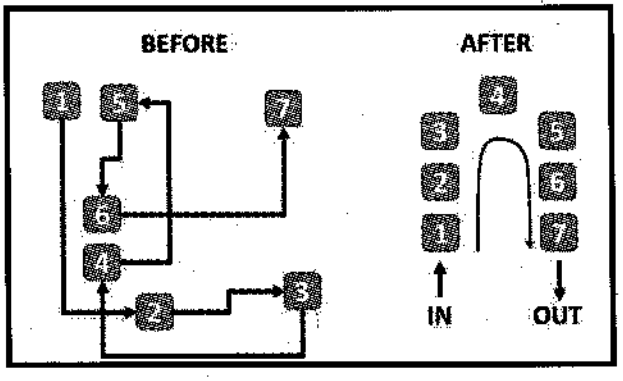
Small cluster of machines run by single machine operator

Takes each output part from machine » To machines in cell

Thus resolves issue of WIP & helps to identify defective output.

Benefits

- Lower Maintenance Cost
- Use of simple and small machines
- Easier to reconfigure production Facility



(Similar to Cellular Manufacturing)

Number of KANBAN

(Boxes required for holding kanban size) = $\frac{\text{Quantity of Safety Stock + Consumption during lead period}}{\text{Kanban Size}}$

3.12 TAKT – TIME

= Rate at which a product needs to be completed to meet customer demand.
& useful concept in JIT as production is based on customer demand

- Average Time between Start of Production of 1 Unit" To "Start of Production of next unit
- Helps to decide speed of / at Manufacturing facility

$$\text{TAKT - TIME} = \frac{\text{Available Production Time}}{\text{Total Quantity Required}}$$

Note: Available Production Time = Total available Time for pdn. – Planned Downtime (Spent in shutdown and cleaning)

Eg: Total Time Available = 480
Planned downtime = 30
Total Quantity required = 10 units

$\frac{480-30}{10 \text{ units}}$ = 45 minutes (TAKT – TIME)

Interpretation: Process must be set up in such way to produce 1 unit in every 45 minutes. Takt Time is adjusted so that production and demand are synchronized.

Student Notes

Lean 2

4 KAI ZEN COSTING (Continuous Improvement)

Change for Good

Continual Examination & **Improvement of existing process**

Small, incremental Changes routinely applied

Sustained over a long period

Result in significant improvement, effective waste management & reduction in cost

4.1 KAIZEN STRATEGY

Aims to involve workers from multiple functions & levels in organization in working together to address problem or improve process.

4.2 Principles of Kaizen

- Team in Quality Circles
- Strong personal discipline
- Workers are confident about offering suggestions
- There is always room for improvement
- Everyone's opinion is valued and considered

4.3 Assumptions

- Gradual Improvement in processes.
- Involve all employees of all areas.
- Improving productivity.
- Improving system.
- Eliminate waste.
- Collective decision & application of knowledge.
- Setting standards, continually improving.

4.4 Benefits of Kaizen Costing

- » It Reduces waste in employee waiting time, transportation, excess inventory, etc.
  » Improve efficiency.
- » Achieve cost reduction through improvements.
- » Participative approach improves teamwork across the organization.
- » Less number of defective products.
  » Leads to customer satisfaction & reduce warranty cost.
- » Improves overall profitability of Company.

Lean 3

5 5s

» Applied to wide variety of industries

Workplace organization method

How workplace should be organized for Efficiency & Effectiveness

by

- Identifying & Storing items used
- Maintaining the area & items
- Sustaining the new order

5.1 5s

Sort(Seiri)

Set in order(Seiton)

Shine(Seiso)

Standardize(SeiKetsu)

Sustain(Shitsuke)

S1 Sort (Seiri)

- Eliminates obstacles & evaluate necessary items to make work easier.
- Reduce chances of being disturbed with unnecessary items.
- Prevent accumulation of unnecessary items.

S2 Set In Order (Seiton)

- Arrange all necessary items into their most efficient & accessible arrangements.
- Ensure FIFO basis.
- Place components according to their uses.

S3 Shine (Seiso)

- Clean your workplace daily.
- Keep workplace safe, easy to work & pleasing.
- People able to detect problems within 50 feet.

S4 Standardize(SeiKetsu)

- Standardize best practices.
- Maintain high standards & orderliness.

S5 Sustain (Shitsuke)

- Training & Discipline to maintain proper order.
- "DO WITHOUT BEING TOLD".
- Training is Goal oriented.
  ⌄
  Monthly feedback necessary.

Lean 4

6 Total Productive Maintenance

⌄

Approach to equipment Maintenance;

⌄

That strives to achieve perfect production.

- No breakdowns
- No small stops
- No defects
- No accidents (safe environment)

6.1 Total Productive Maintenance

System of

maintaining & improving

integrity of

Production & quality system

through

Machines equipments processes employees

Creates shared responsibility

& Keeps equipments in top working condition.

6.2 TPM Emphasizes

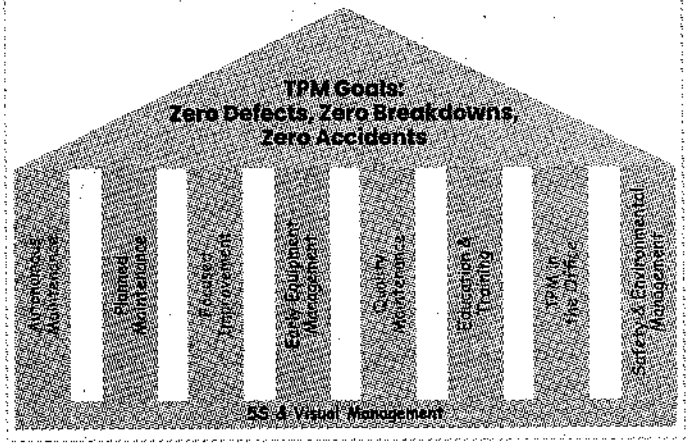
Proactive & Preventive maintenance

to maximize efficiency of equipment.

6.3 Step in Introduction of TPM in Organization

STAGE A Preparation	» Announcement by Management to introduce TPM. » Introductory education campaign for the workforce. » Setting up TPM and Departmental Committees. » Introductory education campaign for the workforce. » Develop early equipment management program. » Preparation and formulation of a master plan.
STAGE B Introduction	» Invite customers, affiliated companies & subcontractors.
STAGE C Implementation (8 Pillars of TPM)	» Develop an autonomous maintenance program. » Develop an equipment management program. » Develop a planned maintenance program. » Increase skills of production & maintenance personnel. » Develop early equipment management program. » Preparation and formulation of a master plan.
STAGE D Institutionalise	» Perfect TPM implementation and raise TPM levels.

6.4 Eight Major Pillars of TPM



Foundation of TPM – 5s

Deals with organising a workplace which helps to recognize and uncover the problems.

Student Notes

1 Autonomous Maintenance (Responsibility for routine maintenance)

- Greater ownership of equipment
- Increases Operator Knowledge
- Ensure lubricated equipment
- Identify issue before failures
- Frees maintenance personnel

2 Focused Improvement (Small groups of employees work together proactively)

- Identify Recurring Problems
- Minor improvement on continuous basis
- Combines Collective talent

3 Planned Maintenance (Zero breakdown and optimum maintenance cost)

- Reduces unplanned stop time
- Maintenance to be planned for times equipment not scheduled for production
- Better control of wear & failure prone parts
  - (Preventive / Breakdown corrective maintenance

4 Early Equipment Management

(Directs practical knowledge of manufacturing)

(Equipment towards improving design of new equipment)

- Reaches planned performance levels much faster
- Maintenance is simpler & robust

5 Quality Maintenance (Design error detection & prevention into production process)

- Targets quality issues
- Removes root sources of defects
- Customer satisfaction

6 Education & Training (Fill knowledge gaps)

- Develop skills to maintain equipment & identify emerging problems
- Personnel learns techniques for proactive & preventive maintenance
- Managers are trained

7 TPM in Administration (Improve Productivity & Efficiency)

- Addresses waste in Admin Functions
- Elimination of losses
- Supports production through improvement Admin. operations

8 Safety, Health, Environment (Maintain safe & healthy working environment)

- Eliminates potential health & safety risk
- Targets accident free workplace

7 Performance Measurement in TPM

Overall Equipment Effectiveness (OEE)

Measure that identifies % of planned production time that is truly productive.

OEE Score	
100%	Perfect production
85%	World class for discrete manufacturing
60%	Fairly typical for discrete manufacturing
40%	Not uncommon for manufacturing Without TPM

Performance x Availability x Quality = OEE %

7.1 Types of Maintenance under TPM

Component	Availability	Performance	Quality
TPM Goal	No Stops	No small stops/ slow running	No defects
Productivity Loss	Availability Loss	Performance loss	Quality loss
	Includes all events that stops planned production.	Includes factors that cause production to operate at low speed when running.	Factors out manufactured pieces that do not meet quality standards.
	* Equipment Failure/ Breakdown *Set-up/ Adjustments	*Idling and Minor Stoppages *Reduced Speed	*Reduced Yield and *Quality Defects and Rework

Formula's for Availability, Performance Quality Ratios (Newly introduced)

(I) Availability Ratio = $\frac{\text{Planned Production Time - Total time "Loss" Per Shift}}{\text{Planned Production Time}}$

OR

Availability Ratio = $\frac{\text{Operating time}}{\text{Planned Production Time}}$

(II) Performance Ratio = $\frac{\text{Standard time required}}{\text{Actual time Taken}} \Big/ \frac{\text{Ideal cycle time x total count}}{\text{Operating time}}$

OR

Performance Ratio = $\frac{\text{Actual Production x Standard time p.u.}}{\text{Operating Time}}$

(III) Quality Ratio = $\frac{\text{Actual Production - Quality loss due to scrap etc.}}{\text{Actual Productioin}} \Big/ \frac{\text{Good Count}}{\text{Total count}}$

1) Planned Production Time = Total Time Available - (Planned Downtime)
(Planned Downtime = Lunch break, Miscellaneous break, Preventive Maintenance, etc.) = Planned Production Time

2) Unplanned Downtime / Loss of Time / Shift
(i) Breakdown Maintenance (ii) Setup Changes (iii) Power Failure

3) Operating Time = (Planned Production Time - Unplanned Downtime)

Lean 5 — 8 Cellular Manufacturing

Equipments & workstations are arranged to

Facilitate small lots + Continuous flow production

In cell, all operations are performed

In close proximity

Often in 'U- shaped Layout'

8.1 Workers from different departments

Are co-located in a cell to

- Increase workflow
- Reduce response time
- Break down barriers

8.2 Cellular Manufacturing Systems

Grouped together according to families of parts produced

- Provides distinct advantage in that material flow is improved
- Reduces distance travelled
- Reduces overall lead time

8.3 Goals

- Move as quickly as possible
- Make wide variety of similar products
- Minimizing waste

8.4 Advantages of Cellular Manufacturing

- Reduction in setup time
- Reduction in work in progress
- Reduction in material flow distance
- Improvement in machine utilization
- Reduction in production lead time
- Improvement in quality
- Better worker morale
- Reduction in material handling cost and time

8.5 Cellular Manufacturing

Group Technology

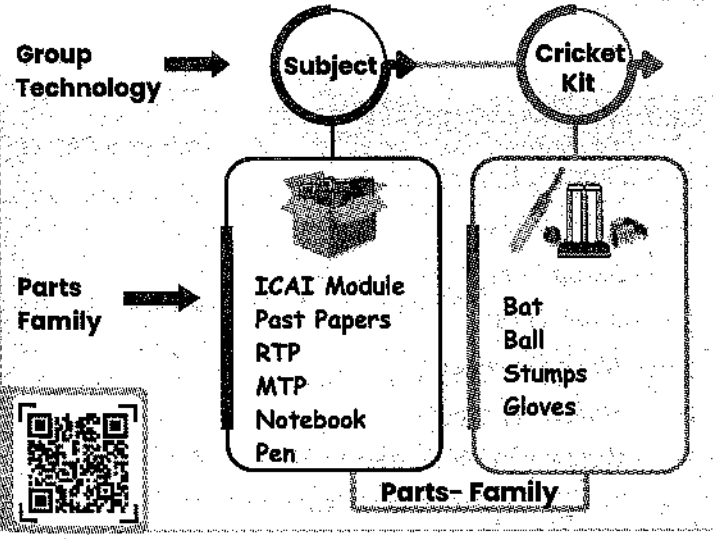
Manufacturing technique in which parts having similarities, manufacturing process and function are manufactured in one location using small number of machine/process.

Parts Family

All individual parts of Group Technology are called Parts-family.

Manufacturing / Machine Cells

Set of machines that are grouped together based on products or parts that they produce.



8.6 Types of Machine Cells

A. Single- Machine Cell

Single Machine Cell consists of

In cases where parts/products are made by One Type of Process

One Machine + Supporting fixtures and tooling to make one or more part families.

Raw Material → Machine → Product

B. Multiple Machine Cell

Group Machine Cell with manual handling

- Movement of parts between machines is done physically.
- Human operators run the cell and perform material handling.

→ U- Shaped Cell

Group Machine Cell with Semi-integrated handling

- Movement is done using mechanical handling system like Conveyor.

→ In-line layout

Flexible Manufacturing System

- Highly automated machine cell with a combination of automated processing stations with fully integrated material handling system.

→ Loop layout

Concept Related To Cellular Manufacturing / ROCA

Part Family Grouping

Form Machine cells based on part families.

Machine Group

Form Machine cells based upon similarities in part Routing and then allocate parts to cells.

Machine-Part Grouping

Form Part families and Machine Cells simultaneously.

As can be seen from above-
Grouping of Right Machines with each other is of Utmost Importance and for that we have to use the concept of **ROCA**

R ank **O** rder **C** lustering **A** lgorithm

8.7 Advantages of ROCA

- Material flow,
- Machine Utilisation,
- Space Utilisation,
- Productivity,
- Component Standardization,
- Employee Morale,
- Quality

8.8 Disadvantages of ROCA

- Planning Effort,
- Paper Work
- Setup Time
- Down Time
- Work Movement
- Work in Process
- Material handling cost
- Direct/ Indirect lab costing cost

Lean 6 | 9 Six Sigma

'Quality improvement technique'

to eliminate defects that affects customer satisfaction

9.1 Focus on Six Sigma

- Aspects of performance & processes to achieve zero defets
- Aims for perfection
- Customer satisfaction
- Decision based on data driven facts

9.2 Implementation of Six Sigma

- **DMAIC** – Improve Existing Processes
- **DMADV** – Improve New Processes

9.3 Implementation of Six Sigma

Tata Nano

- **D Define** ➤ The scope of project (customer, issue, opportunity, goals, etc.)
- **M Measure** ➤ Current performance (Establish metrics & measure baseline performance)
- **A Analyze** ➤ Existing process (compare current performance to goal)
- **I Improve** ➤ The process to eliminate root cause(Develop gap-closure action)
- **C Control** ➤ New process (Standardize improvement to sustain gains)

Tata Safari

- **D Define** ➤ Who are best customers and what are priorities?
- **M Measure** ➤ How is process performing & measured?
- **A Analyze** ➤ What are most important causes of defects?
- **D Design** ➤ How to design or redesign process?
- **V Verify** ➤ How do we verify that design meets goals?

9.4 LIMITATIONS OF SIX SIGMA

- Focuses on Quality Only
- Does Not Work With Intangible Results
- Substantial Infrastructure is Required
- Not All Products Need To Meet Six Sigma Standards
- Six Sigma is Complicated For Some Tasks
- Six Sigma Focuses On Specific Type Of Process Only
- There Are Lot to Real Time Barriers While Translating Theoretical Concepts To Practical Applications

9.5 Similarities Between DMAIC & DMADV

- Both are based on Defects per million opportunities.
- Both use the same kind of six sigma quality management tools.
- Customer's needs are the basic parameter for both methodologies.
- Both methodologies are for improving quality of product/ process.

9.6 Dis-similarities Between DMAIC & DMADV

DMAIC	DMADV
Review the existing processes and fixed problem(s).	Emphasises on the design of the product and processes.
More reactive process.	Proactive process.
Increase the capability.	Increase the capacity.
Rupee benefits quantified rather quickly.	Rupee benefits more difficult to quantify and tend to be much more term
Examples of DMAIC problem-solving methods: • Reduced the cycle time to process a patent. • Reduce the number of errors in sales list. • Improve search time for critical information.	Examples of procedures that the DMADV development method is designed to address: • Add a new service. • Create real-time system. • Create a multiple source lead tracking system.

10 Process Innovation

Implementation of a new or significantly improved production or delivery method.

PRODUCTION	+ DELIVERY +	SUPPORT SERVICES
This is related to processes, equipment and technology to enhance manufacturing or production processes. This includes computer software.	Delivery process innovations involve tools, techniques and software solutions to help in supply chain and delivery systems. This includes barcodes, tracking system or shipping software.	Innovations in processes aren't limited to simply production or delivery, but also areas including purchasing, maintenance and accounting.

11 Business Process Re-Engineering

"**Fundamental rethinking** and **radical redesign** of business **processes** to achieve **dramatic improvements** in critical contemporary measures of performance, such as cost, quality, service and speed."

11.1 Key words in Definition

Fundamental Rethinking
- Why do people do what they do?
- Why do they do it in the way they do?
- Do these activities add value?

Radical Redesign
- Getting to that root cause
- It's about business re-invention
- Reinvent what is done & how it is done

Dramatic Improvement
- Achieve 'quantum leaps in Performance'

Process Improvement
- Process centered approach
- Kind of work people do.
- skills they need
- Way in which performance is measured.

11.2 Major stage of BPR

Process Identification	Process Redesign	Process Reassembly	Process Rationalisation
Each task performed begin re-engineered is broken down into a series of process.	Remaining processes are redesigned.	Re-engineered processes are implemented in the most efficient manner.	Process which are non valuable, to be discarded.

Student Notes:

CASE STUDIES

12 Case Study 1 – Kaizen Costing – Zen Limited – ICAI Module CS #9

VIDEO STARTS AT 40TH MIN

ISSUES

Zen Ltd — Leading Mobile Manufacturing Company of the world.

- Fall in Net profit from 10% to 8% , owing to increase in cost of raw material & repair cost.
- Increase in repair cost by 1.5 crores equal to 1% of total turnover.
- 200 Repair Centers and technician sends all faulty phone to central center at Mumbai, for repairing.
- 3-4 Batches per day per centre.
- Phone repair or replaced are then sent back to the customer.

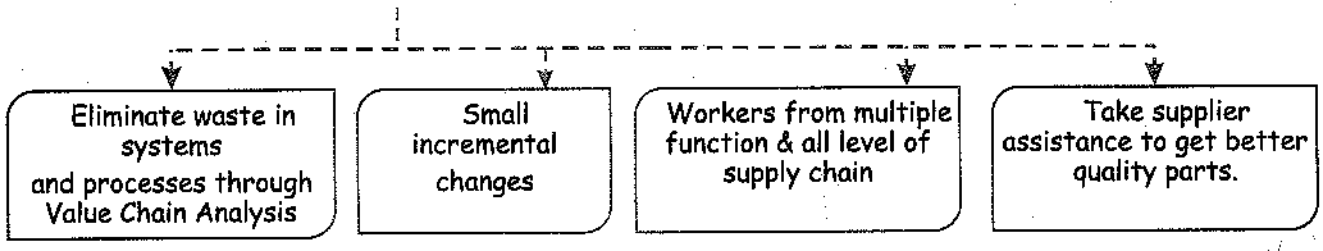
CONCEPT

- Scope & benefits of Minor improvements.
- How can the Warranty Claim process be improved.

EXPLANATION

- Kaizen (Change for Better). Small and Continuous improvement across all functions and processes & employees.

Example 1 - Toyota Production System.



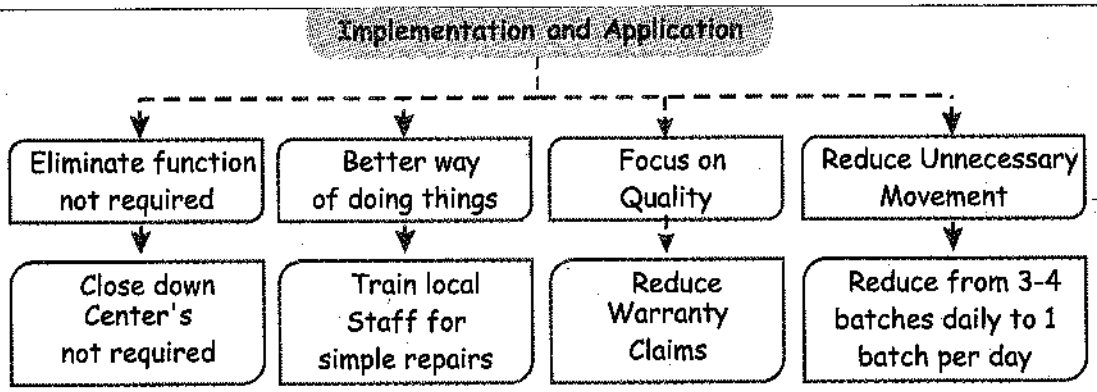
Example 2 - An airline company removed olives from salad considering 75% of flyers are leaving olives, resulting saving of $40,000 per annum.

Example 3 - Use of nano sim by minimizing design.

Example 4 - Unnecessary movement of material and men (video conferencing instead of traveling of meeting).

Note: All above should be without compromising quality. (iphone 5C failed as it used plastic instead of Aluminium.)

CONCLUSION



General points of Kaizen learnt from case study:

1) Product improvement using Kaizen is likely to result in less number of defective products leading to customer satisfaction and reduction in warranty related costs.

2) Kaizen Focus: All function, Process and employee involvement.

13 Case Study 2 – 5 S – Gold Star Limited (RTP May 20) (ICAI CS #10)

ISSUES

- Gold Star Limited - Manufactures traditional cycles & assembles electronic cycles.
- Workers complaint that all categories of jigs and tools are not available, tools available also belongs to outdated product design.
- Manager is of opinion tools are not accessible; as workers pick the tool from tool kit or tool board; but not place it back after use.
- There is shortage of staff(2 members) in maintenance department, this causes delayed repairs of equipments resulting in deterioration in its utility.
- Attrition rate at senior management positions is quite high and no formal hierarchy tree is established.
- KPIs are not established for all factors of assembly process.

CONCEPT	A report; in favour of implementing/ APPLYING 5S at GSL and EXPLAINING the expected benefit from implementation of 5S.

EXPLANATION

- Report on operational aspect of 5S and expected advantage.
- 5S represent scientific way of workplace management so that work can be performed effectively , efficiently , and safely .
- They define a system for workplace organization and standardization.

5S

S1 - Sorting (Seri)

- To over-come the problem of 'idle laying over material'.
- Visual Aid Technique

Red Tag	Yellow Tag
(Card of unwanted things)	(Card of needed thing)

- Sorting need to be done in following categories:
  - ✓ Not needed at all - to be moved to **red** tag area.
  - ✓ Needed { But not now - need to be moved to store with yellow tag. / But not here - to be moved to red tag area. / But not so much quantity.
- Sorting can help GSL to identify:

- Obsolete - Defective - Scrap - Not in place - Unnecessary/extra

S2 – Set in order (Seiton)

- Ensuring 'place for everything and everything in its place'.
- Save search time and eliminate motion waste through visual management.
- To implement systematic arrangement, consider:
  - Analyse status.
  - Decide - Which things will belong where?
  - Decide - How they should be put away?
  - Get everybody to follow rules through indexing , labelling, etc.

S3 - Shine (Seiso)

- Ensure cleanliness 'in and of' everything.

- Cleaning should be with meaning. - Cleaning is inspection

S4 - Standardization (Seiketsu)

- Establishing the 'standards' and make 'operating procedure'
- To create consistency and ensure all steps are performed correctly
  - ✓ Fix responsibilities for implementing & evaluating system.
  - ✓ Integrate these responsibilities into routine work.
  - ✓ Check how well the system is working and sustaining itself.

S5 - Sustain (Shitsuke)

- To sustain with standards it is required to do:
  - Daily monitoring
  - Using 'red tag campaign'
  - Structured communication
  - Improving ownership by allocating areas
  - Communicating visually through fixed point photography
  - Continuous training of all employees

Sixth S is 'safety' which was added later on, in order to ensure safety while performing all the remaining 5S

CONCLUSION

S1	S2	S3	S4
Reduction of material lying, by segregating them into different categories.	Solve the specifically problem of non-accessibility of tools.	Keep things in order with regular cleaning, so that maintenance become 'preventive function' rather corrective.	Standardised process GSL can identify Critical Success Factors (CSFs) and benchmark the Key Performance Indicator (KPIs) against each CSFs.

- Inculcate practice of 5S in the system and work culture and sustain them on continuous basis, irrespective of attrition.

Student Notes

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- Inculcate practice of 5S in the system and work culture and sustain them on continuous basis, irrespective of attrition.

Student Notes

14 Case Study 3 – 5 S – Toys Limited – Case Study Digest– Case Scenario #9

ISSUES

- **Toys Limited** - manufactures toys and games.
- The major games under this category are DO IT YOURSELF (DIY) Kits.
- The number of elements in a kit range from 200 to 350 elements.
- The games are sold online.
- Customer feedback have been very positive on the "quality of the elements" provided with the kits.
- The manufacturing facility is around 50 kms from the Central Warehouse.
- In last two months, the customer support division has reported a major increase in the consumer complaints under the category *"missing elements"* in the kits.

CONCEPT	Lean System and Innovation - 5S.

EXPLANATION

- The current problem emphasises on "missing elements"
- This highlights that there are issues related with workspace organisation.
- The positive feedback on the "quality of the elements" reflects that the production related process is robust.
- 5S explains how a workspace should be organized for efficiency and effectiveness by identifying and storing the items used, maintaining the area items, and sustaining the new order.

5S

- **Sort**
  - ✓ Focus on identifying necessary elements of the kit,
  - ✓ Remove the unwanted items and
  - ✓ Ensure that all the elements of a particular kit are available
  - ✓ Unwanted items tagged **"Red flag"**.
- **Set in Order**
  - ✓ It will ensure that the elements of the kit are placed at the properly allocated space for the kit.
  - ✓ Fixed quantity and fixed elements at each space.
- **Shine**
  - ✓ Element missing as workplace is mismanage and untidy workplace.
  - ✓ Focuses on keeping the workplace clean on regular basis and in top condition
- **Standardise**
  - ✓ Focus is on maintaining high standards through orderliness and as per the required quality and quantity.
- **Sustain**
  - ✓ It involves establishing and maintaining responsibilities amongst the team leaders and members.

CONCLUSION	Considering the above aspects of 5S lean management system, its proper implementation will strengthen the way the kits are being packaged and will ensure that the issue of missing elements can be brought down significantly.

15 Case Study 4 - TPM - Super Refineries Limited (ICAI Module CS #11)

ISSUES

Super Refineries : Leading Oil Refining Company in India.
- 40% Market share and 100% capacity running 365 days in a year.
- Currently no maintenance schedule for plant & machinery.
- Maintenance of Adhoc basic.
- Last 3 months:

30% dispatches delayed due to machine breakdown.
20% rejection on account of quality issue.
Meeting of BOD to manage above issue and implement better system.

CONCEPT

Losses of Machinery Breakdown due to non-maintenance.
Features of TPM & comparison with TQM.
Types of Maintenance practices to be implemented.

EXPLANATION

Losses Due to Break-Down
- Equipment failure leading to loss of time.
- Idle waits & stoppage.
- Interior quality products Causing financial loss
- Additional set up costs.

Features of TPM (Eliminating production due to faulty equipment)
- Zero Breakdown
- Zero Downtime
- Zero Failure
- Zero Loss of Efficiency

Traditional Maintenance
- Centered in maintenance department

TPM
- Co-ordination amongst all departments and workers.
- Train operators to take care of minor maintenance.
- Zero losses with respect to minor stops, defects and unavoidable downtime.

CONCLUSION

8 Pillars of TPM

Autonomous Maintenance	Focused Improvement	Quality Maintenance	Early Equipment Maintenance
Planned Maintenance (Trouble free machine & equipment)	Education & Training (across all levels & departments)	Office TPM	Safety & Health

Types of Maintenance

Breakdown	Preventive	Corrective	Maintenance prevention	Autonomous
No Maintenance	Daily Maintenance	Easy to clean and Maintain	(Use of Technicians)	(Self Maintain)

TQM
- Focus on Quality of the product.
- Better for customer satisfaction.

TPM
- Focus on equipment used to produce the products.
- Better for internal employees working.

16 Case Study 5 - Six Sigma - Smooth Connect Telecom (Case Study Digest - Case Scenario #5)

ISSUES

- Smooth Connect Telecom (SCT) - private sector telecom company.
- 2nd largest player in telecom sector of country, with subscriber base of more than 10 million.
- SCT is known for continuous innovation in its services, with changing pace of technology and business.
- SCT is also facing tough competition from Voice Telecom on pricing and customer volume.
- Criticized by customers for poor customer services, misallocation of call duration and call drop; but majority of complaints are on account of-
  A. Calculating wrong tariff, and
  B. Dull and delayed response from customer care executives.

CONCEPT 'How SCT can APPLY DMAIC method to implement Six Sigma'.

EXPLANATION & CONCLUSION

- Six-Sigma seeks to improve the quality of process by identifying and removing the cause of defects.
- Six-Sigma can be implemented through two methodologies
  - ✓ DMAIC (Define, Measure, Analyse, Improve and Control) - Improve existing business process (remove defect).
  - ✓ DMADV (Define, Measure, Analyse, Design and Verify) - Create new business process (defect free).

DMAIC methodology of Six Sigma implementation at SCT

- **Define - Define the improvement area** (Customer requirement or problem faced by customer)

Delayed Revenue	Loss of Revenue
Litigation of wrong billing	Posting to alternate telecom

  - ✓ Customer care executives need to be trained.
- **Measure - Existing performance for comparison**
  - ✓ No. of complaints as a percentage of total customer.
  - ✓ Wrongly billed customers.
  - ✓ Arrange time to solve complaints.
  - ✓ Establish KPI against CSF daily: like no. of complains; wrong billing.
  - ✓ It will work as easy signal to senior management.
- **Analyse - Cause effect relationship between factors of process**
  - ✓ Find the root cost of complaint and wrong billing to take preventive and corrective steps.
- **Improve - Plan improvement on basis of analysis**
  - ✓ Improvement plan should be flexible for SCT & valuable for customers.
  - ✓ Reissue of bill where it was wrongly issued earlier.
  - ✓ Wait for reissue needs to be stoped.
- **Control - Continuous control to identify and correct the process variance**
  - ✓ Improved processes needs to be controlled continually in order to assure enhanced performance shall be maintained.

17 Case Study 6 - BPR - DIC Insurance Company (Case Study Digest - CS #11)

ISSUES

- DIC - Insurance Company
- Covering general risk of individuals and their family members.
- Since past 3 years volume of business increase but profits remained static.
- Some processes are computerized and some are still paper based which is slow and leads to complaints.
- No. of complaints increasing day by day due to which DIC intends to computerized fully re-engineer business processes to increase profitability.

CONCEPT

(i) How BPR can be implemented? ADVISE.
(ii) DISCUSS the improvements that might be expected from introducing BPR
(iii) RECOMMEND, performance targets which DIC could introduce to ensure that the re-engineered processes enable it to achieve its key business objectives.
(iv) Why DIC's staff might be concerned about BPR and its implications for them? EXPLAIN.

EXPLANATION

(i) How BPR can be implemented?

Business Process

Series of Process

Process 1 Process 2 Process 3 Process 4

Essential/Not Essential Value Added/ Non Value Added

Connect them with technology

- Then each business process requires to be documented and analysed.
- DIC is facing a hyper-competitive marketplace where customers expect superior benefits.
- BPR helps in understanding customer centric
- value & non value added activities.

(ii) Improvements expected by implementation of BPR

a) Fast information processing and error reduction
- Updation of data base on real time basis
- Reduce delays and risk of errors
- Eg: Enquiry receive > Staff access data base & update

b) Better facilities for salesperson
- Access data remotely from laptops
- Get details from policies, premiums
- Eg: Can show various policy

c) Motivating staff leading to overall improvement
- Job more effectively
- Better impression to customers.

d) Parallel Processing
I.T. helps inter-linking' allowing to work on multiple things... thus saving time.

(iii) Key business objectives
Performance targets

Speeding up the process	Error free work
- No. of transaction needs to be measured	- Set targets for complaint and error reduction.
- No. of claims settled on time	- Helps in business growth
- No. of policies issued on time	

(iv) Perception of BPR programmes

- Main aim of BPR is to increase business efficiency.
- Employees resist change as they think it may endanger their jobs, creating uncertainty.
- New Pattern of work.
- Change in people's roles.
- Change in pattern of working.
- Since employees are use to old processes, and they are comfortable with it; change is not acceptable by the staff.

CONCLUSION

Established KPI against CSF daily, like number of complaints, wrong billing, it will work as early signal to senior management.

MASTER SUMS

18 Question 1: (Just in Time)

Delight Engineering Solutions (DES) (a hypothetical company) is manufacturing product CAF-5 from use of single raw material CAI-100. The two major departments operational in Delight Engineering Solution are purchase and production. DES is facing high competition due to large number of competitors in market. Demand of CAF-5 is fluctuating, therefore high storage cost is prime cause of low financial performance. DES Company decided to move from traditional system to JIT system.

From purchase and store following data is collected. Annual consumption is of 1,800 units of CAI-100. List Price of each unit of CAI-100 is 4,000. The cost of placing order is 2,000 and cost of carrying one unit of CAI-100 for a year is 2%. Company presently use EOQ model of ordering. Purchase Manager further estimated that, if JIT system of inventory is implemented, ordering cost will increase by 50% from current level, whereas carrying cost can be avoided up-to 90%. But there is prospective order of 5 units of CAF-5 which can't be served, due to non- availability of stock and failure of delivery by supplier. Contribution from each unit of CAF-5 is 1,200. Stock insurance cost will reduce by 400 on annual basis. There will also be reduction in working capital requirement, which will result in interest saving of 500 on annual basis.

Further, Production and Engineering department supported by marketing department provide details that presently average production of CAF-5 is 150 units of per month, although for next 4 months expected demand will be 120, 160, 140, 180 units. Maximum capacity from man- hours perspective is 150 units. 20 man-hours required for producing each unit and labour rate per hour is 3. Casual labour is not available in market. Overtime rate will be 200%. Average monthly cost of storage of each item of CAF-5 is 65.

Required

(i) EXPLAIN the JIT purchasing and JIT production and the effect of its introduction.

(ii) COMPUTE cost savings if it moves to JIT Purchasing.

(iii) COMPUTE cost savings if it moves to JIT Production.

Solution

(i) Just-in-time (JIT) is a collection of ideas that streamline a company's production process activities to such an extent that wastage of all kind viz., of time, material and labour systematically driven out of the process.

JIT purchasing suggests that materials should only be purchased as and when required. While JIT production shows that finished products should only be produced as and when required by customers. Whereas in traditional manufacturing system, to smooth out production and to meet forecasted demand, materials and finished goods are stored in advance.

JIT Purchasing reduces the inventory level which will result in reduction of carrying cost of inventory, as well as reduces the level of working capital which will save the opportunity cost in form of interest expenditure. On the other hand, JIT Production gives opportunity to customize the product as per customers' needs, conformance to customers' need is essential to quality. It also reduces the level of working capital which save the opportunity cost in form of interest expenditure.

Prerequisite of JIT purchasing or production is integration with vendor, if vendor is not integrated properly or less reliable, then situation of stock out can arise and which can result into loss of contribution.

Multitasking by employee is another key feature of JIT, group of employees should be made based upon product instead based upon function. Hence, functional allocations of cost become less appropriate.

Overall, JIT enhance the quality into the product by eliminating the waste and continuous improvement of productivity.

(ii) Cost Savings in JIT Purchasing

Reorder Size under present regime:

Under current scenario reorder size of CAI-100 will be EOQ. Formula for EOQ is mentioned below-

$$EOQ = \sqrt{\frac{2 \times A \times O}{C}}$$

Where:

A = Annual Consumption i.e., 1,800 units of CAI-100

O = Ordering Cost per order i.e., 2,000 per order

C = Carrying Cost per unit per annum i.e., 80 (2% of 4,000) per unit per annum

$$\sqrt{\frac{2 \times A \times O}{80}} = \sqrt{\frac{2 \times 1800 \times 2000}{80}} = 300 \text{ Units}$$

EOQ (reorder size under present regime) of CAI-100 is 300 Units

Cost Comparison under present and JIT regime (annual basis)

Particulars	Present System	JIT System
Ordering Cost (1,800 units/ 300 units) × 2,000 JIT-150% of present cost	12,000	18,000
Carrying Cost (300 units/2 × 80) JIT- Reduced by 90% in comparison to present cost	12,000	1,200
Stock-out Cost (5 units × 1,200)	-	6,000
JIT- Reduction in Stock Insurance Cost on annual basis	-	(400)
Opportunity Cost (saved) on reduced amount of working capital on annual basis	-	(500)
Net Cost of Inventory Management	24,000	24,300
Incremental Cost in shifting to JIT	**(300)**	

Since implementation of JIT Purchasing results in incremental cost of 300 per annum basis, hence it is not economically worth to move to JIT system of inventory purchase.

(iii) Cost Savings in JIT Production

Carrying Cost in Present Scenario (for next four months)

Month	I	II	III	IV
Opening Stock	-	30	20	30
Add: Production	150	150	150	150
Less: Demand	120	160	140	180
Closing Stock	30	20	30	-
Average Stock*	15	25	25	15
Carrying Cost (65 per unit)	975	1,625	1,625	975
Total Carrying Cost for 4 months	5,200			

*Average Stock = Opening Stock + Closing stock/2

Overtime Cost in JIT Scenario (for next four months)

Month	I	II	III	IV
Demand	120	160	140	180
Production	120	160	140	180
Bottleneck	150	150	150	150
Shortfall*	-	10	-	30
Labour hrs. as overtime required (20 hours for each unit of CAF-5)	-	200	-	600
Overtime Cost (Payment at rate of 6 per hour)	-	Rs.1,200	-	Rs.3,600
Total Overtime Cost for 4 months	**Rs.4,800**			

*Shortfall good need to produce in overtime, due to limited man-hour available and casual labour is not available in market.

Based upon comparative cost for upcoming four month under present and JIT scenario, there is **cost saving of 400** (5,200 vs. 4,800) in move to JIT system production. Hence, it is economically worth to move to JIT Production.

19 Question 2: (ICAI Module Question) (OEE - Overall Equipment Effectiveness)

KIWI Ltd. manufactures spare parts and can be called "high volume based" manufacturing environment. The company is using the system of TPM for maintaining and improving the integrity of manufacturing process. There are several different automated manufacturing machines located in the plant, through which manufacturing of spare parts are done and supplied to cater the demand in the market.

A 12- hour shift is scheduled to produce a spare part in KIWI Ltd. as shown in the schedule below. The shift has three 15- minute breaks and a 10- minute clean up period.

Production Schedule for Automated machine NZ : Cycle: 10 (seconds),

Spare parts Manufactured: 3,360

SCRAP: 75

Unplanned Downtime: 36 minutes

Required

CALCULATE OEE (Overall Equipment Effectiveness) and comment on it.

Solution

Calculation of Planned Production Time

Total time (12 hrs. x 60 mins.)	720
Less: Planned downtime	
Break (3 x 15 mins.)	45
Clean up time	10
Planned Production Time	665

Availability Ratio per shift $= \left(\frac{665 \text{ mins} - 36 \text{ mins}}{665 \text{ mins}}\right) \times 100$

$= \mathbf{94.59\%}$

Actual Production = 3,360 parts

Standard time = 10 seconds

Standard Time Required = 3,360 parts x 10 seconds/ 60

= 560 minutes

Actual Time Taken = 665 mins. - 36 mins.

= 629 minutes

Performance Ratio $= \frac{560 \text{ Mins}}{629 \text{ Mins}} \times 100$

$= 89.03\%$

Quality Ratio $= \left(\frac{3{,}360 \text{ parts} - 75 \text{ parts}}{3{,}360 \text{ parts}}\right) \times 100$

$= 97.77\%$

Thus, **OEE** = 0.9459 x 0.8903 x 0.9777

= 82.34%

Comment: Since the OEE of KIWI Ltd is very close to 85% i.e. world class performance level, company should take measures to improve it and strive to attain 85% level. Availability Ratio of machine NZ 10 is 94.59% exceeding the ideal value of > 90% which is good but the Performance and Quality Ratios need attention as they are below their ideal values of 95% and 99% respectively.

20 Question 3: (RTP Question) (Reverse OEE)

Sheetal Bearing Balls Limited (SBBL) is the famous name for bearing balls of different sizes.
Mr. Syal recently joined as Manager Production and Operations at Unit 3 of Ludhiana (in Punjab) plant of the SBBL, wherein 10mm diameter steel ball bearings for bicycles are manufactured.
The plant is largely automated and lashed with the latest technology machines.
From Mr. Singh, Plant Accountant Mr. Syal come to know that since machines are of the latest technology and workers are motivated due to the liberal workman policy of SBBL, hence productivity and quality is and was never an issue, but availability is. Over lunch, when Mr. Syal greets Mr. Kumar, Plant Head, he also expresses his worry over excessive downtime and optimal use of limiting factors.
Mr. Syal, while navigating the ERP and reviewing the files & other documents handed over to him, which was prepared and maintained by his predecessor; come across the OEE rate of 93.555% measured during last week for machine '107-10M-Bearing' (which is limiting factor – caused bottleneck activity) during a normal shift. Since the said machine has a high-performance rate of 105%; hence Mr. Syal decided to dig deep into the composite OEE.
In the normal shift of 9 hours workers are allowed to take 2 short breaks of 15 minutes each and a lunch break of 30 minutes. During such a normal shift, out of the total manufactured 27,216 bearing balls by said machine, only 272 balls are found defective.
Required
(I) DETERMINE the unplanned downtime witnessed by machine 107-10M-Bearing and advise Mr. Syal, the best way-out to reduce the same (in brief).
(ii) MEASURE the Ideal Cycle Time to manufacture a single bearing ball.

Solution

(i) Unplanned downtime of machine 107-10M-Bearing

Overall equipment effectiveness (OEE) is a quantitative metric for measuring the productivity of individual equipment in a manufacturing plant. According to Seiichi Nakajima who introduced OEE, it is capable to identify and measure the losses in a manufacturing process through availability rate, performance rate, and quality rate.

OEE = Availability Rate × Performance Rate × Quality Rate Quality Rate

Particulars	Units
Output units – total count	27,216
Rejected units out of the above	272
Good units – good count (which met the quality criteria) (27,216 - 272)	26,944
Quality Rate (Good Counts / Total Counts) (26,944 units / 27,216 units) → 99.00%	

Since the quality rate is 99.00% and performance rate (105%), as well as overall equipment effectiveness (93.555%), is also given in the case; hence availability rate can be measure-
Availability Rate × 105.00% × 99.00% = 93.555%
The **Availability rate** is 90% i.e., run time [or net operating time (NOT)] / planned production time [or net available time (NAT)]

Planned Production Time

Particulars	Time in minutes
Total possible time (9 hours × 60 minutes) [scheduled time]	540
Less: Planned down time [scheduled loss]	
Short breaks (2 breaks × 15 minutes)	30
Meal break (30 minutes)	30
Planned production time	480

Since the Availability rate is 90% and planned production time is 480 minutes, hence run time shall be 432 minutes (run time / 480 minutes = 90.00%).
Since unplanned downtime is the difference between run time and planned production time, hence unplanned downtime of machine 107-10M-Bearing is 48 minutes.

Particulars	Time in minutes
Planned production time	480
Less: Run time (actual time taken)	432
Unplanned Downtime	48

Note:

Alternate Working
Unplanned downtime = Planned production time (1 – availability rate) 480 minutes (1 – 90%) = 48 minutes

Advise-

In order to reduce the unplanned downtime, preventive maintenance shall be practiced either before or after each shift; and the shine (out of 5S) principle shall be adopted by the workman as part of the TPM initiative. It is expected that the time spends on preventive maintenance will be less than the current unplanned downtime of 48 minutes.

(ii) Ideal Cycle Time to manufacture a single bearing ball

Performance rate can be computed by dividing standard time required [or ideal operating time] with run time. Since performance rate (105%) is given in the case and run time (432 minutes) computed above; hence the standard time required to manufacture 27,216 bearing balls is 453.6 minutes (standard time required / 432 minutes = 105.00%)
So, standard time required to manufacture a single bearing ball (i.e., ideal cycle time) is 1 (one) second (453.6 minutes × 60 / 27,216 balls) i.e., 60 bearing balls per minute.

Note:

Alternate Working
OEE = (Good count × Ideal cycle time) / Planned production time
93.555% = (26,944 × Ideal cycle time) / 480 minutes
Ideal cycle time = 1 second per bearing ball

For Your Understanding

OEE = Availability × Performance × Quality

1. Availability: NOT / NAT = (432 / 480) × 100 = 90.00%
2. Performance: IOT / NOT = (453.60 / 432) × 100 = 105.00%
3. Quality: (IOT - LOT) / IOT = (453.60 - 4.533....) / 453.60 × 100 = 99.00...%

$$\left\{\frac{27{,}216 \text{ units} - 272 \text{ units}}{27{,}216 \text{ units}}\right\} X\ 100$$

OEE = A × P × Q = 90.00% × 105.00% × 99.00...% = **93.555...%**

Alternative Presentation

Good Counts = 27,216-272 = 26,944 units

Planned Production Time= 540 mins. - 60 mins. = 480 mins. (or NAT) OEE = (Good Counts × Ideal Cycle Time) / Planned Production Time {(26,944 / 60 units (per min.)} / 480) x 100 = **93.555...%**

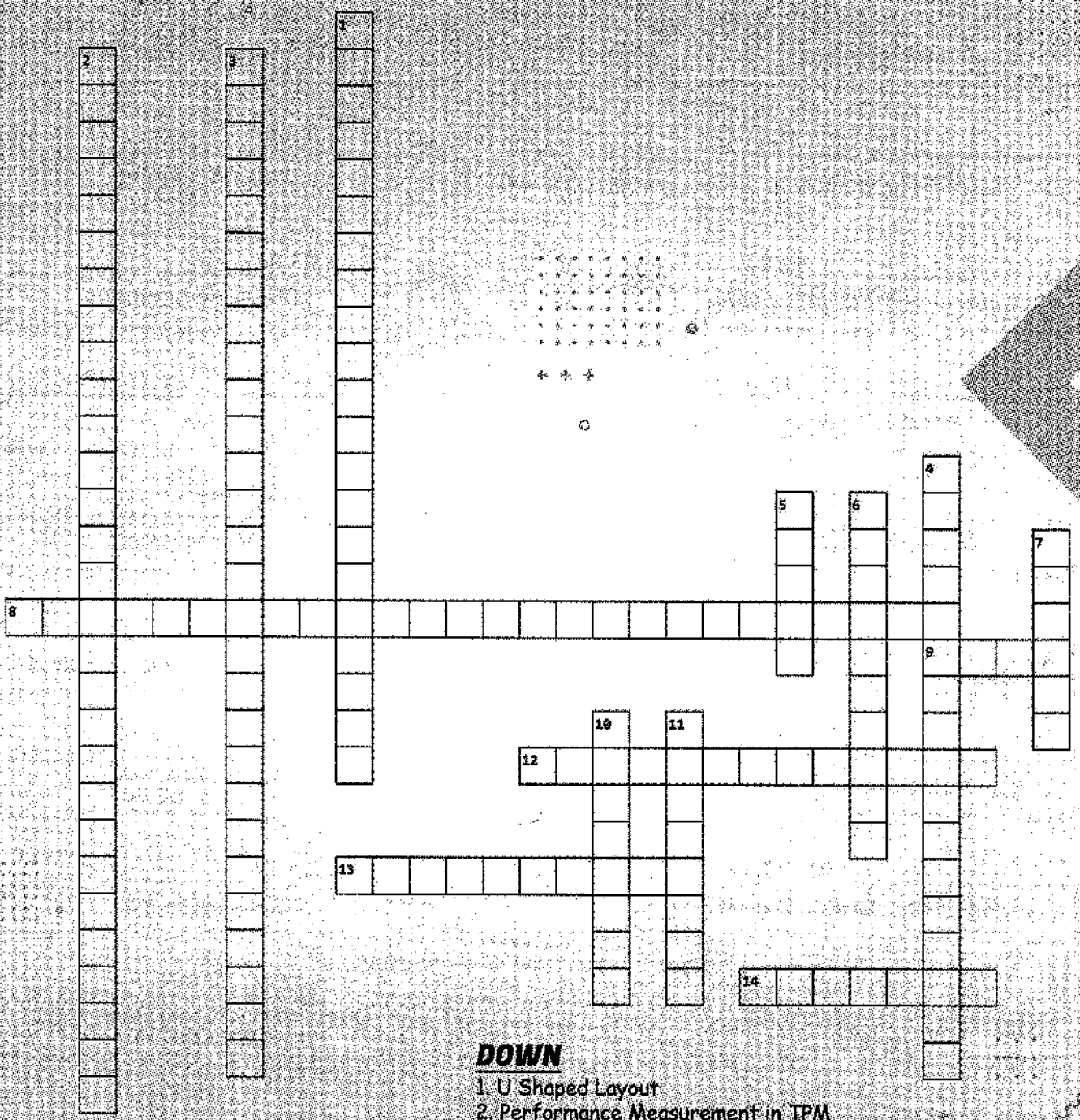
Workings :

1.Scheduled Time (total time) = 540 Minutes (9hrs. × 60 mins.)
2.Planned Down Time = 2 short breaks × 15 minutes +meal break 30 minutes = 60 minutes.
3.Net Available Time (NAT) = 540 - 60 = 480 minutes.
4.Unplanned Downtime = 48 minutes.
5.Net Operating Time (NOT) = Net Available Time - Unplanned Downtime NOT = 480 - 48 = 432 minutes.
6.Ideal Operating Time (IOT): 27,216 total units / 60 (units per min.) = 27,216 / 60 = 453.60 minutes.
7.Lost Operating Time (LOT): 272 units / 60 (units per min.) = 272 / 60 = 4.533... minutes.

Student Notes

GAME OF CONCEPTS

CHAPTER 3



ACROSS

8. Approach to equipment Maintenance
9. Seiri
12. Continuous Improvement
13. Pull System
14. Shitsuke

DOWN

1. U Shaped Layout
2. Performance Measurement in TPM
3. Fundamental rethinking and radical redesign
4. Implementation of a new improved production or delivery methad
5. Seisa
6. Removing waste and Identify Activities
7. Set in order
10. Quality Improvement Technique
11. Standardize

UPLOAD 11 SOLVED CROSSWORD PUZZEL & UPLOAD THIS ON INSTAGRAM STORIES & TAG US @ca_sankalp_kanstiya & YOU CAN WIN EXCITING GIFTS.

- **ANSWERS ARE UPLOADED ON WEBUCATE APP ON PLAY STORE.**
- **WINNERS NAME WILL BE UPLOADED ON WEBUCATE APP.**

APP CODE

COST MANAGEMENT TECHNIQUES

SCAN AND REVISE

Chapter 4

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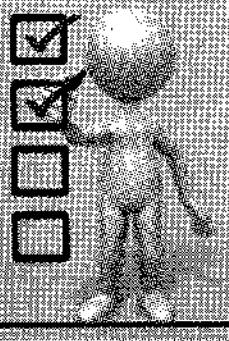


STUDY MENTOR

1 Introduction

In today's competitive environment, COST is the main game changer giving rise to various cost management techniques. Reduce the cost & increase the profit is the mantra of organisations.

Cost Management Techniques to be understood in this chapter are:

a) Cost Control b) Cost Reduction c) Target Costing
d) Life Cycle Costing e) Pareto Analysis f) Environment Management Accounting.

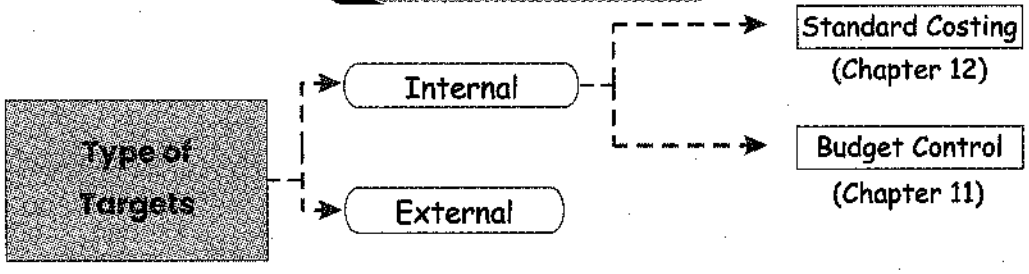
2 Cost Control/ Waste Control

- Regulation of cost by executive's action. Executives are provided with yard sticks such as standards or budgets with which actual costs and performances are compared continuously to ascertain the degree of achievement made.

⇩

Continuous comparison of actual with standard to keep actual in check.

2.1 Scope of Cost Control



2.2 Six Pre- requisites of Cost Control

Effective delegation of authority & responsibility for cost.	Agreed plan to set up objectives & goals.	Motivation to reach established goals.	Timely & efficient reporting.	Recommendation followed by action.	Effective system of follow up.

3 Cost Reduction

Achievement of real & permanent reduction in unit cost of products manufactured.

⇩

Does not accept Standard or Budget rather challenges Standard/Budget to make improvement.

⇩

Continuous effort to reduce cost till optimal level.

3.1 Cost Reduction Techniques

- Value analysis
- Standardisation of product
- Production Planning and Control
- Inventory Control (JIT)
- Simplification and variety reduction.
- Target Costing
- Kaizen Costing

3.2 Scope of Cost Reduction

1 Product Design

Efficient designing for a new product or improving the design for an existing product reduces cost in the following manner:

- Cheaper substitute, higher yield & less quantity.
- Reduced time of operation & increased productivity reduce cost.
- Standardization and simplification.

2 Organisation

Proper re-organisation are looked into:

- Definition of each function and responsibility.
- Proper assignment of task and delegation of responsibility to avoid overlapping.
- A suitable channel of communication .
- Co-operation and closed relationship.
- Removal of doubts and fiction.
- Encouragement to employees.

3 Factory Lay Out Equipment

- Study the factory layout and the utilisation of the existing equipment to determine scope of cost reduction.
- The necessity for replacement of plants, introduction of new techniques or expansion of facilities.

4 Production Plan Programme & Method

Production control ensures proper planning of work. An efficient cost reduction programme should examine the following points whether:

- Wastage of manpower and material is minimum.
- There is any scope for reducing idle capacity.
- Reduce Labour wastage & increased productivity by eliminating faulty production method, plant layout & designs or introducing incentive schemes.

3.3 Reduction of cost by standardisation of components

Standardisation	Example	Other Points
Using same component for more than 1 product.	Cars of different models. ⇩ Same door, handle and wiper.	• Economies of sale • Ease in inventory control • Ease for operator.

3.4

Basis	Cost Control	Cost Reduction
Aim	Compare actual with standards.	Achieve real & permanent reduction in unit cost.
Saving	Temporary saving in cost.	Realistic saving in cost.
Exercise	Less dynamic.	Fully dynamic.
Emphasis	Present & past behaviour of cost.	Partly on present cost & largely on future cost.
Concern	Preventive measure.	Corrective measure.
Tools	Budgetary & Standard Costing.	Value engineering, work study.
Function	Competitive analysis of actual with standard.	Function is to find out substitute ways.
Control	Control through compliance with standard.	Continuous process of critical examination.
Quality	Quality maintenance is not a guarantee.	Product utility, Quality & Character are retained.

*** Cost Reduction + Cost Control = Optimal Cost Structure**

4 TARGET COSTING

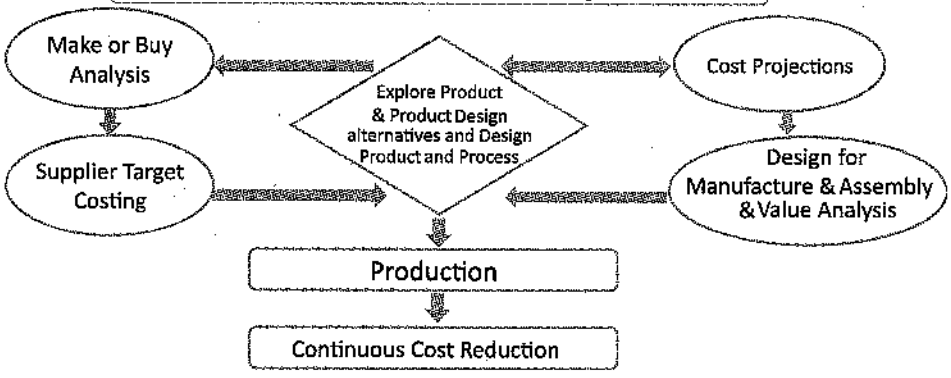
"A structured approach to determining the cost at which a proposed product with specified functionality and quality must be produced, to generate a desired level of profitability at its anticipated selling price".

Target Price
What price we think the consumer will pay for product.

DETERMINE

Target Profit
How much profit margin we expect.

Target Cost = Target Price - Target Profit



Target Costing	Production Specification	Target Price and Volume	Target Profit	Target Cost	Product Design
Traditional Costing	Production Specification	Product Design	Estimated Cost	Target Cost	Target Price

Note: Target Costing initiates cost management at earliest stages of product development & applies it through out the product life cycle.

4.1 Key Features of Target Costing

- Company is price taker rather than price maker.
- Minimum required profit margin is already included in target selling price.
- It focuses on cost reduction and effective cost management.
- Product design, specification & customer expectation are already built in TSP.
- Cost Reduction = Current Cost - Target Cost.
- Team is formed to integrate activities.

4.2 Advantages

- Proactive approach to cost management.
- It reinforces top-to-bottom commitment to process and product innovation.
- It uses management control system to support and reinforce manufacturing strategies.
- Target Costing ensures proper planning well ahead of actual production and marketing.
- Implementation of Target Costing enhances employee awareness and empowerment.
- Target costing starts with customer's study or market study.
- Minimize non-value added activities.
- Foster partnership with suppliers.
- Encourages selection of lowest cost value added activities.
- Target Costing takes market - driven approach towards cost.

4.3 Steps of Target Costing

Step 1

Re-orient culture of thinking & attitude

⇓

Such that importance is given to

- Market driven prices
- &
- Need of customer can be prioritized

Step 2

Identify market requirements as regards:

- Design
- Utility
- Need for new product or
- Improvements in existing products.

Note: If dealing multiple products, perform this for all products.

Step 3

Establish market driven target price based on

- Market Share
- Competition
- Strategy
- Price by Competitors
- Elasticity of Demand

Step 3A

Determine volume of product.

Step 3B

Establish target profit margin.

Step 4

Determine target cost by reducing desired margin from market driven target price.

