CHAPTER 1: DEVELOPMENTS IN BUSINESS ENVIRONMENT

Accounting is the language of business that communicates the financial results of an enterprise to various stakeholders viz., investors, regulating agencies, the management itself etc. by means of various financial statements. Accounting is the process of identifying, measuring, recording, classifying, summarising, analyzing, interpreting and communicating the financial transactions and events. Accounting is classified into Financial Accounting, Cost Accounting, Management Accounting, Tax Accounting etc.

Management Accounting deals with the application of accounting techniques for providing information designed to help all levels of the management in planning and controlling the activities of business enterprise and in decision making. The objective of this branch of accounting is to provide any and / or all information that management needs in taking a rational decision depending on the situation and to evaluate the impact of its decisions and actions. Management Accounting is not only confined to the areas of cost accounting but also covers other areas such as capital expenditure decisions, capital structure decisions, dividend decisions, investment decisions etc. as well. Management Accounting rules are set within the company with emphasis on future to accomplish management objectives relating to adding value to the company. This is the data that could be soft, or estimates, that must only improve the value of decisions more than the cost of information. The emphasis of Management Accounting is on timeliness and focuses on different segments of the organization and need not follow GAAP or any prescribed format. Management accounting data must only be relevant for management decisions in Planning, Directing, Motivating and Controlling.

IMPACT OF CHANGING ENVIRONMENT ON COST AND MANAGEMENT ACCOUNTING

Question:

How has the composition of manufacturing costs changed during recent years? How has this change affected the design of cost accounting systems?

Answer:
Traditionally, manufacturing companies classified the manufacturing costs to be allocated to the products into (a) Direct materials. (b) Direct labour and (c) Indirect manufacturing costs. In the present day context characterised by intensive global competition, large scale automation of manufacturing processes, computerization and real time processing of data, diversification to suit customer needs, manufacturing costs are classified in to three broad categories as under:

1. **Direct costs**: As many total costs relating to cost objects as feasible are classified into direct costs. The objective is to trace as many costs as possible into direct and to reduce the amount of costs classified into indirect because the greater the proportion of direct costs the greater the accuracy of the cost system.

2. **Indirect cost pools:** Increase the number of indirect cost pools so that each of these pools is more homogeneous. In a homogeneous cost pool, all the costs will have the same cause-and-effect relationship with the cost allocation base.

Use cost-and-effect criterion for identifying the cost allocation base for each indirect cost pool.

The change in the classification of manufacturing costs as above has lead to the development of Activity Based Costing (ABC). ABC refines a costing system by focusing on individual activities as the fundamental cost objects. An activity is an event, task or unit of work with a specified purpose, for example, designing, set up, etc. ABC system calculates the costs of individual activities and assigns costs to cost objects such as products or services on the basis of the activities consumed to produce the product or provide the service.

TOTAL QUALITY MANAGEMENT (TQM):

TQM is a systematic process for identifying and implementing solution and prioritise opportunities for improvement. TQM seeks to increase customer satisfaction by finding the factors that limit current performance. The TQM approach stresses on the need for a customer-oriented approach to management reporting, eliminating some or more of traditional reporting practices. The emphasis of TQM is to design and build quality in the product, rather than allow defectives and then inspect and rectify them. The focus is on the causes rather than the symptoms of poor quality. While

doing this, modern management accounting practices are put to use. It is often viewed as a technique suitable for manufacturing processes but this is an important tool to increase efficiency in service sector also.

Quality: It is a measure of goodness to understand how a product meets its specifications. When the expression "quality" is used, we usually think terms of an excellent product or service that fulfills or exceeds our expectations. These expectations are based on the intended use and the selling price. When a product surpasses our expectations we consider that quality.

Costs of performing checks to ensure quality specifications are called quality costs. These are of 4 types

a. Prevention costs,
b. Appraisal costs,
c. Internal failure costs and
d. External failure costs.

Question:

Classify the following items under appropriate categories of quality costs viz. Prevention Costs, appraisal Cost, Internal Failure Costs and External Failure costs:

a. Rework
b. Disposal of scrap
c. Warranty Repairs
d. Revenue loss
e. Repair to manufacturing equipments
f. Discount on defective sale
g. Raw material inspection
h. Finished product inspection
i. Establishment of quality circles
j. *Packaging inspection*

Answer:

Prevention Costs	: g, i	Appraisal Costs	: h, j
Internal Failure	: a, b, e	External Failure Costs	: c, d, f.

CIMA defines 'Total Quality Management' as "Integrated and comprehensive system of planning and controlling all business functions so that products or services are produced which meet or exceed customer expectations. TQM is a philosophy of business behaviour, embracing principles such as employee involvement, continuous improvement at all levels and customer focus, as well as being a collection of related techniques aimed at improving quality such as full documentation of activities, clear goal-setting and performance measurement from the customer perspective."

TQM is composed of **three important parameters**:

Total: Organization wide
Quality: With its usual Definitions, with all its complexities.
Management: The system of managing with steps like Plan, Organise, Control, Lead, Staff, etc.

Deming's Philosophy: Deming is treated as the father of the Quality Control. He says that only 15 percent of quality problems are actually due to worker error. The remaining 85 percent are caused by processes and systems, including poor management. Further, it is up to management to correct system problems and create an environment that promotes quality and enables workers to achieve their full potential. He outlined his philosophy in 14 points / principles which are as under:

a. "Create constancy of purpose towards improvement". Replace short-term reaction with long-term planning.

b. "Adopt the new philosophy". The implication is that management should actually adopt his philosophy, rather than merely expect the workforce to do so.

c. "Cease dependence on inspection". If variation is reduced, there is no need to inspect manufactured items for defects, because there won't be any.

d. "Move towards a single supplier for any one item." Multiple suppliers mean variation between feedstock.

e. "Improve constantly and forever". Constantly strive to reduce variation.

f. "Institute training on the job". If people are inadequately trained, they will not all work the same way, and this will introduce variation.

g. "Institute leadership". Deming makes a distinction between leadership and mere supervision. The latter is quota and target-based.

h. "Drive out fear". Deming sees management by fear as counter-productive in the long term, because it prevents workers from acting in the organisation's best interests.

i. "Break down barriers between departments." Another idea central to TQM is the concept of 'internal customer', that each department serves not the management, but the other departments that use its inputs.

j. "Eliminate slogans". Another central TQM idea is that it's not people who make most mistakes - it's the process they are working within. Harassing the workforce without improving the processes they use is counter-productive.

k. "Eliminate management by objectives". Deming saw production targets as encouraging the delivery of poor-quality of goods.

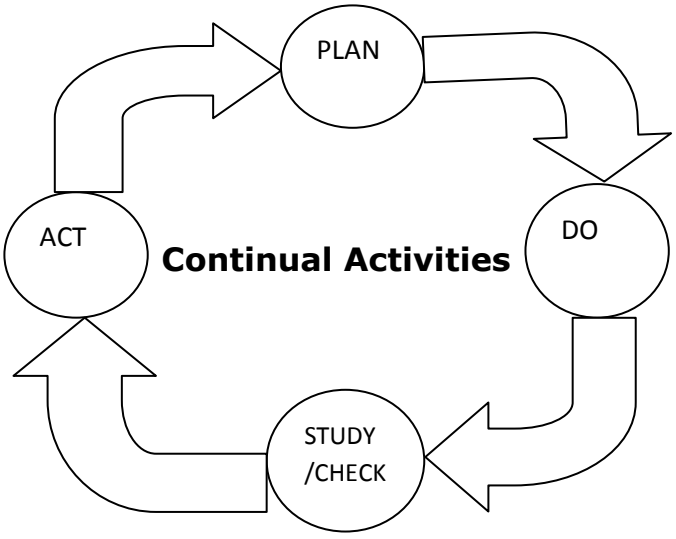
l. "Remove barriers to pride of workmanship". Many of the other problems outlined reduce worker satisfaction.

m. "Institute education and self- improvement".

n. "The transformation is everyone's job".

The Plan–Do–Check/Study–Act Cycle:

The plan – do – check / study – act (PDCA) cycle describes the activities a company needs to perform in order to incorporate continuous improvement in its operation. This cycle, is also referred to as the **Shewhart cycle or the Deming wheel**. The circular nature of this cycle shows that continuous improvement is a never-ending process.



Plan: The first step in the PDCA cycle is to plan. Managers must evaluate the current process and make plans based on any problems they find and to

improve current systems. They need to document all current procedures, collect data, and identify problems.

Do: The next step in the cycle is implementing the plan (do). During the implementation process managers should document all changes made and collect data for evaluation.

Study/Check: The third step is to study the data collected in the previous phase. The data are evaluated to see whether the plan is achieving the goals established in the plan phase.

Act: The last phase of the cycle is to act on the basis of the results of the first three phases. The best way to accomplish this is to communicate the results to other members in the company and then implement the new procedure if it has been successful. Note that this is a cycle; the next step is to plan again. After we have acted, we need to continue evaluating the process, planning, and repeating the cycle again.

Six Sigma

Question:

Write a short note on Six Sigma process in Quality Control Process.

Answer:

Six Sigma is a set of practices originally developed by Motorola to systematically improve processes by eliminating defects. A defect is defined as non-conformity of a product or service to its specifications. Continuous improvement can be brought into the organisational culture by introducing continuously changing planned targets. One such target can be six-sigma accuracy.

In quality practice, six-sigma means variations of only 3.4 parts per million parts is only acceptable. Six sigma is the statistical measure used to ensure quality of products and services. The six sigma academy has developed a break through strategy consisting of measure, analyze, improve and control, that allows companies to make exceptional bottom-line improvements.

Like its predecessors, Six Sigma asserts the following:

a. Continuous efforts to reduce variation in process outputs is key to business success
b. Manufacturing and business processes can be measured, analyzed, improved and controlled
c. Succeeding at achieving sustained quality improvement requires commitment from the entire organization, particularly from top-level management.

