STRATEGIC COST MANAGEMENT

UNIT-I

Section-A

1. Discuss the term job costing and process costing systems with examples

   - **Job costing systems:**

   The cost object is a unit or multiple units of a distinct product or service called a job. Each job generally uses different amounts of resources.

   - **Process costing systems:**

   The cost object is masses of identical or similar units of product or service.

   *Ex: assembly of individual aircrafts at Boeing

   Construction of ships at Mazgoan Dock

   *Ex: oil refining by Indian Oil

   Beverage production by PepsiCo

2. Distinguish job costing from process costing?

   - Job costing systems assign costs to distinct units of a product or service.

   - Process costing systems assign costs to masses of identical or similar units and compute unit costs on an average basis.

   - These two costing systems represent opposite ends of a continuum.

   - The costing system of many companies combines many elements of both job costing and process costing.
3. Explain the methods of cost volume profit analysis?

- Identify the problem and uncertainties

Every decision deals with selecting the cost of action, the chosen action is uncertain and it only are known in future.

- Obtain information

Information is used to understand the uncertainties better.

- Make predictions about the future

- Make decisions by choosing among alternatives

- Implement the decision, evaluate performance, and learn

4. Describe the two potential problems that should be avoided in relevant-cost analysis?

**Break-even point**

BEP is that quantity of output sold at which total revenues equal total costs. The methods of BEP are,

- **Equation method**

  Operating income = (selling price*Quantity of units sold) - (variable cost per unit*Quantity of units sold) - fixed costs

- **Contribution margin method**

  (Contribution margin per unit*Quantity of units sold) - fixed costs

**Target operating income**

Operating income that a company aims to earn per unit of a product or service sold.
5. **Explain the role of Regression Analysis in cost estimation.**

- Regression Analysis is a statistical method that measures the average amount of change in the dependent variable associated with a unit change in one or more independent variables.

- The least squares technique determines the regression line by minimizing the sum of the squared vertical differences from the data points.

- The vertical difference called residual term, measures the distance between actual cost and estimated cost for each observation.

6. **What are the different methods that can be used to estimate a cost function?**

The four methods of cost estimation are,

- **Industrial engineering method**
  
  It is also called work measurement method.
  
  It estimates cost function by analyzing the relationship between inputs and outputs in physical terms.

- **Conference method**
  
  It estimates cost functions on the basis of analysis and opinions about costs and their drivers gathered from various departments of a company.

- **Account analysis method**
  
  It estimates cost functions by classifying various cost accounts as variable, fixed, or mixed with respect to the identified level of activity.

- **Quantitative analysis method**
  
  It uses a formal mathematical method to fit cost functions to past data observations.
7. Discuss the merits and limitations of linear programming

**Merits of linear programming**

- It can be used to analyze all different areas of life, it is a good solution for complex problems, it allows for better solution, it unifies disparate areas and it is flexible.
- It is so useful, because it can be used in so many different areas of life, from economic puzzles and social problems to industrial issues and military matters.
- It can take into account multiple factors; linear programming can be used to solve complex problems.
- Linear programming allows for a better quality solution because it considers many factors and limitations instead of just guessing at a solution.
- It is also advantageous because it unifies many different areas and takes them into account.
- As long as something can be quantified in a linear manner, it can be brought into account. Because of this openness in what factors can be included, linear programming is very flexible.

**Limitations of linear programming**

- Linear programming include that not all variables are linear, unrealistic expectations are made during the process and there are often limitations imposed on the final solution.
- These include the fact that usually all of the variables that need to be taken into account in order to solve a problem cannot be quantified in a linear manner.
- The assumptions made in linear programming are also unrealistic, because a linear relationship assumes that factors never really change, when in reality they do.
- Finally, limiting the range of the problem also limits the possible solutions that are given in the problem.
Section-B

1. What are learning curve and its applications?

Learning curve

- Learning curve is a function that measures how labor-hours per unit decline as units of production increase because workers are learning and becoming better at their jobs.

- Managers use learning curves to predict how labor-hours, or labor costs, will increase as more units are produced.

- An experience is a function that measures that decline in cost per unit in various business functions of the value chain –marketing, distribution and so on-as the amount of these activities increases.

The two learning curve models are,

1. Cumulative Average Time Learning model
2. Incremental Unit Time Learning model

Cumulative average time learning model

In the Cumulative average time learning model, cumulative average time per unit declines by a constant percentage each time the cumulative quantity of units produced doubles.

Ex: consider Rayburn Company, a radar systems manufacturer. Rayburn has an 80% learning curve. The 80% means that when the quantity of units produced is doubled from X to 2X, cumulative average time per unit for 2X units is 80% of cumulative average time per unit for X units. Average time per unit has dropped by 20 % (100%-80%).
**Incremental Unit Time learning model**

In the Incremental Unit Time Learning model, incremental time needed to produce the last unit declines by a constant percentage each time the cumulative quantity of units produced doubles.

**Ex:** consider Rayburn Company, a radar systems manufacturer. Rayburn has an 80% learning curve. The 80% here means that when the quantity of units produced is doubled from \(X\) to \(2X\), the time needed to produce the last unit when \(2X\) total units are produced is 80% of time needed to produce the last unit when \(X\) total units are produced.

**2. Explain linear programming and its applications**

**Linear programming**

Linear programming is a method or technique of determining an optimum program of interdependent activities in view of available resources (Or) it is a technique of allocating limited resources in an optimum manner so as to satisfy laws of supply and demand for firm’s product.

**Applications of linear programming**

- Devising of a production schedule that could satisfy future demands (seasonal or otherwise) for the firm’s product and at the same time minimize production costs.

- Choice of investment from a variety of shares and debentures so as to maximize return on investment.

- Allocation of a limited publicity budget on various heads in order to maximize its effectiveness.

- Selection of the product mix to make the best use of machines, man-hours with a view to maximize profits.

- Selecting the advertising mix that will maximize the benefit subject to the total advertising budget.
• Determine the advertising mix that will maximize the benefit subject to the total advertising budget.

3. Discuss regression analysis and its types?

Regression Analysis

• Regression Analysis is a statistical method that measures the average amount of change in the dependent variable associated with a unit change in one or more independent variables.

• The least squares technique determines the regression line by minimizing the sum of the squared vertical differences from the data points.

• The vertical difference called residual term, measures the distance between actual cost and estimated cost for each observation.

• The smaller the residual terms, the better the fit between actual costs observations and estimated costs. Goodness of fit indicates the strength of the relationship between cost driver and costs.

• Accurate costs estimation helps managers predict future costs and evaluate the success of cost reduction initiatives.

Types of regression analysis

1. Simple regression

Simple regression analysis estimates the relationship between the dependent variable and one independent variable.

2. Multiple regression

Multiple regression analysis estimate the relationship between the dependent variable and two or more independent variable.
4. Explain the methods, potential problems and assumptions of cost volume profit analysis?