Step 4A

Establish balance between target cost & requirements.

Step 5

Establish target costing process.

Step 6

Analyze alternatives to identify opportunity to reduce cost.

Step 6A

Establish product cost models & design alternate to support decision making.

Step 7

Use tools to close gap between determined cost in Step 6A & target cost in Step 4A.

Step 7A

Re-engineer the indirect process by eliminating Non- value added functions.

Step 8

Measure results & maintain management focus.

4.4 Principles of Target Costing

- Leadership of target selling price.
- Focusing on customer.
- Using and developing teamwork.
- Reduce the cost of product life cycle.
- Focus on stage of product design.
- Attention to all stages of value chain.

4.5 Problem with Target Costing

- Cost cutting can result in finger-pointing in various parts of the company.
- The development process can be lengthened to a considerable extent.
- For every problem area outlined have the dominant solution in retaining strong control over the design teams, which calls for a good team leader.
- Effective implementation and use requires the development of detailed cost data.
- Representatives from number of departments on the design team can sometimes make it more difficult to reach a consensus on the proper design.
- May reduce the quality of products due to the use of cheap components.
- Requires high level of forecasting and estimation.

4.6 Impact of Target Costing on Profitability

Target costing have large positive impact on profitability

Depending on

- Management commitment to its use
- Continuous emphasis on product costs throughout life cycle
- Constant involvement of accountant in all stages
- Precise targeting of correct prices
- Type of strategy a company follows

Target Costing results not only in better Cost Control but also in better price control.

4.7 Most useful situation

Assembly-oriented industries, as opposed to repetitive process industries that produce homogeneous products.	Involved heavily with the diversification of the product lines.	Use technologies of factory automation, including computer - aided design, flexible manufacturing systems, office automation, and computer-aided manufacturing.
Must develop systems for reducing costs during the planning, design & development phases of a product's life cycle.	Are implementing management methods such as just -in- time, value engineering.	Have experienced shorter product life cycles where the pay - back for factory automation typically must be achieved in less than eight years.

5 Components of Target Costing

5.1 Value Analysis

- Planned approach to cost reduction.
- Reviews material composition of product.
- Scope for modification & improvement.

Without Value/ Quality Reduction

Aims

Achieve target cost by

- Identifying improved product design that reduce the products cost without sacrificing its utility.
- Eliminating unnecessary functions that increase the products cost.

5.3 Value Engineering

- Use of Value Analysis for new products.
- Standard of Quality & Reliability.

Reduce Cost through

- Design change,
- Modification of material specification,
- Change in source of supply, etc.

5.2 Steps in Value Analysis

- Identification of problem.
- Collecting information of the product & finding out the availability of the competitive products in the market.
- Exploring and evaluating alternatives and developing them.

5.4 Value Engineering

- **Can we eliminate functions from the production process?**
  Detailed review of the entire manufacturing process and determine the non- value added activities.
- **Can we eliminate some durability or reliability?**
  Any designs that have had their structural integrity reduced must be thoroughly tested to ensure that they meet all design standards.
- **Can we minimize the design?**
  Creation of a design that uses fewer parts or has fewer features.
- **Can we design the product better for the manufacturing process?**
- **Can we substitute parts?**
  Search for less expensive components or materials that can replace more expensive parts currently used in a product design.
- **Can we combine steps?**
  Eliminate some of the transfer and queue time from the production process, which in turn reduces the chance that parts will be damaged during these transfers.
- **Can we take supplier's assistance?**
- **Is there a better way?**
  One is a more general attempt to start from scratch and build a new product or process that is not based in any way on pre-existing ideas.

6 Life Cycle Costing

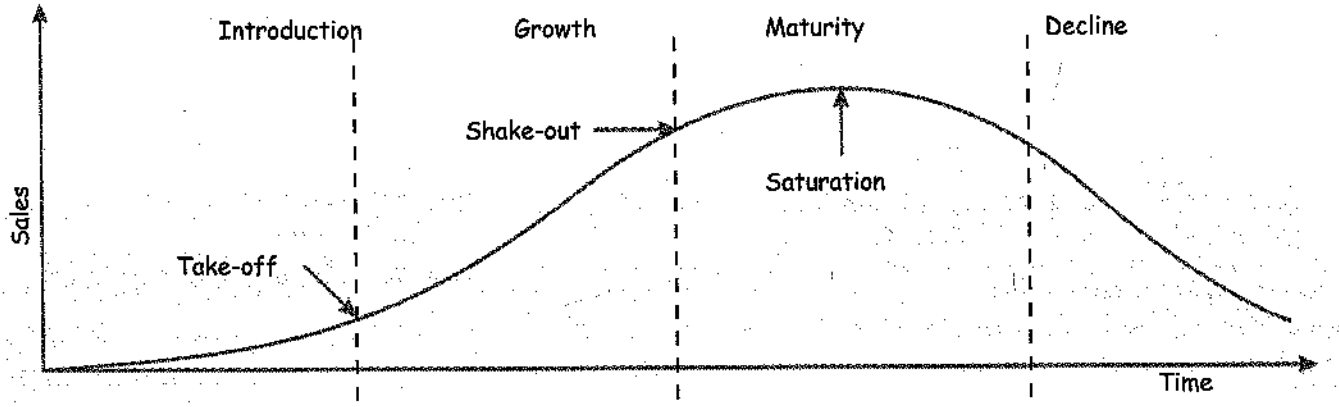
Identifying costs & revenue over a products life i.e., **from inception to decline.**

⇩

Aims to maximize profit

Process of estimating how much money you will spend on an asset over its useful life.

The 4 Life Cycle Stages and their Marketing Implicatioins



Introduction	Growth	Maturity	Decline
• Low Sales • High cost per customer • Financial losses • Innovative customers. • Few (if any) competitors.	• Increasing sales • Cost per customer falls • Profit rise • Increasing No. of customer • More competitors	• Peak sales • Cost per customer lowest • Profit high • Mass market • Stable number of competitors.	• Falling sales • Cost per customer lowest • Profit fall • Customer base contracts • Number of competitors fall.

6.1 Life Cycle Process

- Tangible asset
- Intangible asset

Helps to predicts willingness of business to pay for new assets.

6.2 Purpose of Life Cycle Cost Analysis

- Choose between two or more assets → Purchasing decisions → Consider overall cost & not just price tag
- Determine asset's benefits → Accurately predict asset's ROI worth expense → Consider future cost & not just current purchase cost
- Create accurate budgets → Estimated overall cost helps to create accurate budgets

6.3 Uses of Product Life Cycle

- Planning tool
- Control tool
- Forecasting tool

6.4 Characteristics Of Life Cycle Costing

- The products have finite lives and pass through all 4 phases of cycle.
- Product cost, revenue and profit patterns tend to follow predictable courses through the product life cycle.
- Profit per unit varies as products move through their life cycles.
- Different threats and opportunities that give rise to different strategic actions for all stages.
- Products require different functional emphasis in each stage.
- Finding new uses or getting the present users to increase their consumption may extend the life of the product.

6.5 Benefits Of Life Cycle Costing

- Results in earlier actions to generate revenue or to lower costs.
- More accurate and realistic assessment of revenues and costs.
- Promote long-term rewarding.
- Long-term picture of product line profitability.
- Overall framework for considering total incremental costs over the entire life span of a product.
- Enhance control of manufacturing cost.
- Traces research & design & development cost.

6.6 Stages of Life Cycle Costing

Characteristics

Stage 1 - Introduction Stage	Stage 2 - Growth Stage	Stage 3 - Maturity Stage	Stage 4 - Decline Stage
Decisions about the product branding, packaging & labelling.	High volume of business and increase in competition.	Overcapacity in the industry.	Sales of most product forms drop to zero or may remain at a low level.
High distribution and promotional expenses.	Sales increase at an increased rate in early growth stage.	Intensified competition.	Sales decline for a number of reasons, including technological advances, consumer's shift in taste, etc.
Profits are low or negative due to low initial volume.	New channels to handle additional volumes and new markets.	Population growth & replacement demand govern future sales.	No. of organisations producing the products drops.
Aggressive promotional efforts to increase awareness.	Improving and/or adding features or strategic lowering of prices to attract more buyers.	No new distribution channels to fill.	Profits start declining and at times become negative
Huge efforts to attract various marketing channels.	The length of the growth stage varies according to the nature of the product and competitive reactions.	Customers start moving towards other products and substitutes.	–
Pricing may be low penetration or high skimming pricing.	Same promotional spending or slightly higher.	Some laggard buyers still enter the market.	–
Product refinements are not possible.	Educating market is main goal.	Profits start to decline.	–
Few competitors produce basic version of products.	Overall strategy for trade off between high profits and high market share.	Strong marketing challenges.	–
Focus on those buyers who are the most ready to buy.	Shift of emphasis from product awareness to product conviction.	High R & D budgets.	–

6.7 Stages of Life Cycle Costing

Strategies

Stage 1 – Introduction Stage	Stage 2 – Growth Stage	Stage 3 – Maturity Stage	Stage 4 – Decline Stage
Inducing customers to try and buy the product.	Maintain control over product quality to assure customer satisfaction.	Prices may have to be reduced to attract the sensitive -price consumers.	The firm can continue to offer the product to its loyal customers (niche segment) at a reduced price.
Strengthening or expanding channel and supply chain relationships.	Maximize availability of the product through strong distribution channel.	Various sales promotion incentives are necessary for the consumers as well as dealers to maintain their interest in the product.	Firm can even discontinue the product.
Building on the availability and visibility of the product that boost channel intermediaries to support the product.	Find the ideal balance between price and demand as per price elasticity.	Distribution becomes more intensive and incentives may be offered to encourage product over competing products.	The various marketing decisions in the decline stage will depend on the fact that, whether it is being revived, or given a new lease of file, or left unchanged if it is being liquidated.
Setting price in alignment with the competitive realities of the market.	Overall strategy shifts from acquisition to retention of customers, from motivating product trial to generating repeat purchases and building brand loyalty.	Strong marketing efforts are needed to win over the competitor's customers.	The product can be maintained in the market by differentiation, keeping low cost for some more time by adding certain new features and finding new uses.
Attracting customers by raising awareness of the product through promotion activities.	Development of long-term relationships with customers and partners for the maturity stage.	Product features may be improved or enhanced to differentiate product from that of the competitors.	Use the product as replacement product for launching another new product successfully in the market.
--	Value-based pricing strategies may be considered.	--	The price may be maintained or reduced drastically if liquidated.
--	Establish a clear brand identity through promotional campaigns.	--	--

7 Pareto Analysis by Vilfredo Pareto (80:20 Rule)

Pareto Analysis is a rule that recommends focus on the most important aspects of the decision making in order to simplify the process of decision making.

⩔

It is based on the **80: 20 rule** that was a phenomenon first observed by Vilfredo Pareto, a nineteenth century Italian economist.

⩔

It helps to clearly establish top priorities and to identify both profitable and unprofitable targets.

7.1 Advantages of Pareto Analysis

- Breakdown of big problems into smaller pieces by looking at different set of root cause.
- Identification of significance of each cause.
- Prioritise where to focus & apply efforts.
- Ensure optimal use of scare resource.
- Act as control mechanism.

7.2 Disadvantages of Pareto Analysis

- Possibility of exclusion of important problems.
- Wrong identification of causes.
- Effectiveness of Pareto Analysis is based on data/ information.

7.3 CHARACTERISTICS

- Prioritize problems, goals & objectives to identify root causes.
- Select and define key quality improvement programs.
- Select key customer relations and service programs.
- Select key employee relations improvement programs.
- Select and define key performance improvement programs.
- Allocate physical, financial and human resources.

7.4 Application of Pareto Analysis

Pricing of a Product

Used to analyse cost - profit - price - volume relationship for multi-products.

⩔

Customer Profitability Analysis

Instead of product, customer can be analysed

⩔

Stock Control

Few goods in stock makeup the most value

⩔

Activity Based Costing

Analysing monitoring & controlling those cost drivers that cause most cost.

⩔

Quality Control

How many times each type of failure occurs.

8 Environmental Management Accounting (EMA)

- **EMA** is the process of collection and analysis of the information relating to environmental cost for internal decision making.
- EMA identifies and estimates the costs of environment-related activities and seeks to control these costs.
- The focus of EMA is not on financial costs but it also considers the environmental cost or benefit of any decisions made.
- EMA is an attempt to integrate best management accounting thinking with best environmental management practice.

8.1 Environmental Information

Physical Information

Physical flow of energy water, material as well as wastes & emissions.

Traces inputs & outputs & ensure no resources/ material left uncounted.

Monetary Information

Environmental costs driven by efforts to control waste & emission.

8.2 Areas of Application of EMA

- Product Pricing
- Budgeting
- Calculating Cost
- Investment Appraisal
- Saving of Environmental Project or setting quantified performance targets.

8.3 Importance of EMA among organisation

- Environment Cost represent significant proportion of operating costs.
- Regulatory requirements & consequence of non-compliance are very severe.
- Socially & Environmentally responsible organisation with positive footprint.

9 Environmental cost

Cost connected with actual or potential deterioration of natural assets due to economic activities.

9.1 Classification 1 - Generic Classification

Internal Environment Costs	External Environment Costs
Costs incurred by organisation out of pocket. • Waste disposal costs; • Cost incurred to improve the system & checks to avoid violation; • Regulatory costs; • Up-front & Back-end costs.	Costs born by society: • Use of water, energy resources; • Emission of carbon & change in climate; • Health care costs of a person effected by the environmental effect of business activities; • Soil erosion & Forest degradation; • Increase in average temperature level.

9.2 Classification 2 – US Environmental Protection agency

- **Conventional Costs** → Use of environment friendly RM, utilities, capital goods & supplies.
- **Potentially Hidden Costs** → Cost which lose their identity in general overheads. Eg: Upfront/ Backend/ Regulatory environmental cost.
- **Contingent Costs** → May/ may not be incurred in future. Eg: Penalty, fine, legal expenses.
- **Relationship & Corporate Image Costs** → Cost of preparing environmental reports.

9.3 Classification 3 – Types of Environmental Costs

Environmental Prevention Cost	Environmental Appraisal Costs	Environmental Internal Failure Costs	Environmental External Failure Cost
Associated with preventing adverse environmental impact.	Activities executed to determine whether products, process & activities comply with environmental standards, policies and laws.	Incurred from activities that have been produced but not discharged into the environment.	An activities performed after discharging waste into the environment.
Creating environmental policies	Monitoring, testing, inspection & reporting	Recycle scrap	Cleaning up contaminated soil
Environmentally driven R & D	Regulatory Compliances	Disposing toxic material	Restoring land to its natural state
Pollution control equipment	Audit environmental activities.		

9.4 Classification 4 – United nations Division for Sustainable Development

- Cost incurred to protect the environment. (To prevent pollution)
- Costs of wasted material, capital and labour. (To prevent inefficiencies)

10 EMA Methodology

- Identification of environmental cost
- Allocation of environmental cost to cost centre & cost units
- Controlling environmental cost

Intense review of cost of materials, utilities, energy, water & waste disposal.

These are not separate type of cost rather a part of money flowing throughout a corporation.

Cost accounting & informed business decision require allocation of identified environmental cost.

10.1 Advantages

- **Improve Revenue**
  Production of new products or service meeting the environmental needs, increase sales.
- **Improve the Image of organisation (as a corporate citizen) among the stakeholder.**
- **Cost Reduction**
  Attention to the use of resources can lead reduction in cost.

10.2 Disadvantages

- **Increase in Costs**
  Legal and regulatory requirements
- **Addition burden on to management in order to implement EMA, which may cause diversion from core activities.**
- **Cost of Failure**

10.3 Techniques for identification and Allocation

Input – Output Analysis

- Preparation of records for material inflow and then balances these inflows with the quantum of outflow.
- What enters the production system, must move out.
  - Productive Output
  - Unproductive Output

Flow Cost Accounting

- Organisational structure is also considered apart from material flows.
- Used to improve material efficiency.
- Eg: Canon saved 30 million Euros in material costs.

Life-Cycle Costing

- Takes into account the costs and revenues of a product over its whole life.

Activities Based Costing

- Deals with the allocation of cost pool to the cost centres using cost drivers on the basis of consumption.
- Volume of emission/ waste environmental impact added.
- Toxicity of Emission.

10.4 In context of environmental accounting

Environment-Related Costs

Preparation of records for material inflow and then balances these inflows with the quantum of outflow.

Environment – Driven Cost

Deals with the allocation of cost pool to the cost centres using cost drivers on the basis of consumption.

10.5 Few Measures of Allocation

- Value of Emissions / Waste
- Toxicity & Waste Treatment
- Environment impact added (Volume X Input/unit of volume)
- Relative cost of treating emissions

10.6 Controlling Environmental Costs

(Based on nature of industry type of environment cost and the % of Total Cost)

Waste	Water	Energy	Transport Travel	Consumable RM
• Weight of Materials Bought is compared To product yield. • (Input - Output Ratio) • Lost Land Resources. • Generation of greenhouse Gases. • Taxes for landfill. • Cost of unused. • RM & disposal. • Fines for Compliance Failure.	**2 Major Costs** • Buying Cost • Disposing Cost ⩔ Reduce Water Bills by Lowering Consumption.	• Identify inefficiency & wasteful practices.	• Invest in fuel efficient vehicles	• Toner cartridges for Printers should be refilled rather than replaced. • Result = Saving in financial cost and waste.

11 Role of EMA in Product/Process related Decision Making

- Different pricing of products as a result of re-calculated costs;
- Re-evaluation of profit margins of products;
- Phasing out certain products when the change is dramatic;
- Re-design processes or products in order to reduce environmental costs &
- Improving house keeping & monitoring of environmental performance..

Student Notes

CASE STUDIES

12 Case Study 1 – Environmental Management Accounting – Shandaar Bangle Ltd (ICAI Module CS#10)

VIDEO STARTS AT 53rd MINUTE

ISSUES

Mfg process >>> Glass Melting >>> Parison Making >>>> Spiral

- Poor Environmental impact
- Bad conditions of workplace
- Management planning to take care of environment
- Plant trees, dust collector, noise absorbing device

CONCEPT

Environment Management Accounting and Quality Costs

Analysis: ABC,
Life cycle
Input - output
Non - Financial Consideration

EXPLANATION

Concept of EMA

Analysis of Financial & Non - Financial Information to Support Environment

Benefits
- Product Pricing
- Budgeting
- Investment Appraisal
- Environmental Performance Evaluation

Environmental Cost

Prevention	Appraisal	Internal Failure	External Failure
Prevent Production of Waste	Comply with Environment Standards	Production of Harmful Gases	Heavy Penalty

CONCLUSION

Techniques for Identification

ABC	Life Cycle	Input / Output
Number of Trees planted Volume of Nitrogen oxide treated	RM : Some Natural ↓ Product Waste Mfg : Other gases ↓ Mktg : Transportaion	Allocate & Analyse environmental cost to Input & Output of Glass Bangles

Non – Financial Consideration

- Safety monitoring system
- Train workers
- Regular health check – ups
- Protective glasses clothes / gloves

13 Case Study 2 – Value Engineering – STPL (Case Study Digest– Case Scenario #6)

ISSUES

- Star Tiles Production Limited (STPL) - manufacturer of floor tiles and interlocking tiles.
- STPL deals in variety of tiles with different brand name, some in development stage and some in maturity.
- Majority customers are price sensitive.
- Workers are allocated with specific rules and responsibilities and works strictly as per guidelines of superior.
- Workers are not allocated as per skills.
- Decision making is centralize.
- Due to fixed nature of payment workers are not concerned about quality.
- Mis-management of stock.

CONCEPT

- Value Engineering & New Concepts
- Productivity, stating in context of what it should be measured?
- Productivity enhancement techniques, which can be applied at STPL in order to enhance productivity?

EXPLANATION & CONCLUSION

(i) Productivity

- It's all about efficient and effective use of all resources
- Productivity is usually linked to 'time and motion'

Put pressure on worker to perform faster.

Increase the productivity either by increasing the value or reducing the time required to create that value.

(ii) Productivity Improvement Techniques

- **Value Analysis/ Engineering**
  - ✓ Improve value of product at every state of product life cycle.

Development stage: Establish design & process

Maturity Stage: (Replace costly component with cheaper one.)

- **Quality Circles**
  - ✓ Small group of employees in order to -

Meet regularly to identify, analysis and solve proble

Advice the management to implement new methods

Financial and **Non-Financial incentives** (Incentives are real cause of motivation to worker.)

Includes better wages and salaries, bonus etc.

Includes better working condition, welfare facilities, worker participation in management.

- **Operations Research**
  - ✓ Use mathematical & scientific methods may solve the problems of productivity.
- **Training**
  - ✓ Rather than retrenching the operationally sound employees, they must be trained on technological part.

- **Job Enlargement & Job Enrichment**
  - Horizontal expansion of job (increase variety of jobs)
  - Vertical expansion of job (job satisfaction)
- **Job Evaluation**
  - ✓ Fixing value of each job in the organisation
- **Inventory Control & Material Management**
  - ✓ Overstocking and under-stocking should be avoided through- Scientific Purchase, Systematic Store Keeping, Proper Inventory Control, etc.
- **Quality Control**
  - ✓ Ensure identification of causes of quality deviation & correction thereof.
- **Human Factor Engineering**
  - ✓ Understanding of technology and human requirement to ensure fitment of job to men; to increase human efficiency & wellbeing.

14 Case Study 3 – Quality Cost / JIT – Dewar Bikes (Case Study Digest – Case Scenario #10)

ISSUES

- **Dewar Bikes (DB)**- Bike manufacturing company
- Make fundamental changes to its production approach to combat increased competition from foreign manufacturers.
- Non-lucrative, pollutive and with less safety features in comparison to the foreign bikes.
- The process of making a bike takes about 11-12 hours in total.
- Standard industry time is 8-9 hours.
- DB forecasts demand based on its internal policies & historical trends.
- Statement Showing 'Total Quality Costs'.

Particulars of Costs	(Rs.)
Prevention Costs	
Supplier Review	2,50,000
Appraisal Costs	
Equipment Testing (Rs. 36 × 1,600 hrs.)	57,600
Internal Failure Costs	
Down Time	15,40,000
Manufacturing Rework (Rs. 456 × 3,200 bikes)	14,59,200
External Failure Costs	
Customer Complaints (Rs. 70 × 2,000 hrs.)	1,40,000
Warranty Repair (Rs. 3,120 × 2,600 bikes)	81,12,000
Total Quality Costs	**1,15,58,800**

CONCEPT

- Concept of Quality Cost/JIT.
- Analysis of quality costs and ADVISE on two measures to reduce the non- conformance cost.
- Advise on implementation of just-in-time purchasing and production.

EXPLANATION

Analysis of Quality Costs

- The total quality costs statement displays the relationship between conformance and non-conformance costs and the drivers of a reduction in overall spending on quality.

Total Productive Maintenance (TPM)	Total Quality Management (TQM)
Maintaining & improving the integrity of production & quality by keeping all equipment in top working condition.	Aims at improving quality of output through continual improvement of internal practices.
To avoid breakdowns and delays in manufacturing processes.	Objective is to eradicate waste and increase efficiency without compromising quality.

Implementation of Just in Time

- Purchasing of components and production of bikes » Based on customer demands.
- Ensure suppliers supply the **right quantity** of components required at the **right time**.

DB will be able to reduce manufacturing time around 3 hours » By streamlining the flow of information in entire supply chain.

- **Supplier - Status**

Alternative supplier on continuous basis.	Establish long term cooperative relationship with smaller number of supplier.	Close proximity of supplier.	Timely supply of high quality material delivered at right time.	Provide manufacturing schedules and product specification.	Treat suppliers as partners and development ERP.

CONCLUSION

- TPM will help DB in reducing internal failure cost (25.95% of Total Quality Cost).
- Machines work properly, chances of rework will reduce which will reduce warranty repair and customer complaints (71.39% of Total Quality Cost).
- As there is huge disparity between conformance and non conformance cost, DB is not a TQM company. DB must engage its staff in continuous improvement process, to be successful.
- The Board desires to improve the quality as well as financial position which can be achieved through successful implementation of quality control and lean system. However, the factors discussed above should be taken care of.
- It is worthwhile to note that any return on investment in proposed system must be viewed long term rather than short term since optimum results may not be realized until the system has been in place for some time.

15 Case Study 4 – SCM – Dream Homes (case study Digest– CS #6)

ISSUES

- Dream Homes, a US based MNC, selling home-based products opening few stores in India.
- The firm kept its material cost low and primarily relied on the recycling process. It does both manufacturing few products and outright purchases of few products.
- To manufacture the finished products, it takes 3 weeks and 4 weeks to deliver manufactured product from the time order is received. The standard lead time in industry is 2.5 weeks. For purchase outrightly, a PO is prepared based on inventory in hand and no safety stock.
- Its store locations are in metro cities but fails to tap states like Gujarat and Odisha however plans to reach out to people all over the country.
- Going digital for e-customers but due to cultural gaps in India than US and low middle class income, they thought to apply Target Costing to set online prices.
- They also need flawless SCM system for e-commerce project in India.

CONCEPT

(I) DISCUSS the suitability of Target Costing concept to Dream Homes?
(ii) Critically ASSESS its current inventory management system and RECOMMEND suitable changes in light of its business strategy.
(iii) ADVISE the SCM look for Dream Homes as per their requirement.

EXPLANATION & CONCLUSION

(i) Target Costing

- Dreams Homes' products lack much differentiation.
- USP of firm » to offer quality products at low prices. can be

E Commerce requires firm:

- To operate as per JIT approach.
- To control fixed costs.
- Other variable costs.
- Get lower price of purchase by long term contracts.

(ii) Current inventory management system

- Inventories of raw materials, WIP and FG are maintained at the stores and warehouses blocking large assets which are maintained in a traditional manner; to be out of the place for an E Retailer. Dream House **forecasts demand** based on its internal policies and historical trends, whereas it should be pulled **by current market trends and prediction of future market sentiments.**
- It is also building up **too much safety stock** which takes up cost and space. The lead time of the firm is remarkably high relative to industry standards, which is untenable in an Environment which may lead to losing a large chunk of customers who do not want to wait.
- **JIT inventory management** takes care of massive holding cost suffered related to large build ups by setting up plants near chain of suppliers' location to ensure several pick-ups each day rather than holding on to bulks.
- **ERP** and other sources of electronic data interchange between supplier and Dream Homes will act as backbone in supporting the JIT activity and help to reduce the lead time to deliver the ordered products from 4 weeks to around 2.5 weeks
- For the products purchased from its suppliers, employ **vendor managed inventory technique** where suppliers control the inventory management system by allowing them access to the inventory information from all locations.
- Similarly, to manage the inventory at warehouse and to manage inbound shipment, **RFID (Radio Frequency Identification)** technique can be used to pick up, process and ship the order thereby allowing supplier to manage firm's inventory. Low cost of inventory management will consequently reduce the overall cost of inventory and thus help, in achieving set cost target.

(iii) Designing of Supply Chain Management (SCM)

Focus on

- Building strong collaborations with suppliers
- Minimum lead time
- Timely supply of Raw material
- Low inventories (E-environment)
- Appropriate transportation in remote place
- Speedy shipment
- Hassle free returns.

- Vendor managed inventory system » Onus of inventory management shift onto suppliers.

- Large capital investment on distribution centres.
- Multifaceted robotics technology with human participation.

Student Notes

MASTER SUMS

16 Question 1: (Environment Management Accounting)

A fertilizer company produces Grade A and Grade B fertilizers. One kilogram of Grade A fertilizer sells for Rs.280 per kilogram and one kilogram of Grade B fertilizer sells for Rs.400 per kilogram.

The products pass through three cost centers CC1, CC2 and CC3 during the manufacturing process. Total direct material cost per kilogram of fertilizer produced is Rs.300 and direct labor cost per kilogram of fertilizer produced is Rs.200. Allocation between the cost centres is given below:

Particulars	CC1	CC2	CC3	Total
Cost of Direct Material (per kg of fertilizer)	Rs. 90	Rs.120	Rs. 90	Rs. 300
Cost of Direct Labour (per kg of fertilizer)	Rs. 60	Rs.80	Rs. 60	Rs. 200
Cost Allocation to Grade A	30%	50%	30%	
Cost Allocation to Grade B	70%	50%	70%	

All of expenses (considered to be overheads) per kilogram of fertilizer produced is Rs.150. This is allocated equally between Grade A and Grade B fertilizer. Pricing decisions for the fertilizers is made based on the above cost allocation.

The management accountant of the company has recently come across the concept of environmental management accounting. Pricing of products should also factor in the environmental cost generated by each product. An analysis of the overhead expenses revealed that the total cost of Rs.150 per kilogram of fertilizer produced, includes incinerator costs of Rs.90 per kilogram of fertilizer produced. The incinerator is used to dispose the solid waste produced during the manufacturing process. Below is the cost center and product wise information of solid waste produced:

Waste produced (in tonnes per annum)	CC1	CC2	CC3	Total
Grade A	2	3	1	6
Grade B	2	2	5	9

Based in the impact that each product has on the environment, the management would like to revise the cost allocation to products based taking into account the incinerator cost that each product generates. The remaining overhead expenses of Rs.60 per kilogram of fertilizer produced can be allocated equally.

Required

(i) CALCULATE product wise profitability based on the original cost allocation. RECALCULATE the product wise profitability based on activity based costing methodology (environmental management accounting).

(ii) ANALYZE difference in product profitability as per both the methods.

(iii) RECOMMEND key takeaways for the company to undertake the above analysis of overhead costs and pricing as per environmental management accounting.

Solution: (i) Product Wise Profitability as per Original Allocation Methodology

(Figures in Rs. per kilogram of fertilizer produced)

Particulars	Grade A	Grade B	Total
Selling Price	280	400	680
Direct Material (Refer Table 1)	114	186	300
Direct Labour (Refer Table 1)	76	124	200
Overheads (allocated equally)	75	75	150
Total Expenses	265	385	650
Profit	15	15	30
Profitability	5.36%	3.75%	×

Table 1 Allocation of Direct Materials and Labour as per Cost Centre and Product

Particulars	CC1			CC2			CC3			Total for the		
	A	B	CC Total	A	B	CC Total	A	B	CC Total	Gr. A	Gr. B	Grand Total
Direct Material	27	63	90	60	60	120	27	63	90	114	186	300
Direct Labur	18	42	60	40	40	80	18	42	60	76	124	200

Product Wise Profitability (activity based costing using environmental management accounting) requires the following steps:

1. Overhead expenses of Rs. 150 per kilogram of fertilizer produced be first bifurcated into incinerator costs and other overhead costs.
2. Incinerator costs of Rs. 90 per kilogram of fertilizer needs to be allocated first to the cost centres. This is done based on the waste generated at each cost centre. The individual cost allocated to each cost centre is again allocated to products based on the waste generated at each cost centre by each product. Refer Part Ola of table 2 for detailed calculations.
3. As mentioned in the problem, other overhead costs are allocated to each product at each cost centre level equally. Refer Part b of Table 2 for detailed calculations.
4. The above allocations to each product at a cost centre level is then summed up to get the product wise overhead cost allocation. Refer Part C of Table 2 for detailed calculations.

Accordingly, the **Revised Product Profitability** would be as follows:
(Figures in Rs. per kilogram of fertilizer produced)

Particulars	Grade A	Grade B	Total
Selling Price	280	400	680
Less: Direct Material (refer table 1)	114	186	300
Less: Direct Labour (refer table 1)	76	124	200
Less: Overheads (refer table 2)	66	84	150
Profit	24	6	30
Profitability	8.57%	1.50%	*

Table 2 Allocation of Overhead Expenses to each Cost Centre and Product
(Figures in Rs. per kilogram of fertilizer produced)

Product Waste Produced (in tonnes per annum)	CC1	CC2	CC3	Total
Grade A	2	3	1	6
Grade B	2	2	5	9
Total Waste	4	5	6	15
Incinerator Cost Allocated to Cost Centres (based on waste generated)	24	30	36	90
Other Overhead Expenses	20	20	20	60
Total Cost Centre Wise Overhead	44	50	56	150

Part A: Allocation of Incinerator Cost from Cost Centre to each product (based on waste produced at each cost centre by each product)				
Product	CC1	CC2	CC3	Total
Grade A	12	18	6	36
Grade B	12	12	30	54
Total Incinerator	24	30	36	90

Part B: Allocation of Other Overhead Cost from Cost Centre to each product				
Product	**CC1**	**CC2**	**CC3**	**Total**
Grade A	10	10	10	30
Grade B	10	10	10	30
Total Other Overhead	20	20	20	60

Part C: Total Overhead Cost (Cost Centre and Product Wise i.e. part a + b)				
Product	**CC1**	**CC2**	**CC3**	**Total**
Grade A	22	28	16	66
Grade B	22	22	40	84
Total Overhead Cost	44	50	56	150

Summarizing Product Profitability as per both methods:

Product	(Profit in Rs. per kg of fertilizer produced)		Profit %	
	Original Method	ABC (as per EMA)	Original Method	ABC (as per EMA)
Grade A	15	24	5.36%	8.57%
Grade B	15	6	3.75%	1.50%

(ii) As summarized above, originally the profit generated from Grade A and Grade B products, was Rs.15 per kilogram. Grade A was the more profitable product giving return of 5.36% compared to Grade B's return of 3.75%. This has been calculated by allocating overheads equally to Grade A and B.
During the year, 15 tons of waste is produced during the manufacturing process. Grade B fertilizer produces more waste that accounts for 60% of the waste. Therefore, Grade B should bear higher amount of the incinerator cost compared to Grade A. Allocation based on this premise, dramatically changes the profitability of the products. As calculated above, Grade A fertilizer, due to lower incinerator cost allocation , generates a profit of Rs.24 per kilogram of fertilizer. Grade B's profits accordingly are lower, since the product generates more waste and has to bear a larger share of clean-up expenses. Profitability of Grade A increases to 8.57% while Grade B falls dramatically to 1.50%.

(iii) The company can draw a number of conclusions from this analysis of overhead costs as per environmental management accounting. This analysis has helped the company reach the conclusion that Grade B fertilizer produces more waste. The company could adopt either of the following approaches:
(a) To maintain the same level of profitability, the company can increase the price of Grade B by another Rs.9 per kilogram. This is a 2.25% increase in the sale price of Grade B fertilizer. Depending on the market for this grade of fertilizer, the company has to decide whether to increase the price of the product. While a price increase

may be possible if the company has a strong market hold, it might be difficult if competition in the market is high.

OR

(b) The other approach, a more sustainable approach that is the aim of environmental management accounting, would be to reduce the waste produced in the manufacturing process. This analysis, has quantified the waste generated in the process. Better manufacturing techniques, could save the company incinerator costs, that would yield better profits for the company.

17 Question 2: (Nov 2018 ICAI Question 2) (Target Costing)

Zen Ltd., forms a Committee consisting of its Production, Marketing and Finance Directors to prepare a budget for the next year. The Committee submits a draft budget as detailed below:

Selling price per unit		50
Direct material cost per unit	Rs.9	
Direct labour cost per unit (3hrs @ Rs.3)	Rs.9	
Variable overhead (3 hrs @ Rs.2)	Rs.6	24
Contribution per unit		26
Budgeted Sales Quantity		25000 units
Budgeted Contribution (25,000x 1"26)		6,50000
Budgeted Fixed Cost		5,00000
Budgeted Profit		1,50,000

The Management is not happy with the budgeted profit as it is almost equal to the previous year's profit. Therefore, it asks the Committee to prepare a budget to earn at least a profit of Rs. 3,00,000. To achieve the target profit , the Committee reports back with the following suggestions:

The unit selling price should be raised to Rs. 55.

The sales volume should be increased by 5,000 units.

To attain the above said increase in sales, the company should spend Rs.40,000 for advertising. The production time per unit should be reduced.

To win the acceptance of the workers in this regard the hourly rate should be increased by Rs. 3 per unit besides an annual group bonus of Rs. 30,000.

There is no change in the amount and rates of other expenses. The company has sufficient production capacity.

As the implementation of the above proposal needs the acceptance of the work force to increase the speed of work and to reduce the production time per unit, the Board wants to know the extent of reduction in per unit production time.

Required

(i) CALCULATE the target production time per unit and the time to be reduced per unit.

(ii) IDENTIFY the other problems that may arise in production due to decrease in unit production time and also suggest the remedial measures to be taken.

(iii) STATE the most suitable situation for the adoption of Target Costing.

Solution:

Workings

Statement Showing Target Cost (Direct Labour and Variable Overhead)

Particulars	Amount (Rs.)
Target Sales (55x 30,000Units)	16,50,000
Less:Target Profit	3,00,000
Less:Direct Material Cost (9x30,000Units)	2,70,000
Less: Budgeted Fixed Costs	5,00,000
Less:Proposed Advertising	40,000
Less: Proposed Annual Group Bonus	30,000
Target Cost (Variable Overhead and Direct Labour) for30,000 units	5,10,000

(i) Target Production Time per unit and Time to be reduced per unit

Important Note:

As per the reading of the Question, there is ambiguity (confusion) in the line giving rise to the various interpretations and alternatives.

"To win acceptance of workers, hourly rate should be increased by Rs. 3 per unit."

Alternative 1: Increase in labour cost p.u. by Rs. 3 p.u. (Recommended)

Alternative 2: Increase in labour rate per hour by Rs. 3/hr. (Recommended)

Alternative 3: Increase in labour rate @ Rs. 3 and averaging it with 3 hrs /unit.

Alternative 1: Flat increase in labour cost p.u. by Rs. 3 p.u.

If labour cost is increased @ Rs. 3 p.u.

∴ Current Rate	Rs. 9 p.u.
Add: Increase p.u.	Rs. 3 p.u.
Labour Cost Rate	RS. 12 p.u.
No. of units	30,000
x Labour Cost Rate	Rs. 12 p.u.
∴ Labour Cost	Rs. 3,60,000
Target Cost Allowable for Labour & Variable Overheads	Rs. 5,10,000
∴ Cost Remaining for Variable Overheads (Rs. 5,10,000 – Rs. 3,60,000)	Rs. 1,50,000
∴Total Variable Overheads	Rs. 1,50,000
Rate per Variable Overheads	Rs. 2/hr
Total Hours Allowable (Rs. 1,50,000/Rs. 2/hr)	75,000 hrs
No. of units	30,000 units
∴ Hours allowable p.u. (75,000hrs./ 30,000 units)	2.5 hrs/unit
∴ Time to be reduced p.u. (3 hrs/unit -2.5 hrs/unit)	0.5 hours/unit

Alternative 2: Increase in labour rate p.u. by Rs. 3/hour

Current labour rate/hour	Rs. 3/hr
Add: Increase in labour rate @ Rs.3/labour	Rs. 3/hr
∴ Variable Overheads rate/hr	Rs. 2/hr
∴ Total Cost of Labour + Variable Rate	Rs. 8/hr (3+3+2)
Total Cost of Labour + Variable	Rs. 5,10,000
∴ Total Allowable Hours (Rs. 5,10,000/ Rs. 8/hour)	63,750 hours
Total no. of units	30,000 units
∴ Hours per unit allowable (63,750 hours/ 30,000 units)	2.125 hours
∴ Time to be reduced per unit	0.875 hours

Alternative 3: Increase in labour rate @ Rs. 3 p.u. and averaging it with 3 hours/unit (Not recommended)

Current labour cost/unit	Rs. 9/unit
Add: Increase in Labour cost/unit	Rs. 3/unit
Total Labour Cost/unit	Rs. 12/unit
Total Hours/unit	3 hours/unit
Labour cost/hour (Rs.12/unit / 3hours/unit)	Rs.4/hour
Add: Variable Overhead Cost/Hour	Rs.2/hour
New (Labour + Variable O/H) rate/hour	Rs.6/hour
Total Cost of Labour and Variable O/H	Rs. 5,10,000
Total Allowable hours (Rs. 5,10,000 / Rs.6/hour)	85,000 hours
Total No. of Units	30,000 units
∴ Hours per unit allowable	2.83 hours
∴ Time to be reduced per unit (3hours - 2.83 hours)	0.17 hours

(ii) Problem

The target-costing method is applicable particularly for repetitive manufacturing. It should however be recognised that some products often bear a high degree of repetition and that there often are considerable repetitions where reduction targets could come into play as a framework for improving design. Working under pressure to finish new design assignments in a short time may take development resources away from efforts to optimise or re engineer production processes. If approaching product design as an activity to be optimised independently there is a risk that target costing may not succeed to satisfactorily addressing overall performance , so in short decrease in unit production time may lead to unwanted pressure on design and its implementation stage.

Remedial Measures

As a remedial action organisation should retain strong control over the design teams headed by a good team leader. This person must have an exceptional knowledge of the design process, good interpersonal skills and a commitment to staying within both time and cost budgets for a design project. If the time is too short even an organisation may reject a project for the time being. Later, it can be tried out with new cost reduction methods or less expensive materials to achieve target cost and control overall production activities.

(iii) Target costing is most useful in situations where the majority of product costs are locked in during the product design phase . This is the case for most manufactured products, but few services . In the services area, such as consulting , the bulk of all activities can be reconfigured for cost reduction during the "production" phase, which is when services are being provided directly to the customer. In the services environment , the "design team" is still present but is more commonly concerned with streamlining the activities conducted by the employees providing the service, which can continue to be enhanced at any time, not just when the initial services process is being laid out.

18 Question 3 (ABC + Target Costing)

Speedo limited is a specialist car manufacturer that produces various models of cars. The organization is due to celebrate its 100th anniversary next year. To mark the occasion, speedo Limited intends to produce a sports car; the Model Royal. As this will be a special edition, production will be limited to 1,000 numbers of Model Royal Cars. speedo Limited is considering using a target costing approach and has conducted market research to determine the features that consumers require in a sports car. Based on this market research and knowledge of competitors products, company had decided to price the Model Royal at Rs. 9.75 lacs. Company requires an operating profit margin of 25% of the selling price of the car. Details for the forth coming year are as follows:

Forecast of direct costs for Model Royal Car-

Labour = Rs. 2,50,000

Material = Rs. 4,75,000

Forecast of annual overhead costs-

	Rs. In lacs	Cost Driver
Production Line cost	2,310	See Note 1
Transportation Cost	900	See Note 2

Note 1

The production line that would be used for model Royal has a capacity of 60,000 machine hours per year. The production lime time required for Model Royal is 6 machine hours per car. This production line will also be used to make other cars and will be working in full capacity.

Note 2

Some models of cars are delivered to showrooms using car transporters. 60% of the transportation costs are related to the number of deliveries made. 40% of the transportation costs are related to the distance travelled. The car transporters have forecast to make a total of 640 deliveries in the year and carry 10 cars each time. The car transporter will always carry its maximum capacity of 10 cars.

The total annual distance travelled by car transporters is expected to be 2,25,000 kms. 50,000 kms of this is for the delivery of model Royals car only. All 1,000 Model Royal cars that will be produced will be delivered in the year using the car transporters.

Required:

(i) Calculate the forecast total cost of production and delivering a Model Royal car using Activity Based Costing principles to assign the overhead costs.

(ii) Calculate the cost gap that currently exists between the forecast total cost and the target total cost of a Model Royal Car.

Solution

Workings:

Statement showing "Cost Driver Rate"

Overhead	Cost (Rs. In lacs)	Cost Driver	Cost Driver Rate(Rs.)
Production Line cost	2,310	60,000 Machine Hours	3,850 per hour (2,310/60,000hrs lacs)
Transportation cost:			
Delivery Related (60%)	540	640 Deliveries	84,375 per delivery (540/640 deliveries lacs)
Distance Related (40%)	360	2,25,000 kms	160 per km (360/2,25,000 kms) Lacs

(i) Forecast Total Cost using Activity Based Costing Principles

Elements of cost	Rs.
Material	4,75,000.00
Labour	2,50,000.00
Overhead Production Line cost (Rs. 3,850 x 6 hours)	23,100
Transportation cost- Delivery related (Rs. 84,375/10 cars) Distance Related {(160 x 50,000 kms) / 1,000 cars)}	8,437.50 8,000.00
Total	7,64,537.50

(ii) Calculation of cost gap between Forecast Total cost and Target Total cost

Particulars	Amount (Rs.)
Target Selling Price	9,75,000.00
Less: Operating Margin (25%)	2,43,750.00
Target cost (Target Selling Price - Operating profit)	7,31,250.00
Forecast total cost	7,64,537.50
Cost Gap (Rs 7,64,537.50 - 7,31,250.00)	33,287.50

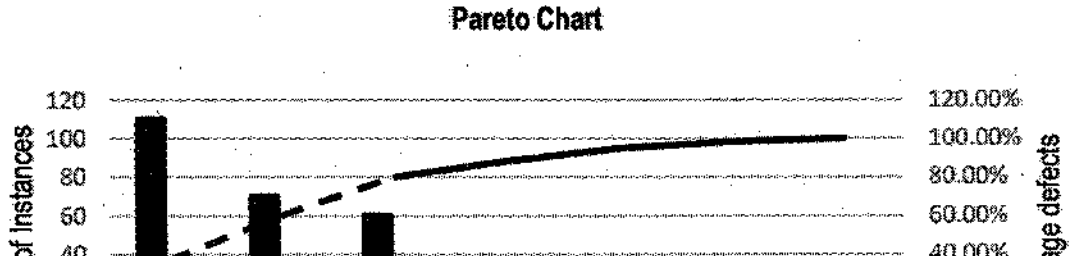
19 Question 4: (Parato Analysis)

The following information is given about the type of defects during a production period and the frequencies of their occurrence in a spectacle manufacturing company:

Defect	No. of defect
End Frame not equidistant from the centre	10
Non-uniform grinding of lenses	60
Power mismatches	20
Scratches on the surface	110
Spots / Stains on lenses	5
Rough edges of lenses	70
Frame colours-shade differences	25

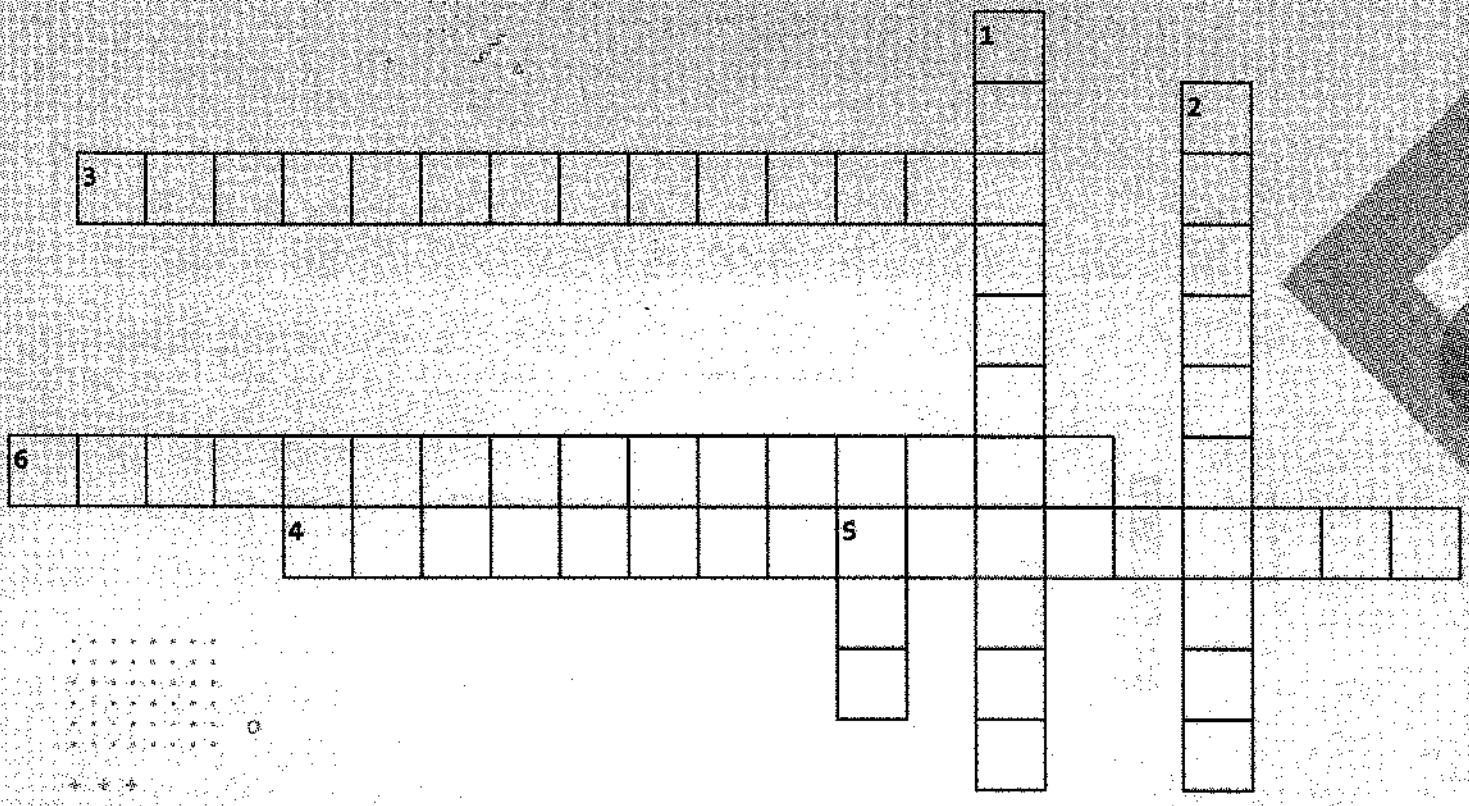
Required

PREPARE a frequency table so that a Pareto Chart can be constructed for the defect type. Also, IDENTIFY key areas of focus.


Pareto Chart
No. of Instances
120
100
80
60
40
20
0
120.00%
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
% age defects
Scratches
Rough edges
Non-uniform grinding
Shade differences
Power mismatches
Not equidistant
Spots/Strain

GAME OF CONCEPTS

CHAPTER 4



ACROSS

3. 80: 20 rule
4. Cost connected with actual or potential deterioration of natural assets due to economic activities
6. from inception to decline

DOWN

1. Continuous comparison of actual with standard to keep actual in check
2. Target Price - Target Profit
5. the process of collection and analysis of the information relating to environmental cost for internal decision making

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- WINNERS NAME WILL BE UPLOADED ON WEBUCATE APP.

APP CODE

Learning Curve

Chapter 5

01 Introduction to Learning Curve — 1

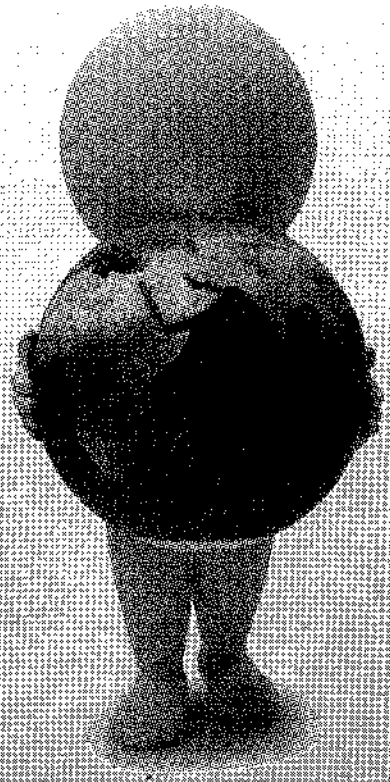
02 Fundamentals of Learning Curve — 1

03 When Output does not Double — 1

04 Question 1 – Basic Sum — 2

05 Question 2 – Pricing Policy with Learning Curve — 2 - 4

06 Question 3 – Decision Making with Learning Curve — 4 - 5



MENTOR

Learning Curve

As per ICAI Module Chapter 5 is deleted from syllabus. However, we have put learning curve which is not a separate chapter in Module. But application of learning curve is asked in Exam and included here.

(This chapter is only important from practical application point of view with chapters like, Decision making, Pricing policy and standard costing. Here we have covered basics of learning curve and its applications is covered with the respective chapters.)

1 Introduction

As more units are produced, people involved in production become more efficent than before. Each additional unit takes less time to produce. The amount of improvement or experience gained is reflected by a decrease in man-hours or cost. The application of learning curve can be extended to commercial and industrial activities as well as defense production.

2 Fundamentals of Learning Curve

- Learning Curve **Percentage** will always be **less than 100%.**
- Learning Curve **Applies** directly only when the **output doubles.**
- Learning Curve **applicable** only on **average hours.**
  If the hours are not given, than the cost may be taken as a base factor.
- These activities particularly relate to **manual work and not machine oriented activities.**
- It is useful in:
  a) Letting labour standard times. c) Calculation of incentive rates in wages bargaining.
  c) Pricing of successive batches. d) Evaluating like wage movements in project evaluation.
- Average Labour Cost p.u = $\frac{\text{Total hours x Cost per hour}}{\text{No. of Units}}$

3 Where output does not double

$Y = ax^b$

Where, a = Total time taken for 1st unit

x = Total no. of units

b = Learning index (Given) $b = \frac{\text{Log L.C.\%}}{\text{Log 2}}$

y = Average time per unit applicable for "x" cumulative unit.

Properties of log

1. $\text{Log } a^b = b \log a$
2. $\text{Log } a \times b = \log a + \log b$
3. $\text{Log } a / b = \log a - \log b$

MASTER SUMS

4 Question 1 (Basic understanding: When output doubles)

ABC & Co. has given the following data:

90% Average – Time Curve

Cumulative Units (x)	Average Hours	Total hours	Marginal Hours
1	100	100	100
2	90	180	80
3	?	?	?
4	81	321	?

Required

Fill in the blanks.

Solution

In order to calculate average time p.u. applicable for first 3 units we should apply mathematical relation in the following manner.

$Y = ax^b$

$Y = 100 \times (3)^{-01522}$

$\text{Log } y = \log 100 \times 3^{-01522)}$

$= \log 100 + \log 3^{-01522}$

$= \log 100 - 0.1522 \times 0.4771$ (from log table)

$\text{Log } y = 1.927385$

Taking antilog both side .

Y = Antilog 1.927385 (from antilog table)

$Y = 84.59$

This is the average time p.u applicable for first 3 cumulative unit.

Statement of Learning Curve

Cumulative Units	Average Hours	Total hours	Marginal Hours
1	100	100	100
2	90	180	80
3	84.59	253.77	73.77
4	81	324	70.23

5 Question 2 (Pricing Policy with Learning Curve) (ICAI Module Question)

Bosch Ltd. Has developed a special product. Details are as follows: The product will have a life cycle of 5,000 units. It is estimated that market can absorb first 4,500 units as Rs 64 per unit and then product will enter the "decline" stage of its life cycle.

The company estimated the following cost structure:

Direct Labour ..... Rs 6 per hour

Other variable costs..... Rs. 19 per unit

Fixed costs will be Rs. 40,000 over the cycle of the product. The 'labour rate' and both of these costs will not change throughout the product's life cycle.
The first batch of 100 units will take 1,000 labour hours to produce. These will be an 80% learning curve that will continue unit 2,500 units have been produced. Batches after this level will each take the same amount of time as the 25th batch. The batch size will always be 100 units.

Required:
CALCULATE average selling price of the final 500 units that will allow the company to earn a total profit of Rs. 80,000 from the product if average time for 24 batches is 359.40 hours.
(Note: Learning coefficient is -0.322 for learning rate of 80%). The values of Logs have been given for calculation purpose:
Log 2 = 0.30103; log 3 = 0.47712; log 5 = 0.69897; antilog of 2.534678 = 342.51; antilog of 2.549863 = 354.70; antilog of 2.555572 = 359.40; antilog of 2.567698 = 369.57

Solution

Average 'Selling price' of the first 500 units

Particulars		Amount (Rs.)
Direct Labour [(8,867.50 hrs. + 241.90 hrs. x 25 batches) x Rs 6]		89,490
Add: Other Variable Costs (5,000 unjts x Rs. 19)		95,000
Add: Fixed Costs		40,000
Total Life cycle cost		2,24,490
Add: Desired Profit		80,000
Expected Sales Value (5,000 units x Rs. 19)		3,04,490
Less: Sales Value (4,500 units x Rs. 64)		2,88,000
Sales value (Decline Stage)	.... (A)	16,490
Sales Unit (Decline stage)	.... (B)	500
Average Sales Price per unit	...(A)/(B)	32.98

Working
(i) The cumulative average time per batch for the first 25 batches
The usual learning curve model is $Y = ax^b$ Where

Y= Average time per batch (hours) for x bacthes a = Time required for first batch (hours)
X = Cumulative number of batches produced
B = Learning coefficient
The Cumulative Average Time per batch for the 25 batches

$$Y = 1{,}000 \times (25)^{-0.322}$$
$$\text{Log } y = \log 1{,}000 - 0.322 \times \log 25$$
$$\text{Log } y = \log 1{,}000 - 0.322 \times \log (5 \times 5)$$
$$\text{Log } y = \log 1{,}000 - 0.322 \times [2 \times \log 5)$$
$$\text{Log } y = 3 - 0.322 \times [2 \times 0.69897]$$
$$\text{Log } y = 2.549863$$
$$Y = \text{antilog of } 2.549863$$
$$Y = 354.70 \text{ hours}$$

(ii) The time taken for the 25th batch

Total Time for first 25 batches	= 354.70 hours x 25 batches
	= 8,867.50 hours
Total Time for first 24 batches	= 359.40 hours x 24 batches
	= 8,625.60 hours
Time taken for 25th batch	= 8,867.50 hours - 8,625.60 hours
	= 241.90 hours

Question 3 (Pricing Policy with Decision Making) (Similar Question in ICAI Exam May'19)

AUD International Co. is a multiproduct firm. It is planning to launch a new product 'X-500' In the upcoming months. Production will be in batches of 1000 units throughout the life of the product. It is also possible to achieve 90% learning rate but the learning would cease after 64th batch. Other relevant data of product 'X-500' is as follows.

Expected Life	2,56,000 units
Selling Price per unit	Rs. 123
Direct Material per unit	Rs. 36
Direct Labour Cost First Batch	Rs. 52,500
Other Variable Cost	Rs. 24
Specific Fixed Cost	Rs. 38,75,000

Required

(i) Calculate the Expected Profit to be earned from the product over its lifetime.
Note: The learning index for a 90% learning curve is -0.152 = 0.5314; (63) - 0.152 = 0.5327

(ii) It is now thought that a learning effect will continue for all of the 256 batches that will be produced. Calculate the 'Rate of Learning' required to achieve a lifetime product profit of Rs. 1,00,00,000 assuming that a constant rate of learning throughout applies throughout the product's life.