In addition to the material and labour savings, which flow directly to the bottom line, a company engaged in six sigma, can expect to see:

a. Improved customer satisfaction
b. Reduction cycle time
c. Increased productivity
d. Reduction in total defect
e. Improved process flow

Question:
What are the essential requirements for successful implementation of TQM? OR What are the critical success factors for implementation of TQM Program?
Answer:
The essential requirements for successful implementation of TQM are referred with acronym **7 Cs'** (In certain cases 6 Cs' also). They are:

1. Commitment: Total commitment must come from top management. Quality expectation must be made clear by the top management, together with the support and training required for its achievement.

2. Culture: Proper training must be given to effect changes in culture and attitude.

3. Continuous Improvement: TQM should be recognised as a continuous process and not merely a one-off program.

4. Cooperation: Employee involvement and co-operation should be sought in the development of improvement strategies and associated performance measures.

5. Customer Focus: The needs of internal customers (colleagues) and external customers (recipient of final product) should be the prime focus. Perfect service with zero defects is what is acceptable.

6. Control: Documentation, procedures and awareness of current best practices are essential if TQM implementations are to function appropriately.

7. Communication: Communication is very closely related to the quality process. Exchange of ideas in meetings results in improved decisions. Continuous Two way communication between Top management and operational management enables to institute remedial measures immediately.

Question:
Discuss the benefits accruing from the implementation of a TQM Program. OR How does TQM facilitate value addition in an organisation?

Answer:
The benefits accruing from the implementation of a TQM Program in an organisation are:

(i) There will be increased awareness of quality culture in the organization.
(ii) It will lead to commitment to continuous improvement.
(iii) It will focus on customer satisfaction.
(iv) A greater emphasis on team work will be achieved.

Identification of Improvement opportunity and implementation of Quality Improvement Process:

The benchmarking of activities and internal analysis provides the ground for the identification of improvement opportunities and the formal implementation of the improvement process. This is often done through the 6 steps referred with acronym **PRAISE** as detailed below along with hurdles likely to be faced and methods to overcome at each step:

Step	Activity	Elements	Likely hurdles	Remedies
1	Problem Identification	Areas of Customer dissatisfaction. Absence of competitive advantage. Complacency on present arrangements.	Effects of the problem are apparent but identification of the problem is difficult. Problem is identifiable but difficult to measure.	Participative approach like brain storming, panel discussion etc. Quantification and precise definition of problem
2	Ranking	Prioritise problems and opportunities by perceived importance, and ease of measurement and solution.	Difference in perception of individuals in ranking. Difference in preferences based on functions e.g. production, finance, marketing etc. Lack of consensus between Individuals.	Participative approach Subordination of Individual to group interest
3	Analysis	Ask 'Why?' to identify possible causes. Keep asking 'Why?' to move beyond the symptoms and to avoid jumping to premature conclusions. Ask 'What?' to consider potential implications. Ask 'How much?' to quantify cause and effect.	Adoption of adhoc approaches and quick fix solutions.	Lateral thinking brainstorming
4	Innovation	Use creative thinking to generate potential solutions Barriers to implementation available enablers, and People whole co-operation must be sought.	Lack of creativity or expertise. Inability to operationalise ideas, aspects of each strategy i.e. convert thoughts into action points.	Systematic evaluation of all aspects of each strategy
5	Solution	Implement the preferred solution.	Resistance from middle	Effective internal

		Take appropriate action to bring about required changes. Reinforce with training and documentation back-up.	managers	communication Training of personnel and managers Participative approach
6	Evaluation	Monitor the effectiveness of actions Establish and interpret performance indicators to track Progress towards objectives. Identify the potential for further improvements and return to step 1	Problem in implementation. Lack of measurable data for comparison of expectations with actual.	Effective control system to track actual feedback system.

The quality improvement process should be the stepping stone for positive and constructive movement within the organisation. This has the destructive potential of the process also. It is imperative to observe the fundamental 4 Ps' of quality improvement to avoid or overcome the destructive potential.

Question:

List out the remedies available for difficulties experienced during implementation of PRAISE.

Answer:

Remedies available for difficulties experienced in each step available during implementation of praise:

Activities	**Remedies**
1. Problem Identification	Participate in programs like brain storming, Multi voting, GD etc Precise definition of a Problem and quantification.
2. Ranking	Participative approach. Sub ordination of individual to group approach.
3. Analysis	Lateral thinking/Brain storming.
4. Innovation	Systematic evaluation of all aspects of each Strategy.
5. Solution	Effective internal communication. Training of personnel/managers.
6. Evaluation	Participative approach. Effective control system to track actual Feedback system.

Question:

Explain 4 Ps' of quality improvement principles.

Answer:

The **4 Ps'** of quality improvement principles are as below:

1. People: To avoid misdirection, TQM teams should consist of team spirited individuals who have a flair for accepting and meeting challenges. Lack of enthusiasm will be apparent from a generally negative approach and a tendency to have pre-arranged meetings which coincide with the meetings of TQM teams.

2. Process: The rhetoric and inflexibility of a strict Deming approach will often have a demotivating effect on group activity. It is essential to solve problem practically and to regard the formal process to reach at conclusions.

3. Problem: Problems need to be approached in a systematic manner, allowing for immediate feedback, together with recognition of the contribution made by individual participants. Experience suggests that the least successful groups are those approaching problems that are deemed to be too large to provide meaningful solutions within a finite time period.

4. Preparation: Additional training on creative thinking and statistical processes are needed in order to give participants a greater appreciation.

A 3-point action plan for the choice of projects and the implementation of quality improvement process is as follows:

1. Bite-sized chunks. It is tempting to seek a large cherry to pluck, but big improvement opportunities are inevitably complex and require extensive inter-departmental co-operation. The choice of a relatively small problem in the first instance provides a greater chance of success. This will generate the acceptance of the quality improvement processes by the users thereby increasing the morale of the operating personnel.

2. Solvable problem. The problem selected should not be trivial, but it should be a simple one with a potential impact and a clear improvement opportunity. Measurable progress towards implementation should be accomplished within three or four months (or less if possible) in order to maintain the motivation of participants and advertise the success of the improvement process itself. This helps in easier implementation of further quality improvement processes.

3. Recognition of participants. The successful projects and team members should receive appropriate recognition throughout the enterprise. Prominent individuals should be rewarded for their efforts both as personal recognition and as encouragement to others. The precise nature of the reward may be recognition itself, although in some situations material, but

usually non-monetary, prizes may also be appropriate.

The implementation of TQM processes can provide long-lasting benefits as long as the achievement of quality goals is not in conflict with other objectives. By overcoming the initial obstacles, a TQM process can provide us with an additional tool to improve competitiveness and ensure long-term survival.

ACTIVITY BASED COSTING (ABC):

Activity Based Costing (ABC) is an accounting methodology that assigns costs to activities rather than to products or services. This enables resources and overhead costs to be more accurately assigned to products and services that consume them. ABC assigns costs to activities based on usage of resources.

Factors prompting the development of ABC system include:

1. Growing overhead costs because of increasingly automated production
2. Increasing market competition which necessitated more accurate product costs.
3. Increased diversification to attain economies of scale and larger market share.
4. Decreasing costs of information processing because of continual improvements and increasing application of information technology.
5. Traditional costing fails to capture cause and effect relationship.

The flow of activities under ABC is identified through 4 core areas:

• **Cost Object**–It is an item for which cost measurement is required e.g. a product or a customer.

• **Cost Driver**–It is a factor that causes a change in the cost of an activity. There are two categories of cost driver:

• **Resource Cost Driver**–It is a measure of the quantity of resources consumed by an activity. It is used to assign the cost of a resource to an activity or cost pool. E.g. Staff wages, Electricity, Advertising etc.

• **Activity Cost Driver**–It is a measure of the frequency and intensity of demand, placed on activities by cost objects. It is used to assign activity costs to cost objects viz. a product or a customer. Eg. Inspection and testing charges, Machine set up costs, Material ordering costs, Material handling and storing costs, etc.

Question:
Give two examples for each of the following categories in activity based costing:
(i) Unit level activities
(ii) Batch level activities
(iii) Product level activities
(iv) Facility level activities.
Answer:
Activities essentially fall into 4 categories known as manufacturing cost hierarchy.
i) Unit level activities: This relates to the number of units produced. Eg. (a) Use of indirect materials (b) Inspection or testing of every item produced or say every 100th item produced(c) Indirect consumables;
(ii) Batch level activities: This relates to the number of batches required to produce the desired units. (a) Material ordering (b) Machine set up costs (c) Inspection of products–like first item of every batch;
(iii) Product level activities: These are the activities that are specifically required for products and often these are one time activities for the products. Eg. (a) Designing the product (b) Producing parts to a certain specification (c) Advertising costs, if advertisement is for individual products (e) specific tools for a product;
(iv) Facility level activities: The costs cannot be identified directly with each product. Hence they are to be apportioned on suitable basis to the products that are produced. Eg. (a) Maintenance of buildings (b) Plant security (c) Production managers' salaries (d) Advertising campaigns promoting the company;

The various stages in ABC are:

a Identification of the activities that take place in the organisation. The major activities in the organisation are identified. These can be Machine related activities, Direct labour related activities, and various support activities such as ordering or receiving material, handling of material etc.
b Assigning costs to cost pool for each activity.
c Spreading of support activities across the primary activities on suitable basis.
d Determining cost driver for each activity. This is a variable which decides work volume or work load of an activity. The question that is asked is what causes the activity to incur costs?
e Assigning the costs of activities to products according to product demand for activities.

Benefits of ABC: ABC is of prime importance for organisations product

costing where:

- Production overheads are high in relation to direct costs.
- There is a great diversity in the product range.
- Products use different amounts of the overhead resources.
- Consumption of overhead resources is not primarily driven by volume.