Methods of CVP Analysis

- Identify the problem and uncertainties

Every decision deals with selecting the cost of action, the chosen action is uncertain and it only are known in future.

- Obtain information

Information is used to understand the uncertainties better.

- Make predictions about the future

- Make decisions by choosing among alternatives

- Implement the decision, evaluate performance, and learn

Two potential problems that should be avoided in relevant-cost analysis

1. Break-even point

BEP is that quantity of output sold at which total revenues equal total costs. The methods of BEP are,

- **Equation method**

  Operating income= (selling price*Quantity of units sold)-(variable cost per unit*Quantity of units sold)-fixed costs

- **Contribution margin method**

  (Contribution margin per unit*Quantity of units sold)-fixed costs

2. Target operating income

Operating income that a company aims to earn per unit of a product or service sold
Assumptions of CVP

- Changes in the level of revenues and costs arise only because of changes in the number of product units sold. The number of product units sold is the only revenue driver and the only cost driver.

- Total costs can be separated into two components—a fixed component that does not vary with units sold and a variable component that changes with respect to units sold.

- When represented graphically, the behaviors of total revenues and costs are linear in relation to units sold within a relevant range.

- Selling price, variable cost per unit and total fixed costs are known as constant

5. Discuss the similarities between job costing from process costing?

Companies can choose to use the accounting job order costing method when they have a single product line or numerous products to manufacture. However, it is less costly and less time-consuming if they elect to use process costing when calculating the manufacturing of a single product line.

There are similarities with both methods as well as differences, which include costing flow, manufacturing overhead and length of cost time analysis involved.

Costing Flow

- Job order costing and process costing accounting methods are similar in that they both observe three cost categories: direct material, direct labor and direct manufacturing overhead.

- Costs are accumulated in each of these categories as every individual customer order (job order costing) or manufacturing run (process costing) is put into motion.
The primary difference between these two costing methods in regards to costing flow (costs accumulated through the production or service process) is that job order costing is much more time-intensive than process costing.

**Manufacturing Overhead**

- Orders that are unique in nature (products or services tailored to a specific customer, meeting their specifications---such as yacht making), incur manufacturing overhead costs that can vary considerably for each order. These are job order manufacturing overhead concerns.

- But process costing does not have this concern, a key difference between the two, as process costing incurs the exact same manufacturing overhead with every production run made through its assembly-line process.

- However, there is a similarity between the two costing methods in regards to manufacturing overhead costs. Both job order and process cost methods require the reporting and analysis of all cost incurred for every manufacturing overhead expense. Both methods must take into account the total cost it takes to manufacture the item ordered by the customer, as a whole, regardless of quantity or specialized components used.

**Cost Time Analysis**

- Analyzing costs accumulated from completing a job enables the accounting department to determine if the order was profitable.

- This requires analysis time as each department (raw materials/inventory, manufacturing departments and accounting) must record all costs associated with completing their portion of the order.

- The similarity between job order and process costing methods when analyzing all this data is that each method requires analysis for each of the three parts:
inventory/raw materials cost, manufacturing costs and total units produced divided by total cost.

- Orders for products that are mass produced---single product lines, no specification exists to slow down continuous flows of a product (concrete)---require less complicated analysis.

- Costing time analysis in those cases (process costing) differentiates considerably from analysis time in job order costing, where one yacht produced could involve many different manufacturing processes.

6. Discuss the features of process costing?

Process costing can be defined as costing method which ascertains the cost of a product at the stage of manufacturing. In simple words under process costing the product of one process becomes the input of next process. Here is the list of the features of process costing –

- Production under process costing is done through continuous flow of products which are identical or homogeneous.

- Costs are computed periodically and also average cost can be easily computed under this method of costing.

- Under this cost data is available process as well as departments thus enabling a better control over costs by the management.

- In process costing sometimes by-products may emerge which have to be further processed in order to make them marketable and hence accordingly accounting adjustment needs to be made for such by- products.

- There is always some work in progress under proves costing both at the beginning and at the end of the accounting period because it is a continuous process.
7. What are the advantages and disadvantages of job order costing system

**Advantages of Job Order Costing**

- Job order costing offers a detailed analysis of the costs of materials, labor cost and overheads by functions and nature.
- Job order costing makes it possible to appraise the profitability of a job.
- Job order costing facilitates the estimation of the cost of a similar job.
- Job order costing allocates overheads on the basis of a predetermined rate.
- Job order costing makes it easy to identify spoilage and defects to take corrective actions.
- Job order costing evaluates efficiency of different types of jobs with cost records by using statistical techniques.

**Disadvantages of Job Order Costing**

- Job order costing needs a great deal of clerical work in recording material issue, wage computation and payment and overhead charges.
- Ascertainment of overhead rate needs allocation and apportionment of the overheads from service department to production department by using reasonable parameters like selecting a suitable basis.
- Strict control of costs associated with a job is difficult since overheads are allocated on estimation.
UNIT-II

Section-A

1. What is life cycle budgeting and explain its features?

Life cycle budgeting

- In life cycle budgeting, managers estimate the revenues and business function costs of the value chain attributable to each product from its initial R&D to its final customer service and support.

- Budget life cycle costs can provide useful information for strategically evaluating pricing decisions.

The features of life cycle budgeting are,

- The development period for R&D and design is long and costly.

- Many costs are locked in R&D and design stages—even if R&D and design costs themselves are small.

2. What do you mean by target costing?

- Market based pricing starts with a target price. A target price is the estimated price for a product or service that potential customers will pay.

- This estimate is based on an understanding of customer’s perceived value for a product or service and how competitors will price competing products or services.

- Having this understanding of customers and competitors has become important for three reasons:

- Competition from low cost producers has meant that prices cannot be increased.

- Products are on the market for shorter period of time, leaving less time and opportunity to recover from pricing mistakes, loss of market share, and loss of profitability.
Customers have become more knowledgeable and demand quality products at reasonable prices.

3. **Explain the cost driver concept?**

- A cost driver is a variable, such as the level of activity or volume, which casually affects the costs over a given span of time. That is there is a cause and effect relationship between a change in the level of activity or volume and a change in the level of total costs.

- The cost driver of a variable cost is the level of activity or volume whose change causes proportionate changes in the variable cost.

- Costs that are fixed in the short run have no cost driver in the short run but may have a cost driver in the long run.

- In the long run, volume of production is a cost driver of testing costs.

- Costing system that identifies the cost of each activity such as testing, design, or setup is called activity-based costing systems.

4. **Write a note on**
   
   a) **Value chain**

   b) **strategic positioning**

**Value chain**

- Value chain is the sequence of business functions in which customer usefulness is added to products or services.

- Research and development --- design of product or processes -- Production -- Marketing -- Distribution -- customer service.