Solution

(i) Total Direct Labour Cost for the first 64 batches is based on the learning curve of 90% (when the direct labour cost for the first batch is Rs. 52,500)

The usual learning curve model is $y = a x^b$

Where,

Y = Average direct labour cost per batch for x batches

A = Direct labour cost for first batch

X = Cumulative no. of batches produced

B = Learning coefficient / index

Y= Rs 52,500 x (64) - 0.152

= Rs. 52,500 x 0.5314

= 27,898.50

Total direct labour cost for the first 64 batches

= 64 batches x Rs. 27,898.50

= Rs. 17,85,504

Total direct labour cost for the first 63 batches is based on the learning curve of 90% (when the direct labour cost for the first batch is Rs 52,500)

Y = 52,000 x (63) - 0.152

= 52,500 x 0.5327

= Rs. 27,966.75

Total direct labour cost for the first 63 batches
= 63 batches x 27,966.75
= Rs. 17,61,905
Therefore, Direct Labour cost for the 64th Batch = 17,85,504 - 17,61,905
= Rs. 23,599
Total Labour Cost over the products Life = 17,85,504 + (23,599 x 192 batches)
= Rs. 63,16,512

Statement Showing "Life Time Expected Profit"

Particulars	Amount (In Rs.)
Sales (Rs 123 x 2,56,000 units)	3,14,88,000
Less: Direct Material (Rs. 36 x 2,56,000 units)	(92,16,000)
Less: Direct Labour	(63,16,512)
Less: Other Variable Cost Rs (24 x 2,56,000 units)	(61,44,000)
Less: Specific Fixed cost	(38,75,000)
Profit	59,36,488

(ii) In order to achieve a profit of Rs. 1,00,00,000 the total direct labour cost over the products Lifetime would have to be equal to:

Particulars	Amount (In Rs.)
Sales (123 x 2,56,000 units)	3,14,88,000
Less: Direct Material (36 x 2,56,000 units)	92,16,000
Less: Expected Profit	1,00,00,000
Less: Other Variable Cost (24 x 2,56,000 units)	61,44,000
Less: Specific Fixed Cost	38,75,000
Direct Labour Cost	22,53,000

Average Direct Labour Cost per batch for 256 batches is 8800.78 (Rs. 22,53,000/ 256) Total Direct Labour Cost for 256 batches on learning Curve of r% (when the direct labour cost for the first batch is Rs. 52500)

$Y = Rs.\ 52,500 \times (256)^b$

$8800.78 = Rs.\ 52,500 \times (256)^b$

$0.1676 = (256)^b$

$\log 0.1676 = b \times \log 2^8$

$\log 0.1676 = \frac{\log r}{\log 2} \times 8 \log 2$

$\log 0.1676 = \log r^8$

$R = \sqrt[8]{0.1676}$

$R = 80\%$

Decision Making

Chapter 6

SCAN AND REVISE

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03	CVP Analysis — 1 - 2	04	Absorption Costing v/s Marginal Costing — 2
05	Relevant Cost — 2 - 5	06	Key Factor / Limiting Factor — 6
07	Cost Indifference Point — 6	08	Concept of Jumping Break even - Point (Multiple BEP) — 6
09	Shut Down Point / Shut Down Decision — 6	10	Outsourcing Decisions — 6-7
11	Minimum Pricing Decisions — 7	12	Keep or Drop Decisions — 7
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17	CS #1 - Ethics - Nutty Bites — 10	18	CS #2 - Decision Making - Ethics - Sprinter Sportswear — 11
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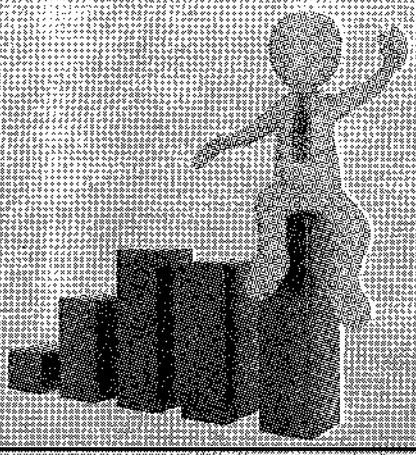

STUDY MENTOR

Decision Making

Chapter 6

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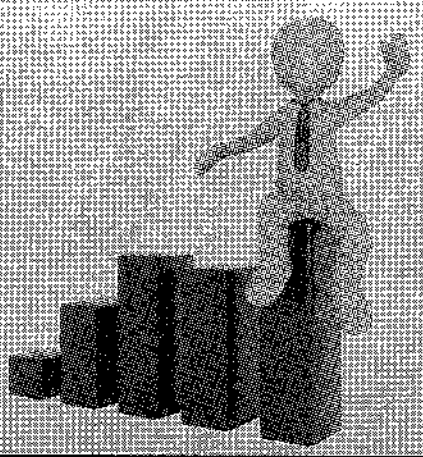


1 DECISION MAKING

We have to take Decision when there are

⇓

Choice of Alternatives + Future Oriented

⇓

Decision based on

- **Financial Considerations**
  - **Cost** — Outflow
  - **Benefit Analysis** — Inflow
- **Non-Financial Considerations**
  - Ethics
  - Quality
  - Customer Satisfaction
  - Environmental Factor, etc.

Relevant Cost	Irrelevant Cost
Cost which changes with change in decision making.	Cost which does not change with change in decision making.

⇓

Cost to be incurred
(+) Benefit Lost
(-) Benefit Gain
xxx

If Net Benefit is Positive : Accept the Project
If Net Benefit is Negative : Reject the Project

2 Decision Making Model

Define the problem. ⇒ Identify alternatives, eliminating unfeasible alternatives. ⇒ Identify costs & benefits of each alternative. ⇓ Examine total relevant costs, benefits of each alternative. ⇐ Assess non - financial factors and ethical issues. ⇐ Select alternative with greatest overall benefit

3 CVP Analysis

⇓

Analyse inter-relationship among

Revenue — Cost — Level of Activity — Profit

Useful for decisions related to

⇓

Production, Pricing, Marketing, Cost Structure, etc

3.1 Sales

P/V Ratio = $\frac{\text{Contribution}}{\text{Sales}}$

(-) Variable Cost = Contribution

(-) Fixed Cost = Net Profit

BEP (Point of No profit No Loss) = $\frac{\text{Fixed Cost}}{\left(\frac{\text{Contribution p.u.}}{\text{PV Ratio}}\right)}$ OR

MOS (Point Beyond BEP to Earn Profit) = $\frac{\text{Net Profit}}{\left(\frac{\text{Contribution p.u}}{\text{P/V Ratio}}\right)}$ OR

PV Ratio = $\frac{\text{Contribution p.u}}{\text{Sales Price p.u.}} \times 100$

Marginal Income Statement

	Sales
(-)	Variable Cost
	Contribution
(-)	Fixed Cost
	Net Profit

4 Absorption Costing VS Marginal Costing

There are two techniques of working out costs.

As per CIMA, Absorption Costing

Practice of charging both fixed & variable costs to the Product

⇓

Absorbed on basis of pre-determined rate:

⇓

(Budgeted Fixed Overheads / Budgeted Production)

⇓

As per normal capacity utilization

Valuation of stocks

⇓

(Variable production overheads p.u.

(+) Fixed production overheads p.u)

As per CIMA, Marginal Costing

According to CIMA, Marginal costing is a practice of asertainment of cost and its effects on profit of changes in volume or output by differentiating between fixed and variable cost.

⇓

Variable costs are treated as product cost

⇓

Charged to the product & fixed costs are treated period cost

⇓

Written off against profit

Valuation of Stocks

⇓

(Variable production OHs p.u)

Note: In a nutshell, in Absorption, FC = Product Cost and in Marginal, FC = Period Cost

5 Relevant Cost

⇓

Future cost that differ across alternatives

⇓

Decisions impacting profitability are always based on Relevant Cost

5.1 Various Terminologies

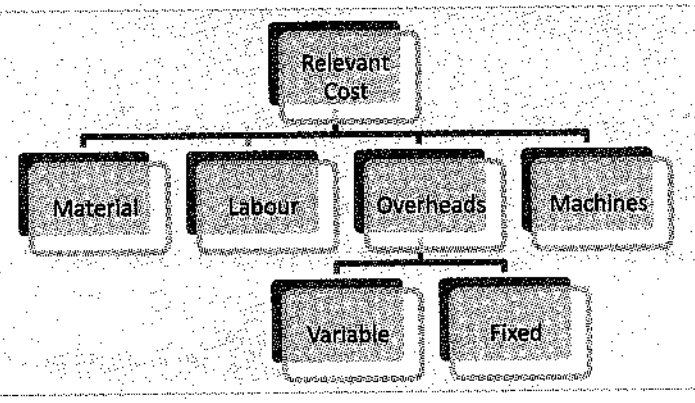
Sunk Cost (Irrelevant + Past)
Cost already incurred & cannot be recovered. Past Cost excluded from future business.

Committed Cost (Irrelevant + Future)
Investment already done & cannot be recovered. Also obligation already made & cannot get out of.

Opportunity Cost
Benefit foregone when one course of action is chosen over alternatives.

Fundamentals for determining relevant costs

- Results in cash outflows.
- Related to future.
- Incremental costs.
- Opportunity cost is most Relevant cost.
- Sunk costs & committed cost are Irrelevant cost.



5.2 Relevant cost of Materials

Material

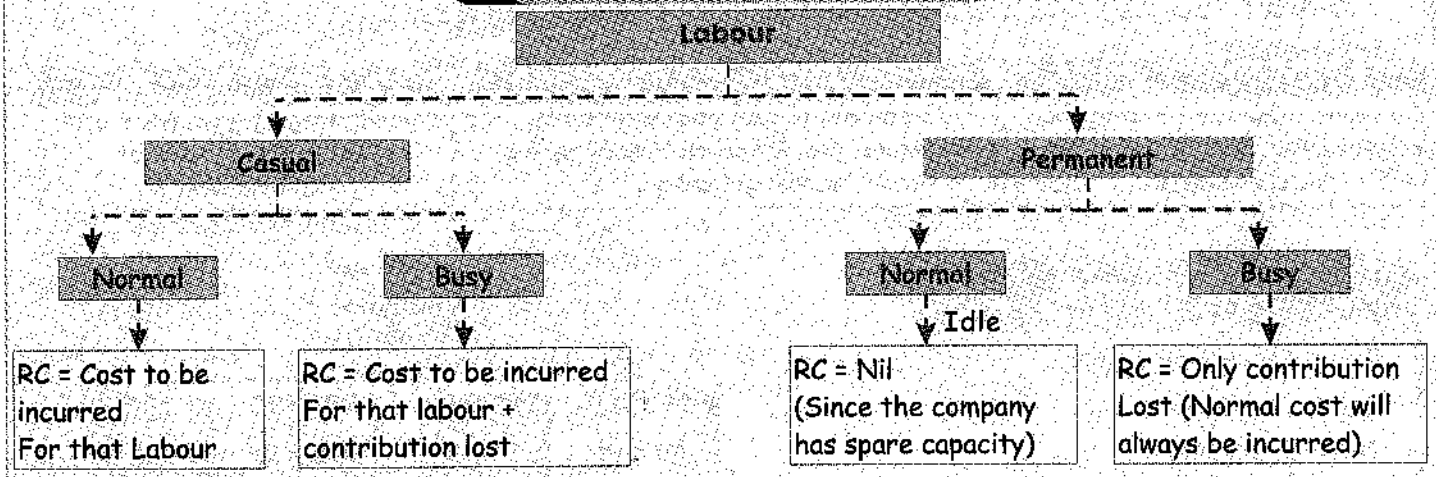
- **Out of Stock** → RC = Replacement Cost i.e Purchase Cost from Market
- **In Stock**
  - Regular Use i.e Fast Moving → RC = Replacement Cost i.e Purchase cost from Market
  - Restricted Use/ No use i.e Dead Stock
    - No use Elsewhere → RC = Realisable Value
    - Used as Substitute → RC = Selling Price In market (Realisable Value or Substitute Value) Whichever is Higher

*RC = Relevant Cost

Note: In case of Toxic Material, its disposal cost is considered as "Relevant Revenue" of project.

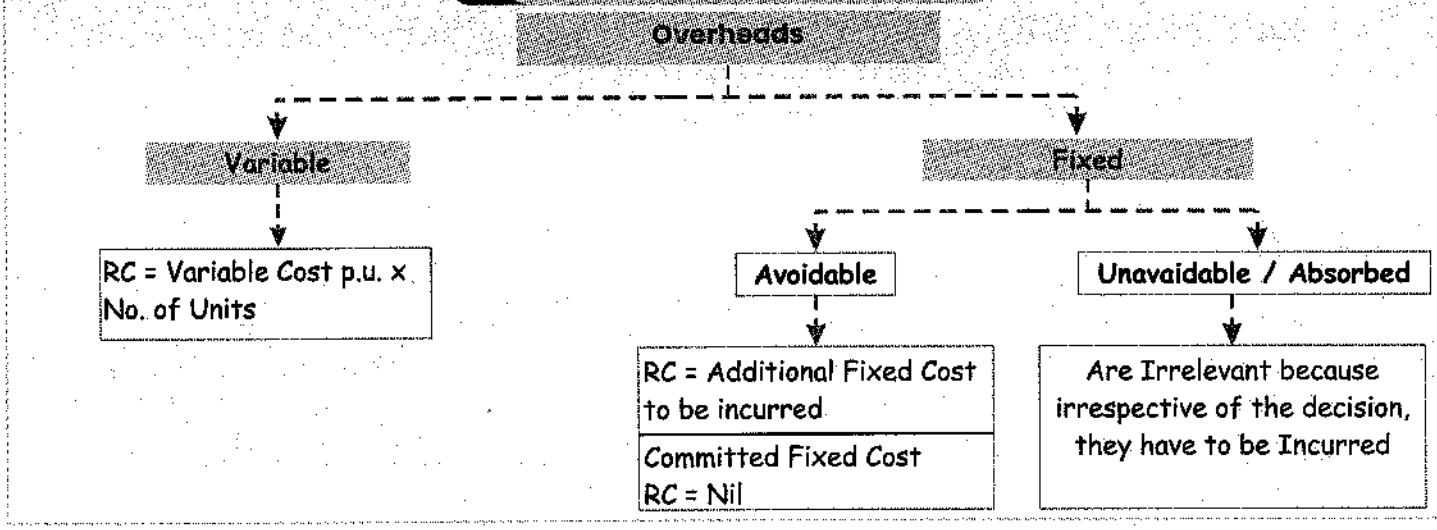
Student Notes

5.3 Relevant cost of Labour

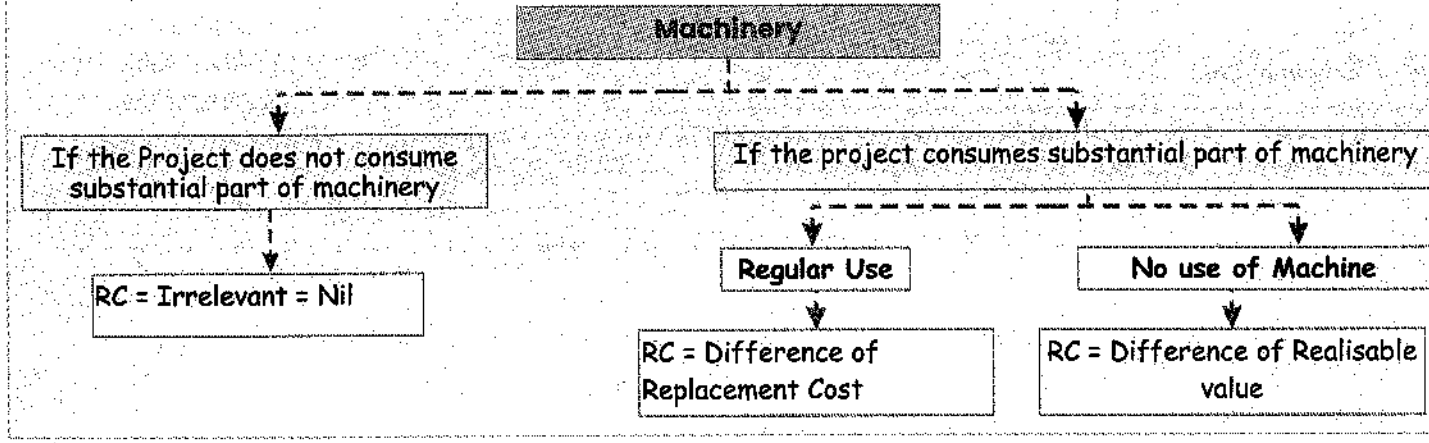


Note: If nothing is given always assmed it to be casual labour

5.4 Relevant cost of Overhead



5.5 Relevant cost of Machinery



5.6 Example of Relevant Costing

i) Market Research Undertaken:
Always sunk cost

ii) 4 Types of Material

M1	M2
Unit 1.5 kg 1 = required RM not in stock ↓ RC = Replacement Cost	1u = 2kg required ↓ Out of Stock → RC = Replacement cost ↓ In Stock → In Use → Replacement cot ↓ In Stock → Not in Use → Realisable Value

M3 • In Stock but No additional supply available
• Current stock > Used for other product

Relevant Cost = SP (other product)
⊖ VC (other product)
(excluding cost of Material)
= Coutribution (other product)
x Units Lost of other product

M4 In Stock: (Toxic Material)

• Company planning to dispose @ cost but now using in our project. Disposal cost will become Relevant Revenue for project.

Machinery:

Check 2 Things

- **Regular Use** → Difference of Replacement Cost
- **Not in Use** → Difference of Realisable Value

LABOUR

Skilled

- Already engaged in meeting demand Of other product

In this case;
Labour Cost =

- Hourly rate of Labour
+
- Contribution lost on account of loosing other product

$$\left(\text{Total hrs. required} \times \frac{\text{Contribution p.u.}}{\text{Hours p.u.}}\right)$$

Unskilled

- Under - utilised and excess hours available.

Rel Cost = Nil

- Supervisory cost : will remain whether or not contract accepted : Nil
- Only 2 of them can replace other position where salary is Rs. 90,000 it contract is to be accepted.
  Rel. Cost = Rs. 90,000/-
- For a man can work on other contract presently operated by semi skilled labour at cost of Rs. 2,70,000/-
  Rel. cost = Rs. 2,70,000/-

6 Key Factor / Limiting Factor (LF)

Factors that limit the activities of an undertaking

⮟

"Human wants are unlimited but, resources are limited."

⮟

"Limitation on Input puts restrictions on Output."

⮟

Decision is based on contribution per limiting factor

$$LF = \frac{\text{Contribution per unit}}{\text{Limiting Factor per unit}}$$

(Material / Machine Hrs/ Labour Hrs.)

7 Cost Indifference Point

Point at which Company is indifferent for selecting various alternatives.

Total Cost of 2 alternatives is same.

$$\text{Cost Indifference Point} = \frac{\text{Change in Fixed Cost}}{\text{Change in Variable Cost}}$$

Interpretation of Cost Indifference Point

At Activity level below the Indifference Point	Alternative with lower fixed cost to be used
At Activity level above the Indifference Point	Alternative with lower variable cost to be used
At Activity level equal to the Indifference Point	Any alternative to be used

8 Concept of Jumping Break Even Point (Multiple BEP)

BEP is total contribution required to recover fixed cost

$$\text{BEP} = \frac{\text{Fixed Cost + Semi Variable Cost}}{\text{Contribution/ Unit}}$$

9 Shut Down Point / Shut Down Decision

Decision to shut down or continue

Level of Activity at which Operating Loss = Fixed Cost, if plant is shut down

Shut down point means point at which management would be indifferent to shut down or continue decision.

$$\text{Shut down point (in value)} = \frac{\text{Present F.C - Fixed cost if plant is shut down}}{\text{P/V Ratio}}$$

$$\text{Shut down point (in units)} = \frac{\text{Present F.C - Fixed cost if plant is shut down}}{\text{Contribution per unit}}$$

9.1 Interpretation of Shut Down Point / Shut Down Decision

If Actual Sales = Shut Down point	Either Shut Down or Continue Plant
If Actual Sales > Shut Down point	Continue Plant
If Actual Sales < Shut Down point	Shut Down Plant

10 Outsourcing Decision / Make or Buy

Whether to continue 'making' a product or 'buying' from external firm.

Outsourcing requires incremental analysis & enables to

- Reduce Cost
- Benefit from supplier efficiency

10.1 Outsourcing decision – Accept or Reject?

Incremental cost savings + opportunity costs < incremental costs, reject
Incremental cost savings + opportunity costs > incremental costs, accept
Incremental cost savings + opportunity costs are = incremental costs, focus primarily on qualitative factors to evaluate the decision.

10.2 When should a company outsource?

A firm generally decides to outsource if:

- It costs less rather than to manufacture it internally.
- The return on investment to manufacture is not attractive enough.
- The company does not have requisite skilled manpower to make.
- Manufacturing internally will mean additional labour problem.
- Adequate managerial manpower is not available.
- Seasonal demand resulting in a considerable risk of maintaining inventories.
- Transport & other infrastructure facilities are adequately available.
- The process of making is confidential or patented.
- There is risk of technological obsolescence.

11 Minimum Pricing Decisions

Useful in situation where there is intense competition

- Surplus production capacity
- Clearance of old inventories
- Getting special orders
- Improving market share
- Investment cost to Opportunity cost (if any)

12 Keep or Drop Decisions

Incremental Revenue	Incremental Cost Savings	Opportunity Costs
Difference in revenue between the original sales revenue and new revenue that is expected to result due to dropping a segment. Decision - Keep/ down	Variable cost associated with a segment to be dropped one incremental cost + saving that increase profit.	The value of next best alternative while making a decision; what is given up always increment.

12.1 Decision - Accept or Reject?

- If incremental saving> incremental revenue lost, drop the segment.
- If incremental revenue lost = incremental cost saving, qualitative effects must be used to make the decision.
- If incremental cost saving < incremental revenue lost, segment should not be drop.

13 Special order decisions

Focus on whether special prices order should be accepted/ rejected.

Price discrimination law require that firms sell identical products at same price.

Law does not apply to

- Noncompeting customer from the same market.
- Potential customer in markets not ordinarily served.

13.1 Decision – Accept or Reject?

- If incremental revenue < incremental cost, reject the special order, unless qualitative characteristics fiercely impact the decision.
- If incremental revenue = incremental cost, qualitative effects must be used to make the decision.
- If incremental revenue > incremental cost, accept the order, unless qualitative characteristics fiercely impact the decision.

14 Sell/ Further Process

Sell or Process further refers to a decision-making situation where an executive has to decide either to sell a component/ product/ raw material as it is or alternatively process it further by incurring additional expenses.

⇩

Differential sales value is more than the further processing cost

2 Rules to follow

- Only the incremental costs and revenues of the further process are relevant
- The joint process costs are irrelevant - they are already 'sunk' at the point of separation

15 Activity Based CVP Analysis

Costs are segregated into unit and non-unit-based categories.

⇩

Non-unit- based costs are fixed with respect to production volume.

⇩

The Break-even can then be expressed as follows:

Break-even units = [Fixed costs + (Setup cost × Number of Setups) + (Engineering Cost × Number of Engineering Hours)]/ (Price - Unit Variable Cost)

⇩

A comparison of the ABC BEP with the conventional BEP reveals two important differences.

⇩

First, the fixed costs differ.

Second, the numerator of the ABC break-even equation has two non-unit-variable cost terms.

⇩

"The use of activity-based costing does not mean that CVP analysis is less valuable.

Student Notes

16 Non-Financial Consideration

- Information of an organisation that cannot be expressed in monetary terms.
- Non-financial information ensures profitability and sustainability in long term.
- The company should focus on advantages of non-financial information such as quality, employee satisfaction, customer satisfaction, CSR, brand name, etc.

Environmental Factors	Staff Motivation	Government Regulations
• Pollution, Deforestation, Impact on climate must be considered while selecting a project. • Projects get delayed/ stalled because of this. • Government impose restrictions/ penalties.	• Automation should not render the staff redundant. • Strikes/ Lockouts • Company should try participative approach.	• Profits should not be at the expense of violating government regulations. • Harmful in long term • .Comply with all laws & regulations.

Availability of resources	Availability of project site	Ethics	Corporate social responsibility
• RM, Manpower, Infrastructure, Electricity, etc. • No constraint should be there on its availability.	• Site selection very important. • Should be based on project requirements • Wrong project site can be harmful.	• Duty to take care of all stakeholders (employees, suppliers, Customers, etc.) • Fair and Transparent.	• Ethical principles for society and environment. • Sustainable development. • Uplift well-being of society.

Limitation of Non-Financial Consideration

- Time and cost
- Subjective measurement
- Inproper Measure draw attention on wrong objective
- Lack of statistical reliability
- Management disintegration

16.1 Ethics

Ethics are moral principle that guide the conduct of individuals. By their behaviour and their attitude, manager set the company culture

Guideline for Ethical Conduct

- Identify ethical decision by using personal ethical standards
- Identify the consequence of the decision and its effects.
- Consider obligation and responsibilities to those affected by decision.
- Make a decision that is ethical and fair to those affected by it.

CASE STUDIES

17 Case Study 1 - Decision Making - Ethics - Nutty Bites - (ICAI Module)

ISSUES	• Nutty Bites - Producers of edible snacks. • Medical studies have indicated peanut allergic reactions are on the rise. • Media campaign force companies like Nutty Bites to make disclosure about the presence of peanut on its package labelling. • Risks of "cross contamination" amongst products.
CONCEPT	• **Decision Making** - Ethics

EXPLANATION & CONCLUSION	(i) Modern organizations have a moral duty of care to a wider range of stakeholders not just its owners/ investors. The presence of peanuts or peanut oil makes it a potential "health hazard" to some consumers. Food safety is a fiduciary duty that Nutty Bites owes to the society. CSR is the duty an organization has towards a wider community.
	(ii) Addressing this ethical issue will help Nutty Bites to become a morally responsible organization . The long-term benefits to its business: • Avoid bad publicity that damages its reputation and brand image. • Avoid potential legal action. • Operating environment within the business is more ethical.
	(iii) Following could be some of the responses that Nutty Bites could take to address the issue: • A clear warning in ingredients box that factory uses peanuts while manufacturing some of its products. This should be included even in products that do not contain peanuts, to avoid any harm due to risk of cross contamination. • Segregate areas to have separate processing lines for products with peanuts/ peanut oil and those without it. If possible, have segregated staff for the two production lines in order to avoid the risk of cross-contamination or else, train the staff on the risks of cross-contamination. • Equipment should be thoroughly cleaned while switching production from one variety to another. • Storage of peanut material should be well segregated and monitored to avoid contamination. • If Nutty Bites has the resources , it could invest in pharma companies that are finding a medical solution to this problem.
	(iv) Risk of product safety is an important issue that needs constant review. • Review would be of the production process, storage , material handling as well as ingredient of raw materials. • The benefit of constant review is that Nutty Bites can immediately identify danger of contamination. • On the other hand, constant review requires time and money, with an ever-present possibility of contamination. • It is not feasible to ensure complete safety . • Reviewers & quality inspectors could become negligent once the process is well established which lead to instances of contamination. • To conclude , Nutty Bites is morally responsible to spread awareness that some of its products may contain allergy causing peanuts/ peanut oil.

18 Case Study 2 - Decision Making - Ethics - Sprinter Sportswear - (ICAI Module)

ISSUES

- Sprinter Sportswear - Multi-national company in 23 countries.
- Production has been entirely outsourced to 175 factories (operating independently) located in places where cost of operations is low.
- Procurement is the stored at distribution centers & dispatched to wholesalers.
- Some countries reported high child labor employment.
- Factories in these countries do not directly employ children instead they subcontract the work to contractors who in turn hire children illegally
- Working conditions in these factories are very unhygienic and oppressive.

CONCEPT

- **Decision Making** - Ethics

(I) DISCUSS why Sprinter sportswear should attempt to address this issue.
(ii) SUGGEST some of the actions that the company can take to address this issue.

EXPLANATION & CONCLUSION

(i) Work can be outsourced to locations to countries on the other side of the globe to achieve low cost advantage. A company may not be directly responsible for faulty practices of its suppliers. However, modern organizations have a moral duty of care to a wider range of stakeholders who may not directly be related to the company. The issue here relates to exploitation of child workers by factories , perpetrated by sub-contracting work to third party workers. While Sprinter sportswear has not done anything illegal , it owes moral responsibility towards these children . Since children are employed in factories, Sprinter should address this issue.

(ii) Sprinter should aim to make its products responsibly. Some actions it can take are:

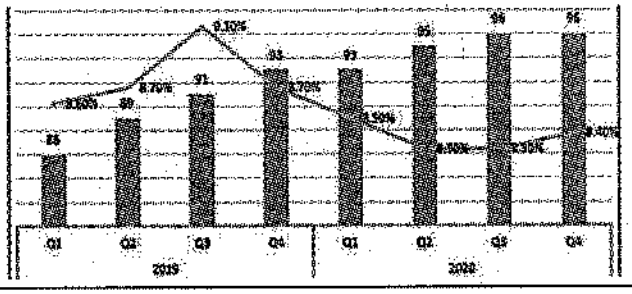
(a) Develop a Code of Conduct related to hiring practices & that details the acceptable standards of conducting business.
(b) Workplace environment, safety, and environment sustainability .
(c) Insist suppliers to implement these Codes of Conduct. Insist supplier be open to periodic inspection by Sprinter.
(d) Set up an audit team for regular audits in factories.
(e) Do business only with those factories are complying with its standards. Penalize the offenders or terminate contract in case of serious offences.
(f) List location wise suppliers & information about their products on its website from whom it procures its products. This will enable watch groups to know who the suppliers are and warn the company if there are any labor issues within these factories .

Student Notes

19 Case Study 3 - Decision Making Ethical & Non - Financial Considerations - Kristin LLP

Case Study 3 (RTP Nov 20)

ISSUES

- Kristin LLP - Sells household products.
- Recently received few negative feedbacks about the product and customer services.
- CEO wants to improve level of customer satisfaction by:
  - ✓ Providing helpline 24/7,
  - ✓ Redesign its online platform,
  - ✓ Rewarding loyal customers,
  - ✓ Ease the return and refund policy.
  - ✓ 

CONCEPT

- **Decision Making** - Ethical & Non - Financial Considerations
- Does the seeming lack of improvement in financial performance with customer satisfaction, Kristen LLP should stop investing a superior customer experience? DISCUSS.

EXPLANATION

- There are two considerable sides of the question, one is customer satisfaction and another one is profitability.
- By the proposed plans firm manage to get higher customer satisfaction score card which in turn improves firm's financial result i.e. increase ROA. However, the same is costly.
- This additional cost will decrease the firm's ROA and increase the asset base.
- The optimum level of customer satisfaction is where the incremental benefits are equal to incremental costs of increasing satisfaction.

CONCLUSION

- While observing, customer satisfaction increased from 86 points to 91 points in first 3 quarters of 2019 where, additional benefits seems to be more significant than the additional cost. Subsequently, additional cost has increased more rapidly than the additional benefits resulting decrease in ROA.
- However, toward the end of 2020, we see a marginal increase in ROA. This is due to the lead-lag relation between satisfaction and ROA. Increased satisfaction might take some more quarters to result in higher ROA. However, toward the end of 2020, the customer satisfaction score stabilizes at current levels (93-96 points).
- Kristin should not stop investing in superior customer experience, the lack of apparent pattern in customer satisfaction and profitability could stem from several causes. Instead, take decision considering current satisfaction levels, the cost to increased satisfaction , perception of the increased benefit & current sales.

20 Case Study 4 – Ethical & Non – Financial Considerations – Star Limited (ICAI Module)

ISSUES

- Star Limited - Copper Rods Manufacturers
- It is considering commencing a new plant for manufacturing cable wire.

Project – Study

Capital cost = Rs. 500 Crores	• Employ 70% of labour on contractual basis.	• Buy new land adjacent to existing plant, which is under forest reserve area.
NPV = 200 Crores	• Paying 15% lower wage to immigrant workers.	• New plant will produce harmful chemical waste; disposed to nearby river.
Life = 20 years	• No contribution to retirement fund for immigrant workers.	• New treatment plant cost = Rs. 100 Crores.
IRR = 17.5%		

CONCEPT Ethical & Non - Financial Considerations

EXPLANATION

- There are two considerable sides of the question, one is customer satisfaction and another one is profitability.
- By the proposed plans firm manage to get higher customer satisfaction score card which in turn improves firm's financial result i.e. increase ROA. However, the same is costly.
- This additional cost will decrease the firm's ROA and increase the asset base.
- The optimum level of customer satisfaction is where the incremental benefits are equal to incremental costs of increasing satisfaction.

Positive NPV of Rs. 200 Crores at an IRR of 17.5%. So project is financially viable.

Financial Decision Making
- Capital budgeting based on evaluation like NPV/ IRR/ Payback period.
- Maximization of shareholders' wealth.

Non-Financial Decision Making
- Environmental factors
- Staff Motivation
- Government regulation
- Availability of resources/ project site.
- Ethics
- Corporate Social Responsibility

Payment to labour & Ethics
- Duty to take care of all stakeholders.
- Company pay 15% lower wage to immigrantes but more than required by law; hence no legal action.
- It impacts reputation labourers go on protest & strike.
- The company should not discriminate.
- Labours might go on protest & strike
- No contribution to retirement funds can have legal impact.
- The company should give same wages & retirement benefits.

Availability of land & bribery

Unethical Means

- Forest reserve area being used.
- Paying bribes for land – acquisition.

Ethical Means

- Evaluate buying of land at legal places > Higher cost, but beneficial in long run.
- In future, the company could face litigation & there is possibility of allotment being cancelled.
- Impact Goodwill, brand image & reputation of company

Chemical waste & technology

- Emission of chemically harmful waste > pollutes environment.
- This would lead to protest by local residents & NGO's.
- By incurring Rs. 100 Crores in new technology, company can treat such waste partially.
- This will reduce NPV by Rs. 100 Crores &b IRR will also reduce.
- Company should operate in a socially responsible manner.

CONCLUSION	• Balance financial & non – financial decision making. • New plant cost Rs. 100 Crores; resulting in loosing of BPV by Rs. 100 Crores but better for all stakeholders.

MASTER SUMS

Question 1 - Limiting factor & cost indifference point
Question 2 - Shut down point
Question 3 - Make or Buy
Question 4 - Outsourcing
Question 5 - Decision making with relevant cost
Question 6 - CVP Analysis

Student Notes

MASTER SUMS

21 Question 1: (ICAI Module Question) (Limiting factor & cost indifference point)

BNZ Ltd. is engaged in the manufacturing of plastic bottles of a standard size and produced by a joint process of machines. The factory has 5 machines and capable of producing 40 bottles per hour. The variable cost per bottle is Rs. 0.32 and the selling price is Rs. 0.80 each. The company has received an offer from another company for manufacturing of 40, 000 units of a plastic moulded toy. The price per toy is Rs. 30 and the variable, cost is 24 each. In case of the company takes up the job , it has to meet the expenses of making a special mould required for the manufacture of the toy. The cost of the mould is Rs. 1,00,000. The company's time study analysis shows that the machines can produce only 16 toys per hour. The company has a total capacity of 10,000 hours during the period in which the toy is required to be manufactured. The fixed costs excluding the cost of construction of the mould during the period will be Rs. 10 Lakh. The company has an order for the supply of 3,00,000 bottles during the period.

Required

(i) Do you ADVISE the company to take up the order for manufacturing plastic moulded toys during the time when it has an order in its book for the supply of 3,00,000 bottles.

(ii) If the order for the supply of bottles increases to 4, 00, 000 bottles, will you ADVISE the company to accept the order for the supply of plastic moulded toys? State the reasons.

(iii) An associate company of BNZ Ltd. has idle capacity and is willing to take up the whole or part of the manufacturing of the plastic moulded toys on sub-contracting basis. The subcontract price inclusive of the cost of construction of mould is Rs.28 per toy. DETERMINE the minimum expected excess machine hour capacity needed to justify producing any portion of the toy order by the company itself rather than subcontracting.

Solution

Workings

Statement Showing "Contribution / Machine Hour"

	'Bottle'	'Toy'
Demand (units)	3,00,000	40,000
Sales (Rs. P.u.)	0.80	30.00
Less: Variable Cost (Rs. P.u.)	0.32	24.00
Less: Specific Fixed Cost (Rs. P.u.)	---	2.50
Contribution (P.u.)	0.48	3.50
Machine Hours Required per unit	0.025	0.0625
Contribution / Machine Hour	19.20	56.00

Fixed cost if specifically incurred for a project is relevant and use for calculations.

Advice on Supply of 3,00,000/ 4,00,000 Bottles

i) BNZ Ltd. can accept plastic moulded toy's order as sufficient number of hrs. i.e. 2,500 hrs. (10,000 hrs.- 3,00,000 bottles x 0.025 hrs.) are available and would be able to generate additional benefit of 3.50 per unit on 40,000 units of toys i.e. Rs. 1,40,000.

(ii) If the order for the supply of bottles increases to 4,00,000 bottles, then 2,500 more hrs. will be required to produce the additional bottles. BNZ Ltd. has to decide whether to utilize 2,500 hrs. for existing bottle order or for toy Order.

Machine time is limiting factor . Therefore , contribution per machine hour from both the activities (i.e. bottles and toys) should be calculated to decide whether the order should be accepted. Contribution per hour is more in case of toys (refer workings) . Therefore , BNZ Ltd. should utilize the remaining 2,500 hours for manufacturing toys rather than to fulfil the order for supply of additional bottles.

Prioritizing production based on contribution per machine hour would maximize profits. However, existing order fulfilment is necessary for building long term and sustainable customer relationship. Developing and maintaining long term and intimate relationships with the profitable customers provides valuable benefits to the company as the relationships between company and customers grow, a customer who is satisfied with the company's products and services , tends to commit the relationship , and buy more over time. Cost of keeping the existing customers is less expensive than the cost of acquiring new customers.

Hence, BNZ Ltd. should be taken into consideration long term supplier relation before accepting the toy order based on financial consideration as contribution per hour is more in case of toys. Further, company may also explore outsourcing opportunities for production of toys .

(iii) Minimum number of toys needed to be manufactured to justify the increase in fixed cost of 1,00,000 to make the mould is 25,000 toys {1,00,000/ (28 - 24)}. Thus, as long as company has excess capacity available to manufacture more than 25,000 toys it is cheaper to produce than to buy from subcontractor.

$$\text{Minimum Expected Excess Capacity hours to justify} = \frac{25{,}000 \text{ toys}}{16 \text{ toys}} = 1562.5 \text{ or } 1563 \text{ hours}$$

Question 2 (Shut down point)

G Ltd. Produces and sells 95,000 units of 'X' in a year at its 80% production capacity. The selling price of product is Rs. 8 per unit. The variable cost is 75% of sales price per unit. The fixed cost is Rs. 3,50,000. The company is continuously incurring losses and management plans to shut-down the plant. The fixed cost is expected to be reduced to Rs. 1,30,000. Additional costs of plant shut-down are expected at Rs. 15,000.

Should the plant be shut-down? What is the capacity level of production shut-down point?

Solution:

If Plant Operations continue:

Particulars	Amount
Selling price	8.00
Less: Variable Cost	6.00 (8 x 75%)
Contribution	2.00
X No of units	95,000
Total contribution	1,90,000
Less: Fixed Cost	3,50,000
Loss	(1,60,000)

If Plant Shut Down:

Fixed cost Reduced to : Rs. 130,000 (if Shut Down)
Additional Cost : Rs. 15,000
Total Shut down Cost : Rs. 145,000

Fixed cost Reduced to : Rs. 130,000 (if Shut Down)
Additional Cost : Rs. 15,000
Total Shut down Cost : Rs. 145,000

If plant continued	(160,000)
If plant shut down	(145,000)
It is advisable to shut down the plant.	

$$\text{Shut down point} = \frac{\text{Fixed Cost-shut down cost}}{\text{Contribution p.u}}$$

$$= \frac{350{,}000-(130{,}000+15000)}{2} = 102{,}500 \text{ units}$$

(ii)At 80% capacity 95,000 units are produced.
= 1,18,750 units are produce

$$\text{BEP (Shut down point)} = \frac{\text{Capacity Utilised}}{\text{Total Capacity}}$$

$$\text{BEP (Shut down point)} = \frac{1{,}02{,}500}{1{,}18{,}750} = 86.32\%$$

23 Question 3 (Make or Buy)

Agro caps Ltd., engaged in manufacturing agricultural machinery, is preparing its annual budget for the coming year. The company has a metal pressing capacity of 20,000 hours which will be insufficient for manufactures of all requirements of components A, B, C and D.
The company has the following choices -
i) Buy the components entirely from outside suppliers.
ii) Buy from outside suppliers and / or use a [atrial second shift.

The data for the current year are given below:
Standard Product cost per unit -

	A	B	C	D
	Rs.	Rs.	Rs.	Rs.
Requirements (in units)	2,000	3,500	1,500	2,800
Variable cost				
Direct Materials	37	27	25	44
Direct Wages	10	8	22	40
Direct Expenses	10	20	10	60
Fixed Overhead	5	4	11	20
Total Production Cost	62	59	68	164

Direct expenses relate to the use of the metal presses which cost Rs. 10 per hour, to operate. Fixed overheads are absorbed as a percentage of direct wages.
Supply of all or any part of the total requirement can be obtained with following prices, each delivered to the factory -

Component	(Rs.)
A	60
B	59
C	52
D	168

Second shift operations would increase direct wages by 25 percent over the normal shift and fixed overheads by Rs. 500 for each 1,000 (or part thereof) second shift hours worked.

You are required to present, with calculations:

a) Which component, and in what quantities should be manufactured in the 20,000 hours of press time available?

b) Whether it would be profitable to make any of balance of components required on a second shift basis instead of buying them outside suppliers.

Solution

a) In the question, we have to decide between 2 options "Make" or "Buy" we will consider, the relevant production cost & compare it with outside purchase cost & take decision based on better profitability.

Statement of cost to decide make or Buy

	A	B	C	D
Direct Material	37	27	25	44
Direct Wages	10	8	22	40
Direct Expenses	10	20	10	60
	(1 hr.)	(2 Hrs.)	(1 Hr.)	(6 hrs)
Fixed Overheads (WN:1)	-	-	-	-
Own Manufacturing cost	57	55	57	144
Sub contract cost	60	59	52	168
Difference of savings for own manufacturing	3	4	(5)	24
			Sub contract (WN:2)	
÷ No of hrs/ unit	1	2	-	6
Saving/hr.	3	2	-	4
Rank	II	III	-	I

WN1: Fixed Overheads

We have ignored fixed overheads because they are on absorbed basis and accordingly. Whether any product is there or discontinued will not have nay impact on its total Fixed cost.

WN2: Sub contract – C

Since Internal manufacturing cost is high than outside purchase cost. We will buy it from outside market.

From the above table we can conclude that product A,B & D are to be manufactured internally.

		A		B		D
Total hrs. required		(2000 x 1)	+	(3,500 x 2)	+	(2,800 x 6)
	=	2000 hrs	+	7000 hrs	+	16800 hrs
	=	25,800 hrs				
(-) hrs. available	=	(20,000 hrs)				
Excess hrs. required		5,800 hrs				

Since the hrs. are limited we have to produce the units based on contribution per limiting factor.

In this case, selling price is not given & therefore we will use the concept – ANTI LIMITING FACTOR wherein ranking will be based on –

$$\frac{\text{Savings}}{\text{Limiting factor}}$$

Where Savings = sub Contract Price – own Manufacturing Cost
The though process behind taking savings as the key factor is that if the manufacturing is not done internally then it will have to be purchased from outside which will result in the heavy cash outflow, which can now be saved by taking decision on savings.

Allocation of hours:

Total hours available	20,000 hrs.
(-) used for "D" (2800 units)	(16,800) hrs.
Remaining hrs.	3,200 hrs.
(-) used for "A" (2000 units)	(2000) hrs.
Remaining hrs.	1200 hrs
÷ No. of hrs. required by B	÷ 2 Hrs.
Production of B	600 units

(b) Whether to use second shift or buy from external market for 2900 units of B.

Option 1: if we use second shift

Direct Material	27
Direct labour	10 (8 + 25%)
Direct expense	20
Variable cost	57
x No of units	2,900
Contribution	165,300
+ FC	3,000

(Rs. 500 : 1,000 hrs
X 6 : 5,800 hrs = 6,000 hrs (Part is considered as Full)
Rs. 3,000 (2,900 u x 2 hr / u)}
Total cost 1,68,300

Option 2: To buy Remaining Units of B from Outside Market:
Sub Contract Price : 59
Units : 2,900
Total Cost : Rs. 1,71,100

Recommendation: We will use second shift as it saves Rs. 2,800 (1,71,100 - 1,68,300).

24 Question 4 (Outsourcing)

Mount Sports Manufacturing Facilities (MSMF) deals in manufacturing of sports articles. Although MSMF is major market player but can capture the market further. Currently MSMF manufactures five types of badminton shuttle named as P-101, P-102, P103, P-104 and P-105. Production facilities are miting factor at MSMF. Production and marginal cost data of these 5 products are specified in table below:

Particulars	P-101	P-102	P-103	P-104	P-105
Monthly production (in units)	1,000	1,200	2,000	3,000	1,500
Direct Material Cost (per unit)	6	4	7	3	6
Direct Labour Cost (per unit)	4	9	5	8	5
Variable Production Overhead(per unit)	2	3	2	2	1

On drive to cost leadership strategy, MSMF is thinking to out-source some of the products. Shuttles can be sourced from a well-established company 'Protease' at the following prices. There is no tie-in between products, all products can outsources individually. These costs are on CIF basis;

Particulars	P-101	P-102	P-103	P-104	P-105
Outsourcing Cost/Buy in Cost (per unit)	17	18	18	11	15

Company-wide fixed overheads are of Rs.15 Lacs each year. Out of which Rs.2,40,000 is directly attributable to the production of these 5 products on annual basis. This fixed overhead of
Rs.2,40,000 is evenly split across such 5 products and entirely avoidable. Till date company does not have experience to outsource any element of production.
Mr. Singh who is newly appointed management accountant, bring the huge experience to the organization on cost control and reduction techniques. While discussing the possibility of outsourcing with CFO, Mr. Singh explained the limitation of out-sourcing and also presents a white paper on gain sharing arrangement; which can be entered with supplier to whom outsourcing is considered.

Required

RECOMMEND, the product/(s) which should be outsourced. Also, EXPLAIN gain sharing arrangement along with aspects that MSMF need to consider, ensuring success out of gain sharing arrangement as a part of out-sourcing contract with Protease.

Solution

(i) Recommendation on out-sourcing of the products - Product **P-102** and **P-104** can be out-sourced. (see computations below)

Particulars	P-101	P-102	P-103	P-104	P-105
a. Monthly production (in units)	1,000	1,200	2,000	3,000	1,500
b. Direct Material Cost (Rs. per unit)	6	4	7	3	6
c. Direct Labour Cost (Rs. per unit)	4	9	5	8	5
d. Variable Production Overhead (Rs. per unit)	2	3	2	2	1
e. Marginal Cost(Rs. per unit)(b)+(c)+(d)	12	16	14	13	12
f. Monthly Total Marginal Cost/VariableCost (e)×(a)	12,000	19,200	28,000	39,000	18,000
g. Monthly Allocable Fixed Overhead*	4,000	4,000	4,000	4,000	4,000
h. Total Monthly Cost Production -in- house (f)+(g)	16,000	23,200	32,000	43,000	22,000
i. Outsourcing Cost/ Buy in Cost (?perunit)	17	18	18	11	15
j. Total Monthly Cost Outsourcing/Buy in (i)×(a)	17,000	21,600	36,000	33,000	22,500

Total monthly cost of in house production is Rs.1,36,200 and Total comparable monthly cost of outsourcing/Buy-in is Rs.1,30,100. There is overall saving of Rs. 6,100, but since there is no tie-in between products, hence decision on all products whether can be outsourced or produced in-house can be taken individually.
The above calculation suggests that only P-102 and P-104 can be sourced through outsourcing due to, whereas P-101, P-103 and P-105 can be produced more cheaply in- house.

(*)
Since avoidable in nature, hence relevant for decision making. ₹2,40,000 is annual cost, hence monthly fixed overhead expenditure will be ₹20,000.
However, following aspects needs to be kept in mind, prior to entering to out- sourcing arrangement of product P-102 and P-104

Issue 1
If products **P-102** and **P-104** are outsourced, the company would then have spare capacity. Since the production function/capacity is a limiting factor and there is scope of selling the further units of **P-101, P-103** and **P-105;** in order to acquire the market share. Hence, spare capacity is of great importance and will be a powerful argument for outsourcing.

Issue 2
The reaction of the workforce at MSMF is also need to be considered because of two reasons;
a. If production of **P-101, P-103** and **P-105** cannot be expanded to take up the spare capacity on account of out-sourcing of **P-102** and **P-104,** then lay-off may be required - Which may cause problem like strike by remain workforce or an industrial dispute.
b. Facts also suggest that products **P-102** and **P-104** are labour intensive (due to high comparative high labour cost). Hence, even the spare capacity on account of out- sourcing of **P-102** and **P-104** is used, and then also the some of labour forces need to be retrenched.

Issue 3
Even if lay-off is accepted by workforce, then also cost associated with redundancies may be critical. Such cost is relevant for decision-making, hence should be considered.

Issue 4
Since the MSMF has no experience in the outsourcing till now, hence while dealing with Protease, MSMF need to ensure;
a. Timely delivery in right quantity
b. Quality of supplies
c. Penalties in case of default.

(ii) Gain Sharing Arrangement by MSMF as part of outsourcing agreement with Protease (Concept link in Chapter 2)
Gain Sharing Arrangement is a contractual arrangement where, entity (MSMF) & outsourcing supplier (In this case protease) share the financial gain which result out of either productivity gains or increased efficiency at end of outsourcing supplier from continuous improvement, transformation, or innovation.
This arrangement in form of clause is usually included in Master Agreement of outsourcing. Outsource supplier find it unique selling point and entity is also on for continuous improvement apart this both will get share in cost saved.
Although gain sharing arrangement is largely useful in case of outsourcing services agreement, but MSMF can also while entering out-sourcing contract with Protease for **P- 102** and **P-104;** but following aspects need to be considered;
Reason for failure of Gain Sharing Arrangement - Gain Sharing Arrangement sounds great but in practice it is quite difficult to execute. Even after a considerable level of efforts due to following reasons it may fail;
a. Unstructured/Poorly structured terms of arrangement, in outsourcing contracts.
b. Error in implementation.
c. Relationship between outsource supplier and entity.

Precaution need to be taken – Action plan for executing gain share arrangement must contain:
a. Be specific in outsourcing agreement.
b. Predefined formula for sharing of benefits and period thereof.
c. Effort from entity, because innovation is not only responsibility of outsource supplier.
d. Constitute innovation team to create an innovation structure, generate the idea and execution of same.

Overall
In consideration of above analysis, company should consider the outsourcing of P-102 and P- 104 by entering outsourcing contract with Protease. At this point, it is important to note that cost analysis emphasizes purely quantitative, financial considerations. However, outsourcing decisions are often influenced by qualitative factors, which are not directly affected in calculations. The impact of the same should also be taken into consideration. The issues suggested above are not exhaustive. Further, before opting gain sharing arrangement, the same should also be reviewed carefully from a business, legal, and tax perspective.

25 Question 5 (Decision making with relevant cost)

Golden Pacific Airlines Ltd. operates its services under the brand 'Golden Pacific'. The 'Golden Pacific' route network spans prominent business metropolis as well as key leisure destinations across the Indian subcontinent. 'Golden Pacific', a low-fare carrier launched with the objective of commoditizing air travel, offers airline seats at marginal premium to train fares across India.
Profits of the 'Golden Pacific' have been decreasing for several years. In an effort to improve the company's performance, consideration is being given to dropping several flights that appear to be unprofitable.
Income statement for one such flight from 'New Delhi' to 'Leh' (GP - 022) is given below (per flight):

	Rs.	Rs.
Ticket Revenue (175 seats x 60% Occupancy x ₹ 7,000 ticket price)		7,35,000
Less: Variable Expenses (₹1,400 per person)		1,47,000
Contribution Margin		5,88,000
Less: Flight Expenses:		
Salaries, Flight Crew	1,70,000	
Salaries, Flight Assistants	31,500	
Baggage Loading and Flight Preparation	63,000	
Overnight Costs for Flight Crew and Assistants at destination	12,600	
Fuel for Aircraft	2,38,000	
Depreciation on Aircraft	49,000*	
Liability Insurance	1,47,000	
Flight Promotion	28,000	
Hanger Parking Fee for Aircraft at destination	7,000	7,46,100
Net Gain / (Loss)		(1,58,100)

* Based on obsolescence

The following additional information is available about flight GP-022.

1. Members of the flight crew are paid fixed annual salaries, whereas the flight assistants are paid by the flight.
2. The baggage loading and flight preparation expense is an allocation of ground crew's salaries and depreciation of ground equipment.
3. One third of the liability insurance is a special charge assessed against flight GP-022 because in the opinion of insurance company, the destination of the flight is in a "high - risk" area.
4. The hanger parking fee is a standard fee charged for aircraft at all airports.
5. If flight GP-022 is dropped, 'Golden Pacific' Airlines has no authorization at present to replace it with another flight.

Required

Using the data available, prepare an ANALYSIS showing what impact dropping flight GP-022 would have on the airline's profit.

Solution

1. As per the statement given in the problem, FlightGP-022 incurs a net (loss) of `158,100. This is the net result of revenue less costs. Revenue is entirely variable depending upon passenger occupancy. Costs are both variable and fixed nature. To analyze the impact of dropping flight GP-022, we need to re-compute net gain/ (loss) that Golden Pacific earns when it operates the flight based on relevant costing principles.

   Net Gain/ (Loss) = Revenue earned from flight operations less Variable costs of operation

   Revenue earned is the ticket revenue earned from flight operations of GP-022, this is entirely variable. Variable costs of flight operations are those expenses that would be incurred only when the flight is operated. These include variable expenses per passenger, salari es flight assistants, overnight costs for flight crew and assistants, fuel for aircraft, a third portion of flight insurance that is specifically related to this flight sector and flight promotion expense. These are expenses that will not be incurred if the flight is not operated. Hence, relevant for decision making.

   Other expenses like salaries of flight crew and hanger parking fees for aircraft are fixed expenses that will be incurred even if the flight does not operate. Loading and flight preparation expense is an allocated cost that will continue to be incurred even if flight GP- 022 does not operate. Depreciation of aircraft and liability insurance expense (2/3 rd portion not related to a specific flight sector) are sunk costs. These expenses have already been incurred and hence are irrelevant to decision making. Therefore, these fixed, allocated and sunk expenses are ignored while analyzing the decision whether to continue operating flight GP-022.

Flight GP-022
Statement Showing Net Gain/ (Loss)

	Rs.	Rs.
Contribution Margin if the flight is continued		5,88,000
Less: Flight Costs		
Flight Promotion	28,000	
Fuel for Aircraft	2,38,000	
Liability Insurance (1/3 × Rs. 1,47,000)	49,000	
Salaries, Flight Assistants	31,500	
Overnight Costs for Flight Crew and Assistants	12,600	3,59,100
Net Gain/ (Loss)		2,28,900

If Golden Pacific Airlines Ltd. discontinues flight GP-022, profits will reduce by Rs.2,28,900. The statement showing loss in operations of Rs. 158,100 is misleading for decision making purpose because it accounts for costs that are fixed and irrelevant. However, since flight GP-022 yields a net gain of Rs. 2,28,900, flight operations should continue.

26 Question 6 (CVP Analysis)

Catalyst Ltd. Makes a single product with the following details:

Description	Current Situation	Proposed Change
Selling Price (Rs. /unit)	10	
Direct Costs (Rs. /unit)	5	
Present number of setups per production period, (before each production run, setup is done)	42	
Cost per set up (Rs)	450	Decrease by Rs. 90
Production units per run	960	1,008
Engineering hours for production period	500	422
Cost per engineering hour (Rs)	10	

The company has begun Activity Based Costing of fixed costs and has presently identified two cost drivers, viz. production runs and engineering hours. Of the total fixed costs presently at ` 96,000, after the above, ` 72,100 remains to be analyzed. There are changes as proposed above for the next production period for the same volume of output.

Required

(i)COMPUTE units and production runs Catalyst Ltd. should produce in the changed scenario for break-even.

(ii)ADVISE whether Catalyst Ltd. should continue to break up the remaining fixed costs into activity- based costs.