Question:

State with a brief reason whether you would recommend an activity based system of costing in each of the following independent situations:

a. *Company K produces one product. The overhead costs mainly consist of depreciation.*
b. *Company L produces 5 different products using different production facilities.*
c. *A consultancy firm consisting of lawyers, accountants and computer engineers provides management consultancy services to clients.*
d. *Company S produces two different labour intensive products. The contribution per unit in both products is very high. The BEP is very low. All the work is carried on efficiently to meet the target costs.*

Answer:

a. No as only one product is being produced (no apportionment / allocation of overheads) and depreciation is the major cost component.
b. ABC Costing is required for pricing as different products are being produced using different production facilities for allocation / apportionment of overheads. Cost drivers of each production facility / product could be different.
c. As variety of services are being rendered each service will have different cost driver. Hence, ABC is required through which correct costs can be ascertained.
d. As the products are labour intensive and as BEP is low (implying low fixed costs) ABC is not recommended eventhough two products are being produced. Labour hours / cost would be the suitable basis.

Question:

"Cost can be managed only at the point of commitment and not at the point of incidence. Therefore, it is necessary to manage cost drivers to manage cost." Explain the statement with reference to structural and executional cost drivers.

Answer:

A firm commits costs at the time of designing the product and deciding the method of production. It also commits cost at the time of deciding the delivery channel (e.g. delivery through dealers or own retail stores). Costs are incurred at the time of actual production and delivery. Therefore, no significant cost reduction can be achieved at the time when the costs are

incurred. Therefore, it is said that costs can be managed at the point of commitment.

Cost drivers are factors that drive consumption of resources. Therefore, management of cost drivers is essential to manage costs. Structural cost drivers are those which can be managed by effecting structural changes. Examples of structural cost drivers are scale of operation, scope of operation (i.e. degree of vertical integration), complexity, technology and experience or learning. Thus, structural cost drivers arise from the business model adopted by the company.

Executional cost drivers can be managed by executive decisions, examples of executional cost drivers are capacity utilization, plant layout efficiency, product configuration and linkages with suppliers and customers.
It is obvious that cost drivers can be managed only at the point of structural and operating decisions, which commit resources to various activities.

Question:
In the context of Activity Based Costing System, explain the following statement:

"Strategic cost analysis should exploit internal linkages"

Answer:
Activity based costing is an accounting methodology that assigns cost to activities rather than to products or services. Activity Based Costing tracks the flow of activities by creating internal link between activity / resource consumption and cost object. Exploiting internal linkages means taking advantage of the relationships among the activities that exist within a firm's segment of value chain. Activity cost and analysis are essential parts of this strategic analysis. Activities not based on production units / sales units, based on the variable activity drivers are analyzed. The traditional costing system is not rich enough to supply the information needed for thorough analysis of linkages.

Question:
What is the fundamental difference between Activity Based Costing System (ABC) and Traditional Costing System? Why more and more organisations in both the manufacturing and non-manufacturing industries are adopting ABC? OR Explain the need for emergence of ABC.

Answer:
In the traditional system of assigning manufacturing overheads, overheads are first allocated and apportioned to cost centres (production and support service cost centres) and then absorbed to cost objects (e.g. products). While under ABC, overheads are first assigned to activities or activity pools (group of activities) and then they are assigned to cost objects. Thus, ABC

is a refinement over the traditional costing system. Usually cost centres include a series of different activities. If different products create different demands on those activities, the traditional costing system fails to determine the product cost accurately. In that situation, it becomes necessary to use different rates for different activities or activity pools.

The following are the reasons for adoption of ABC by manufacturing and nonmanufacturing industries:

a. ABC helps to estimate cost of individual product or service more accurately. This helps to formulate appropriate marketing / corporate strategy.
b. There is product and customer proliferation. Demand on resources by products / customers differ among product / customers. Therefore, product / customer profitability can be measured reasonably accurately, only if consumption of resources can be traced to each individual product / customer.
c. ABC improves the accuracy of accounting for support service costs.
d. The costs associated with bad decisions have increased substantially.
e. Reduction in the cost of data processing has reduced the cost of tracking resources consumption to large number of activities.

Question:
Differentiate between Value – added and Non Value - added activities in the context of ABC with examples.
Answer:
Value - added and non value - added activities (VA): The value-added activities are those activities which are necessary for the performance of the process. The customers are usually willing to pay (in some way) for the service. For example polishing furniture by a manufacturer dealing in furniture is value added activity.

In contrast, non value added activities do not generate any identifiable value by the internal or external customer. Such activities do not improve the quality or function of a product or service, but they can adversely affect costs and prices. Examples of non value added activities are: Scheduling activities, Movement of materials, Waiting for inputs in process, Start up preparations for production, Storing of inventories etc.

Activity Based Cost Management (ABM): ABC implementation has shown great benefits in Cost Management rather than in providing accurate costs. ABM is used to describe the Cost Management by application of ABC. ABM focuses on the efficient and effective management of activities as the

route to continuously improve the value received by the customers. ABM is being effectively used in:
Cost reduction;
Activity Based Budgeting;
Business process re-engineering. This involves examining business processes and making substantial changes on how organisation currently operates;
Benchmarking;
Performance measurement. Etc.

ABC Vs. ABM: ABC refers to the technique for determining the cost of activities and the output that those activities produce. It is the logical distribution of overhead i.e. overhead should be distributed on the consumption of resources consumed by goods and services. The aim of ABC is to generate improved cost data for use in managing a company's activities.

The ABM is a much broader concept. It refers to the management philosophy that focuses on the planning, execution and measurement of activities as the key to competitive advantage.

ACTIVITY BASED BUDGETING (ABB): Activity-based budgeting is a process of planning and controlling the expected activities for the organisation to derive a cost-effective budget that meets forecast workload and agreed strategic goals. An activity-based budget is a quantitative expression of the expected activities of the firm, reflecting management's forecast of workload and financial and non-financial requirements to meet agreed strategic goals and planned changes to improve performance.

Key Elements of ABB:
(i) Type of work to be performed;
(ii) Quantity of work to be performed; and
(ii) Cost of work to be performed.

TARGET COSTING:

Question:
What is Target Costing? It is said that implementation of the target costing technique requires intensive marketing research. Explain why intensive marketing research is required to implement target costing technique.
Answer:

Today's economy is market driven and **Customer is King.** Customer focus has become imperative for survival. The philosophy is what customer wants and is willing to pay for rather than what it costs to produce. Hence, from the market determined price, the desired profit is excluded to ascertain the target cost. i. e.

Target Cost = Target Price – Target Profit

Instead of

Cost + Profit = Selling Price.

Target Cost is a management technology using scientific principles and technologies to establish a cost target, break down the cost target into and improve cost. These technologies are adopted during the life cycle cost of the product i.e. from development, design, manufacturing, distribution, sales, usage and disposal costs.

Target costing is also said as a cost reduction program or profit management program before the birth of the product itself.

It can also be defined as "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". This is a cost management technique that aims to produce and sell products that will ensure the target margin. It is an integral part of the product design.

While designing the product, the company needs to understand what value target customers will assign to different attributes and different aspects of quality. This requires use of techniques like value engineering and value analysis. Intensive marketing research is required to understand customer preferences and the value they assign to each attribute and quality parameter. The company also needs to forecast how much customers are willing to pay for the product and to its features.

The company plays within the space between the maximum attributes and quality that the company can offer and the minimum acceptable to target customers. Therefore in absence of intensive marketing research, the target costing technique cannot be used effectively.

Features of Target Costing System:

1. Target costing is viewed as an integral part of the design and introduction of new products. Cost planning is done at the design and development stage itself, since around 80% of the costs are committed before production starts. Customer needs and preferences are ascertained through market surveys.

2. Target selling price is determined using various sales forecasting techniques.
3. Target production volumes are ascertained along with target selling price and target profit.
4. The next stage is to determine target costs by fixing cost reduction targets. During this process Functional analysis, Cost tables, Quality functions of the product are considered.
5. Fair degree of judgment is needed where the allowable cost and the target cost differ.
6. The total target is broken down into its various components, each component is studied and opportunities for cost reductions are identified. These activities are referred as value engineering (VE) and value analysis (VA).

Question:

What is target costing? It is said that target costing fosters team work within the organisation. Explain how target costing creates an environment in which team work fosters.

Answer:

Target cost is the difference between the estimated selling price of a proposed product with specified functionality and quality and target margin. This is a cost management technique that aims to produce and sell products that will ensure the target margin. It is an integral part of the product design. While designing the product the company allocates value and cost to different attributes and quality. Therefore, they use the technique of value engineering and value analysis. The target cost is achieved by assigning cost reduction targets to different operations that are involved in the production process. Eventually, all operations do not achieve the cost reduction targets, but the overall cost reduction target is achieved through team work. Therefore, it is said that target costing fosters team work.

Question:

From a cost plus pricing model, a market driven model for pricing has lead to "target price". How has it lead to target costing method for cost reduction?

Answer:

Until towards the last decade of the 20th century, product pricing was essentially a part of push strategy. Manufacturing to stock on the basis of an assured demand with adequate protection to tariff walls from the government, especially, Indian entrepreneurs produce goods at their own cost and provided their margin and fix their selling price on the "cost plus pricing" basis. However, this approach came in for a rude shock when the information technology revolution or the "third wave" as it is called engulfed the entire world. While on the one hand, developed countries found their

market shrinking due to stagnation in their population, but had surplus capacity to produce world class goods, they had to look for new markets. Logistics no longer was a problem and the delay in reaching the customer was totally removed. Liberalized economies meant breaking down tariff walls and the markets became open. Now the customer has many options for buying a product as numerous producers were queuing up with quality products. Pricing of product was no longer the prerogative of the manufacturer, but of the customer. Pricing thus became market driven and a product of pull strategy.