- Managers track the costs incurred in each value chain category. Their goal is to reduce costs in each category and to improve efficiency.
Strategic positioning

- The overall intended objectives and approach to a situation.
- Most business managers will carefully develop a well thought out strategic position and take considerable steps to communicate it to staff clearly so that all parts of the business can be operating toward the firm's stated goals.

5. When the life cycle costing and the life cycle budgeting is used in an organization?

The life cycle costing and life cycle budgeting techniques are particularly important when,

- A high percentage of total life cycle costs are incurred before production begins and revenues are earned over several years.
- A high fraction of the life cycle costs are locked in at the R&D and design stages.

6. How do you implement target costing in an organization?

The steps involved in implementing target costing are,

1. Develop a product that satisfies the needs of potential customers

2. Choose a target price

3. Derive a target cost per unit by subtracting target operating income per unit from the target price

   \[
   \text{Target cost per unit} = \text{target price} - \text{target operating income per unit}
   \]

   Target cost per unit is the estimated long run cost per unit of a product or service that enables the company to achieve its target operating income per unit of the product.

   Target operating income per unit is the operating income that a company aims to earn per unit of a product or service sold.
Section-B

1. Discuss the concept of cost driver and its categories?

Cost driver

- Cost drivers are used for cost allocation. It represent the force that drives the costs to be incurred.
- Direct labor hours is considered as cost driver.
- Some companies use direct labor hours as the labor intensive production cost centers and machine hours in their equipment intensive ones.
- The alternative cost drivers that are used to allocate costs either to cost centers or products can be grouped into the following principal categories.

Cost driver categories

- Payroll related
- Headcount related
- Material related
- Space related
- Transaction related
- Product related
- Customer related
- Business related
2. Describe the methodology of life cycle costing

The following fundamental concepts are common to all application of life cycle costing concept,

- Cost breakdown structure
- Cost estimation
- Discounting cost which occur in different time period
- Estimation of inflation
- Risk assessment
- Sensitivity
- Optimum bias

Cost estimation structure

The basic characteristics are

- Include all cost elements
- Define each element
- Identify the element with a significant level of activity
- Should be designed to allow close control and monitoring different levels of data within various categories
- Should have well defined boundaries to avoid omission and duplication
- For costs of subcontracts separate cost categories should be designed

Cost estimation

Known factors: Procurement cost, unit production cost, cost of service provided etc
Cost estimating relationships: derived from historical data, care should be taken with this data in rapidly changing industries.

**Expert opinion:** When real data is unobtainable this is used

**Discounting**

It is a technique used to compare costs and benefits that occur in different time periods

**Inflation**

It is a normal practice to exclude inflation effects when undertaking LCC analysis

**Risk assessment**

Cost estimate are made up of the base estimate and risk allowance. The cost involved with the risk

**Sensitivity**

The sensitivity of cost estimates to factors such as changes in volumes, usage etc need to be considered

**Optimum bias**

Being over optimistic about the parameters of the key project such as work duration.

3. **How to calculate profit variance analysis?**

Variances based on profits are,

**Total sales margin variance**

\[
\text{Total sales margin variance} = \text{Total actual Margin} - \text{total budgeted margin}
\]

**Sales margin price variance**

\[
\text{Sales margin price variance} = \text{Actual quantity sold (actual sales price per unit)} - \text{standard sales per unit}
\]
Actual profit-standard profit
=actual margin (standard rate of margin per unit*actual units sold)

Sales Margin Volume Variance
=Revised standard profit-standard profit

Sales margin quantity or sub volume variance
=Budgeted profit-Revised standard profit

4. What is target costing? Explain its advantages and disadvantages.

Target costing of a product or job is sum total of the variable cost targets fixed for each element of cost (material, labor, power, consumables etc.) required to be incurred for producing that product or job estimated on zero-base principles, plus the fixed cost targeted on the same principles, so that the total cost plus the estimated margin of profit is not more than the price the product is capable of fetching in the market.

Zero base principle is the variable cost incurred for producing zero units of the product and from that position what is the incremental variable cost for each unit plus the fixed targeted cost (Rent, Rates and taxes, advertisement, communication etc.) required setting up the facility to produce an estimated number of units.

**Advantages**
1. We have a cost goal to achieve within the selling price, on realization of which there can be no loss
2. The costs are worked to be contained within the market price which makes the product competitive.
3. The financial feasibility workings are more credible.

**Disadvantages**
1. In the anxiety to contain costs within target, essential costs may be omitted or compromised leading to loss.
2. The working accuracy of the target cost is very difficult.
3. The cost incurred may be different leading to under or over costing, unless there is a mechanism to collect actual costs and compare them with targets.
5. Explain competitive advantage and its sources

Competitive advantage occurs when an organization acquires or develops an attribute or combination of attributes that allows it to outperform its competitors.

Competitive advantage comes from many places beyond simply the product and service and below I have outlined 14 possibilities for advantage. They are supported by considerable data, research and experience; the data sources are included in a bibliography below for your reference. Sources of competitive advantage lie all along the value chain based on Michael Porter’s seminal work, Competitive Advantage and famously depicted below.

![Value Chain Diagram]

**Sources of Competitive Advantage**
- Externally-focused Strategies
  - Localization in Global Markets
  - Strategic Alliance or Acquisition
  - Competitive Actions
  - Customer Clusters
- Internal Leadership Role
  - Company-Wide Market Orientation
  - Strategic Fit between Marketing and Manufacturing
  - Implementation of Strategy
• Human Resources: Sources of Competitive Advantage
  Human Capital
• Technology Development: Sources of Competitive Advantage
  Technological Change
  Business Analytics
• Logistics and Operations: Sources of Competitive Advantage
  Production System
  Business Processes
• Government Programs: Sources of Competitive Advantage
  National Export Promotion
UNIT-III

Section-A

1. Define the term Activity based costing?

   - Activity-based costing approaches costs from the perspective that products do not cause costs; they require activities, and the activities themselves are the causes of all costs incurred.

   - This method is better suited to the increasingly complex flow of today's manufacturing processes.

   - Shifting the focus from products to activities highlights the existence of non-value-add, or NVA, activity.

   - If activity is occurring that does not contribute efficiently to the production of the finished good or service, it can be targeted for reduction or elimination, thereby reducing costs.

2. What are the Advantages and disadvantages of ABC method of Inventory Control?

   **Advantages**
   - It ensures control over the costly items in which a large amount of capital is invested.

   - It helps in developing scientific method of controlling inventories. Clerical costs are considerably reduced and stock is maintained at optimum level.

   - It helps in maintaining stock turnover rate at comparatively higher level through scientific control of inventories.

   - It ensures considerable reduction in the storage expenses. It results in stock carrying stock.
It helps in maintaining enough safety stock for C category of items. The following graph demonstrates ABC inventory classification.

Disadvantages
This analysis suffers from the following drawbacks:

- This technique can be successfully employed only, if there is proper standardization of materials in the store.

- A good system of codification of materials should be in operation for the success of this analysis.