Solution

Workings

Statement Showing 'Non-unit Level Overhead Costs'

Particulars	Current Situation	Proposed Situation
No. of Production Runs/ Setups	42	
Cost per Setup	Rs. 450	Rs. 360
Production Units *per run*	960 units	1,008 units
Production Units	40,320 (960 units × 42)	40,320
Engineering Hrs.	500	422
Engineering Cost *per hour*	Rs. 10	Rs. 10

Requirement of Question

(i) Break Even Point (Changed Scenario)

$$\text{Break Even Point} = \frac{\text{FixedCost} + (\text{SetupCost} \times \text{No.of Setups}) + (\text{EngineeringCosts} \times \text{No.of EngineeringHrs.})}{(\text{Price} - \text{Unit Variable Cost})}$$

$$= \frac{\text{Rs. 72,100} + (\text{Rs. 360} \times 40 \text{Setups}) + (\text{Rs. 10} \times 422 \text{hrs.})}{(\text{Rs.10} - \text{Rs. 5})}$$

= 18,144 units

$$\text{Break Even Point (No of Production Runs)} = \frac{\text{Break Even (units)}}{\text{Production (units per run)}}$$

$$= \frac{18{,}144 \text{units}}{1{,}008 \text{units}}$$

= 18 Runs

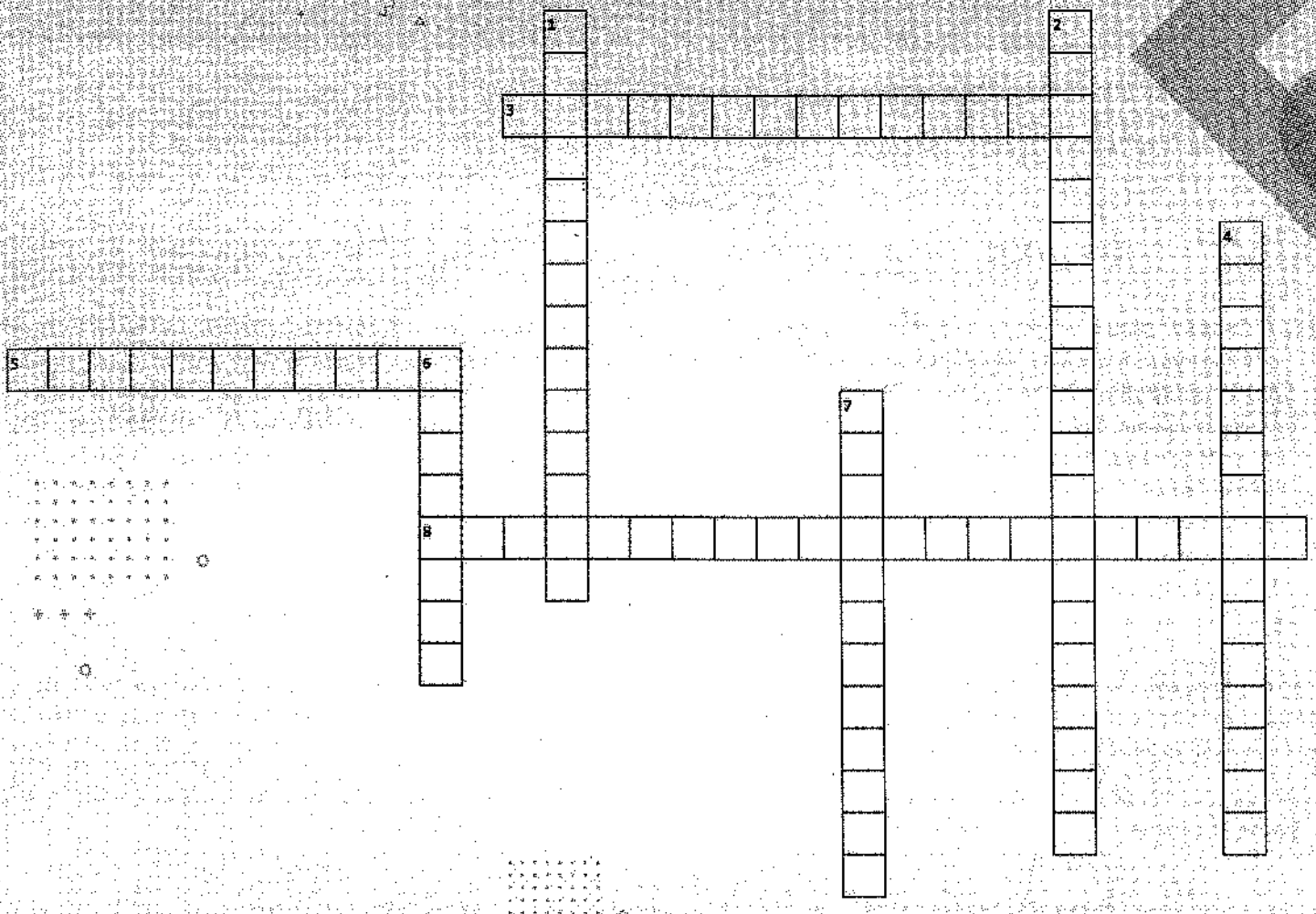
(ii) A company should adopt Activity Based Costing (ABC) system for accurate product costing, as traditional volume based costing system does not take into account the Non-unit Level Overhead Costs such as Setup Cost, Inspection Cost, and Material Handling Cost etc. Cost Analysis under ABC system showed that while these costs are largely fixed with respect to sales volume, but they are not fixed to other appropriate cost drivers. If break up the remaining ` 72,100 fixed costs consist of only a small portion of these costs, ABC need not be applied.Note- "The use of activity-based costing does not mean that CVP analysis is less valuable. In fact, it becomes more valuable, since it delivers more precise understandings concerning cost behaviour. These understandings produce better decisions. CVP analysis within an activity-based framework, however, must be improved".However, it may also be noted that the primary study has resulted in cost savings. If the savings in cost are expected to exceed the cost of study and implementing ABC, it may be justified. Further it is pertinent to mention that ABC offers no increase in product-costing accuracy for single-product setting.

Note- "The use of activity-based costing does not mean that CVP analysis is less valuable. In fact, it becomes more valuable, since it delivers more precise understandings concerning cost behaviour. These understandings produce better decisions. CVP analysis within an activity-based framework, however, must be improved".

Student Notes

GAME OF CONCEPTS

CHAPTER 6



ACROSS

3. Point at which their is neither profit nor loss
5. Analysing the interrelationships among revenues,costs,levels of activity and profit
8. The point at which a co. is indifferent for selecting various alternatives

DOWN

1. Difference between the actual sales and the break even sales
2. Make or buy
4. benefit that a person could have received,but gave up to take up another course of action
6. Cost that has already been incured
7. Future cost that differ across alternatives

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APP CODE

Pricing Decisions

Chapter 7

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MENTOR

1 Theory of price

- **Optimum price** - Price which yields maximum profit.
- **Basic assumption** - Firm's main objective is to maximize its profit.
  - Firm considers position of demand & cost functions.
  - Firm produces one product.
- If the firm sells unlimited units, TR will be a straight line. (TR = MX)

  Where TR = Total Revenue Line M = Quantity of units sold X = Price per unit
- Total Revenue will increase as more units are sold - but increase in TR will decline.

2 Profit Maximisation Model

- Profit is maximum at a level of output
- Where, (Marginal Revenue (MR) = Marginal Cost)
- Determines the level upto which production can be continued.
- Basic price equation
- $P = a - bQ$
- Where, P = Price b = Slope of demand curve Q = Quantity demanded

  a = Price at which demand is zero $\left[\frac{\Delta \text{ in Price}}{\Delta \text{ in Quantity}}\right]$
- Marginal Revenue Equation
- $MR = MC = a - 2bQ$

Note: Practical question related to this concept covered in **MASTER SUMS.**

3 Types of Market Structure

3.1 Perfect Competition

- Firm has a pricing policy of its own as sellers are price takers.
- Homogeneous Products (Similar)
- Free Entry & Exit
- Perfect Knowledge of Prices & technology
- Large Buyers & Sellers Can increase demand by reducing price & continue to sell until Marginal Revenue = Marginal Cost
- Eg: FMCG like soap, shampoo.

3.2 Monopolistic Competition

- Large no. of firms producing similar but not identical products. Limited growth of competitors. Excess profit attracts new competition with close substitutes.
- Free Entry and Exit
- Heavy Expenditure on Advertisement & Other Selling Cost
- Product Differentiation
- Some Control over Price
- Maximize profit by equating marginal revenue and cost.
- Eg: Nike, McDonald

3.3 Oligopoly Market

- Few firms producing or selling homogenous or identical products.
- Interdependence
- Advertisement cost huge
- Entry and Exit Barriers
- Change in any variable (sales, Advt., etc.) will have a reaction from competitors.
- Similar pricing as competitor by close analysis or co-operation.
- Major market is with 2-3 players whereas others have lower share.
- Eg: Coke & Pepsi, Ola & Uber, Amazon & Flipkart.

3.4 Monopoly Market

- Price Maker
- Barriers to Entry
- No Close Substitutes
- Full Control over Supply
- Seller is a price setter but still factors like demand and price are considered to maximize profit.
- Eg: Google as search engine, Microsoft (software).

PRICING STRATEGIES FOR OLIGOPOLIES	NON PRICING STRATEGIES FOR OLIGOPOLIES
(a) **Predatory Pricing:** Keeping price artificially low, and often below the full cost of production. (Reliance Jio) (b) They may also operate a **Limit-Pricing Strategy** to discourage entrants (entry forestalling price). (c) Oligopolists may **collide** with rivals and raise price together but this may attract new entrants. (d) Cost-Plus Pricing, Plus Markup	Non-price competition is the favoured strategy for oligopolists because price competition can lead to destructive price wars - examples include: (a) Trying to improve Quality & After Sales Servicing, such as offering extended guarantees. (b) Spending on Advertising, Sponsorship, and Product Placement. (c)Sales Promotion, such as buy-one-get-one-free, is associated with the large supermarkets, which is a highly oligopolistic market, dominated by three or four large chains. (d) Loyalty Schemes, which are common in the supermarket sector, such as Reliance's One Card.

4 Pricing Policy

(Important for long run survival. Cost, demand & competitive environment are crucial factor.)

Provide an incentive for adopting improved technology and maximizing production » Work towards better balance between demand and supply » Avoid adverse effects on the rest of the economy » Encourage optimum utilisation of resources » Promote export

Principles of Product Pricing

5 Price Customization (PCDT)

Based on

Product line	Customer's past behaviour	Demographics	Time Differential
Consumer products can be customized and accordingly the prices. Eg: Mobile phones: 16GB vs 32GB	A customer with good payment record may be given more discounts then the others. Eg: D-Mart	Different pricing may be adopted based on age or social status. Eg: Railway concession for senior citizens.	Pricing for a product or service is also done on the basis of time differential i.e. different price for different time period. Eg: Book my show

D-Mart

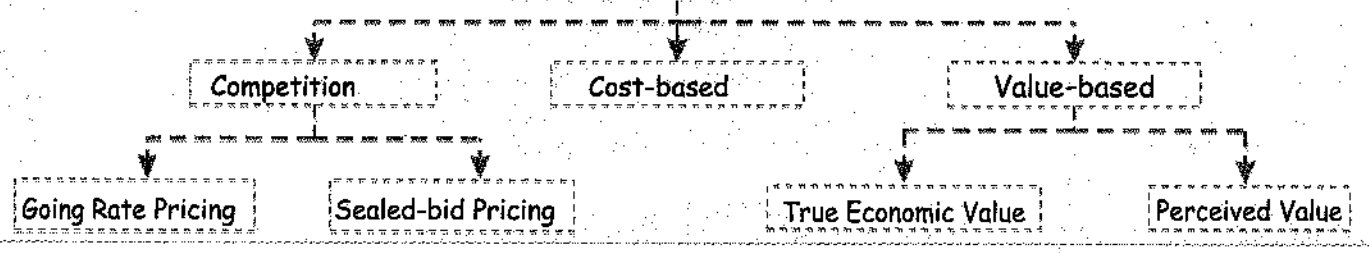
bookmyshow

6 Factors of Price Sensitivity

(Measures customers behaviour to change in price of a product.) Low price senstivity means " pricing does not impact customer's behaviour." and vice versa.

- **Unique Value Effect**
  More unique the product, Lower is the price sensitivity. (Antique Products)
- **Shared Cost Effect**
  If the cost of the product is shared by another party, the buyer will have less prone to price sensitivity. (Sharing of space/ Rent)
- **Sunk Investment Effect**
  Price sensitivity is low in products which are used along with assets previously bought. (New car bought; new seat cover is sunk investment)
- **Substitute Awareness Effect**
  If the buyers are aware of substitutes and these perform the same function, then the buyer's price sensitivity will be high. (Coke vs Pepsi)
- **End-Benefit Effect**
  Buyers are less price sensitive where the expenditure on the product is low compared to the total cost of the end product. (TV stand with high end TV)
- **Price Quality Effect**
  Higher the perceived quality of the product, lower the price sensitivity. (iphone)
- **Difficult Comparison Effect**
  Price sensitivity will be low if the buyer has difficulty comparing two alternatives. (Beach facing house)
- **Total Expenditure Effect**
  If the expenditure on the product represents a low proportion of the consumer income, the price sensitivity will be less visible for such a product. (Packet of bread for a CA)
- **Inventory Effect**
  If the product cannot be stored, the buyer will be less price sensitive. (Perishable stock)

7 Pricing Method



8 Cost - Based Pricing

Method 1

Estimate cost (Full cost) of Product & fix profit margin.

Full cost includes selling & administration.

Method 2

(Marginal cost/Variable cost) + Markup (to cover fixed cost and profit)

Utility of Cost Based Pricing Less competitive environment/ customised products of customer.

9 Competitive Based Pricing

Pricing based on what competitors are charging.

Pricing = Competitors price (+/-)% based on own cost and demand.

Going Rate

- Firms pricing at the average level charged by industry.
- Used in (a) homogeneous product (identical) market, (b) where difficult to measure cost. (food, raw material, textile).
- Ensure good cost control.
- No major marketing cost incurred.

Sealed Bid

- Bid is firms offer price (kind of tender pricing).
- Used in defense contract/ government related work.
- Contract awarded to "Lowest Bidder + Highest Quality".
- Bidder will bid based on his minimum marginal cost.
- Bid decided on overall market conditions.

10 Value Based Pricing

(Pricing = Customer's perception of its value.)

True Economic Value (TEV)

- Measure of benefits that a product intends to deliver to the customer in relation to other products.

TEV = Cost of next best alternative + Value of performance differential

Cost of comparable product | Value of additional feature provided by seller

- If our product : Superior : Add to TEV.
  Inferior: Reduce from TEV
- Eg: (1) Tea Price
  - Normal Restaurant Rs. 20/-
  - 5 Star Hotel Rs. 500/-
  - Pricing based on TEV (Ambience / Comfort etc.)
- Eg: (2) Fashion Clothing (Sabyasachi)

Perceived Value

- Value that consumer understands the product delivers to it.
- Price which customer is willing to spend.

Price = Above COGS below Perceived Value

300 - True Economic Value
200 - Perceived Value ← Benefit to Customer
150 - Price ← (+) Profit
100 - Cost of Sales

Framework to create value for custoners

- Develop product (Satisfy wants & needs of customer)
- Promotion program
- Right distribution channel
- Design proper pricing strategy

11 Pricing in Period of Recession (Sell at a price less than total cost but above marginal/ variable cost.)

- The firm can continue to produce and use the services of skilled employees who are well a trained and will be difficult to re-employ later if discharged.
- Plant and machinery can be prevented from deterioration through idleness.
- The business would be ready to take advantage of improved business conditions later.
- This avoids the competition of securing the business of the firm.
- A situation like this should not lead to a drastic price cutting and the orders accepted should not cover a long period extending over the production facilities of a period when business conditions improve.

11.1 Pricing Below Marginal Cost

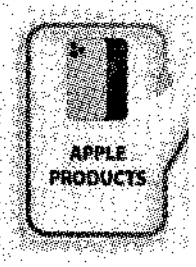
• Where materials are of perishable nature. **(Fruits & Vegetables)**	• Where stocks have been accumulated in large quantities and the market prices have fallen. **(Changing Fashion for clothing industry)**	• Where such reduction enables the firm to boost the sales of other products having larger profit margin. **(Iphone XI and Iphone XII)**	• To popularize a new product. **(Reliance Jio)**

12 Pricing Strategy

12.1 Price Skimming

High introductory price is charged for an innovative product. (Eg: iphone)

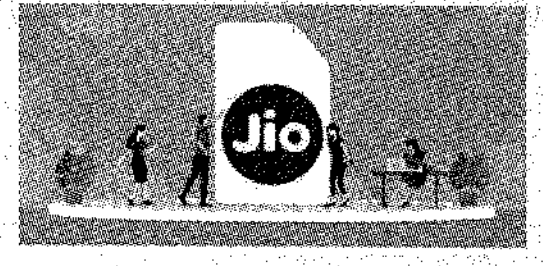
- The Product must be highly distinctive & demand for that product must be very inelastic.
- The Company Must be able to maintain its uniqueness for some time.
- High promotional expenditure.
- High initial prices help recover sources of capital.



12.2 Penetration Pricing

Initial low price to capture a large market can capture a very big share. (Eg: Jio)

- The price elasticity of demand is high & easy substitutes are available.
- The firm can increase its production capacity with increase in demand.
- When customers are highly price sensitive
- When company has to face high competition.
- Helps in long term survival & profitability.



Note: Inelastic demand means no change in demand with increase in price & vice versa.

13 Price Adjustment Policies

(Adjusting basic prices to account for "Customer difference" & charging situations"

Distributor Discount	Quantity Discount	Cash Discount	Price Discrimination	Geographical Price
• Discount given to various distributors in trade channel • Eg: Wholesaler, Dealer, Retailer.	• Price reductions in terms of physical units. • Used for large homogenous (identical) product.	• Based on promptness of product payment. • Overcomes bad credit risks. • Credit purchase = Foregoing cash discount	• Different prices based on customer, place, product, time. • **Following conditions:** - Segmental Price discrimination - No reselling should be possible. - No chance of competitor underselling • Eg: Airline company pricing if last moment purchase.	• Based on freight. • Nearer the location; lower the freight; lower the price.

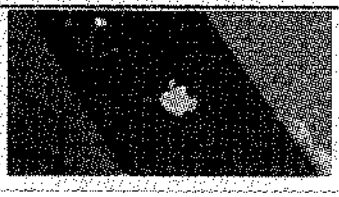
14 Pricing and Product Life Cycle

Introduction Stage	Growth Stage	Maturity Stage	Decline Stage
Skimming Policy with high prices, but low profit margin due to high fixed cost.	Reduce price to penetrate market further.	Price match or beat competitor.	Cut price if not repositioning.
Penetration Policy to enter the market and gain a high share quickly or to prevent competitors from entering.	Increase Pricing	Retain higher prices in some market segments.	Some increase in prices may occur in the late decline stage.

Student Notes

15 Strategic Pricing of New Products

Basis	Revolutionary	Evolutionary	Me - Too
Idea	Product new to market replacing existing methods or technologies.	Upgraded version of Revolutionary product.	Product emerged as a result of sucess of revolutionary / evolutionary product.
Position	Market leader	Market settler.	Market Follower.
Potential	Create own value with product differentials & uniqueness.	Few additional characteristics than revolutionary.	Exact cheap copy/ Replica of revolutionary / evolutionary.
Pricing	Premium pricing for taking first initiative.	Price based on cost, benefit and demand.	Price takers and much lower than revolutionary/ evolutionary.
Example	iphone	Samsung , One plus	Oppo, vivo



15.1 Structured Approach to Pricing Decision

- Company & marketing objectives
- Set pricing objectives & policy
- ASSESS
  - Target market
  - Costs/ cost structure
  - Customer demand
  - Competitors
- Select
  - Pricing method
  - Specific pricing

15.2 Sensitivity Analysis in Pricing Decision

Product pricing decision must be balanced against costs and competitive market conditions. Sensitivity analysis is required to determine how sales and cost will respond to changes in the market conditions.

External Factors	Internal Factors
- Market demand.	- R&D Cost.
- Change in market prices.	- Production/ Marketing Cost.
- Exchange rate fluctuation.	- Product Prices.

16 Pricing Issues of Services

- When services are uniquely tailored to each customer's needs, the pricing cannot be easy. Each service transaction is likely to have distinct pricing structure
- Accommodate the intangible costs that a customer may have to bear with.
- Some of the services like health care, education, communication, transport, etc. fall within the larger domain of government. Therefore, price of those services tends to be regulated
- Some services pricing is determined in a collective manner. Trade association, professional bodies, or other institutions may impose broad guidelines for fixing the price.

MASTER SUMS

17 Question 1 (Concept of True Economic Value)

A customer wants to buy a system for a single year (after which it will be scrapped) with plans to use it for 2,500 hrs.

Cost Structure (similar products):

Particulars	System - X	System - X^2
Operating cost / hour	Rs. 5	Rs. 7.50
Probability of system crash	10%	0.5%
Price	Rs. 37,500	?

Find the TEV for the System - X2 if the cost of a System Crash to the buyer is 1,00,000.

Solution:

Particulars	Rs.
System Cost	RS. 6,250 2,500 HRS. x (Rs 5.00 - Rs. 7.50)
System Crash Savings	Rs. 9,500 Rs. 1,00,000 x (10.00% - 0.50%)
Price of Next Best Alternative	Rs. 37,500
TEV	Rs. 40,750

18 Question 2: (May 19, Question 2 -20 Marks) (Profit Maximization Model)

Amber Ltd. is a leading company in the Footwear Industry. The company has four factories in different locations with state of the art equipments. Due to competition in the market, company is continually reviewing its product range and enhancing its existing products by developing new models to satisfy the demands of its customers.

The company currently has a production facility which has a capacity of 3,500 standard hours per week.

Product 'Comfort' was introduced to the market six months ago and is now about to enter the maturity stage of its life cycle.

However, research by the marketing department indicates that demand of the product 'Comfort' in the market is price sensitive. The likely market responses are as follows:

Selling price per unit(\")	1,750	1,600	1,525	1,450	1,300
Sales demand per week(units)	550	725	1,000	1,150	1,200

The variable cost per unit of manufacturing 'Comfort' is Rs. 750.

Standard hours used to manufacture one unit is 2 hours.

Product 'Sports' was introduced to the market two months ago using a penetration pricing policy and is now about to enter its growth stage. Each unit has a variable cost of Rs.545 and takes 2.50 standard hours to produce. Market research has indicated that there is a linear relationship between its selling price and the number of units demanded, of the form P = a - bx. At a selling price of Rs. 1,000 per unit demand is expected to be 1, 000 units per week. For every Rs. 100 increase in selling price the weekly demand will reduce by 200 units and for every Rs. 100 decrease in selling price the weekly demand will increase by 200 units.

Product 'Ethnic' is currently being developed and which is about to be launched in the market. This is a highly innovative designer product which the company believes that it will have a revolutionary impact on the market and consumer behaviour. The company has decided to use a market skimming approach to pricing this product during its introduction stage.

Required

(a) (i) ADVISE which of the above five selling prices should be charged for product 'Comfort', in order to maximize its contribution during its maturity stage.

(ii) CALCULATE the number of units to be produced of product 'Sports' in order to utilize all of the spare capacity from your answer to (i) above and the selling price per unit of product 'Sports' during its growth stage.

(b) COMPARE penetration and skimming pricing strategies during the introduction stage, using product 'Ethnic' to illustrate your answer.

(c) EXPLAIN with reasons, for each of the stages of 'Ethnic's product life cycle, the changes that would be expected in the

(i) average unit production cost

(ii) unit selling price

Solution

(a) (i) Selling Price for "Comfort" that would maximize its contribution at Maturity stage:

Contribution per unit of "Comfort" = Selling Price per unit - Variable Cost per unit

Total Contribution = Contribution per unit x Units sold

All figures in Rupees

Sales (units) per week	550	725	1,000	1,150	1,200
Selling Price per unit	1,750	1,600	1,525	1,450	1,300
Less: Variable Cost per unit	750	750	750	750	750
Contribution per unit	1,000	850	775	700	550
Total Contribution	5,50,000	6,16,250	7,75,000	8,05,000	6,60,000

Total contribution is maximum when sales are 1,150 units. Therefore, the selling price per unit of "Comfort" should be 1,450 per unit.

(ii) Production Number of "Sports" and Selling Price per unit

Amber Ltd. has a production capacity of 3,500 hours per week. As explained in (i) above, it would manufacture 1,150 units of "Comfort" per week. Each unit of "Comfort" requires 2 hours of production. Therefore, total production hours for Comfort would be 1,150 units x 2 hours = 2,300 hours per week.

Production capacity remaining to manufacture "Sports" = 3,500 hours - 2,300 hours

= **1,200 hours per week.** Each unit of "Sports" requires 2.5 hours of production.

Therefore, the number of "Sports" units that can be produced = 1,200 hours / 2.5 hours = **480 units per week.**

Linear relationship between Selling Price and Number of Units Demanded has been given to be P= a - bx.

P = Selling Price per unit

a = Selling Price when demand will be zero

b (slope) = Change in Price / Change in Quantity x = Quantity Demanded

Given, at a Selling Price of 1.000 per unit, Quantity Demanded will be 1,000 units per week.

For every 100, per unit increase / decrease in Selling Price,

the Quantity Demanded will decrease / increase by 200 units per week respectively.

A 500 per unit increase in Selling Price will result in fall of 1,000 units of Sales per week. The Selling Price at which Sales will be Zero i.e. a = Rs. 1.500 per unit.

b (slope) = Change in Price / Change in Quantity = 100 / 200 = 0.50

Penetration pricing is most commonly associated with a marketing objective of increasing market share or sales volume, rather than short term profit maximization. Thus, substituting the values in the equation to find the Selling Price of

"Sports" when the Quantity Sold is 480 units:
P = a - bx
= 1,500 - 0.50 x (480)
= 1,500 - 240
= 1,260
Sports should be sold at Rs. 1,260 per unit during the growth stage.

Alternative

Hours after production of Product 'Comfort ' (3,500-1,150x2) =1,200 hours to be utilized to produce product 'Sports'.
1,200 hours/ 2.5 = 480 units
10% increase in selling price will lead to 20% decrease in demand of units of product "Sports". Here we can produce only 480 units which amounts to 52% decrease in units so the selling price should be increased by 26% as per given price demand function. So, the selling price per unit will be 1,260 for 480 units of product "Sports".

(b) (i)"Ethnic" is given to be a highly innovative product that is about to be launched into the market. The product with unique features that will differentiate it from other products leading to a revolutionary impact on market and customer behavior. There seem to be no competitors providing similar products.

Skimming Price Strategy is adopted to charge high prices in the introduction stage in order to recover costs. Skimming Price will be suitable for "Ethnic" because:

- Market for the product is not yet established. Initially high promotional expense may have to be incurred to create customer awareness and build a market for the product.
- Due to its innovative feature, the customers would not mind paying a premium for the unique product offering. Demand would be inelastic.
- The market demand is unknown. Initial capital outlay to produce this product may be high, resulting in high cost of production.

Production and promotional costs in the initial years is likely to be high. Therefore , a higher selling price would help Amber Ltd. to recover the costs. Since demand is likely to be inelastic, charging a premium may not be a problem.

- The price can be gradually reduced once the market for the product is established. Competitors may reverse engineer and offer similar products , due to which price may have to be lowered in the long run to retain customers.

Penetration Pricing is adopted to charge a low price in the initial stage for penetrating the market as quickly as possible. For a new product, this low-price strategy will popularize the product. Once the market is established , the price may be increased. Penetration pricing will be suitable when :

- Demand for the product is elastic, more demand when prices are low.
- Large scale production of the product yields economies of scale.
- Threat of competition requires prices to be set low. It serves as an entry barrier to prospective competitors as well.

Product "Ethnic" is an innovative product that the manufacturer believes will change the whole market once it is launched. A strategy of penetration pricing could be effective in discouraging potential new entrants to the market. However, the product is believed to be unique and as such demand is likely to be fairly inelastic. In this instance a policy of penetration pricing could significantly reduce revenue without a corresponding increase in sales. Thus, this strategy is not suitable for "Ethnic".

(ii) Impact on Unit Selling Price and Average Cost of Production per unit at each stage of "Ethnic" Product Lifecycle (From Chapter 4)

Introduction Stage

As explained in (b) above, at the Introduction Stage of Lifecycle, due to high cost of production and initial promotion expenditure , the unit cost of production will be high. Using Skimming Price Policy, the unit selling price will also be high.

Growth Stage

This is the second phase of the Life-Cycle, product awareness among customers would result in increased demand. Therefore , scale of production likely to increase. The new market segment would attract competitors , who are like to reverse engineer and offer similar products in the market. Promotional activities and marketing activities need to continue to maintain and gain market share.

Accordingly , the unit selling price would reduce from the introduction stage on account of the following reasons:

- Competitors offering similar product would take away the uniqueness feature of "Ethnic".
- Again , to gain market share, the unit selling price may have to be lowered to make it attractive to a larger segment of customers.

The unit cost of production is also likely to reduce due to the following reasons:

- Increased production would result in increased material procurement from suppliers. Bulk purchasing discounts can be negotiated with them to lower cost of production.
- Learning curve and experience would enable the labor force to become more efficient. This leads to higher production with the same level of resources leading to cost savings.
- Larger production batches due to increase in scale of operations will reduce the unit variable overhead cost.
- Economies of scale would result due to fixed overhead cost being spread over larger number of units.

Maturity Stage

The third phase of Product Life-Cycle that is characterized by an established market for "Ethnic". After rapid growth in sale volume in the previous stages, growth of sales for the product will saturate. Competition would be high due to large number of rivals in the market, this may lead to decreasing market share.

It is likely that the price of the product will be lowered further at the maturity stage in a bid to preserve sales volumes. The company may attempt to preserve sales volumes by employing an extension strategy rather than reducing the selling price. For example, they may introduce product add-ons to the market that are compatible with "Ethnic".U n i t production cost will remain constant:

- Direct material cost will remain constant. If procurement is lower than the growth phase, it might even lead to slightly higher prices since supplier may not extend bulk discounts.
- The benefits of efficient production due to the effect of learning and experience may also have waned . Therefore , unit labour cost is also likely to remain constant.
- Since scale of production is no longer increasing, the unit variable overhead costs are also likely to remain constant.

Decline Stage

This last stage in the product cycle is characterized by saturated market, declining sales, change in customer's tastes etc. Profitability may slowly start decreasing with fall in sales.

At the decline stage, Product "Ethnic" is likely to have been surpassed by more advanced products in the market and consequently will become obsolete. The company will not want to incur inventory holding costs for an obsolete product and is likely to sell "Ethnic " at marginal cost or perhaps lower.

Sales volumes at the decline stage are likely to be low as the product is surpassed by new exciting products that have been introduced to the market. Furthermore, the workforce may be less interested in manufacturing a declining product and may be looking to learn new skills. For both of these reasons, unit production costs are likel y to increase at the decline stage.

Student Notes

19 Question 3 (Combo question on "Theory of Price + Transfer Pricing")

Eastern Company Ltd. Has two Divisions namely cosnub Bogie Division (CBD) and wagon Division (WD). CBD Manufactures Cosnub Bogies and WD manufactures BOBN type of wagons. To manufacture a Wagon WD needs four Casnub Bogies. CBD is the only manufacturer of the CA Snub Bogies and supplies both WD and outside customers. Details of CBD and WD for the coming financial year 2016-17 are as follows:

	CBD	WD
Fixed Costs (Rs.)	9,20,20,000	16,45,36,000
Variable cost per unit (Rs.)	2,20,000	4,80,000*
Capacity per month (units)	320	12

Market research has indicated that the demands in the market for Eastern company Ltd.'s products as different quotation are as follows -

For casnub Bogies: Quotation price of Rs. 3,20,000 no tender will be awarded, but the demand will be increased by 30 casnub bogies with every Rs.10,000 reduction in unit quotation price below Rs. 3,20,000.

For wagons: Quotation price of Rs. 17,10,000 no tender will be awarded but the demand for wagons will be increase by two wagnos with Every Rs. 50,000 reduction in the unit quotation price below Rs. 17,10,000.

Required:

(i) Calculate the unit quotation price of the Wagon that will maximise Eastern company Ltd.'s profit for the financial year 2020-21.

(ii) Calculate the unit quotation price of the Wagon that is likely to emerge if the divisional managers of CBD and WD both set quotation prices calculated to maximize divisional profit from sales to outside customers and the transfer price is set at market selling (quotation) price.

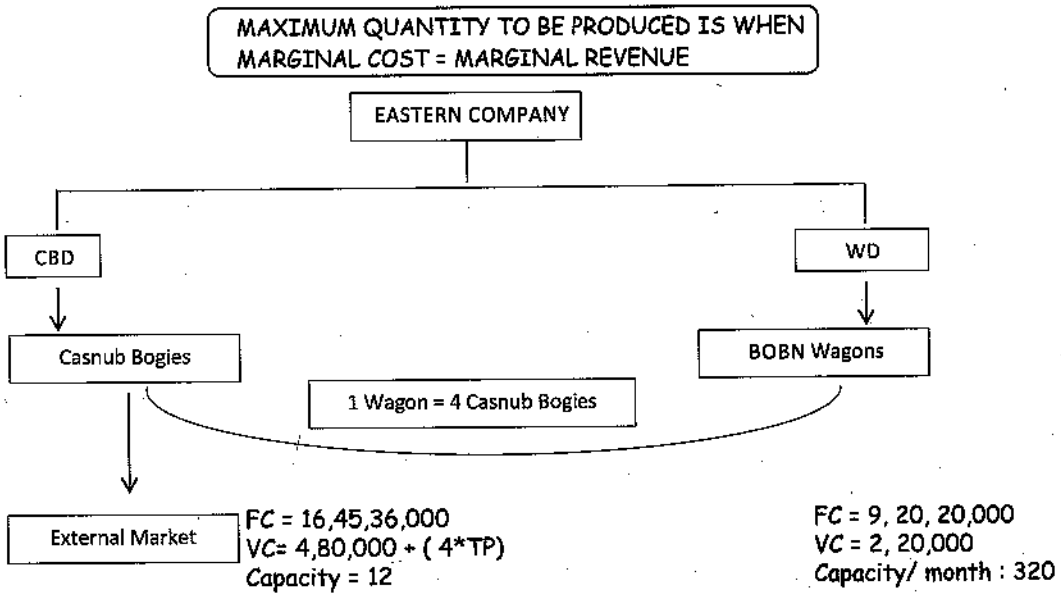
[Note: If P = a - bQ then MR = a - 2bQ]

Solution

Note:

The above question is based on the economies of demand & supply. Hence, we have to find out the quantity which will maximise the profit & the quantity is based on the function of elasticity of demand. We have to calculate the Optimum Quantity to be produced and sold by using the concept of demand and supply.

Maximum quantity to be produced is when marginal cost = marginal revenue



As per the statement in the question, decrease in price of Rs.50,000 will increase the demand by 2 units.

If P = a - bQ

Where P = Quotation Price to earn Maximum Profit
A = Max price that can be quoted at which there is nil demand
B = Demand Function → $\frac{\text{Change in Price}}{\text{Change in Quantity demanded}}$
Q = Optimum Quantity to be sold to earn maximum profit

	WD	CBD
A	17,10,000	3,20,000
b	50,000/2	10,000/30

1) Then, MR = a - 2bQ
Max price that can be quoted
↓
Marginal Revenue at point of - Max profit
Marginal Cost = Marginal Revenue
Quantity = to be calculated

i) Unit Quotation price of Wagon
According for Wagon Department the calculation will be as under -
We know, Marginal Cost (MC) = Marginal Revenue
↓
Variable cost
[480,000 + (220,000 x 4)] (Transfer price = Variable cost)
∴ 13,60,000 = a - 2bQ
∴ 3,60,000 = 17,10,000 - 2x $(\frac{50,000}{2})$ x Q
∴ 13,60,000 = 17,10,000 - 50,000
∴ 50,000 Q = 3,50,000
∴ Quantity to be sold for optimum profit = 7 units
P = a - bQ

∴ P = 17,10,000 - $(\frac{50,000}{2})$ x 7

∴ P = Quotation Price = Rs. 15,35,000/-

2) Note : In Second part, calculate Quotation price for CBD and that becomes Transfer Price for Wagon Dept.

Divisional Managers of CBD & WD both set quotation prices

CBD
↓
Market Price
↓
Price at which profit is maximum
↓
∴ Marginal Cost = Marginal Revenue
∴ 2,20,000 = a - 2b Q
∴ 2,20,000 = 3,20,000 - 2 $(\frac{10000}{30})$ x Q
∴ 2,20,000 = 3,20,000 - $\frac{10000}{15}$ Q

∴ Q= Quantity to be sold for optimum profit = 150 units

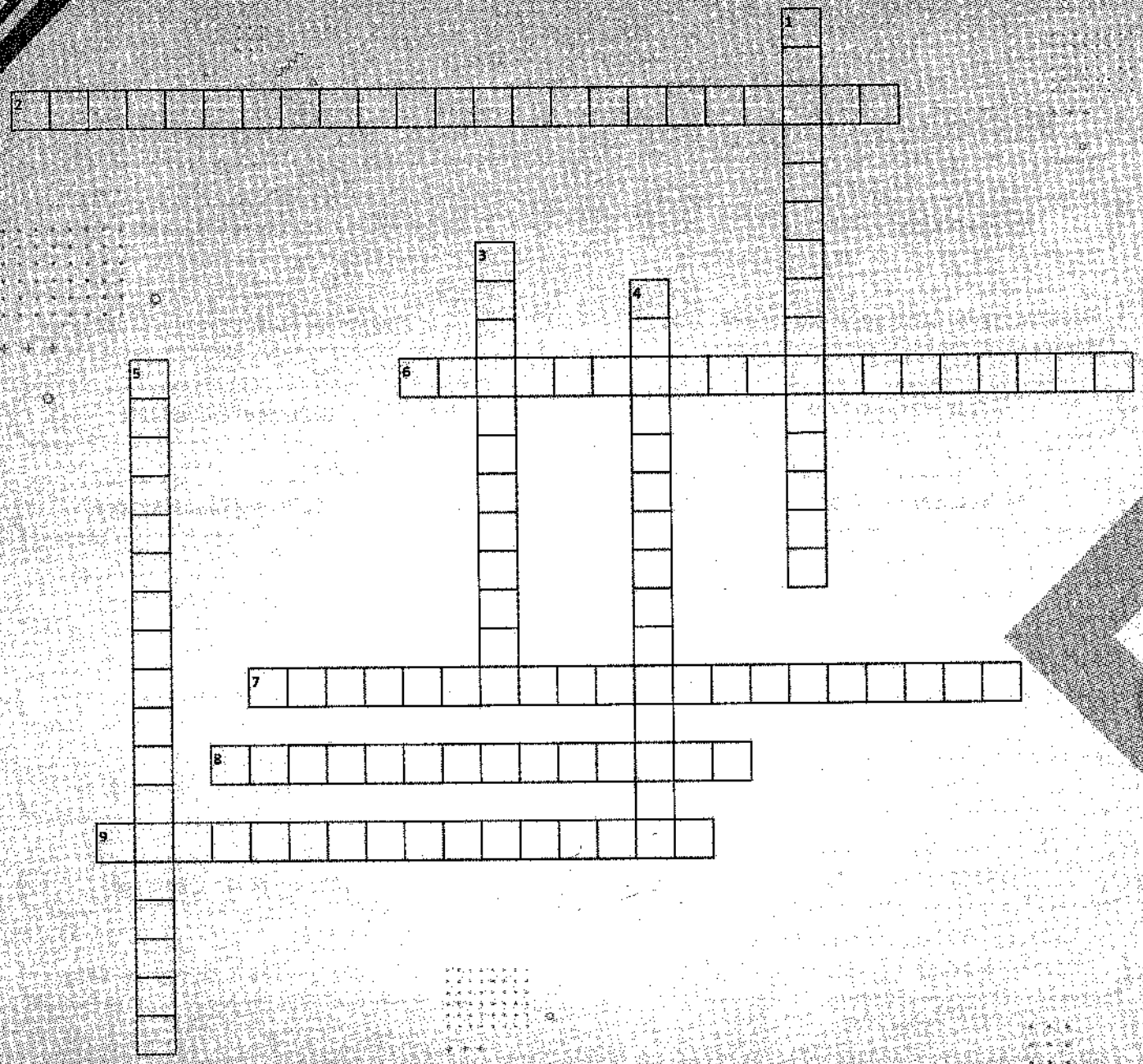
P = a-bQ
P = 3,20,000 - $\frac{10,000}{30}$ X 150
P = Quotation Price = Rs. 2,70,000/-

Wagon department

We know, Marginal Cost = Marginal Revenue
Marginal Cost = [480,000 + (270,000 x 4)]
∴ [480,000 + (270,000 x 4)] = Marginal Revenue
∴ 15,60,000 = a - 2 b Q
∴ 1560,000 = 17,10,000 - 2 $(\frac{50000}{2})$ x Q
∴ 50000 Q = 150,000
∴ Q= Quantity to be sold for optimum profit = 3 units
∴ P = a-bQ
∴ P = 17,10,000 - $\left(\frac{50000}{2} \times 3\right)$
∴ P = Quotation Price =Rs 16,35,000

GAME OF CONCEPTS

CHAPTER 7



ACROSS

2. Large number of firms producing similar but not identical products
6. A product introduces upgraded version with few additional characteristics of the product
7. Product is new for the market and has the potential to create its own value
8. A firm is a price setter
9. Measures the customers behaviour to the change in price of a product

DOWN

1. High intraductory price is charged for an innovative product
3. When its emergence is a result of the success of a revolutionary product
4. Structure where there are few firms producing or selling homogenous or identical product
5. Low price as the principal instrument for penetrating mass markets early

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APP CODE

Performance Measurement & Evaluation

Chapter 8

SCAN AND REVISE

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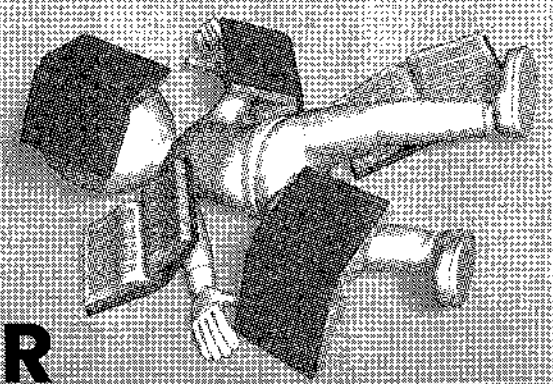

STUDY MENTOR

Performance Measurement & Evaluation

Chapter 8

SCAN AND REVISE

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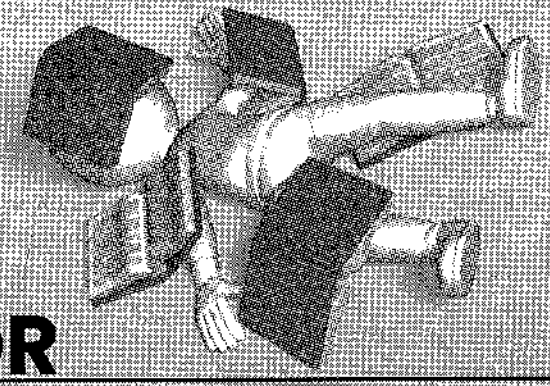


STUDY MENTOR

1 Responsibility Accounting

(Profitability/ Activity Accounting)
Used where top management has delegated authority to make decisions.

⇩

Collection, Summarization & Reporting of Financial Information

Where individual manager is accountable for Cost, Revenue or Assets of firm

2 Organizational Structures

Outlines roles of individual | Decides authority & responsibility allocated | & decides how coordination is done

To attain organisational objective

Organizational Structures

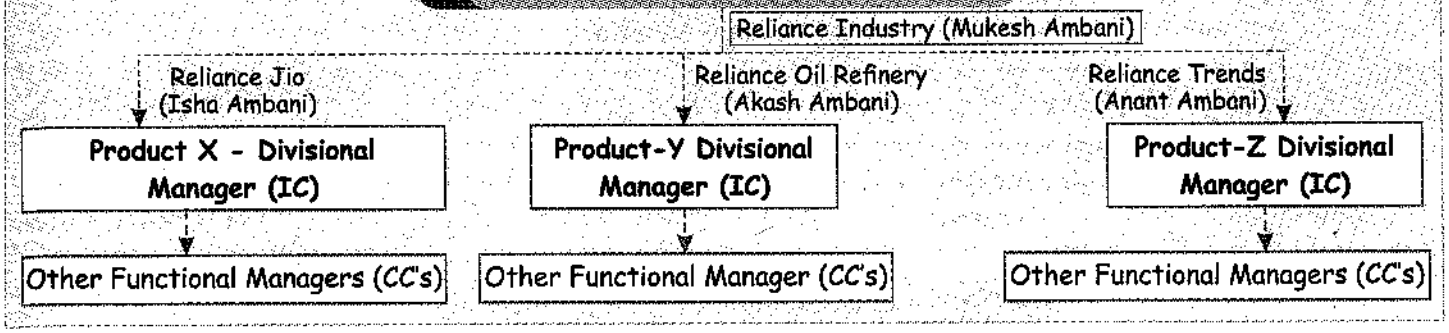
Entrepreneurial	Functional (2.1) (For single product Co.)	Divisional (2.2) (For Multi product Co.)	Matrix (2.3) (For project oriented Co.)
Management & control revolves around owner only ⇩ Entrepreneur act in dual capacity, both as owner & manager.	Business departmentalization by grouping employees by speciality, skill or related roles (marketing, finance, purchase) ⇩ Pricing, product mix & output decision made by central management. ⇩ Appropriate for small/medium sized business, but can result in conflict of interest.	Divisional operating individually based on geographical areas, markets, products & service ⇩ Full autonomy for Selling price/ product mix/ supplier, etc. ⇩ Appropriate for diversifying growing companies.	For managing large & complex process ⇩ Cross functional teams are formed to reap the benefits of decentralization, speedy decisions & early reduction of disputes.

2.1 Functional - Chief Executive

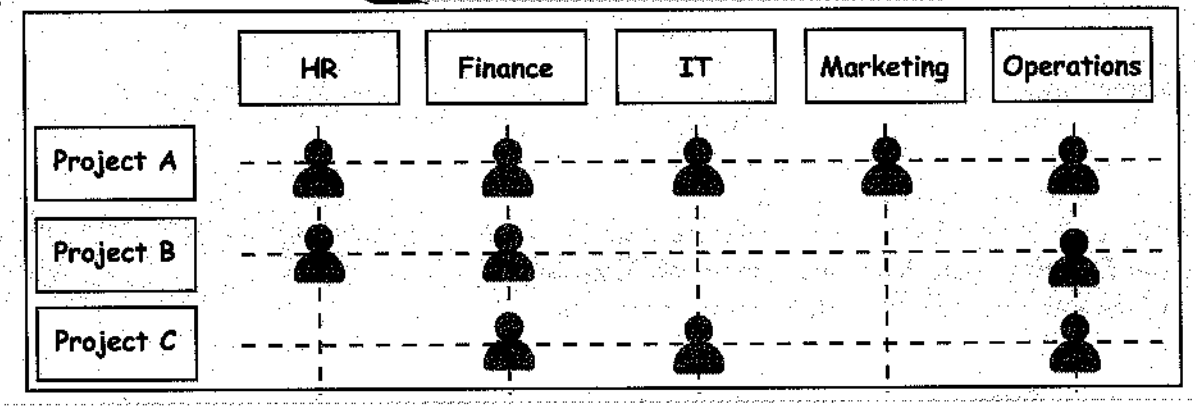
- Production Manager (CC)
  - Other Functional Managers (CC)
- Marketing Manager (RC)
- Financial & Administration Manager (CC)
- Purchasing Manager (CC)
- Research & Development Manager (CC)

Where RC = Revenue Centre
CC = Cost Centre

2.2 Divisional - Chief Executive



2.3 Matrix Organisational Structure



3 Responsibility Centres

It's a part, segment or sub unit of an organization whose manager is accountable for a specified set of activities

3.1 4 Types of Responsibility Centres

Cost centre	Revenue centre	Profit centre	Investment centre
Supervises, allocates, segregates & eliminates all sort of cost related to Company ⇩ Prime work is to check cost of an organisation & to limit unwanted expenses. (purchase/ production/ labour department) Eg: Paint department of an automobile firm.	Accountable for initiating & Monitoring revenue ⇩ Can monitor a few marketing expenses ⇩ Analysis budgeted revenue with actual revenue & budgeted marketing expenses with actual marketing expenses. (Sales Department) Eg: Booking counter of airline company.	Control on both revenue & cost ⇩ Identifies profits on basis of cost & incomes ⇩ Accountable for all actions associated with sales of goods & production (C.E.O.) Eg: Canteen facility of a company.	Responsible for investment & revenue ⇩ Can control expenses income, fund invested in asset, etc. ⇩ Performance based on ROI / RI / EVA (C.F.O.) (Return based on Investment / utilization of assets.) Eg: Branch expansion by company.

4 Performance Management System

Four stage solution

Appropriate organisational structure must be determined. » Evaluate the degree of delegation & identify the responsibility centres. » Establish (both financial and non-financial measures) target for each measure. » Review KPI targets (Key Performance Indicator) and take corrective action (if required).

5 Divisional Performance Measures

If organization is divisionalised then performance also needs to be measured at the division level for each division.

⇓

To measure divisional performance certain measures or indicators need to be established.

⇓

A Good Performance measure should be-

- Provide reasonable incentive to divisional manager on meeting KPI (Goal Congruence)
- Include factors for which manager can be held accountable
- Recognize long term as well as short term objectives

5.1 Divisional Performance Measures

- **Pure Financial (Financial Performance Measures)**
  - Return on Investment (ROI) — A
  - Residual Income (RI) — B
  - Economic Value Added (EVA) — C
- **Other Measures (Financial, Non-Financial & Social)**
  - Triple Bottom Line (TBL) — D
  - Balanced Scorecard — E
  - The Performance Pyramid — F
  - Building Block Model — G
  - The Performance Prism — H

Scope of Non-Financial Performance Indicator (NFPI)

In today's environment it is important to consider sustainable performance in all functional areas.

Management of Human Resources	Product and service quality	Brand awareness & company profit
Monitor & control staff in term of: Staff Turnover Absentee Rate Result of Job Satisfaction Survey	**Qualitative Product & Service;** That can beat rival's product & Full-fill need of customer	**In term of:** Value of brand with high loyalty Perceived Quality R&D image Brand awareness

6 Financial Performance Measures

Return on Investment

- Divisional profit as a % of assets. Measures gain/loss generated by initial investment

⇩

Used to influence financial decisions, compare company's profitability & analyze investments

⇩

The Formula for calculating ROI:

$$ROI = \frac{NPAT}{CE}$$

Where : NPAT = Net Profit After Taxes
CE = Capital Employed

⇩

Points to be kept in mind:

Instead of focusing on absolute size of divisions profit, company focuses on ROI
- Provides relative profitability.
- Useful for divisions of different sizes.

⇩

Limitation of ROI
- Against goal congruence & promotes individual profitability instead of company's profitability.

Residual Income

Used to overcome disadvantages of ROI

⇩

Amount left over operating profit after paying all cost of capital used to generate revenues

⇩

The Formula for calculating RI:

$$RI = OI - OE - \left(\text{min. reqd. return} \times \text{operating assets}\right)$$

Where : OI = Operating Income
OE = Operating Expense

⇩

Points to be kept in mind:
- Provides absolute profitability
- Promotes goal congruence
- There is a greater probability that managers will be encouraged when acting in their own and company's best interest.

⇩

Limitation of RI
- Two companies different in size of sales/ assets should not be compared using RI because large division is more likely to earn a larger RI then a small division.

Economic Value added

Stakeholders can decide that the Company is generating or destroying their wealth

⇩

Measures based on residual wealth calculated by

Operating Profit- COC

⇩

The Formula for calculating EVA:

EVA = [NOPAT - (Invested Captial x WACC)

Where : NOPAT = Net Operating Profit After Taxes
Invested Capital = ESH + R&S + PSH + Debt
WACC = Weighted Average Cost of Capital

⇩

Points to be kept in mind:
- If profit after interest and tax is given; add back interest (Net of Tax)
- Opening Capital employed should be taken
- Add back non cash item and accounting depreciation if included in operating profit.
- Deduct economic depreciation
- Accrued Tax: Add Back -Tax Paid: Deduct
- Deferred revenue expenditure (Advt., R&D) if debited in P/L should be added back.
- If previous year adjustment are not done for non cash item/ PFDD/ Deferred revenue exp. (R&D) then add back in opening capital employed also.

⇩

Limitation of EVA
- An absolute measure hence comparison of performance between enterprises of different size not possible.
- Largely based upon historical data.

How to increase EVA

NOPAT	Increase	Increase more than Capital Employed	Keep as it is
Capital Employed:	Keep as it is	Increase	Remove unwanted capital employed

In EVA show

$$WACC = \left(\text{weight of equity} \times \text{cost of equity}\right) + \left(\text{weight of debt} \times \text{After tax cost of debt}\right)$$

In EVA

EBIT
(-) Int.
EBT
(-) Tax
EAT
(+) Int. (Net of Tax)
NOPAT

Non-financial Performance Measures

7 Triple Bottom Line (TBL)

Sustainable development concept led to development of TBL.
(SD Means: Economic development without depleting or harming natural resources.)

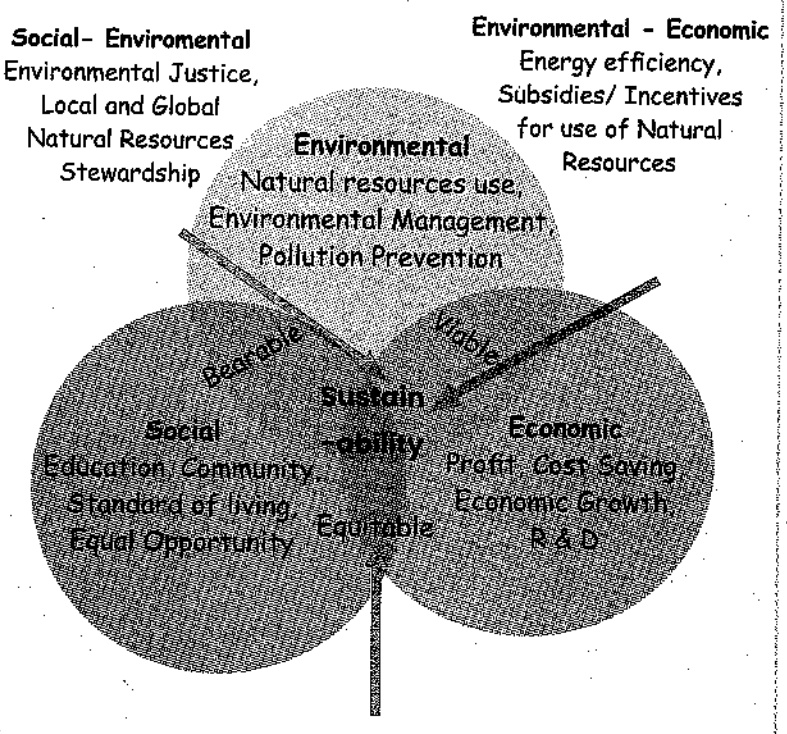
TBL meets the needs of the product without compromising the ability of future generation to meet their own needs.

7.1 TBL incorporates three dimension-

- **Environmental (Planet)-** Measures the impact on resources (no use of plastic bag).
- **Social (People)-** Relates to corporate governance, motivation, incentives, health and safety, human capital development, human rights and ethical behaviour (not using child labour).
- **Economic (Profit)-** Refers to measure maintaining or improving the company's success (Sales/ ROI/ Profit).

To measure performance of business decision in economic terms we consider only one bottom line i.e. profit, but to consider sustainability of business decision there are three bottom lines i.e. People, Planet and Profit.

7.2 The Three Spheres of Sustainability



8 Balance Scorecard (BSC)

A performance measurement system that considers not only financial measures; but also customer, business process and leaning measures.

The BSC translates the organisation's strategy into 4 perspectives, with balance between the following:
(1) Internal & External Measures,
(2) Objective & Subjective Measures
(3) Performance result & Drivers of future result.

8.1 Benefits of Balance Scorecard

- It links performance measures to key elements of a company's strategy.
- Requires balanced consideration of all four perspectives to prevents improvements in one area at the expense of another.
- It considers financial & non-financial measures & goals & both internal & external factors.
- It attempts to identify the needs and concerns of customers.

8.2 4 Perspectives of BSC

Financial Perspective

"How Do We Look To Shareholders?

⇩

Revenue & earnings (ROI, Growth, Cost Management, Profit Margin)

⇩

Link business objectives to corporate strategy.

⇩

Value for Shareholder (EVA)

⇩

Cash flow (survival & sustain).

⇩

Strategies Objectives:

- Profitability,
- ROCE

Customer Perspective

"How Do Customer View Us?"

⇩

Identify customers and market segments in which they compete

⇩

Quality: Customer satisfaction

Delivery time: On time, on site, after sales support.

⇩

Return on complaint, repeat buyer, customer loyalty/ retention.

⇩

Focus on quality, delivery time, performance, service, exceed customer expectation.

⇩

Brand retention

⇩

Strategies Objectives:

- Zero Recall
- Stock-out

Internal Business Perspective

"At What Must We Excel?"

⇩

Improve operational, efficiency and minimize problems.

⇩

Customer relationship manager

⇩

Fast business decision and approvals

⇩

Work culture and employee confidence

⇩

Cross selling

⇩

Reduce time on NVA

⇩

Strategic Objectives:

- TQM/ TPM
- Zero Idle Time / Critical Success Factor.

Learning and Growth Perspective

How Do We **Improve** and **Create Value**

People (Employee capacity) | System (Information system) | Organisation procedure (R & D Setup)

⇩

- Long term growth & sustainability
- Eco-friendly product line
- New customer centric products.

⇩

Strategic Objectives:

- Expansion of Eco-friendly product line
- Introduction of limited edition items.

8.3 The Results and Determinants Framework For BSC (CSF/ KPI)

Perspective	Strategic Objective (CSF)	Measure (KPI)
Financial Perspective	• Improve ROI • Increase Sales	• % increase in ROI • % increase in sales
Customer Perspective	• Improve brand recognition • Customer retention	• % of target audience who recognize brand • %of suggestions/ complaints responded • % increase in repeat customers/ Number of repeat customers
Internal Perspective	• Improve in product quality • Improve on time delivery to customers • Reduction in time spent in non-value added activities	• % reduction in defect rate • % of orders on time • % increase in MCE
Learning & Innovation	•Technology leadership •Skill development	• Spend on R&D • Training hours undergone

9 Performance Pyramid

(Strategic Management & Reporting Technique)

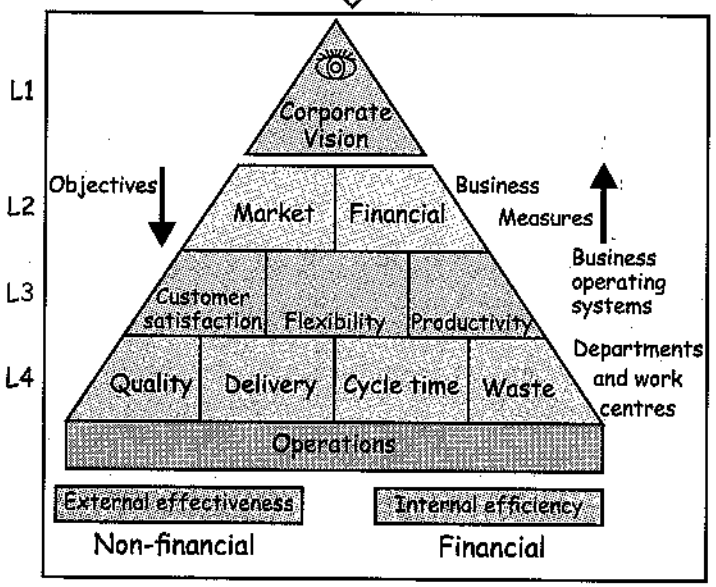
⇩

It focuses only on shareholder and customers

⇩

It links the business Strategy with day- to-day operations

⇩



9.1 Structure

- Long term success & competitive advantage (L1)
- At corporate level,Financial & market objective are set.(L2)
- At strategic business unit level, strategies are developed to achieve these objectives. (L3)
  (1) Customer Satisfaction
  (2) Flexibility (Effective communication between department)
  (3) Productivity
- Supported by specific operational criteria at departmental level. (L4)
  (1) Quality: Achievement of designed quality standard in % terms, cost of after sales service.)
  (2) Delivery: (Goods achieving planned delivery date.)
  (3) Process Time: Lower cycle time
  (4) Waste: Reduce idle machine capacity

⇩

"Objectives" are from top to bottom

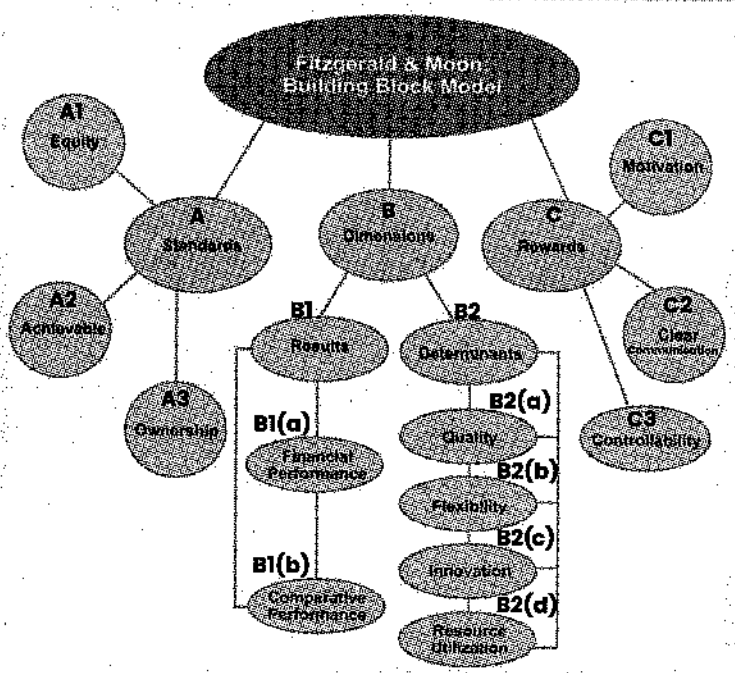
"Measures" are from bottom to top

⇩

Note: Performance pyramid focuses only on shareholder & customer.