From the point of view of the management accountant the market driven price is the target price at which the manufacturer has to market his products and source his earnings. At the same time the management accountant has also understood that if a business has to be carried on, it has to earn a return on capital employed (ROCE) at a higher level than the average cost of capital. Having quantified this return per unit of sale this element is deducted from the target price to yield the target cost. This area is the battle ground where the higher existing costs needed to be brought down to a level of the target cost for which a financial strategy has to be developed. This financial strategy would involve cost reduction at all levels (i.e. life cycle costs) and thus would involve analysis of marketing costs and profitability on the one hand, product development policy and strategy on the other hand. Towards this, the main thrust of cost reduction is a three pronged exercise:

- Value engineering during design and development
- Kaizen costing during production
- Activity based management and costing during all stages of product life

Question:

List the steps involved in Target Costing process.
List the steps involved in target costing process with the help of a block diagram.

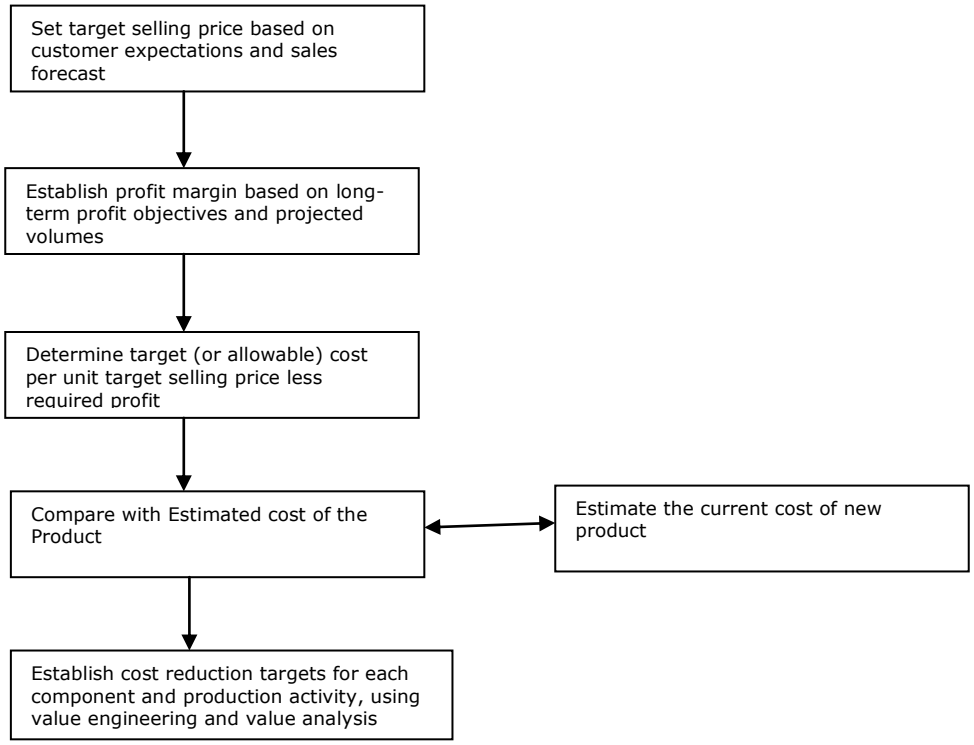
Answer:

Steps involved in Target Costing process are:

1. Customer's requirements as to the functionality and quality of the product are first studied.
2. Setting of target selling price based on customer expectations and sales forecast with regard to Sale Price and Sales Volume.
3. Establishing profit margin based on long-term profit objectives and projected volumes.
4. Determining target cost per unit (target selling price less required profit)

5. Comparing with Estimate the current cost of new product.
6. Establishing cost reduction targets for each component and production activity, using value engineering and value analysis.
7. Identifying cost reduction opportunities.

Target Costing Process:



Value Analysis: Value Analysis involves studying the activities that are involved in producing the product to detect Non Value Added activities that may be eliminated or minimized without impairing the function or quality of the product.

Question:
How can Value Analysis achieve Cost Reduction? OR
Briefly explain the concept of Value Analysis as cost reduction technique.
Answer:
Value Analysis can achieve cost reduction in the following manner:

1. Identifying and removing unnecessary components in a product having no utility.
2. Having component substitution at a lesser cost without affecting quality of the product.
3. Simplifying product design.
4. Introducing alternative methods with lesser cost and improved efficiency.

5. Recommendation, improvement and follow-up for implementation

Question:
State whether each of the following independent activities is value-added or non-value-added:

a. *Polishing of furniture used by a systems engineer in a software firm.*
b. *Maintenance by a software company of receivables management software for a banking company.*
c. *Painting of pencils manufactured by a pencil factory.*
d. *Cleaning of customers' computer key boards by a computer repair centre.*
e. *Providing, brake adjustments in cars received for service by a car service station.*

Answer:
Except a, rest are value added activities.

Value Engineering: Following are the issues that are dealt during review of value engineering.

1. Can we eliminate functions or steps from production process?
2. Can we combine steps?
3. Can we eliminate some durability or reliability of the product?
4. Can we minimise the design?
5. Can we design the product better to facilitate easy manufacturing?
6. Can we substitute parts?
7. Is there a better way? This step is vague as this is not focused in the way the previous steps are involved but strikes at the core of the cost reduction issue. This is a very wide area and involves even interaction with outsiders as well including suppliers and their manufacturing processes and activities.

Implementation of Target Costing: The steps involved in implementation of Target Costing Program are:

1. Creation of project charter.
2. Obtaining a management sponsor.
3. Obtaining a budget.
4. Identifying a strong Team Manager.
5. Enrolling full time participants.
6. Using project management tools like PERT, CPM Charts etc.

Problems with Target Costing:

1. The development process can be lengthened to a considerable extent since the design team may require a number of design iterations before it

can devise a sufficiently low-cost product that meets the target cost and margin criteria.

2. A large amount of mandatory cost cutting can result in finger-pointing in various parts of the company; especially if employees in one area feel they are being called on to provide a disproportionately large part of the savings.
3. Representatives from number of departments on the design team can sometimes make it more difficult to reach a consensus on the proper design

Standard Cost Vs. Target Cost.

	Standard Cost	Target Cost
Focus	Internal	External
Waste	Within allowed limits	Zero-defect approach
Orientation	Confirming to standards	Kaizen (continuous improvements)
Behavioural impact	Variance analysis sets the stage for excuse hunting and friction	Promotes creative and cohesive team work
objective	Control of operation costs	Reinvent the product with strategic thrust
Time	Short term and reactive	Medium to long term and proactive.

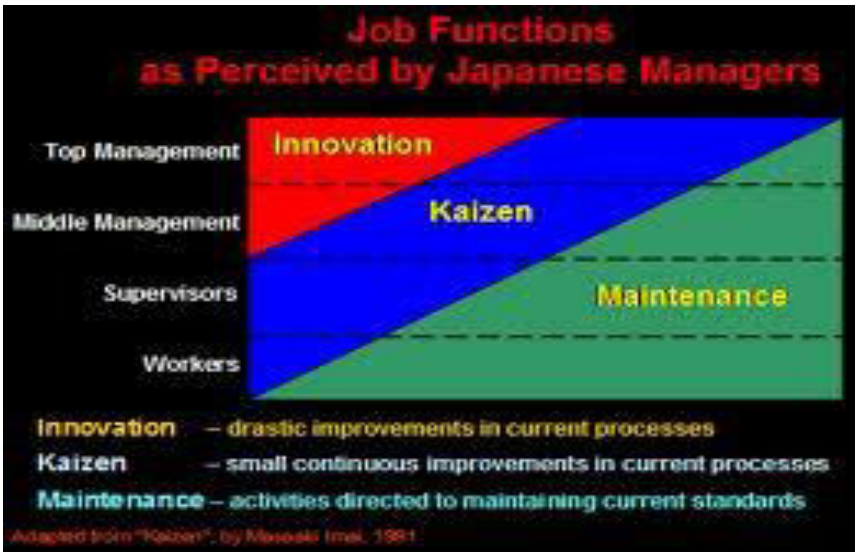
Most Useful Situations for Target Costing:

Target costing is most useful in situations where the majority of product costs are locked in during the product design phase. Target costing improves profitability in two ways:

- It places continuous emphasis on product costs throughout the life cycle of the product.
- It improves profitability through precise targeting of the current prices (i.e. adoption of standard costs indirectly) at which the company feels it can place a profitable product in the market that will sell in a robust manner.

Kaizen Costing: Kaizen Costing is a Japanese term for a number of cost reduction steps that can be used subsequent to issuing a new product design to the factory floor. Some of the activities in the kaizen costing methodology include the elimination of waste in the production, assembly, and distribution processes, as well as the elimination of work steps in any of these areas

"Kaizen is a Japanese term for continuous improvement in all aspects of an entity's performance at every level.



Kaizen costing is really designed to repeat many of the value engineering steps for as long as a product is produced, constantly refining the process and thereby stripping out extra costs. The cost reductions resulting from kaizen costing are much smaller than those achieved with value engineering but are still worth the effort since competitive pressures are likely to force down the price of a product over time, and any possible cost savings allow a company to still attain its targeted profit margins while continuing to reduce cost.

LIFE CYCLE COSTING:

CIMA defines life cycle costing as the practice of obtaining over their life time, the best use of physical asset at the lowest cost of entity.

Life cycle costing estimates, tracks and accumulates the costs over a product's entire life cycle from its inception to abandonment or from the initial R & D stage till the final customer servicing and support of the product. It aims at tracing of costs and revenues on product by product basis over several calendar periods throughout their life cycle. Costs are incurred along the product's life cycle starting from product's design, development, manufacture, marketing, servicing and final disposal. The objective is to accumulate all the costs over a product life cycle to determine whether the profits earned during the manufacturing phase will cover the costs incurred during the pre and post manufacturing stages of product life cycle.