- The analysis is based on monetary value of the items in use. Other important factors one ignored.

- In spite of the above mentioned limitations, the ABC analysis is very popular method of inventory control. It is an effective instrument in reducing the cost of materials in the store house.

3. What are the considerations of Activity Based costing?

- The primary benefit of activity-based costing is that it brings a much higher level of focus and understanding to bear on fixed cost categories.
• However, there is a significant up-front time investment required to develop a system of accounting that accurately addresses each category of activity involved in a business.

• This process will usually involve some form of value-stream or process-flow analysis, which, while time-consuming, will provide invaluable insights into the true drivers of a company’s costs.

4. What Are the Two Stages of Allocation in Activity-Based Costing?
Activity-based costing is an improved method for allocating overhead costs. Instead of using one factor for cost allocation, this new method focuses on different aspects of the production process and allocates the overhead based on each product’s reliance on different overhead aspects.

**Stage 1: Allocation to Activities**
The first step in Activity-Based Costing is to divide the expenses of certain overhead activities to a per-event cost. For example, say that the overall cost of resetting a machine for production during the year was $1 million. You have two products and you had to switch the machine over 100 times. The first stage of allocation would stipulate that the cost of one setting switch is $10,000.

**Stage 2: Allocation to Production**
The second step in activity-based costing is to allocate the activity cost to each product. Using the same example, a uniform batch of each product would be produced after every switch. So after every switch, 1,000 units of Product A or 10,000 units of Product B would be produced. The “switching cost” allocated to a single item of Product A would be $10, while the switching cost for a single item of Product B would be $1.

5. Define Conventional costing systems? Explain its drawbacks
• The allocation of manufacturing overhead (indirect manufacturing costs) to products on the basis of a volume metric such as direct labor hours or production machine hours.
As manufacturing becomes more sophisticated the manufacturing overhead costs usually increase while the direct labor hours or production machine hours decrease. Hence, the direct labor or machine hours are unlikely to be the root cause of the manufacturing overhead.

Activity based costing (ABC) has developed as a technique to overcome the shortcomings of conventional costing.

**Drawbacks of conventional costing**

- Conventional costing is an outdated costing system in many companies because those manufacturing companies now use machines and computers for much of their production. Traditional costing negates other cost drivers that may contribute to the cost of an item.

- Another disadvantage of solely using the conventional costing system is that it can lead to bad management decisions because it excludes certain non-manufacturing costs.

6. **Explain hidden factory?**

- The Hidden Factory is a term that refers to activities in an operation or standard operating procedure (SOP).

- A few examples of Hidden Factories are workarounds, rework, or any of the 7 wastes, which I will describe below.

- Most organizations have some form of a Hidden Factory and being able to “see” these hidden factories in an organization requires learning to see what waste is and understanding that waste in any operation — service or manufacturing — can be a substantial drain on the bottom line, top line, on employee morale, shareholders and, most importantly, the customer.
Section-B

1. Difference between Traditional Costing and ABC.

Traditional costing or Conventional costing

- Many manufacturing companies use the traditional costing system to assign manufacturing overhead to units produced.

- Users of the traditional costing method make the assumption that the volume metric is the underlying driver of manufacturing overhead cost.

- Under traditional costing, accountants assign manufacturing costs only to products. Traditional accounting fails to allocate nonmanufacturing costs that also are associated with the production of an item, such as administrative expenses.

- Companies commonly use traditional accounting in external financial reports because it provides a value for the cost of goods sold.

Pros and Cons of Traditional Costing

Pros

An advantage of using traditional-based costing is that it aligns with Generally Accepted Accounting Principles, or GAAP. Easy implementation for companies that provide one product also is a plus.

Cons

- However, traditional costing is an outdated costing system in many companies because those manufacturing companies now use machines and computers for much of their production. Traditional costing negates other cost drivers that may contribute to the cost of an item.
Another disadvantage of solely using the traditional costing system is that it can lead to bad management decisions because it excludes certain non manufacturing costs.

**Activity-Based Costing**

c) Activity-based costing provides a more accurate view of product cost, but companies typically use it as a supplemental costing system.

d) The allocation bases used in activity-based costing differ from those used in traditional costing.

e) Activity-based costing determines every activity associated with producing an item and allocates a cost to the activity. The cost assigned to the activity is then assigned to products that require the activity for production.

**Pros and Cons of Activity-Based Costing**

**Pros:**

Greater costing accuracy is the primary benefit of activity-based costing. Companies assign cost only to the products that require the activity for production. This method eliminates allocating irrelevant costs to a product. Other advantages of activity-based costing include an easy interpretation of cost for internal management, the ability to enable benchmarking and a greater understanding of overhead costs.

**Cons:**

f) Implementing an activity-based costing system within a company requires substantial resources. This can prove a disadvantage for companies with limited funds.

g) Another disadvantage of using activity-based costing is that it is easily misinterpreted by some users.
2. What is the Activity-Based Costing Method in Accounting?

Activity-based costing, or ABC, is a costing method that managers can use for internal cost reporting and decision making. While ABC isn't allowed for external financial reporting, companies may find it useful to enact an ABC system to more effectively analyze cost data. ABC systems excel at being able to assign costs to products that are manufactured and supported by many different types of activities.

Costs Assigned to Products

ABC systems differ from traditional job order costing systems in the different costs that are assigned to products. Using traditional costing; only manufacturing costs can be assigned to products. Under ABC, both manufacturing and non-manufacturing costs may be assigned. This allows companies to more accurately cost products. For example, under traditional costing, warranty repair costs are never considered a cost of production, even though the company wouldn't incur warranty repairs if they didn't produce the product. Under ABC, these costs can be included as manufacturing costs.

Costs Excluded From Products

Under traditional costing, companies are prohibited from excluding any manufacturing costs from products. This includes overhead costs that aren't easily traced to products. However, ABC allows these "organization-sustaining" costs to be excluded from product costs. For example, under traditional costing, the costs of heating and cooling the factory are included as product costs even though the costs will be incurred whether the company produces a small or large number of products. Under ABC, these costs can be excluded so management can examine only relevant costs.

Allocation of Costs

The biggest difference between ABC and traditional costing is the way the methods assign overhead costs to objects. Under traditional costing, overhead costs are assigned to products using a plant-wide, predetermined overhead rate. This rate, which is usually calculated at the beginning of the year, is determined by making estimates of total overhead costs and total activity. Under ABC, costs are assigned to activity pools and separate rates are calculated for each activity. As a consequence, companies that use ABC are able to determine the costs of setting up a machine or designing a product much
more accurately, as they are able to assign only the overhead for these activities, where under traditional costing they would be assigning a portion of total factory overhead.

**Management Reporting**

ABC costing systems are able to produce management reports that are suitable for internal decisions. However, as not all costs are assigned to products, these reports are not appropriate for external reporting. Because ABC systems require many decisions in the implementation process, care must be taken that the activities, pools and costs identified are appropriate for the company. Otherwise, information that management receives from the accounting system could do more harm than good.