10 Building Block Model

Fitzgerald and Moon proposed a Building Block Model which suggests the solution of performance measurement problems in service industries. But it can be applied to other manufacturing and retail businesses to evaluate business performance.



STANDARD	REWARDS
A1 - Equity Equally challenging for all parts of business.	**C1 - Motivation** Set in manner which motivates employees to achieve business goals.
A2 - Achievable Should be realistic if targets are impossible; employee will not be motivated.	**C2 - Clear** Scheme should be clearly communicated to employees in advance.
A3 - Ownership Acceptable to everyone. Employees should be involved in process rather than being imposed on them.	**C3 - Controllability** Rewarded or penalized of result over which they have control or influence.
RESULTS	**DETERMINANTS**
B1 (a) - Financial Performance (monetary terms) Used to identify areas of strengths and weaknesses, in respect to Sales, Costs, ROI & Profit.	**B2 (a) - Quality** Ability to deliver goods & services with consistency. Quality should be enough for a product price paid.
B1 (b) - Competitive Performance How they stand in comparison to its competitors?	**B2 (b) - Flexibility** Responsiveness to change in the factor influencing the business performance.
	B2 (c) - Innovation Ability to devise new product and new ways of doing things.
	B2 (d) - Resource Utilization Ability to use resources to achieve business objectives.

10.1

	Dimensions of Performance	Types of Measures
Results	Competitiveness	▪ Relative Market Share and Position ▪ Sales Growth ▪ Measures of the Customer Base
Results	Financial Performance	▪ Profitability ▪ Liquidity ▪ Capital Structure ▪ Market Ratios
Determinants	Quality of Service	▪ Reliability ▪ Responsiveness ▪ Aesthetics/appearance Communication ▪ Cleanliness/tidiness ▪ Comfort ▪ Friendliness ▪ Courtesy ▪ Competence ▪ Access ▪ Availability ▪ Security ▪ Communication
Determinants	Flexibility	▪ Volume Flexibility ▪ Delivery Speed Flexibility ▪ Specification Flexibility
Determinants	Resource utilization	▪ Productivity ▪ Efficiency
Determinants	Innovation	▪ Performance of the Innovation Process ▪ Performance of Individual Innovations

11 Performance Prism

BSC (Balance Scorecard) focuses only on customer & shareholder whereas here the focus is on all stakeholder (i.e. Investors, Customer, Employee, Government, Suppliers)

Focus on requirement of all stakeholders and their needs.

11.1 6 interrelated facets of Performance Prism

1 Stakeholder satisfaction

- "Who are the stakeholders and what do they want and need?
- Identify & give importance to "All Stakeholder"
  - (i) Investors: Return on Investment
  - (ii) Suppliers: Better price for products.
  - (iii) Customer: Quality products at cheaper price
  - (iv) Government: Timely taxes revenues.
  - (v) Employees: Work life balance, Safe & Secure Environment
  - (Employee T/o ratio, Employee duration)

2 Strategies

- 'What strategies we require to ensure that the wants & needs of our stakeholders are satisfied?'
- Identify those strategies which organisation would adopt to ensure
  - Wants and needs of stakeholders are satisfied
  - Organsation's own requirement are satisfied
- Appropriate communication
- Implementation
- Continuous evaluation
- Eg: For employees: better pay/ working condition/ growth opportunity

3 Process

- "What are the processes we have to put in place in order to allow our strategies to be delivered?"
- These are: Develop new products, generate demand, fulfil demand, plan and manage the enterprise.
- For each processes, it should be possible to identify specific measures.
- **Sub-Process:** Assign and give responsibility to process owners
- Focus on most important processes.
- Continuous evaluation

4 Capabilities

- "What are the capabilities we require to operate our processes?
- Resource, practices, technology, infrastructure: for all processes
- Company must have right capability and keep on developing throughout organisation

5 Stakeholder's Contribution

- It recognises the fact that not only do organisations have to deliver value to their stakeholders, but also that organisations enter into a relationship with their stakeholders which should involve the stakeholders contributing to the organisation.
- "What the organisation expect from stakeholders to contribute and deliver?
- Quid Pro Quo: 'Something in return'
- Suppliers: Provide quality raw material
- Government: Provide best infrastructure, hospitals and economy.
- Investors: Remain invested
- Customers: Purchase our product and contribute to revenue and profit.
- Employee: employees offer **ideas & suggestion,** remain loyal, develop expertise.

11.2 Financial Performance Measure

Advantages

- Focus on financial objectives.
- Such measures are objectives.
- Quantification of results is possible.
- The measures are comparable.
- Framework to measure financial performance is established in most of the cases.

Disadvantages

- Focus on short term profit & ignores long term sustainable growth.
- Measure can be distorted by inflation.
- Financial information might be manipulated.

11.3 Non-Financial Performance Measure

Advantages

- Help business to measures both Financial or Non-Financial areas.
- Focuses on qualitative aspects.
- Have a long term view.

Disadvantages

- Require huge amount of information to measure each area.
- Such measures are subjective.
- Measures of quality are difficult to measure.

11.4 Benefits of Performance Measurement

- Develops agreed measures of activity
- Clarifies the objectives of the organization
- Greater understanding of process
- Facilitate comparison between divisions
- Promotes accountability to stakeholder
- Setting of targets for managers
- Facilitate comparison between different organizations

11.5 Performance Measurement - Problems

Tunnel Vision	Sub - Optimization	Myopia	Misrepresentation	Misinterpreting	Ossification	Gaming	Irrelevance
Under focus on few performance measure to the detriment of other areas.	Focus on individual objectives at the expense of overall objective organisation.	Focusing too much on short-term measures and not looking long-term	Incorrect communication and presentation of data.	Intention to deceive by presenting the information in complexity making it difficult to decode.	Keeping of out of date measures and ignoring dynamics of current business environment	Deliberate attempt to distort the measure in advantageous position.	Business managers focus on irrelevant measures.

12 Benchmarking Schemes

Intend to be the best of the best (Xerox, Ford, Motorola) for improving their competitiveness and effectiveness. Continuous improvement in performance.

⇓

Comparing a firm's products, services or activities against the best performing organization; either internal or external to the firm

⇓

Objective is to find how the products can be improved

⇓

Driving force to establish high performance & means to accomplish goals.

13 Performance Measurement in Not for Profit Sector

NPOs are formed for certain specific mission & objectives, generally for social causes, environmental causes, charitable causes, etc.

Key Characteristics

- Established for charitable, welfare, social, environmental & mutual co-operation activities as principle operation
- Required amount of funds to arrange a set of resources for attainment of above purposes
- Getting funds from members rather than shareholders, it is important here to note judiciary relation towards contributors still exists.
- Since purpose is not to earn profit, not allowed to distribute surplus among stakeholders

13.1 Need of Performance Measure in NPO?

Key challenges

1) Difficult to quantify cost & benefits

Difficult to quantify due to Nature & Timing of benefits

- There is time gap between cost incurred & benefits accrued
- Can be measured only in terms of utility or satisfaction

2) Performance & commitment of State

Engaged in functions with high public importance but are primary responsibilities of state

3) Multiple Objectives

A single NPO may have diverse stakeholders to deal with & has it's own need . This will cause multiple objectives. (Prioritization is key)

4) Measuring the utility of funds

NPOs don't earn to spend, they just budget to spend. Spending excessively without purpose may not create utility. (Value for money framework should be used)

Student Notes:

Models for Measuring the Performance

14 Value for Money (VFM) Framework

Used for measurement of performance in NPOs, and are expected to provide best possible value from available money. It ensures

Effectiveness (spend wisely)	Efficiency (spend well)	Economy (spend less)
Whether organisation has achieved it's desired mission & objectives?	Whether resources and funds available to the organisation been utilised efficiently?	Whether the appropriate quantity and quality of inputs is available at the lowest cost?

Note: Additional 2E's = Equity (Spend Fairly) and Ethics (Spend properly).

(Example of VFM framework in School)

Effectiveness	Efficiency	Economy
• Quality education to all students. • Number of students dropping out. • Number of students completing education.	• No. of students trained/ hour. • Students to teacher ratio should be low.	• Amount spent on maintaining school premises. • Remuneration to teachers.

15 Adapted Balanced Scorecard

Performance measurement – Problems

Customer Perspective	Financial Perspective	Internal Process Perspective	Innovation & Learning Perspective
Satisfaction of (Market Growth) beneficiary and other stakeholder's interest.	Fund raising, funds growth and funds distribution	Internal efficiency, volunteer development and quality.	The capability of organisation to adjust to the changing environment.

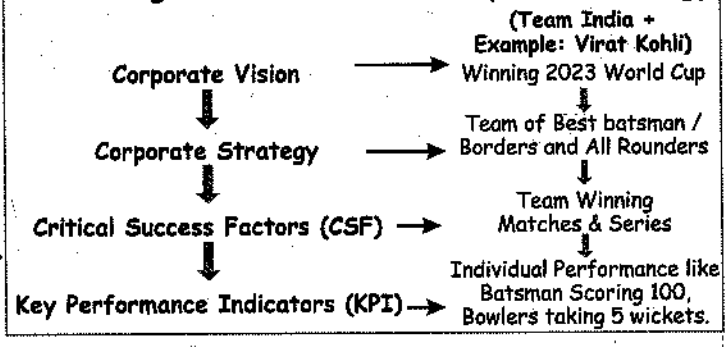
CSF / KPI / SMART

SMART Objective

Even objectives of organisation also need to be SMART.

Specific → should be clearly defined;
Measurable → have means to quantify;
Achievable → can be achieved i.e. should be realistic;
Relevant → relevant to the organization 's strategic goals;
Time → Constrained have a designated start and end dates.

Linking CSFs to KPIs and Corporate Strategy



Corporate Vision - It tells us 'where' to go i.e. Destination
Corporate Strategy - It tell us 'how' to reach the destination i.e. Path to be followed

Critical Success Factors (CSF) - It tells us 'what' to do i.e. Goals to be achieved
Key Performance Indicators (KPI) - It helps us to measure how far we have achieved the goal.

CASE STUDIES

16 Case Study 1 – Triple Bottom Line – Vidyut Dam Project (Case Study Digest- CS #14)

ISSUES	• Vidyut Dam Project

CONCEPT

As part of policy initiative, if VHDCL is willing to implement the Triple Bottom Line (TBL) reporting initiative; then ADVISE the management regarding dimensions of TBL, and what are perspectives composed by different dimensions of TBL. Also, enumerate the challenges, expected benefits, and initiatives under each dimension in context of Vidyut Dam & Vidyut Hydroelectric Power Plant (1,000 MW).

EXPLANATION

TBL = Focus on People, Planet and Profit for sustainability (long term survival) of business.

VHDCL = Certification: CSR Commitment for quality, environment & safety.
Awards: for CSR & Training

People (Social Equity)

(Corporate Governance, Motivation, Incentives, Human Capital Development, Human Rigths, Ethical Behaviour, Health and safety.)

Major - Concern	Remedies	Other Points
• Displacement of Town inhabitants. • Reduction in flow of river • People lost their lands but how allotted of poor quality.	• Development of Hill station / lakes/ hotels. • Better Road Network for ease of living & communication. • Shifting of district head quarter. • Improved Health facilities (80 bed hospital). • Education facilities (900 students).	• Water supply to neighbouring state. • Distributuion of power as well.

Planet (Environment)

• Environmental consequences of locating Dam in Work Ecosystem. • Catastrophed region resulting in Dam-break.	**Scope of Improvement** • Rainwater Harvesting: 9 lakh litres • Green Energy Generation & Technology promotion: (LED based solar lights) • Environment Protection: (Lots of Plantations)

CONCLUSION	The project largely seems sustainable as running in profit since it was operational, leaving minimal and positive environmental footprint, and also payback to society (especially directly affected local population) with alternate better facilities and compensation (may be with few minor exceptions or irregularity on case-to-case basis).

17 Case Study 2 – Triple Bottom Line – PSL (Paper Solutions Ltd.) (ICAI Module CS #19)

ISSUES

- Paper Mill producing writing paper. Mill located in small town where Eucalyptus trees grow in plenty.
- Farmers get lively hood from tree plants by providing raw material to paper mill
- 40% staff are from local community
- Overall growth leading to sustainable business.

CONCEPT Inform benefits of TBL report and how you can give back to the society community.

EXPLANATION

Traditional Accounting:

Single bottom line (i.e. Net Profit) focus, calculated by reducing costs from revenues. So financial aspects are totally covered in Annual reports of the company. So emphasis is higher on monetary aspects.

CONCLUSION

TBL Report (Triple Bottom Line)

S:Social (People), E:Environment (Planet), E:Economic (Profit)

- TBL focus on addressing non monetary interest of all stakeholders.
- Create sustainable initiatives that will be highly beneficial in the long run.
- Helps stakeholders make informed assessment of opportunities and risks that company faces.
- Overall business strategy should be linked to TBL reporting, and garner goodwill for the company.
- Project Sustainable as it is profitable; with minimal environment footprint; Alternate facilities and compensation.

18 Case Study 3 – Balance Score Card – Fair Limited (ICAI Module CS #16)

VIDEO START AT 1 HR: 27 MIN

ISSUES

- Manufactures & Sells Motor Vehicles in India and Globally.
- 10,000 employees on Fixed Salary and PRP (Performance Related Pay)
- 2 lakh vehicles recalled on account of quality issues like faulty gearbox.
- Company penalized for selling vehicles which does not meet the emission norms.
- Recall on account of lower quality material to save cost on account of Performance Related Pay
- Board concerned with Reputational risk, issues and lowering profits

CONCEPT

Concept → Advantage & Disadvantages → Financial measure

Concept → 2 CSF's, 2 KPI's → Non financial Measure

EXPLANATION

Financial Measure (Focus on profits made by a business and financial results.)

Advantages
- Objective of wealth creation
- Easy to compare with other companies
- Measurable financial performance

Disadvantages
- Ignores long term growth
- Distorted by inflation
- Easy to manipulate

Non-Financial Measure

Disadvantages
- Highly subjective
- Difficult to compare
- Not measurable

Advantages
- Takes long term view
- Qualitative aspect considered
- Measures every area

CONCLUSION

Non-Financial Measure

Balance Scorecard

Financial	Customer	Internal Business	Training & Growth
Focus Revenue, profit, cost control	Customer satisfaction and On time delivery	Business Systems & Process	Technology and new stuffs Employee Training

	CSF	KPI
Financial	Most profitable company	Revenue, profitability ratios
Customer	No 1 choice of customer	No. of vehicles sold / Vehicle recalls
Internal Business	TQM, Zero iddle Time	No. of defective cars produced / Faulty production
Training & Development	Skill Development, Upto date Technology	Amount Spent on R & D / New Modules Launched

20 Case Study 5 - Case Study Performance Prism - Galaxy Limited (ICAI Module CS #14)

ISSUES	• Business of Logistics & Distribution. • Already implemented Balance score card and doing good in financial performance customer service and innovation. • But company facing high employee turnover as no focus on employee development. • Too much work pressure. • Truck drivers are also on contractual basis, not entitled to retirement bonus or anything.

CONCEPT	**Alternate Performance Measurement Mechanism** Performance Prism by Andy Neely & Chris Adams. Considers all stakeholders; like employees, suppliers, government, creditors etc. .

EXPLANATION & CONCLUSION

5 Facets

Stakeholder Satisfaction	Contribution	Strategy	Processes	Capabilities
Identify all stakeholders and determine its relative importance (Employee + Truck drivers).	Efficiency of employees Productivity On time Delivery	Wants & Needs of stakeholders must be satisfied (efficiency of truck drivers if they are on full time employment).	Measures to evaluate each process of organization.	Have proper Technologies & Infrastructure

All 5 Facets of Performance Prism are interlinked and must support each other.

Student Notes

19 CASE STUDY 6 – Building Block Model – Bhalla & Singh LLP – Case Study Digest– CS #2

ISSUES

- Bhalla & Singh LLP: An Accounting Firm offers accountancy, assurance, tax consultancy, business advisory services
- Performance related data (Last FY)

Particulars for BS LLP	Accounting	Audits	Tax Consultancy	Business Advisory
Revenue (In Crores)	690	846	145	34
Growth of revenue over previousyear	2%	9%	3%	18%
Net profit ratio	5%	4.3%	6.7%	9.8%
Revenue (In Crores) of Accounting Industry as whole	2,518	5,430	1,652	286

- Remuneration of Partners (Fixed contract + share in profit) & Non partners (Fixed salary + Variable, depending upon rating)
- Ratings

Particulars for BS LLP	Accounting	Audits	Tax Consultancy	Business Advisory
Customer Ratings (higher the better)	3.6	3.2	3.1	4.5

- Large numbers of business are entering into either internal/ external reconstruction; resultantly advisory services are in huge demands.

CONCEPT

(i) List **essential components** of any performance management system. (theory)
(ii) Describe **Building Block Model** of performance management. (theory)
(iii) Evaluate firm's existing performance management system from perspective of **3 essential aspects** of Building Block Model. (Case based)
(iv) **Advise the main improvements** that introduction of a Building Block approach can bring to BS LLPs' performance management system. (Case based)
(v) Building Block Model **(3 concepts - Dimensions, Standards, Rewards)**

EXPLANATION

(i) Essential Components of Performance Management System Established (FRSR)

- Functional and divisional organization's structure (hierarchy levels)
- Responsibility centers and persons
- System to identify KPI and establishing yardsticks
- Review system against standards & take corrective step

(ii) Building Block model (developed by Fitzgerald and Moon) **should be based on 3 concepts:**

- **Dimensions** (sets - Results & Determinants)

EXPLANATION

- **Standards** (properties - Ownership, Achievability & Fairness)
- **Rewards** (properties - Clarity, Controllability & Motivation)
  (Students can draw and explain theory)

(iii) Evaluation of Existing Performance Management System

Does not focus upon determinants by BBM	Only based on Financial Performance

Further Evaluation

Dimensions		Reward System
Financial	Competitive	• Criteria of rating & weight not mentioned clearly causing de-motivation. • Profit of respective division not clear & controllable.
Change in Net Profit, Revenue.	Compare with industry revenue & calculate market share.	

(iv) Advise to Improve the Performance Management System
(All dimensions and critical success factors should be measured.)

Flexibility	Resource Utilization	Innovation	Standard	Reward System
Delivery of service, manner and timing of delivery.	• Check staff productivity • Hourly rate charged and paid	Use IT tools New range and category of service.	Use BBM to keep it achievable and fair. (Financial & Non fianancial)	On controllable factors for partner and non partner staff. • Partner: Share in profit • Non Parter: Variable salary based on productivity.

CONCLUSION	• Out of 4, initial 2 questions are theoretical and can be handled in any case scenario. The rest depends on analysis of case. • Building Block Model is simple to understand and the analysis rotates around 3 concepts ie. Dimensions, Standards, Rewards. The existing system has its own way of measuring performance; hence the helpful points should be highlighted and areas where scope of this model can be used should be noted as improvements.

20 Case Study 7 - TBL in Fashion (Clothing) Industry(Case Study Digest - Case Scenario #8)

ISSUES

- Next Gen clothing (NGC) - Fashion Industry
- NGC had no history of reporting sustainable efforts to build up a strong environment to work in.
- The community focused on the form rather than the substance of it.
- Production of cotton involves enormous water usage
- Viscose derived directly from wood pulp and converted into cloth by application of chemicals and water.
- It kept overlooking the brutal effects of producing cotton and viscose in local farms which was the primary source of raw material for NGC
- Destructive impacts on environment that NGC is bringing to their plate.

CONCEPT Triple Bottom Line

EXPLANATION

i) Sustainability: Environment Ethical means of (Fashion Industry) producing wearables. (eg: clothes, footwear). Think beyond fashion and ensure Ecological balance (People, Planet, Profit).

ii) Application of TBL Report:

Planet Environmental

Producing Quality Material	Use Organic Material & Safety	Recycle	Producing Poly Clothes
• Use cheap material of less Quality. • NGC: Long Lasting Textile materials of Premium Quality.	• Organic Material reduce use of pesticides & other toxic material. • Will provide health relief. • Use of water to be kept in mind.	• Entice customers to turn over used clothes. • Exchange used clothes for new ones @ 20% discount. • Helps in reducing carbon gases.	• Use Recycled Polyester materials. • Reduce use of Plastic. • Poly = Less Ecological impact / Easily Recyclable/ Consume less water.

Social : People

Awareness among customers	Compliance to Labour laws	Reducing use of Water Consumption
• Discard clothes at right time and place to make it reusable. • Used clothes should be disposed in an Environment amicable manner.	• Use of low Quality machines = Accidents + Legal liabilities + Reputational Risk. • No use of children for manufacturing or against local labour laws.	• Using JIT approach. • Use controllable production of RM on need basis and limited quantities. • Restrict flow of hazardous chemicals into rivers.

CONCLUSION

Hire Expert for presentation and preparation of sustainability Report.

- Support International needs of All Stakeholders.
- Will provide Reputational advantage and competitive edge over competitors.

MASTER SUMS

21 Question 1 (Sum on Building Block Model)

The Soup Ltd. offers a range of beauty parlor services like hair care, body care, manicures/ pedicures, skincare, etc. It has 150 Centre/s across the country. The business of beauty parlor is extremely competitive in all region. Each centre operates autonomously and managers are able to offer customize services. Soup's mission statement is "to inspire and enhance beauty by using knowledge and experience". To establish long term relationship of trust and commitment with clients, Soup wants to provide their client highest level of satisfaction with emphasis on-

- Service Customization
- Professionalism, Work, and Clinical Responsibility
- Client's Feedback

Company has developed a website where it creates blogs, post high-quality content related to beauty tips. Website is also connected to social media to reach customers. If a customer searches Soup's services on search engine, it automatically redirects to the place of nearest service center. Soup's all services are presently booking through online channel.

Results for one of the centre, "Roop", are given below. The column headed "Centre" shows the average figures for all Centre/s:

Particulars	Roop Oct'20	Centre Oct'20
Revenue (Rs.)	91,26,000	1,08,66,900
Gross profit (Rs.)	48,50,400	51,37,740
Number of senior Beauticians	90	110
Number of junior Beauticians	60	55
Number of website hits	15,010	19,260
Total number of services booked online and completed	9,915	12,270
Number of services taken from repeat customers	1,510	1,605
Total time spent completing jobs (hours)	24,120	25,880
Number of new service packages	3	2
Customer percentage in terms of feedback forms showing score of 9 or 10	86%	77%

Notes

(1) Beauticians are categorized as 'senior' if they have been qualified for more than three years.

(2) 'Junior' Beauticians includes both trainee beauticians and beauticians who have been qualified for less than three years.

(3) The Roop launched three new service packs during the year:

- free coupon of worth Rs. 600 for services over and above Rs. 1,200.
- a head massage costing only Rs. 240, instead of the usual Rs. 480, for 10 days advanced bookings.
- a haircut Rs. 120 will be charge, which usually costs Rs. 360, for all customers booking hair spa.

These three new service packs produced revenues of Rs. 7,92,000; Rs. 6,96,000 and 6,48,000 respectively. Two comparable new service packs developed by other centre/s produced revenues of Rs. 5,28,000 and Rs. 5,04,000.

(4) Customers to rate the particular centre from 1 to 10 in an online feedback form with 10 being the best.

Required

The Chief Executive Officer (CEO) of Soup has recently attended a webinar and heard about Building Block Model of Performance Management. The CEO is interested to know how the dimensions block could be applied at Soup Ltd.

(i) ANALYZE Roop's performance relative to the other Centre/s.
(ii) EXPLAIN how the Standards and Rewards blocks support the Dimensions block in case of Building Block Model.

Solution

(i) Analysis

Competitiveness

	Roop	Centre/s Average
Website hits converted into orders (in percentage)	66.06% (9,915/15,010) x 100	63.71% (12,270/ 19,260) x 100

This ratio shows whether Roop's services are attractive compared to its competitors, which is essential if it is going to persist in such a competitive market.
It has performed considerably better than Centre/s average, having converted 66.06% of website hits into jobs, compared to the 63.71% converted by other Centre/s. This is a good outcome.

Financial Performance

	Roop	Centre/s Average
Gross profit ratio	53.15% (48,50,400/ 91,26,000) × 100	47.28% (51,37,740/ 1,08,66,900) × 100

Gross profit ratio is the measure for financial performance. It indicates the percentage of revenue which exceeds the cost of goods sold. Roop's gross profit ratio is 5.87% higher than the average, which is a good result. This could be because of new service pack sales. It is also likely to be because of ratio of senior beauticians to junior beauticians (1.5), which is lower than the average (2) and junior beauticians will invariably be paid less than senior ones.

Quality of Service

	Roop	Centre/s Average
Jobs from repeat customers (in percentage)	15.23% (1,510/ 9,915) × 100	13.08% (1,605/ 12,270) × 100

Quality is a key aspect of Roop's service to customers and if it is poor, customers will not return.
Again, Roop has surpassed the other Centre/s on average by 2.15 percentage points. Though, it has a lower ratio of senior beauticians to junior beauticians (1.5) than other Centre/s (2), it might be possible that Roop has a portfolio of enthusiastic staff. So, the quality of work is probably better, thus the higher level of repeat customers.

Flexibility

	Roop	Centre/s Average
Time taken per job (hrs.)	2.43 (24,120/ 9,915)	2.11 (25,880/ 12,270)

The comparison shows that Roop takes longer time to complete a job than the other Centre/s average, which is not really good, and is probably because of they have slightly less experienced staff on the whole, but it could also be that they do a more comprehensive job than other Centre/s. Given the fact that they have a higher % of return customers than the other Centre/s and they are also graded 9 or 10 by most of the customers (86%). Therefore, this cannot be viewed as too adversely.

	Roop	Centre/s Average
Revenue per beautician (Rs.)	60,840 (91,26,000/150)	65,860 (1,08,66,900/ 165)

The crucial resource in a service company is its staff and so these indicators measure how this resource is being utilized.

Roop's utilisation of its staff is lower than that of the other Centre/s by Rs. 5,020 per beautician. This clearly links in with the point that the average time to complete a job is longer at Roop than other Centre/s. However, given that Roop uses a slightly less experienced staff than other Centre/s and the fact that its gross margin is higher than the average, this should not also be viewed too adversely.

Innovation

	Roop	Centre/s Average
Revenue generated From new service packs (in percentage)	23.4% {(7,92,000 + 6,96,000 +6,48,000) / 91,26,000} × 100	9.5% {(5,28,000 + 5,04,000) / 1,08,66,900} × 100

Roop is offering a wide variety of service packs to its customers. The ratio of 23.4% indicates that Roop has really outperformed other Centre/s on this front, generating a far larger part of its revenue by the introduction of new service packs, which must have attracted customers. This is a really good performance.

(ii) The **standards** block fixes the target for the performance indicators chosen for each of the dimensions. The targets must meet three criteria - they must be achievable, fair and encourage employees to take ownership. The performance of the organization could suffer if the targets set do not meet these criteria.

The **rewards** block makes sure that employees are motivated to attain the standards. It also examines the properties of good reward schemes which are that they should be clear, motivating and based on controllable factors. If standards and rewards are set appropriately, the staff will be engaged and motivated and it is then more likely that the goals, i.e., **dimensions**, of the organisation will be achieved.

22 Question 2 (Balance Score Card + EVA)

NFC Limited is a company engaged in the manufacture and supply of forgings and castings for automotive and industrial applications. Automotive contributes to 60% of its revenues while the balance (40%) can be traced to industrial applications which amongst others include, Power, Oil and Gas and General Engineering. The company has an R&D set-up which includes new product development. The company recently concluded successfully a Long- Term Settlement with the workmen with an increase in productivity numbers in terms of output per man per day more than offsetting the increase in wages offered to workmen. The company has just completed (October 2018) its strategy and business planning exercise for Calendar year 2019 and beyond. The following is the data on 2018 (estimate) and the business plan for 2019.

Balance Sheet	Estimate 2018 Rs Million	Budget 2019 Rs Million
Equity	3,000	3,000
Reserves (Opening)	1,000	2,250
Transfer (Current year surplus)	1,250	730
Debt @10% (pre-tax)	2,000	1,500
Trade Creditors	600	700
Total	**7,850**	**8,180**

Plant and Machinery	4,000	3,500
Inventories	1,500	1,630
Debtors	1,600	1,770
Cash	750	1,280
Total	7,850	8,180
Profit and Loss Account		
Sales	9,000	10,800
Less: Expenses	6,000	7,000
Less: Depreciation	500	500
Less: Interest	200	200
Profit	2,300	3,100
Less: Tax @ 30%	690	930
Profit After Tax	1,610	2,170
Less: Dividend and Dividend Distribution Tax	360	1,440
Transfer to Reserves	1,250	730

Assumptions/objectives drawn up in the making of the strategy and business plan document are as follows:

1. To improve shareholder value by attempting to grow EVA substantially over 2018.

2. To de-risk exposure to few sectors further by looking at other diverse applications through new technologies, tie-ups etc. This could be in the areas of Defense and Aerospace or even new areas like Electric Vehicles which would be the future in the mobility space.

3. To keep investing in R&D to ensure that the company keeps pace with changes in technologies and in meeting customer requirements by developing new products in accordance with their needs

4. Financials:
   a. An increase of 20% in Sales has been assumed over 2018. This includes an expected market growth of 12%, 3% from a new product "NP" to a large manufacturer (a new customer) for 9 months in 2019. It is expected that the new customer will approve the product by March 2019 (3 months from January 2019 when the approval process will start) so that 9 months sale can be realized. It normally takes 5 months for the approval. The company expects the balance 5% growth from normal new products, new customers, improved service levels in terms of delivery etc. Capacity is sufficient, also aided by the productivity improvement from the Long-Term Settlement with the workers.
   b. Inventories: A reduction in number of days inventory held by 5 days has been budgeted. Without this reduction, the inventories would have been Rs. 1,800 Million as against Rs. 1,630 Million budgeted.
   c. Debtors: A reduction in number of days sales outstanding by 5 days has been budgeted. Without this reduction, the debtors would have been Rs. 1,900 Million as against Rs. 1,770 Million budgeted.
   d. Expenses have been budgeted at Rs. 7,000 Million taking into consideration cost savings. It should have been Rs. 7,500 Million taking into consideration, increased activity levels (Sales), cost inflation including the wage increase from the Long-Term Settlement but without cost savings.
   e. No reduction or increase in creditors budgeted except for the increase in activity levels (Sales).
   f. Repayment of debt Rs. 500 Million on 31st Dec 2019.

Required

Prepare a detailed Balance Scorecard & EVA (Cost of Equity 14%).

Solution

(i) Balanced Score Card

Perspectives	Objective	Measures	Targets	Initiatives
Financial				
EVA (Rs. Millions)	▪ Grow EVA	▪ Absolute	▪ Rs.1,435 Million	▪ Repay Rs. 500 Million of debt ▪ Reduce working capital ▪ Improve profit through top line growth and cost reduction
Working Capital	▪ Reduce working capital	▪ Reduce inventory and debtors by 5 days each	▪ 300 Million reduction (170 + 130)	▪ MIS on inventory and debtors on real-time basis ▪ Weekly short meetings on inventory and debtors to monitor and initiate actions to achieve targets
Customer				
New Products	▪ Increase over 2018	▪ As a % to Sales	▪ From x % to y %	▪ Meet *existing customers* with new product offerings ▪ Meet *new customers* and find out their requirements ▪ Participate in exhibitions
On time Delivery	▪ Increase over 2018	▪ % of deliveries on time to total deliveries	▪ From x % to y %	▪ Strengthen production planning and control process ▪ Leverage IT systems for accurate and timely information flow on orders, delivery dates

Internal Process				
Manpower Productivity	▪ Increase output per man per day	▪ As agreed under the long-term settlement	▪ From XX to YY	▪ Training of employees ▪ Improved communication ▪ Improved supervision
Cost Reduction	▪ Reduce cost of Production	▪ Raw material costs ▪ Outsourcing costs ▪ Overheads	500 Million Reduction	▪ Alternate sources for raw material ▪ Improve yields through *value engineering* ▪ *Make or buy* on certain high- cost outsourced components
				▪ Reduction in travel costs (use video conferencing), ▪ Monitor other costs to save
New Product Approval by Customer	▪ For expediting approval of "NP"	▪ Reduction in time taken for approval	▪ By 2 months	▪ Form a task force ▪ Weekly progress monitoring by CEO ▪ Use of PERT/CPM tools
Learning & Growth				
Train senior technical staff in new technologies (products for defense, aerospace)	▪ To keep pace with changing technologies and to de risk exposure to few sectors	▪ Timeline	▪ By MMYY (e.g., Dec 20)	▪ Specific training ▪ Participation in seminars on new technologies
Explore possibilities for tie-ups on products for Electric Vehicles.	▪ Future growth Through products for Electric Vehicles	▪ Timeline	▪ By MMYY (e.g., Jun 20)	▪ Appoint a consultant ▪ To look at possible partner ▪ Prepare a road map to achieve the objective

(ii) Rationale for each of the above perspectives:

a. EVA has been included under "Financial Perspective" as this is what the company intends to drive the same and it is a good measure of shareholder value as it takes into consideration cost of equity which a normal profitability metric ignores. Working Capital is included, as an improvement in the working capital measure would affect cost of capital and hence EVA.

b. New products and improvements in delivery times have been included under "Customer Perspective" as these have to be driven to achieve the sales volumes beyond normal industry growth. This will ultimately improve sales, profits and hence EVA

c. Manpower productivity and cost reduction have been included under "Internal Perspective" as these have to be monitored and further efforts taken to reduce other costs to achieve the cost reduction planned to finally achieve the profits required to deliver the EVA.

d. As the balanced score card is just not a short-term measure, initiatives on new products, technologies and new markets have been included in the "Learning and Growth" perspectives to plan for long term sustained growth and to ensure that the company stays relevant in a changing business environment.

(ii) EVA Calculations

Particulars	2018 (Est.) Rs Million	Budget 2019 Rs Million
PAT	1,610	2,170
Add: Interest adjusted for tax {Interest×(1-0.3)}	140	140
NOPAT	**1,750**	**2,310**
Capital Employed (see assumptions below)		
Equity (14%)	3,000	3,000
Reserves	1,000	2,250
Debt (10%)	2,000	2,000

Cost of Capital		
Equity (14%)	420	420
Reserves (14%)	140	315
Debt {10%×(1-0.3)}	140	140
Cost of Capital	**700**	**875**
EVA (NOPAT - Cost of Capital)	**1,050**	**1,435**

Assumptions

For 2018 estimated, Capital Employed is opening equity, reserves and debt. Similarly, for budget 2019, for calculating Capital Employed, opening equity, reserves have been considered.

Economic and accounting depreciation were assumed to be the same.

23 Question 3 (BSC - Balance Scorecard)

The CEO indicated that the Board wanted the company to grow double the turnover by 2024 with 2019 as the base. He wanted the CFO to make out a draft Balanced Score Card for 2020 addressing the challenges faced by the company and also its objective of doubling the turnover by 2024, so that this can be discussed with the Senior Management Team and finalized.

Required

You are a Senior Finance Manager of the company and the CFO asks you to draft brief report and he also provides you with newspaper reports on India's move towards BS VI emission norms, the India's plans to move to Electric Vehicles and also about the current slowdown faced by the economy including a severe one in the automotive industry.

	2019	2018	2017	2016	2015
Revenue growth over Previous year	8.1%	8.8%	9.7%	1.6%	---
Revenue (Rs. Cr.)	400	370	340	310	305
Expenditure (Cr.)	(359)	(326)	(297)	(277)	(265)
Operating Profit (Rs. Cr.)	41	44	43	33	40
Interest (Rs. Cr.)	(14)	(13)	(12)	(11)	(10)
Depreciation (Rs. Cr.)	(14)	(13)	(12)	(8)	(8)
PBT (Rs. Cr.)	13	18	19	14	22
Operating Profit %	10.3%	11.9%	12.6%	10.6%	13.1%
PBT %	3.3%	4.9%	5.6%	4.5%	7.2%

Additionally, the following information is to be noted:

1. Parts Per Million (PPM) has deteriorated to 115 in 2019 from the best of 25 achieved in 2017.
2. Working Capital turns (Sales/ Working Capital) have deteriorated to 34 times from 67 times in 2017.
3. The company also lost three of its customers who cited quality and price considerations.
4. The company's attrition at middle management was high at 13% compared to industry's 10%. The predominant reasons attributed to this are lack of challenging work and career growth prospects.

Solution

Report on Balanced Score Card for 2020 addressing the challenges faced by the company

The challenges faced by the company can be categorized as follows:

1. Financial: Declining profitability and hence reduced returns to shareholders. Possible causes; Declining sales growth, challenges in getting price increases, increasing cost of quality due to increasing defects (PPM), higher interest costs due to higher working capital.
2. Top-line (sales) related: Declining sales, slowdown in economy, dependence on auto industry, lack of- new products, new customers, and loss of customers.
3. Operations including procurement: Increasing PPM levels, input cost increases.

Balanced Score Card

Perspectives	Measures/ Targets
Financial Perspective	▪ Grow Sales by 10% (over 2019) by December 2020. ▪ PBT Margin for 2020 not to be less than 10%. ▪ NWC turns to be 60 by December 2020.

Customer Perspective	▪ Bring down PPM levels to 50 by March 2020. ▪ Bring down Cost of Product by 5% & share 50% with customer. ▪ Carry out a Customer Satisfaction Survey by March 2020 and implement actions by December 2020.
Internal Perspective	▪ Launch and adopt Total Productive Maintenance. 1. Complete training by April 2020, 2. Launch and adoption from May 2020 ▪ Form a cross functional team for working on, mon itoring and through reduction of inventory (reduce number of days improving NWC: FG from xx to yy), speedy collections (reduce number of days receivables from aa to bb), negotiating higher credit from raw material suppliers (increase credit from x to y days). ▪ Reduction in time to launch new products from xx days to yy days.
Learning and Growth	▪ Conduct a market study for entry into manufacture of gaskets for sectors other than automotive as a de-risking and growth strategy. Complete study by June 2020 a nd action viability study and CAPEX by December 2020. ▪ Revisit and rehash Human Resource Development program to bring in new talents, train existing resources on new technologies, new produ cts by June 2020. ▪ Adopt latest Information technologies for speedy and accurate data analysis and Management Information System for quick decision making, speedier internal operations and quick customer service.

Rationale for the above

1. Tasks included in the Learning and Growth perspectives will help the company's growth as it will de-risk the threat from Electric Vehicles which will eliminate the need for internal combustion engines used in fossil fuel driven automobiles. It will also enable the company to enter into other industries where gaskets find use. The Human Resource Development Program will address the dual challenge of attrition and making the current employees ready for new markets and technologies. With Information Technology space changing, adoption of new technologies will help the company staying ahead or in tandem with competition.
2. Including Total Productive Maintenance will help the company address quality issues and productivity of machines. This along with NWC initiatives will not only improve customer satisfaction but also improve bottom line.
3. Inclusion of PPM, cost reduction and customer surveys will improve Customer satisfaction, customer retention, bring in new customers and stop loss of customers
4. Inclusion of growth in sales targets will help achieve the company's growth objectives. Others like net profit improvement and improvement in NWC will automatically flow from the initiatives in the other three perspectives.

24 Question 4: (Performance Pyramid)

You are paid assistant working in SBCLLP - an accounts firm. You are received the following email from one of SBC's senior partner:

Analysis of the new proposal for the period 2020 to 2022 based on

- External effectiveness and
- Internal efficiency

Forecast of PEL's Financial and Non-Financial Data

Particulars	2020	2021	2022
Total market size (Rs. In lacs)	110	115	120
PEL Sales (Rs. In lacs)	18	21	23
PEL Total Costs (Rs. In lacs)	14.10	12.72	12.55
Production Achieving Design Quality Standards	95.5%	98.0%	98.5%
Returns form customers (% of Deliveries)	2.0%	1.0%	0.5%
Cost of After-Sales Service (Rs in lacs)	1.5	1.1	1.0
Sales Meeting Planned Delivery Dates	85%	90%	95%
Average Cycle Time (Customer Enquiry to Delivery) (weeks)	50	45	40
Components Scrapped in Production (%)	6.5%	4.0%	1.5%
Idle Machine Capacity (%)	9%	5%	1%

Required : Analysis of Contents of Performance Pyramid

Solution

A) External Effectiveness - The marketing success of the proposal is associated with the achievement of customer satisfaction. The success will need an efficient business operating system for all aspects of the cycle from product design t0 after-sales service to customers. Customer satisfaction is linked with Improved quality and delivery. Quantitative measures of these factors are as follows:

(i) Quality is expected to improve. The percentage of production achieving design quality standards is expected to increase from 95.5% to 98.5% between 2020 and 2022. In the same period, returns from customers for replacement or rectification should drop from 2% to 0.5% and the cost of after-sales service should drop from Rs. 1.3lacs to Rs.1.0 lacs.

(ii) Delivery efficiency improvement that is expected may be measured in terms of the rise in the percentage of goods achieving the planned delivery date. This percentage rises from 85% in 2020 to 95% in 2022

B) Internal Efficiency - The financial success of the proposal is linked to the achievement of high productivity. This should be helped through reduced cycle time and decreased levels of waste. Quantitative measures of these factors are as follows:

(i) The average total cycle time from customer enquiry to delivery should drop from 5 weeks in 2020 to 4 weeks in 2022.

(ii) Waste in the from of idle machine capacity is expected to drop from 9% to 1% between 2020 and 2022. Also, component production scrap is expected to drop from 6.5% in 2020 to 1.5% in 2022.

25 Question 5 (EVA)

Write a report to the chief executive officer to EVALUATE the accuracy of the EVA calculation and the assumptions.

Annexure 1

NOPAT

Particulars	Year ended 31st March 2021 Rs. in Lacs (L)	Notes
Operating Profit	1,102.80	
Add:		
Non-Cash Expenses	30.20	
Marketing Expenditure Capitalised	46.20	7
Less:		
Tax	269.60	9
Lost Tax Relief on Interest	48.96	
Net Operating Profit After Tax (NOPAT)	860.64	

Capital Employed

Particulars	Year ended 31st March 2021 Rs. in Lacs (L)	Notes
From the Statement of Financial Position	4,802.00	10
Add:		
Marketing Expenditure Capitalized	46.20	7
Adjusted Capital Employed	4,848.20	

WACC = (1/2 × 15%) + (1/2 × 7·8%)
= 11.40%

EVA = NOPAT – (WACC × Capital Employed)
= Rs. 860.64 L – Rs. 4,848.20 L × 11.40%
= Rs. 860.64 L – Rs. 552.69 L
= Rs. 307.95 L

Assumptions and Notes

1. Debt/Equity 1:1
2. Cost of Equity is 15.00%
3. Cost of Debt (pre-tax) is 7.80%
4. Tax Rate is 30.00%
5. Interest charged in the period was Rs. 163.20 L.
6. In current fiscal year, BC spend Rs. 80.00 L in Training and Development by leveraging the latest digital technologies including virtual classrooms to deliver highly relevant training to staff at the point of need.
7. Marketing Expenditure has been Rs. 46.20 L each year for the last two years to build the long- term brand.
8. The total R & D spending was Rs. 20 L during this year for in- depth study of the TCP/IP protocols. The TCP/IP based products have not been launched yet.
9. BC has paid Tax of Rs. 260 L while the tax charged per the accounts was Rs.269.60L.
10. Capital employed during the Period (from the statement of financial position):

Solution:

Opening	4,564.00 L
Closing	4,802.00 L

WN 1: Non-Cash Expenses have been correctly added back to the profit as these are expenses which do not affect the cash flow of a given period.

WN 2: Addition back of Marketing Expenditure is also correct as spending contributes to future value-creation. For the same reason, the prior year spending is also added in to capital employed.

WN 3: Training and Development Expenses should be capitalised. Training and Development Expenses have been treated as an expense in the income statement, they should be added back to profit, and added to capital employed (at the end of the year).

WN 4: Research and Development (R & D) Expenses should be treated as marketing expenditure for long period.

WN 5: The tax expenses in the EVA calculation should be the tax paid with adjustment for lost tax relief on interest and not the adjusted amount of tax charged in the accounts.

- The WACC is incorrect because it should be based on post-tax cost of debt.
- Generally, a company takes, at least, a year's time to earn a return on investment. Thus, the capital employed figure should be based on the beginning numbers.

Particulars	Year ended 31st March Rs. in Lacs
Operating Profit (given)	1,102.80
Add:	
Non-Cash Expenses (given) (WN 1)	30.20
Marketing Expenditure Capitalised (given) (WN 2)	46.20
Training & Development Expenses (WN 3)	80.00
R & D Expenses (WN 4)	20.00
Less:	
Tax (WN 5)	260.00
Lost Tax Relief on Interest	48.96
Net Operating Profit After Tax (NOPAT)	970.24

Capital Employed

Particulars	Rs. in Lacs
From the Statement of Financial Position (Starting)	4,564.00
Marketing Expenditure Capitalized	46.20
Adjusted Capital Employed	4,610.20

WACC = (1/2 × 15%) + (1/2 × 7·8% × 70%) = 10.23%

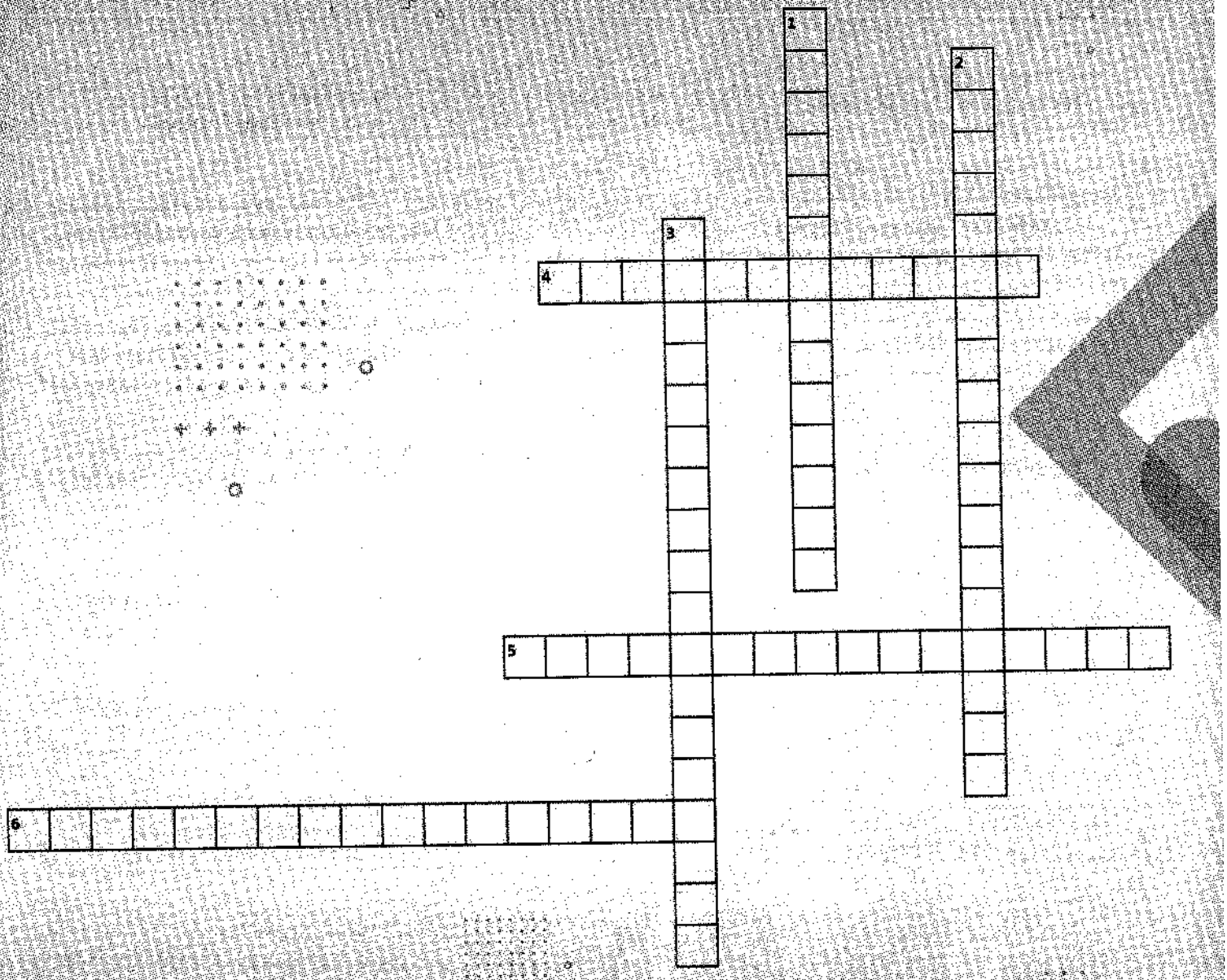
EVA = NOPAT – (WACC × Capital Employed)

= Rs.970.24 L – Rs.4,610.20 L × 10.23% = Rs.498.62 L

The recomputed EVA has increased from Rs.307.95 Lacs to Rs.498.62 Lacs which shows a positive position for BC as it adds up the shareholder's wealth.

GAME OF CONCEPTS

CHAPTER 8



ACROSS

4. Technique for continuous improvement in performance
5. People,Planet and Profit
6. Method which displays organization's performance into four perspective

DOWN

1. Measure of profit after a company pays all costs to capital
2. gain or loss in relation to its initial cost
3. The incremental difference in the rate of return over a company's cost of captial

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- ***ANSWERS ARE UPLOADED ON WEBUCATE APP ON PLAY STORE.***
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APP CODE

Divisional Transfer Pricing

SCAN AND REVISE

Chapter 9

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STUDY MENTOR

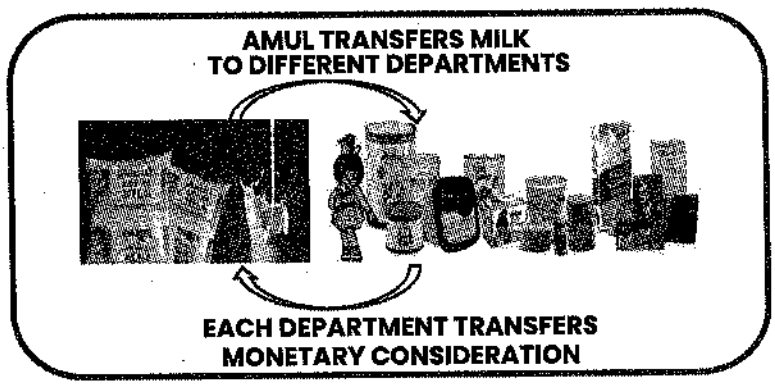
1 TRANSFER PRICING

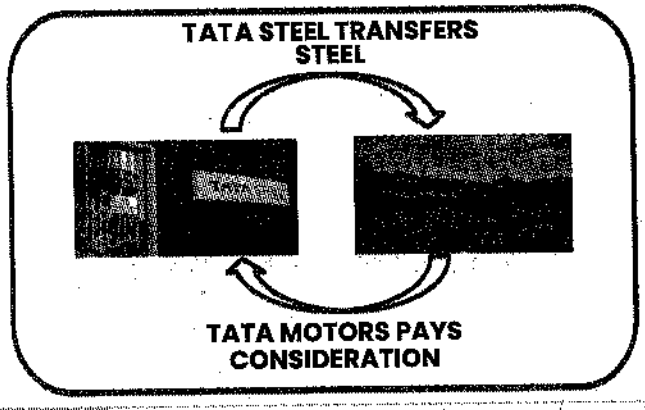
Transfer Price is the internal pricing mechanism of the organization under which one division of an organization charges for a product/service transferred to another division of same organization. Hereby forming basis for allocation of combined revenue among various divisions.

Profit = Selling price - Cost

- External selling price (Chapter 7 - Pricing Decision)
- Internal selling price (Chapter 9 - Transfer Pricing)

Internal Selling Price means pricing for transfer of goods/ services within internal departments; also called as Transfer Price.





1.1 Flow of Transfer Pricing

Goods supplied / Services rendered = **Intermediate Product**

Transferring Department → **Recipient/ Transferee Department**

Recipient/ Transferee Department → **Transferring Department**

Consideration = **Transfer Price**

To **maximize** Revenue on sale of "Intermediate Product" ← **Objectives** → To **minimize** Cost on purchase of "intermediate Product"

Company Objectives

- Overall Company Profitability
- Utilization of Spare Capacity of Divisions
- Optimum Resource Utilisation

1.2 Inter divisional transactions involve

- Transfer of goods and services
- Inter-divisional loans at specified interest rates
- Payments for intangibles like intellectual property for usage of brand, patent in the form of royalty fee or license fee.

2 Utility/ Need of Transfer Pricing

Performance evaluation	Employee engagement & compensation	Resource allocation	Taxation & profit remittance	Decentralise Organisation
• Each division becomes profit accountable, which is a key metric to evaluate its performance. • This motivates each manager to maximize the division's profitability. • Consequently, it improves the scope for company's overall profitability.	• Often managers are compensated based on performance of the division they are responsible for. • Since transfer pricing influences financials, it must be priced at a rate that is perceived to be fair by all the concerned divisional managers. • Transfer pricing that is unnecessarily detrimental to a division could affect employee morale.	• Co-ordination among units for production and sales enables better allocation and utilization of its resources. • Based on transfer price, key decisions may be taken, e.g. to produce material in-house or purchase from outside, expand operations etc. • Primary aim of these decisions is to maximize profits, while promoting goal congruence among divisions.	• Repatriate Profit / Tax burden to group company/ Head office situated in lower tax regime, specially for multinational companies.	• In decentralized organisation is every department is responsible for its own profitability. • So even for internal transfer, correct pricing is must; thereby promoting goal congruence (win-win situation).

Goal Congruence — Win-win situation for individual department and general profitability of company.

3 Three situations in case of TP

3.1 Situation 1. When there is Full idle capacity.

MINIMUM TRANSFER PRICE

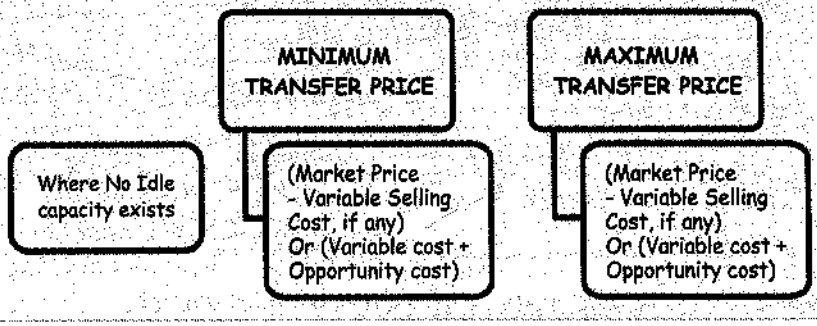
Where Idle Capacity is more than Internal Demand

(Variable Cost - Variable Selling Cost, if any)

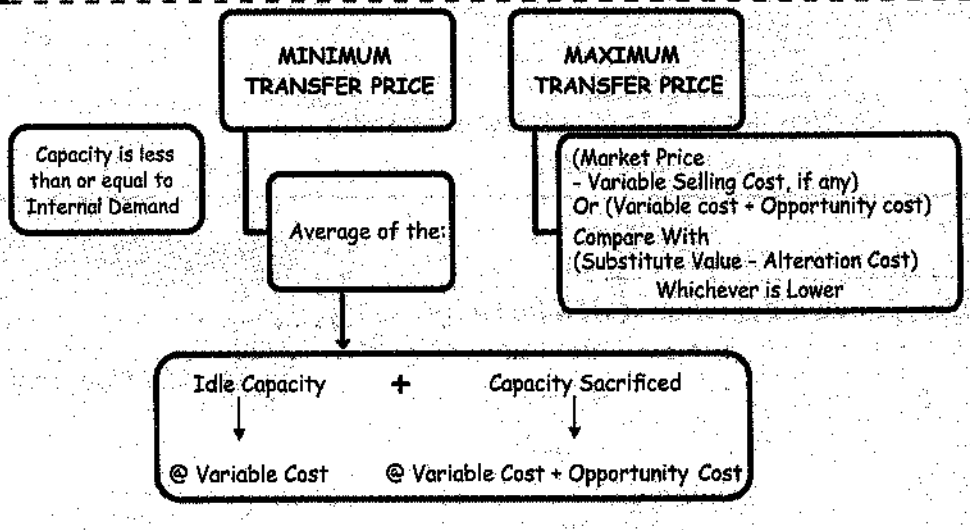
MAXIMUM TRANSFER PRICE

(Market Price - Variable Selling Cost, if any)
Or (Variable cost + Opportunity cost)
Compare With
(Substitute Value - Alteration Cost)
(Whichever is Lower)

3.2 Situation 2. When there is Zero Idle Capacity, ie. Fully occupied.



3.3 Situation 3. When there is part idle capacity and part occupied capacity



Note:- Variable selling cost refers to the cost incurred for marketing the product. Since this is not required in case of internal transfers that cost will not be incurred and hence not recovered from the transferee division.

Note:- Whenever substitute product is available we will always compare it with the market price of the transferor division and then arrive at final transfer pricing decision.

Student Notes

Master Question:

XYZ Limited

(Transferor) Div A → Product P —Transfer→ (Transferee) Div B → Product Q

Product R @ Rs32 / unit (no alterations) (Substitute for Product P)

External - Demand : 18,000 units
SP : Rs 30
T.V.C : Rs 20
(Incl. Selling VC of Rs 2)
(Other VC of Rs/18)
Contribution p.u = Rs.10/- (opportunity cost)
(TVC = Total Variable Cost)

Pdt. Q = Pdt. P + Alterations of Rs. 5

Case 1

Division A

: Production Capacity = 25,000 units

- External Demand 18000u
- Spare = 7000u ⊖ Required =5000u by Division B

Case1 Fully Spare

Minimum

(TVC - VSC)

(20 - 2) = 18

TVC = Total Variable Cost

VSC = Variable Selling Cost

MP = Market-Price

OC = Opportunity Cost

SV = Substitute Value

AC = Alteration Cost

Maximum

MP - VSC

30 - 2 = 28

(or)

VC + OC

18 + 10 = 28

Compare with

Substitute Value − Alteration Cost (whichever is lower)

(32 - 5) = 27

∴ Max TP = 27

∴ Case 1 : Min TP - Max TP

Range (18 - 27)

Case 2

Production Capacity = 20,000 units

- External demand 18000 u
- Spare 2000 u

Required by Div B = 5000u

Case 2 : (Part Spare, i.e:- Part occupied.)