Phases in the Life Cycle of a Product: The life cycle of a product consists of four phases viz.

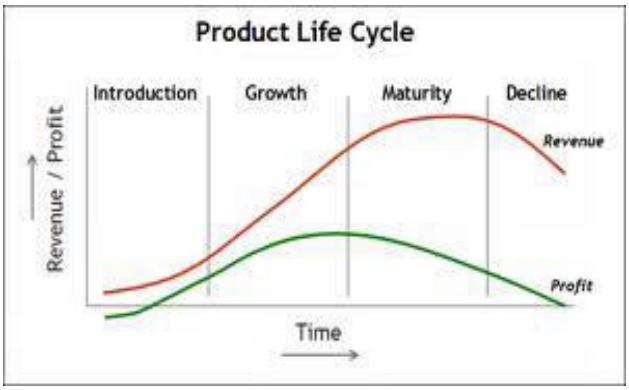
1. Introduction;

2. Growth;
3. Maturity;
4. Saturation & Decline.

The life cycle of a manufactured product consists of the following stages:

Market Research	Specification	Design
Prototype Manufacture	Development	Tooling
Manufacture	Distribution	Selling
Product Support	De commissioning	

The various stages of revenues and profits of the product's life cycle can be depicted as below:



The salient features of the products during the different stages of its life cycle are summarised below:

Sl. #	FEATURE	INTRODUCTION	GROWTH	MATURITY	DECLINE
Characteristics					
1	Sales	Low Sales	Rapidly increasing sales	Peak Sales	Declining sales
2	Costs	High Cost per customer	Avg. Cost per Customer	Low Cost per Customer	Low Cost per Customer
3	Profits	Negative	More profit	High Profit	Declining Profit
4	Customer	Innovators	Early Adopters	Early Majority + Late Majority	Laggards
5	Competitor	Few	More in Number	Stable Number, Beginning to Decline	Declining Numbers
Objectives					
	Marketing	Create product Awareness and Trial	Maximise Mkt. Share	Maximise Profits & Defend Mkt. Share	Reduce Expenses & Milk Brands
Strategies					
1	Product	Offer Basic Product	Offer Product Extension, service, Warranty	Diversify Brands, Models	Phase out Weak Products
2	Price	Charge Cost +	Price to	Price to Match	Cut Price

			Penetrate Mkt.	Better Competition	
3	Distribution	Build Selective Distribution	Build Intensive Distribution	Build More Intensive Distribution	Selective Phase out Unprofitable Unit
4	Advertising	Build Product Awareness among Early Adopters and Dealers	Build Awareness & Interest in Mass Mkt.	Stress on Brand difference & Benefits	Reduce to Retain Hard Core Loyals
5	Sales Promotion	Use Heavy Sales Promotion to Introduce Trial	Reduce Sales Promotion due to Increased Consumer Demand	More Sales Promotion to Encourage Brand Switching	Reduce to Minimum Level

Question:

Explain the essential features of Life-cycle costing.

Answer:

Essential features of Life Cycle Costing are:

a. Tracing of costs and revenue of product over several calendar period-throughout their entire life cycle.
b. Emphasis is on Cost and revenue accumulation over the entire life cycle of the product.
c. Life cycle costing traces research and design.
d. It focuses on development costs, incurred to individual products over their entire life cycles.
e. Total magnitude of research and development costs are reported and compared with product revenues generated in later periods.

Question:

Why is Product Life Cycle Costing important?

Answer:

Product life cycle costing is important for the following reasons:

a. When non-production costs like costs associated with R & D, design, marketing, distribution and customer service are significant, it is essential to identify them for target pricing, value engineering and cost management. For example, a poorly designed software package may involve higher costs on marketing, distribution and after sales service.
b. When high percentage of total life-cycle costs are incurred before production begins and revenue are earned over several years.

Question:

Meena is a news reporter and feature writer for an economic daily. Her assignment is to develop a feature article on 'Product Life-cycle Costing', including interviews with the' Chief Financial Officers (CFO) and operating, managers. Meena has been given a liberal budget for travel so as to

research into company's history, operations, and market analysis for the firm she selects for the article.
Required:
(i) Meena has asked you to recommend industries and firms that would be good candidates for the article. What would you advise? Explain your recommendations.

Answer:

The product life cycle spans the time from the initial R & D on a product to when customer service and support is no longer offered for that product.
Life Cycle Costing technique is particularly important when:

(a) High percentage of total life-cycle costs are incurred before production begins and revenue are earned over several years and
(b) High fraction of the life cycle costs are locked in at the R & D and design stages. Meena should identify those industries and then companies belonging to those industries where above mentioned feature are prevalent. For example, Automobile and Pharmaceutical Industries companies like Tata Automobile, M&M, Ranbaxy and Dabur will be good candidates for study on product life cycle costing.

Question:

State the benefits of Product Life Cycle Costing.

Answer:

The benefits of product life cycle costing are summarized as follows:

1. The product life cycle costing results in earlier actions to generate revenue or to lower costs than otherwise might not be considered. There are a number of factors that need to be managed in order to maximise return on a product.
2. Better decisions should follow from a more accurate and realistic assessment of revenues and costs, at least within a particular life cycle stage.
3. Product life cycle thinking can promote long-term rewarding in contrast to short-term profitability rewarding.
4. It provides an overall framework for considering total incremental costs over the entire life span of a product, which in turn facilitates analysis of parts of the whole where cost effectiveness might be improved.

VALUE CHAIN ANALYSIS (VCA):

Value chain for any firm is the value creating activities all the way from basic raw material sources from component suppliers through to the ultimate end use product delivered into the final consumers' hands.
A company can gain competitive advantage not just by surpassing its competitors, but discovering what customer want and then profitably

satisfying, and even exceeding, customer expectations. This is done by a concept called Value Chain Analysis. VCA can be used to better understand which segment, distribution channels; product differentiation will yield the firms greatest competitive advantage.

Question:
What is the concept of 'Value-chain' and why is it important for Cost Management? Mention three 'useful strategic frameworks of the value chain analysis.

Answer:
Value chain is the linked set of value creating activities from the basic raw materials and components sources to the ultimate end use of the product or service delivered to the customer.

Proter described the value chain as the internal processes or activities a company performs "to design, produce, market, deliver and support its product". He further stated that "a firm's value chain and the way it performs individual activities are a reflection of its history, its strategy, its approach of implementing its strategy, and the underlying economics of the activities themselves".

The 6 business functions contained in the value chain are:

a. Research & Development;
b. Design;
c. Production;
d. Marketing;
e. Distribution; and
f. Customer service.

The objective of value chain is to serve as means of increasing the customer satisfaction and managing costs effectively. Coordination of the individual parts of the value chain activities creates conditions to improve customer satisfaction in terms of cost efficiency quality and delivery.

VCA is important because it helps a firm:

1. To identify the industry value chain and then assign costs, revenues and assets to value activities.
2. To diagnose the cost drivers regulating each value activity.
3. To develop sustainable cost advantage either by controlling cost drivers better than competitors or by reconfiguring the chain value.

By analyzing costs, revenues and assets in each activity systematically a company can achieve low cost. Thus value chain helps managers in deciding

how to apply the organization's valuable physical and human resources to each linked process so as to achieve cost effectiveness.

The business activities are classified into primary activities and support activities.

Primary activities are those activities which are involved in transforming the inputs into outputs: **Examples**:

- Order processing and distribution;
- Installation, repair and parts replacement;
- Transforming inputs into final products;
- Material handling and warehousing;
- Delivery and after sales service;
- Communication, pricing and channel management; etc.

Support activities are intended to support the primary activities: **Examples:**

- Purchase of raw material and other consumable stores
- Selection, promotion, appraisal and employee relations
- General management, planning, finance, accounting

Three useful strategic frameworks for value chain analysis are:
• Industry structure analysis;
• Core competencies; and
• Segmentation analysis.

Steps in Value Chain Analysis include the following:

a. Internal cost analysis: Organisations use value chain analysis to identify the sources of profitability and understand the costs of their internal processes or activities. Value creating processes and Cost drivers of the processes are identified and costs are assigned to such processes. During this process both structural and executional cost drivers are considered and internal relationships between the processes are identified. Based on this information, the value creating processes are ranked. Some processes offer more opportunities for value creation and the general rule of 80:20 applies here also.
b. Internal differentiation analysis: The value chain approach is also used by the organisations to identify opportunities for creating and sustaining superior differentiation of their products in the market. Factors like Product features, Marketing Channels, Service & Support, Brand or image positioning, Price etc. are considered. For a firm to achieve superior differentiation, it must create unique and sustainable values to customers as compared to its competitors.

c. Vertical linkage analysis: Linkages among value creating processes do not end with the activities within the firm. The analysis must be used to understand the relationships and associated costs among external suppliers and customers in order to maximise the value delivered to customers and to minimise cost.

Question:

How can value analysis achieve cost reduction?

Answer:

Value analysis can do cost reduction in the following manner:

a. By identifying and removing unnecessary components in a product which had no utility earlier.
b. By introducing component substitution at a lesser cost without affecting the quality of the product.
c. By simplifying the product design.
d. By introducing alternative methods with less cost but improved efficiency.

Question:

Differentiate between 'Traditional Management Accounting' and 'Value Chain Analysis in the strategic framework'.

Answer:

Value Chain vs. Traditional Management Accounting

1. TMA focuses on internal information While VCA Focuses on external information.
2. In TMA, Application of single cost driver at the overall firm level is taken. While In VCA, Application of multiple cost drivers i.e. structural and executional are taken for each value activity.
3. TMA assume that cost reduction must be found in the value added process While VCA Exploits linkages throughout the value chain i.e. within firm, with suppliers and customers.
4. TMA Insights for strategic decisions somewhat limited in traditional management accounting While VCA Identify cost driver at the individual activity level and develop cost / differentiation advantage either by controlling those drivers better than competitors or by reconfiguring the value chain.