**3. Discuss the origin and development of Activity Based Costing?**

Troxel and Weber discuss the 3 phases of ABC development, a future phase, and provide some company examples for each of the various phases.

**Phase 1 - Serendipitous Implementation 1980**

- ABC characteristics were present in some systems.
- The ABC approach was not yet identified.
- Systems with ABC characteristics were just considered a sophisticated traditional system.
- Systems were used for normal financial purposes, not strategic purposes.
- Most common in Europe.

**Phase 2 - Ad Hoc Implementation 1980 - 1985**

- The ABC approach was identified and differences from the traditional cost accounting methods were recognized.
- No structure was yet defined for ABC systems.
- ABC was considered an alternative to a conventional cost system.
- The few systems that were developed were on an ad hoc basis.
• Recognition that ABC provides some strategic insights, but still used primarily for financial reporting.

• Some concern that full implementation of ABC would conflict with GAAP.

**Phase 3 - Structured Implementation 1985 - 1990**

• Objectives and approaches of development of ABC systems have been specifically identified.

• Recognition that ABC provides strategic insights and should be used as a decision making tool.

• ABC no longer considered just a replacement for an existing cost accounting system.

• Database technology has helped make ABC more practical.

• Cooper and Kaplan helped lead the way through their research and publications.

**Phase 4 - Integration with Performance Management - 2000**

• Both commonalities and disparities will be recognized between cost drivers and critical performance factors.

• Continue to better link product costing, performance measurement, and investment justification.

• Explain the process of hidden factory?

• A process is an systematic activity comprising of smaller activities that culminate in an outcome — service or product. A process can take up time, space, and resources. All processes can be categorized into the following categories: Value-added, Non-value added but necessary, and Non-value added.

**From the Customer’s Perspective:**

• Value-added: This step in the process adds form, function, and value to the end product and for the customer.

• Non-Value-Added: This step does not add form, function, or assist in the finished goods manufacturing of the product.
• Non-Value-Added-But-Necessary: This step does not add value, but is a necessary step in the final value-added product.

(2) & (3) naturally create waste, of which there are 7 types:

• Over-Production: Producing more than is needed, faster than needed or before needed.
• Wait-time: Idle time that occurs when co-dependent events are not synchronized.
• Transportation: Any material movement that does not directly support immediate production.
• Processing: Redundant effort (production or communication) which adds no value to a product or service.
• Inventory: Any supply in excess of process or demand requirements.
• Motion: Any movement of people which does not contribute added value to the product or service.
• Defect: Repair or rework of a product or service to fulfill customer requirements.

4. Outline the procedure involved in the implementation of activity based costing?

Step1:
Identify the product that is the chosen cost object
The cost object is used to calculate the total costs of quality of the machines.

Step2:
Identify the direct costs of quality of the product
Direct cost includes employee such as inspectors and workers in repair areas who are dedicated to a product line.

Step3:
Select the activities and cost allocation bases to use for allocating indirect costs of quality to the product
The activities that result in prevention, appraisal, and internal and external failure costs and it indicate in parentheses the business functions of the value chain in which these cost occur.

**Step 4:**

Identify the indirect cost of quality associated with each cost allocation base

These are the total costs (variable and fixed) incurred for each of the costs-of-quality activities, such as inspections, in all operations.

**Step 5:**

Compute the rate per unit of each cost allocation base

For each activity, total costs are divided by total quantity of the cost allocation base to compute rate per unit of each cost allocation base.

**Step 6:**

Compute the indirect cost of quality allocated to the product

**Step 7:**

Compute the total costs of quality by adding all indirect costs of quality assigned to the product
Section-A

1. Define the term cost of quality

"The cost of quality."

It’s a term that's widely used – and widely misunderstood.

The "cost of quality" isn't the price of creating a quality product or service. It's the cost of NOT creating a quality product or service.

Every time work is redone, the cost of quality increases. Obvious examples include:

- The reworking of a manufactured item.
- The retesting of an assembly.
- The rebuilding of a tool.
- The correction of a bank statement.
- The reworking of a service, such as the reprocessing of a loan operation or the replacement of a food order in a restaurant.

Quality costs are the total of the cost incurred by:

- Investing in the prevention of nonconformance to requirements.
- Appraising a product or service for conformance to requirements.
- Failing to meet requirements.
- Different types of Quality Costs

Prevention Costs

The costs of all activities specifically designed to prevent poor quality in products or services.

Examples are the costs of:

- New product review
Quality planning
- Supplier capability surveys
- Process capability evaluations
- Quality improvement team meetings
- Quality improvement projects
- Quality education and training

**Appraisal Costs**

The costs associated with measuring, evaluating or auditing products or services to assure conformance to quality standards and performance requirements.

- These include the costs of:
  - Incoming and source inspection/test of purchased material
  - In-process and final inspection/test
  - Product, process or service audits
  - Calibration of measuring and test equipment
  - Associated supplies and materials

**Failure Costs**

The costs resulting from products or services not conforming to requirements or customer/user needs. Failure costs are divided into internal and external failure categories.

**Internal Failure Costs**

Failure costs occurring prior to delivery or shipment of the product, or the furnishing of a service, to the customer.

Examples are the costs of:
- Scrap
- Rework
- Re-inspection
- Re-testing
- Material review
- Downgrading

**External Failure Costs**

Failure costs occurring after delivery or shipment of the product — and during or after furnishing of a service — to the customer.

Examples are the costs of:

- Processing customer complaints
- Customer returns
- Warranty claims
- Product recalls

**Total Quality Costs:**

The sum of the above costs. This represents the difference between the actual cost of a product or service and what the reduced cost would be if there were no possibility of substandard service, failure of products or defects in their manufacture.

2. Write short notes on internal failure cost?

Internal failure costs are costs that are incurred as a result of identifying defective products before they are shipped to customers. The labor, material, and (usually) overhead that created the defective product. The areas / nomenclature are numerous and include; scrap spoilage, defectives, etc.

