



इरान्शे

Last Mile Referencer for

The Institute of Chartered Accountants of India
(Set up by an Act of Parliament)

Board of Studies

INTERMEDIATE

GROUP-II

PAPER 4

**COST AND
MANAGEMENT
ACCOUNTING**

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Saransh – Last Mile Referencer for Cost and Management Accounting

While due care has been taken in preparing this booklet, if any errors or omissions are noticed, the same may be brought to the notice of the HoD, BoS. The Council of the Institute is not responsible in any way for the correctness or otherwise of the matter published herein.

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PREFACE

Board of Studies, the student wing of the Institute, does not leave any stone unturned in providing best-in-class services to its students. It imparts quality academic education through its value-added study materials, wherein concepts are explained in lucid language. Illustrations and Test-Your-Knowledge Questions contained therein facilitate enhanced understanding and application of concepts learnt. Website for practising MCQs & Case Scenarios contain a rich bank of MCQs and Case Scenarios to hone the analytical skills of students, by applying the concepts learnt in problem solving. Revision Test Papers contain updates and Q & A to help students update themselves with the latest developments before each examination and revise the concepts and provisions by solving questions contained therein. Suggested Answers containing the ideal manner of answering questions set at examination also help students to revise for the forthcoming examination. Mock Test Papers help students to assess their level of preparedness before each examination. BoS also conducts live virtual classes through eminent faculty for its students across the length and breadth of the country.

To reach out to its students, the BoS has also been publishing subject-specific capsules in its monthly Students' Journal "The Chartered Accountant Student" since the year 2017 for facilitating effective revision of concepts dealt with in different topics of each subject at the Foundation, Intermediate and Final levels of the chartered accountancy course. Each issue of the journal includes a capsule relating to specific topic(s) in one subject at each of the three levels. In these capsules, the concepts and provisions are presented in attractive colours in the form of tables, diagrams and flow charts for facilitating easy retention and quick revision of topics.

In today's business world, Chartered Accountants are very much part of the decision-making team of any Organisation. They are rigorously involved in decision making process with the help of Cost and Management Accounting tools. The saransh on Intermediate Paper 4 'Cost and Management Accounting' covers diagrams, flow charts tables and formulas. In addition, it encompasses case studies and skill assessment-based questions so that students can critically analyse business problems and strengthen their analytical skills through interpreting and evaluating. This saransh, though, facilitates the students in undergoing quick revision, under no circumstances, such revisions can substitute the detailed study of the materials provided by BoS.

Happy Reading

President Message



It is with immense pride that I introduce the Saransh booklets, a meticulously curated resource available across the Foundation, Intermediate, and Final levels of the Chartered Accountancy course. ICAI has always been dedicated to providing our students with the best possible resources to succeed in their studies and careers, and Saransh is a demonstration of this commitment.

The Saransh – Last Mile Referencers have been thoughtfully designed by the Board of Studies (BoS) to serve as an invaluable companion for your studies and exam preparation. Our aim is to simplify complex concepts and provisions, making them easier to understand, memorize, and revise. However, Saransh is not a substitute for the detailed BoS study material but a supplementary tool to complement your in-depth study.

The newly revamped Saransh booklets have been updated not only in content but also in their presentation. With a more logical and organized structure, enhanced visual appeal, and a user-friendly layout, these booklets are now more effective in aiding your studies.

We have extended the Saransh series to cover all core areas of the Chartered Accountancy course. Whether you are studying Direct Tax Laws and International Taxation, Indirect Tax Laws, Accounting Standards, Indian Accounting Standards, Auditing, Cost and Management Accounting, Strategic Cost Management and Performance Evaluation, Company Law, or Financial Management and Strategic Management, you will find a Saransh booklet for each subject.

Saransh is designed not only to help you grasp and recall essential concepts but also to guide you in approaching each subject strategically. The insights provided in these booklets will help you develop a structured approach to your studies, ensuring that you are well-prepared for your examinations.

I urge you to make the most of the Saransh booklets. While these booklets will support you, it is your dedication, perseverance, and hard work that will ultimately determine your success.

I wish each of you the very best in your studies and future careers.

Warm regards,

CA. Ranjeet Kumar Agarwal
President, ICAI



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INDEX

Chapters	Pg No.
Introduction to Cost and Management Accounting	01
Material Cost	10
Employee Cost and Direct Expenses	17
Overheads: Absorption Costing Method	31
Activity Based Costing	37
Cost Sheet	46
Cost Accounting Systems	53
Unit & Batch Costing	58
Job Costing	63
Process & Operation Costing	69
Joint Products & By Products	73
Service Costing	81
Standard Costing	92
Marginal Costing	98
Budget and Budgetary Control	109

In today's cutthroat competitive landscape, **Cost and Management Accounting** is no longer just a tool for internal reporting but a strategic process. It empowers businesses to **reduce costs, optimize pricing**, and improve **operational efficiency**, ensuring they stay ahead of the competition while maintaining profitability and long-term sustainability. Without a clear understanding of costs, businesses may lose their competitive edge and profitability. This subject serves as the backbone of financial planning, providing insights into both current performance and future financial prospects. It helps managers and business leaders in decision-making, planning, and control by providing relevant cost-related information.

Chartered Accountants, acting as a worldwide business solution provider, have a crucial role in assisting a company to achieve its long-term objectives. Cost and Management Accounting assists Chartered Accountants in making prompt and knowledgeable business decisions.

The objective of this subject is to develop an understanding of the basic concepts and applications to establish the cost associated with the production of products and provision of services and apply the same to determine prices, understanding of cost accounting statements and to acquire the ability to apply information for cost ascertainment, planning, control and decision making.

Some Tips on How to Prepare for the Examination

When it comes to studying for practical exams, **memorizing** key concepts and information is essential. To improve your memorization abilities, consider incorporating the following techniques into your study routine:

Repetition and Practice

Regularly reviewing and practicing cost concepts strengthens your understanding and helps you retain the information. Practice problem solving to ensure you understand the concepts. Working through material repeatedly strengthens your memory, making it more likely you will retain the information in time for the exam. Using these effective memory techniques will help you improve your ability to remember concepts you have learned and apply them during the exam.

Use Flashcards and Note-Taking

Use flashcards to enhance your reminiscence of key concepts, formulas, and definitions. Write down the data you want to memorize on one facet of the flashcard and the corresponding info on the opposite facet. Test yourself often with the aid of using the flashcards and actively recalling the data. This method supports your reminiscence via repetition and lively engagement. In addition, take complete notes in the course of your study sessions. Summarize essential points, spotlight key terms, and prepare data in a manner that makes feel to you. The act of writing down data can aid in retention, and reviewing your notes often allows strengthen your understanding. Nothing compares to handwritten notes when you want to master the 3 Rs of memory: remember, retain, and recall. The extra you write, the higher you understand. The extra you study the notes on your very own handwriting, it complements your mind's ability to seize data and preserve it for an extended period.

Mnemonic Devices / ACRONYMS

Mnemonic devices are memory aids that help you remember information by associating it with something easier to recall. For example, you can create an acronym using the first letter of each term you need to remember. This technique can be particularly helpful when memorizing theory or formulas.

Time Management

One important thing to be kept in mind is Time Management specially during the Exam. Always allocate specific time to each section and stick to it. For this you can practice model test papers so that you can approach the exam with clarity and improve your chances of achieving a high score.

Visualizations and Imagery

Visualizing information can improve memory retention. Create mental images or diagrams to represent complex cost concepts. Charts, graphs and tables can be excellent tools, especially for taking notes on practical subjects such as cost and management accounting and financial management. This is a good way to take notes on formula etc. Connecting visual images to content makes it easier to remember during exams.

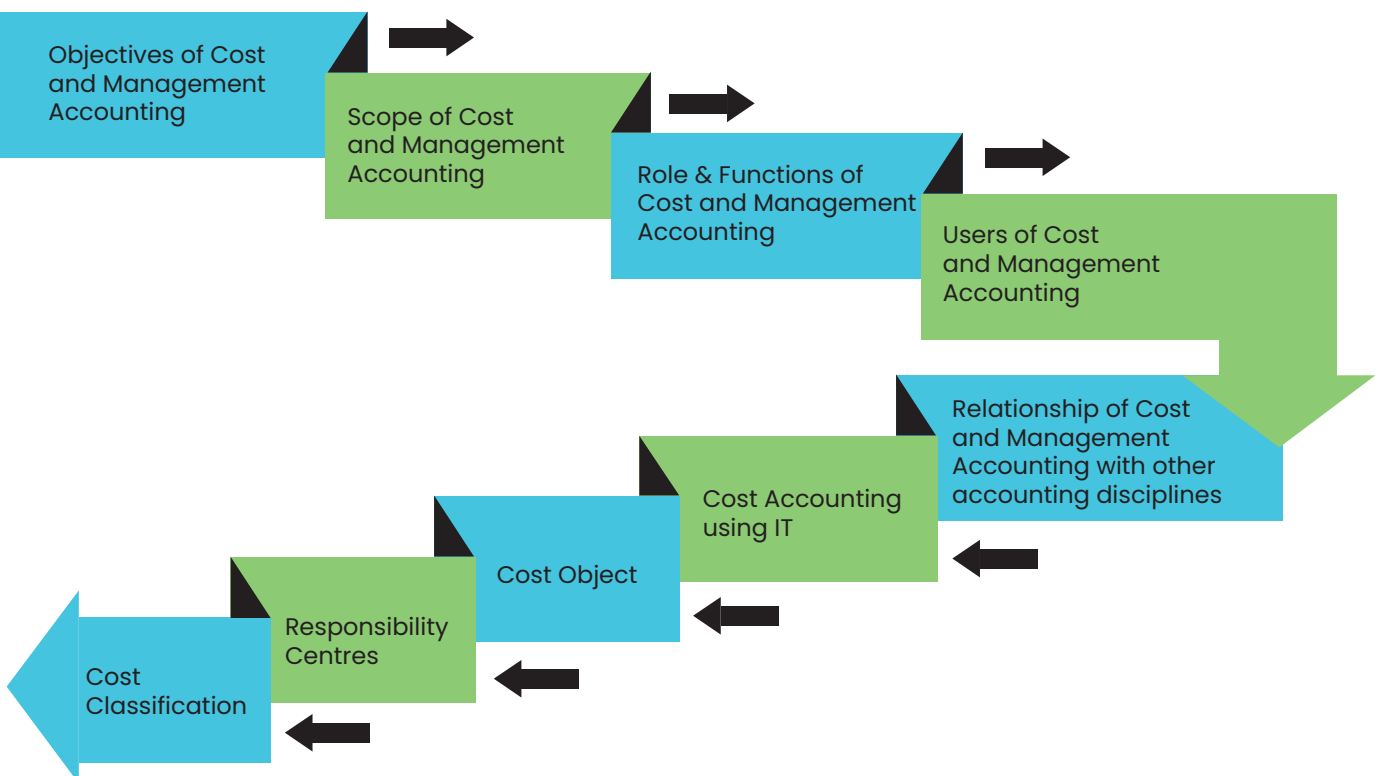
Cost and Management Accounting

In contemporary business environment, existence of an entity depends on the way it tackles the challenges posed by the competitive market conditions. Cost leadership being one of the competitive strategies, gives an added advantage to the entity. Cost being an important aspect for survival and growth in business, requires a mandatory awareness about the cost control and cost reduction. Fourth industrial revolution, also known as Industry 4.0, puts more emphasis on the digitization of information for effective decisionmaking, which enables an entity in keeping ahead of competition. Cost and Management accounting, a discipline of accounting, capacitates an entity in taking timely decisions by provisions of cost, profitability and other relevant information.

Chartered Accountants, as a global business solution provider, play an important role in business, have an onus by helping an entity to achieve its long-term objectives. In this direction, Cost and Management Accounting helps Chartered Accountants in taking timely and informed business decisions.

Introduction to Cost and Management Accounting

Chapter Overview



Meaning of Terms used in Cost and Management Accounting

First of all, let us discuss the meaning of various terminologies used in Cost and Management Accounting to have a clear understanding about the subject.

Cost

The amount of expenditure incurred on or attributable to a specified article, product or activity.

Costing

Costing is defined as the technique and process of ascertaining costs.

Cost Accounting

It is the process of accounting for cost.

Cost Accountancy

Cost Accountancy has been defined as the application of costing and cost accounting principles, methods and techniques.

Management Accounting

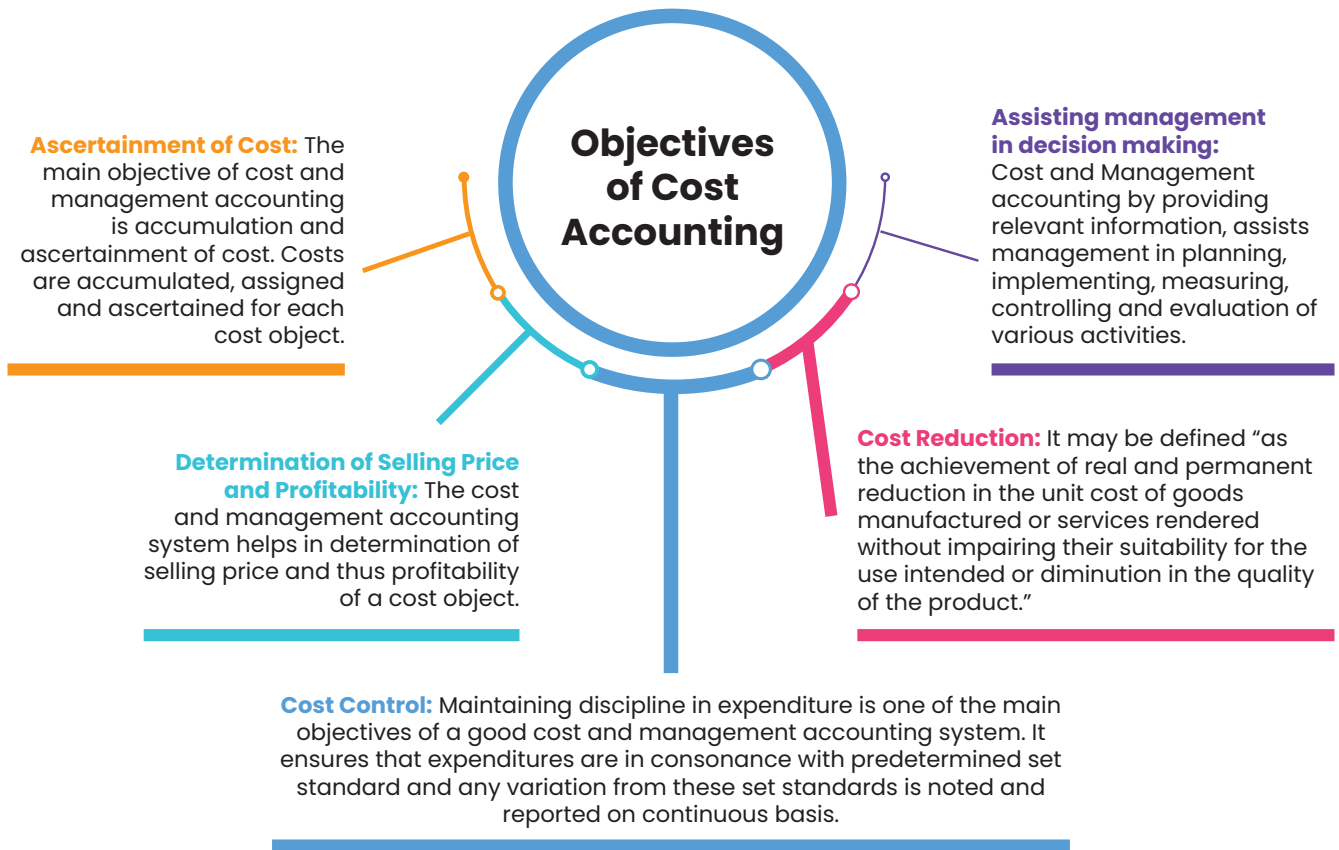
Management accounting is the application of the principles of accounting and financial management.

Cost Management

It is an application of management accounting concepts, methods of collections, analysis and presentation of data.

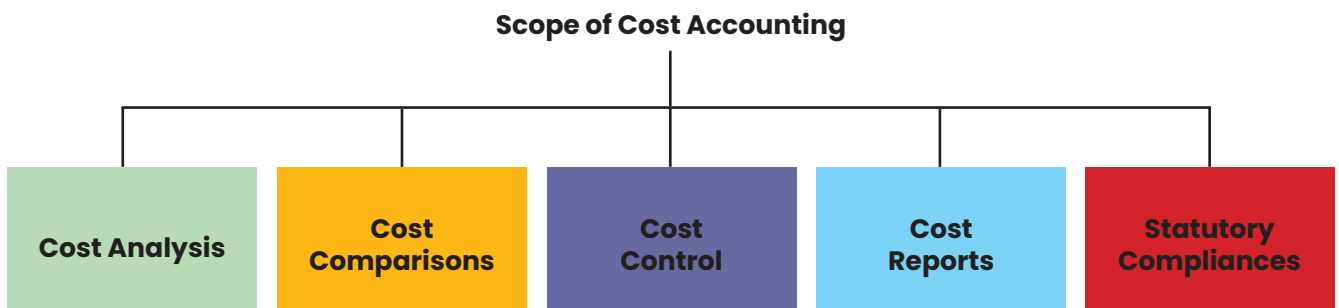
Objectives of Cost Accounting

There are many objectives of cost accounting. The main objectives are explained below. We also need to keep our focus on understanding the difference between Cost Control and Cost Reduction.



Scope of Cost Accounting

We also need to know various scopes of cost accounting. Cost ascertainment and the process of cost accounting are the major scopes. The other scopes are presented below:



Role and Functions of Cost and Management Accounting

Role of a Cost and Management Accounting system

Provide relevant information to management for decision making

Assist management for planning, measurement, evaluation and controlling of business activities

Help in allocation of cost to products and inventories for both external and internal users.

Functions of Cost and Management Accounting System

Collection and accumulation of cost for each element of cost

Assigning costs to cost objects to ascertain cost.

Sets budget and standards for a particular period or activity beforehand and these are compared with the assigned and ascertained cost.

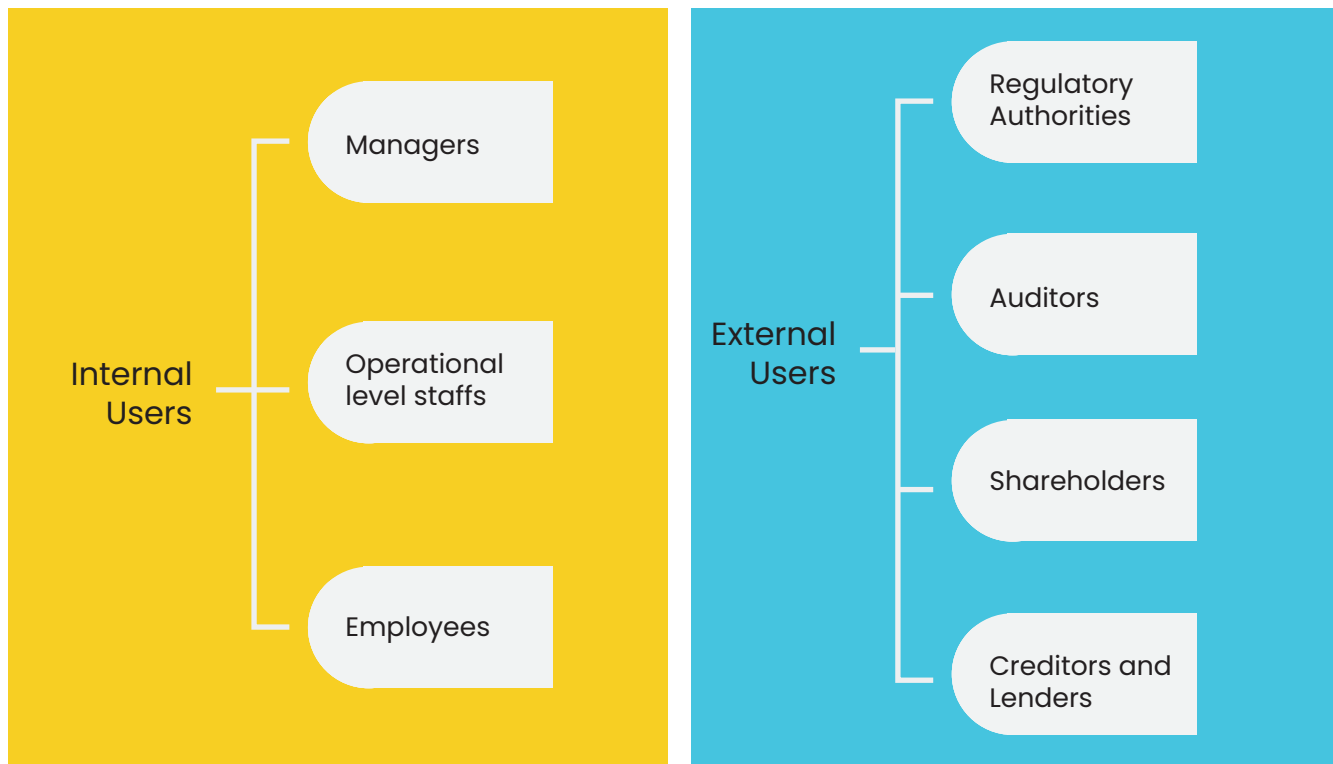
Provision of relevant information to the management for decision making.

