

DEVOLPMENT IN THE BUSINESS ENVIRONMENT

1. Life Cycle Costing:

1.1 Meaning:

[2002(M), 2003(N), 2004(N), 2007(M), 2010(10)] (4 marks)

Estimates and accumulates costs *over a product's entire life cycle* in order to determine whether the *profits earned* during the manufacturing phase will cover the costs incurred during the *pre- and post manufacturing stages*.

- Life cycle costing helps management to understand the cost consequences of developing and making a product and to identify areas in which cost reduction efforts are likely to most effective.
- Most accounting system report on a period-by-period basis and product profits are not monitored over their life cycles. In contrast, product life-cycle reporting involves tracing costs and revenues on a product-by-product basis over several calendar periods throughout their life cycle.

1.2 Phases of product life cycle:

Product life cycle consists of following four stages:

1. Introduction:

- During introductory phase, product is launched into the market.
- Its customers are innovators.
- Competitor is almost negligible and profits are none-existence.

2. Growth:

- Under growth phase, sales and profit rise, at a fast pace.
- Competitor enters in the market often in large numbers.
- As a result of competition, profit start declining near the end of the growth phase.

3. Maturity:

- During the phase of maturity sells continues to increase, but at a decreasing rate.
- When sells level off, profits are decline.
- The main reason is intense price competition; some firms extend their product line with new model.

4. Saturation and decline:

- Under this phase of product life cycle demand of the product disappear.
- Better and less costly substitute is available in the market.

1.3 Stages of a product life cycle: -

[2003(N)] (7 Marks)

1. **Market research:** Market research establishes what does product the customer want and how much he is prepared to pay for it and how many he will buy.
2. **Specifications:** It describes product design, product life, maximum permissible maintenance cost, maximum permissible manufacturing cost etc.
3. **Design:** Designers provide the drawings and process schedules which provide geometry of product and some of the manufacturing process.
4. **Prototype manufacture:** Under this stage small number of the product are produce to meets the requirements of the specification.
5. **Development:** Under this stage testing and changes are made in the product to meet the requirement of the specification.

6. **Tooling:** Tooling up for production mean building a production line costing several lakhs of rupees, building expensive jigs, buying special purpose machine tools. We may say that it is decision phase whether it is profitable or not and should it be produced?
7. **Manufacturing:** This stage involves purchase of raw materials, purchase of components, and use of labour and assemble the product.
8. **Selling:** In this stage products are sold.
9. **Distribution:** In this stage products are distributed to the sales outlets and to the customers.
10. **Product support:** Under this stage products are free replacement and free services are provided.

1.4 Importance of Life Cycle Costing: -

[2006(M)] (4 Marks)

1. Non-production (pre-production) costs are *significant* like research and development costs, design, marketing and customer services and these costs are essential for target price and value engineering.
2. It helps to decide whether R&D and design activities should be undertaken, where R&D and design cost constitute high % of total life cycle cost.
3. A complicated design may lead to huge expenditure on material and labour cost every time the product is produced. Life cycle budgeting highlights costs throughout the product life cycle and facilitates value engineering at the stage before costs are locked in. (locked in means committed)

1.5 The major characteristics of product life-cycle concept are as follows:

[2004(N) 5 marks]

1. The products have limited lives and pass through the cycle of development, introduction, growth, maturity, decline and deletion at varying speeds.
2. Profit per unit varies as products change through their life cycles.
3. Each phase of the product life-cycle poses different threats and opportunities that give rise to different strategic actions.
4. Finding new uses or new users or getting the present users to increase their consumption may extend the life of the product.
5. Products require different functional emphasis in each phase-such as an R&D emphasis in the development phase and a cost control emphasis in the decline phase.

1.6 Essential features of Life Cycle Costing: -

[2009(M)] (5 Marks)

1. Tracing of costs and revenue of product over several calendar period-throughout their entire life cycle.
2. Emphasis is on cost and revenue accumulation over the entire life cycle of the product.
3. Life cycle costing traces design and development costs.
4. It focuses on development costs, incurred to individual products over their entire life cycles.
5. Total magnitude of research and development costs are reported and compared with product revenues generated in later periods.