Limitations of Value Chain Analysis are:

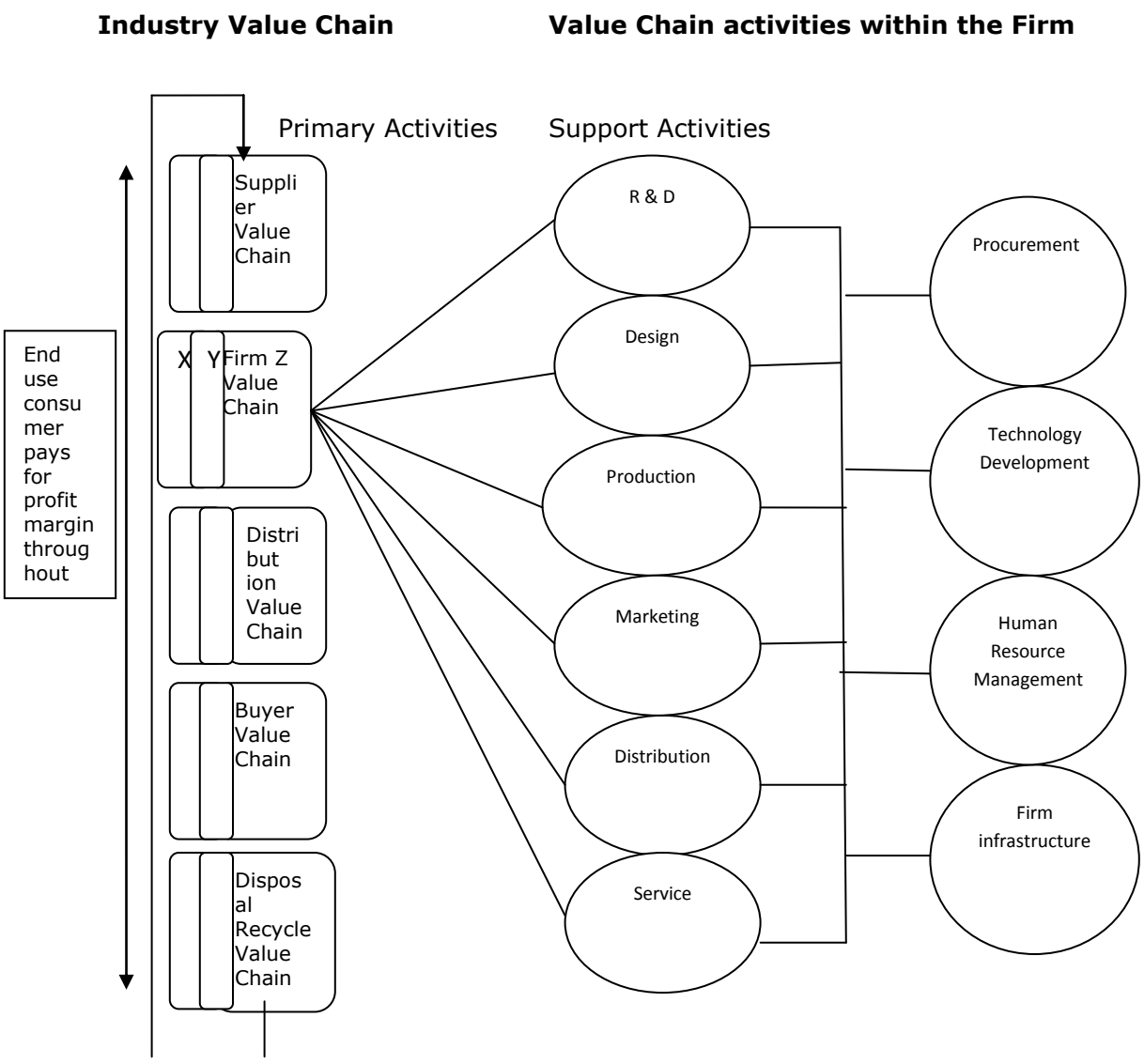
1. Non availability of data;
2. Identification of stages;
3. Ascertainment of Cost, Revenues and Assets;
4. Identification of Cost drivers;
5. Resistance from employees;

6. Science Vs. Art. VCA is more an art than science. Certain reports are more subjective and hence differ from person to person.

Question:

Explain with a diagram the value chain activities within the firm with suitable classifications under primary and support activities and also the industry value chain indicating what the end use consumer pays for!

Answer:



COST CONTROL AND COST REDUCTION:

Question

Distinguish between Cost Control and Cost Reduction.

Answer

Cost Control: Cost control is regulation by executive control the costs of operating an undertaking. Cost Control involves continuous comparisons of actuals with the standards or budgets to regulate the former. Standards or budgets once set up are not attended during the period or until some mistakes are discovered in standards.

Cost reduction: Cost reduction is the achievement of real and permanent reduction in unit cost of products manufactured. It, therefore, continuously attempts to achieve genuine savings in cost of production, administration, selling and distribution. It does not accept a standard or budget as fixed. It rather challenges the standards / budgets continuously to make improvement in them. It attempts to excavate, the potential savings buried in the standards by continuous and planned efforts. Infact, Cost Reduction is one of the techniques of Cost Control.

The differences can be summarised as below:

Sl. #	Cost Control	Cost Reduction
1	Emphasises is on past performance viz. Analysis of variances etc.	Emphasis is on fresh approvals keeping in view the functional value to the customer
2	It is a conservative approach and stresses on conformity to the procedures	It is a dynamic approach. Each part of sub function is analysed.
3	This is a directive of the management stating that the limits of cost control are to be adhered to.	It requires review at all levels to bring about permanent reduction.
4	It takes short term review to reduce costs in given situations	It seeks to reduce unit cost as a system study on permanent basis
5	It is a preventive function and efforts are directed to remain within laid down limits.	It is an approval keeping in view functions and values. This exists even when cost control is there.
6	It uses traditional costing techniques like standard costing etc.	It uses modern thinking like technology up gradation, value analysis, value engg, advanced manufacturing technology etc. apart from traditional techniques.

Question:
Classify the following items under the more appropriate category:

Category (CC) – Cost Control Or
Category (CR) – Cost Reduction

a. *Costs exceeding budgets or standards are investigated.*
b. *Preventive function*
c. *Corrective function*
d. *Measures to standardize for increasing productivity*
e. *Provision of proper storage facilities for materials.*
f. *Continuous comparison of actual with the standards set.*
g. *Challenges the standards set*
h. *Value analysis*

Answer:
A, b, e, f are Cost Control category. Rest are Cost Reduction category.

COMPUTER -AIDED MANUFACTURING: Computer-aided manufacturing process is carried out by a range of machinery together with its concomitant software. Maximum elements of CAM are computer numerical control (CNC) and robotics. CNC machines are programmable machine tools. These are capable of performing a number of machining tasks, e.g. cutting, grinding, moulding, bending etc. Human operators will tire and are error prone. CNC machines are able to repeat the same operation continuously in identical manner, with high accuracy level.

JUST IN TIME (JIT):

Question:
Write short notes on JIT philosophy.
Answer:
Just-In-Time is a time management philosophy (also called lean management philosophy) that seeks to utilize the most important resource, i.e. time, in an efficient and effective manner. A complete JIT system begins with production, continues through the manufacturing plant, and even includes the types of transactions processed by the accounting system. Most important in JIT system is to ensure receiving of products / spare parts / materials from its suppliers on the exact date and at the exact time when they are needed in order to reduce excessive inventory in stock.

The process of JIT involves:
a. Identifying significant activities in the Firm, and classify into VA (Value-Added) and NVA (Non-Value-Added) activities.

b. Simplify VA activities so as to improve productivity / efficiency / output.
c. Eliminate NVA activities so that time earlier spent on NVA activities can now be used for V A activities.
d. Achieve significant cost reduction by eliminating time related and NVA activity related costs.

Steps in JIT:

a. Evaluation of supplier by purchase staff with regard to quality, quantity and reliability of supply.
b. Visit to suppliers' sites and inspection of supply quality there to ensure quality and time etc.
c. A small cluster of machines are operated who can monitor each output part from machine to machine within the cell and can immediately identify defective output.
d. Empowered workforce is allowed to stop their machines when they see a problem and take action for immediate resolution of the bulk of performance problems.

JIT results in Reduction of following inventory costs:

a. Interest cost related to the debt that funds the inventory investment
b. Elimination of NVA items/activities
c. Cost of inventory that becomes obsolete over time
d. Cost of rent for inventory storage facilities
e. Cost of all equipment used in the warehouse
f. Cost of warehouse utilities
g. Cost of warehouse employees
h. Cost of insurance needed to cover the possible loss of inventory

Question:

How does the JIT approach help in improving an organisation's profitability?

Answer:

JIT approach helps in the reduction of costs / increase in prices as follows:

1. By immediate detection of defective goods being manufactured, early correction is ensured with least scrapping.
2. By Elimination of NVA items/activities
3. By reducing WIP between machines within working cell.
4. By reducing OH costs in the form of rentals for inventory, insurance, maintenance costs etc.
4. By ensuring higher product quality leading to higher premium in the selling price.
5. By detection of problem areas in production to reduce costs by improvement.

Question:

Explain how the implementation of JIT approach to manufacturing can be a major source of competitive advantage.

Answer:

JIT provides competitive advantage in the following ways:

1. Stocks of raw materials and finished goods are eliminated, stock holding costs are avoided.
2. JIT aims at elimination of non-value added activities and elimination of costs in this direction will improve competitive advantage.
3. It affords flexibility to customer requirements where the company can manufacture customised products and the competitive advantage is thereby improved.
4. It focuses the direction of performance based production of high quality product.
5. It minimises waiting times and handling costs.