To gather data like time taken, wastages, process idleness etc., analyse the data, prepare reports and take necessary actions



Users of Cost and Management Accounting

Cost and Management Accounting information which are generated or collected are used by various stakeholders. The users of the information can be broadly categorized as below:



Relationship of Cost Accounting, Management Accounting, Financial Accounting and Financial Management

There is a close relationship between various disciplines like Cost Accounting, Management Accounting, Financial Accounting and Financial Management. Sometimes these disciplines are interrelated and dependent on each other also.



Introduction

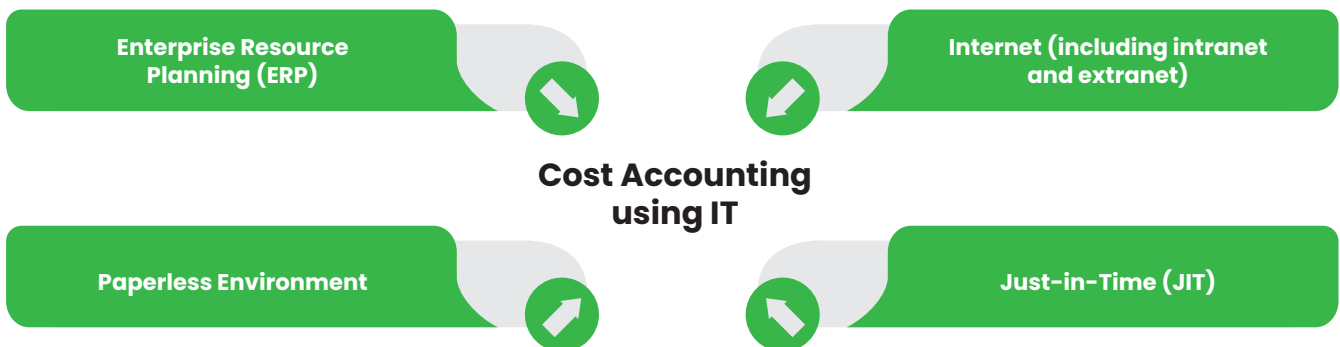
Essentials of a good Cost Accounting System

The essential features which a cost accounting system should possess are depicted as below:



Cost Accounting using Information Technology

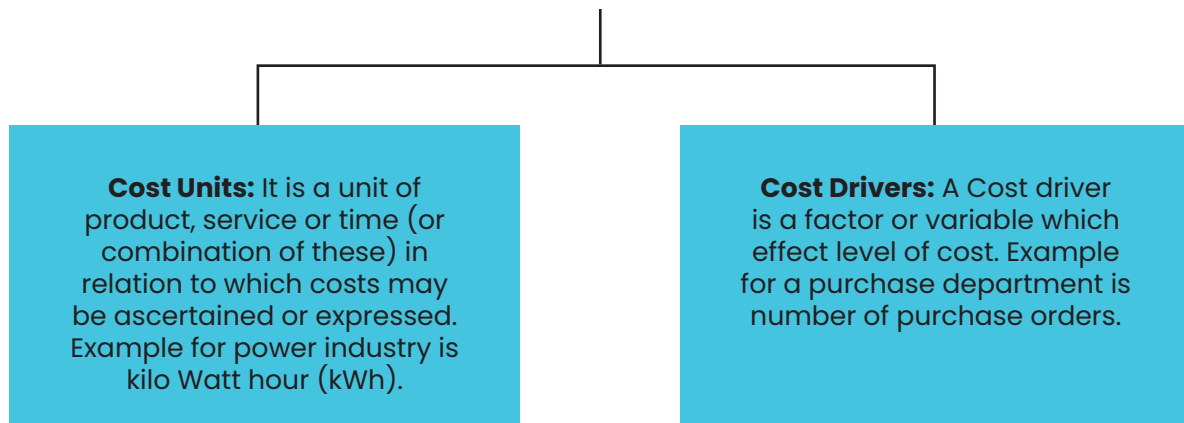
With the use of information technology, the cost accounting system gets integrated and automated. The basic features are depicted as below:



Cost Objects

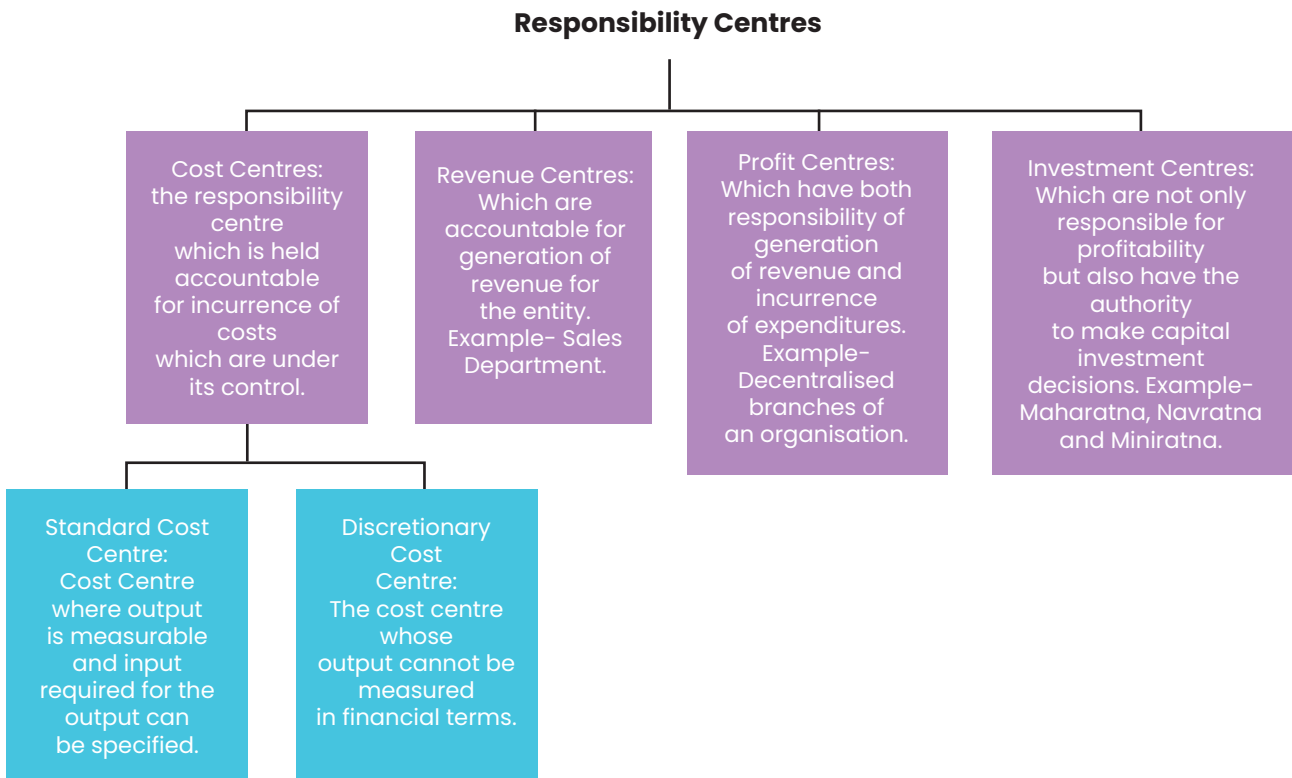
It is very important to understand the meaning of cost object, cost unit and cost driver. Their meaning alongwith examples are illustrated below:

Cost Object: Cost object is anything for which a separate measurement of cost is required. Cost object may be a product (book), a service (airline), a project, a customer, a brand category etc.



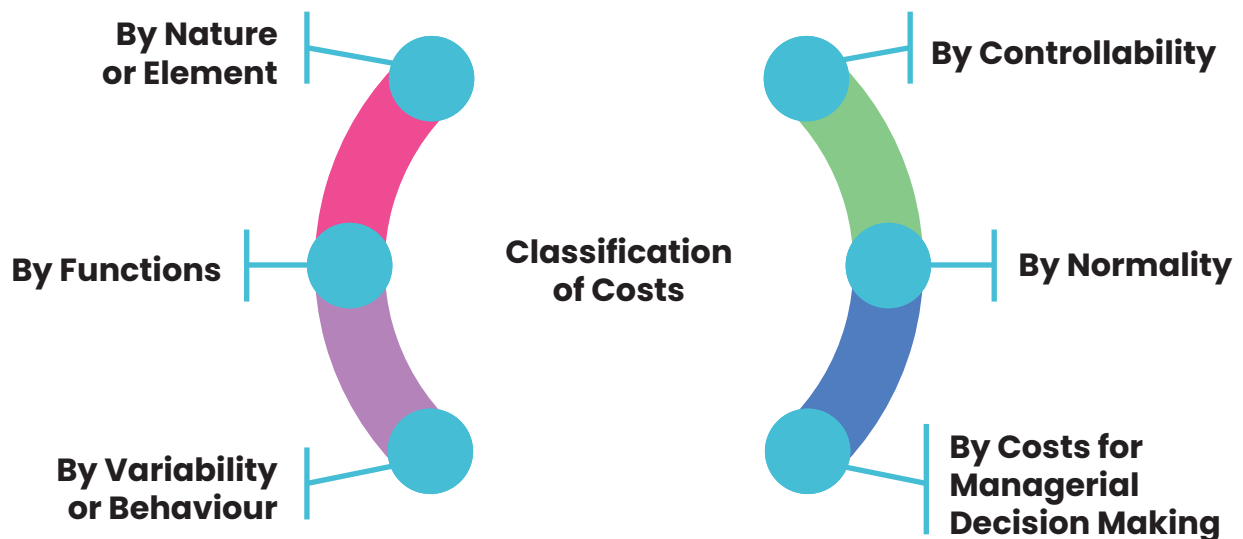
Responsibility Centres

To have a better control over the organisation, management delegates its responsibilities and authorities to various departments or persons, which are known as responsibility centres. There are four types of responsibility centres as discussed below:



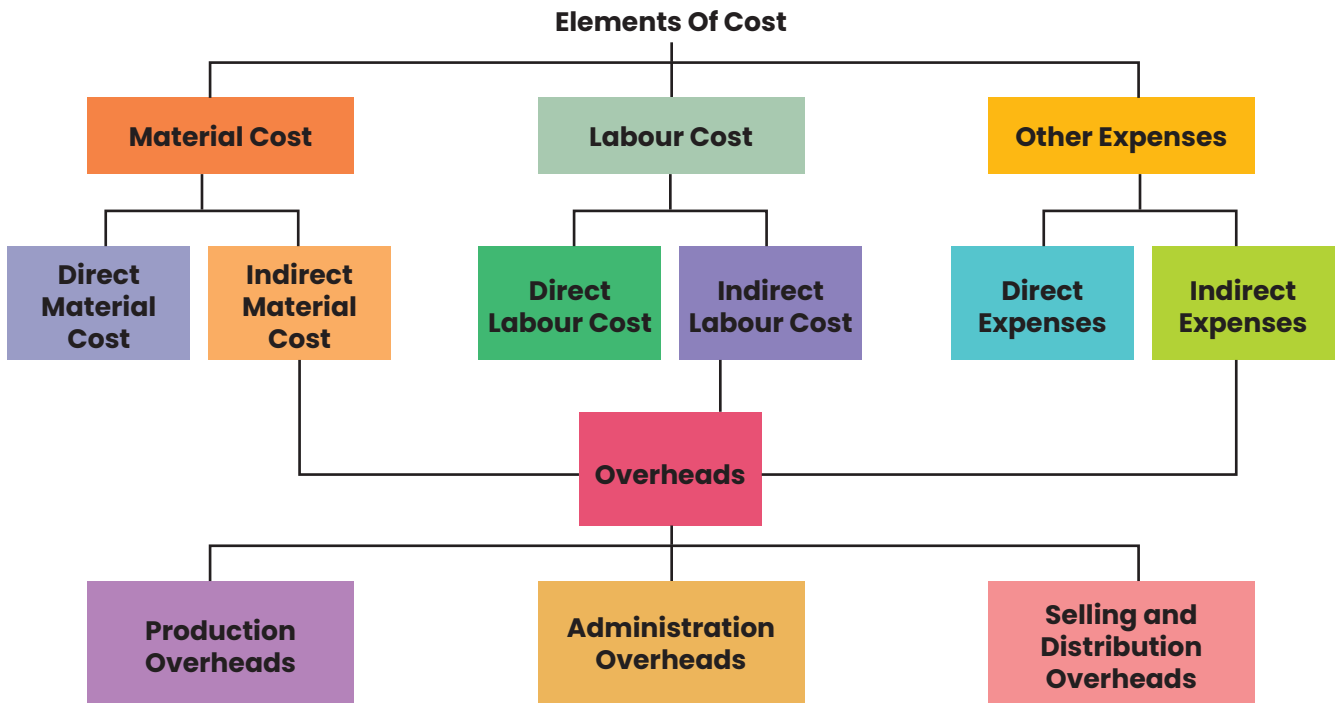
Classification of Costs

Classification of costs basically means grouping of costs according to their common features. The important ways of classification of costs are illustrated as below:



Introduction

(i) By Nature or Element



(ii) By Functions

Direct Materials	}		
Direct Employees (Labours)		Prime Cost	
Direct Expenses			
Indirect Material	}	Factory Overheads	Factory Cost or Works Cost
Indirect Labour		Administration Overheads	Cost of Goods Sold
Indirect Expenses		Selling and Distribution Overheads	Cost of Sales

(iii) By Variability or Behaviour



(iv) By Controllability

Controllable Costs: Cost that can be controlled

Uncontrollable Costs: Costs which cannot be influenced or controlled

(v) By Normality

Normal Cost - It is the cost which is normally incurred

Abnormal Cost - It is the cost which is not normally incurred



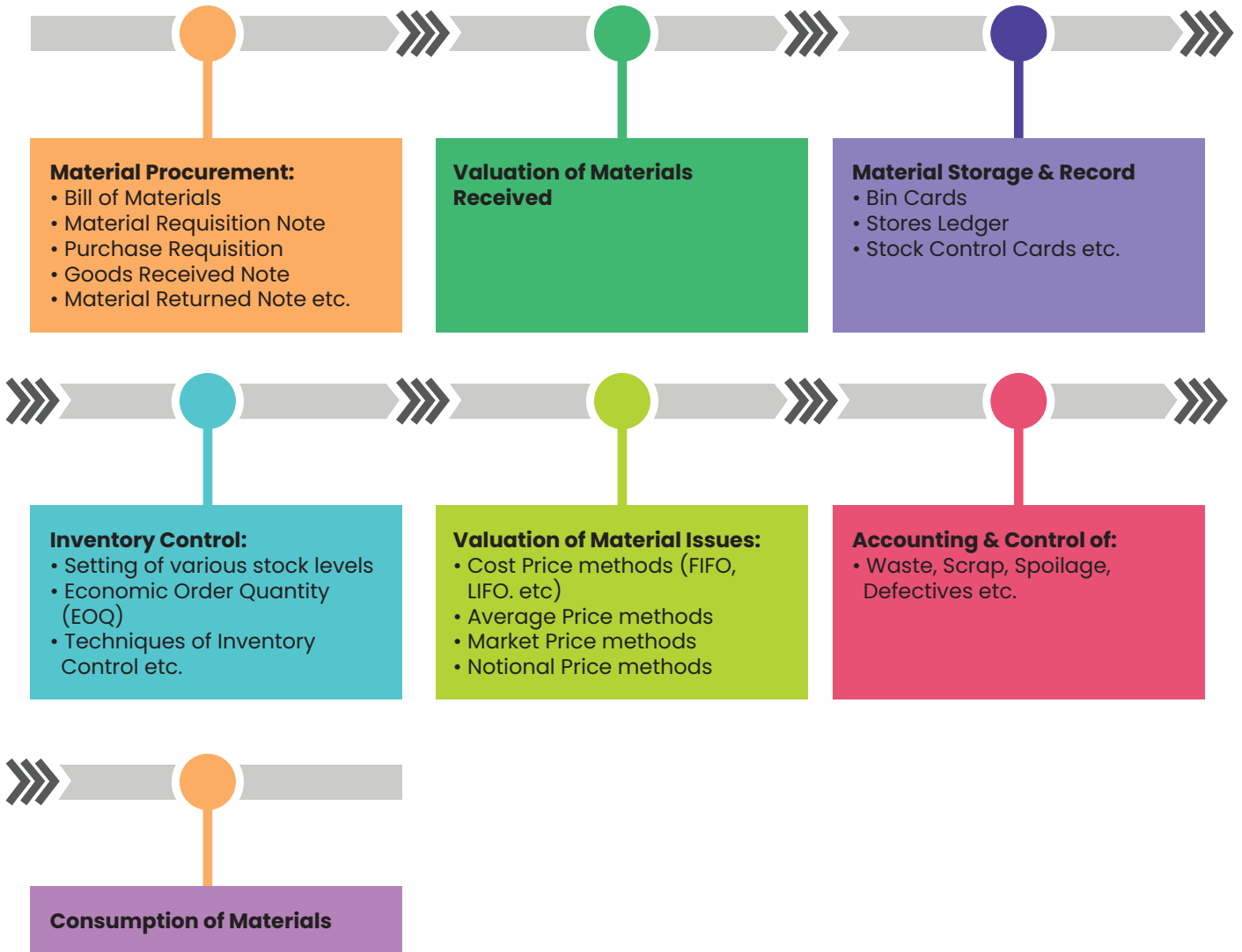
Introduction

(vi) By Cost for Managerial Decision Making

(a) Pre determined Cost	A cost which is computed in advance before production or operations start	(j) Out-of pocket Cost	It is that portion of total cost, which involves cash outflow
(b) Standard Cost	A pre-determined cost, which is calculated from managements 'expected standard of efficient operation' and the relevant necessary expenditure	(k) Shut down Costs	Those costs, which continue to be incurred even when a plant is temporarily shut-down e.g. rent, rates, depreciation, etc
(c) Marginal Cost	The amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit	(l) Sunk Costs	Historical costs incurred in the past are known as sunk costs. They play no role in decision making in the current period.
(d) Estimated Cost	The expected cost of manufacture, or acquisition, often in terms of a unit of product computed on the basis of information available in advance of actual production or purchase	(m) Absolute Cost	These costs refer to the cost of any product, process or unit in its totality.
(e) Differential Cost	It represents the change (increase or decrease) in total cost (variable as well as fixed) due to change in activity level, technology, process or method of production, etc.	(n) Discretionary Costs	Such costs are not tied to a clear cause and effect relationship between inputs and outputs.
(f) Imputed Costs	These costs are notional costs which do not involve any cash outlay.	(o) Period Costs	These are the costs, which are not assigned to the products but are charged as expenses against the revenue of the period in which they are incurred.
(g) Capitalised Costs	These are costs which are initially recorded as assets and subsequently treated as expenses.	(p) Engineered Costs	These are costs that result specifically from a clear cause and effect relationship between inputs and outputs.
(h) Product Costs	These are the costs which are associated with the purchase and sale of goods (in the case of merchandise inventory).	(q) Explicit Costs	These costs are also known as out of pocket costs and refer to costs involving immediate payment of cash. Salaries, wages, postage and telegram, printing and stationery, interest on loan etc.
(i) Opportunity Cost	is cost refers to the value of sacrifice made or benefit of opportunity foregone in accepting an alternative course of action.	(r) Implicit Costs	These costs do not involve any immediate cash payment.