1.7 Benefits of the product life cycle:

[2002(N), 2004(N), 2010(M)] (4 marks)

- (i) It is an earlier action to generate revenue or to lower cost than otherwise might be considered.
- (ii) Better decision should be taken after the assessment of revenues and costs in the earlier stage of the product.
- (iii) It promotes long-term rewarding in difference to short-term profitability rewarding.

- (iv) It provides an overall framework for considering total incremental costs over the life span of a product.

2. Activity Based Costing:-

2.1 Meaning:

[2000(M), 2005(N)] (4 Marks)

- Activity Based Costing is an accounting methodology that assigns costs to activity rather than products or services.
- It enables resources & overhead costs to be more accurately assigned to products & services that consume them.

Or,

According to **CIMA** “ Cost attribution to cost units on the basis of benefits received from indirect activities i.e. ordering cost, setting up, assuring quality etc.”

ABC assign cost to activity based on their use of resources. It then assigns cost to objects, such as products or customers, based on their use of activities.

2.2 Difference between traditional costing and ABC system:

[2007(N)] (5 Marks)

1. Traditional system allocates overheads to production and service department and then reallocates service department costs to the production departments whereas an ABC system assign overheads to each major activity (rather than department).
2. ABC system many activity-based cost centers (alternatively known as activity cost pools) are established whereas with traditional systems overheads systems tend to be pooled by departments although they are normally described as cost centers.

2.3 Factor promoting the development of activity-based costing system includes: [2004(M)] (5 Marks)

- (i) Growing overhead costs because of increasingly automated production
- (ii) Increasing market competition which necessitated more accurate product costs.
- (iii) Increasing product diversity to secure economies of scope & increased market share.
- (iv) Decreasing costs of information processing because of continual improvements and increasing application of information technology.
- (v) Traditional costing fails to capture cause and affect relationship.
- (vi) Traditional costing often to highlight inter-relationship among activities in different department.

2.4 The following are the reasons for adoption of ABC by manufacturing and non-manufacturing Industries: - [2007(N)] (5 Marks)

- (i) ABC helps to estimate cost of individual product or service more accurately.
- (ii) Demand on resources by products / customers differ among product / customers. Therefore, product / customer profitability can be measured reasonably or accurately, only if consumption of resources can be traced to each individual product / customer.
- (iii) New production techniques have resulted in the increase of the proportion of support service costs in the total cost of delivering value to customers. ABC improves the accuracy of accounting for support service costs.

- (iv) The costs associated with bad decisions have increased substantially.
- (v) Reduction in the cost of data processing has reduced the cost of tracking resources consumption to large number of activities.

2.5 Following reason may create problem for adoption of ABC system in service organization-

- (a) It is quite difficult to establish appropriate cost drivers for facility sustaining cost.
 - (b) Cost objective are difficult to be specified when products are intangible.
 - (c) Introduction of ABC system become expensive when required information for setting up of ABC system is not available.
- [2005(M)] (4 Marks)**

2.6 ABC support corporate strategy in many ways such as:

[2005(N)] (4 marks)

- (a) Information generated by ABC system can also encourage management to redesign the products.
- (b) ABC system will report on the resource spending.
- (c) Performance based accurate feedback can be provided to cost centre managers.
- (d) ABC provides data which effectively support to operational level and strategic level.
- (e) Accurate product costing will help the management to compare the profits of various customers, product lines and to decide on price strategy.

2.7 Decision making:

[2000(N)] (4 Marks)

The areas in which Activity based information is used for decision making are as follows:

1. Transfer pricing
2. Make or buy decisions and outsourcing
3. Pricing decision
4. Plant closed down decision or shut down decision
5. Capital investment decision and Product line profitability.

2.8 Different level of activities that drive the expenses at the product level: [2002(N), 2006(N)]

Following are four different categories of activities that drive the expenses at the product level.

1. Unit level activities:

- Unit level activities are the activities whose costs are strongly help to the number of units produced.

For example, the use of indirect materials and indirect consumable tends to increase in proportion to the number of units produced.

2. Batch level activities:

- Batch level activities are the activities whose costs are driven by one number of batches of units produced.
- For example- material ordering cost and machine set up cost falls into this category they are incurred for the batch.