Minimum

Average of :

Idle Capacity 2000u @ 18 (TVC - VSC) (20 - 2) = 36000

⊕

Capacity Sacrificed 3000u @ (VC + Opp Cost) @ (18 + 10) = 84000

= 120,000 / 5000u

= Rs. 24 p.u

Maximum (Same as case i)

Case 3 | **Production Capacity = 18,000 units**

- External demand: 18000 u
- Spare = Nil

Required by = 5000 u
Div B
Case 3: Fully Occupied

Minimum TP = (MP - VSC)	Maximum TP = (MP - VSC)
30 - 2 = 28	30 - 2 = 28
or	or
(18 + 10) = 28	18 + 10 = 28

Note: If Min TP > (Substitute Value - Alteration Cost) then Transferee will Purchase from outside and no internal Transfer is possible.

Min TP : Think form viewpoint of Transferor
Max TP : Think form viewpoint of Transferee

4 Transfer Pricing based on Limiting Factor

Whenever there are more than 2 products in a division and the capacity of production is limited; concept of (Limiting factor + transfer pricing) is used.

Products are ranked based on limiting factor and the least ranked product is sacrificed.

Eventually in such cases the

TP = Variable cost of the product being transferred + opportunity cost of the product being sacrificed

Student Notes

4.1 Concept: Limiting factor with Transfer Pricing

Master Qn # 2 — **PQR.LTD** — (ICAI Module Qn)

DIV A (3 product)	X	Y	Z
External Demand	800	500	300
SP	96	92	80
(-) VC	33	24	28
Contribution pu	63	68	52
÷ Lab hrs / u	6	8	4
= Contn / hr	10.5	8.5	13
Rank	II	III	I

Div B

- 300u of Y required by Div.B
- Substitute Cost of Y = Rs 45 pu

4.2 Steps to be followed in Qns. of Limiting factor + T.P.

1) Hours required to satisfy External demand

2) Production Capacity
   - External Demand
   - Spare Capacity

3) Statement of hours utilisation based on Rankings

4) Unit to be transferred (its Variable Cost)

⊕

Unit / hours to be sacrificed

(i.e. Calculate Contribution lost for Sacrificed Units.)

Step1: Hours for External demand

External Sales	Qty	Hours pu	Hours needed
X	800	6	4800
Y	500	8	4000
Z	300	4	1200
			10,000 hours

3 - Possible Case

Case 1 I. External Demand Satisfied + Full spare Capacity

- **Min TP**: VC of unit to be transferred
- **Max TP**: M.P of unit to be transferred (or) Substitute value (whichever is lower)

II. **Case 2** External demand also not satisfied

- **Min TP**: VC of unit to be transferred ⊕ Contribution lost of unit to be scarified (Hours sacrificed x contribution/hour)
- **Max TP**: M.P of unit to be transferred (or) Substitute value (whichever is lower)

III. **Case 3** External demand satisfied + Some Spare Capacity

- **Min TP**: VC of unit to be transferred ⊕ Contribution lost of unit to be scarified (Hours sacrificed x contribution/hour)
- **Max TP**: M.P of unit to be transferred (or) Substitute value (whichever is lower)

Case I: External Satisfied + Demand Fully Spare

Hours Available : 13000 hours

- Hours for External demand: 10,000 hours
- Spare = 3000 hours
  - Read by = 2400 hours
  - Div.B (300 x 8h)

Case 1: Fully Spare

- **Min TP**: VC of unit to be transferred 500 u; VC x 24/u = Rs 12000/-
- **Max TP**: MP of unit to be transferred — MP : 92 (or) (Substitute cost): 45 — i.e. 45/- (whichever is lower)

Case 2: Hours Available 8000 hours | External Demand also not Satisfied

Hours for External demand → 10,000 hrs

∴ Case 2

External demand also not satisfied

∴ Hours to be sacrificed = (300u x 8h/u) = 2400 hours

(In Current hours available:)

8000 hrs : Z : (I) : 1200
X : (II) : 4800
Y : (III) : 2000
(8000 hours)

Min TP

VC of unit to be transferred = Rs.7,200
(300x24p.u.)
uints
+
+ Countribution lost of unit to be sacrificed

1st Sacrifice : Y (2000h x 8.5) = 17000
+
Then Sacrifice : X (400h x 10.5) = 4200
21,200

∴ = 28400 / 300u (Rs. 72,00+ Rs. 21,200)

Min TP = 94.67

Max TP

MP of unit to be transferred

MP : 92
(or)
(Substitute cost): 45

i.e. 45/-
(whichever is lower)

(Better to purchase from outside as substitute value = Rs.45)

(Since Min TP is more than Max TP, it is better to purchase from outside)

Student Notes

Case 3: External Demand Satisfied + Some Spare Capacity

Hours Available 12000 hours

- Hours for External demand: 10,000 hrs
- (2000hrs spare) → Case 3

Units required by Div B: (300u x 8h) = 2400 hrs

- 2000 Spare
- ∴ (Hours to be sacrificed = 400h) (2400 - 2000 spare)
- 400h (To be sacrificed) of Rank III i.e. Unit Y)

Min TP

VC of unit to be transferred. (300x24) = Rs 7200

(+)

Contribution lost of hours to be sacrificed (400h x 8.5) Rs 3400

Rs 10,600 (7200 + 3400)

÷ 300u

Min TP 35.33/-

Max TP

MP of unit to be transferred

MP : 92

(or)

(Substitute cost): 45

i.e. 45/- (whichever is lower)

(Better to purchase from outside as substitute value = Rs.45)

(Range: 35.33 - 45)

(Since Min TP is more than Max TP, and Substitute Value, it is better to purchase from outside)

5 METHODS OF TRANSFER PRICING

5.1 Market Based Transfer Pricing

Transfer recorded at external market price, adjusted for any costs that can be saved by internal such as selling & distribution expenses.

5.2 Advantages

- Unbiased, since demand & supply determine MP.
- No scope for manipulation.
- Competitive pricing resulting in company's overall profit.

5.3 Disadvantages

- MP may not be completely unbiased, if competitive environment does not exist.
- Not suitable when MP fluctuate widely.
- MP not available for WIP goods.

5.4 Behavioural Consequences

Promotes competitiveness within the entity. The supplying division will have to compete with the outside vendor may lead to cost competitive operations. The purchasing division has more alternatives to choose from.

6 Negotiation based Transfer Pricing

Managers independently negotiate & arrive at a mutually agreeable transfer price.

6.1 Advantages

- Autonomy to decide whether to purchase (or sell) from its sister unit or source them from (or to) external market.

6.2 Disadvantages

- Requires sufficient external information regarding the external market price, terms of trade etc.
- Internal cost information must also be shared in order to negotiate a reasonable price.

6.3 Behavioural Consequences

Promotes goal congruence. Top management intervention may be required if decisions lead to sub-optimal utilization of resources (i.e decisions taken for personal benefit). Negotiated prices depend on the ability of the manager to bargain on behalf of the division.

7 Cost based Transfer Pricing

- Based on internal cost records of company.
- Used when management wants to benchmark performance with cost targets set within the company.

7.1 Advantages

- Performance can be benchmarked to internal cost targets (budgets).
- Information is more easily available as compared to market price.

7.2 Disadvantages

- The cost basis on which transfer pricing is used can be subjective since there can be multiple ways of interpreting costs.
- Manager of supplying division may not attempt to reduce cost (against Goal Congruence).

8 Types of Cost based Transfer Pricing

8.1 Marginal Cost Based TP

Transfer Pricing recorded at marginal cost (i.e variable cost).

8.2 Advantages

- Useful when the supplying division has excess capacity.
- Purchasing division enjoys the benefit of a lower price compared to the market.

8.3 Disadvantages

- No fixed cost or mark-up is allowed to be charged to the purchasing division. Each unit of internal sale will hence result in a loss at approximately fixed cost per unit.
- No incentives for supplying division as there is no markup.

8.4 Behavioural Consequences Profit evaluation is centralized at the entity level.

9 Standard Cost Based

Transfer Pricing recorded at predetermined cost based on budgets & certain assumptions.

9.1 Advantages

Performance evaluation can be done against budgeted cost targets. Facilitates better understanding of costs through variances.

9.2 Disdvantages

Profit performance measurement is centralized and cannot be measured for individual divisions.

9.3 Behavioural Consequences Based on historic records. Little incentive to make costs more efficientto improve profitablility.

10 Full Cost Based Transfer Pricing

TP based on full product cost. Cost of production plus S&D, Admin, R&D.

10.1 Advantages

- Full cost of goods transferred is recovered hence the supplying division will not show a loss.

10.2 Disdvantages

- Since mark-up cannot be charged on internal transfers, the supplying division does not record any profit on these sales. This is a disincentive for the supplying division.

11 Cost Plus a Mark-up Based Transfer Pricing

Transfer price is based on full product cost plus a mark-up. Mark-up could be a percentage of cost or of capital employed.

11.1 Advantages

- Supplying division makes a profit, so the division is positive for incentives.

11.2 Disdvantages

- S&D expense is transferred even though not incurred for internal transfer.

11.3 Behavioural Consequences It distorts the company's cost structure while making decisions. Purchasing department view the cost as a variable but it includes a portion of fixed costs. Consequently, market price calculated based on the transfer price for the input supplied, may be slightly inflated.

Practical Question on Shared Profit relative to cost / shared contribution relative to cost:

Example:	Div.A	Div.B	Div.C
External SP	–	–	1000
Less: Cost	200	300	400

Step: 1

Calculate profit for the company as a whole:

SP	:	1000
(-) All Division costs	:	900 (200 + 300 + 400)
NP	:	100

Step: 2

Divide Profit in the ratio of Cost (ie: 2: 3: 4)

100 x 2 / 9 = 22 (Div. A) / 33 (Div. B) / 44 (Div. C)

Step: 3

Always Remember

TP = SP = Cost + Profit

Div.A (TP) to Div. B = SP = 200 + 22 = 222

DIVB (TP) = SP = 300 + 222 + 33 (TPC)

= 555

Note : i) Same Concept applies to shared contribution Method
(Contribution for company as a whole is divided in ratio of variable cost)
2) In case of Market based T.P. , Transfer is at Market price , which becomes receiving department cost.

12 International Transfer Pricing

Taxation, profit repatriation and transfer prices are critical considerations to the senior management of the multinational companies. Multinational organisations try to maximise profits by using transfer price as a tool to reduce the tax impact on earnings. Where the supplying division is in a country with higher tax rate the transfer price will be settled lower in order to reflect higher earnings(Resulting from lower purchase cost) In the purchasing division which has a lower tax rate. Likewise supply from lower tax rate countries may be priced higher in order to reflect higher earnings for that unit thereby reducing the tax impact

13 Currency Management using Transfer Pricing

International firms are exposed to exchange fluctuation risks. These fluctuations create uncertain cash flows in corporate currency. With inter- divisional trading between subsidiaries in different countries, when one subsidiary makes a loss on a contrary exchange rate movement, the other will make a profit. The company as a whole should manage its exposures to currency risks. The management of currency risk is the responsibility of either the profit centre managers or a treasury department. A MNC might be keen to set transfer prices in a currency such that any currency losses arise in the subsidiary in the high- tax country, and currency profits arise in the country with the lower tax rate if it is fairly - certain about exchange rate movement in the future.

14 General International Transfer Pricing Impact

A multinational company may have operations in various countries which have different tax rates. The potential for maximization of income by a Multinational Company through the use of Transfer Pricing mechanism is based on the successful implementation of the following –

- Income Tax Rates
- Import duty – TP in divisions
- Inflation
- Income Repatriation

14.1 Example of International transfer pricing: (ICAI Module Question)

1. Tax impact of various transactions

Ex: Module Qn : Bruce Lee ltd in china supplies 150,000 units to group co. Hero ltd in India @ CNY 30 per unit.

Variable cost = CNY 20 per unit

Hero ltd is paying custom duty @ 29.5%. Price inclusive of custom duty = (30*9.80) + 29.5% = 380.73

Proposed scenario: Hero ltd is considering to purchase from LOCAL market @ INR 320. P.U. Bruce Lee ltd will sell 120,000 units locally & will lose sale of 30,000 units.

Tax info: Tax rate in china = 25%, in India = 34% (1 CNY = 9.80 INR)

Inland Tax on local sale = 10%

Ans: Bruce Lee Division

Net additional income or loss of income due to transferring to Hero Ltd

Loss to supplying division

Contribution loss= 30,000*10CNY*9.80 =29,40,000

Inland tax=(120,000*30CNY*10%)*9.80 =35,28,000

Net loss=64,68000

2.Tax impact on above. Tax saving @ 25%=16,17,000

Tax savings @ 25%=48,51,00

Hero Ltd Division

Net additional expenses or saving in expenses due to purchasing from LOCAL div.

Benefit to purchasing division

Saving in purchase price=(380.73-320)*150,000 = 91,90,500

2. Tax impact on above.

Tax impact @ 34% = 30,97,230

After tax benefit = 60,12,270

15 TRANSFER PRICING DECISION, DIFFERENT CIRCUMSTANCES

Different Demand Levels

A supplying division caters to demand from

- Internal divisions
- External markets, if any and
- Any special orders. Production is subject to available capacity.

Production cost benefits from economies of scale. For example, a machinery may be capable of processing 10,000 units. However, production beyond this level may require the purchase of another machine requiring additional space. This increases the fixed cost incurred by the department. Hence, production cost is dependent on economics to scale. Certain types of demand may result in cost savings.

For example, internal sales require lower packaging costs since the product may be transferred in bulk to the purchasing division. Likewise, special orders may not require selling expenses since typically it is the customer who approaches the seller in these cases and not the other way around.

Therefore, while catering to different levels of demand, any change in cost should also be accounted for to calculate transfer pricing. The general rule for minimum and maximum range of transfer price applies here too.

Student Notes

15.1 Different demand & capacity expansion :

Eg : Below is the data of Division A and Division B

Selling price (External Market)	80
Selling price (Special Order)	70
Variable mfg cost	(55)
Variable S&D cost (External Sales)	(10)
Variable S&D cost (Special Order / Transfer to B)	(5)

- Total capacity= 50,000 units.
- Existing capacity = 30,000 units (It can increase capacity upto 50,000 by incurring 50,000 for every 10,000 units)

- It received an order form Div-B to sell 45000 units at 75 or lesser units @ Rs.70/-
- If Div-A sells to div-B or special order, it can eliminate S&D of Rs5 by incurring 50,000 as fixed cost.
- What should be the best strategy for Div A ?

15.2 Total Capacity = 50,000 units

Max External Sales	Special Order	Demand by B
30,000 units	15000 units (Accept in full or Reject)	45,000 units (If sold 45000 u to B then tp = 75; if less than 45000 then tp = 70)

15.5 By increasing capacity (incurring 50,000), it can earn 10,000 units* 15=150,000 contribution. Thus, it's better to increase capacity. Contribution from Div-B=75-55=20. Thus, it's better to sell 45000 units to B & remaining 5000 to external market.

15.3 Evaluation of Possibilities

Ext Mkt	Sell all 45000 u to B	Sell less than 45000 u to B	Spl. (15000) Order
SP 80	75	70	70
(-) VMC 55	55	55	55
(-) VSC 10	–	–	–
(-) VSC (B+) -	–	–	–
Count : 15	20	15	15

15.4 As per the above summary below are the strategic possible For Div A

(i) Sell 30,000 u of External + 20,000 u to B @70/-

(ii) Sell 30,000 u to External Market + 15,000u to Spl Order + 5000u to Div B @ 70/-

(iii) Sell 45000 u to Div B @75/- + 5000 u to External Market

(iv) Sell 35000 u to Div B @ 70/- + 15000 u Spl order

15.6 Profitability Statement of A

Sales :	
B (45000*75)	: 3375,000
Ext. Mkt (5000*80)	: 400,000
Sales	: 37,75,000
(-) Variable Costs	
(-) VMC (50000*55)	2750,000
(-) VSC (Ext.) (5000*10)	50,000
=Contribution	:975,000
(-) Fixed Cost:	
Upto 30,000 u	430,000
(+) 10,000 u	50,000
(+) 10,000 u	50,000
(-) Fixed Cost of Div B & Spl Order	50,000
NET - PROFIT	3,95,000

16 Proposals For Resolving Transfer Pricing Conflict

Conflict of interest between interests of individual divisions and the company can also be addressed by following the following systems for transfer pricing:

• Dual Rate Transfer Pricing System

The supplying division records transfer price by including a normal profit margin thereby showing reasonable revenue. The purchasing division records transfer price at marginal cost thereby recording purchases at minimum cost. This allows for better evaluation of each division's performance. It also improves co - operation between divisions, promoting goal congruence and reduction of sub -optimization of resources.

Drawbacks of Dual Pricing include:

- It can complicate the records, thereby may result in errors in the company's overall records.
- Profits shown by the divisions are artificial and need to be used only for internal evaluations.

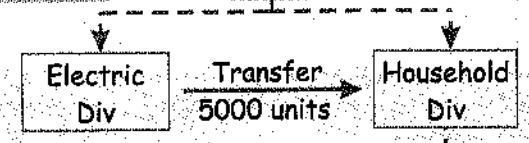
• Two Part Transfer Pricing System

This pricing system is again aimed at resolving problems related to distortions caused by the full cost based transfer price.

Here, transfer price = marginal cost of production + a lump -sum charge (two part to pricing).

While marginal cost ensures recovery of additional cost of production related to the goods transferred, lump -sum charge enables the recovery of some portion of the fixed cost of the supplying division. Therefore, while the supplying division can show better profitability, the purchasing division can purchase the goods a lower rate compared to the market price.
Eg : Div A is training dept providing training to Div B & C. Div A incurrs Rs 10,00,000 fixed cost p.a. and Rs 750 variable cost for training.
TP = 750 + Some Portion of RS 10,00,000

16.1 Question GL Ltd (4 divisions)



(Fully Utilised with external Demand)

@ Rs25 (MP)
⊖ VC 16

Contribution p.u. : 9 p.u.

(70% Capacity)

TP @ 18/-
SP : 130
⊖ Comp : (50)
⊖ Switch : (18)
⊖ OVC : (40)

Contribution p.u. : 22
Fixed Overhead p.u. : 21

16.2 TP to be charged by Elec div. if it is Fully Occupied.

i) Since Elec. division is fully occupied, so it will transfer its goods and services @ MP. According, any price bellow Rs 25/- (i.e its MP) will not be acceptable.
Also, since Elec Div. is a profit centric division (based on ROI) so it will not transfer below its MP as it is fully occupied.

16.3 ii) Impact of different TP on overall Profitability :

If TP > 18 (or 25)... then it will not be affordable to the Household division.

If TP > 18

Electric Div → Electric Div

But HH division will be closed down

5000 Switches × (25 - 16 MP VC)

Contribution = 5000 x 9
= 45000/-

16.4

If TP < 18

- Electric Div
  - TP = 18
  - ⊖ VC = 16
  - C = 2
  - × 5000 u
  - 10,000
- HH Div will continue
  - Couth 22 p.u.
  - @ 5000 u
  - Rs 110,000

16.5

→ Overall co. benefit	= 120,000 Rs
⊖ Already Earned	= 45,000 Rs
Additional Benefit to the Company will be	Rs. 75000 ÷ 5000 u = Rs 15 p.u.

16.6

iii) Range of T.P.

- Min TP (Transferor) (Isko kitna minimum chahiye hi chahiye) — Electrical
  - Full Occupied @ min TP = MP = 25/-
- Max TP (Transferee) (Yeh max kitna de sakta hai) — Household
  - SP : 130
  - ⊖ Comp : (50)
  - ⊖ OVC : (40)
  - Max ④⓪

Range = 25 - 40

16.7

What will be the Maximum transfer price if in above scenario substitute is available to Transferee at

Maximum : TP	@ 35/-	@ 45/-
	MP : 25	MP : 25
(or)	Substitute Value : 35	Substitute Value : 45
(or)	(SP - All variable cost) (excluding T.P) : 40	(SP - All variable cost) (excluding T.P) : 40

MAX TP : Substitute value = Rs 35/-

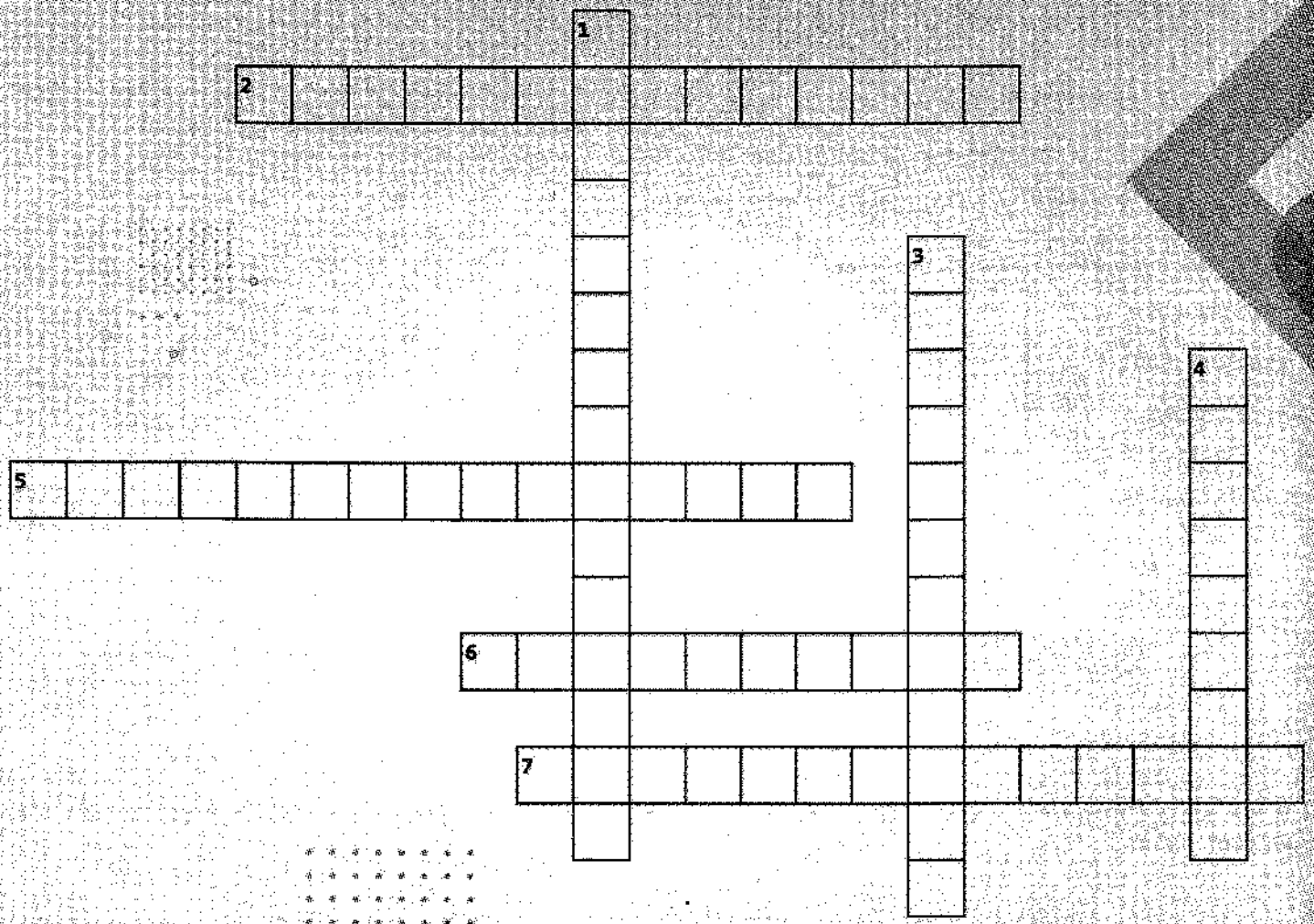
(SP - All variable cost) = Rs 40/-

Hint : Centre Value

Student Notes

GAME OF CONCEPTS

CHAPTER 9



ACROSS

2. divisional goal have to align with the organization's overall business objectives
5. Internal pricing mechanism of the organsiation
6. purchaser and supplier different TP
7. Recorded at a predetermined cost

DOWN

1. Cross border transfers
3. Agreed rate between two divisions
4. Variable cost plus lump sum

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APP CODE

Strategic Analysis of Operating Income

SCAN AND REVISE

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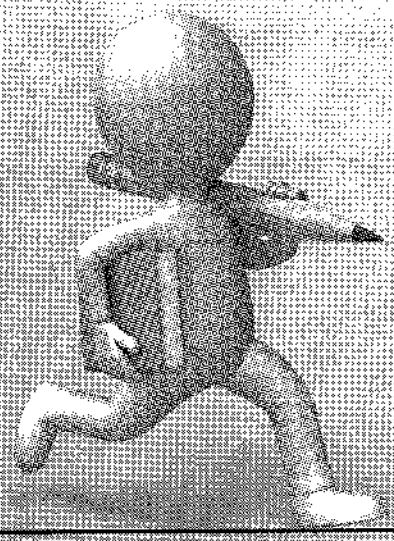


STUDY MENTOR

1 Activity Based Costing

Attempts to absorb overheads into product costs on more realistic basis. It is a method of assigning overhead & indirect costs to products & services based on activities.

The cost drivers are used as an absorption base. Eg. of cost driver (Ordering, setup, No . of batches, etc.)

1.1 Benefits of ABC

- Clear linkage between cost and responsibility
- Better identification of required resources

1.2 Practical Steps in ABC Approach

STEP 1 Identify significant activities

Activity which is significant enough to justify to give an activity a separate treatment.

STEP 2 Calculate total cost of each activity:

- Ordering
- Receiving Deliveries
- Production Set-up
- Customer Support

STEP 3 Determine the appropriate activity cost drivers for each activity

STEP 4 Calculate activity cost driver rate

$$\text{Activity Cost Driver Rate} = \frac{\text{Total Cost of an Activity}}{\text{Activity Cost Driver Volume}}$$

STEP 5 Charge activity cost to end products, jobs & processes

Activity cost charged to end product = Activity consumed x Activity cost driver rate

1.3 ABC in Advanced Manufacturing Environment

Factors attributing change in manufacturing environment

- **Global Competitiveness** → Internet has put an end to geographical barriers.
- **Workplace Automation** → Machine intensive phase allows more flexible manufacturing than labour intensive phase

1.4 Areas in which ABC is used for Decision Making

- Pricing of products
- Design and development of new products
- Market segmentation and distribution channels
- Plan closed down decision
- Product line profitability
- Make or buy decision & outsourcing

1.5 Factors promoting development of ABC

- Increasing product diversity
- Increasing market competition
- Overhead functions are as important to customers as physical processed on the shop floor
- Growing dissatisfaction among the working executives regarding traditional costing
- Shrinking Direct Labour
- Growing overhead costs
- Traditional costing often fails to highlight inter-relationship among activities in different departments

2 Direct Product Profitability (DPP)

Used to measure the profitability of an individual product and assist management to know the true profitability to make appropriate decisions & concentrate on profitable products and removed loss making product

2.1 Benefits of DPP

- Better Cost Analysis
- Rationalisation of Product ranges
- Better Pricing Decision
- Better Management of Store & Worehouse Space

2.2 4 Indirect cost for DPP Analysis

Overhead Costs	Volume Related Costs	Inventory financing costs	Production Batch Costs
Incurred through an activity that is not directly linked to a particular product.	Cost is in relation to space occupied by products & includes storage & transport cost.	Money blocked in stock & its opportunity cost	If product items of batch are stocked on shelves a labour time cost is incurred.

3 Customer Profitability Analysis

New Technique linked to ABC wherein

Customers are Charged

According to their activity utilization

Banks

- Withdrawal of Cash
- Unauthorised overdraft
- Request for statement
- Stopping a cheque
- Returning a cheque

Hotels

- Garden Facilities
- Swimming Pool
- Gymnasium
- Restaurant
- Bar

Manufacturing Company

- Transport Facility
- Rush Orders
- After Sales Services
- Technical Support
- Customised Packaging

Customers are charged as per the services required by them

3.1 Benefits of CPA

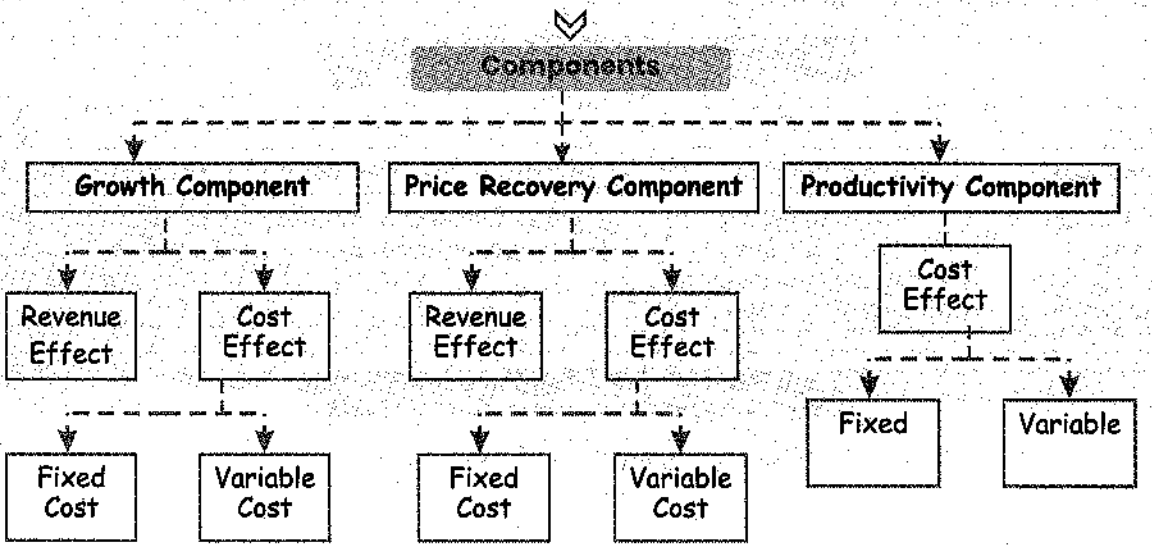
- It helps Supplier to identify which customer are eroding overall profitability & which customers are contributing to it.
- Helps to have a Constructive dialogue between buyer & seller.
- Enhances Decision Making related to Customers.
- Helps in Effective Cost Reporting & Communication.
- Helps to find out Value & Profitability of each Customer Segment.

4 Profitability Analysis

- **Profit** ≫ is the engine that drives the business enterprise.
- **Profitability** ≫ means ability to make profit from all the business activities of an organization.
- **Profitability analysis** ≫ can be useful to measure the performance of a firm against acceptable standards.

4.1 Strategic Profitability Analysis

Operating profit of a firm is affected by various components which are responsible for changes in revenue and costs.



Note: The formula for above components is done with practical solving of sums on page no.10.20

5 Activity Based Cost Management (ABM)

- System for determining the profitability of every aspect of a business so that its *strengths can be enhanced* and its *weakness can either be improved or eliminated together.*
- ABM can be applied to different types of companies, including manufacturing service providers, non-profits, schools & government agencies.
- ABM = Cost Management application of ABC / Extension of ABC

5.1 Special Considerations

- ABM focuses on business process & managerial activities driving organizational business goals, ABC seeks to identify & reduce cost drivers by optimizing resources.
- Activity-based costing can be considered an offshoot of activity-based management.
- ABM is a discipline that focuses on the efficient and effective management of activities as the route to continuously improving the value received by customers.

5.2 Benefits of ABM

Cost Reduction	Budget Implementation	Decision Making	Resource Utilization	Cost Definition
Provides excellent basis and focus for cost reduction.	Provides operational management with a clear view of 'how to implement' an Activity Based Budget.	Provision of excellent basis for effectiveness of management decision making.	Identification of key process waste elements, permit management prioritization and leverage of key resources.	Provision of clear understanding of the underlying causes of business processing costs.

5.3 Steps of implementing ABM

1. Decide what are the organisation's most important issues and what types of information would be required to address those issues.
2. Top Management support is cited to identify critical information needs.
3. Incorporate ABC methods into organization's financial reporting process.
4. If integrating ABC into the main cost reporting system is not feasible, consider developing a separate ABC system.
5. The existing information system should easily support input requirements.
6. Implement ABM at a high level in order to get concepts across.

5.4 Difference Between ABC & ABM

ABC	ABM
• Technique of determining cost of activities & their. • Logical distribution of overhead.	• Management philosophy that focus on planning, execution and measurement of activities as key to competitive advantage.

5.5 Implementing ABM (Components)

Cost Driver Analysis Identifying & analyzing cost drivers (any factor that causes a change in the cost of activity) improves cost effectiveness & cost improvement through ABM. (operational ABM and strategic ABM). (Eg: Quality of parts, Defective work).

Operational ABM (Current Product)	Strategic ABM (New Product)
• Scrutinising cost of each activity. • Increasing operational efficiency • Allocate resources to activities that lead to higher efficiency.	• Analyse profitability of an activity. • Acquiring new customer. • New Product. • Advertisement.

6 Activity Analysis — To meet goal of drastic cost reductions & value enhancement. Deals with eliminating non-value added activities & thus reducing total no. of activities to be performed. Analyse & categorise each activity into value added activity & non-value added activity.

6.1 Activity Analysis

Value Added

- Activities indispensable to complete the process.
- Measures for identifying
  - Is the activity necessary? → If Yes, it is VA
  - Is the activity efficiently performed? → If It is useful to adopt budgets, targets, or external benchmarks to establish VA baseline, it is VA
  - Is an activity sometimes VA & sometimes NVA? → Needless movement of raw material, It is NVA. However, sometime it may be needed to transfer WIP units between production operations, It is VA

Non-Value Added

- Work that is not valued by external or internal customer.
- Do not improve quality or function of product / service but adversely affect cost & prices creates waste.

6.2 6 major wasteful activities(SWIMS)

Storing	Waiting	Inspecting	Moving	Scheduling
An activity that uses time & resources while a good or material is held in inventory.	An activity in which materials or work in process use time and resources by waiting for the next process.	An activity in which time and resources are spent ensuring that the product meets specifications.	An activity that uses time and resources to move materials, work in process, and finished goods from one department to another.	An activity that uses time and resources to determine when different products have access to processes (or when and how many setups must be done) and how much will be produced.

7 Performance Analysis — Identify significant activities for the purpose of performance analysis. Focuses on activities that have most potential for performance improvement.

Significant activities based on

Based on Cost	Based on Time Spent
• Comparison on Benchmark set and actual(with our competitors). • Provide managers with incentives to impose operations.	- Quality, cycle time - Productivity - Customer service time (Inform us our scope for improvement).

8 Variety of Business Applications of ABM

Cost reduction	Activity based budgeting	Business process re-engineering	Benchmarking	Performance management
Identify cost against activity and find opportunities to streamline or reduced costs or eliminates entire activity.	ABB analyse resource input and cost of each activity. It is a planning and control system that seeks to support the objectives of continuous improvement.	BPR involves examining business process & making substantial changes to how organisation currently operates. It means re-engineer existing process to have dramatic improvement in cost, quality, service & speed.	Process of Comparing ABC derive activity cost of one segment of company with those of other segments.	Measures relating to costs, time, quality & innovation

9 Activity Based Budget (ABB)

While a traditional budgeting method adjusts previous costs based on inflation or changes in business activity, activity-based budgeting is a much more thorough way of looking at costs.

It provide a framework for estimating the amount of resources in accordance with budgeted level of activity.

It means planning and controlling expected activities to derive a cost effective budget.

Every cost incurred be looked at closely to determine if efficiencies can be created, and costs reduced.

9.1 Key elements of ABB

1. Type of work/activity to be performed
2. Quantity of work/activity to be performed;
3. Cost of work/activity to be performed.

9.2 Advantages of ABB

- Allows you to see what associated cost are for each operational activity
- Helps to break down cost
- Helps to the better evaluate different business units & allocate capital.

9.3 Disadvantages of ABB

- Costly & time consuming
- Difficult in business with complex production cycle.

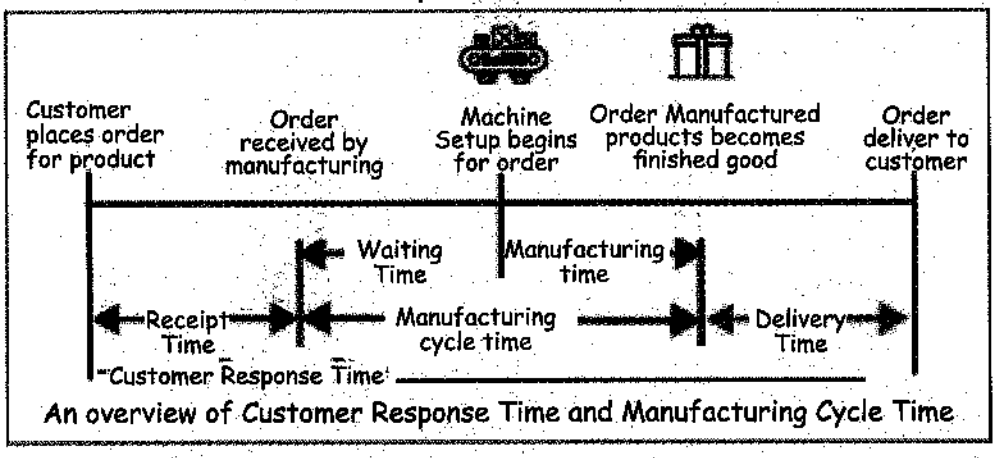
9.4 Activity-Based Budgeting (ABB) Vs. Traditional Budgeting Processes

ABB	TBP
• Complex method. • Budgeting based on projected activities and its related costs.	• Simplistic method. • Adjust prior period budgets far inflation or revenue growth.

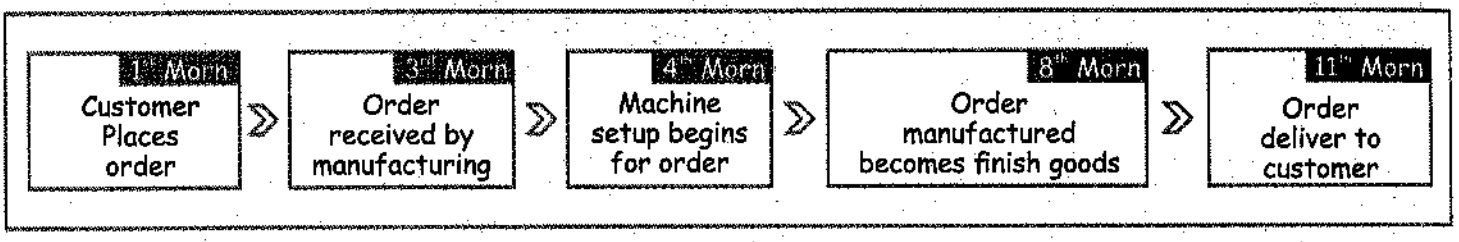
10 Concept of MCT/ MCE

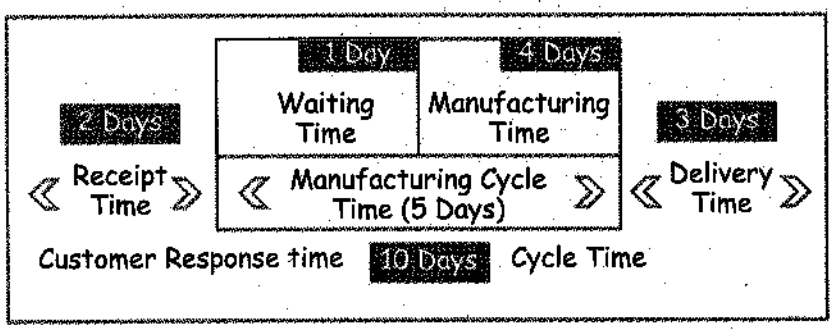
(Manufacturing Cycle Time) + (Manufacturing Cycle Efficiency)

General Operation of a Business



An overview of Customer Response Time and Manufacturing Cycle Time





Doctor Example

Patient » 50 Minutes

10 Minutes	25 Minutes	15 Minutes
(Admin Tasks)	(Waiting Area)	(Nurse/ Doctor)
NVA	NVA	VA

Minimizing NVA Service time allows Doctors to treat more patients.

i.e $\frac{15}{50}$ $\frac{VA}{(VA + NVA)}$ = 30%

$$MCE = \frac{\text{Value Added Activities}}{\text{Manufacturing Cycle Time}} \quad (60\%)$$

(Value Added + Non Value Added Activities)

$\frac{60 \text{ Min}}{100 \text{ Min}}$

Application of MCE in reducing NVA activities

Time Taken		Ways To Reduce
Inspection Time		Total quality control zero defect manufacturing
Manufacturing Time		Concept of cellular Manufacturing (Chapter 3)
Waiting & Storage Time		Concept of JIT (Chapter 3)

(Perfect MCE = 1 i.e. all Value Added Activities)

MCE = 0.5 Means (50% are NVA)

Anything below 1 means NVA

11 Miscellaneous - CRM

Concept of Customer Relationship Management & its 3 fundamentals

11.1 CRM

Approach to manage and coordinate customer interactions.

To identify new acquire, retain customers.

Increase Profitability

Decrease customer management costs.

11.2 3 Fundamental Aspects of CRM

Operative CRM	Analytical CRM	Collective CRM
Individual interactions and transaction by customers are kept in database. ⇩ Used by service, sales & marketing team for day to day decisions.	Evaluation & prediction of customer behaviour	Customer information must flow smoothly through supply chain. ⇩ Customer interaction through email, digital media to simplify communication.

CASE STUDIES

12 CASE STUDY 1 - ABC - Melody - (ICAI Module)

ISSUES

- Melody - Manufacturing of musical instruments (Labour intensive products)

• Piano	• Electronic Keyboard Instruments
- High quality pianos for professionals. - Standard as well as customized piano. - Professional craftsman hired as subcontractors when required. - Charges extra for sub-contracting plus 10%	-Home Keyboards for young music enthusiasts. - Standard Products.

Sr. No.	Particulars	Piano	Keyboard	Total
1.	Number of items manufactured	1,000	10,000	
2.	Sale Price per unit	2,50,000	15,000	
3.	Revenue	25,00,00,000	15,00,00,000	40,00,00,000
4.	Materials	7,50,00,000	3,75,00,000	11,25,00,000
5.	Direct Labour	8,00,00,000	6,75,00,000	14,75,00,000
6.	Subcontracting Cost	3,75,00,000	-	3,75,00,000
7.	Production Overheads	4,50,00,000	65,00,000	5,15,00,000
8.	Total Cost of Production (4+5+6+7)	23,75,00,000	11,15,00,000	34,90,00,000
9.	Gross Profit (3 - 8)	1,25,00,000	3,85,00,000	5,10,00,000

Production Overheads — **Figures in Rs**

Particulars	Amount
Inspection and Testing	3,45,00,000
Space Maintenance Cost for Subcontracting Work (rent, utilities, 2 support staff to maintain storage)	50,00,000
Other Production Overheads (rest of the utilities, rent, salary of support staff at storage)	1,20,00,000

CONCEPT	• Treatment of production overhead under absorption costing & ABC. • Steps to implement ABC, • ABM & ways to improve business performance.

EXPLANATION & CONCLUSION

EXPLANATION & CONCLUSION

(i) Treatment of production overhead under

Absorption Costing	Activity Based Costing
• Product cost includes all Manufacturing cost (Fixed + Variable). • Overheads allocated by single cost driver based on volume of production. • Single cost driver applied to entire production overhead. (Eg: Labour used to allocate overheads to piano & keyboards). • All overheads allocated to all products based on these driver irrespective if it has used the resources or not. (Eg: Production overhead includes maintenance cost for subcontracting work).	• Identify cost of each activity & assign cost based on number of activities used by each unit. • Instead of being clubbed as single pool, each activity captured in respective cost pools. (Most appropriate cost driver) (Eg: Cost of maintaining space for subcontracting should be allocated to piano only). • Allocation is made on more logical basis.

(ii) Implementation of ABC Method

Activity Mapping	Cost Pools	Cost Drivers	Overhead Rate	Overhead Cost Allocation	Product Cost
Break down production process into various activities. ⩔ Club activities by their nature to form pool.	Identify each activity products for each category.	Identify activity that bring about cost. ⩔ Based on volume or transaction.	Determine cost per unit of cost driver.	Based on how much measure the product utilizes.	Allocated overhead cost added to cost of Direct material and labour.

(iii) Appropriateness of ABC Method

Piano	Keyboard
• Produce only 1000 / year. • Nor 2 customisation are same. • Varied range of manufacturing. • Production overhead cost form 35% of total production cost. (substantial portion)	• Produced 10,000 / year. • Standard products, no customisation. • No variation in process. • Production overhead cost from only 6% of total cost of production.

- Implementing ABC is time consuming and complex.
- Here, Absorption costing seems more practical due to standardization & low quantum of production overheads.

(iv) ABM helps to improve business performance

Product Pricing	Analysis of Activities	Performance Measurement
More accurate cost of production for each piano: • **Operational Level** - Identifying cost pools relating for subcontracting work.	• More detailed look at activities comprising manufacturing process. (Eg: Storage is NVA activity)	• Employee resource should be used more toward value adding activities.
• **Strategic Level** - Determine which type of customisation are most profitable.	• Inventory turnover can be improved. (Eg: Standardized procurement system of Raw material from reputed suppliers)	• Proper training required.

Student Notes

MASTER SUMS

13 Question 1: (Concept)

XYZ Ornamental Company has been a name to count on for quality and service. It has been designing wide range of ornamental products for more than two decades using the highest - quality standard. Such quality is achieved through years of experience and the integrity that is maintained by its employees. They are known for their perfection. VGG approached XYZ to make inquiry of two products. The two products are indoor fountain known as 'The Star' and a large gnome known as 'Dwarfs' for garden. Mr. Bob, the management accountant of XYZ, has estimated the variable costs per unit of 'The Star' and 'Dwarfs' as being Rs.622.50 and Rs.103.75 respectively. He estimated his calculations based on the following information:

(1) Products Data

	The Star	Dwarfs	Other Products
Production/ Sales (units)	10,000	20,000	80,000
Total Direct Material Costs	Rs. 22,50,000	Rs. 7,50,000	Rs. 60,00,000
Total Direct Labour Cost	Rs. 15,00,000	Rs. 5,00,000	Rs. 60,00 ,000

(2) Total variable overheads for XYZ are Rs.120,00,000 out of which 30% belong to the procurement, warehousing and use of direct materials. While all other variable overheads are related to direct labour

(3) XYZ presently allocate variable overheads into products units using percentage of total direct material cost and total direct labour cost.

(4) VGG is willing to purchase 'The Star' at Rs.740 per unit and 'Dwarfs' at Rs.151 per unit.

(5) XYZ will not accept any work yielding an estimated contribution to sales ratio less than 28%.

The directors of XYZ are considering switching to an activity-based costing system and recently appointed a management consultants firm to undertake an in-depth review of existing operations. As result of that review, the consultants concluded that estimated relevant cost drivers for material and labour related overhead costs attributable to 'The Star' and 'Dwarfs' are as follows:

	The Star	Dwarfs	Other Products
Direct Material Related Overheads: (The volume of raw materials held to facilitate production of each product is the cost driver.)			
Material Ratio per product unit	5	8	5
Direct Labour related overheads: (The number of labour operations performed is the cost drivers			
Labour Operations per product unit	7	6	5

Required

(i) Give a financial ANALYSIS of the decision strategy which XYZ may implement about the manufacture of each product using the unit cost information available.

(ii) DISCUSS whether activity-based management should be adopted in companies like XYZ.

Workings

(a) Direct Material Cost per unit

	The Star	Dwarfs
Total Costs (Rs.)	22,50,000	750,000
Production units	10,000	20,000
Cost per unit (Rs.)	225·00	37.50

(b) Direct Labour Cost per unit

	The Star	Dwarfs
Total Costs (Rs.)	15,00,000	5,00,000
Production units	10,000	20,000
Cost per unit (Rs.)	150·00	25·00

(c) Variable Overheads

Material Related

Overhead Cost = 30% × Rs.120,00,000 = Rs.36,00,000

Total Volume Factor

Particulars	Units	Required per unit	Total Volume
The Star	10,000	5	50,000
Dwarfs	20,000	8	1,60,000
Other	80,000	5	4,00,000
Total Volume Factor			6,10,000

Overhead per unit of volume = Rs.36,00,000/ 6,10,000 = Rs.5.90.

Therefore, Overhead Cost per product unit will be as follows:

The Star	5	Rs. 5.90	29.50
Dwarfs	8	Rs. 5.90	47.20

Labour Related

Overhead Cost = 70% × Rs.120,00,000 = Rs.84,00,000

Total Variable Overheads are 120L. Out of which 30% i.e. 36L relates to material and 70% i.e. 84L relates to Labour. Now allocate variable overheads into product units using % of total direct material cost and total direct labour cost.

VO Material Related	40% of Material Cost
	Rs. {36L/ (22.5L + 7.5L + 60L)}
VO Labour Related	105% of Labour Cost
	Rs. {84L/ (15L + 5L + 60L)}
The Star & Dwarf VO Material Related	Rs. 90 = 40% of Rs. 225;
	Rs. 15 = 40% of Rs. 37.5
VO Labour Related	Rs. 157.5 = 105% of Rs. 150;
	Rs. 26.25 = 105% of Rs. 25

Total Operations Factor

Particulars	Units	Required per unit	Total Volume
The Star	10,000	7	70,000
Dwarfs	20,000	6	1,20,000
Other	80,000	5	4.00,000
Total Operations Factor			5,90,000

Overhead per operation = Rs.84,00,000/ 5,90,000 = Rs.14.24.

Therefore, Overhead Cost per product unit will be as follows:

The Star	7	Rs.14.24	99.68
Dwarfs	6	Rs.14.24	85.44

(d) **Product Information** (by unit) is as follows:

Particulars	The Star		Dwarfs	
	Current Scenario	ABC Basis	Current Scenario	ABC Basis
Selling Price ...(A)	740.00	740.00	151.00	151.00
Direct Material Cost	225.00	225.00	37.50	37.50
Direct Labour Cost	150.00	150.00	25.00	25.00
Variable Overhead Cost:				
Material Related	90.00	29.50	15.00	47.20
Labour Related	157.50	99.68	26.25	85.44
Total Variable Cost ...(B)	622.50	504.18	103.75	195.14
Contribution ...(A) - (B)	117.50	235.82	47.25	(44.14)
Contribution to Sales (%)	15.88	31.87	31.29	(29.23)

(i) Analysis

The product costs per unit along with the respective contribution per unit may be calculated either by employing an ABC approach or alternatively by using the existing basis for the allocation of variable overhead cost. The current scenario of product costing suggests that 'Dwarfs' should be produced as per the request of VGG because the contribution to sales ratio is 31 .29%. However, the current scenario of product costing also suggests that XYZ should not undertake production of 'The Star' at a selling price of Rs.740 per unit since the estimated contribution to sales ratio is 15.88% is lower than the desired contribution to sales ratio of 28%.

Activity based costing approach ensures greater accuracy by using multiple cost drivers and determines areas generating the greatest profit or loss. Table [(d)] shows how much the contribution to sales (%) for each product changes when the overhead allocation method changes to ABC. As shown in Table, contribution to sales ratio on 'The Star' increased to 31.87% from 15.88% while contribution to sales ratio on 'Dwarfs' reduced from 31.87% to -29.23%. Thus, XYZ should opt to produce 'The Star' for VGG as contribution to sales ratio is 31.87 which is higher than the desired one.

(ii) The term Activity based management (ABM) is used to describe the cost management application of ABC. The use of ABC as a costing tool to manage costs at activity level is known as Activity Based Cost Management (ABM). ABM is a discipline that focuses on the efficient and effective management of activities as the route to continuously improving the value received by customers and to improve strategic and operational decisions in an organisation. Kaplan and Cooper divide ABM into Operational and Strategic.

Operational ABM covers the actions that increase efficiency, lower cost (i.e. reduce the cost driver rate of activities) and lead to higher revenue through better resources utilisation- in short, the action required to do things right. In other words, it is all about 'doing things right', using ABC information to improve efficiency. It also helps in identifying and improving value added activities and removing non -value added activities as to reduce cost without distorting product value.

Strategic ABM is about 'doing the right things'. It uses ABC information to determine which products is to be manufactured and which activities is to be used. XYZ can also use this for customer profitability analysis, identifying that which customers are the most profitable and focusing on them more.

A risk with ABM is that some activities have an implicit value are not reflected in a financial value added to any product. For example, a good and pleasant working environment can attract and retain the best human resources, but might not be identified as value added activities in operational ABM.

ABM provides managers an understanding of costs and helps teams to make certain decisions that benefit the whole organizations and not just their own activities.

Therefore, some companies like XYZ may adopt ABM to improve their operations and obtain useful activity information.

14 Question 2 (Concept)

ANCA Limited has decided to analyse the profitability of its four retail customers. It buys product 'Bio-aqua' at Rs.218 per case and sells to them at list price less discount. The data pertaining to four customers are:

Particulars	Customer			
	A	B	C	D
No. of cases sold	7,580	38,350	78,520	15,560
List selling price	Rs. 250	Rs. 250	Rs. 250	Rs. 250
Actual selling price	Rs. 245	Rs. 236	Rs. 228	Rs. 232
No. of sale visits	6	12	16	10
No. of purchase orders	12	18	35	24
No. of delivery kilometres	280	350	450	400

It's four activities and cost drivers are:

Activity	Cost Driver Rate
Sale visits	Rs. 750 per sale unit
Order taking	Rs. 800 per purchase order
Deliveries	Rs. 10.50 per delivery km travelled
Product handling cost	Rs. 2.50 per case sold

Required

(i) COMPUTE the customer level operating income.

(ii) ANALYZE the profitability for each customer.

Solution:

(i) Customer's Profitability Statement

Particulars	Customer- A	Customer- B	Customer- C	Customer- D
Sales (cases)	7,580	38,350	78,520	15,560
	(Rs)	(Rs)	(Rs)	(Rs)
List Price per case	250	250	250	250
Less: Discount	5 (Rs 250 × 2%)	14 (Rs 250 × 5.6%)	22 (Rs 250 × 8.8%)	18 (Rs 250 × 7.2%)
Actual Selling Price (Net of Discounts) per	245	236	228	232
Less: Variable Cost per unit	218	218	218	218
Contribution per unit	27	18	10	14
Total Contribution	2,04,660 (Rs 27 × 7,580 units)	6,90,300 (Rs 18 × 38,350 units)	7,85,200 (Rs 10 × 78,520 units)	2,17,840 (Rs 14 × 15,560 units)
Less: Additional overhead				
Visit Cost	4,500 (6 × Rs 750)	9,000 (12 × Rs 750)	12,000 (16 × Rs 750)	7,500 (10 × Rs 750)
Order Processing Cost	9,600 (12 × Rs 800)	14,400 (18 × Rs 800)	28,000 (35 × Rs 800)	19,200 (24 × Rs 800)
Delivery Cost	2,940 (280 × Rs 10.50)	3,675 (350 × Rs 10.50)	4,725 (450 × Rs 10.50)	4,200 (400 × Rs 10.50)
Product Handling Cost	18,950 (7,580 × Rs 2.50)	95,875 (38,350 × Rs 2.50)	1,96,300 (78,520 × Rs 2.50)	38,900 (15,560 × Rs 2.50)
Profit per customer	1,68,670 (11.81% of total)	5,67,350 (39.72% of total)	5,44,175 (38.10% of total)	1,48,040 (10.37% of total)
Profit per customer per case	22.25	14.79	6.93	9.51

3(ii) Going by volume of cases sold, customer C is the biggest customer accounting for 56% of total sales volume, followed by customer B (27%), customer D (11%) and customer A (6%). However, in terms of profit per customer, Customer B is the most profitable accounting for 39.72% of the cumulative customer profits of Rs.14,28,235. Customer C contributes to 38.10% of the same. Comparing customers B and C, customer B is more profitable despite accounting for sales volume that is less than half of customer B (customer C's 56% of sale volume versus customer B's 27%). The primary reason for this is because the discount given to customer C (8.8%) is higher than that given to customer B (5.6%). The difference in terms of sale could be due to the fact that customer C is the biggest customer and hence is able to negotiate for a higher discount.

Consequently, for each case sold, customer C gets an additional discount of Rs.8 as compared to customer B. This is reflected in the contribution generated per case. Sale of one case to customer C generates Rs.10 contribution versus sale of one case to customer B generates Rs.18 contribution. This has a huge impact on profitability. In terms of profit generated per case sold, customer C has the lowest contribution at Rs.6.93 per case. The company may review whether this difference in terms of sale to each of its customers is justified. If the discount to customer C at 8.8% was initially extended to promote sales, negotiations can be made to reduce this to mutually acceptable rates. However, care must be taken not to lose customer C to competitors.

Customer D is the least profitable accounting for just 10.37% of the total customer profits. In terms of sale volume, the customer ranks third providing 11% volume. However, the customer is not profitable because of the following reasons:

(a) A discount rate of 7.2% is provided to the customer. Each case sold after a discount of Rs.18 per case, generates a contribution per case of only Rs.14 per case. This is much lower compared to the contribution per case of customer A (Rs.27 per case) and customer B (Rs.18 per case). This discount policy may need to be reviewed. One scenario where such a high discount may be justified would be where customer D supplies the products that it manufactures at a discounted rate to a sister concern of the company. Therefore, at a parent company / overall level, the higher discount rate for a low volume customer D may be justified.

(b) For a customer that provides 11% of volume, the number of site visits during the year were 10. Customer C giving 56% of volume had only 16 visits and customer B giving 27% of volume had only 12 visits. This indicates that customer D, although a smaller customer, requires more visits than regular customers. Therefore, site visit costs are higher for this customer. The reason for a higher handholding by the company for this customer has to be analyzed. For example, one possible reason could be that customer D requires the cases customized to its production requirement. This may require more site visits by the company's personnel. To resolve this, due to the extra work involved, the company may wish to charge a higher sale price for the cases customized for customer D. In another other scenario, it may choose to charge the customer a fixed rate for each site visit.

(c) For a customer that provides 11% of volume, the number of orders placed in a year are 24. Customer C giving 56% of volume placed 35 orders in a year and customer B giving 27% of volume placed 18 orders in a year. This indicates that customer D, although a small customer, places orders more frequently than other larger customers. Therefore, order processing costs are higher for customer D. The company may revise ordering schedule for this customer orfind out the reason for higher proportion of purchase orders, in order to pass on some of the cost to the customer. For example, let us say, customer D has an agreement with the company to provide cases "just in time" resulting in more frequent orders as compared to other customers. Therefore, the company is providing flexibility in procurement to customer D. For this convenience, it may pass on some of the ordering cost to customer D by way of a higher selling price or a lower discount.