Material Cost

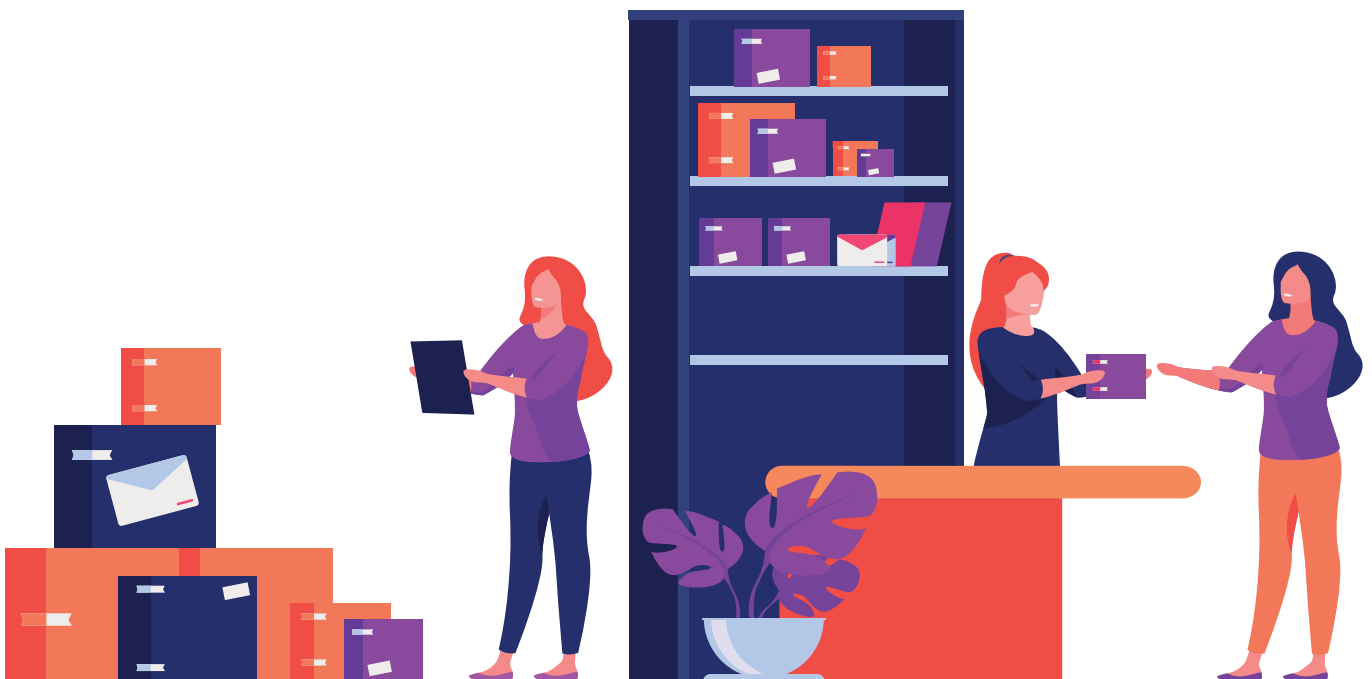
Chapter Overview



Value at Which Materials are Recorded in Stores Ledger

From the following table we can understand the procedure of calculating total value at which materials are to be recorded in stores ledger.

Particulars	Amount	Amount
Purchase Price		XXX
Additions/ Inclusions:		
Insurance charges	XXX	
Commission or brokerage	XXX	
Freight inward	XXX	
Cost of containers	XXX	
Wastage due to normal reasons	XXX	
Duties and Taxes for which no credit or refund is available	XXX	XXX
Deduction/Exclusions:		
Discount, Rebate and Subsidy	XXX	
Duties and Taxes for which credit or refund is available	XXX	
Penalties and charges	XXX	
Other expenses not borne	XXX	(xxx)
		XXX



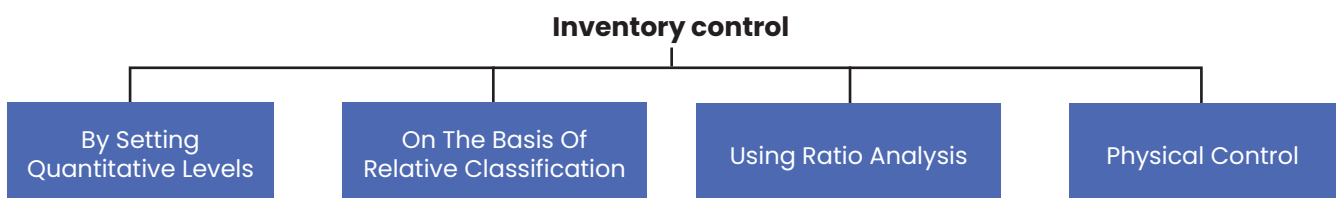
How Material is Procured?

Material requirement procedure can be understood with the help of the following diagram. We should focus on various documents in general required and also should keep in mind the departments who initiate these documents.



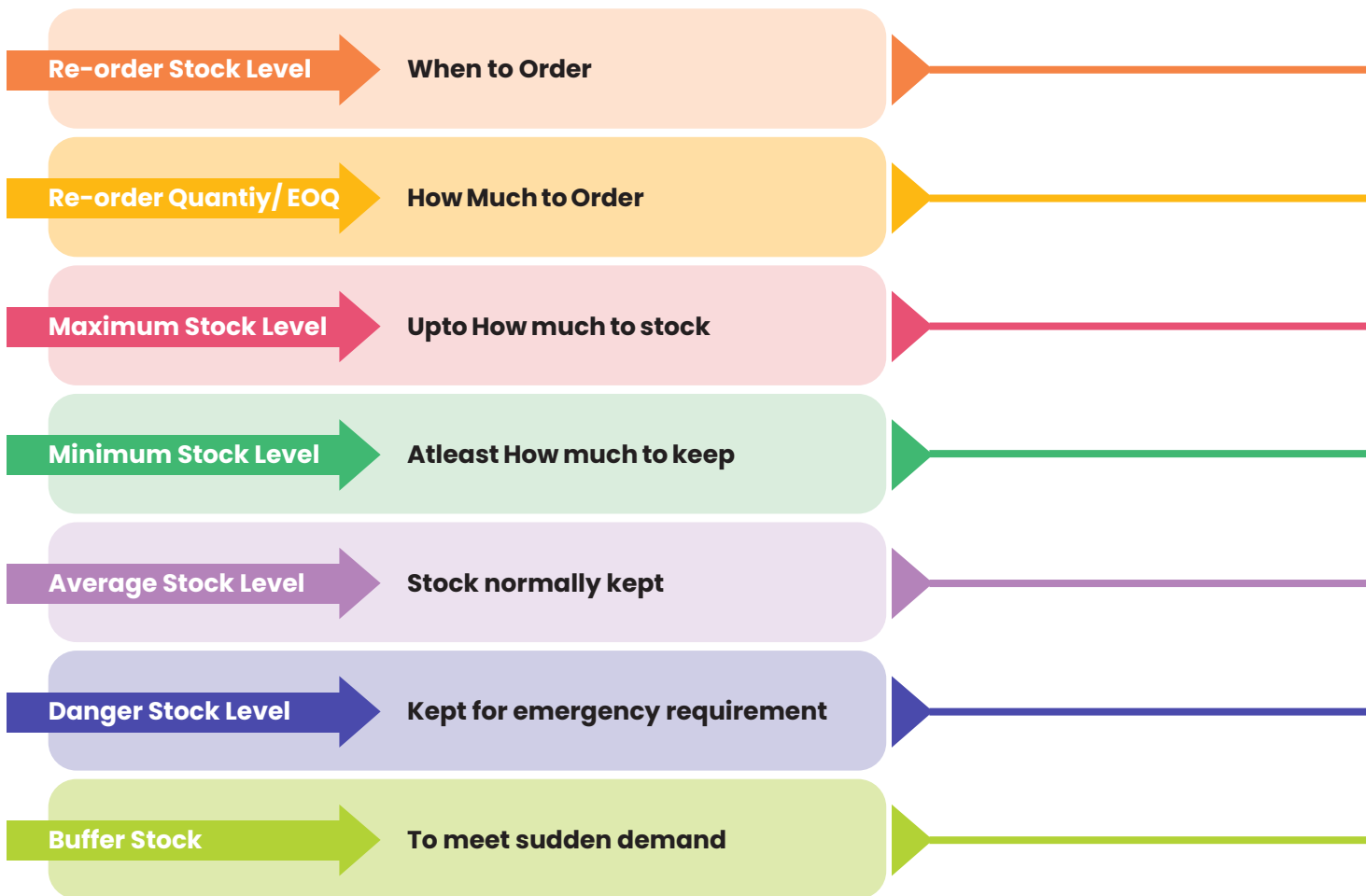
How Inventory is Controlled?

Inventory control is the function of ensuring that sufficient inventory is retained to meet all requirements. In inventory control, it is essential to balance between overstock and understock. Various techniques of inventory control are illustrated below:



Material Cost

(a) Inventory Control- By Setting Quantitative Levels



(i) **Re-order Stock Level (ROL):** Maximum Consumption × Maximum Re-order Period Or, $ROL = \text{Minimum Stock Level} + (\text{Average Rate of Consumption} \times \text{Average Re-order period})$

(ii) **Re-Order Quantity/ Economic Order Quantity (EOQ):**

$$EOQ = \sqrt{\frac{2 \times \text{Annual Requirement (A)} \times \text{Cost per order (O)}}{\text{Carrying Cost per unit per annum (C)}}$$

Just in Time (JIT) Inventory Management

JIT is a system of inventory management with an approach to have a zero inventories in stores. According to this approach material should only be purchased when it is actually required for production.



(iii) Minimum Stock Level:

Minimum Stock Level = Re-order Stock Level - (Average Consumption Rate × Average Re-order Period)

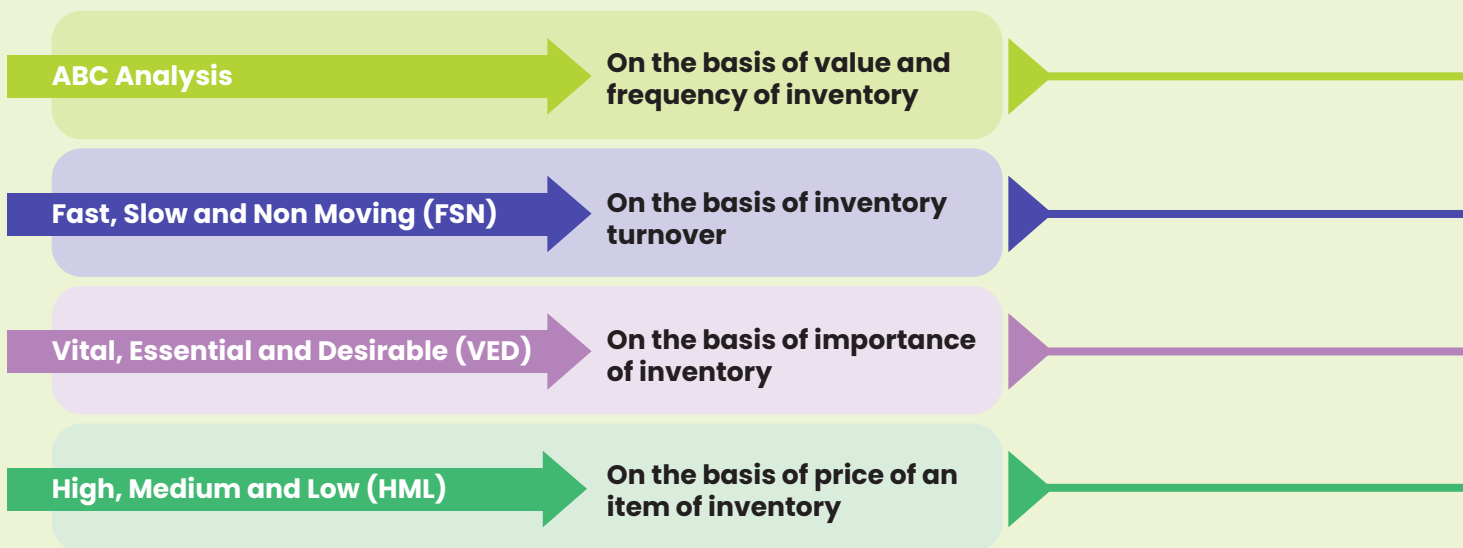
(iv) Maximum Stock Level:

Maximum Stock Level = Re-order Level + Reorder Quantity - (Minimum Consumption Rate × Minimum Re-order Period)

(v) Average Inventory Level:

Average Stock Level = Minimum Stock Level
+ 1/2 Re-order Quantity

Or
Average Stock Level = $\frac{\text{Maximum Stock Level} + \text{Minimum Stock Level}}{2}$

(b) On the basis of Relative Classification**(c) Using Ratio Analysis**

(i) Input Output Ratio: Input-output ratio is the ratio of the quantity of input of material to production and the standard material content of the actual output.

(ii) Inventory Turnover Ratio:

Inventory Turnover Ratio = $\frac{\text{Cost of materials consumed during the period}}{\text{Cost of average stock held during the period}}$

(d) Physical Control

(i) Two Bin System: Two Bin System is supplemental to the record of respective quantities on the bin card and the stores ledger card.

(ii) Establishment of system of budgets: Based on this, inventories requirement budget can be prepared. Such a budget will discourage the unnecessary investment in inventories.

(iii) Perpetual inventory records and continuous stock verification : Perpetual inventory represents a system of records maintained by the stores department in the form of Bin cards and Stores ledger.

(iv) Continuous Stock Verification: The system of continuous stock-taking consists of physical verification of items of inventory.

Valuation of Material Issue

Cost Price Methods

- Specific Price Method
- First-in First-out (FIFO) method
- Last-in-First-out (LIFO) method
- Base Stock Method

Average Price Methods

- Simple Average Price Method
- Weighted Average Price Method

Market Price Methods

- Replacement Price Method
- Realisable Price Method

Notional Price Methods

- Standard Price Method
- Inflated Price Method
- Re-use Price Method

Some of the techniques are discussed as follows:

(i) First-in First-out method (FIFO): The materials received first are to be issued first when material requisition is received. Materials left as closing stock will be at the price of latest purchases.

(ii) Last-in First-out method (LIFO): The materials purchased last are to be issued first when material requisition is received. Closing stock is valued at the oldest stock price. (Accounting Standard- 2 and Ind AS-2 do not allow LIFO method for inventory valuation, however, for academic knowledge it may be studied)

(iii) Simple Average Method:

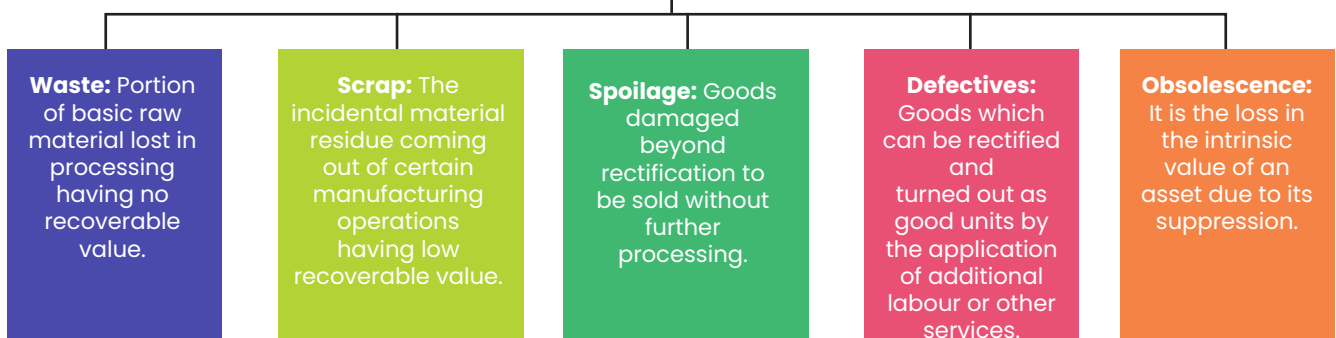
$$\text{Material Issue Price} = \frac{\text{Total of unit price of each purchase}}{\text{Total Nos of Purchases}}$$

(iv) Weighted Average Price Method: This method gives due weightage to quantities purchased and the purchase price to determine the issue price.

$$\text{Weighted Average Price} = \frac{\text{Total cost of materials in stock}}{\text{Total quantity of materials}}$$

Normal and Abnormal Loss of Materials

Loss of Material



Treatment of Loss of Material**(i) Treatment of Waste**

Normal- Cost of normal waste is absorbed by good production units.

Abnormal- The cost of abnormal loss is transferred to Costing Profit and loss account.

(ii) Treatment of Scrap

Normal- The cost of scrap is borne by good units and income arises on account realisable value is deducted from the cost.

Abnormal- The scrap account should be charged with full cost. The credit is given to the job or process concerned. The profit or loss in the scrap account, on realisation, will be transferred to the Costing Profit and Loss Account.

(iii) Treatment of Spoilage

Normal- Normal spoilage (i-e., which is inherent in the operation) costs are included in costs either charging the loss due to spoilage to the production order or by charging it to production overhead so that it is spread over all products.

Abnormal- The cost of abnormal spoilage (ie., arising out of causes not inherent in manufacturing process) is charged to the Costing Profit and Loss Account.

(iv) Treatment of Defectives:

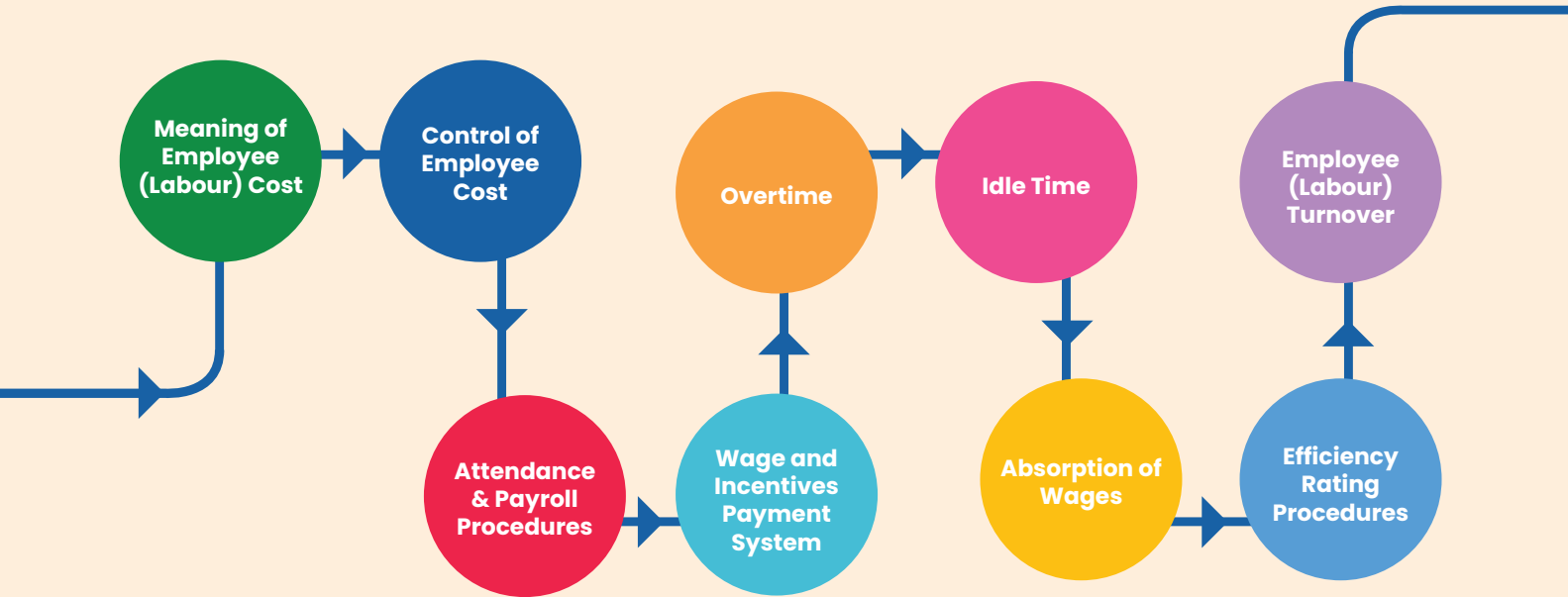
Normal- The cost less realisable value on sale of defectives are charged to material cost of good production.

Abnormal- The material cost of abnormal loss is transferred to costing profit and loss account.

(v) Treatment of Obsolescence: The value of the obsolete material held in stock is a total loss and immediate steps should be taken to dispose it off at the best available price. The loss arising out of obsolete materials on abnormal loss does not form part of the cost of manufacture.

Employee Cost and Direct Expenses

Points of Discussion

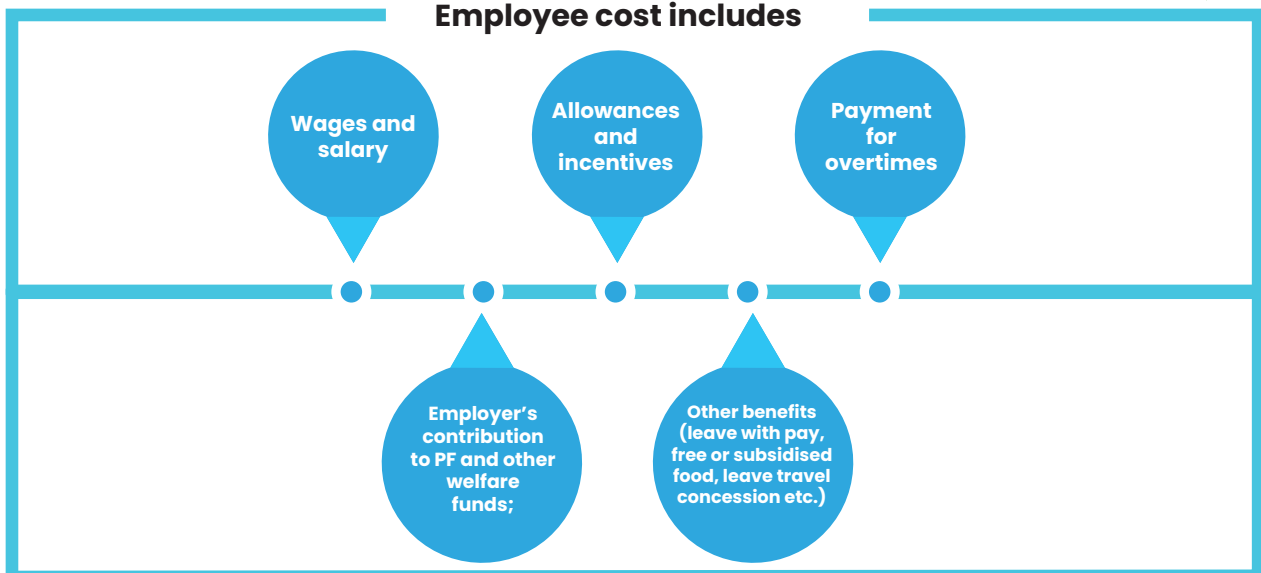


Meaning of Employee (Labour) Cost

Employee (Labour) Cost

- Benefits paid or payable to the employees of an entity, whether permanent, or temporary for the services rendered by them.
- Includes payments made in cash or kind.