Question:

State the advantages and disadvantages of Just-in-Time approach in the context of inventory control.

Answer:

Advantages of JIT approach:

a. Substantial savings in stockholding costs
b. Elimination of waste
c. Saving in factory and warehouse space
d. Reduction in obsolete stocks.
e. Reduction in ordering costs

Disadvantages of JIT approach:

a. Additional investment in new machinery and layout
b. Difficulty in predicting the daily/weekly demand
c. Increased risk of stock-out.

Question:

The following independent situations are given in JIT systems of production. You are required to state if each recommendation is valid or invalid and give a brief reason.

SI. #	***Situation***	***Recommendation by the Cost Accountant***
a	*A company produces LCD TVs. Presently total inventory turnover is measured annually.*	*Compute inventory turnover every month. Break it down into raw material, WIP, expensive inventory and finished goods.*

b	*Textile company.*	*Accept employees' claim for piece rate incentive for exceeding a certain production volume.*
c	*Sports goods manufacturing company.*	*Closely monitor direct labour variances including idle time variances to convince employees to work faster.*
d	*Multiproduct production*	*Monitor the average set up time per machine in a period which is given by Aggregate set up time of all machines Total number of machines.*

Answer:

a. **Valid** – JIT system emphasises extraordinary high inventory turnover. When a company is producing LCD TVs' total turnover of inventory will be high. So, differentiation of inventory into RM, WIP & FG is useful.

b. **Invalid** - In textile industry, employees are paid extra if they exceed certain production volume targets. JIT focuses on producing only what is needed and not to accumulate inventory on account of high incentives. So, any piece rate system must be replaced with focus on quality of output or the number of suggestions for improving the JIT system.

c. **Invalid** - Monitoring Direct labour efficiency is highly inappropriate in JIT system. As JIT system does not focus on fast workings of employees. Instead JIT focuses on quality of product manufactured. JIT system strives to avoid unnecessary activities and hence eliminate non-value-added activities like monitoring direct labour variance, including idle variance etc.

d. **Invalid** - The average setup time per machine is of great importance as it can be measured periodically and plotted on a trend line. The shortest possible setup intervals are crucial for the success of short production runs. So, this is a major JIT measurement. It is best to measure it by each machine, rather than in the aggregate, since an aggregate measure does reveal enough information about which equipments require more setup time or reduction in work.

Question:

What do you mean by back-flushing in JIT system? What are the problems that must be corrected before it will work properly?

Answer:

It is the costing system that omits recording some or all of the journal entries relating to the cycle from purchase of direct materials to the sale of finished goods. The journal entries for the subsequent stages use normal or standard costs to work backward to flush out the costs in the cycle for which the journal entries were omitted earlier.

Backflushing requires no data entry of any kind until a finished product is completed. Once production is completed, the total finished quantity is entered into computer system which works the quantities of raw materials as per BOM.

To work system properly some serious problems must be corrected.

1. **Production reporting:** The total production figure entered into the system must be absolutely correct or else the wrong component types and quantities will be subtracted from stock.
2. **Scrap reporting:** All abnormal scrap must be diligently tracked and recorded; otherwise these materials will fall outside the back flushing system and will not be charged to inventory, resulting in inaccurate inventory.
3. **Lot tracing:** Lot tracing is difficult under the back flushing system. It is required when a manufacturer need to keep records of which production lots were used to create a product in case all the items in a lot must be recalled.
4. **Inventory accuracy:** Maintain accurate set of inventory records.

Kanban Cards: A "Kanban card," is a notification card that a downstream machine sends to each machine that feeds it parts, authorizing the production of just enough components to fulfill the production requirements being authorized in turn by the next machine further downstream. This is also known as a "pull" system, since kanbans are initiated at the end of the production process, pulling work authorizations through the production system. With this approach, there is no way for work-in-process inventory to build up in the production system, since it can be created only with a kanban authorization.

MATERIAL REQUIREMENT PLANNING (MRP):

Material Requirement Planning is a computerised production operation system providing a basis for production decisions. In other words, MRP involves input planning based on output budget. Material Requirement Planning is a part of the overall Manufacturing Resources Planning.

Objective of material requirement planning:

1. To determine how much final products are to be produced and at what time.
2. To ascertain the required units of production of sub-assemblies.
3. To determine the requirement of materials based on an updated Bill Of Materials file.

4. To compute inventories lead time, WIP lead time, batch sizes lead time and manufacturing and packaging lead times.
5. To control inventory by ordering bought-in components and raw materials in relation to the orders received or forecast rather than the more usual practice of ordering from stock-level indicators.

Question:

Explain the pre-requisites for successful operation of material requirement planning.

Answer:

Pre-requisites for successful operation of MRP system are:

1. The latest production and purchasing schedules prepared should be strictly adhered and updated for Day to Day changes.
2. Raw Materials, sub-assemblies and components required for production should be predetermined in quantifiable terms. Standard should be set for the consumption quantity, quality, mix and yield of raw materials for every unit of finished product.
3. Work-force must be appraised of the system and the need for absolute adherence to the schedules is prepared.
4. Necessary internal control system should be developed to ensure total adherence to the schedule.
5. Accuracy of the data supplied is vital to the MRP system.

Question:

Mention the data required to operate the material requirement planning system.

Answer:

Data requirements to operate material requirement planning system are:

1. **Master Production schedule:** This schedule specifies the quantity of each finished units of products to be produced and the time at which each units will be required.
2. **Bill of Material file:** The bill of material file specifies the sub-assemblies, components and materials required for each of the finished goods.
3. I**nventory file:**This file maintains details of items in hand for each sub-assembly, components and materials required for each of the finished goods.
4. **Routing file:**This file specifies the sequence of operations required to manufacture sub-assemblies, components and finished goods.
5. **Master Parts file:**This file contains information on the production time of subassemblies; components produced internally and lead times for externally acquired items.

Question:

Differentiate between MRP and MRP-II?

Answer:

a. Material requirements planning (MRP) is a production planning and inventory control system used to manage manufacturing processes.

   Manufacturing resource planning (MRP II) is defined as a method for the effective planning of all resources of a manufacturing company. Ideally, it addresses operational planning in units, financial planning in rupees, and has a simulation capability to answer "what-if" questions and is an extension of closed-loop MRP. MRP II is wider in nature and covers other areas also apart from MRP such as:
   Planning of components and sub assemblies;
   Computing the resources viz., Machine and Labour capacities;

b. MRP allows for the coordination of raw materials purchasing,

   MRPII facilitates the development of a detailed production schedule that accounts for machine and labour capacity, scheduling the production runs according to the arrival of materials. MRPII is concerned with the integration of all aspects of the manufacturing process, including materials, finance and human relations.

c. Manufacturing resource planning (MRP II) can provide better control of the following, compared to the Material Requirement planning (MRP)
   - Better control of inventories
   - Improved scheduling
   - Productive relationships with suppliers
   - Improved design control
   - Better quality and quality control
   - Reduced working capital for inventory
   - Improved cash flow through quicker deliveries
   - Accurate inventory records

SYNCHRONOUS MANUFACTURING:

Synchronous Manufacturing is an all-encompassing manufacturing management philosophy that includes a consistent set of principles, procedures, and techniques where every action is evaluated in terms of the common global goal of the organization. Synchronous manufacturing philosophy requires managers' focus on those areas of operations where there exists potential for global improvement.

Principles Associated With Synchronous Manufacturing are:

1. Do not focus on balance idle capacities; focus on synchronizing the production flow.

2. The marginal value of time at a bottleneck resource is equal to the throughput rate of the products processed by the bottleneck.
3. The marginal value of time at a non-bottleneck resource is negligible.
4. The level of utilisation of a non-bottleneck resource is controlled by other constraints within the system.
5. Resources must be utilized, not simply activated.
6. A transfer batch may not, and many times should not, be equal to the process batch.
7. A process batch should be variable both along its route and over time.

BUSINESS PROCESS RE-ENGINEERING (BPR):

Business process re-engineering is a business management strategy, originally pioneered in the early 1990s, focusing on the analysis and design of workflows and processes within an organization. BPR seeks to help companies radically restructure their organizations by focusing on the ground-up design of their business processes thus enabling them to become world class competitors. A business process is a set of logically related tasks performed to achieve a defined business outcome. Re-engineering emphasized a holistic focus on business objectives and how processes related to them, encouraging full-scale recreation of processes rather than iterative optimization of sub-processes. A key stimulus for re-engineering has been the rapid and continuing development of Information and Networking Technologies.

Business process re-engineering is also known as business process redesign, business transformation, or business process change management.

Reengineering starts with a high-level assessment of the organization's mission, strategic goals, and customer needs. Basic questions are asked, such as "Does our mission need to be redefined? Are our strategic goals aligned with our mission? Who are our customers? Etc. As a structured ordering of work steps across time and place, a business process can be decomposed into specific activities, measured, modeled, and improved. It can also be completely redesigned or eliminated altogether. This leads to dramatic improvements in critical performance measures, such as cost, quality, service, and speed.

Most of the work being done does not add any value for customers, and this work should be removed, not accelerated through automation. Instead, companies should reconsider their processes in order to maximize customer

value, while minimizing the consumption of resources required for delivering their product or service.

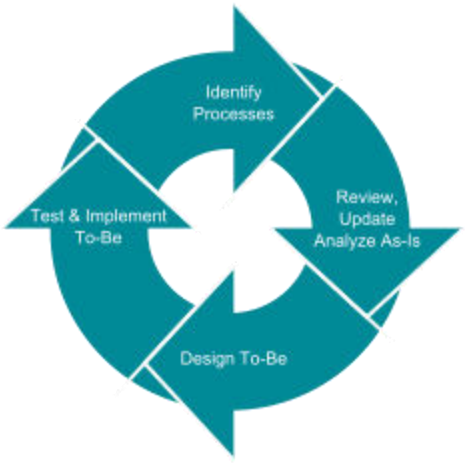
"B P R may be defined as the <u>fundamental</u> rethinking and <u>radical</u> redesign of business <u>processes</u> to achieve <u>dramatic</u> improvements in critical contemporary modern measures of performance, such as cost, quality, service, and speed."