(d) Again, given the volume, the number of deliveries to customer D (400) is at a higher proportion compared to the larger customers C (450) and B (350). The company may revise delivery schedule for this customer or find out the reason for higher proportion of deliveries, in order to pass on some of the cost to the customer. For example, let us say, customer D has an agreement with the company to provide cases "just in time" resulting in more frequent deliveries as compared to other customers. Therefore, the company is providing flexibility in procurement to customer D. For this convenience, it may pass on some of the delivery cost to customer D by way of a higher selling price or a lower discount.

Customer A is the smallest customer providing only 6% of total sale volume. However, with a contribution per case at Rs.27 per case and a profit per case at Rs.22.25 per case, it is the most profitable of all customers. The primary reason for this is the discount of 2% offered is much lower than other customers. Each case sold to customer A yields a contribution of Rs.27 as compared to a contribution of Rs.10 from customer C, the biggest customer. Possible reason for a lower discount maybe customer A, being a smaller player, may have lesser bargaining power compared to other customers. If the company wishes to have a longer business relationship with customer A, it may wish to provide more favourable discount terms to this party. However, since customers B and C are much larger customers, any benefit passed onto customer A should not impact the company adversely in the long run. For example, in order get more orders from customer A, the company gives a 10% discount to the party. Consequently, the profitability of customer A will decrease. Let us say customer A places huge orders due to which there are capacity constraints within the company. Sales to customers B and C, the current larger customers, may be impacted. This could affect the company adversely in terms of lost sales to customers B and C and loss of business relationships with these parties. Therefore, careful consideration should be given before extending discounts to improve sales from customer A.

As regards product handling cost, each customer is currently charged Rs.2.5 per case sold. The company, if feasible, apply Activity Based Costing technique to find out if this can be allocated based on the cost driver for each customer. Let us say, packing cost before shipment is part of product handling cost. If customer B requires special packing to ship the goods, then customer B needs to be allocated a higher packaging cost as compared to the others. This cost can be recouped from customer B through a higher selling price.

15 Question 3: (Concept)

"W" specialises in engineering design and manufacture in the automotive and motorsport industry . "W"'s design team has many years' experience in the design and development of engine components for the market and high performance engines. Though "W" is performing well, but many a times, the customers complained that they had to wait for long after placing the orders. "W" is interested in cutting the amount of time between when a customer places an order and when the order is completed . For the last year , the following data were reported in respect of Division "D":

Inspection time	= 0.5 days per batch
Process time	= 2.8 days per batch
Wait time	= 16.0 days per batch
Queue time	= 4 .0 days per batch
Move time	= 0.7 days per batch

Required

(i) CALCULATE Manufacturing Cycle Efficiency (MCE) and INTERPRET the result.
(ii) STATE what percentage of the production time is spent in non-value added activities.
(iii) CALCULATE the delivery cycle time.
(iv) CALCULATE the new MCE if by using Lean Production all queue time can be eliminated.

Solution:

i) Manufacturing Cycle Efficiency (MCE)

$$= \frac{\text{Processing Time}}{\text{Inspection Time + Process Time + Queue Time + Move Time + Wait Time}}$$

$$= \frac{2.8 \text{ days}}{0.5 \text{ days} + 2.8 \text{ days} + 4.0 \text{ days} + 0.7 \text{ days} + 16.0 \text{ days}} = 11.67\%$$

Interpretation

In AKG, the MCE is 11.67%, which means that 88.33% of the time a unit is in process is spent on the activities that do not add value to the product. Monitoring the MCE helps companies to reduce non -value added activities and thus get products into the hands of customers more quickly and at a lower cost.

(ii) Percentage of Time Spent on Non- Value Added Activities

= 100% -11.67%

= 88.33%

(iii) Delivery Cycle Time

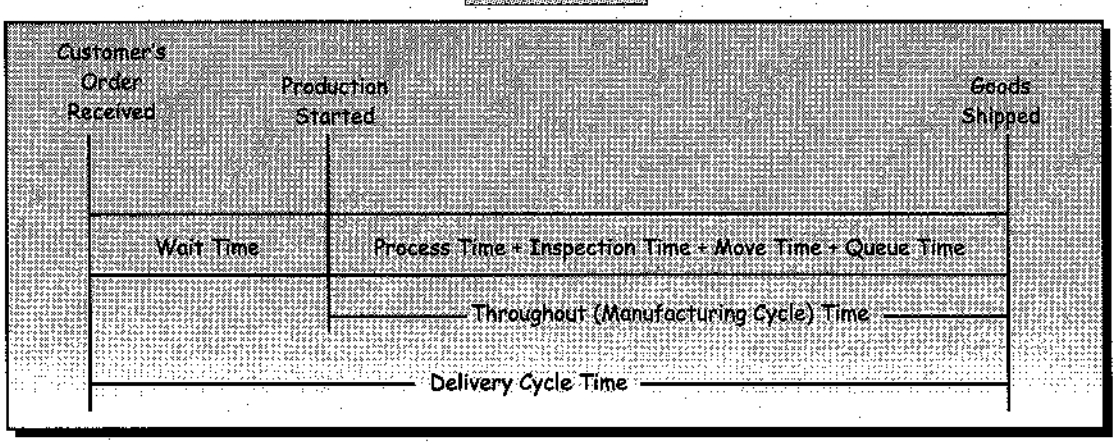
= 0.5 days + 2.8 days + 4.0 days + 0.7 days + 16 days

= 24 days

(iv) Revised MCE

$$= \frac{2.8 \text{ days}}{0.5 \text{ days} + 2.8 \text{ days} + 4.0 \text{ days} + 0.7 \text{ days} + 16.0 \text{ days}} = 14\%$$

Alternative



(i) Manufacturing Cycle Efficiency (MCE)

$$= \frac{\text{Value Added Time (Processing Time)}}{\text{Throughput (Manufacturing Cycle) Time}} = \frac{2.8 \text{ days}}{0.5 \text{ days} + 2.8 \text{ days} + 4.0 \text{ days} + 0.7 \text{ days}} = 35\%$$

Interpretation

In AKG , the MCE is 35%, which means that 65% of the time a unit is in process is spent on the activities that do not add value to the product. Monitoring the MCE helps companies to reduce non -value added activities and thus get products into the hands of customers more quickly and at a lower cost.

(ii) Percentage of Time Spent on Non- Value Added Activities

= 100% -35 = 65%

(iii) Delivery Cycle Time

= 0.5 days + 2.8 days + 4.0 days + 0.7 days + 16 days = 24 days

(iv) Revised MCE

$$= \frac{2.8 \text{ days}}{0.5 \text{ days} + 2.8 \text{ days} + 0 \text{ days} + 0.7 \text{ days}} = 70\%$$

16 Question 4: (Concept)

"Aditya Decors Ltd. (ADL) is a leading manufacturer of luxury sanitary products and has divided its whole business into different product segments. At the last year the management of ADL has decided to make some changes in its one of product-line ' AADee', the improved version was made available for sale from 1st of April 2019.

At the end of the financial year 2019 - 20, the finance and account department has extracted some relevant data for the product line 'AADee' to analyse the decision taken last year. The data related with AADee for the financial year 2018-19 and 2019-20 are as follows:

Particulars	2018-19	2019-2020
No. of units sold	4,00,000	4,30,000
Selling Price per unit	Rs. 4,175	Rs.4,325
Direct Materials	24,00,000 kg	25,10,000 kg
Cost per kg of Direct Materials	Rs. 470	Rs. 485
Direct Labour Used	32,00,000 hrs	34,80,000 hrs
Rate per labour hour	Rs. 30	Rs. 31
Fixed Costs	Rs. 1,60,00,000	Rs. 1,76,00,000

ADL has the capacity to produce 5,00,000 units of AADee a year.

Required:

(i) Analyse the changes in the operating income from financial year 2018-19 to 2019-20 with respect to the following components:

(a) Growth, (b) Price-Recovery and (c) Productivity Components.

(ii) Reconciliation of Operating Profit from 2018-19 to 2019-20.

Solution:

(i) Analysis of Changes in the Operating Income from Financial Year 2018-19 to 2019-20

(a) Growth Component -

Revenue Effect of Growth Component

$$\left[\frac{\text{Actual units of output}}{\text{Sold in 2019-20}} - \frac{\text{Actual units of output}}{\text{Sold in 2018-19}} \times \text{Selling Price 2018-19}\right]$$

= (4,30,000 units - 4,00,000 units) x 4,175

= Rs. 12,52,50,000 (F)

Cost Effect Growth Component (Variable Costs)

(1) Direct Materials

= Direct Materials required to Produce 4,30,000 units in 2018-19 - Direct Materials Used to Produce 4,00,000 units in 2018-19 x Cost per kg in 2018-19

$$= \frac{24,00,000\text{kg}}{4,00,000 \text{ units}} \times 4,30,000 \text{ units} - 24,00,000 \text{ kg} \times 470$$

= (25,80,000 kg - 24,00,000 kg) x Rs. 470

= Rs. 8,46,00,000 (A)

2. Direct Labour

[Labour hours Required to produce 4,30,000 units in 2019-20 - Labour hours Used to Produce 4,00,000 units in 2018-19] x Rate per hr in 2018-19

= (34,80,000 hours - 32,00,000 hours) x Rs.30
= Rs. 72,00,000 (A)

(b) Price - Recovery Component

Revenue Effect of Price-Recovery Component
= (Selling Price in 2019-20 - Selling Price in 2018-19) x Actual Units of output sold in 2019-20
= (Rs. 4,325 - Rs. 4,175) x 4,30,000 units
= Rs. 64,50,000 (F)

Cost Effect of Price - Recovery Component (Variable Costs)

1. **Direct Material**
   = [Direct Material price in 2019-20 - Direct Material Price in 2018-19] x Direct Material Required to Produce 4,30,000 units in 2018-19
   = (Rs. 485 - Rs. 470) x 25,80,000kg. = Rs. 3,87,00,000 (A)

2. **Direct Labour**
   = (Labour Hour Rate in 2019-20 - Labour Hour Rate in 2018-19) x Labour Hours Required to produce 4,30,000 units in 18-19
   = (Rs. 31 - Rs. 30) x 34,40,000 hrs.
   = Rs. 34,40,000 (A)

Cost effect of Price-Recovery Component (Fixed Costs)

= (Rate per unit in 2019-20 - Rate per unit in 2018-19) x Actual Units of Capacity in last year if Adequate to produce Current year's Output in last year

$= \frac{Rs.1,76,00,000}{5,00,000} - \frac{Rs.1,60,00,000}{Rs.\ 5,00,000\ units} \times 5,00,000\ units$

=(Rs.35.2 - Rs. 32)x 5,00,000 units = 16,00,000 (A)

(c) Productivity Component

Productivity Component (for Variable Costs)

1. **Direct Material**
   = [Direct Materials Used to Produce 4,30,000 units - in 2019-20 - Direct Materials Required to Produce 4,30,000 units in 2018-19] x cost per kg 2019-20
   = (25,10,000 kg - 25,80,000 kg) x Rs. 485
   = Rs. 3,39,50,000 (F)
2. **Direct Labour**
   [Labour Hours Used to Produce 4,30,000 units in 2019-20 - Labour Hours Required to Produce 4,30,000 units in 2018-19] x Rate per hour in 2019-20
   = (34,80,000 hours - 34,40,000 hours) x Rs. 31

(iii) Reconciliation of Operating Profit from 2018-19 to 2019-209

Particulars		Amount (Rs.)
Operating Profit in 2018-19 (Refer to Working Note)		43,00,000
Add:		
Revenue effect of Growth Component	12,52,50,000	
Revenue effect of Price-Recovery	6,45,00,000	
Productivity Component	3,39,50,000	22,37,00,000
Less:		
Cost effect of Growth Component(Direct Material)	8,46,00,000	
Cost effect of Growth Component(Direct Labour)	72,00,000	
Cost effect of Price-Recovery(Direct Material)	3,87,00,000	
Cost effect of Price-Recovery(Direct Labour)	34,40,000	
Cost effect of Price-Recovery(Fixed Cost)	16,00,000	
Productivity Component (Direct Labour)	12,40,000	13,67,80,000
		51,69,20,000

Working Note:

Calculation of Operating Profit in 2018-19 and 2019-20

	2018-19 (Rs.)	2019-20 (Rs.)
Sales (Rs.4,175 x 4,00,000 units: Rs.4,325 x 4,30,000)	167,00,00,000	185,97,50,000
Less: Costs		
Direct Materials (Rs.470 x 24,00,000 kg., Rs.485 x 25,10,000 kg.)	112,80,00,000	121,73,50,000
Direct Labour (Rs.30 x 32,00,000 hrs., Rs.31 x 34,80,000 hrs.)	9,60,00,000	10,78,80,000
Fixed Cost	1,60,00,000	1,76,00,000
Operating Profit	43,00,00,000	51,69,20,000
Increase/(Decrease) in Operating Profit	8,69,20,000	

17 Question 5 (Concept)

Pearson Metal and Motor Works (PM2W) deals in manufacturing of the copper wired electronic motor, which is specifically designed. PM2W is thinking to shift from traditional system to JIT system as part of process innovation. CEO among the other top bosses at PM2W are hopeful that implementation of JIT will not only improve value in value chain for end consumer, but also improve overall manufacturing cycle efficiency. JIT pre-implementation team was formed to evaluate the probabilities, which collects following actual and estimated data about process;

Activity Category	Traditional System (Actual)	JIT System (Estimated)
Inspection	40	30
Storage	80	20
Moving	20	10
Processing	60	40

All data in minutes

Further, PM2W decided to practice single piece flow under JIT, PM2W received an order which is due to manufacture and delivered for 10 such motors. Total available production time to produce what consumer demands is 480 minutes out of which it normal practice that 30 minutes will be spent in shutdown and cleaning. CEO is also considering JIT purchase apart from JIT production.

Required:

(i) Advise whether company should shift to JIT.

Solution

(i) Advise on Shifting to JIT

To evaluate how much of the old cycle was spent in inventory, we need to know how organizations assess the efficiency of their manufacturing processes. One commonly used measure is process cycle efficiency and to calculate the same every process is breakdown into combination of activities such as value added activities, non-value added activities and non-value added activities but

Strategic activities. In order to generate highest value to customer, only value added activities are included in process. But those non-value added activities, which are strategic in nature, also need to be part of process. Therefore, it may be possible that entire process is not efficient.

To measure efficiency of process, managers keep track of the relation between 'times taken by value added activities' in comparison 'total cycle time.' Such relation / ratio is processing cycle efficiency.

$$\text{Process Cycle Efficiency} = \frac{\text{Value Added Time}}{\text{Cycle Time}}$$

Processing time is considered as value added time; whereas time spend on inspection, storage and moving is non-value added time and included in cycle time. The higher the percentage, less the time (and costs) needs to be spent on non-value added activities such as moving and storing etc.

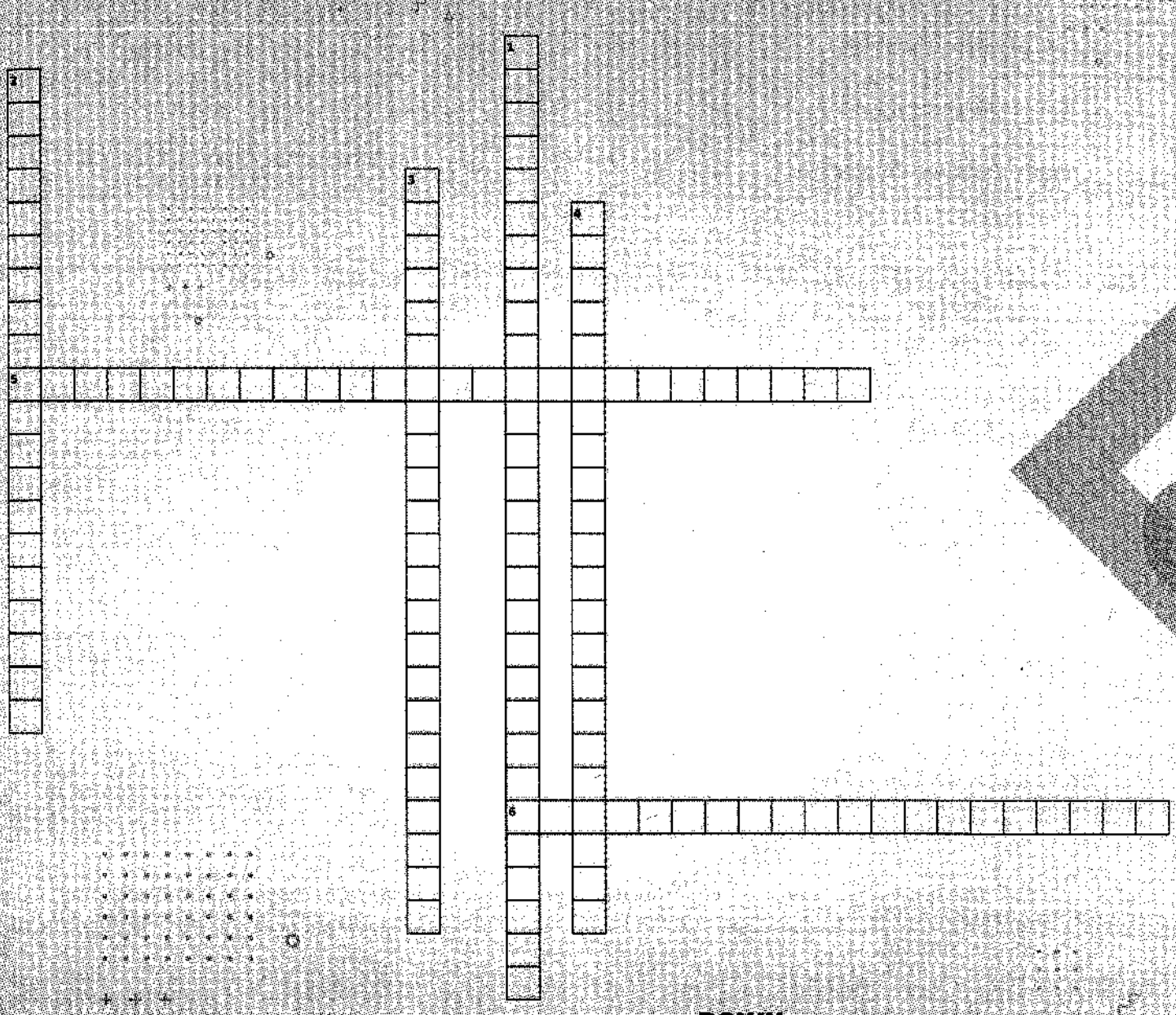
Computations of Processing Cycle Efficiency

Sr. no.	Activity Category	Traditional System (Actual)	JIT System (Estimated)
A.	Inspection	40	30
B.	Storage	80	20
C.	Moving	20	10
D.	Processing	60	40
E.	Value Added Time	60	40
F.	Cycle Time	200	100
G.	Process Cycle Efficiency (E)/(F) x 100	30%	40%

of the 200 minutes required for manufacturing cycle under PM2W's traditional system, only 60 minutes were spent on actual processing. The other 140 minutes were spent on non-value added activities, such as inspection, storage, and moving. The process cycle efficiency formula shows that processing time equaled to 30% of total cycle time. The cycle time is reduced substantially in the JIT system from 200 minutes to 100 minutes. In addition to this, the amount of time that used up in inventory ie; non-value added activities is also reduced. Therefore, process cycle efficiency has been increased from 30% to 40%. This significant improvement inefficiency over the previous system comes from the implementation of JIT system. Therefore, it is advantageous to shift to JIT system.

GAME OF CONCEPTS

CHAPTER 10



ACROSS

5. Profitibity of an individual product
6. The cost and performance of activities,resources and cost objects

DOWN

1. customer profit accountability
2. Activities which are indispensable in order to complete the process
3. Analyzing a company's profitibility by looking at each aspect of its business to determine strengths and weaknesses
4. Does not take historical costs into account when creating budget

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APP CODE

Budgetary Control

SCAN AND REVISE

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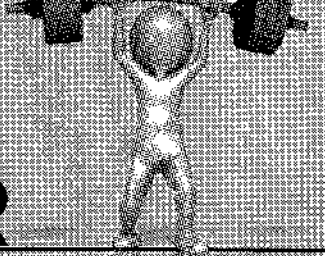


MENTOR

1 Budgetary Control

General

Establishment of standard & Targets

Regarding Income & Expenditure

Continuous Monitoring of Performance

Brown & Howard

System of Controlling Costs by Preparing Budgets

Coordinating the department

Compare Actual with Budgeted

Improve & Achieve Maximum Profit

1.1 Understanding of Budgetary Control :

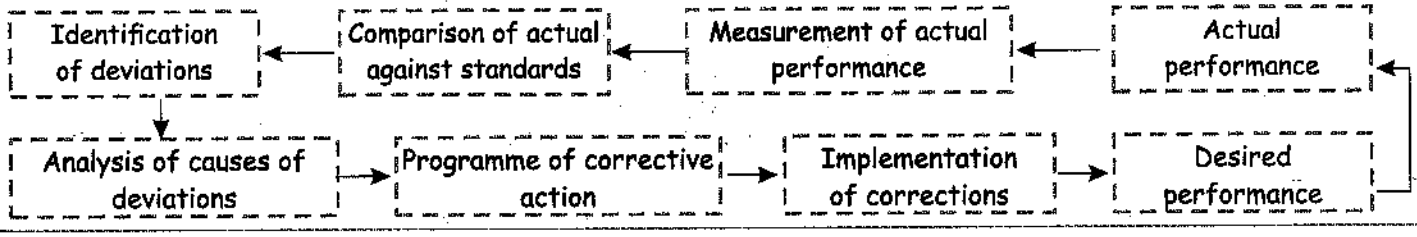
1.2 Pre- Requisite of Effective Budgetary Control

- Serious attitude
- Clear demarcation between areas of Managerial Responsibility (Responsibility Centres)
- Reasonable Targets
- Proper Data Collection, Analysis & Reporting Technique
- Appropriate actions to get things under control
- Short reporting period
- Reports aimed at individual manager, rather than general.
- Timely variance reports

Types of Controls

2 Feedback Control

'Measurement of differences between planned outputs and actual outputs achieved, and the modification of subsequent action and/or plans to achieve future required results. Feedback control is an integral part of budgetary control and standard costing systems.'



2.1 Feedback Management Control Report

- Standardized Format
- Disclose Variations from standard
- Disclose Accomplishment & Responsibility
- Disclose Trend & Relationships
- Reports Extracted promptly

*Feedback is an input for Feed Forward.

2.2 Limitation of Feedback Control

(1) Depends heavily on success of the error detection system.

(2) Time lag between the error detection, error confirmation, and error revision during which actual results may change again.

2.3 Implementation of Feedback Control

- Indicator, both leading and early warring
- Policy Directives
- Adaptive Mechanism
- Congruent System Design
- Trend Analysis
- Contingency Plan

3 Feed Forward Control

Forecasting of differences between actual and planned outcomes and the implementation of actions before the event, to avoid such differences.'

Industrial Dispute

In a city that sends (Material A) to whole country.

Feed Forward: Buy before prices went up

Smart Move Incorporation

Last year sales: 1000 units

Next year covid

Feed Forward: Low purchasing power of customer. So this year sales 400 units.

3.1 Limitation Feed Forward Control

- Estimates of uncertain future.
- Stay of future is not well developed.

3.2 Pre-requisites of Feed-Forward Control

- Thorough planning and analysis are required.
- Careful discrimination must be applied in selecting input variables.
- The Feed - Forward system must be kept dynamic.
- A model of control system should be developed.
- Data on Input Variables must be regularly collected.
- Data on Input Variables must be regularly assessed.
- Feed forward control requires action.

3.3 Feedback & Feedforward Control

Feedback	Feedforward
Reaction after an action has taken place.	Pro-active Mechanism
Movement of differences between planned output and actual output & Modification of subsequent action.	Forecasting of differences between actual and planned outcomes & action implement before Event.
Detective tool.	Progressive tool / Preventive tool.
Focus on Output.	Focus on Input.
Point out and correct improper performance.	Prevent problems before they arise.

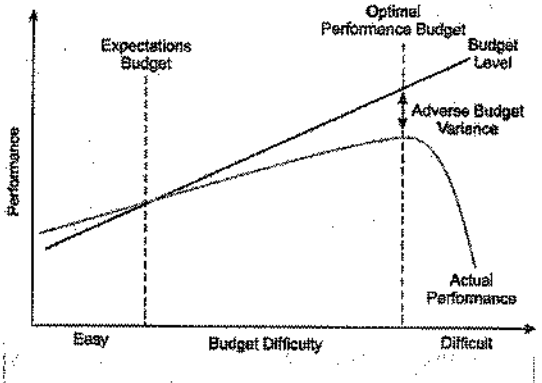
Student Notes:

4 Effect of Budget Difficulty on Performance

After Budgets, Start comparison of

- Actual performance
- Potential Difficulties
- Flexed Budget Performance (Flexed means adjusting budgets with actual to make it comparable.)

Acceptance by Managers as their own Targets.	Good Upward Communication Participation.	More Demanding Budget, Better Results but budget should not be too difficult.	Managers reaction to budget based on culture & Original Norms.	Budgets should be accepted positively.



5 Behavioral Aspects of Budgetary Control

Above graph shows that budget should be moderately difficult to motivate to achieve it; if it is too much difficult then actual performance will fall drastically.

Participation of Managers in Target Setting improves Performance.

At times, Employee is in a fix.

Cost Reduction OR Quality

D) Managers should always think from long term point of view, when implementing a plan.

6 BUDGET-SLACK

Allowing managers to set their own targets will introduce

Slack = Purposely making budget easy to achieve or making easily achievable targets.

"Slack Targets"

High Expectation of Meeting Targets	Relaxed attitude and combination of factors are considered
Managers will introduce Slack	Managers will not introduce Slack

7 Participation in Budget- Setting Process

Top - Down Approach (imposed Style)	Bottom-Up Approach
Budgets Prepared Centrally & subordinate have little influence.	Subordinate Managers to participate in preparation of their own budgets.
Involves Less Management Time.	More Time consuming as Reviewed by Senior Management.
Risk of Inaccurate Budgets.	Risk of Budget Slack.

7.1 Advantages

- Better understanding of what results be achieved and at what costs.
- Can't excuse for unrealistic goals
- Employee Motivation
- Goal Congruence

7.2 Disadvantages

- Lack practical knowledge required.
- Limit the benefits of participation.
- Consume a great deal of time arguing with each other.
- Artificially inflate the proposed budget.

8 Different Situations of PARTICIPATIVE – BUDGETING

Factors of Participation	Participation Style Less-Effective
a) Personality	Authoritarian Managers
b) Work Situation	Highly - ProgrammedEnvironment
c) Locus of Control	Individuals who have "low degree of control"
d) Job-Difficulty	Low
e) Original Structure	Centralized Organization

8.1 Circumstances Where Top-Down Budget Preferred

- Same units; Stable environment
- Highly programmable process & clear input-output
- Scope of budget slack
- Managers can significantly influence the results.

9 Limitations Of Traditional Budgeting

- Time consuming.
- Barrier to change.
- Based on Unsupported assumptions. and Guess work.
- People feel undervalued.
- Infrequent Updation.
- Focus on Cost Reduction & not on Value Creation.
- Not Strategically focused & contradictory.

10 Use of Accounting Information in Performance Evaluation (Jan 21 Paper)

3 Styles of using Budget in Performance –Evaluation

Budget Constrained	Profit-Conscious	Non Accounting
Full focus only on the Budget -Prepared & Short term focus. (Effectiveness)	Focus is on profitability of unit's operations in relation to long term goals. (Quality)	Focus on Non-Financial factors. (Long Term Focus)

10.1 Effects of 3 Styles of Management

	Budget Constrained	Profit Conscious	Non-Accounting
Involvement with cost	High	High	Low
Job related Tension	High	Medium	Medium
Manipulation of Accounting information	Extensive	Little	Little
Relation with superiors	Poor	Good	Good
Relation with colleagues	Poor	Good	Good

11 Beyond – Budgeting

Introduced as a Better Decentralized Technique over Traditional Budgeting

11.1 New Management Philosophy

- Agile & Adaptable
- Eliminates Bureaucracy & Rigid Controls
- Empowers People Participation
- Promotes Transparency

11.2 Suitability of Beyond Budgeting

Rapid change Industries	Using TQM	Undergoing radical change i.e. BPR
Flexible Targets; Responsive to change.	Continuous Improvement.	Original Budgets may not work.

11.3 Implementation of Beyond Budgeting

STEPS

Case for Change » Convince the Board » Get - Started » Design & Implement New process

Train & Educate Employee » Rethink Role of finance » Change Behaviour » Evaluate Benefits » Consolidate Gains

11.4 BB Principles of Adaptive Management

- **Leadership Principles** → COVATP
- **Management Processes** → $R^3T^1P^2$

C Connect to Customers Needs	**R** Organize Management processes around Business Rhythms & Events.
O Strong Organizational Culture	**R** Reward Shared Success.
V Shared Values & sound judgement	**R** Make Resources available as needed
A Autonomy : Trust people with freedom to Act.	**T** Set Direct, Ambitious & Relative Targets.
T Transparent Information for innovation, learning for all	**P** Performance Evaluation in Totality with Learning & Development.
P Purpose : Engage & Inspire people for long term targets	**P** Make Lean & Flexible Plan & Forecasts and not Rigid ones.

11.5 Characteristics of Beyond Budgeting

- Rolling Budgets incorporate KPI'S
- Timely Allocation of Resources
- Focus on improving future results
- Allows managers to react to Environment
- Culture of Innovation
- Incorporate Benchmarking
- Proper delegation of authority

11.6 Benefits of Beyond Budgeting

- Managers work in Coordination, Removes internal rivalry
- Defines clear Responsibilities & Challenges
- Rewards Team Based; not individual
- No budget limits & focus on key-ratios
- Customer Oriented Team
- Quick exchange of information

12 Traditional v/s Beyond Budgeting

Particulars	Traditional Budget	Beyond Budget
1)Targets and Rewards	-Incremental Targets -Fixed incentive	-Stretch goals -Relative Targets and Rewards
2)Planning & Control	-Fixed annual plans -Variance controls	-Continuous planning -KPI & rolling forecast
3) Resource & Co-ordination	-Pre-allocated resources -Central coordination	-Resources on Demand -Dynamic coordination
4)Organizational Culture	-Focus on Managing numbers	-Focus on Value-creation

13 Conclusion on Budgeting

- Budgeting is evolving, rather than becoming obsolete it depends on trust and transparency.
- Shift from the top-down, centralised process to a more participative, bottom-up exercise.
- It highlights the level of improvement that can be achieved even with relatively simple modifications.
- Budgeting has changed, neither dramatic nor radical. Instead, incremental improvements.
- Forecasting in facts is more important.

Student Notes

CASE STUDIES

14 CASE STUDY 1 -Feedback and Feed-forward control - Real Petroleum Corporation (ICAI MODULE)

ISSUES

- Real Petroleum Corporation - Lubricant oil manufacturers for motor vehicles
- Company offers lubricant oils in various packages ranging from a 100 ml pouch to a 200 litres drum. About 70% of lubricant sales are made in 900 ml 'cans'.
- Any 'can' having lesser quantity of oil is removed before the 'cans' are packed into the cartons.
- The 'cans' which are short filled & of broken cannot be reused. Hence the product is wasted.
- The company wants to add a component in its packaging unit to avoid short fill in packaging. It will be installed after the first stage of packaging. The component will measure the volume of product and will forward the 'can' for capping and sealing only if the quantity in 'cans' is correct. In case the 'can' does not have required volume of product, the 'can' will be topped up with balance product before the capping and sealing process. The company will be able to achieve 0% wastage due to short filling after implementation of new system.

CONCEPT

- Budgetary Control - Feedback and Feed-forward control.
- Existing type of control proposed and the type of control.

EXPLANATION

CONTROL Control is a management function of establishing benchmarks and comparing actual performance against the benchmarks and taking corrective actions. Control is required at all levels of organisation to ensure that the organisation achieves its intended objective.

There are two types of control systems - Feedback Control and Feedforward Control.

Feedback Control

- ✓ Control activity that takes place after a process is complete.
- ✓ A corrective action to rectify the problem.
- ✓ Loss of significant time to take corrective action.

Feed-forward Control

- ✓ A preventive control.
- ✓ Foresee potential problems and take corrective action.
- ✓ These are costly to implement.
- ✓ It detects deviation from standard or goal to allow correction.

CONCLUSION

Current Mechanism (Feedback Control)

- Actual volume of product is measured at the end of packaging process.
- Any 'can' which is short filled is not packed in the carton.
- Ensures lower quantity of product is not supplied.
- Leads to product losses as identification of short-filled 'cans' at the end of process is not useful to the production process.
- In case of huge variation in the final packaging, system can be reviewed to ensure that such problems do not acquire in the future.

Proposed Mechanism (Feed forward Control)

- Here short filling is identified in the packaging process itself and corrective action.
- The savings must be compared with the cost required to modify the packaging process before finalising on whether the new system should be implemented or not.

15 Case Study 2 -Short comings of Budgetary Control System- Global Mfg (ICAI MODULE)

ISSUES	• Global Mfg. Ltd. a UK based Company • Our advertisement cost was comparatively higher than other companies working in education field as well as with our previous years.

CONCEPT	Short comings of Budgetary Control System

EXPLANATION

Short coming which reduces effectiveness

Lack of Co-ordinated goal	Influence of uncontrollable factors	Short-Run perspective
Have clear understanding of goal for decision making	Actual performance relative to budget influenced by UF i.e, rush orders.	Results in inappropriate decisions

The improvements in the budgetary control system must correct the deficiencies described above.

- It must more clearly define the company's objectives.
- It must develop an accounting reporting system.
- Establish budget values for appropriate time periods which do not change monthly.

16 Case Study 3 -Participative Budgeting- Excellent Woodcraft (ICAI Module)

ISSUES

- Excellent Woodcraft Private Limited (EWPL) - Manufacturers and suppliers of an unlimited array of Wooden Furniture Items.
- It has strived to proffer an excellent blend of optimum quality and price, and successfully established the company as the preferred choice of customers in the past years. This is the reason that its products and services are applauded in the industry for its flawlessness.
- At EWPL, latest technology based machines and equipment are set, which provide support in hassle-free production and storage of the proffered assortment.
- It has a team of skilled and experienced professionals, who are trained to understand and meet the diverse client requirements within the committed time period.
- EWPL's Budgeting Process for Sales
  - ✓ Each salesgirl makes a customer-wise listing of sales
  - ✓ The sale manager looks at variance in sales growth and modifies low projections.
  - ✓ The usual result is a 7% to 10% increase in projected sales, which the sales manager allocates among the salesgirls based on their past performance.

CONCEPT	• Budgetary Control - Participative Budgeting • (i) DISCUSS the participative nature of the sales budgeting process at EWPL. • (ii) ADVISE on best approach from EWPL's perspective that may be adopted.

EXPLANATION

(i) In participative budgeting, subordinate managers create their own budget that are reviewed by senior management.

- Communicates sense of responsibility to subordinate managers. (Bottom up approach)
- Budget's goals become the manager's personal goal, resulting in goal congruence.
- Involves individuals whose knowledge of local conditions may enhance the planning process.

Top Bottom Approach	Bottom up Approach
• Budget figures imposed on sales personal. • Loss participation of sales personal.	Each sales person prepare their own budget and reviewed by senior management. Sales person motivated to achieve goals. Time intensive & expensive. Risk of budget slack.

CONCLUSION

(i) Here the participative budget is for name sake only. In virtually every instance, the participative input is subject to oversight and discussion by sales manager.

Substitute

- Such a process appears to be the case in EWPL. J's statement indicates a very autocratic style which seems to be arbitrary and capricious (changing behaviour suddenly in a way that is difficult to predict.
- There is little incentive for the salesgirls to spend much time and effort in projecting the true expected sales.

(ii) EWPL can use combination of both top down and bottom up approaches.

- This may include forecast of key economic variables and their potential impact on the EWPL.
- These budgets need to be reviewed to validate the uniformity with the EWPL's objectives.

17 CASE STUDY 4 - Competitive Advantage And Control System - Wings International Corporation (ICAI MODULE)

ISSUE

- Wings International - Airline Industry.
- It adopts "low cost advantage" strategy due to new entrants in domestic segment.
- It was not able to generate sufficient profit due to low cost strategy.
- Wing international decided to adopt "differentiation advantage" strategy.

CONCEPT

- Strategy for becoming 'no frills' airline.
- Differentiation advantage.
- Management control report - Feed forward control report.
- Management control report - Feedback control report.

EXPLANATION & CONCLUSION

(i) Wings International is a premium segment airline charging "full service" rates for its ticket. "low-cost advantage" strategy achieved through following measures.

"Low-cost advantage" strategy achieved through following measures.

- "no-frills" airline, where the ticket included only the seat, other facilities to be purchased extra.
- Baggage allowance reduced to economize space.
- Save on fuel costs.
- Facilitates online ticket booking.

"low-cost advantage" strategy did not work due to the following reasons:

- Price war from competitors reduced the ticket prices
- Variable prices to fill up flight capacity.
- Costs of operations rising in the recent years.

Due to the above reasons, Wings International's venture as a low-cost airline became unviable.

(ii) Wings International plans to foray into offering its service to flyer from smaller cities.

"Differentiation Advantage" Strategy

- Offering a "full service" price with high quality facilities differentiate Wings' airlines from its "low cost, no frills" competitors.
- More connectivity to flyers using its unique "hub-spoke" model.
- Strategic tie-ups with other airlines and hospitality providers.
- Product differentiation between the road and rail transport providers.
- Dedicated customer service lines to resolve issues.

(iii) Management Control Report - Feed Forward Control Report.

Feed Forward Control Report

- Preventive tool / measures
- Measures error before it actually takes place.
- Measures to change operational variable of to achieve desired results.

»

Guidelines to Implement - Feed forward

- Through planning and analysis is required.
- Careful discrimination in selecting input variables.
- Feed forward mechanism should be kept dynamic.
- A model system should be developed.
- Data on input variables should be collected regularly.
- Feed-forward control requires action.

(iv) Management Control Report - Feedback Control Report

Feed Back

- Corrective tool
- It tracks actual with budgeted results.
- Provide feed back about operations.

»

Management Control Report - Feed-Back Control Report

- Should disclose both accomplishment and responsibility.
- Should be extracted promptly.
- Should disclose variations from standard. Should be in a standardized format.

18 Case Study 5 -Beyond Budgeting- Magical Stay (ICAI MODULE)

ISSUES

- Magical Stay (Public Listed Company) - Hotel Industry (Having properties at popular tourist destinations).
- Each hotel having 50 rooms that has standard, elite and luxury size suites.
- Currently having 9 properties spread across World & headquarters in Singapore.
- To have uniformity across locations, key metrics like room rent per day, employee hiring, capital investments are handled by headquarters & implemented by management at each location.
- The manager of each hotel is given a target & to meet the set targets management is under pressure to work.
- In the past, if target met for couple of years, the senior management had closed down the hotel and exited the property.
- Best performers are given more liberal budgets to operate on. There are constant negotiations for been given a "reasonable / practical target" that has to be achieved.
- Recent monthly results shows that 7 of the 9 properties have consistently not been able to meet the targets in the past 6 months.
- Due to recessionary trend occupancy during peak season has only been 60%, hence operations are bleak and uncertain.
- Suggestions to improve performance in order to decentralize:
  - ✓ When hotel is not fully booked, rent out rooms at an attractive discount.
  - ✓ Allow procurement of kitchen supplies locally, rather than specified vendors.
  - ✓ Monthly reward and recognition program for employees.
  - ✓ Allow location management autonomy, with a reasonable budget to cater to purchasing equipment.
- Company moves its focus to "growth based targets" instead of "budget based targets".

CONCEPT

- (i) Traditional budgeting process had a negative impact on Magical Stay's operations.
- (ii) "Growth based targets" instead of "budget based targets".

EXPLANATION

(i) Magical Stay is operating in a business scenario that is highly competitive and dynamic. Focus of the traditional budget was profit target of ` 1,500 million for the year 2018.

Impact of Traditional Budgeting Process (Top Down Approach)

- Policies are not flexible in a fast changing business environment.
- Budgets were based on internal benchmarks and assumptions made by the management.
- Certain decisions may be shelved, if P.Y. profit is the only Benchmark. Such decisions that may need to be undertaken quickly, may not be incurred at all because there is no budget for it.
- Operations management did not have autonomy
- Managers try to negotiate for lower sales targets to achieve intent in meeting targets than focusing on business growth.

EXPLANATION

Feedback from operations managers

- Targets based on growth instead those based on the budget alone is the philosophy of "beyond budgeting".
- A more decentralized and participative.
- Quicker decisions to ensure customer satisfaction.
- Identify opportunities to generate more revenue.
- Unbiased benchmarks based on peer group performance better.
- Employee morale is boosted
- It fosters healthy competition among employees.

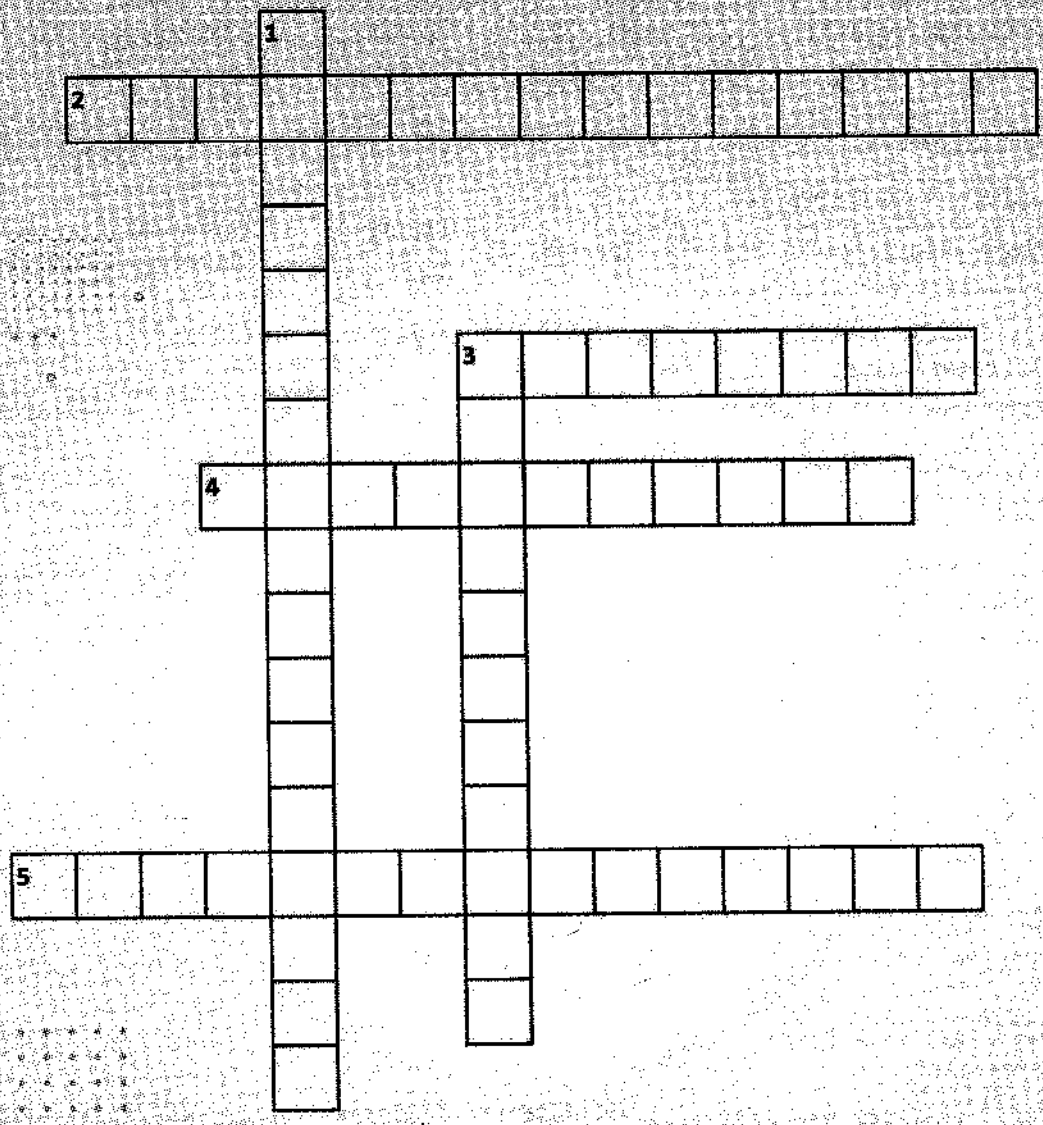
CONCLUSION

- (i) Focus is on achieving budget target rather than implementing strategies that can create more value to the company.
- (ii) Since the focus is on growth, beyond budgeting can be a way of achieving better results in challenging business environment.

Student Notes

GAME OF CONCEPTS

CHAPTER 11



ACROSS

2. New way of budgeting
3. Reaction after an action has taken place
4. Budget gap
5. Budget prepared centrally & subordinate have little influence

DOWN

1. Subordinate managers to participate in preparation of their own budget
3. Pro-active Mechanism

UPLOAD 11 SOLVED CROSSWORD PUZZEL & UPLOAD THIS ON INSTAGRAM STORIES & TAG US @ca_sankalp_kanstiya & YOU CAN WIN EXCITING GIFTS.

- **ANSWERS ARE UPLOADED ON WEBUCATE APP ON PLAY STORE.**
- **WINNERS NAME WILL BE UPLOADED ON WEBUCATE APP.**

APP CODE

Standard Costing

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STUDY MENTOR

1 Standard Costing

1.1 OBJECTIVES OF ADOPTING STANDARD COSTING SYSTEM

- Cost Management
- Planning & Control
- Decision Making
- Product Costing

1.2 Advantages

- Cost Control
- Price Fixation
- Measuring Performance
- Optimum Resource Utilisation

1.3 Disadvantages

- Departmental Conflicts
- Not Realistic
- Ignores Inflation & Other Uncertainities

1.4 Step of Standard Costing

- Investigate the reason.
- Identify the problems.
- Take corrective action.

2 VARIANCES

A technique of cost ascertainment and control whereby standard cost are pre-determined and subsequently compared with actual cost.

Variances of Efficiency	Variance of Price Rates	Variance Due to Volume
Variances due to the effective or ineffective use of materials quantities, labour hours, once actual quantities are compared with the predetermined standards.	Variance arising due to change in unit material prices, standard labour hour rates and standard allow.	Variance due to the effect of difference between actual activity and the level of activity assumed when the standard was set.

2.1 Controllable Variances

Controlled by the Departmental Head.

Price variances becomes controllable if the production controller has failed to place orders in time and urgent purchase was made at extra cost.

2.2 Uncontrollable Variances

Beyond Control of Departmental head.

Price Variance regarded as uncontrollable if the price increase is due to MARKET FLUCTUATION.

3 Profit Variance

- Total Sales Variance
  - Sales Margin Variance (7.2)
  - Sales Value Variance (7.1)
- Total Cost Variance
  - Material Cost Variance (4)
  - Labour Cost Variance (5)
  - Variable Overhead Variance (6.1)
  - Fixed Overhead Variance (6.2)

4 Direct Material Variance

Direct Material Cost Variance is difference between Standard cost of INPUTS (i.e.MATERIALS) specified and the Actual cost Material used.

4.1 Responsibility of Material Cost Variance

- Purchase Manager → Material Price Variance
- Production Manager → Material Usage Variance

4.2 ANALYSIS OF MATERIAL VARIANCE

Material Cost Variance
(Standard Material Cost - Actual Material Cost)
(SQ x SR - AQ x AR)
{[Standard Quantity of input for Actual output(SQ) x Standard rate of input (SR)]
-[Actual Quantity consumed (AQ) x Actual rate of input (AR)]}

Material Price Variance
(Standard rate -Actual rate) x Actual quantity of input
(SR - AR) x AQ

Material Usage Variance
(Standard quantity of input for actual output - Actual input) x Standard rate
(SQ - AQ) x SR

Derivation of Sub Usage Variance
Adding & Subtracting SMQ from both sides
(SQ - SMQ + SMQ - AQ) x SR
(SQ - SMQ) x SR + (SMQ - AQ) x SR

Material Sub Usage Variance
(When the total quantity of standard and actual is different)
(SQ - SMQ) x SR

Material Mix Variance
(When the ratio of standard and actual quantity is different)
(SMQ - AQ) x SR

Where, SMQ = Standard Mix Quantity
Calculated as Total of Actual Quantity in Standard Ratio

Variance Table = If, SM > AM = (F)
SR > AR = (F)
SM > SMM = (F)
SMM > AM = (F)

5 Labour Variance

These two basic variances that can be calculated in respect of direct labour total variance (also known as labour cost variance) are (a) Rate variance and (b) Efficiency variance

5.1 Responsibility of Labour Cost Variance

- Labour Rate Variance ← Personnel / HR Manager
- Labour Manager → Labour Efficiency Variance

5.2 ANALYSIS OF LABOUR VARIANCE

Labour Cost Variance
(Standard Labour Cost - Actual Labour cost)
(Standard hours for Actual output x Standard Rate per labour hour - Actual Hours paid x Actual Rate)

Labour Efficiency Variance
[(Std hours for Actual Output-Actual hrs) x Std Rate per labour hr]
Derivation of Sub Efficiency Variance
(SH - AH) x SR
(SH - SMH + SMH - AH) x SR
(SH - SMH) x SR + (SMH - AH) x SR

Idle Time Variance
(Actual Hrs Paid - Actual Hrs Worked) x Standard Rate per labour hr
(Always Adverse)

Labour Rate Variance
[(Std Rate - Actual Rate) x Actual Labour hrs PAID]
(SR - AR) x AH

Labour Sub Efficiency Variance
(When **TOTAL** of Standard hours and Actual hours is different)
(SH - SMH) x SR
Adding & Subtracting SMH form both sides
(SH - SMH + SMH - AH) x SR

Labour Mix Variance
(When **RATIO** of Standard and Actual hours is different)
(SMH - AH) x SR

Where, SMH = Standard Mix Hours
SMH = Total of Actual Hours in Standard Ratio

Total Hour is same for Labour, Variable and Fixed Overheads

Idle Time
Actual hours paid (gross hours)
- Actual hours worked (net hours)

Variance Table = If, SH > AH = (F)
SR > AR = (F)
SH > SMH = (F)
SMH > AH = (F)

6 Overhead Variance — a) Fixed Overhead Variances b) Variable Overhead Variances

6.1 ANALYSIS OF VARIABLE OVERHEAD VARIANCES

Variable Cost Variance
(Std Budgeted Variable OH - Actual Variable OH)
(Std Variable OH Rate p.u x Actual output - Actual Variable Rate p.u x Actual Output)
(Std Hours for Actual x Std VOH Rate per hr - Actual Hrs x Actual Variable Rate / Hrs)

- **Variable OH Expenditure Variance**
  (Std variable OH Rate per hour - Actual Variable OH Rate per hr) x Actual hrs worked
- **Variable OH Efficiency Variance**
  (Std Hours for Actual Production - Actual hrs worked x Std Variable OH Rate per hour

Total Hour is same for Labour, Variable and Fixed

Very Important Point:
Standard Variable Overhead Rate > Actual Variable Overhead Rate = (F)
Standard Hours > Actual Hours = (F)

6.2 ANALYSIS OF FIXED OVERHEAD VARIANCES

Fixed Overhead Cost Variance
(Absorbed Fixed Overheads - Actual fixed overhead)
(Actual production x RECOVERY RATE P.U.- Actual Fixed Overheads)
(Actual Production x Standard Hours per unit x Standard Rate Per Hour - Actual Fixed Overhead)

- **Fixed OH Expenditure Variance**
  Budgeted Fixed OH - Actual Fixed OH
- **Fixed OH Volume Variance**
  (Budgeted Production - Actual Production) x RR p.u.
  (Budgeted Prodn - Actual Prodn) x Std hours x RR per hr.
  (Budgeted Prodn x Std Hours) - (Actual Prdn x (Std hr)] x RR/hr.
  (Budgeted hrs for Budget Prdn - Std Hrs. for Actual Prdn) x RR per hour

(ALWAYS CALCULATED IN TERM OF HOURS)

- **Fixed OH Capacity Variance**
  (Budgeted Hrs - Actual hours) x RR per hour
  - **Fixed OH Calender Variance**
    (Budgeted days - Actual days) x RR per days
  - **Fixed OH Revised**
    Capacity Variance (Budgeted hours for Actual days - Actual Hours) x Recovery Rate per hour
- **Fixed OH Efficiency Variance**
  (Std. hours for Actual production - Actual hours) x RR per hour

Overhead variances arise due to difference between **Actual** overhead and **Absorbed** overheads.

Variable Overhead	Fixed Overhead	
Std. Variable Ohd rate = $\frac{\text{Std Voh}}{\text{Std Hours}}$	RR/u : $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Production}}$	RR/u : Std hours p.u. x RR/ hour
Actual Variable ohd rate = $\frac{\text{Actual Voh}}{\text{Act hours}}$	RR/hr : $\frac{\text{Budgeted Fixed Overheads}}{\text{Budgeted Hours}}$	Std hours p.u. : $\frac{\text{Budgeted Hours}}{\text{Budgeted Production}}$

Total Hours is same for Labour, Variable and Fixed Overheads

Variance Table

Variances Table= Budget Fixed Overhead > Actual Fixed Overheads = (F)
Budget Production > Actual Production = (A)
Budget Hours (capacity) > Actual Hours = (A)
Standard Hours for Actual Production > Actual Production = (F)
Standard Days > Actual Days = (A)

Following ratios are derived from the formulas of Fixed OH Variance:

1. Efficiency Ratio = $\frac{\text{Standard hours for Actual Production}}{\text{Actual hours for Actual Production}} \times 100 \left[\text{Activity Ratio} \times \text{Capacity Ratio}\right]$

2. Capacity Ratio = $\frac{\text{Actual hours}}{\text{Budgeted hours}} \times 100 \left[\text{Efficiency Ratio} \times \text{Activity Ratio}\right]$

3. Activity Ratio = $\frac{\text{Standard hours for Actual Production}}{\text{Budgeted hours for Budgeted Production}} \times 100 \left[\text{Efficiency Ratio} \times \text{Capacity Ratio}\right]$

Student Notes

7 SALES VARIANCE

The sales variances can be computed in two ways.

7.1 a) Sales Variances by Turnover Method

Sales Value Variance:
(Budget Sales Value - Actual Sales Value)
(Budgeted Sales Value - Actual Sales)
(Budgeted Sales Qty x Budgeted Selling Price) - (Actual Sales Qty x Actual Selling Price)

- **Sales Price Variance**
  [(Budgeted SP - Actual SP) x Actual sales qty]
- **Sales Volume Variance**
  [(Budgeted Sales Qty - Actual sales qty) x Budgeted SP]
  - **Sales Quantity Variance**
    (Budgeted sales qty - Std Sales mix qty) x Budgeted SP
    (BSQ - SSMQ) x BSP
  - **Sales Mix Variance**
    (Std Sales mix qty - Actual sales qty) x Budgeted SP
    (SSMQ - ASQ) x BSP

Variance Table = Budget Sales Quantity > Actual Sales Quantity = (A)
Budget Sales Production > Actual Sales Production = (A)
Budget Sales Quantity > Standard Sales Mix Quantity =(A)
Standard Sales Mix Quantity > Actual Sales Quantity = (A)

7.2 b) Sales Variances by Margin Method

Sales Margin Value Variance:
(Budgeted Margin - Actual Margin)
[(Budgeted Sales Qty x Budgeted Margin) - (Actual Sales Qty x Actual Margin)]

- **Sales Margin Price Variance**
  [(Budgeted margin - Actual margin) x Actual sales qty]
- **Sales Margin Volume Variance**
  [(Budgeted sales qty - Actual sales qty) x Budgeted margin]
  - **Sales Margin Quantity Variance**
    [(Budgeted sales qty - Std Sales mix qty) x Budgeted margin]
    (BSQ - SSMQ) x BM
  - **Sales Margin Mix Variance**
    [(Std Sales mix qty - Actual sales qty) x Budgeted margin]
    (SSMQ - ASQ) x BM

*BM = BSP - BC
AM = ASP - BC

8 Concept of Marginal with Market Size & Market Share Variance

8.1 SALES MARGIN QUANTITY VARIANCE

Sales Margin Market Size Variance	
Budgeted Market Size	xx
(-) Actual Market Size	xx
	xx
X Our share in Market	
X Budgeted Margin / Budgeted selling price	

Sales Margin Market Share Variance
(ASQ - Industry Sales as per our share)
x Budgeted Margin / Budgeted selling price

Variance Table = Budget Market Size > Actual Market Size = (A)
Actual Sales Quantity > Individual Sales Quantity = (F)

9 Reconciliation of profit marginal costing approach

Note: the difference between absorption costing and marginal costing approach is in the treatment of fixed cost only absorption costing treats fixed cost as product cost and marginal costing treats fixed cost as period cost

Summary of Changes

Absorption Costing Approach	Marginal Costing Approach
1. Profit Volume Variance is used.	1. Contribution Volume Variance is used.
2. Fixed OH Cost Variance and its entire sub analysis is used i.e. (Expenditure variance + Capacity variance + Efficiency variance)	2. Only Fixed OH Expenditure variance is used.