Employee cost includes



Classification of Employee cost:



Direct employee cost	Indirect employee cost
1. Cost of employees, directly engaged in the production process.	1. Cost of employees who are not directly engaged in the production process.
2. Easily identifiable and allocable to cost unit.	2. Apportioned on some appropriate basis.
3. Varies with the volume of production and has positive relationship with the volume.	3. May not vary with the volume of production.

Employee Cost Control

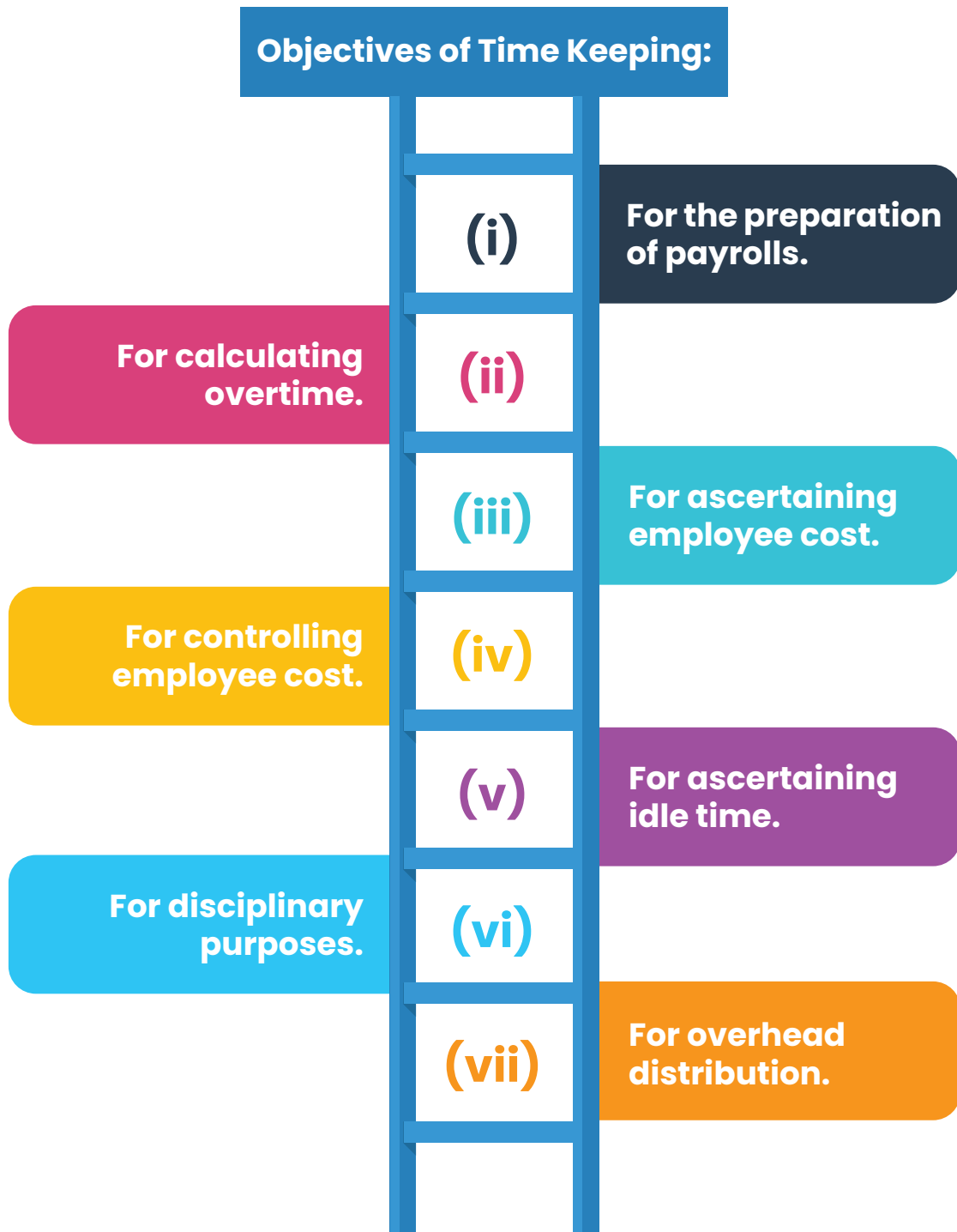
Employee (Labour) Cost Control

- To control over the cost incurred on employees.
- To keep the wages per unit of output as low as possible.
- To give the employees an appropriate compensation and encourage efficiency.

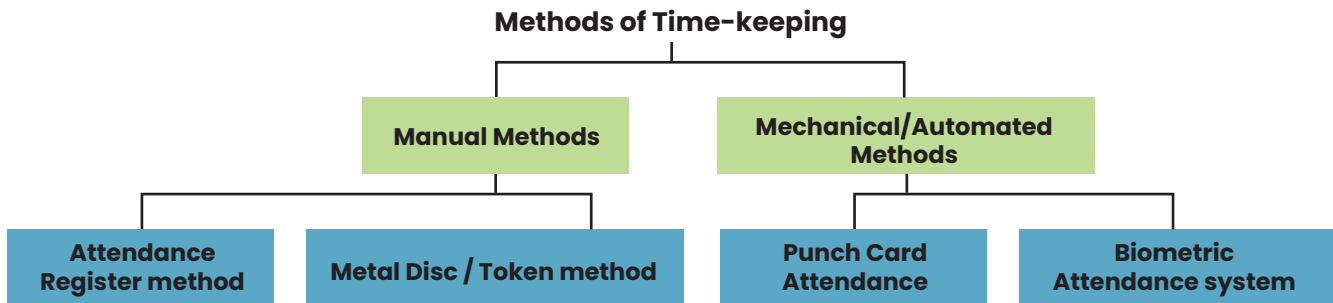
Factors for the Control of Employee Cost:



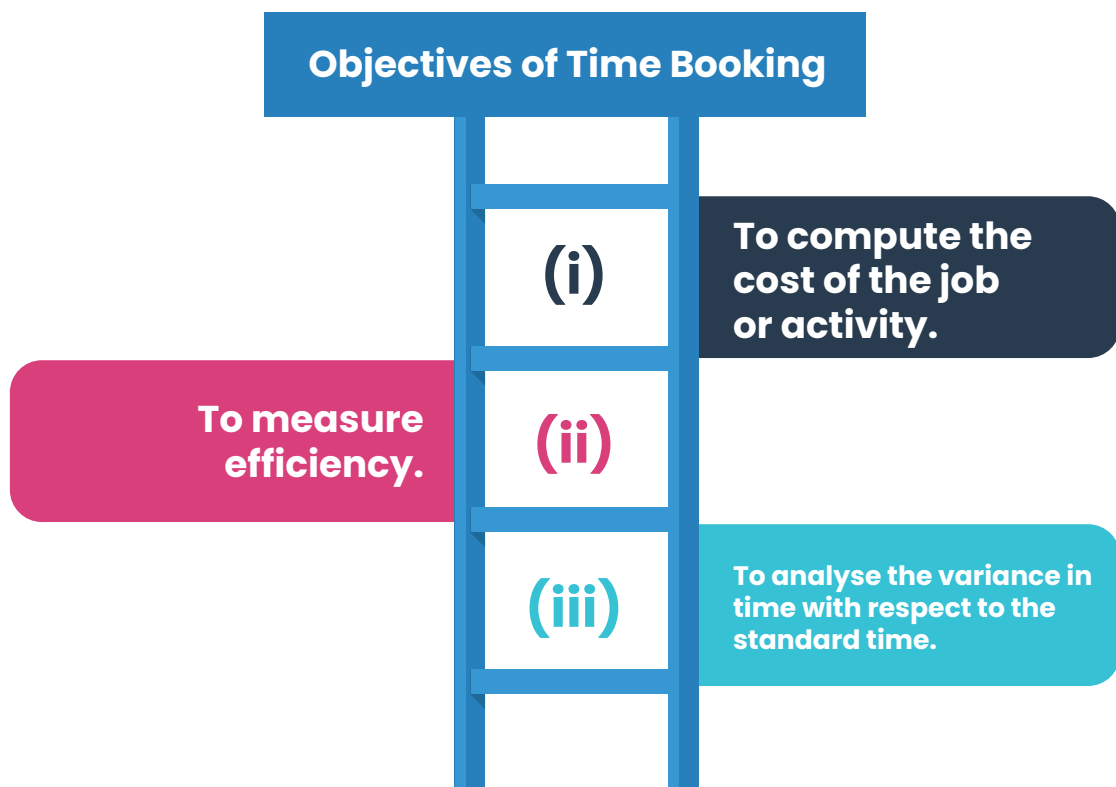
Time-keeping: A record of total time spent by the employees in a factory.



Methods of Time-keeping

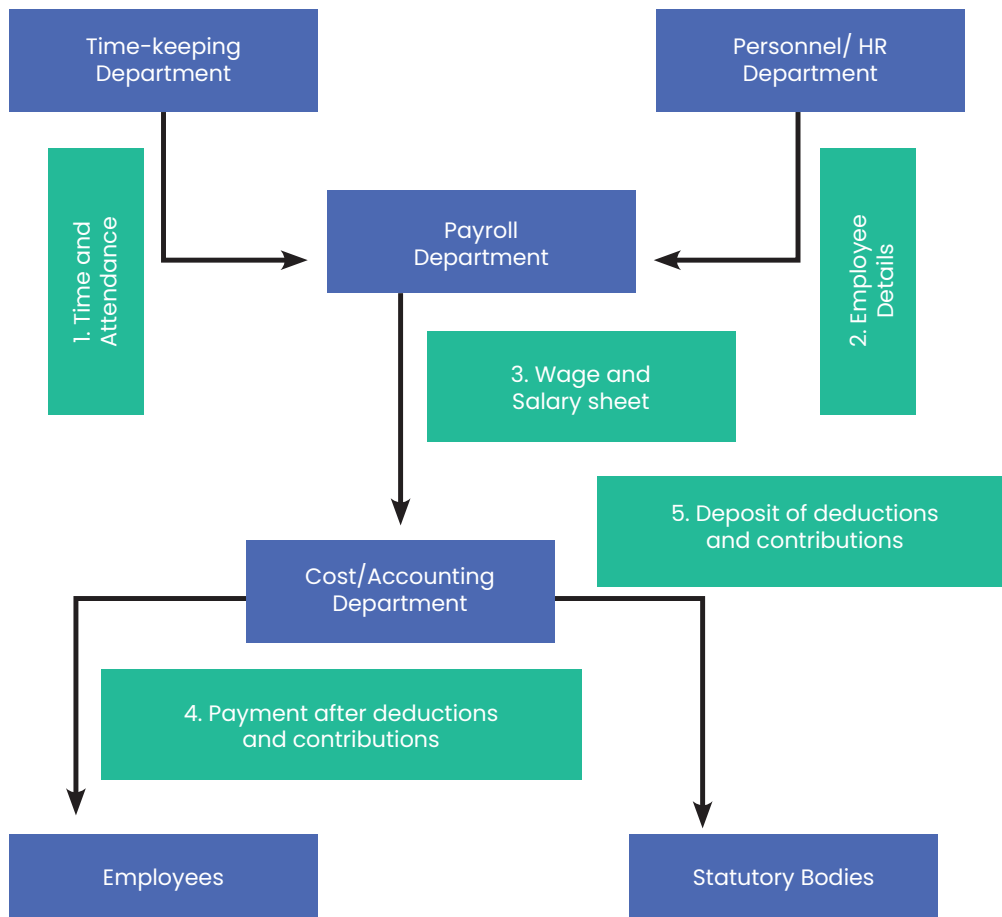


Time-Booking: A method wherein each activity of an employee is recorded.



For collection of all such data, a separate record, generally known as Time (or Job) card, is kept.

Payroll Procedures of Employees



Step 1

• Attendance and Time details:

Detailed sheet of number of days or hours worked by each employee as reflected by the time keeping methods are sent to the payroll department.

Step 2

• List of employees and other details:

List of employees on roll and the rate at which they will be paid is sent by the personnel/ HR department.

Step 3

• Computation of wages and other incentives:

Payroll department prepares pay slip and forward the same to the cost/ accounting department.

Step 4

• Payment to the employees:

After all deductions (like PF, ESI, TDS), wages/salary is paid to the employees.

Step 5

• Deposit of all statutory liabilities:

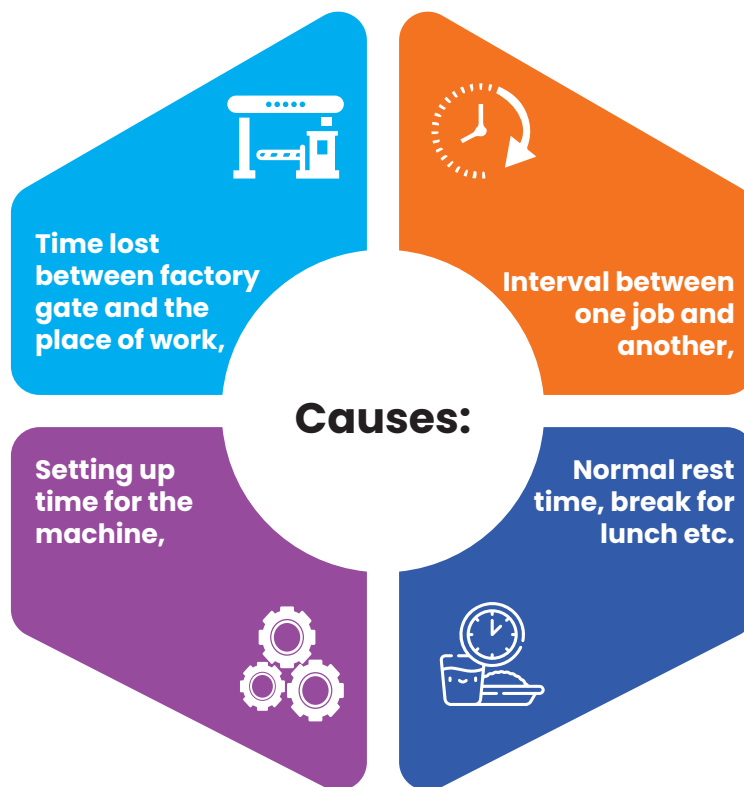
All statutory deductions are paid to the respective statutory bodies & funds.

Idle Time

The time during which no production is carried-out because the worker remains idle but are paid.



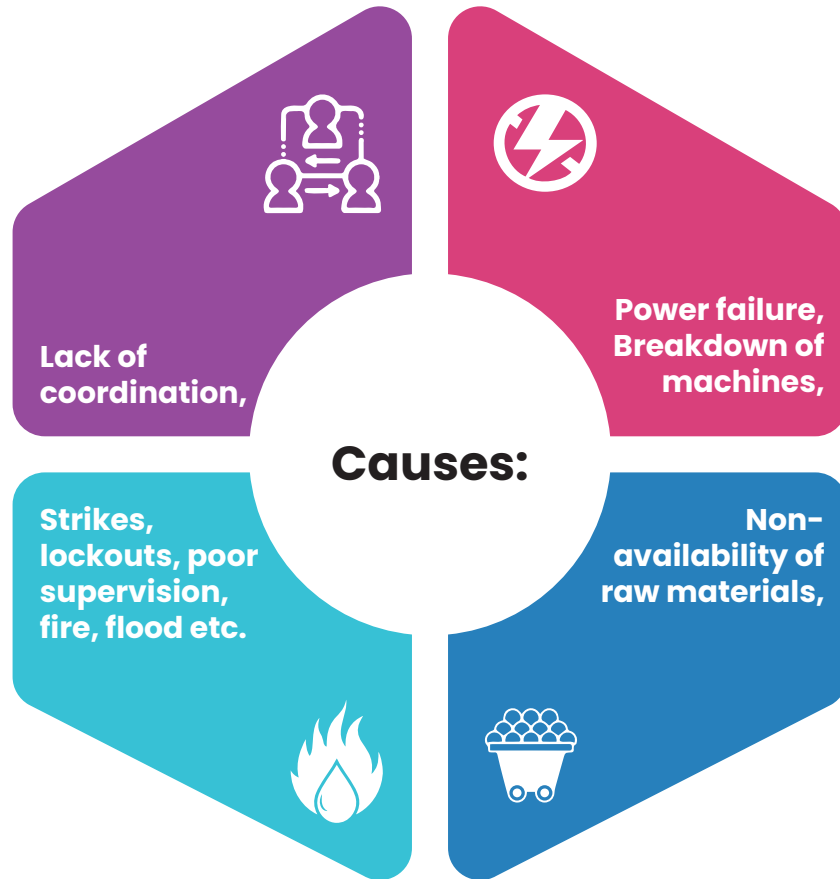
Normal Idle Time: Time which cannot be avoided or reduced in the normal course of business.



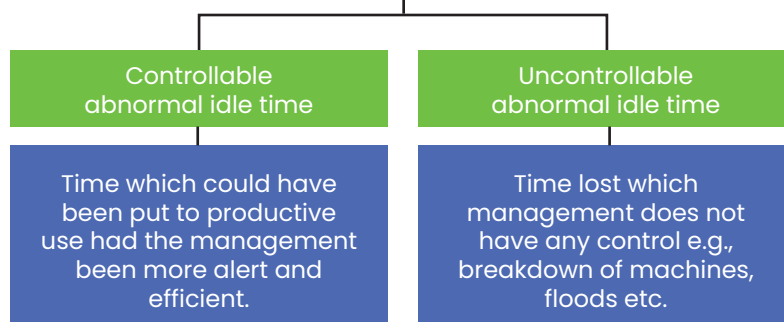
Treatment of Normal Idle Time

- Treated as a **part of cost of production.**
- In the case of **direct workers** an allowance for normal idle time is considered while **setting of standard hours** or standard rate.
- In case of **indirect workers**, normal idle time is considered for the **computation of overhead rate.**

Abnormal Idle Time: Apart from normal idle time, there may be factors which give rise to abnormal idle time.



Causes further analysed into



Treatment of Abnormal Idle time

- **Not included in production cost.**
- Shown as a **separate item** in the **Costing Profit and Loss** Account.
- For each category i.e. **controllable and uncontrollable** idle time, the **break-up** of cost due to various factors should be **separately shown**.
- **Management** should aim at **eliminating controllable idle time**.

Overtime

Overtime: Work done beyond normal working hours.