3. Product level activities:

- Product level activities are driven by the creation of a new product line and its maintenance.
- For example, advertising costs and product designing costs fall into this category because they are incurred for the individual product.

4. Facility level activities:

- Facility level activities costs are related to maintaining the building and other facilities required by a concern.
- For example plant security costs and maintenance cost fallen into this category.

3. Target costing:-

3.1 Meaning:

[2000(N), 2007(N)] (4 Marks)

- It is estimation of process which is *based on understanding* of
- *Customer's supposed value* for the product or service and how competitor will *price competing* products or services.
- Target costing is a customer-oriented technique that is widely used by Japanese companies and which has recently been adopted by companies in *Europe and the USA*.

A major feature of target costing is that a team approach is adopted to achieve the target cost.

- The team members include designers, engineering, purchasing, manufacturing, marketing and management accounting personnel.
- Their aim is to achieve the target cost specified for the product at the prescribed level of functionality and quality.

3.2 Advantages of Target costing:

The major advantage of adopting targeting costing is that

1. It is determined during a product's design and planning stage so that it can have a maximum impact in determining the design and planning the level of the committed costs.
2. It is repetitive process with the design team, which ideally should result in the designs that give an expected cost is equal or less than target cost.
3. If the target cost cannot be achieved then the product should not be launched.

3.3 Stages of Target costing:-

[2000(Nov), 2004(M), 2006(N)] (4 Marks)

1. Stage 1: determine the target price which customers will be prepared to pay for the product.
2. Stage 2:- Deduct a target profit margin from the target price to determine the target cost.
3. Stage 3:- Estimation of actual cost of the product.
4. Stage 4:- If estimated actual cost exceeds the target cost investigate ways of driving down the actual cost to the target cost

3.4 Problem with Target Costing:-

1. During development phase the team may require a number of design repetitions before it can plan a sufficient low-cost product to meet target cost and target profit margin. But project manager is unwilling to "*pull and plug*" on a design project that cannot meet its costing goals within a reasonable time frame.
2. Large amount of cost cutting may increase dissatisfaction among the various part of company, especially for employee.
3. Design team can sometime make it more difficult to reach a consensus on the proper design because there are too many opinion regarding design issues.

3.5 Impact of Target costing on profitability:-

Target costing improves profitability in two ways:-

1. It places such a detailed continuing emphasis on product costs throughout the life cycle of every product.
2. It improves profitability through precise targeting of the correct prices at which the company feels it can field a profitability product in the marketing that will sell in a robust (healthy) manner.

3.6 Target costing may assist control of costs and pricing of product as under:

- (a) Target costing considers the price that ought to be charged by a company to achieve a given market share.
- (b) Target costing should take life cycle costs in to consideration.
- (c) If there is a gap between the target cost and expected cost, ways and means of reducing the cost.
- (d) The target cost may be used for controlling costs by comparison.

3.7 Benefits of target profit:

[2010(M)] (3 Marks)

- (a) It helps to create company's competitive position in market oriented management approach.
- (b) Management control system focuses on cost reduction with value addition.
- (c) It helps to retain or increase market share by aligning the product with customer needs.
- (d) It promotes team spirit.

4. Value Engineering/value Analysis:-

4.1 Meaning

[1999(M), 2009(N)] (4 Marks)

- It is systematic interdisciplinary examination of factors affecting the cost of a product or service in order to devise means of achieving the specified purpose at the required standard of quality and reliability at the target cost.
- The aim of value engineering is to achieve the assigned target cost by
- Identifying improved product designs that reduce the product's cost without sacrificing functionality (value added cost) and
- Elimination of unnecessary functions that increase the product's costs and for which customer are not prepared to pay extra for (i.e. non value added cost).

4.2 Difference between value added and non value added activities costs: [2006(M)]

Value added	Non value added
Value added activities are those activities which add value to the product or service.	Non value added activities are those activities which do not add value to the product or service.
These activities are necessary for the performance of the process.	These activities are not fully necessary for the performance of the process.
It represents work that is valued by the external and internal customer.	It represents work that is not valued by the external or internal customer.
They improve the quality or function of a product.	They do not improve the quality or function of a product.
Customers are usually willing to pay for the service hence value added activities result in cost not in loss.	They create waste result in delay of some sort, add cost to the product or service for which the customer is not willing to pay.