Reconciliations (Budgeted/Standard Profit/Actual Profit)
Reconciliation Statement
Budgeted Profit to Actual Profit

Budgeted profit				
(Budgeted Quantity x Budgeted Margin)				
Effect of Variances				
Material Cost Variance				
Material Price Variance				
Material Usage Variance				
Material Mix Variance				
Material Yield Variance				
Labour Cost Variance				
Labour Rate Variance				

Labour Idle Time Variance

Labour Efficiency Variance (Net)

Labour Mix Variance

Labour Sub-Efficiency Variance

Variable Overhead Cost Variances

Variable Overhead Expenditure Variance

Variable Overhead Efficiency Variance

Fixed Overhead Cost Variances

Fixed Overhead Expenditure Variance

Fixed Overhead Volume Variance

Fixed Overhead Capacity Variance

Fixed Overhead Efficiency Variance

Sales Margin Variance

Sales Margin Price Variance

Sales Margin Volume Variance

Sales Margin Mix Variance

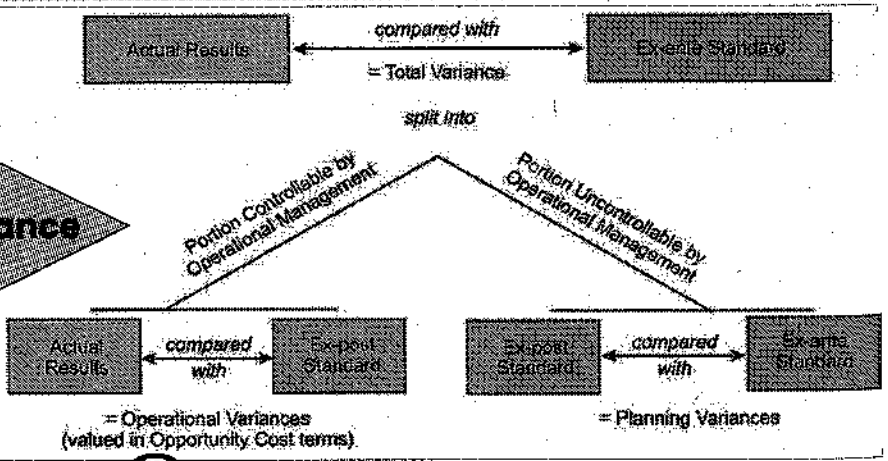
Sales Margin Quantity Variance

Actual Profit

10 FACTORS TO BE CONSIDER WHEN INVESTIGATING VARIANCE

Planning	Type of Variance	Cost	Pattern in Variance	Budgetary process
• Standard is an average of estimates & therefore small variations seen can be ignored. • Organizations can establish limits & variances beyond those limits should be further investigated.	Adverse variance over favorable variances for estimates.	Cost of investigation should be lower than the benefits.	Monitor variance over a period of time & if its worsening then investigate related variances	If it is uncontrollable & unrealistic then investigation should be re-evaluating the budgetary process

11 Planning / Operational Variance



(A) When there is only 1 input

11.1 Price Variance

Planning	Operational
=(Original Standard Rate - Revised Standard Rate) x Revised Standard Quantity	= (Revised Standard Rate - Actual Standard Rate) x Actual Quantity

Usage Variance

Planning	Operational
= (Original Standard Quantity - Revised Standard Quantity) x Original Standard Rate	= (Revised Standard Quantity - Actual Quantity) x Revised Standard Rate

(B) When there is more than 1 input

Original Standard			Revised Standard at Actual			Actual Standard		
Q/H	R	A	Q/H	R	A	Q/H	R	A

11.2 (Planning) Price Variance

Uncontrollable	Controllable
= (Original Standard Rate - Actual Input Rate) x Revised Standard Quantity	= (Actual Input Rate - Revised Input rate) x Revised Standard Quantity

Operational

Material Price Variance	Material Usage Variance
= (Revised Standard Rate - Actual Rate) x Actual Quantity	= (Revised Standard Quantity - Actual Quantity) x Revised Standard Rate

Student Notes

12 Methods used for investigation Variance

Simple Rule of Thumb Model

Based on arbitrary criteria such as investigating if the absolute size of a variance is greater than a certain amount or if the ratio of the variance to the total cost exceeds some predetermined percentage.

Statistical Decision Model

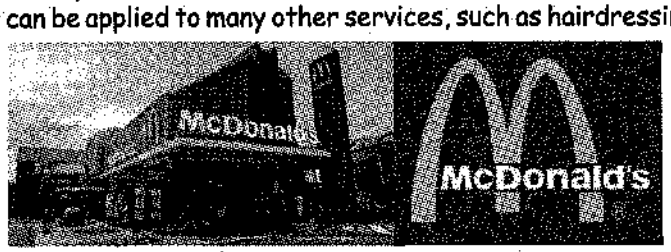
- For the statistical models, two mutually exclusive states are possible.
- First assumes that the system is 'In Control' and a variance is simply due to random fluctuations around the expected outcome.
- Second possible state is, system is 'Out of Control' & corrective action can be taken to remedy the situation.

13 POSSIBLE INTERDEPENDENCE BETWEEN VARIANCE

- Use of cheaper material which is poorer quality, the material price variance will be favourable, but this can cause more wastage of materials leading to adverse usage variance.
- Using more skilled labour to do the work will result in an adverse labour rate variance, but productivity might be higher as a result due to experienced labour.
- Changing the composition of a team might result in a cheaper labour mix (favourable mix variance) but lower productivity (adverse yield variance).
- Workers trying to improve productivity (favourable efficiency variance) in order to get bonus (adverse rate variance) might use materials wastefully in order to save time (adverse materials usage).
- Cutting sales prices(adverse sales price variance) might result in higher sales demand from customers (favourable sales volume variance).
- Similarly, favourable sales price variance may result in adverse sales volume variance.

14 McDonaldization

McDonaldization is a process of rationalization, which takes a task and breaks it down into smaller tasks. This is repeated until all tasks have been broken down to the smallest possible level. The resulting tasks are then rationalized to find the single most efficient method for completing each task. All other methods are then deemed inefficient and discarded.
The impact of McDonaldization is that standards can be more accurately set and assessed for **EACH TASK**. It can be easily ascertained that how much time and cost should go into each activity. The principles can be applied to many other services, such as hairdressing, dentistry, or opticians' services.



CASE STUDIES

15 CASE STUDY 1 – Standard costing with Learning Curve – BMW (Case Study Digest CS #3)

ISSUES

- Bhatia Motor Works (BMW) : Coach Builders (design and fabricate high-quality buses)
- Fabrication division manufactures two products :

Product	Seat Handle	Seat Cover
Men hours p.u.	6 Hours	12 Hours
Units produced	1200	750
Available hours per month	25 days x 8 hrs x 75 men = 15000 hrs per month	

BMW employs 75 men. The budgeted hours are 1,86,000 per annum (as per 26 days per month, but due to breakdown availability remains for 25 days per month)

- Painting Division workers learning curve rate earlier was assumed to be 95%, later adjusted to 90%2C (L. Index - 90%) = -0.152
- In each month 15 buses are made ready for delivery after painting & fabrication.

CONCEPT

- Learning Curve & Control Ratios.
- Planning and operating variance.
- Revised budgeted hours.

Log 2 = 0.3010 Antilog (1.1827) = 15.23
Log 3 = 0.4771 Antilog (1.2808) = 19.08
Log 5 = 0.6990 Antilog (1.1948) = 15.66

EXPLANATION

(i) Investigation of variances are essential

Variances identified are not conclusive sign of performance but investigation of root cause is necessary. Even favourable variances need to be investigated such that favourable price variance may lead to inferior quality and more scrap & rework leading to a higher usage variance.

(ii) Planning and operating variance.

- **Planning Variance** - Due to revision of standards, it is computed as difference of original with revised standard. (Refer Point Number 10 on Page number 12.8).
- **Operating Variance** - Due to variance of actual performance or results from revised standard.

(iii) Revised budget Hours

A learning curve is geometric with the general form $Y = ax^b$

- Time taken to paint 6th unit is 13.08 hours i.e. (91.38 - 78.30) (See working note 1 & 2)
- Time required to paint unit 6th onward = 13.08 hours (because learning curve will cease post 6th unit)
- Revised budgeted time required to paint 15 buses = 78.3 hours (for first 5) + 13.08 hours × 10 units (next 10 - 6th to 15th) = 78.3 hours + 130.8 hours = 209.10 hours

Working note 1 - Time required for painting first 6 buses

$$Y = 20 \times (6)^{-0.152}$$

$$\text{Log } Y = \text{Log } 20 - 0.152 \times \text{Log } 6$$

$$\text{Log } Y = \text{Log } 20 - 0.152 \times \text{Log } (2 \times 3)$$

$$\text{Log } Y = \text{Log } 20 - 0.152 \times (\text{Log } 2 + \text{Log } 3)$$

$$\text{Log } Y = 1.3010 - 0.152 \times (0.3010 + 0.4771)$$

$$\text{Log } Y = 1.3010 - 0.152 \times (0.7781)$$

$$\text{Log } Y = 1.3010 - 0.1183$$

Log Y=1.1827Y=antilog of 1.1827

Y=15.23 hours

Time required for painting first 6 buses is 91.38 hours (15.23 hours × 6 buses)

Working note 2 - Time required for painting first 5 buses

$$Y = 20 \times (5)^{-0.152}$$

Log Y= Log 20 - 0.152 × Log 5

Log y = 1.3010 - 0.152 * (0.6990)

Log y = 1.3010 - 0.1062

Log y = 1.1948

y = 15.66 hours

Time required for Painting 5 buses is 78.3 hours (15.66 hours * 5 buses)

Control Ratios

$$\text{Activity Ratio} = \frac{\text{Standard hours for actual production}}{\text{Budgeted hours}} \times 100$$

= (16,200/ 15,500) × 100 = 104.52%

104.52% signify that BMW is need to work 4.52% extra than what it budgeted for to manufacture what actually it manufactured.

$$\text{Capacity Ratio} = \frac{\text{Actual working hours}}{\text{Budgeted hours}} \times 100$$

= (15,000/ 15,500) × 100 = 96.77%

96.77% signify that BMW actually worked for 96.77 hours against every 100 possible hours.

Or Budgeted Capacity is utilised up to 96.77% and 3.23% capacity remains unutilised.

$$\text{Calendar Ratio} = \frac{\text{Actual number of working days in a period}}{\text{Number of working days in related budgeted period}} \times 100$$

= (25/26) × 100 = 96.15%

$$\text{Efficiency Ratio} = \frac{\text{Standard hours for actual production}}{\text{Actual hours worked}} \times 100$$

= (16,200/ 15,000) × 100 = 108%

108% signify that efficiency is 108% or task for which 108 hours is available finished in 100 hours.

Working Note:

Std hours for Actual Production : (Act. Pdn * Std hrs p.u.) (1200*6) + (750*12) = 16,200 hours

Budgeted Hours : (186,000 / 12 months) = 15500 hours

Actual Hours : (25D * 8h/d * 75 Workers) = 15000 hours

16 CASE STUDY 2 – Budgetary Control & Standard Costing – HAL (ICAI MODULE)

ISSUES

- HAL - Manufacturer, retailer and installer of split AC.
- Sales high volume of standard AC with Limited choices at low profit margins. Focus on efficiency of manufacturing process.
- Average revenue per summer AC installed is 36000. Yearly target = 350.
- Receives complaint for 10% of AC installed. Launch new AC brand summer-cool.
- HAL has 7 teams who are paid without a bonus element, were HAL has never received any complaint.
- Offers 6 month money back guarantee and this has to be fulfilled for 1% of its installation.

CONCEPT

- Appropriateness of HAL current control system.
- Critical success factors.
- Advise changes in standard costing and reporting system to achieve improved control.

EXPLANATION

(i) Current scenario

- Focus only on manufacturing aspect.
- Only 3 variances (material price, material usage & material labour efficiency).
- Other variance also useful.
- Summer cool focus is on "Quality" (can result in unfavourable material price variance).
- Identify HAL's CSF (Critical Success Factors).
- Monthly reporting too less may lead to access a wastage.
- Focus on "Retailing and Installation" also.
- Bonus to summer installation good; but complaint should be in check.

(ii) CSF

- Installation quality (check for each account)
- Customer satisfaction
- Brand performance(350 days x 1 unit x 20t = 7000 units)
- Manufacturing excellence
- (CSF = kya karne se aapko success milegi)

(iii)

(a) Modify remuneration arrangements

Summer	School
- Lots of complaint	- No complaint

(b) Appropriate reporting intervals (weekly)

(c) CSF and KPI's should be e continuous and not based on financial reporting cycle

MASTER SUMS

Q.1 Relevant cost & Standard costing (ICAI Exam Jan' 21 & May 18)
Q.2 ABC & Standard costing
Q.3 Reconciliation statement
Q.4 All variances & Reconciliation
Q.5 Market size and market share
Q.6 Planning and operation variance.

17 Question 1: (ICAI, Jan 2021, May 2018 exam) (Refer Youtube Channel for Solution Video.)

Trident Toys Ltd. manufactures a single product and the standard cost system is followed. Standard cost per unit is worked out as follows:

	Rs.
Materials (10 Kgs. @ Rs.4 per Kg)	40
Labour (8 hours @ Rs.8 per hour)	64
Variable overheads (8 hours @ Rs.3 per hour)	24
Fixed overheads (8 hours @ Rs.3 per hour)	24
Standard Profit	56

Overheads are allocated on the basis of direct labour hours. In the month of April 2019, there was no difference between the budgeted and actual selling price and there were no opening or closing stock during the period.

The other details for the month of April 2019 are as under

	Budgeted	Actual
Production and Sales	2,000 Units	1,800 Units
Direct Materials	20,000 Kgs. @ Rs.4 per kg	20,000 Kgs.@ Rs.4 per kg
Direct Labour	16,000 Hrs. @ Rs.8 per Hr.	14,800 Hrs. @ Rs.8 per
Variable Overheads	Rs.48,000	Rs.44,400
Fixed Overheads	Rs.48,000	Rs.48,000

Required:

(i) RECONCILE the budgeted and actual profit with the help of variances according to each of the following method:
(A) The conventional method
(B) The relevant cost method assuming that
  (a) Materials are scarce and are restricted to supply of 20,000 Kgs. for the period.
(b) Labour hours are limited and available hours are only 16,000 hours for the period.
  (c) There are no scarce inputs.
(ii) COMMENT on efficiency and responsibility of the Sales Manager for not using scarce resources.

Solution:

(i) Computation of Variances

Material Usage Variance = (Standard Quantity – Actual Quantity) x Standard Price
= (18,000* Kgs. – 20,000 Kgs.) x Rs.4.00
= Rs.8,000 (A)

$$\left(1{,}800 \text{ units} \times \frac{20{,}000 \text{ kgs}}{2{,}000 \text{ units}}\right)$$

Labour Efficiency Variance = (Standard Hours – Actual Hours) x Standard Rate
= (14,400* hrs. – 14,800 hrs.) x Rs.8.00
= Rs.3,200 (A)

$$\left(1{,}800 \text{ units} \times \frac{16{,}000 \text{ hrs}}{2{,}000 \text{ units}}\right)$$

Variable Overhead Efficiency Variance = (SHFAP - AH) x SR / Variable Hrs (48000rs /16000 hrs)
= Standard Variable Overheads for Production
- Budgeted Variable Overheads for Actual hours
= (14,400 hrs. × Rs.3.00) - (Rs.3.00 × 14,800 hrs.)
= Rs.1,200 (A)

Fixed Overhead Volume Variance
= (budgeted Production - Actual Production) x RR/u
= (2000 units - 1800 units) x 24 (48000 / 2000 units)
= Rs. 4800 (A)
(therefore, Less units are actually produced, recovery is less and hence adverse.)

Sales Margin Volume Variance
= Standard Margin - Budgeted Margin
= (1,800 units × Rs.56.00) - (2,000 units × Rs.56.00)
= Rs.11,200 (A)

Sales Contribution Volume Variance
= Standard Contribution - Budgeted Contribution
= (1,800 units × Rs.80.00) - (2,000 units × Rs.80.00)
= Rs.16,000 (A)

Particulars	Conv. Method (Rs.)	Relevant Cost Method (Rs.)		
		Scarce Materia	Scarce Labour	No Scarce
Budgeted Profit (2,000 units x Rs. 56	1,12,000	1,12,000	1,12,000	1,12,000
Sales Volume Variance	11,200 (A)	NIL*	12,000$ (A)	16,000 (A)
Material Usage Variance	8,000 (A)	24,000 (A)	8,000 (A)	8,000 (A)
Labour Efficiency Variance	3,200 (A)	3,200 (A)	7,200 (A)	3,200 (A)
Variable Overhead Efficiency	1,200 (A)	1,200 (A)	1,200 (A)	1,200 (A)
Fixed Overhead Volume Variance	4,800 (A)	N.A.#	N.A.#	N.A.#
Actual Profit	83,600	83,600	83,600	83,600

Notes

Scarce Material

Based on conventional method, direct material usage variance is Rs.8,000 (A) i.e. 2,000 Kg. × Rs.4. In this situation material is scarce, and, therefore, material cost variance based on relevant cost method should also include contribution lost per unit of material. Excess usage of 2,000 Kg. leads to lost contribution of Rs.16,000 i.e. 2,000 Kgs. × Rs.8. **Total material usage variance based on relevant cost method, when material is scarce will be: Rs.8,000 (A) + Rs.16,000 (A) = Rs.24,000 (A).** Since labour is not scarce, labour variances are identical to conventional method.

Excess usage of 2,000 Kgs. leads to loss of contribution from 200 units i.e. Rs.16,000 (200 units × Rs.80). It is not the function of the sales manager to use material efficiently. Hence, loss of contribution from 200 units should be excluded while computing sales contribution volume variance.

Therefore, sales contribution volume variance, when materials are scarce will be NIL i.e. Rs.16,000 (A) - Rs.16,000 (A).

Scarce Labour

Material is no longer scarce, and, therefore, the direct material variances are same as in conventional method. In conventional method, excess labour hours used are: 14,400 hrs. - 14,800 hrs. = 400 hrs. Contribution lost per hour = Rs.10. Therefore, total contribution lost, when labour is scarce will be: 400 hrs. × Rs.10 = Rs.4,000. Therefore, **total labour efficiency variance, when labour hours are scarce will be Rs.7,200 (A) i.e. Rs.3,200 (A) + Rs.4,000 (A).**
Excess usage of 400 hrs. leads to loss of contribution from 50 units i.e. Rs.4,000 (50 units × Rs.80). It is not the function of the sales manager to use labour hours efficiently. Hence, loss of contribution from 50 units should be excluded while computing sales contribution volume Variance.

Therefore, sales contribution volume variance, when labour hours are Scarce will be Rs.12,000 (A) i.e. Rs.16,000 (A) - Rs.4,000 (A).

Fixed Overhead Volume Variance

The fixed overhead volume variance does not arise in marginal costing system. In absorption costing system, it represents the value of the under or over absorbed fixed overheads due to change in production volume. When marginal costing is in use there is no overhead volume variance, because marginal costing does not absorb fixed overheads.

(ii) Comment on Efficiency and Responsibility of the Sales Manager

In general, Gross Profit (or contribution margin) is the joint responsibility of sales managers as well as of production managers. On one hand the sales manager is responsible for the sales revenue part, on the other hand the production manager is accountable for the cost-of-goods-sold component. However, it is the top management who needs to ensure that the target profit is achieved by the organization. The sales manager is accountable for prices, volume, and mix of the product, whereas the production manager must control the costs of materials, labour, factory overheads and quantities of production. The purchase manager must purchase materials at budgeted prices. The personnel manager must employ right people at the right place with appropriate wage rates. The internal audit manager must ensure that the budgetary figures for sales and costs are being adhered by all departments which are directly or indirectly involved in contribution of making profit. Thus, sales manager is not responsible for contribution lost due to excess usage or inefficient usage of resources in case of scarce resources. Hence, such contribution lost must be excluded from the sales contribution volume variance.

18 Question 2: ABC & Standard Costing

SPS Limited uses activity based costing to allocate variable manufacturing overhead costs to products. The company identified three activities with the following information for last quarter :

Activity	Standard Rate	Standard Quantity per unit produced	Actual Costs	Actual Quantity
Indirect Materials	Rs. 20 per kilogram	0.5 kilogram per unit	Rs. 9,40,000	48,000 kilogram
Product Testing	Rs. 3 per test minute	10 minutes per unit	Rs. 22,50,000	7,40,000 test minutes
Energy	Rs. 0.20 per minute of machine time	4 minutes of machine time per unit	Rs. 70,000	3,60,000 minutes of machine time

The company produced 80,000 units in the last quarter. Company policy is to investigate all variances above 5% of the flexible budget amount for each activity.

Required

(i) CALCULATE variable overhead expenditure variance and variable overhead efficiency variance for each of the activities using activity based costing. Clearly indicate each variance as favourable or unfavourable I adverse.

(ii) INTERPRET the results of variable overhead efficiency variance as calculated in (i) above in respect of indirect materials and product testing activity.

(iii) IDENTIFY the variances that should be investigated according to company policy. Show calculations to support your answer.

Solution:

(i) Indirect Materials

Efficiency Variance = Cost Impact of undertaking activities more/ less than standard
= (0.50kg. x 80,000units - 48 ,000 kg.) x 20
= 1,60 ,000 (A)

Expenditure Variance = Cost impact of paying more/ less than standard for actual activities undertaken
= 48 ,000kg. x 20 - 9,40,000
= 20,000 (F)

Product Testing

Efficiency Variance = Cost Impact of undertaking activities more/ less than standard
= (10 mins. x 80,000 units - 7,40,000 mins.) x 3
= 1,80,000 (F)

Expenditure Variance = Cost impact of paying more/ less than standard for actual activities undertaken
= 7,40 ,000mins x 3 - 22,50,000
= 30,000 (A)

Energy

Efficiency Variance = Cost Impact of undertaking activities more/ less than standard
= (4 mins. x 80,000 units - 3,60,000 mins.) x 0.20
= 8,000 (A)

Expenditure Variance = Cost impact of paying more/ less than standard for actual activities undertaken
= 3,60 ,000mins x 0.20 - H0,000
= 2,000 (F)

(ii) Indirect Materials

SPS actually spent 48,000 kg. or 8,000 kg. more than the standard allows. At a predetermined rate of 20 per kg., efficiency variance is 1,60 ,000 (A). Since actual quantity were higher than the standard, the variance is unfavorable. This adverse variance , could have been caused by the inferior quality, result of carelessness handling of materials by production workers or could as a result of change in methods of production , product specifications or the way in which quality of the product is checked or controlled.

Product Testing

Favorable efficiency variance amounting to Rs. 1,80,000 indicates that fewer testing minutes were expended during the quarter than the standard minutes required for the level of actual output. This may be due to employment of a higher skilled labor or improvement of skills of existing workforce through training and development leading to improved productivity etc.

(iii) Flexible Budget

Indirect	=	(0.50 kg. x 80,000 units) x	20	= 8,00,000x5%
Materials	=	8.00,000		= 40,000
Product Testing	=	(10 mins. x 80,000 units) x	3	= 24,00,000x 5%
	=	24,00,000		= 1,20,000
Energy	=	(4 mins. x 80,000) x 0.20		= 64,000 x 5%
	=	64,000		= 3,200

Efficiency Variance for all the three activities are more than 5% of their flexible budget amount. So, according to the company policy, efficiency variances should be investigated.

Student Notes

Alternative

Statement Showing Identification of Variances to be investigated

	Calculation	Variance % of Flexible Budget	Criteria	Investigate Y or N
Indirect Materials				
Efficiency Variance	(1,60,000 x100J 8,00,000	**20%**	5%	Y
Expenditure Variance	(20,000 x100J 8,00,000	2.5%	5%	N
Product Testing				
Efficiency Variance	(1,80,000 x100) 24,00000	**7.5%**	5%	Y
Expenditure Variance	(30,000 x100) 24,00,000	1.25%	5%	N
Energy				
Efficiency Variance	(8,000 x100) 64,000	**12.5%**	5%	Y
Expenditure Variance	(2,000 x100) 64,000	3.125%	5%	N

19 Question 3: Reconciliation Statement

Well-known Footwear (WF) is a shop that focuses on shoes for various sports and activities like jogging , cricket, tennis, and hockey. Budgeted profit for the WF is calculated considering an average selling price of 500 per pair of shoes and an average cost of 350 per pair of shoes. The supervisor of the WF has discretion in staffing and in setting prices. Usually, the WF is staffed for 650 hrs. per month at a budgeted rate of 125 per hr. In addition to this base wages, sales staff gets a payment equal to 5.5% of takings. Moreover, staffing levels are not expected to change in response to "little " changes in shoe sales. For Sep '2020, the WF had budgeted sales of 2,250 pairs of shoes and 650 staffing hrs. Actual results for Sep '2020 were as follows:

Pairs of shoes sold	2,500
Revenue	12,00,000
Less: Cost of shoes	(8,25,000)
Less: Staff - additional payment	(66,000)
Less : Staff - base wages @ 125 per hour	(78,125)
Profit	2,30,875

Note- "little " changes in shoe sales specified as ± 12%.

Required

(i)PREPARE a reconciliation statement of budgeted profit to actual profit .

(ii)COMMENT on supervisor 's performance .

Solution:

(i) Reconciliation Statement Budgeted and Actual Profit (Sep' 2020)

Budgeted profit	1,94,375
Sales volume variance (F)	30,625
Sales price variance (A)	50,000
Shoe cost variance (F)	50,000
Staff cost variance -commission (F)	2,750
Staff cost variance -base wage (F)	3,125
Actual profit	2,30,875

(ii) Comment

The performance seems good. It shows that the supervisor of the WF passed on a 5.7% decrease in shoe cost to customers (same is also revealed through the entirely offsetting of the shoe cost variance and price variance) , i.e. shoe costs decreased by 20 per pair, from a standard cost of 350 per pair to an actual cost 330 per pair. Additionally , the selling price decreased by 20 per pair, from a standard price of 500 per pair to an actual price of 480 per pair. In turn , the reduction in the selling price appeared to produce a favourable sales volume variance and a reasonable increase in profit.

Since the reduction in the selling price, staff commissions also were lower than budgeted. Moreover, the 50,000 reduction in revenue led to 0.055 x 50,000 = 2,750 less in commission costs.

Lastly, staffing was 25 hours under budget, leading to a savings of 25 x 125 = 3.125.

Therefore , the supervisor attained an increase in sales with lesser staff hours.

Overall, it appears that the manager has done a great job of making revenue and controlling costs.

Workings

Statement Showing Budgeted and Actual Profit (Sep'2020)

	Budgeted Data	Actual Data
Units (pairs of shoes)	2,250	2,500
Price per pair of shoes	500.00	480.00
Cost per pair of shoes	350.00	330.00
Commission rate	27.50 (5.5% of (500)	26.40 (5.5% (480)
Contribution	122.50	123.60
Revenue	1125,000	12,00,000
Less: Cost of shoes	7,87,500	8,25,000
Less: Staff -additional payment (commission)	61,875	66,000
Less : Staff - base wages	81,250	78,125
Profit	1,94,375	2,30,875

Computation of variances

Total Profit Variance	= 2,30,875 - 1,94,375 = 36,500 (F)
Sales Contribution Volume Variance	= Standard Contribution - Budgeted Contribution
	= 122.50 x 2,500 - 122.50 x 2,250
	= 3,06,250 - 2,75,625 = 30,625 (F)
Sales Price Variance	= Actual Revenue - Standard Revenue
	= 480 x 2,500 - 500 x 2,500
	= 12,00,000 - 12,50,000 = 50,000 (A)
Shoe Cost Variance *	= 350 x 2,500 - 330 x 2,500
	= 8,75,000 - 8,25,000 = 50,000 (F)
Staff Cost Variance-commission*	= 27.50 x 2,500 - 26.40 x 2,500
	= 68,750 - 66,000 = 2,750 (F)
Staff Cost Variance (base wage)	= 81,250 - 78,125 = 3,125 (F)

.(*) Note- The cost variance (for both shoe and staff-commission) equal to the difference between the standard cost and the actual cost.

20 Question 4: All variances & Reconciliation

ZCL Ltd. Produces one standard product X and operates standard costing and budgetary control system. During the month of February the following information were available:

i . Direct Materials:

100 tonnes of material A at Rs. 155 per tonne were issued for production. The standard price of A is Rs. 150 per tonne and standard production from each tonne of material A consumed is 50 units.

ii. Direct Labour: Skilled and semi-skilled workers are employed in the factory. The budgeted labour mix is as follows:

Skilled	6,600 hours at Rs. 1.60 per hour	Rs. 10.560
Semi - Skilled	11,000 hours at Rs. 0.80 per hour	Rs. 8,800

Failure of power, machine breakdown, etc. resulted in 120 idle hours in respect of skilled workers.

iii. Variable Overhead:

The standard variable overhead rate per unit has been set at Rs. 2. Actual variable overhead for the month was Rs. 11,500.

iv. Fixed Overhead:

Budgeted Overhead	Rs. 2,18,750 p.a.
Budgeted Production for the year	62,500 units
Budgeted number of weeks in the year	50 weeks
Actual production (February)	6,000 units
Actual overhead (February)	Rs. 22,000

Sales: Product	Budget			Actual		
	Quantity	Price (Rs.)	Value (Rs.)	Quantity	Price (Rs.)	Value (Rs.)
X	5,000	20	1,00,000	4,600	21	96,600

From the above information, you above information, you are required to calculate the necessary variances and prepare a summary thereof with reconciliation statement.

Solution:

The analysis of direct material will be as under:

Standard			Actual (Given Output = 6,000 units)		
Quantity	Rate	Amount	Quantity	Rate	Amount
120 tonnes	150	18,000	100 tonnes	155	15,500

Standard Quantity = 1 ton of material ..... 50 units of output
? 120 ton ..... 6,000 units of output

Therefore, standard Quantity of Raw Material = 120 tonnes

Material Cost Variance:-

= Std material Cost – Actual material Cost
= 120 tonnes x ₹ 150 – 100 tonnes x ₹ 155
= 2,500 (F)

Material Price Variance

= (Std Price - Actual Price) x Actual Qty
= (₹ 150 - ₹ 155) x 100 tonnes
= 500 (A)

Material Usage Variance

=(Std Qty - Actual Qty) x Standard Rate
= (120 tonnes – 100 tonnes) x ₹ 150
= 3,000 (F)

Direct Labour Variances:-

Category	Standard (5,000 units)			Revised Standard (6,000 units)			Std. mix	Actual (6,000 units)		
	Hrs.	Rate	Amount				Hrs. (w.n 1)	Hrs.	Rate	Amount
skilled	6,000	1.5	7,500	7,200	1.5	10,800	6,480	6,600	1.6	10560
Semi skilled	10,000	1	10,000	12,000	1	12,000	11,000	11,000	0.8	8.8000
Total	16,000		17,500	19,200		22,800	17,480	17,600		19,360

W.N.1: Usually, standard mix is calculated by taking the total of actual and dividing in ratio of standard. However, in this case, there is a component of idle hours. Accordingly, after distributing the actual hours in the standard ratio, we will remove the relevant idle hour component from its respective labour i.e. 120 hours from skilled labour. Below is the working:

17,600 hours in ratio of 6:10
SMH for Skilled : 17,600 x 6/16 = 6,600
SMH for semi Skilled :17,600 x 10/16 = 11,000

Idle Hours to be reduced from skilled:

SMH for skilled : 6,600
(-) Idle Hours : 120
Net SMH for skilled : 6,480 i.e. Actual Hours Worked

Labour Cost Variance:-

= Labour Rate Variance + Labour Efficiency Variance + Labour Idle Time Variance
= 1540 (F) + 2080 (F) + 180 (A)
= 3440 (F)

Labour Rate Variance

= (std rate- actual rate) x Actual hours
Skilled = (₹ 1.5 - ₹ 1.6) x 6600 hours
= ₹ 660 (A)
Semi Skilled = (₹ 1 - ₹ 0.8) x 11,000 hours
= ₹ 2,200 (F)
Total = 2200 (F) + 660 (A)
= 1540 (F)

Labour Efficiency Variance

= (std hours- actual hours worked) x Standard rate
Skilled = (7200 - 6,480 hours) x 1.5
= ₹ 1080 (F)
Semi Skilled= (12000 - 11,000 hours) x1
=₹ 1,000 (F)
Total = 1080 (F) + 1000 (F)
= 2080 (F)

Labour Mix Variance

= (Standard Mix Hours - Actual Hours Worked) x Standard Rate
Skilled = (6,480 - 6,480 hours) x 1.5
= ₹ 0
Semi Skilled = (11000 - 11,000 hours) x1
= ₹ 0
Total = 0 + 0
= 0

Labour Sub Efficiency Variance

= (Standard Hours - Standard Mix Hours) x Std rate
Skilled = (7,200 - 6480 hours) x 1.5
= ₹ 1080 (F)
Semi Skilled = (12000 - 11,000 hours) x1
= ₹ 1,000 (F)
Total = 1080 (F) + 1,000 (F)
= 2080 (F)

Idle Time Variance = Idle Hours x Std rate per hour
= 120 hours x 1.5
= **Rs. 180 (A)**

Variable Overheads Variances:-

Standard Variable OH rate per unit = Rs. 2 per unit
Variable OH cost Variance = Std Variable Oh - Actual Variable OH
= (Std Variable OH rate per unit x Actual Production) - Actual Variable OH
= (2X6,000 - 11,500)
= **Rs. 500 (F)**

Fixed Overheads Variances:

Recovery Rate per unit = $\frac{\text{(Budgeted Overheads)}}{\text{(Budgeted units)}}$ = Rs. 2,18,750 / 62,500 units = Rs. 3.5 per unit

Budgeted Fixed OH Expenditure per month of 4 weeks = (Rs. 2,18,750/ 50 weeks) x 4 weeks months = = Rs. 17,500

Fixed OH Cost Variance
= Absorbed Fixed OH – Actual Fixed OH
= 6000 x ₹ 3.5 - ₹ 22,000
= ₹ 1,000 (A)

Fixed OH Expenditure Variance
= Budgeted Fixed OH – Actual Fixed OH
= 5000 units x ₹ 3.5 - ₹ 22,000
= ₹ 4,500 (A)

Fixed OH Volume Variance
= (Budgeted Production – Actual Production) x Recovery Rate per unit
= (5,000 -6,000) 3.5 per unit
= ₹ 3,500 (F)

Sales Variances:-

Sales Turnover Variance:-
= (Budgeted Quanity x Budgeted Selling Price) – (Actual Quantity x Actual Selling Price)
= (5,000 x 20) – (4,600 x 21)
= 3,400 (A)

Sales Price Variance
= (Budgeted Selling Price – Actual Selling Price) x Actual Quantity
= (20- 21) x 4,600
= 4,600 (F)

Sales Volume Variance
= (Budgeted Quanity – Actual Quantity) x Budgeted Selling Price
= (5,000 – 4,600) x 20
= 8,000 (A)

Sales Margin Variance:-
= (Budgeted Quanity x Budgeted Margin) – (Actual Quantity x Actual Margin)
= [5,000 x (20- 12.3)] – [4,600 x (21-12.3)]
= 1,520 (F)

Sales Margin Price Variance
= (Budgeted Margin – Actual Margin) x Actual Sales Quantity
= [(20-12.3) – (21-12.3)] x 4,600
= (7.7- 8.7) x 4,600
= 4,600 (F)

Sales Margin Volume Variance
= (Budgeted Selling Qty – Actual Sales Qty) x Budgeted Margin
= (5,000 – 4,600) x (20-12.3)
= (5,000 – 4,600) x 7.7
= 3,080 (A)

Standard Cost per Unit:-

Direct Material	3.00 (18,000 / 6,000 u)
Direct Labour	3.80 (19,200 / 6000 u)
Variable Overheads	2.00 (12,000 / 6000 u)
Fixed Overheads	3.50 (Given)
Standard Cost	12.30

Summary of Variances:

Particulars	Rs.	Rs.	Rs.
Direct Material Cost Variance			
Price Variance		500 (A)	
Usage Variance		3000 (F)	
Direct Labour Cost Variance			
Rate Variance		1540 (F)	
Net Efficiency Variance			
Mix Variance	0		
Yield Variance	2080 (F)	2080 (F)	
Idle Time Variance		180 (A)	3440 (F)
Variable OH Cost Variance			500 (F)
Fixed OH Cost Variance			
Expenditure Variance		4500 (A)	
Volume Variance			
Capacity Variance	1881.25 (F)		
Efficiency Variance	1618.75 (F)	3500 (F)	1000 (A)
Sales Value Variance			
Price Variance		4600 (F)	
Volume Variance		8000 (A)	3400 (A)
Sales Margin Variance			
Price Variance		4600 (F)	
Volume Variance [Rs. 8000 (A) x (Rs. 20 - 12.3) / Rs. 20]		3080 (F)	1520 (F)

		Actual Net Profit	
To Direct Material	15,500	By Sales (4,600 x 21)	96,600
To Direct Labour	19,360	By Closing Stock (1,400 unit x 12.3)	17,220
To Variable OH	11,500		
To Fixed OH	22,000	[where, 1400 units = (6,000 - 4,600 units)]	
To net Profit	45,460		
	1,13,820		1,13,820

Reconciliation - Budgeted and Actual Profit

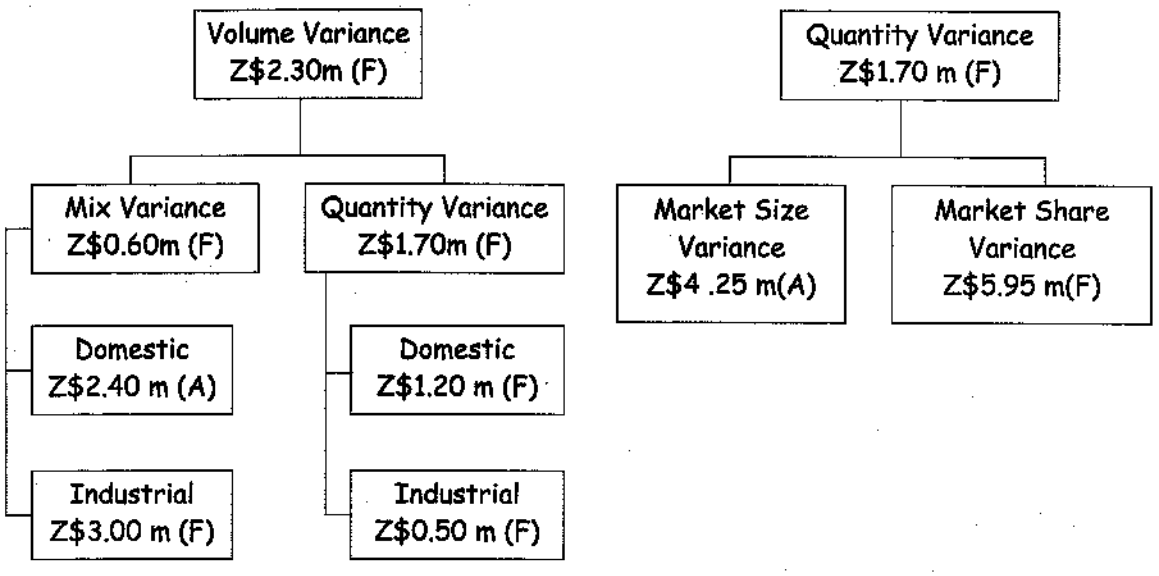
Budgeted Profit (5000 units x [Rs. 20 - Rs. 12.3])	38,500
Add: Sales Margin Price Variance (F)	4,600
Less: Sales Margin Volume Variance (A)	3,080
Add: Total Cost Variance (F) [Rs. 2500 (F) 3440(F) + 500 (F) + 1000 (A)]	5,440
Actual Net profit	45,460

21 Question 5 : Market size and market share (Nov 2020 RTP)

ZM Inc. is a family run business based in Country Z. It is a manufacturer of two types of flooring rolls, one for industrial usage and the other for domestic residential use, throughout mainland of Country Z. The company started with the production of residential domestic flooring . It is now an established player in this market. In the recent years , the company pioneered into making flooring rolls for industrial usage. The management has the following information about the budgeted and actual data for 2020-

Particulars	Static Budget			Actual Result		
	Industrial	Domestic	Total	Industrial	Domestic	Total
Unit Sales in Rolls ('000)	200	600	800	270	570	840
Contribution Margin (Z$ in millions)	1000	2400	34.00	12.825	15.390	28.215

In late 2019, a marketing research estimated market volume for industrial and domestic flooring at 8 m Rolls. Actual market volume for 2020 was 7 m Rolls. Actual sales trend of ZM Inc. is indicative of the sales trends for individual products in the future years, it is likely that they might continue to sell a similar sales trajectory .
A newly appointed accountant has computed following variances from the above data:



'm' refers to million; assume figures in this chart are correct.

Required

Assuming yourself as a performance management expert of ZM, the CEO has asked you to:

(i) ANALYSE the variances computed by the accountant ;

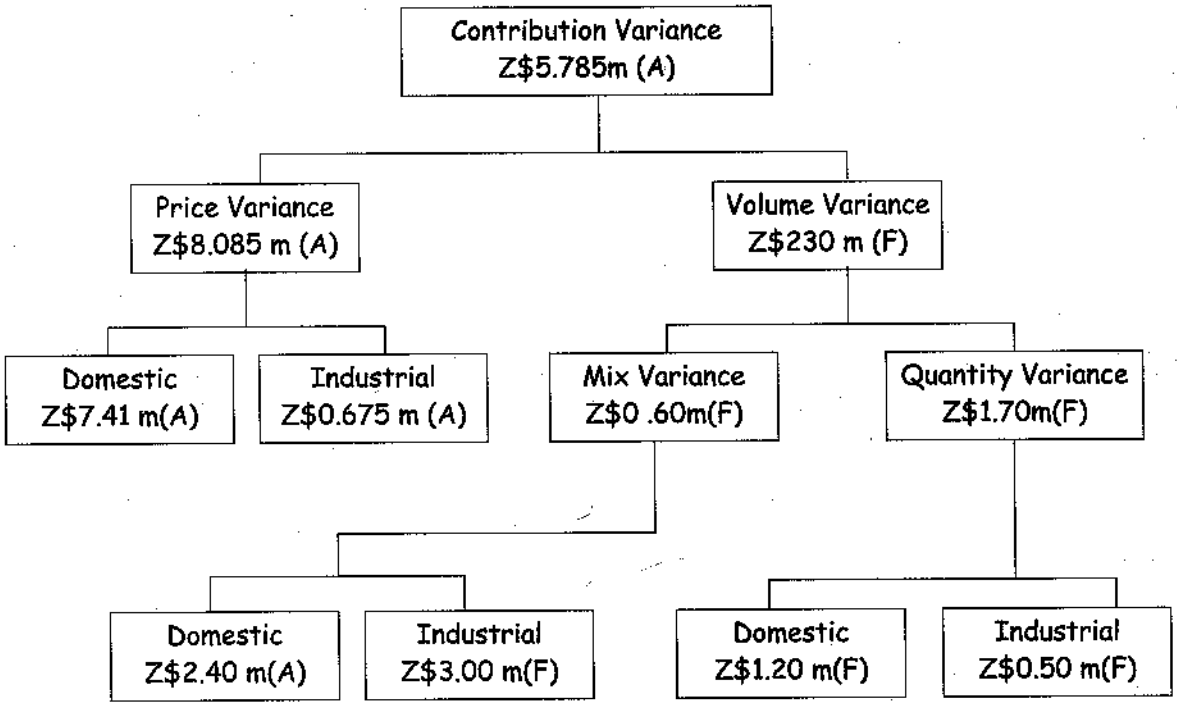
(ii) ADVISE strategic inputs on 'two types of flooring rolls' to help out her in strategic decision making.

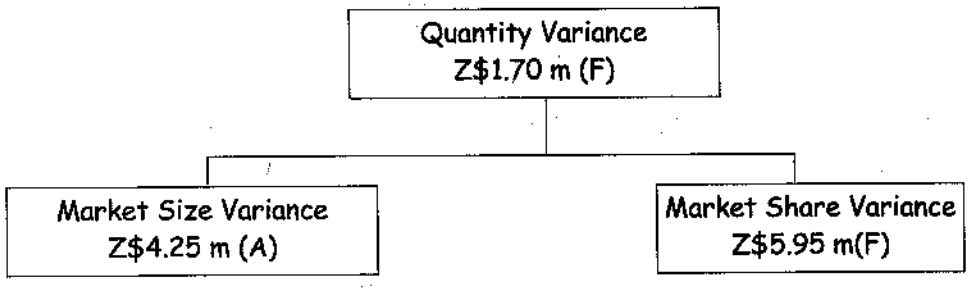
Solution:

(I)Analysis of Variances

It can be seen that total unit sales increased by 40 ,000 rolls resulted in a favorable volume variance. Therefore , a potential increase of Z$2.3 m in contribution margin was achieved as a result of change in sales volume compared with budgeted volume . The volume variance is further divided into a mix and quantity variance. In the case of ZM, mix

variance came out to be Z$0 .60 m favorable and the quantity variance came out to be favorable Z$1.70 m. Favorable mix variance Z$0.60 m indicates that the sales mix shifts toward the industrial flooring rolls i.e. high contribution product. ZM sold 40,000 more rolls than were budgeted, resulting in Z$1 .70 m favorable quantity variance. Therefore, it is necessary to identify the reasons behind the increase in sales. The reasons may be competitor 's distribution issues, better customer services , or growth in overall market. Further insight into reasons of quantity variance can be gain by analyzing market share and size variances. ZM gain 2 market share percentage points from 10% budgeted share to the actual share of 12%. The Z$5.95 m favorable market share variance may be the effect of the decline in contribution margin rate. The impact of changing market size on contribution margin can be traced through market size variance. Market size variance is Z$4.25 m adverse as actual market size decreased 12.5% compared to budgeted market size. Further, it appears that accountant has missed to compute the price variance which is a substantial part of the analysis . If we look closely at the data given, the price variance for domestic as well as industrial roll can be computed without difficulty. The price variance for domestic flooring rolls as well as industrial flooring rolls is unfavorable; this indicates that the both varieties were sold a lower margin than standard. This throughout analysis shows a negative impact of Z$ 5.785 m on contribution margin for which price variance is the main contributor. Revised structures after the computation of price variance are as under:





Workings

Contribution Price Variance

Product	Actual Qty. (units'000)	Actual Contribution per unit (Z$)	Standard Contribution per unit (Z$)	Difference (Z$)	Variance (Z$)
Domestic	570	27.00	40.00	-13.00	7.41 m(A)
Industrial	270	47.50	50.00	-2.50	0.675 m(A)
Total	840				8.085 m(A)

(ii) Strategic Inputs

The actual sale of industrial flooring rolls is 35% higher than projections. However, actual contribution margin of Z$47 .5 is marginally lower than standard contribution margin of Z$50 per unit. This indicates that ZM may have cut its selling price to maintain or gain market share. Therefore, industrial flooring rolls are in the **Growth Phase** of product life cycle. Due to increase in demand, there is a pos sibility of higher sales and profits to be made in future years.

Similarly, the actual sale of domestic flooring roll is 5% lower than the expectations. However, actual contribution margin is Z$27 per roll i.e. 32.5% lower than the standard contribution margin. This indicates that ZM may have sold these at substantially reduced price to maintain the sales volume. Therefore, the domestic residential flooring rolls might be in the **Decline Stage** of product life cycle.

The market size for flooring rolls has reduced from an expectation of 80 lacs rolls to 70 lacs rolls. Therefore, the market size has shrunk significantly by 12.5% for the year 2019. This is a threat to profitability of business. The management has to understand the reasons behind this shrinkage. For example, dwindling demand maybe on account of cheaper substitutes available for flooring rolls. The management has to take cognizance of this threat to business. A positive for ZM is that its actual market share for flooring rolls was higher than expected at 12%. An increase in market share would have a beneficial impact on the company's profitability. Also, despite the shrinkage in market size, demand for industrial flooring rolls seems to be on the rise. This could be an opportunity for the management to consider.

As explained above, the industrial flooring rolls seem to be in the Growth Stage of product life cycle, while the domestic residential rolls are in the Decline Stage. Industrial flooring rolls have a higher contribution margin per roll as compared to domestic residential rolls. Accordingly, ZM may consider phasing out domestic flooring rolls and concentrate on industrial flooring rolls . In view of shrinking market conditions, it would be more profitable to phase out the weaker product and concentrate on the fast moving and profitable product. At the same time, since domestic flooring roll still has significant demand , the strategy to phase out this product may have to be done in a phased and well-planned manner. In view of the shrinking market size, ZM should not end up losing its market share due to phasing out domestic flooring rolls.

Student Notes

For Your Conceptual Understanding
"Budgeted Vs Actual Figures"

	Budgeted Qty. Rolls ('000)	Standard Cont. per Roll (Z$)	Budgeted Cont. (Z$' in millions)	Actual Qty. Rolls ('000)	Actual Cont. per Roll (Z$)	Actual Cont. (Z$' in millions)	Revised Actual Qty. ('000)
Dom.	600	40	24.00	570	27	15.390	630 (840x75%)
Ind.	200	50	10.00	270	47.5	12.825	210 (840x25%)
	800		34.00	840		28.215	840

Contribution Mix Variance

Product	Standard Contribution per unit (Z$)	Actual Qty (units'000)	Revised Actual Quantity (units'000)	Difference ('000)	Variance (Z$)
Domestic	40	570	630	-60	2.40m(A)
Industrial	50	270	210	+60	3.00m(F)
Total		840			0.60m(F)

Contribution Quantity Variance

Product	Standard Contribution per unit(Z$)	Revised Actual Quantity (units'000)	Budgeted Quantity (units'000)	Difference ('000)	Variance (Z$)
Domestic	40	630	600	+30	1.20m(F)
Industrial	50	210	200	+10	0.50m(F)
Total		840			1.70m(F)

Market Size Variance

= Budgeted Market Share % x (Actual Industry Sales Quantity in units - Budgeted Industry Sales Quantity in units) x (Average Budgeted Contribution per unit)
= 10% x (70,00,000 Rolls - 80,00,000 Rolls) x Z$ 42.50
= Z$ 4.25 m (A)

Market Share Variance

= (Actual Market Share % - Budgeted Market Share %) x (Actual Industry Sales Quantity in units) x (Average Budgeted Contribution per unit)
= (12% - 10 %) x 70,00,000 Rolls x Z$ 42.50
= Z$ 5.95 m (F)

22 Question 6:Planning and operation variance.

AGF is a chemical processing company that produces sprays used by farmers to protect their crops. One of these sprays 'Agrofresh' is made by using either chemical A or chemical B. To produce one litre of Agrofresh spray they have the option to use either 12 litres of chemical A or 12 litres of chemical B. During the financial year, the purchase department of AGF has planned to use chemical B as it appeared that it would be the cheaper of the two and their plans were based on a cost of chemical B of 15 per litre.

Due to subsequent market movement during the year the actual prices changed and if the concerned department had purchased efficiently, the cost would have been :

Chemical A	15.40 per litre
Chemical B	16.00 per litre

Production of Agrofresh spray was 1,000 litres and the usage of chemical B was 12,800 litres at a cost of 2.09,920.

You are the CEO of AGF and the management accountant has sent to you the following suggestions through e-mail:

"I feel that in our particular circumstances the traditional approach to variance analysis is of little use as for some of our products we can utilize one of several equally suitable chemicals and we always plan to use such chemical which will lead to cheapest production costs. However due to sharp market movements, we are frequently trapped by the sharp price changes which lead to the choice of expensive alternative at the end."

Required

To check the reality in the content of the mail, you asked, the management accountant of the company:

(i) To CALCULATE the material variances for Agrofresh by using Traditional Variance Analysis Planning and Operational Variances

(ii) To ANALYSE how planning and operational variances approached the variances .

(iii) To ANALYSE how the advanced variances are useful to your organisation .

Solution:

Usage Variance = (12,000 lt. - 12,800 lt.) x 15.00
= 12,000 (A)

Price Variance = (15.00 - 16.40) x 12,800 lt.
= 17,920 (A)

Total Variance = 12,000 (A) + 17,920 (A)
= 29,920 (A)

Operational Variances

Usage Variance = (12,000 lt. - 12,800 lt.) x Rs. 16.00
= 12,800 (A)

Price Variance = (16.00 - 16.40) x 12,800 lt.
= 5,120 (A)

Total Variance = 12,800 (A) + 5.120 (A)
= 17,920 (A)

Planning Variances

Controllable Variance = (15.40 - 16.00) x 12,000 lt.
= 7,200 (A)

Uncontrollable Variance = (15.00 - 15.40) x 12,000 lt.
= 4 ,800 (A)

Total Variance	= 7,200 (A) + 4,800 (A)
	= 12,000 (A)
Reconciliation	= 17,920 (A) + 12,000 (A)
	= 29,920 (A)

Direct Material Usage Operational Variance using Standard Price, and the Direct Material Price Planning Variance based on Actual Quantity can also be calculated . This approach reconciles the Direct Material Price Variance and Direct Material Usage Variance calculated in part.

(ii) Traditional variance analysis is applied based on the assumption that whole of the variance is due to operational deficiencies and the planning associated with setting the original standard is perfectly correct. But this assumption is not practical. When the conditions are volatile and dynamic, traditional variances need to be analysed into planning and operational variances. Planning variances try to explain the extent to which the original standard needs to be adjusted to reflect changes in operating conditions between the current situation and that imagined when the standard was originally derived. Planning variances are generally not controllable and may need to revise to cater the changes due to environmental/ technological changes at a later stage. In certain situation planning variances can be considered controllable as well. Whereas operational variances explain the extent to which adjusted standards have been achieved. Operational variances are calculated after the planning variances have been established and are thus a realistic way of assessing performance . So, it indicates a reality check of traditional variance analysis.

In AGF, as per traditional approach total variances are 29,920 (adverse), out of which 17,920 (adverse) accounts for total operational variance and 12,000 (adverse) is for total planning variance. It is necessary to analyse planning variances further. The planning variance of 12,000 (adverse) can be divided into an uncontrollable adverse variance of Rs. 4,800 and a controllable adverse variance of Rs. 7,200. Similarly , total operational variance can be sub classified as adverse price variance of Rs. 5,120 and adverse usage variance of 12,800. This analysis gives a clearer indication of the ineffi ciency of the purchasing function by the concerned department. Performance of the staff of the purchasing department should be evaluated/ rewarded based on variances which are controllable. If an adverse uncontrollable variance of 4,800 is reported in the performance reports this is likely to lead to dysfunctional motivation effects to the purchase department.

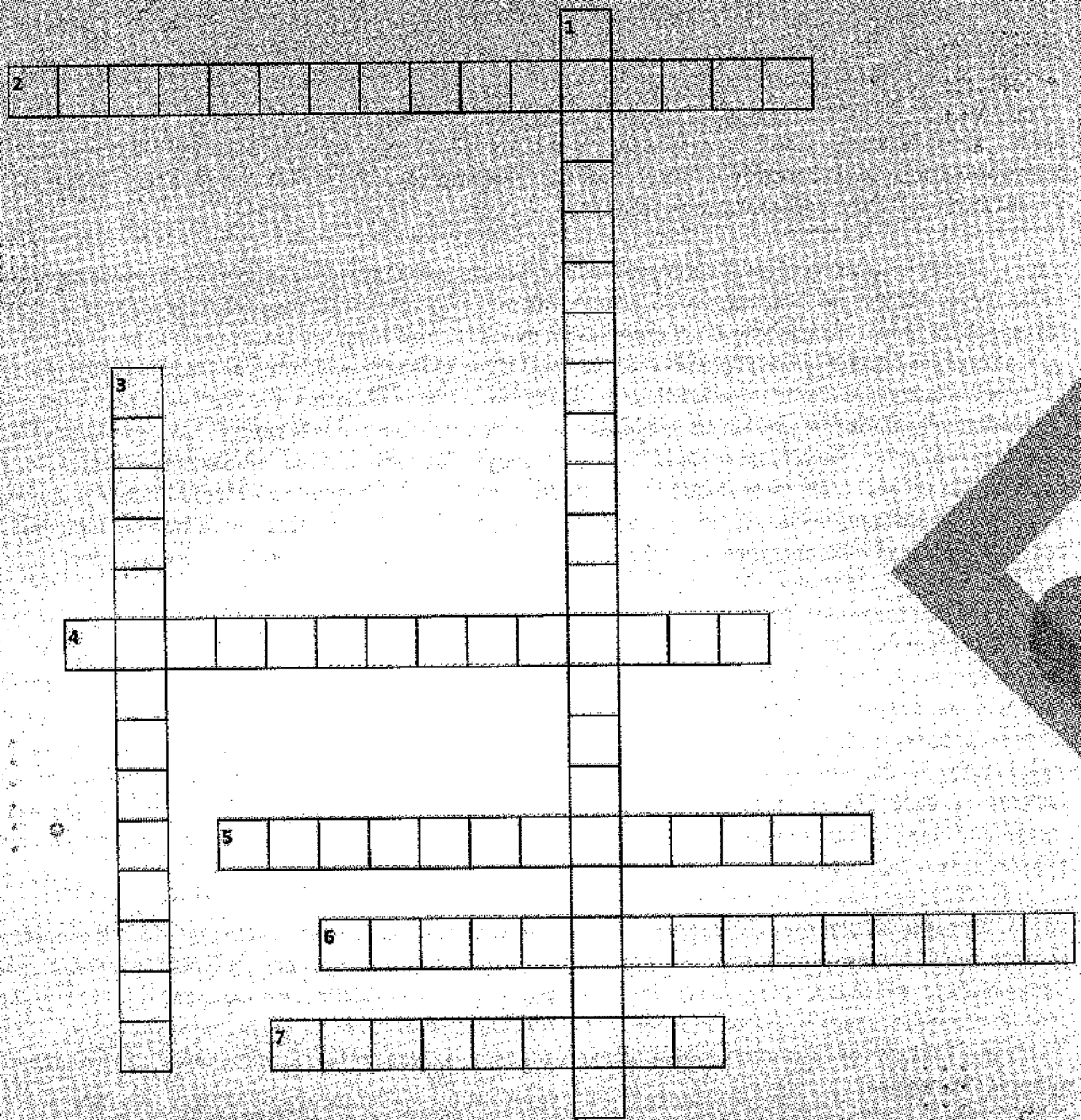
(iii) In today's cutthroat competition , managers must react quickly and accurately to the changes in technology , price fluctuation , consumer tastes , laws and regulations, economic conditions , political conditions , and international conditions etc. which are changing rapidly and dramatically . Accordingly , management accountant should be able to provide necessary inputs by a proper analysis of the things that pertains to his/her area like effect of changes in price. The unique features of advanced variance analysis are that, it considers different market conditions and changes in the dynamic environment.

Moreover , advanced variances classify variances into controllable and uncontrollable variances and help the management to find out reasons for adverse variances so that corrective action can be taken. Similarly, if any adverse variances have arrived, because of changes in the market condition like inflation, it has to be differentiated from the other variances.

AGF is a type of organization where management of performance ca n be done only through advanced variance analysis. Advanced variance analysis of AGF shows that it has adverse planning variance as well as adverse operational variance . Further, the emergence of controllable and uncontrollable variances makes it a perfect case of advance variance analysis in AGF. In AGF , sharp price changes which lead to the choice of expensive alternative and efficiency of purchase department need to be analyzed , reported , and dealt separately by the joint effort of the management accountant and the top management. Hence, advanced variance analysis in AGF is an absolute necessity.

GAME OF CONCEPTS

CHAPTER 12



ACROSS

2. the difference between actual overhead and applied overhead
4. the difference between the standard operating profit budgeted to be made on the items sold and the actual profits made.
5. the monetary difference between actual and budgeted sales
6. the practice of substituting an expected cost for an actual cost in the accounting records
7. the difference between a budgeted, planned, or standard cost and the actual amount incurred/sold

DOWN

1. the difference between the standard cost of materials resulting from production activities and the actual costs incurred
3. Measures the difference between the actual and expected cost per hour, multiplied by the actual hours incurred.

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