Overtime Payment



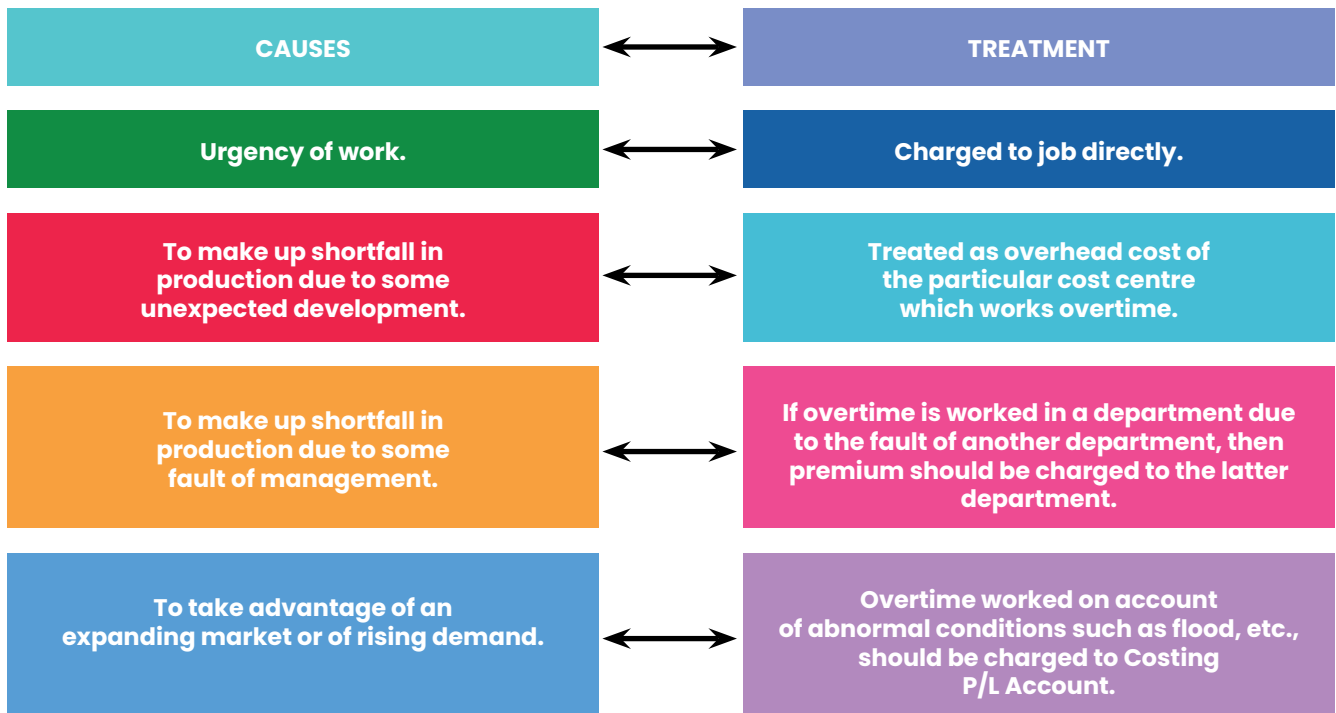
Wages paid for overtime at normal rate



Premium (extra) payment for overtime work

Overtime premium:

Extra amount so paid over the normal rate



Systems of Wage Payment and Incentives

System of Wages Payment

Time based

Output based

Combination of time and output based

Premium Bonus method

Group bonus scheme

Incentives for indirect workers

Employee Cost and Direct Expenses

Time based (Time Rate System):

Workers are paid on time basis i.e. hour, day, week, or month.

$$\text{Wages} = \text{Time Worked (Hours/ Days/ Months)} \times \text{Rate for the time}$$

Output Based (Piece Rate System):

Each operation, job or unit of production is termed a piece.
A rate of payment, is fixed for each piece.
The wages of the worker depend upon his output and rate of each unit of output.

$$\text{Wages} = \text{Number of units produced} \times \text{Rate per unit}$$

Premium Bonus Method:

The worker is guaranteed his daily wages, if output is below and up to standard.
In case the task is completed in less than the standard time, the saved time is shared between the employees and the employer.

Halsey Premium Plan

- A standard time is fixed for each job or process
- Worker gets his time rate even if he exceeds the standard time limit, since his day rate is guaranteed.
- If job done in less than the standard time, bonus equal to 50 percent of the wages of time saved is paid.

$$\text{Wages} = \text{Time taken} \times \text{Time rate} + 50\% \text{ of time saved} \times \text{Time rate}$$

Advantages Of Halsey Premium Plan

- Time rate is guaranteed.
- Opportunity for increasing earnings by increasing production.
- System is equitable in as much as the employer gets a direct return for his efforts in improving production methods.

Disadvantages Of Halsey Premium Plan

- Incentive is not so strong as with piece rate system.
- Harder the worker works, the lesser he gets per piece.
- Sharing principle may not be liked by employees.

Rowan Premium Plan

- **Standard time allowance is fixed for performance of a job.**
- **Bonus is paid if time is saved.**
- **Bonus is that proportion of the time wages as time saved bears to the standard time.**

$$\text{Time taken} \times \text{Rate per hour} + \frac{\text{Time Saved}}{\text{Time Allowed}} \times \text{Time taken} \times \text{Rate per hour}$$

Advantages Of Rowan Premium Plan

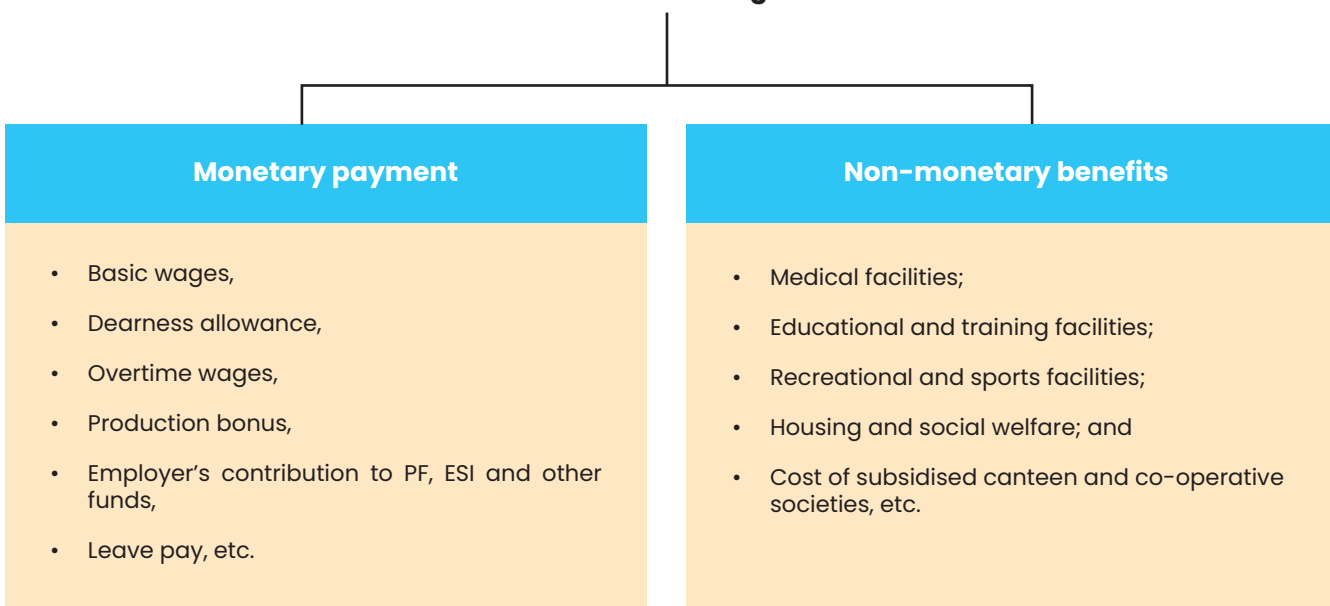
- A worker can **never double his earnings even if there is bad rate setting.**
- Suitable for **encouraging moderately efficient workers.**
- Sharing principle **appeals to the employer** as being equitable.

Disadvantages Of Rowan Premium Plan

- System is a **bit complicated.**
- Incentive is **weak at a high production level where the time saved is more than 50% of the time allowed.**
- Sharing principle is **not generally welcomed by employees.**

Absorption of Wages

Elements Of Wages



Employee Cost and Direct Expenses

Efficiency Rating Procedures

If the time taken by a worker on a job is less than the standard time, then he is rated efficient.

$$\text{Efficiency in \%} = \frac{\text{Time allowed as per standard}}{\text{Time Taken}} \times 100$$

Need for Efficiency rating:



Factors for increasing Employee productivity:

Employing who possess right type of skill.

Placing the right type of person in the right job.

Training young and old workers by providing right types of opportunities.

Taking appropriate measures to avoid the situation of excess or shortage of employees.

Carrying out work study for fixation of wages.

Employee (Labour) Turnover

Employee Turnover

Rate of change in the composition of employee force during a specified period measured against a suitable index.

Methods to calculate Employee Turnover

Replacement Method

This considers actual replacement of employees irrespective of number of persons leaving the organisation

Separation Method

This considers total number of employees separated

Flux Method

This considers both the number of replacements as well as the number of separations

$$\text{Replacement method} = \frac{\text{Number of employees Replaced during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

$$\text{Separation method} = \frac{\text{Number of employees Separated during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

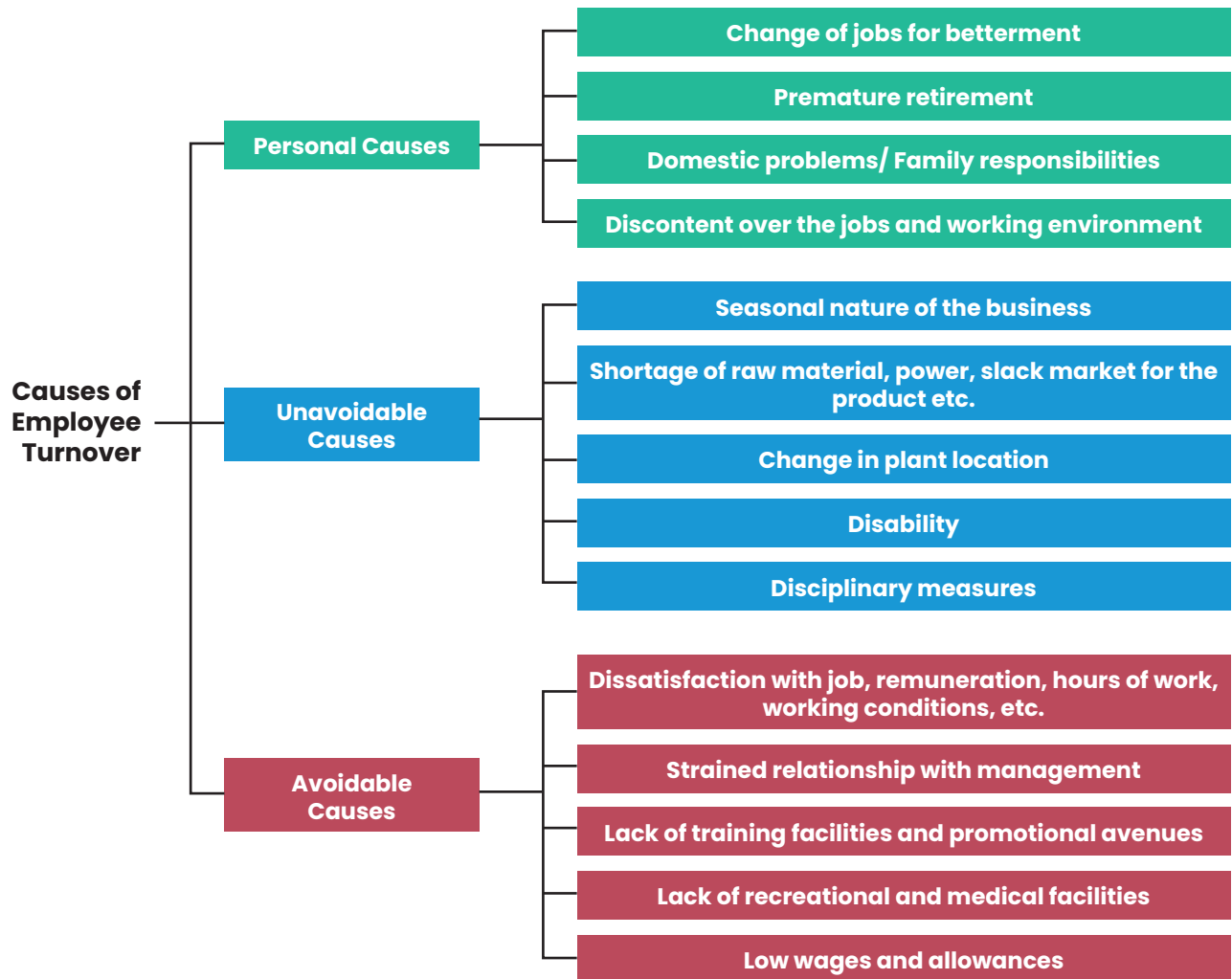
$$\text{Flux method} = \frac{\text{Number of employees Separated} + \text{Number of employees Replaced during the period}}{\text{Average number of employees during the period on roll}} \times 100$$

Or

$$\frac{\text{No. of Separations} + \text{No. of Accessions} \text{ (i.e. No. of Replacements} + \text{No. of New Joinings)}}{\text{Average no. of employees during the period on roll}} \times 100$$

Newly recruited employees are also responsible for changes in the composition or work force, some management accountants fail to take new recruitment for calculating employee turnover. The total number of workers joining, including replacements, is called accessions.

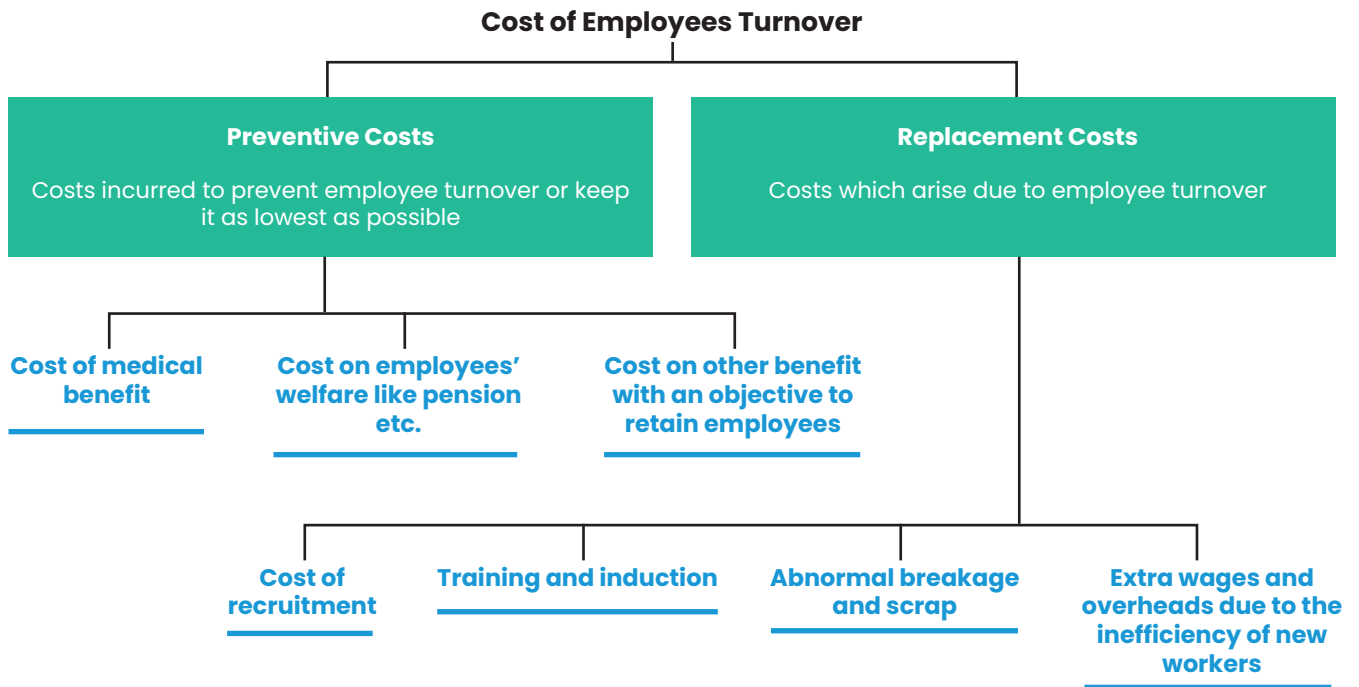
Causes of Employee Turnover:



Effects of Employee Turnover:

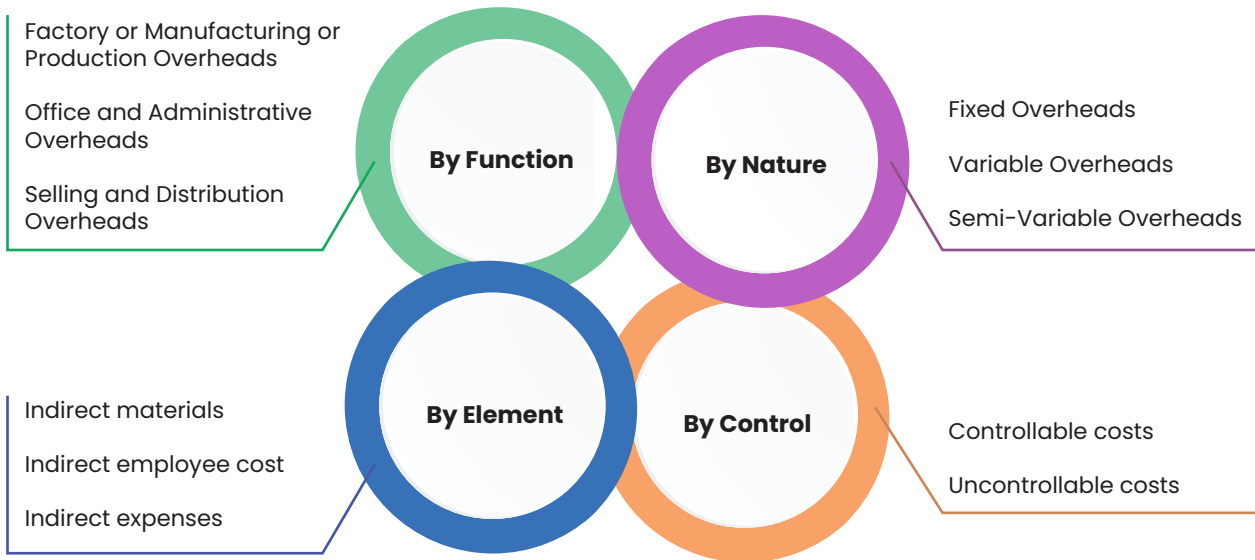
- Even flow of production is disturbed
- Efficiency of new workers is low
- Increased cost of training
- New workers cause increased breakage of tools
- Cost of recruitment

Cost of Employee Turnover:



Classification of Overheads

Overheads are the expenditure which cannot be identified with a particular cost unit. Overheads can be classified as under.



Functional Classification of Overheads

One of the most important ways of classifying overheads is as per their function. As per this classification overheads are classified as under.

Indirect cost incurred for manufacturing or production activity in a factory. Manufacturing overhead includes all expenditures incurred from the procurement of materials to the completion of finished product.

Factory or Manufacturing or Production Overheads

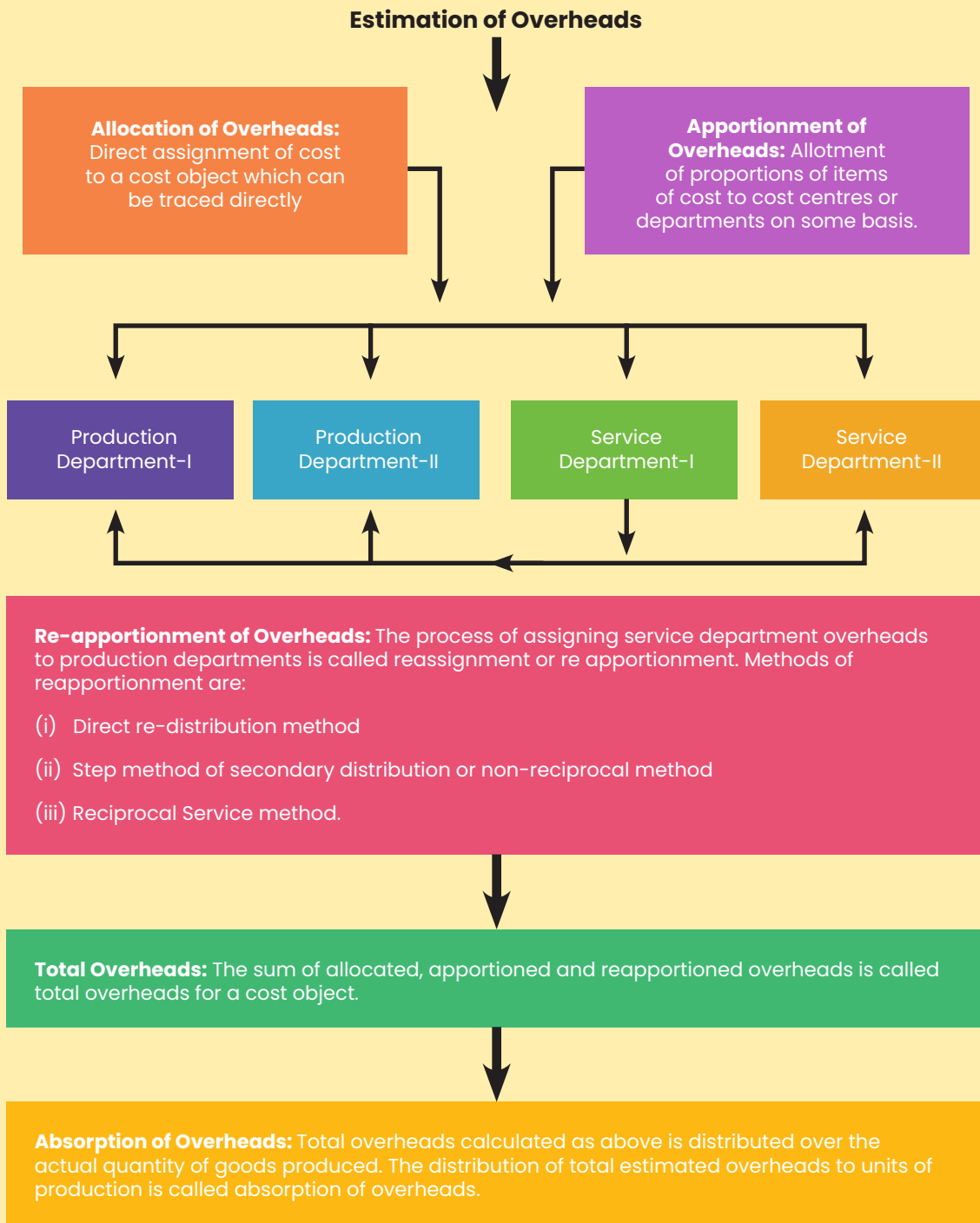
Expenditures incurred on all activities relating to general management and administration of an organisation. It includes formulating the policy, directing the organisation and controlling the operations of an undertaking which is not related directly to production, selling, distribution, research or development activity or function.