4.3 Value analysis and cost reduction: [2009(N)] (5 Marks)

Value analysis can result in cost reduction in the following manner:

- (i) (By identifying and removing unnecessary components in a product which had utility earlier.
- (ii) By introducing component substitution at a lesser cost without affecting the quality of the product.
- (iii) By simplifying the product design.
- (iv) By introducing alternative methods with less cost but improved efficiency.

5. Total Quantity Management:-

5.1 Meaning:-

- A situation where all business functions are involved in a process of continuous quality improvement has been adopted by the company.
- The emphasis of TQM is to design and build quality in, rather than trying to inspect it in, by focusing on the causes rather than the symptoms of poor quality of the product.

5.2 Quality cost: cost of performing the activities to check failure in meeting the quality specification.

These specifications are as follows:

1. Prevention costs:

- These costs are incurred in preventing the production of products that do not conform to specification.
- They include the costs of preventive maintenance, quality planning, quality engineering, quality audits, design review and training and the extra costs of acquiring higher quality raw materials.

2. Appraisal cost:

- These cost are incurred to ensure that materials and products meet quality conformation standards
- They include the costs of inspection product acceptance, packaging inspection, field testing, continuing supplier verification.

3. Internal failure costs:

- These costs are associated with materials and products that fail to meet quality standards.
- They incurred before the product is dispatched to the customers.
- They include scrap, rework, re-inspection, re-testing, and repairs etc.

4. External failure costs:

- These costs are incurred when products or services fail to meet the requirements or satisfy customer needs after they have been delivered.
- They include costs of handling customer complaint, warranty replacement, repairs of returned products and discount due to defects.

5.3 Six C's of successful implementation of TQM/ essential requirement for successful implementation of TQM: [2005(M), 2007(M)] (5 Marks)

1. Commitment:

- Quality improvement must be everyone's job (i.e. group job).
- Clear commitment from the top management, steps necessary to provide an environment for changing attitudes and breaking down barriers to quality improvement must be provided.
- Support and training for it must be extended.

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

3. Continuous Improvement: Recognition of room for improvement continuously as a process, and not merely a one-off programme.

4. **Cooperation:** Must be ensured by involving employees by resorting to mutually agreeable improvement strategies and associated performance measures
5. **Customer Focus:** Perfect service with zero defectives with satisfaction to end user whether external customer or internal customer.
6. **Control:** Documentation, procedures and awareness of current practices ensure checking deviation from the intended course of implementation.

5.4 Benefits of implementing TQM:

- (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

5.5 Critical success factors of TQM:

[2009(N), 2004(M)] (5 Marks)

1. Focus on customer needs.
2. Everyone in the organisation should be involved.
3. Focus on continuous improvement.
4. Design quality in product and production process.
5. Effective performance measurement system.
6. Rewards and performance measurements should be renewed.
7. Appropriate training and education to everyone to understand the aim of TQM.

5.6 Four P's of quality improvement principles:

[2009(N)] (4 Marks)

1. **People:** It will quickly become apparent that some individuals are not ideally suited to the participatory process. Lack of enthusiasm will be apparent from a generally negative approach and a tendency to have prearranged meeting which coincide with the meetings of TOM teams.
2. **Process:** The rhetoric and inflexibility of a strict Deming approach will often have a demotivating effect on group activity.
3. **Problem:** Experience suggests that the least successful groups are those approaching problems that are deemed to be too large provide meaningful solutions within a finite time period.
4. **Preparation:** Training in the workings of Deming- like processes is an inadequate preparation for the efficient implementation of a quality improvement process.

6. Just in time system:-

6.1 Meaning

[2008(N)]

- It is mechanism for reducing non-value added cost and long-run costs.
- It involves a continuous commitment to the pursuit of excellence in all phases of manufacturing system design and operation.
- The aims of JIT are to produce the required items, at the required quality and in the required quantities, at the precise time they are required.