The cost to correct the defective material or errors in service products which are found prior to sending to the customer. Some examples of internal costs of quality are:

- Lost or missing information: The cost to retrieve this expected information.
  The cost analyzing nonconforming goods or services to determine the root causes.
• Supplier scrap and rework: Scrap and rework costs due to nonconforming product received from suppliers. This includes the costs to the buyer of resolving the supplier quality problems.
• 100% sorting inspection: The cost of completing 100% inspection to sort defective units from good units.
• Retest: The cost to retest products after rework or other revision.
• Changing processes: The cost of modifying the manufacturing or service processes to correct the deficiencies.
• Redesign of hardware: The cost to change designs of hardware to correct the issues.
• Redesign of software: The internal cost to changing software designs.
• Scrapping of obsolete product: The cost of disposing scrap.
• Scrap in support operations: Costs from defective items in indirect operations.
• Rework in internal support operations: Costs from correcting defective items in indirect operations.
• Downgrading: The cost difference between the normal selling price and the reduced price due to quality reasons.
• Variability of product characteristics: Rework losses that occur with conforming product (e.g., overfill of packages due to variability of filling and measuring equipment).
• Unplanned downtime of equipment: Loss of capacity of equipment due to failures.
• Inventory shrinkage: Loss costs due to the difference between actual and recorded inventory quantity.
• Non-value-added activities: Cost due to redundant operations, sorting inspections and other non-value added activities. A value-added activity increases the usefulness of a product to the customer; a non-value-added activity does not.
3. Explain the importance of Cost of Quality

- Cost of Quality is an important business practice. By knowing you’re Quality Costs it can help business’s find and correct problems and the costs to attain quality.

- Quality is nearly 20-40 percent of a company’s sale.

- The basic model of quality costs are divided into four categories, but it is equally important to include hidden costs that may affect quality.

- A small business should frequently revisit and restructure their quality control process to uncover opportunities for improvement.

- Internal Failure Costs are associated with product failures and defects discovered before the product leaves the company floor. These defects in products occur when the process does not meet a certain specification or requirement.

- External Failure Costs are incurred during customer use and can include defective products, warranty charges, customer complaints, replacement products, recalls, and repairs. External costs are the most apparent. It is important for small businesses to quantify their external costs.

- Appraisal Costs are those associated with actions designed to find quality problems with measuring, evaluating, inspecting, testing and auditing products and product materials to ensure they adhere to the quality standards and performance requirements of a business.

- Prevention Costs are the most important quality cost investment. Prevention costs keep product failure costs to a minimum. Eliminating defects before production begins reduces the costs of quality and can help companies increase profits.

- Hidden Costs account for the cost of quality in small businesses. It is imperative for small businesses to understand the hidden quality costs such as loss of sales and customer service. Many businesses include warranties in their quality costs, but they often underestimate the full financial impact if the product fails after the warranty expires. Many times the customer incurs the cost of replacing a failed product, the experience may discourage the customer from purchasing from that company again, resulting in loss of sales.
How does conformance quality differ from quality of design? Explain

Quality can be attained only when both of them are controlled satisfactorily. Quality is designed into a product as much as it is built in during its production or service processes.

**Quality of conformance**

Quality of conformance is the level of the quality of product actually produced and delivered through the production or service process of the organization as per the specifications or design. When the quality of a product entirely conforms to the specification (design), the quality of conformance is deemed excellent.

Specifications are targets and tolerances determined by the designer of a product. Targets are the ideal values for which production is expected to strive; tolerances are acceptable deviations from these ideal values recognizing that it is difficult to meet the exact targets all the time due to variability in material, machine, men and process.

**Quality of design**

Quality of design is the quality which the producer or supplier is intending to offer to the customer. When the producer is making the quality of design of the product, he should take into consideration the customer’s requirements in order to satisfy them with fitness for use of the product.

If the quality of design does not reflect the customer's requirements, the product which the producer offers him would not probably satisfy the customer, even if it does sufficiently conform to the design. Quality of design is usually indicated by completeness and correctness of specifications, drawings, catalogues, etc. and is measured with fitness for use.

4. **What are internal and failure costs?**

**Internal Failure Costs**

Failure costs occurring prior to delivery or shipment of the product, or the furnishing of a service, to the customer.
Examples are the costs of:

- Scrap
- Rework
- Re-inspection
- Re-testing
- Material review
- Downgrading

**External Failure Costs**

Failure costs occurring after delivery or shipment of the product — and during or after furnishing of a service — to the customer.

Examples are the costs of:

- Processing customer complaints
- Customer returns
- Warranty claims
- Product recalls

**Section-B**

1. **What is quality? What are its dimensions?**

**Quality-definition**

In manufacturing, a measure of excellence or a state of being free from defects, deficiencies and significant variations. It is brought about by strict and consistent commitment to certain standards that achieve uniformity of a product in order to satisfy specific customer or user requirements. ISO 8402-1986 standard defines quality as "the totality of features and characteristics of a product or service that bears its ability to satisfy stated or implied needs." If an automobile company finds a defect in one of their cars and makes a product recall,
customer reliability and therefore production will decrease because trust will be lost in the car's quality.

**Dimensions of Quality**

**Dimension 1: Performance**

Performance is often a source of contention between customers and suppliers, particularly when deliverables are not adequately defined within specifications.

The performance of a product often influences profitability or reputation of the end-user. As such, many contracts or specifications include damages related to inadequate performance.

**Dimension 2: Features**

While this dimension may seem obvious, performance specifications rarely define the features required in a product. Thus, it’s important that suppliers designing product or services from performance specifications are familiar with its intended uses, and maintain close relationships with the end-users.

**Dimension 3: Reliability**

Reliability may be closely related to performance. For instance, a product specification may define parameters for up-time, or acceptable failure rates.

Reliability is a major contributor to brand or company image, and is considered a fundamental dimension of quality by most end-users.

**Dimension 4: Conformance**

If it’s developed based on a performance specification, does it perform as specified? If it’s developed based on a design specification, does it possess all of the features defined?
**Dimension 5: Durability**

Durability is closely related to warranty. Requirements for product durability are often included within procurement contracts and specifications.

For instance, fighter aircraft procured to operate from aircraft carriers include design criteria intended to improve their durability in the demanding naval environment.

**Dimension 6: Serviceability**

Is the product relatively easy to maintain and repair?

As end users become more focused on Total Cost of Ownership than simple procurement costs, serviceability (as well as reliability) is becoming an increasingly important dimension of quality and criteria for product selection.

**Dimension 7: Aesthetics**

The way a product looks is important to end-users. The aesthetic properties of a product contribute to a company’s or brand’s identity. Faults or defects in a product that diminish its aesthetic properties, even those that do not reduce or alter other dimensions of quality, are often causing for rejection.

**Dimension 8: Perception**

Perception is reality. The product or service may possess adequate or even superior dimensions of quality, but still fall victim to negative customer or public perceptions.

As an example, a high quality product may get the reputation for being low quality based on poor service by installation or field technicians. If the product is not installed or maintained properly, and fails as a result, the failure is often associated with the product’s quality rather than the quality of the service it receives.
2. Explain the Cost of Quality Analysis

Reducing the costs of waste

Cost of Quality is a measurement used for assessing the waste or loss from a defined process. These costs are significant and can be significantly reduced or avoided. Cost of quality measurement can track changes over time for a particular process, or be used as a benchmark for comparison of two or more different processes. Cost of Quality is usually measured in monetary terms, requiring all losses and waste to be converted to their liquidated cost equivalent.