In BPR, information technology is generally considered as playing a role as enabler of new forms of organizing and collaborating, rather than supporting existing business functions. Technology is concerned with the use of computer systems and other forms of communication technology in the business.

The B P R is a continuous activity and the steps involved are:

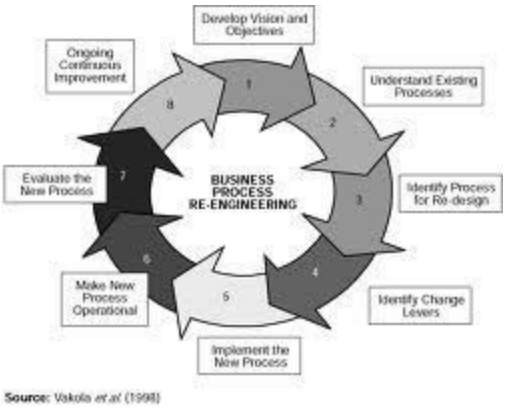
a. Identifying the processes for change;
b. Review, update, and analyse the existing processes (i.e. As is study)
c. Design the updated process (i. e. To Be)
d. Test and improve updated process.

This may be depicted by the following diagram.



Business Process Reengineering Cycle

The more detailed version of B P R involves the following steps:



Source: Vakola *et al* (1998)

1. Develop vision and objectives;
2. Understand existing processes;
3. Identify processes for redesign;
4. Identify change levers / agents;
5. Implement the new process;
6. Make new process operational;
7. Evaluate the new process;
8. Continuous and ongoing improvement.

Business process re-engineering involves examining business processes and making substantial changes in the day to day operation of the organization. It involves the redesign of work by changing the activities.

The **aim of BPR** is to improve the key business process in an organization by focusing on
(a) Simplification,
(b) Cost reduction,
(c) Improved quality and
(d) Enhanced customer satisfaction

The features of BPR are:

1. Several jobs are combined into one.
2. Often workers make decisions.
3. The steps in the processes are in logical order.
4. Work is performed where it makes more sense.
5. Quality is built in.
6. Manager provides a single point of contact.
7. Centralized and decentralized operations are combined.

The principles of BPR are:

1. Processes should be designed to achieve a desired outcome rather than focusing on existing tasks.

2. Users of the output from a process should also perform the process.
3. Information processing should also be included in the work, if the work generates information.
4. Geographically dispersed resources should be treated as if they are centralised.
5. Parallel processes should be linked rather than integrated.
6. Doers should be allowed to self manage.
7. Information should be captured at source.

Criticisms on B P R: The main criticisms on B P R are:

a. B P R is a downsizing tool adopted by managements.
b. B P R presumes that the factor that limits an organisations performance is its processes ineffectiveness which may not be true and offers no means of validating.
c. B P R intends to start on clean slate basis (i. e. afresh) ignoring all the historical achievements and successes.

THROUGHPUT ACCOUNTING:

Throughput Accounting (TA) is a method of performance measurement which relates production and other costs to throughput. Throughput accounting product costs relate to usage of key resources by various products. It assumes that a manager has a given set of resources available and these have been efficiently used to process purchased materials and components to generate sales revenue.

Financial definition: Throughput = Sales – Direct Material Cost.

Throughput accounting has certain similarities with the traditional approach of maximising contribution per unit of scarce resource. In throughput accounting return is defined as sales less material costs in contrast to contribution which is sales less all variable costs Here it is presumed that labour is not a variable cost and the only variable cost is direct material. Except direct materials, rest of the costs are treated as fixed in relation to throughput in short run.

Throughput is influenced by:
- Selling price
- Direct Materials purchase price
- Usage of direct materials
- Volume of throughput.

Constraints on Throughput are:

1. Existence of an uncompetitive selling price.
2. Need to deliver on time to particular customers.
3. Lack of product quality and reliability.
4. Lack of reliable materials suppliers.
5. Existence of shortage of production resources.

THEORY OF CONSTRAINTS (TOC):

Question:

Write short notes on Theory of Constraints (TOC) OR Explain the concept and aim of Theory of Constraints.

Answer:

The theory of constraint focuses its attention on constraints and bottlenecks within the organization which hinder speedy production. The main concept is to maximise the rate of manufacturing output i.e. the throughput of the organisation.

The steps involved in Theory of Constraints are:

1. Identify the systems Constraint.
2. Decide how to exploit the constraint.
3. Subordinate everything to constraint.
4. Elevate the system's constraint.
5. Repeat the process if the constraint is broken.

Aim of theory of constraints (TOC): The theory of constraints (TOC) describes methods to maximize operating income under bottleneck situation. The objective of TOC is to increase throughput contribution while decreasing investments and operating costs. TOC considers a short run time and assumes that operating costs are fixed costs. TOC focuses on the system level effects of continuous improvement. This requires examination of bottlenecks and constraints. **TOC approach advocates that bottleneck resources / activities are to be fully utilised to 100% capacity and rest of the resources should not be used to 100% capacity as such usage will result in accumulation of inventories.**

A L T E R N A T I V E A N S W E R

TOC focuses its attention on constraints and bottlenecks within the Firm that hinder speedy production. The main concept is to maximize the rate of manufacturing output i.e., the Throughput of the Firm.

This requires examination of the bottlenecks and constraints, which are defined as under:

a. **Bottleneck**: It is an activity within the firm where the demand for the resource is more than its capacity to supply.
b. **Constraint**: It is a situational factor, which makes the achievement of objectives / throughput more difficult than it would otherwise be, e.g., lack of skilled employees, lack of customers orders or the need to achieve a high level of quality in product output.

Relationship between Constraint and Bottleneck: A bottleneck is always a constraint but a constraint need not be a bottleneck. For example, let the major constraint be meeting the delivery schedule for customer's orders. The bottleneck in such a case may be certain machine in the factory.

Throughput is thus related directly to the ability to cope with the constraint and to manage the bottleneck. This focus on throughput forced management to examine both the constraints and the bottleneck in order to increase throughput.

Operation of TOC: The main aim of TOC is to increase throughput contribution. This can be done by techniques such as:
a. Linear programming for allocating the optimum use of bottleneck resources,
b. Use of shadow prices for decision-making, and
c. Variance analysis using Activity Based Costing Techniques.

Thus, Theory of Constraints attempts to do the following:
Objective: Maximise Throughput Contribution (i.e., Sales Revenue Less Direct Materials)
Constraints: Subject to:
i) Production Capacity (Supply Constraints) and
ii) Sales Demand (Demand Constraints)

Question:
What are the key measurements of theory of constraints?
Answer:
The 3 measurements of TOC are:

1. Throughput contribution	=	sale – direct materials cost of the goods sold.
2. Investments	=	Sum of materials costs in direct materials, work-in-process, and finished goods inventories; R & D costs; and costs of equipment and buildings.
3. Operating costs	=	costs of operations (other than direct materials) incurred to earn throughput

contribution. Like salaries and wages, rent utilities, and depreciation.

The important concept behind TOC is that the production rate of the entire factory is set at the pace of the bottleneck resource. Hence, in order to achieve the best result TOC emphasises the importance of removing bottlenecks or limiting factor.

Question:
Classify the following items under the three measures used in the theory of constraints:
(i) Research and Development Cost
(ii) Rent / Utilities
(iii) Raw materials used for production
(iv) Depreciation
(v) Labour Cost
(vi) Stock of raw materials
(vii) Sales
(viii) Cost of equipments and buildings.

Answer:
The 3 key measures under TOC are:

1. Contribution : (iii) Raw Material for production (vii) Sales
2. Investments : (i) R& D (vi) Raw Material Stock (viii) Building And Equipment Cost.
3. Operating Costs : (ii) Rent/utilities (iv) Depreciation (v) Labour

SHUT DOWN - DIVESTMENT:

Question:
What is divestment strategy? Highlight the main reasons for divestments.

Answer:
Divestment involves a strategy of selling off or shedding business operations to divert the resources, so released, for other purposes. Selling off a business segment or product division is one of the frequent forms of divestment strategy. It may also include selling off or giving up the control over subsidiary whereby the wholly owned subsidiaries may be floated as independently quoted companies.

Very often it becomes necessary for a firm to temporarily close down the factory due to trade recession with a view to reopening it in the future. In such cases, the decision should be based on the marginal cost analysis. If the products are making a contribution towards fixed expenses or in other words if selling price is above the marginal cost, it is preferable to continue

because the losses are minimized. By suspending the manufacture, certain fixed expenses can be avoided and certain extra fixed expenses may be incurred depending up on the nature of the industry, say, for example, extra cost incurred in protecting the machinery. So the decision is based on as to whether the contribution is more than the difference between the fixed expenses incurred in normal operation and the fixed expenses incurred when the plant is shut down.

Reasons for Divestment Strategy:

1. In case of a firm having an opportunity to get more profitable product or segment but have resource constraint, it may selling off its unprofitable or less profitable division and utilized the recourse so released. Cost Benefit analysis & Capital Budgeting Methods are the useful tools for analyzing this type of situation.
2. In case of purchase of new business, it may be found that some of the part of the acquired business is not upto the mark. In such type of situation disposal of the unwanted part of the business is more desirable than hold it.
3. In case where any business segment or product or subsidiary is pulling down the profit of the whole organization, it is better to cut down that operation of the product or business segment as a turnaround strategy.
4. If managing the organisation is becoming difficult, it is better to dispose off the undesirable activity of the organisation.