Office and Administrative Overheads

- i) Selling overheads: expenses related to sale of products and include all indirect expenses in sales management for the organisation.
- (ii) Distribution overhead: cost incurred on making product available for sale in the market.

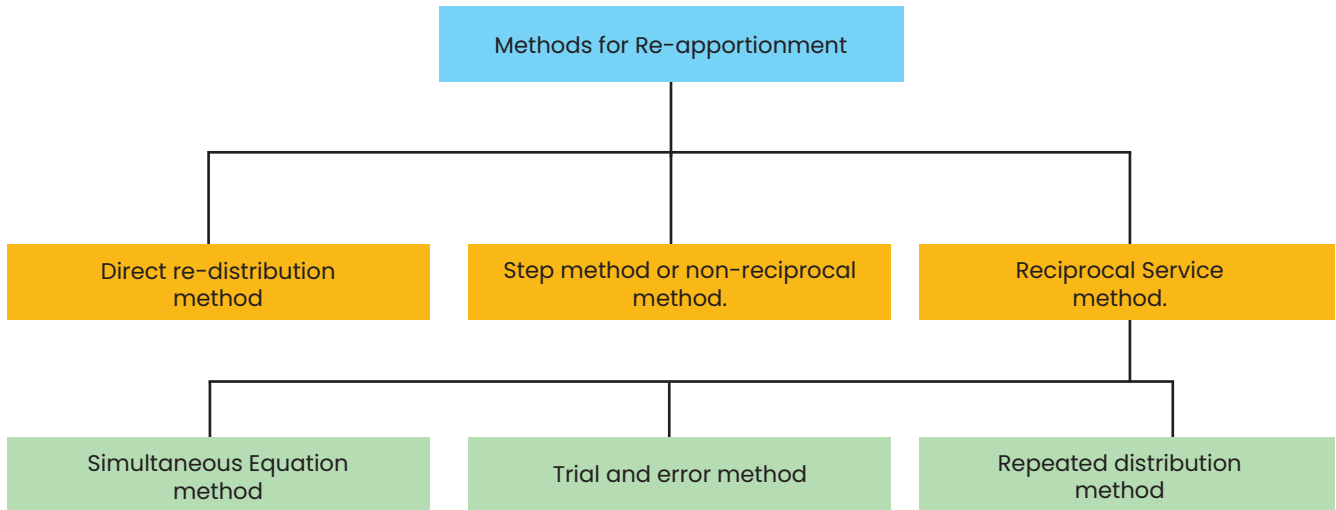
Selling and Distribution Overheads

Steps for Distribution of Overheads



Methods for Re-apportionment of Overheads

The re-apportionment of service department expenses over the production departments may be carried out by using any one of the following methods:



Methods of Absorbing Overheads to various Products or Jobs

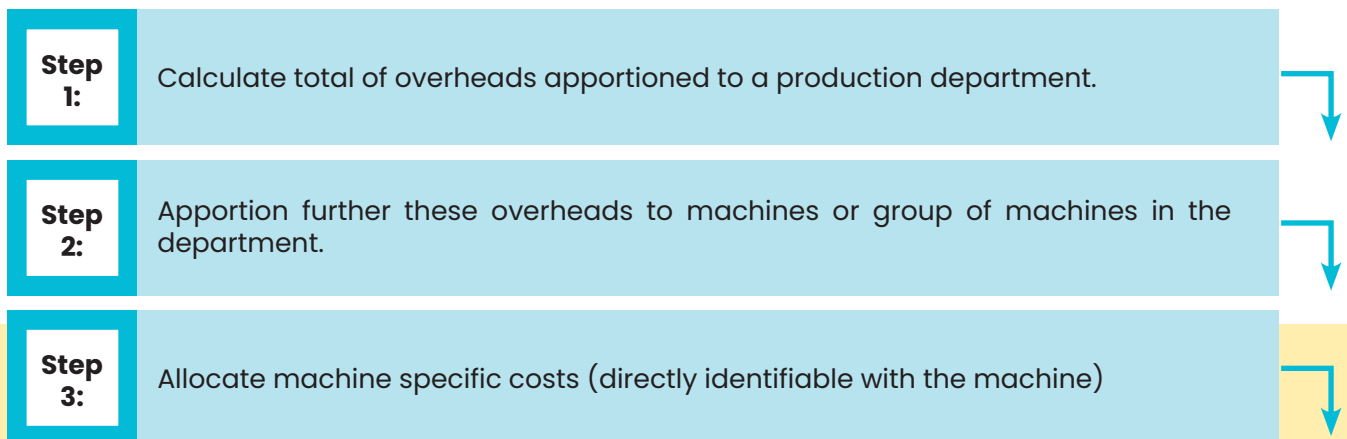
Several methods are commonly employed either individually or jointly for computing the appropriate overheads rate. The more common of these are:

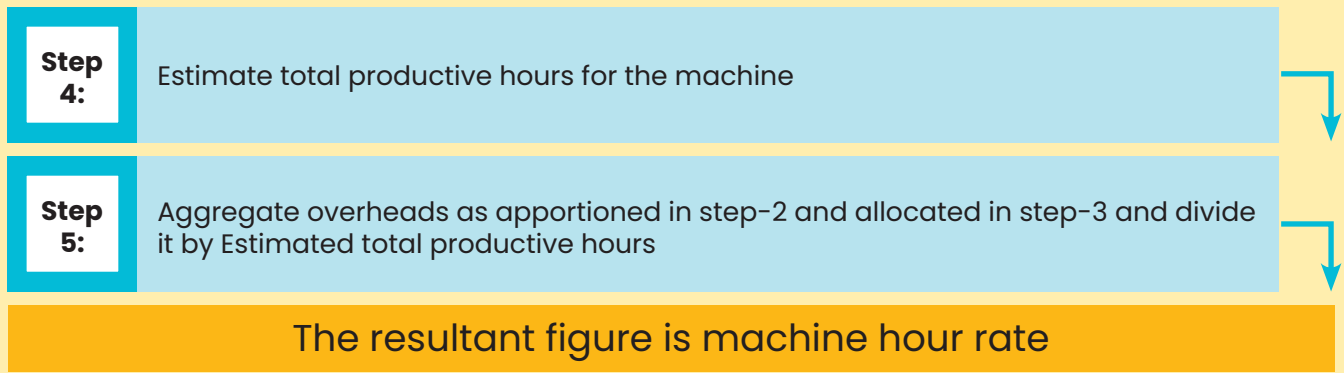


Machine hour rate

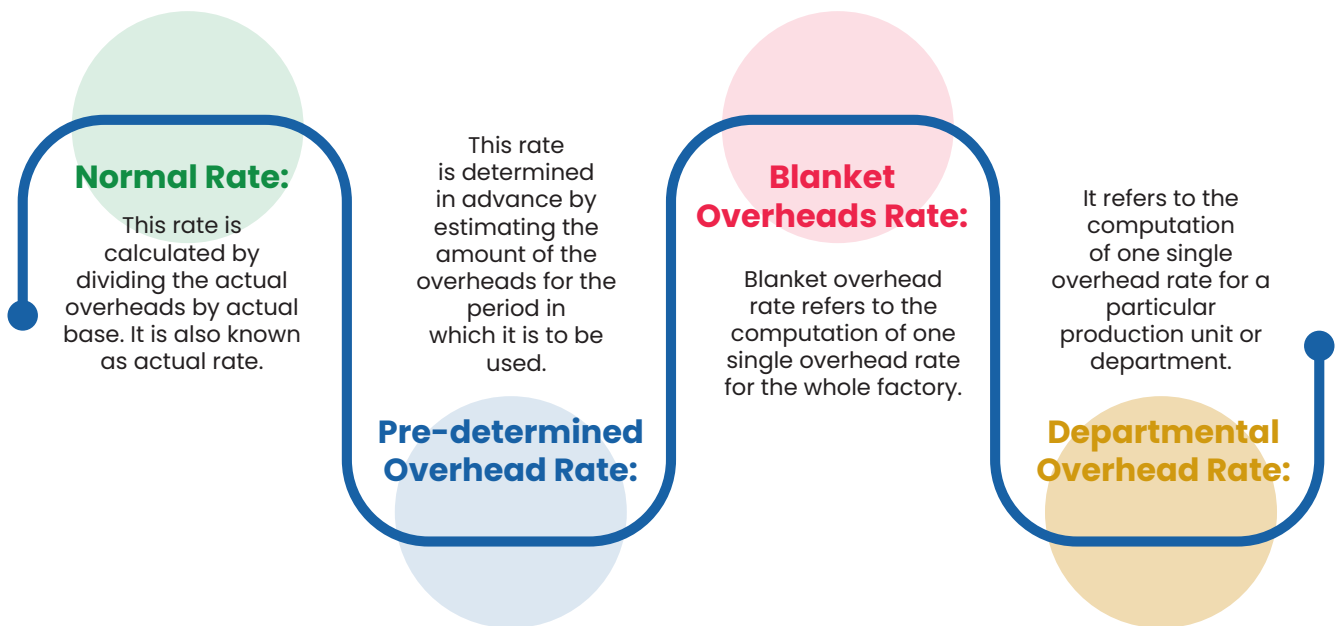
Machine hour rate implies, cost of running a machine for an hour to produce goods.

The steps involved in determining of Machine hour rate is as follows:

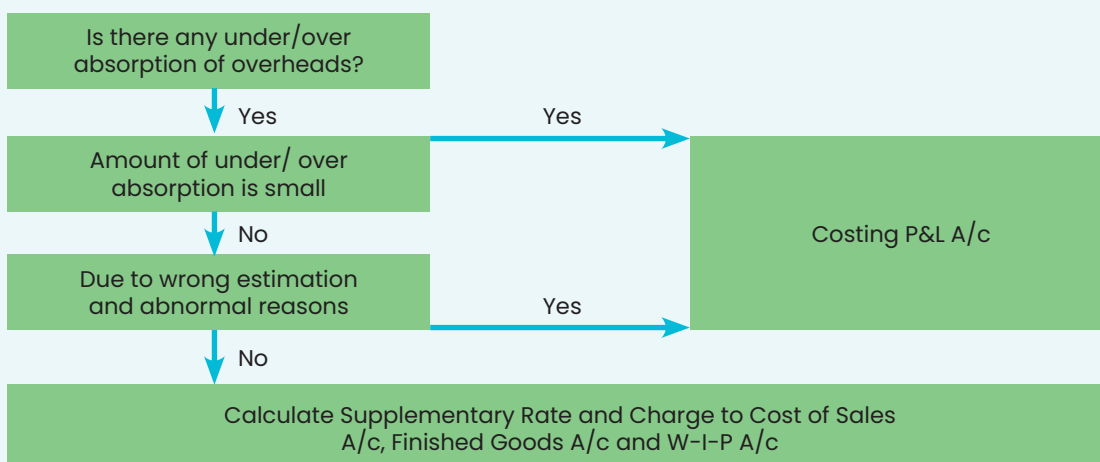




Types of Overheads Rates



Treatment of Under-absorption and Overabsorption of overheads in Cost Accounting



Concepts related with Capacity

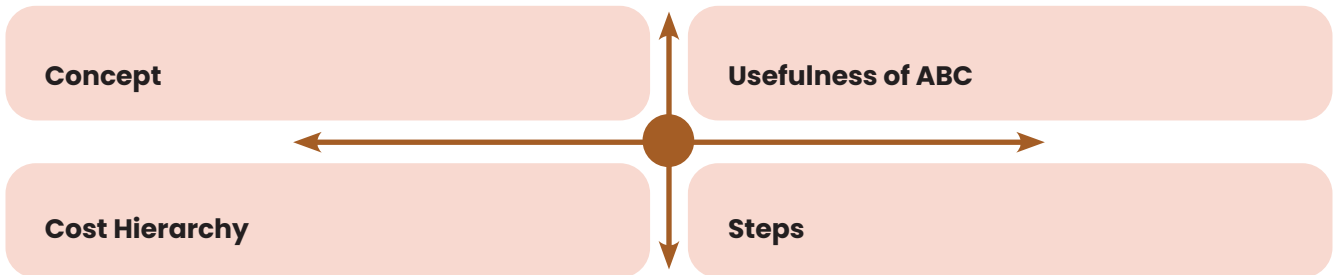


Treatment of Certain Items in Cost Accounting

Interest and financing charges	It includes any payment in nature of interest for use of non- equity funds and incidental cost that an entity incurs in arranging those funds. Interest and financing charges shall be presented in the cost statement as a separate item of cost of sales.
Packing expenses	Cost of primary packing necessary for protecting the product or for convenient handling, should become a part of cost of production. The cost of packing to facilitate the transportation of the product from the factory to the customer should become a part of the distribution cost.
Fringe benefits	These indirect benefits stand to improve the morale, loyalty and stability of employees towards the organisation. If the amount of fringe benefit is considerably large, it may be recovered as direct charge by means of a supplementary wage or labour rate; otherwise these may be collected as part of production overheads.
Research and Development expenses	<p>If research is conducted in the methods of production, the research expenses should be charged to the production overhead; while the expenditure becomes a part of the administration overhead if research relates to administration. Similarly, market research expenses are charged to the selling and distribution overhead.</p> <p>Development costs incurred in connection with a particular product should be charged directly to that product. Such expenses are usually treated as "deferred revenue expenses," and recovered as a cost per unit of the product when production is fully established.</p>

Activity Based Costing

Points Of Discussion

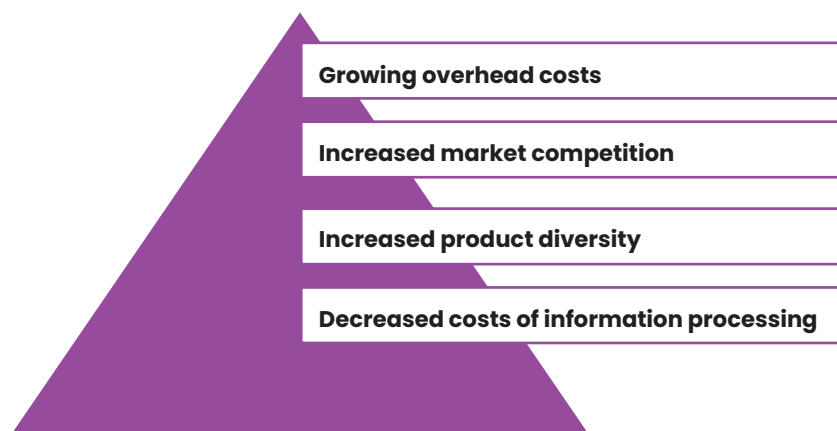


Meaning Of Activity Based Costing

Activity Based Costing (ABC)

- Accounting methodology that assigns costs to activities rather than products or services.
- Costs are assigned based on their use of resources.
- Creates a LINK BETWEEN THE ACTIVITY (resource consumption) and the COST OBJECT.
- Useful to the ORGANIZATION WITH MULTIPLE PRODUCTS.

Factors Prompting Development Of ABC



Usefulness/Suitability Of ABC

ABC is particularly needed in the following situations:

High amount of overhead

Wide range of products

Presence of non-volume related activities

Stiff competition

Advantages And Disadvantages Of ABC

Advantages

- More accurate costing.
- Overhead allocation is done on logical basis.
- Enables better pricing policies.
- Utilizes unit cost rather than just total cost.
- Helps to identify non-value added activities.
- Helpful to the organizations with multiple products.
- Highlights problem areas which require attention of the management.

Disadvantages

- Expensive
- Not helpful to the small organizations.
- May not be applied to organizations with limited products.
- Selection of the most suitable cost driver may be difficult or complicated.

Terms Used

(i) Activity

- Event that incurs cost.

(ii) Cost Object

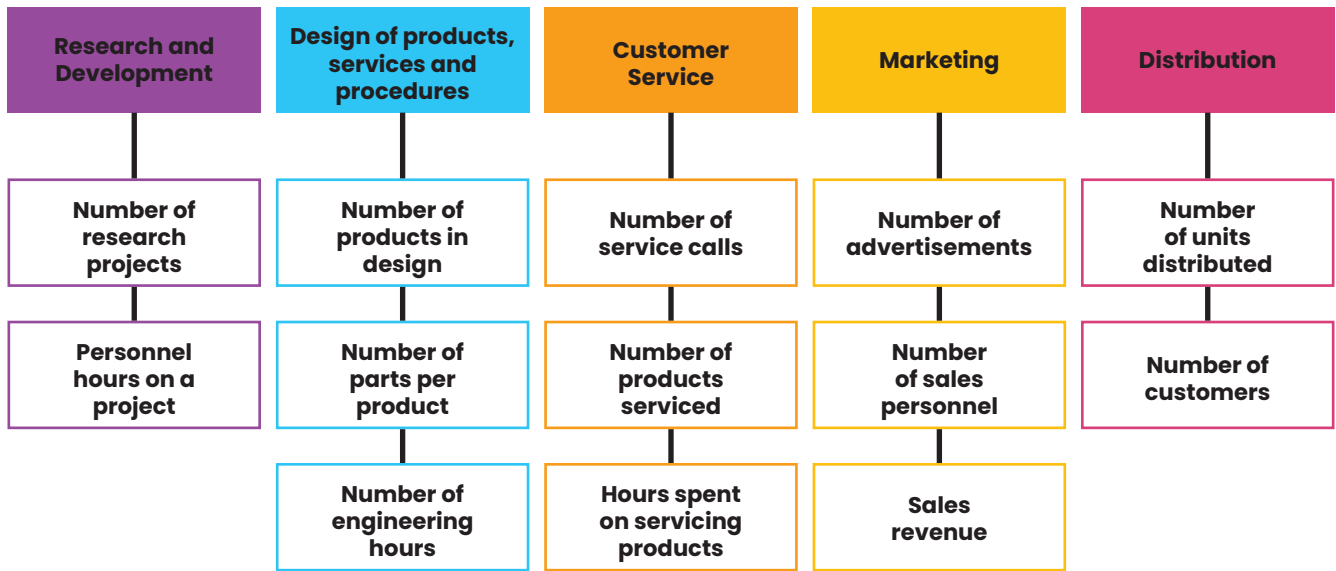
- An item for which cost measurement is required

(iii) Cost Driver

- Factor that causes a change in the cost of an activity-
 - **Resource cost driver:** Measure of the quantity of resources.
 - **Activity cost driver:** Measure of the frequency and intensity of demand.