For example, staff hours lost or spent are converted to their dollar equivalent by multiplying the hourly rate for the staff by the hours spent. Cost of quality measurements can be used to identify the optimum for a process, that is, the best possible outcome from all operating modes, combinations and permutations of the current process.

Most Cost of Quality measurements utilizes 4 categories of costs:

- Internal failure costs are associated with internal losses before the product or service is supplied to the client, such as equipment breakdowns, scrap and productivity losses.

- External failure costs occur outside of the process being analyzed. These costs are usually discovered by or affect third parties such as clients. Some external costs may have originated from within, or may have been caused by, created by or made worse by the process being analyzed. Examples are customer or client complaints, lost customer/client goodwill and warranty repair costs.

- Preventive costs are associated with the prevention of future losses due to poor quality, such as unplanned problems, lost opportunities and waste.
Examples of preventive costs are planning, scheduled maintenance and quality assurance.

- Assessment or appraisal costs are those associated with measurement and assessment of a process. These are usually designed to find quality problems before the product or service is delivered to the client or to improve the quality of the product or service. Examples are inspection, design reviews, quality checks, and audits, reporting systems, data collection systems and forms.

**Organizations that have no cost of quality measurement system often see the following symptoms:**

- Slow rate of improvement

- Bureaucracy or complexity in processes that continues to worsen

- Changes in one area tend to have large, negative effects in one or more other areas

- Management gets personally involved in quality problems only during a major crisis

- Management is running out of ideas as to how to cut costs further

- All employees are not actively and personally involved in driving the organization’s mission forward

- Many individuals and departments disagree on what the top priorities are for the organization

- Sub-processes and departments are operated in a manner that is detrimental to the organization’s overall best interest
Organizations that have a poorly-designed or poorly-implemented cost of quality measurement system often encounter the following symptoms:

- Data collection is watered down or superficially implemented, and the process quickly becomes a make work exercise with little or no real benefit

- Efforts are directed at where it is easy to collect data or implement changes instead of focusing on cost of quality priorities such as largest cost category, most variation or largest business risk Sources

- Input data are often incomplete and definitions are often unclear or not fully understood, resulting in varying interpretation and implementation over time, thus adding significant noise to the data, clouding interpretation attempts and hiding significant trends of extended periods of time.

- Management does not effectively use the data in an effective manner. Decisions are often made without realizing or considering cost of quality.

- Cost of quality dollars expended shift around among the four categories on a revolving basis, with little or no reduction in the total cost of quality. For example, money is spent to increase assessment, which indicates a problem exists with internal or external failure costs. Assessment costs are stopped but preventive costs increase to reduce failure costs. The preventive actions are not comprehensive or consistently applied so internal and external failure costs reappear. The rising failure costs prompt another round of assessment costs, and the cycle is repeated.

- Collection of cost of quality data becomes more costly, burdensome and bureaucratic over time, making it slower to respond to significant changes.

- Statistical analysis of cost of quality data is not performed. Early recognition of trends are missed and random variations are mistaken for significant signals.
The cost of quality system is isolated from other key performance indicator systems, missing the opportunity for more in-depth understanding of cause and effect relationships for the cost of quality results.

**How To Use the Tool:**

1. Cost of quality data can be either collected on a sampling basis or on a continuous basis.

2. After confirming that the data is accurate and comprehensive or representative, and consistent with previous definitions and implementations, data is analyzed for trends and opportunities.

3. Statistical analysis such as regression analysis, indexes, correlations, Pareto analysis, etc., is utilized to formulate conclusions about the present state and recommendations.

4. In some cases utilizing tools such as modeling can predict the optimum cost of quality and the process design or improvement necessary for achieving the optimum can be defined sources.

5. A plan is then defined to modify the current process, phasing as appropriate, to move towards the optimum cost of quality.

6. Projects are analyzed for their impact on cost of quality, and projects or processes that how a high return on quality (Return on Quality = (Dollar Cost of Quality Savings/Dollar Cost of Implementation) x 100)

7. Improvements are measured and evaluated for effectiveness, and a continuous improvement cycle is implemented. Results are also communicated widely.

**3. Write the steps involved in implementation of cost of quality?**

Implementation of quality cost system. The steps are as follows:
1. Obtain management commitment and support.
2. Establish a quality cost team.
3. Obtain the cooperation and support of users and information sources.
4. Operationally define quality costs (to limit the scope of the system).
5. Identify specific quality costs.
7. Set up a code system and forms to accumulate information.
8. Design quality cost reports.
10. Distribute reports.
UNIT-5

Section-A

1. What is TQM? Explain its principles.

Total quality management (TQM) consists of organization-wide efforts to install and make permanent a climate in which an organization continuously improves its ability to deliver high-quality products and services to customers. While there is no widely agreed-upon approach, TQM efforts typically draw heavily on the previously developed tools and techniques of quality control. TQM enjoyed widespread attention during the late 1980s and early 1990s before being overshadowed by ISO 9000, Lean manufacturing, and Six Sigma.

Principles of TQM

The International Standard for Quality management (ISO 9001:2008) adopts a number of management principles that can be used by top management to guide their organizations towards improved performance.

- Customer focus
- Leadership
- Involvement of people
- Process approach
- System approach to management
- Continual improvement
- Factual approach to decision making
- Mutually beneficial supplier relationships.

2. What are the methods to improve the quality?

There are many methods for quality improvement. These cover product improvement, process improvement and people based improvement. In the following list are methods of quality management and techniques that incorporate and drive quality improvement:


• QFD — quality function deployment, also known as the house of quality approach.

• Kaizen — Japanese for change for the better; the common English term is continuous improvement.

• Zero Defect Program — created by NEC Corporation of Japan, based upon statistical process control and one of the inputs for the inventors of Six Sigma.

• Six Sigma — 6σ, Six Sigma combines established methods such as statistical process control, design of experiments and failure mode and effects analysis (FMEA) in an overall framework.

• PDCA — plan, do, check, act cycle for quality control purposes. (Six Sigma's DMAIC method (define, measure, analyze, improve, control) may be viewed as a particular implementation of this.)

• Quality circle — a group (people oriented) approach to improvement.

• Taguchi methods — statistical oriented methods including quality robustness, quality loss function, and target specifications.

• The Toyota Production System — reworked in the west into lean manufacturing.

• Kansei engineering — an approach that focuses on capturing customer emotional feedback about products to drive improvement.

• TQM — total quality management is a management strategy aimed at embedding awareness of quality in all organizational processes. First promoted in Japan with the Deming prize which was adopted and adapted in USA as the Malcolm Baldrige National Quality Award and in Europe as the European Foundation for Quality Management award (each with their own variations).

• TRIZ — meaning "theory of inventive problem solving"
- BPR — business process reengineering, a management approach aiming at optimizing the workflows and processes within an organization.

- OQRM — Object-oriented Quality and Risk Management, a model for quality and risk management.

- How TQM auditing is done?