6.2 Goals of JIT:

- | | |
|--|-----------------------|
| - Elimination of non-value added activities; | - Zero defects |
| - Zero inventory; | - Batch sizes of one; |
| - A 100% on time delivery service. | - Zero breakdowns; |

6.3 Necessary condition for successful implementation of JIT: [2008(N)] (5 Marks)

Following are necessary condition for successful implementation of JIT:

1. The need of smooth and uniform production rates and the need to avoid fluctuation in production rates since this will lead to excess work in progress.
2. A description of the pull system.
3. Focus on eliminating non-value added activities.
4. Focus on routine and preventative maintenance to avoid machine downtime.
5. Focus on reducing set-up time to a minimal.
6. Establishment of JIT purchasing arrangement accompanied by establishing close relationship with suppliers.

6.4 elimination of wastage of resources: [2003(N)] (4 Marks)

JIT helps in reducing the wastage of time in the following way:

- (i) All inspection time is eliminated from the system as operators conduct their own quality checks.
- (ii) All movements which involve shifting inventory and WIP throughout various parts of the plant are eliminated by clustering machines together in logical groups.
- (iii) Storage time is eliminated by clearing out excessive stocks of inventory and having suppliers deliver parts only as and when needed.
- (iv) Cost drivers are charged to wasteful activities that accumulate costs. By shrinking the amount of wastage of time out of the manufacturing process, a company effectively eliminates activities that do not contribute to the value of production.

6.5. Effects on profitability of the organization: [2007(M)] (4 Marks)

JIT approach helps in improving organization profitability:

- (i) **By eliminating non-value added activity:**
 - It do not improve the quality or function of a product or service
 - But increase the cost of the product or services.
- (i) **Zero Defects:**
 - JIT firms decrease defect rates subsequently reducing their inventory and enhancing the attributes of its products.
 - Zero defect policy eliminates all internal and external failure costs.
- (ii) **Cellular manufacturing system:**
 - The operators are trained to operate all the machines on the line and undertaking preventive maintenance.
- (iii) **Adopting pull manufacturing system:**
 - Pull manufacturing system reduces idle time thereby reducing cost of production.
- (iv) **JIT purchasing:**
 - It reduces investment in raw materials and WIP stocks.
 - It also reduces cost through saving in factory space and availing benefit of negotiating with fewer suppliers and reducing of paper work.

7. Material Requirement Planning:-

7.1 Meaning:

[2002(M), 2006(N)] (4 Marks)

- Enterprise resource planning (ERP) software
- It attempts to integrate all departments and functions across a company into a single computer system that can serve all those different departments' particular needs.
- It combines all computerized departments together with the help of a single integrated software
- It helps to various departments to share information and communicate with each other.

7.2 Objectives of MRP:

[2004(M)] (4 Marks)

- (i) To determine the quality of finished goods demanded.
- (ii) To ascertain quality of raw materials and components required for production.
- (iii) To ascertain components and raw-materials bought in relation to the order received.
- (iv) To ascertain inventories, WIP, batch sizes and manufacturing and packing lead time.

7.3 Benefits of ERP:

[2004(M), 2006(N),2010(N)] (4 Marks)

Following are the benefits of ERP:

- (i) Product costing.
- (ii) Inventory management.
- (iii) Competitive edge by improving business process.
- (iv) Quick response to change in market condition.
- (v) Sales service.
- (vi) Automatic control of quality.
- (vii) Distribution and delivery of products.
- (viii) E-commerce

7.4 Features of ERP:

[2003(M), 2004(N)] (3 Marks)

Following are major features of ERP:

- (i) It is covering all functional areas like manufacturing, selling and distribution, payables, receivables, inventory etc of a company.
- (ii) It performs core activities and increases customer services thereby augmenting the corporate image.
- (iii) ERP bridges the information gap across organization.
- (iv) ERP provides complete integration of systems.
- (v) It is a solution for better project management.
- (vi) It allows automatic introduction of latest technologies like electronic fund transfer (EFT), Electronic Data Interchange (EDI), Internet, Intranet, Video Conferencing, E-commerce etc.
- (vii) It eliminates most business problems like material shortage, productivity enhancements, customer service, cash management etc.
- (viii) It provides business intelligence tools.