Activity Based Costing

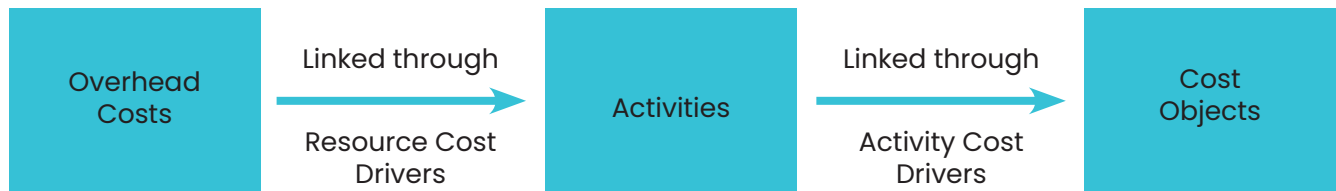
Examples of Cost Driver business function wise:



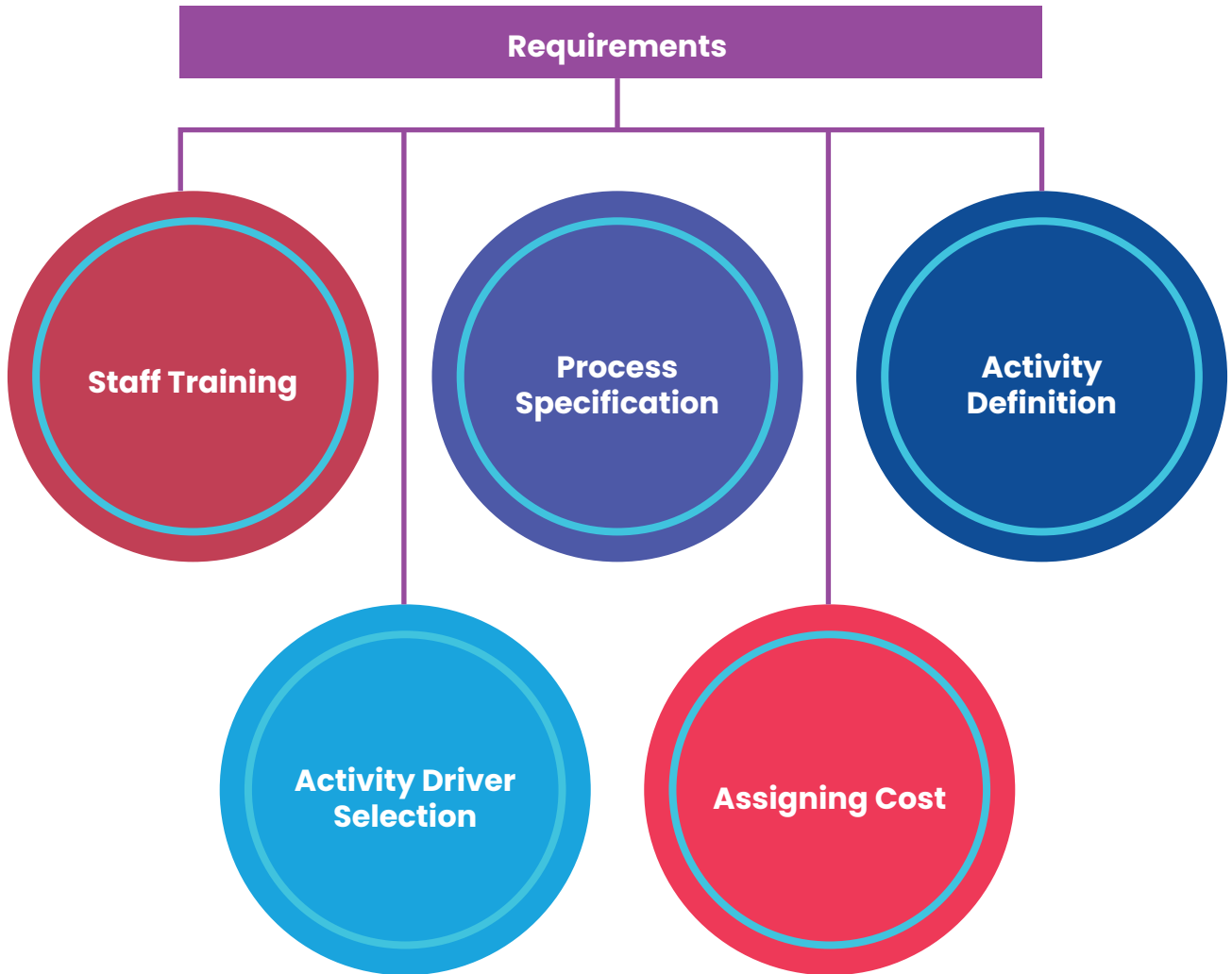
(iv) Cost Pool

- Group of various individual cost items.
- after Example machine set-up.

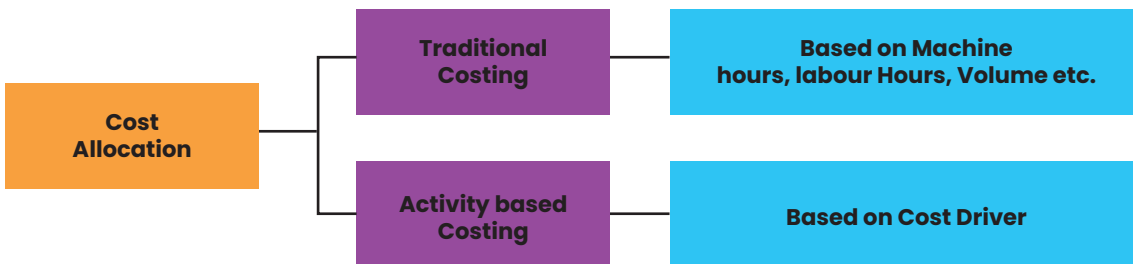
Cost Allocation



Requirements In ABC Implementation



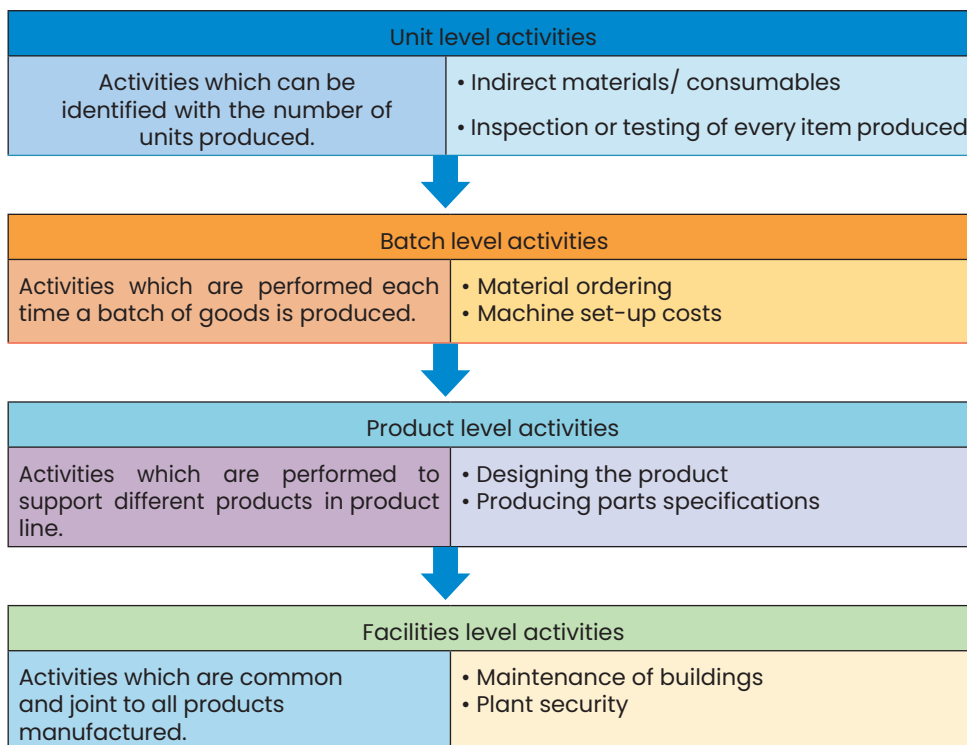
Traditional Absorption Costing Vs ABC



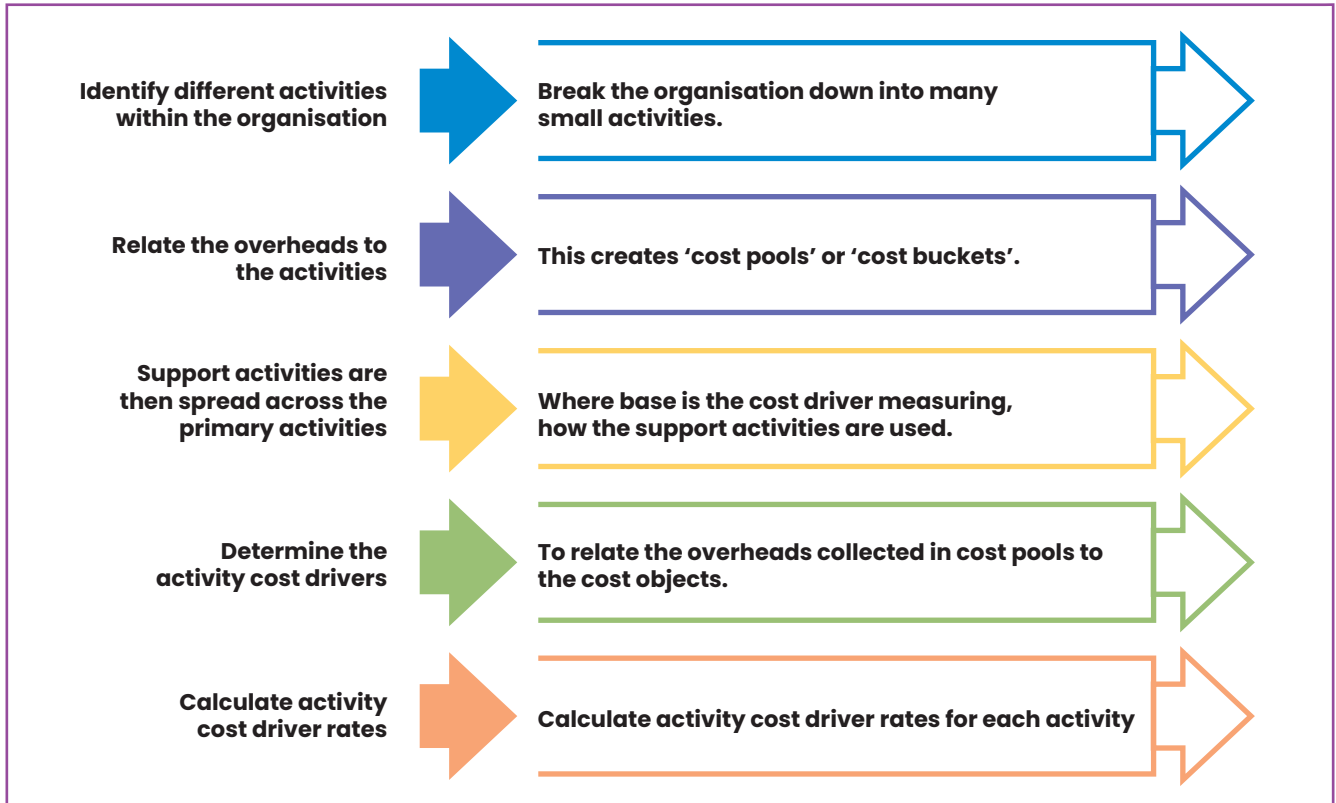
Activity Based Costing

Activity Based Costing	Traditional Absorption Costing
Related to activities	Related to cost centers
More realistic	Not realistic
Activity-wise cost drivers	Time (hours) - only cost driver
Cost are assigned to cost objects	Costs are assigned to cost units
Aids cost control	Not suitable for cost control.

LEVEL OF ACTIVITIES UNDER ABC METHODOLOGY/COST HIERARCHY

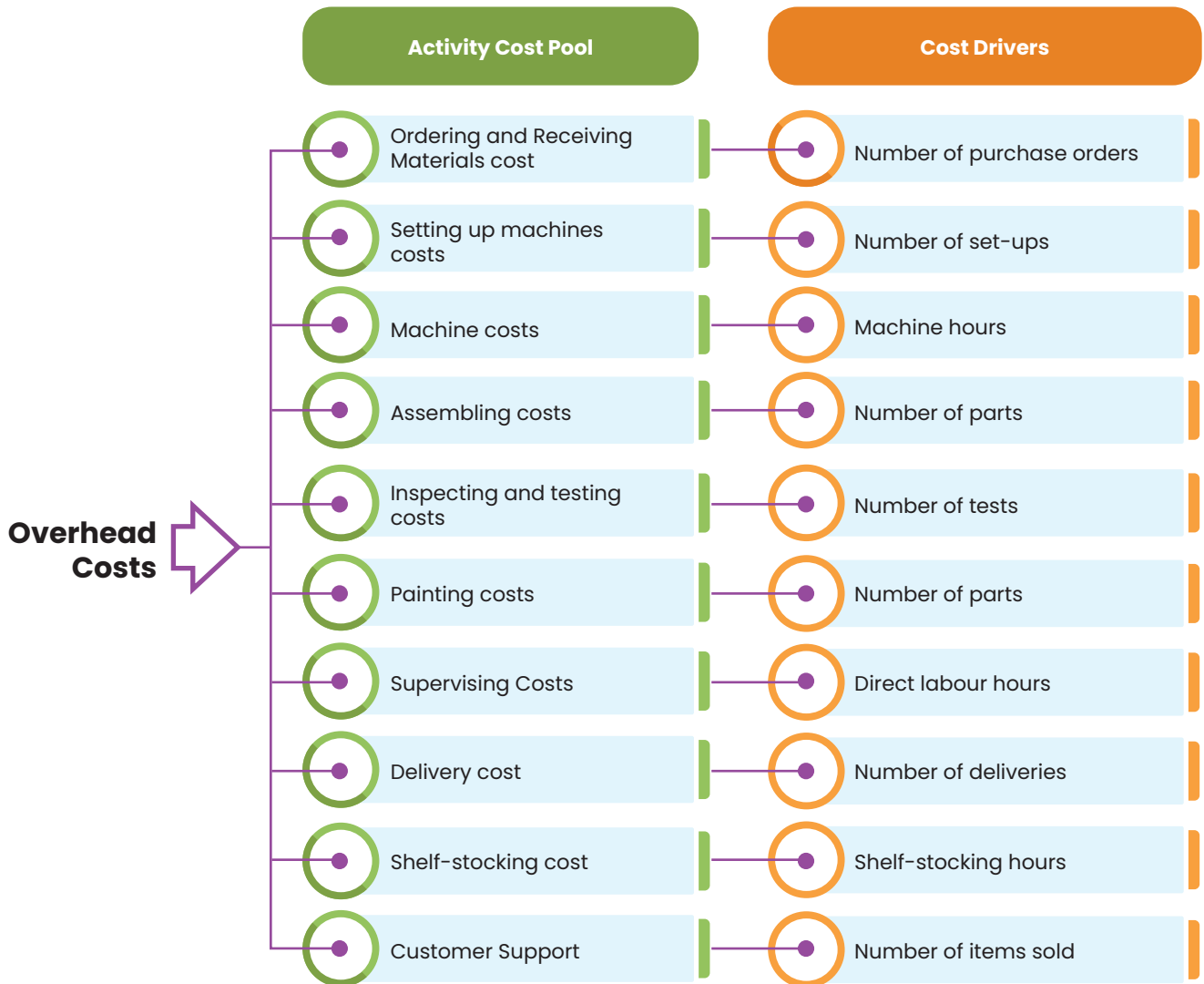


Stages In Activity Based Costing (ABC)



$$\text{Activity cost driver rate} = \frac{\text{Total cost of activity}}{\text{Activity driver}}$$

Examples of Cost Drivers



How to calculate cost per product using ABC?

If it is given that,

Activity	Cost (₹)
Ordering	64,000
Delivery	1,40,000
Shelf stocking	80,000

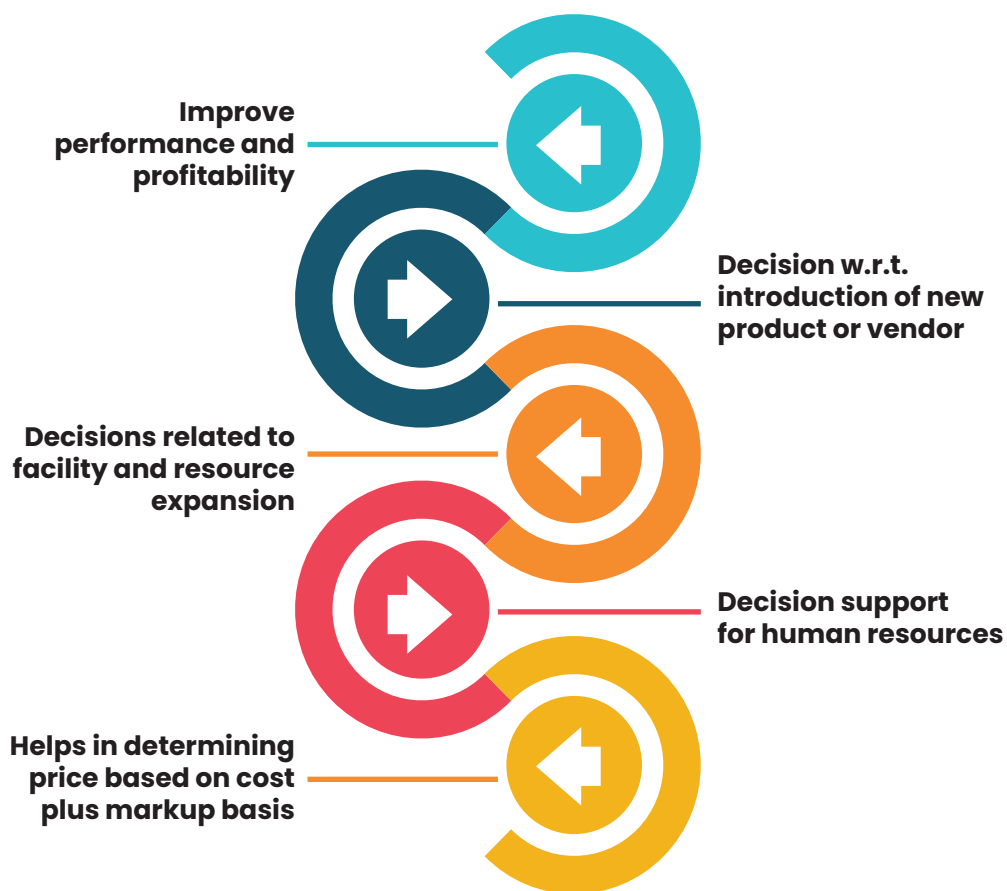
Particulars	Product 1	Product 2
No. of Purchase Orders	30	50
No. of Deliveries	110	90
Shelf Stocking Hours	220	180

Then, cost per product as per ABC

Activity	Total Cost (₹)	Cost Driver	Cost Driver Level	Cost Driver Rate(₹)	Product 1 (₹)	Product 2 (₹)
(a)	(b)	(c)	(d)	(e) = (b)/(d)	(f)	(g)
Ordering	64,000	No. of Purchase Orders	80 (30+50)	800	24,000 (800 x 30)	40,000 (800 x 50)
Delivery	1,40,000	No. of Deliveries	200 (110 + 90)	700	77,000 (700 x 110)	63,000 (700 x 90)
Shelf stocking	80,000	Shelf Stocking Hours	400 (220 +180)	200	44,000 (200 x 220)	36,000 (200 x 180)

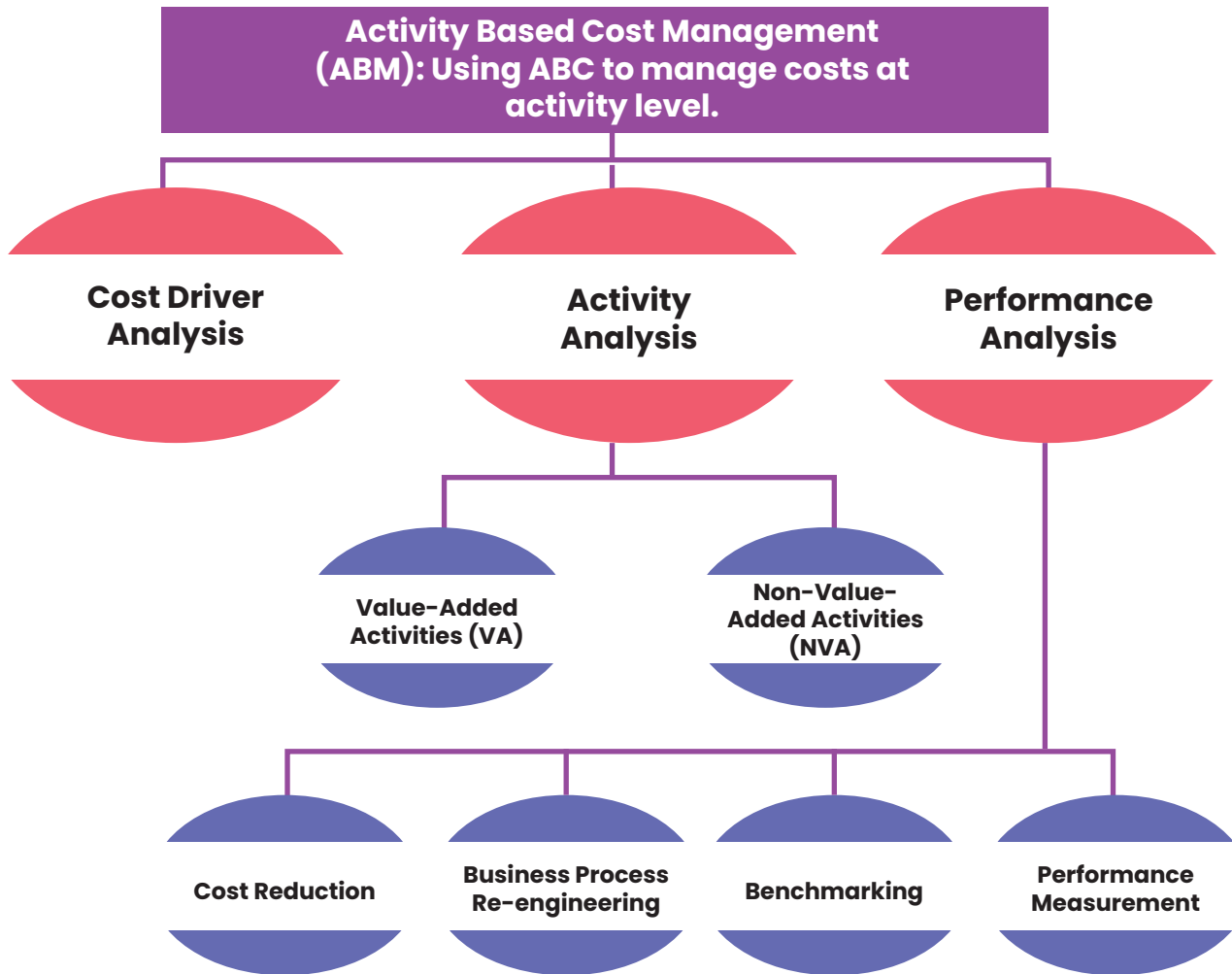
Practical Applications Of Activity Based Costing

As a Decision-Making Tool



Activity Based Costing

As Activity Based Management



Facilitate Activity Based Budgeting (ABB)

It analyses the resource input or cost for each activity. It is the reversing of the ABC process to produce financial plans and budgets.