**The steps followed while TQM auditing,**

- Determine audit focus
- Prepare for the audit
- Perform the audit
- Report the findings in the initial findings report
- Determine the corrective action
- Update the findings report with the corrective action
- Conduct the corrective action
- Update the findings report when actions are completed
- Follow up
- Closure

3. **Explain the term Flexible manufacturing systems.**

- A flexible manufacturing system (FMS) is a group of numerically-controlled machine tools, interconnected by a central control system.

- The various machining cells are interconnected, via loading and unloading stations, by an automated transport system.

- Operational flexibility is enhanced by the ability to execute all manufacturing tasks on numerous product designs in small quantities and with faster delivery.

- It has been described as an automated job shop and as a miniature automated factory. Simply stated, it is an automated production system that produces one or more families of parts in a flexible manner.
Today, this prospect of automation and flexibility presents the possibility of producing nonstandard parts to create a competitive advantage.

### 4. Explain the benefits of flexible manufacturing systems

The potential benefits from the implementation and utilization of a flexible manufacturing system have been detailed by numerous researchers on the subject. A review of the literature reveals many tangible and intangible benefits that FMS users extol. These benefits include:

- less waste
- fewer workstations
- quicker changes of tools, dies, and stamping machinery
- reduced downtime
- better control over quality
- reduced labor
- more efficient use of machinery
- work-in-process inventory reduced
- increased capacity
- increased production flexibility

### Section-B

#### 1. Explain Just in Time and its features.

Just in time (JIT) is a production strategy that strives to improve a business' return on investment by reducing in-process inventory and associated carrying costs.

Just in time is a type of operations management approach which originated in Japan in the 1950s. It was adopted by Toyota and other Japanese manufacturing firms, with excellent results: Toyota and other companies that adopted the approach ended up raising productivity (through the elimination of waste) significantly.
JIT focuses on continuous improvement and can improve a manufacturing organization's return on investment, quality, and efficiency. To achieve continuous improvement key areas of focus could be flow, employee involvement and quality.

**Features of JIT:**

Main features of JIT include:

- Reduced setup time. Cutting setup time allows the company to reduce or eliminate inventory for "changeover" time. The tool used here is SMED (single-minute exchange of dies).

- The flow of goods from warehouse to shelves improves. Small or individual piece lot sizes reduce lot delay inventories, which simplifies inventory flow and its management.

- Employees with multiple skills are used more efficiently. Having employees trained to work on different parts of the process allows companies to move workers where they are needed.

- Production scheduling and work hour consistency synchronized with demand. If there is no demand for a product at the time, it is not made. This saves the company money, either by not having to pay workers overtime or by having them focus on other work or participate in training.

- Increased emphasis on supplier relationships. A company without inventory does not want a supply system problem that creates a part shortage. This makes supplier relationships extremely important.

- Supplies come in at regular intervals throughout the production day. Supply is synchronized with production demand and the optimal amount of inventory is on hand at any time. When parts move directly from the truck to the point of assembly, the need for storage facilities is reduced.

- Minimizes storage space needed.

- Smaller chance of inventory breaking/expiring.

- Waste Elimination Supports Continuous Quality and Productivity Improvement
Explain the objectives of flexible manufacturing systems.

OBJECTIVES OF FMS

The general objectives of an FMS are to approach the efficiencies and economies of scale normally associated with mass production, and to maintain the flexibility required for small- and medium-lot-size production of a variety of parts.

Two kinds of manufacturing systems fall within the FMS spectrum. These are assembly systems, which assemble components into final products and forming systems, which actually form components or final products. A generic FMS is said to consist of the following components:

- A set of work stations containing machine tools that do not require significant set-up time or change-over between successive jobs. Typically, these machines perform milling, boring, drilling, tapping, reaming, turning, and grooving operations.
- A material-handling system that is automated and flexible in that it permits jobs to move between any pair of machines so that any job routing can be followed.
- A network of supervisory computers and microprocessors that perform some or all of the following tasks: (a) directs the routing of jobs through the system; (b) tracks the status of all jobs in progress so it is known where each job is to go next; (c) passes the instructions for the processing of each operation to each station and ensures that the right tools are available for the job; and (d) provides essential monitoring of the correct performance of operations and signals problems requiring attention.
- Storage, locally at the work stations, and/or centrally at the system level.
- The jobs to be processed by the system. In operating an FMS, the worker enters the job to be run at the supervisory computer, which then downloads the part programs to the cell control or NC controller.
- What are the steps involved in Business Process Reengineering

We can generalize Business Process Reengineering (BPR) efforts as an eight step process as follow -
Step 1: Formulate / Modify business visions, policies, objectives

Step 2: Formulate / Modify business strategies according to changing customer requirements, technology changes and competition

Step 3: Analyze the existing business process cycles & workflows and determine how they may be modified or refined

Step 4: Apply IT to setup an optimal Business Information Management Architecture (BIMA) to support the reengineered business process

Step 5: Modify or redesign the existing processes according to the reengineering strategies and develop refined Business Process Automation Systems (BPAS)

Step 6: Apply IT strategies to map BIMA onto an Enterprise Information Management System (EIMS) that is integrated across the enterprise and that fits into and supports the reengineered Business process cycles and workflows.

Step 7: Integrate the EIMS with the BPAS to build up the completed reengineered business system

Step 8: Repeat steps 1-7 for continuous BPR due to changing customer demands, technology changes and business strategies, which leads to business stability

2. Explain the methodology involved in Business Process Reengineering.

- Introduction into Business Reengineering

  The first step in reengineering is to prepare and communicate the “case for action” and the “vision statement”. The “case for action” is a description of the organisation’s business problem and current situation; it presents justification for the need for change. The “vision statement” describes how the organisation is going to operate and outlines the kind of results it must achieve.

- Identification of Business Processes

  During this phase, the most important business processes are identified and are described from a global perspective using a set of process maps. Process maps give a picture of the work flows through the company. They show high-level
processes, which can be decomposed into sub-processes on separate sub-process maps.

- Selection of Business Processes

   It is unrealistic to reengineer all the high level processes of an organisation at the same time. Therefore, it has to be decided which are the processes to be redesigned. This is a very important part of a BPR effort. Candidate for reengineering are the most problematic processes those with great impact to customers or processes with more chances to be successfully reengineered, processes that contribute to organisation’s objectives and so on.

- Understanding of Selected Business Processes

   Before proceeding to redesign, the reengineering team needs to gain a better understanding of the existing selected processes, concerning what they do, how well or how poorly they perform, and the critical issues that govern their performance.

- Redesign of the Selected Business Processes

   This is the most creative phase of the methodology, because new rules and new ways of work should be invented. Imagination and inductive thinking should characterize this phase

- Implementation of Redesigned Business Processes

   The last phase covers the implementation phase of the BPR project. Hammer/Champy does not talk about implementation as much about project planning. They believe that the success of the implementation depends on whether the five preliminary phases have been properly performed.