7.5 Data required to operate MRP system:

[2010(N)] (4 Marks)

Following data are required to operate MRP system:

- (i) **The master production schedule:** it specifies the quantity of each finished units of products to be produced and the time at which each unit will be required.
- (ii) **The Bill of materials file:** it specifies the sub-assemblies, components and materials required for each of the finished goods.
- (iii) **The inventory file:** it maintains details of items in hand for each sub-assembly, components and materials required for each of the finished goods.
- (iv) **The routing file:** it specifies the sequence of required to manufacture sub-assemblies, components and finished goods.

8. Divestment strategy:-

8.1 Meaning

[2009(M)] (4 Marks)

- Divestment involves a strategy of selling off 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 where wholly owned subsidiary company's securities are quoted.
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8.2 Reason for Divestment Strategy

[2009(M)] (4 Marks)

1. To earn more profit by selling out unprofitable or less profitable product or segment and utilized the resources realized from unprofitable or less profitable product or segment in more profitable product or segment. Cost benefit analysis and Capital Budgeting Method are useful tools for it.
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 a case such part is disposed off.
3. In case where any business segment or product or subsidiary is pull down the profit of the whole organization, it is better to cut down of that operation of the product or business segment.

9. Synchronous Manufacturing:-

9.1 Meaning:

[2010(M)] (5 Marks)

- It is an all encompassing manufacturing management philosophy
- It includes a set of principles, procedures, and techniques where every action is evaluated in terms of common goals of the organization.

9.2 Principles of synchronous Manufacturing:

[2010(M)] (5 Marks)

- Focus on synchronizing the production flow than on idle capacities.
- Value of time at a bottleneck resource is equal to the throughput rate of products processed by the bottle neck.
- Value of time at a non bottleneck resource is negligible.
- Level of utilization of a non bottleneck resource controlled by other constraints within the system.
- Resources must be utilized, not simply activated.
- Transfer batch should not be equal to the process batch.
- A process batch should be variable both along its route and overtime.

10. Others

10.1 Theory of constraints:

[2008(M)] (7 Marks)

The theory of constraints focuses on revenue and cost management when faced with bottlenecks. It advocates the use of three key measures. These are

(a) Throughput contribution:

- It is rate at which the system generates profits through sales.
- It is defined as sales revenues less completely variable cost. i.e. sales less material costs only because labour costs tend to be partially fixed and are excluded normally.

(b) Investment (Inventory):

- This is equal to the sum of material costs of direct materials inventory, work-in-process and finished goods inventory, research and development costs and the costs of equipment and building.

(c) Other operating costs:

- The other operating costs equal to all operating costs (other than direct materials) incurred to earn throughput contribution.
- Other operating costs includes salaries and wages, rent utilities and depreciation.

10.2 Backflushing

[2009(M), 2010(M)] (4 Marks)

- Backflushing requires no data entry of any kind until a finished product is completed. At that time the total amount finished is entered into the computer system, which multiplies it by all the components listed in the bill of materials for each item produced.
- For determination of closing inventories, components that should have been used in the production process subtracted from opening inventories.
- Back the entire production process. Given the large transaction volumes associated with JIT, this is an ideal solution to the problem.

The following problems must be corrected before it will work properly:

- Production reporting
- Scrap reporting
- Lot tracing

- (iv) Inventory accuracy.

10.3. Advantages of backflushing:

[Imp.]

- (a) It is much simpler, as there is no separate accounting for WIP.
- (b) Even the finished goods account is unnecessary.
- (c) The number of accounting should be greatly reduced.
- (d) The system should discourage managers from producing simply for inventory since working material does not add value until the final product is completed.

10.4 Throughput accounting:

- It is an approach to accounting which is largely in sympathy with the JIT philosophy.
- It is the accounting system developed in the UK, based on theory of constraints and JIT.
- In essence, TA assumes that a manager has a given set of resources available. Using those resources to generate sales revenue.
- Throughput contribution = sales revenue – direct material cost

10.5 Other factors that might throughput other than a lack of production (bottlenecks)

- (a) The existence of a non-competitive selling price.
- (b) The need to deliver on time to particular customers, which may disrupt normal production flow.
- (c) The lack of product quality and reliability, which may cause large amounts of rework or an unnecessary increase in production volume.
- (d) Unreliable material suppliers, which will lead to poor quality products that require rework.