Key Elements

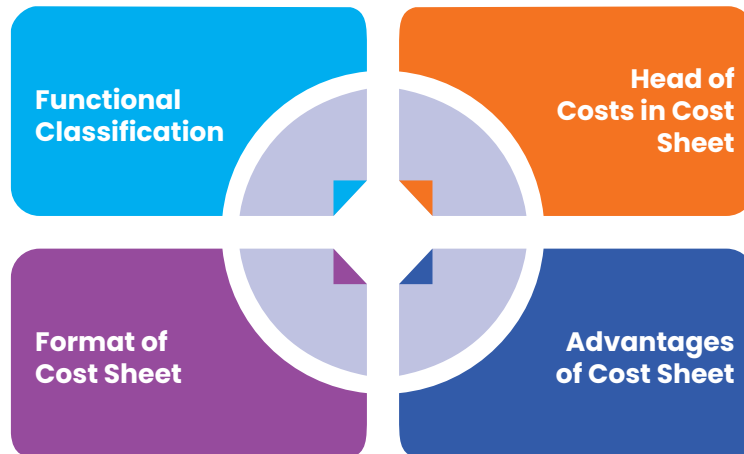
- Type of work to be done
- Quantity of work to be done
- Cost of work to be done

Benefits

- Enhance accuracy of financial forecasts
- Increasing management understanding
- Rapidly and accurately produce financial plans
- Eliminates much of the needless rework

Cost Sheet

Points of Discussion



Functional Classification of Elements of Cost

Direct Material Cost

Direct Employee (labour) Cost

Direct Expenses

Production/ Manufacturing Overheads

Administration Overheads

Selling Overheads

Distribution Overheads

Research and Development costs etc.



Cost Heads in a Cost Sheet

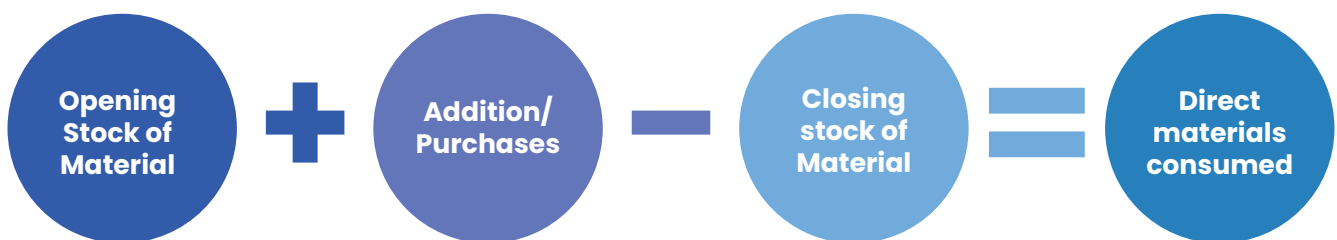
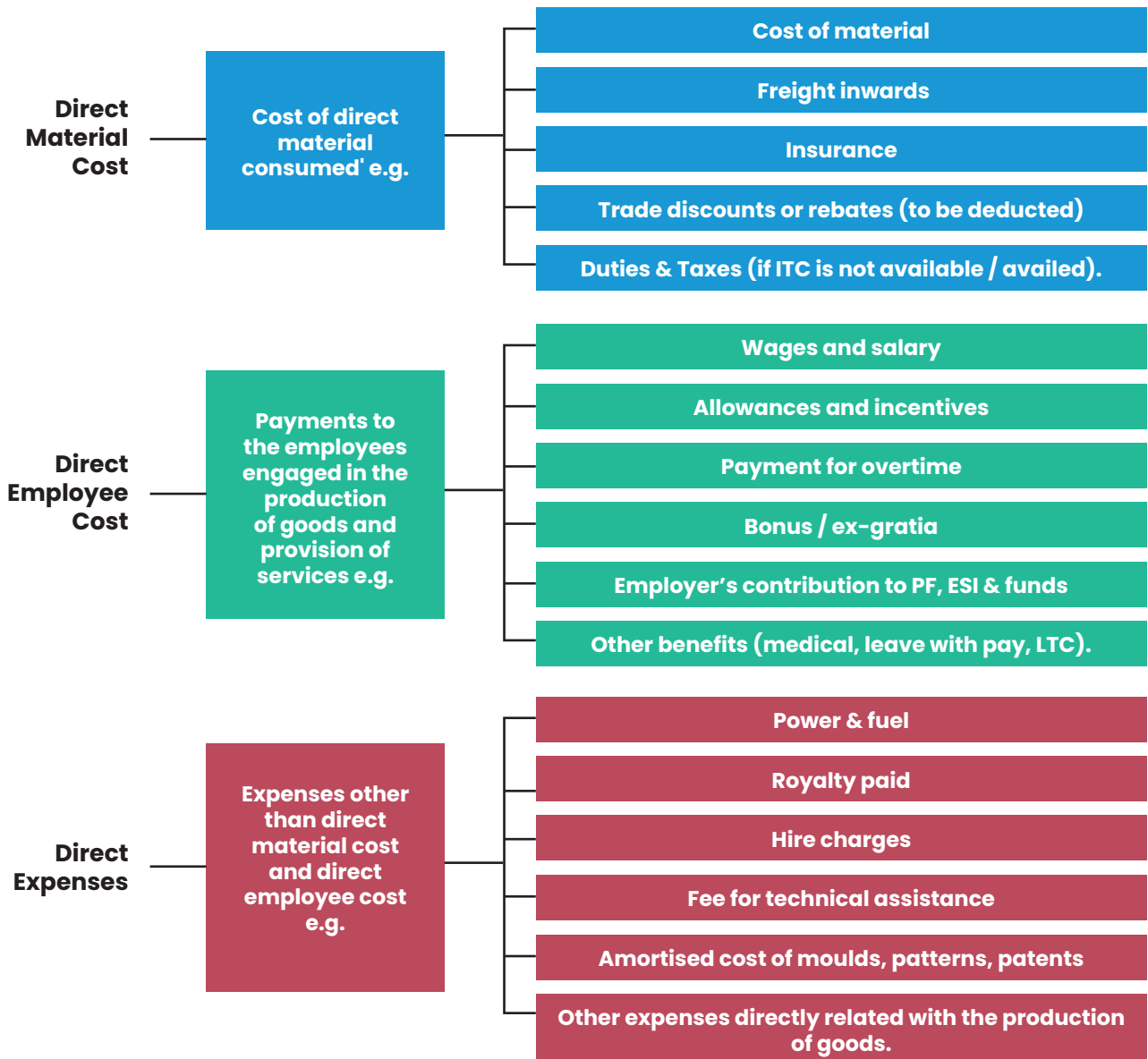
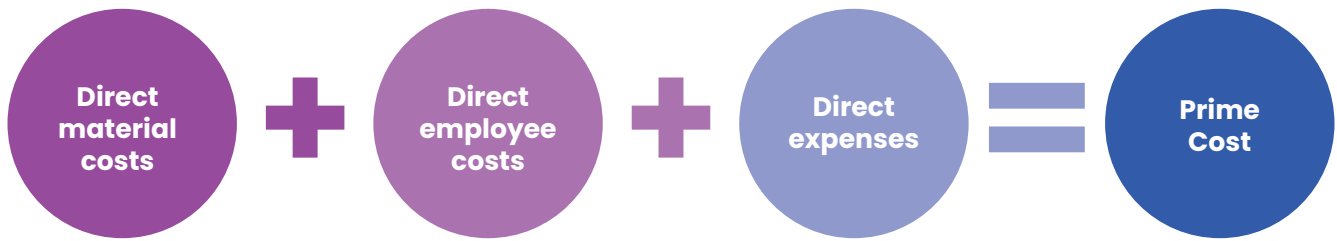
Prime Cost

Cost of Production

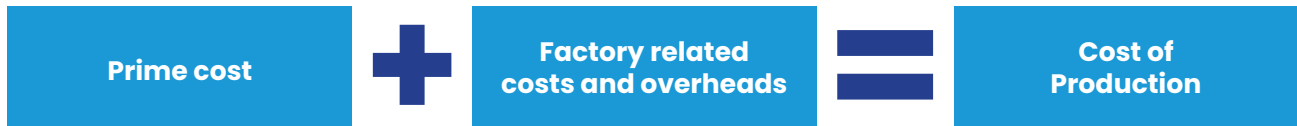
Cost of Goods Sold

Cost of Sales

Prime Cost:



Cost of Production:

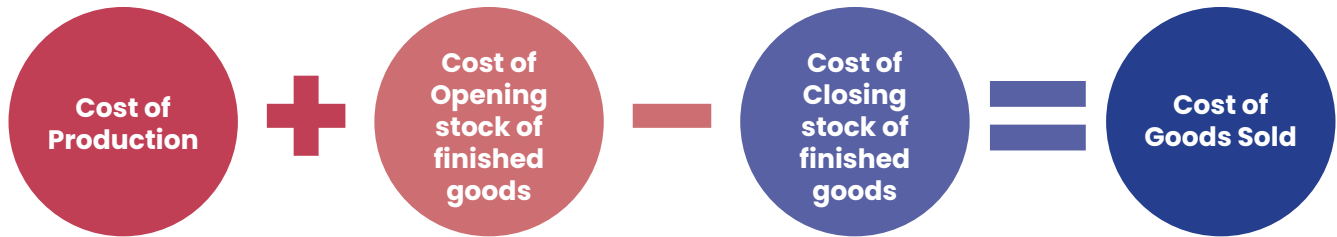


Prime Cost	XXXX
Add: Factory Overheads#	XXX
Gross Works Costs	XXXX
Add: Opening stock of Work-in-process	XXX
Less: Closing stock of Work-in-process	(XXX)
Factory or Works Costs	XXXX
Add: Quality Control Cost	XXX
Add: Research & Development cost (Process related)	XXX
Add: Administrative Overheads related with production	XXX
Less: Credit for recoveries (miscellaneous income)	(XXX)
Add: Packing Cost (Primary packing)	XXX
Cost of Production	XXXX

Factory Overheads (Works / production / manufacturing overheads) includes-



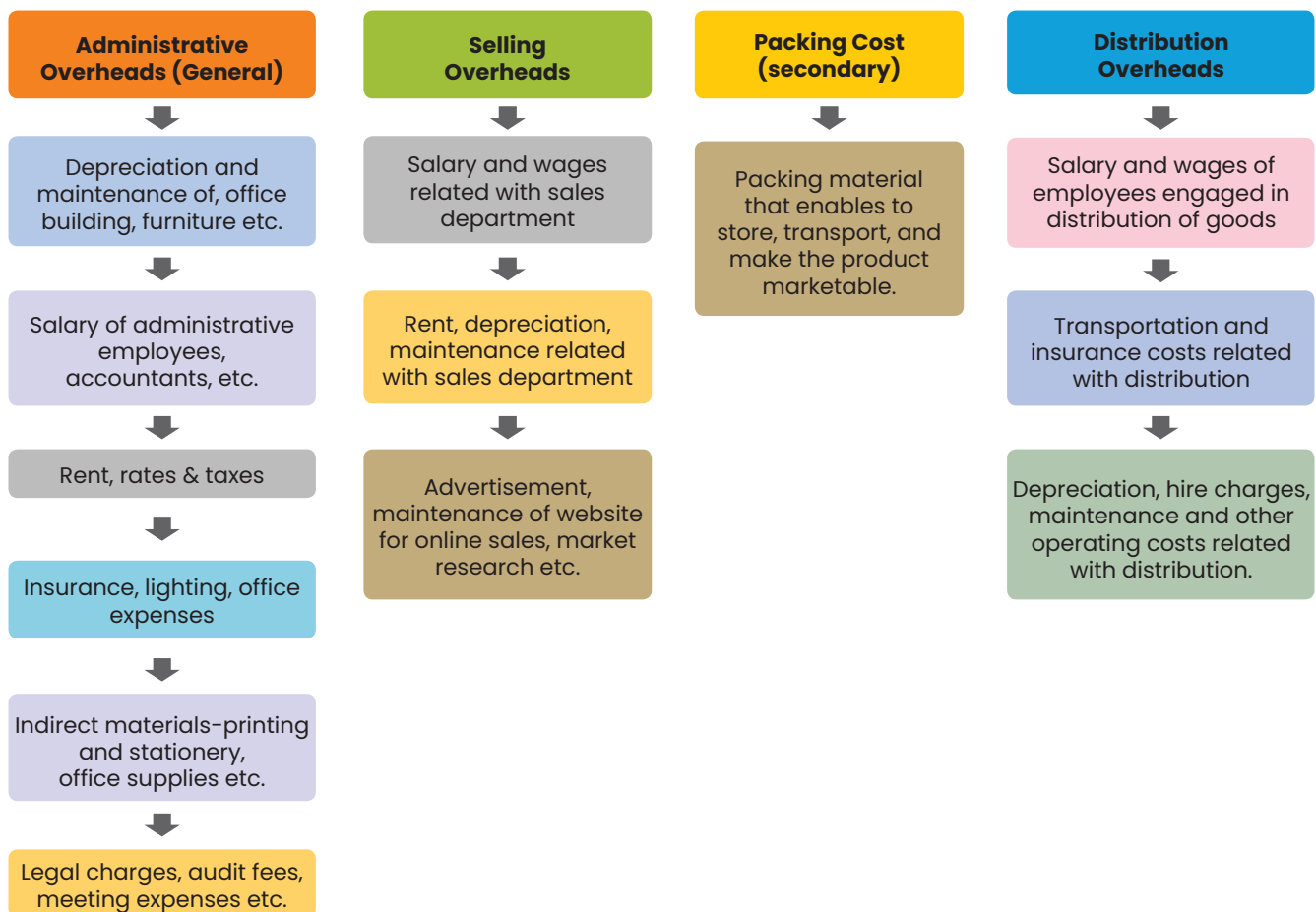
Cost of Goods Sold:



Cost of Sales:

Cost of Goods Sold	XXXX
Add: Administrative Overheads (General)	XXX
Add: Selling Overheads	XXX
Add: Packing Cost (secondary)	XXX
Add: Distribution Overheads	XXX
Cost of Sales	XXXX

Examples:



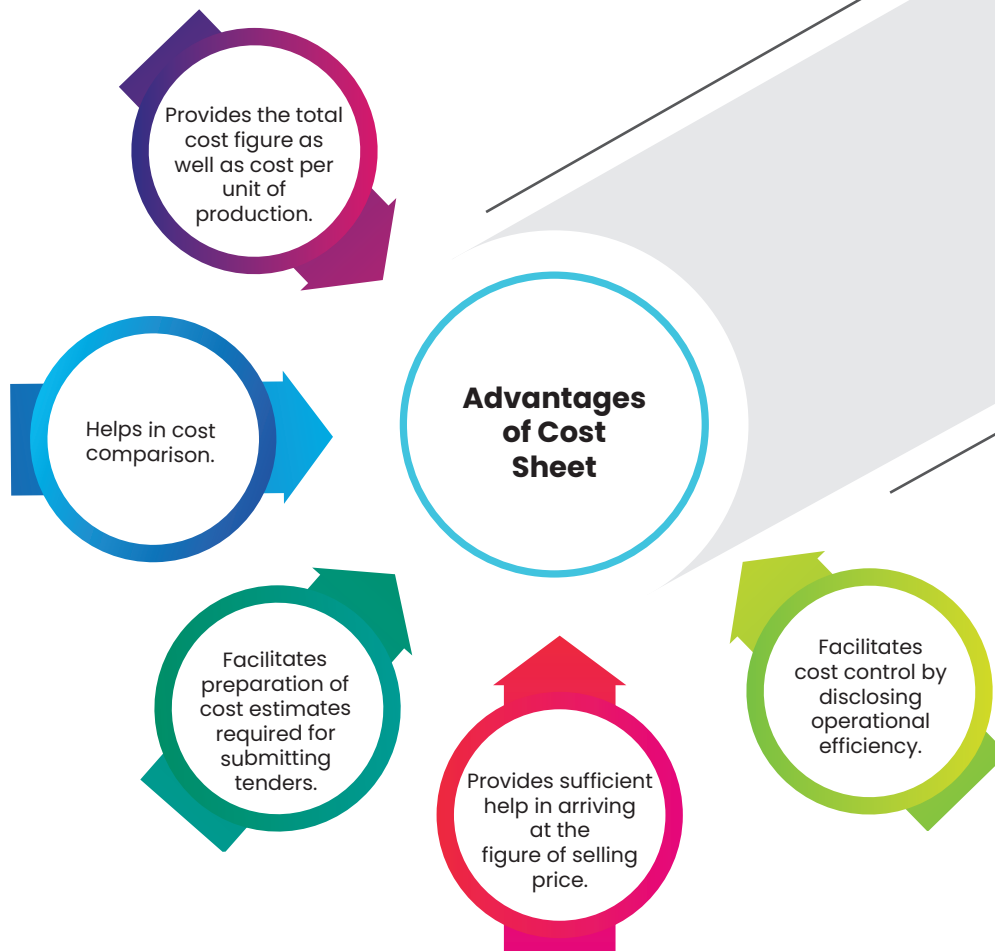
Cost Sheet- Specimen Format

	Particulars	Total Cost (₹)	Cost per unit (₹)
1.	Direct materials consumed:		
	Opening Stock of Raw Material	xxx	
	Add: Additions/ Purchases	xxx	
	Less: Closing stock of Raw Material	(xxx)	
		xxx	xxx
2.	Direct employee (labour) cost	xxx	
3.	Direct expenses	xxx	
4.	Prime Cost (1+2+3)	xxx	xxx
5.	Add: Works/ Factory Overheads	xxx	
6.	Gross Works Cost (4+5)	xxx	
7.	Add: Opening Work in Process	xxx	
8.	Less: Closing Work in Process	(xxx)	
9.	Works/ Factory Cost (6+7-8)	xxx	xxx
10.	Add: Quality Control Cost	xxx	
11.	Add: Research and Development Cost	xxx	
12.	Add: Administrative Overheads (relating to production activity)	xxx	
13.	Less: Credit for Recoveries/Scrap/By-Products/ misc. income	(xxx)	
14.	Add: Packing cost (primary)	xxx	
15.	Cost of Production (9+10+11+12-13+14)	xxx	xxx
16.	Add: Opening stock of finished goods	xxx	
17.	Less: Closing stock of finished goods	(xxx)	
18.	Cost of Goods Sold (15+16-17)	xxx	xxx
19.	Add: Administrative Overheads (General)	xxx	
20.	Add: Marketing Overheads :		
	Selling Overheads	xxx	
	Distribution Overheads	xxx	
21.	Cost of Sales (18+19+20)	xxx	xxx

Treatment of various items of cost in Cost Sheet:

Abnormal costs	<ul style="list-style-type: none"> Any abnormal cost, where it is material and quantifiable, shall not form part of cost of production or acquisition or supply of goods or provision of service.
Subsidy/ Grant/ Incentives	<ul style="list-style-type: none"> Reduced from the cost objects to which such amount pertains.
Penalty, fine, damages, and demurrage	<ul style="list-style-type: none"> Does not form part of cost.
Interest and other finance costs	<ul style="list-style-type: none"> Not included in cost of production. Shall be presented in the cost statement as a separate item of cost of sales.

Advantages of Cost Sheet



Cost Accounting Systems

Points of Discussion

Non-Integral accounting system

Integral accounting system

Reconciliation of Cost and Financial Accounts

Non-integrated Accounting System

SEPARATE LEDGERS are maintained for both cost and financial accounts.

This system is also known as **COST LEDGER ACCOUNTING SYSTEM**.

This system contains limited **ACCOUNTS** due to the exclusion of purchases, expenses and also Balance Sheet items like fixed assets, debtors and creditors.

ITEMS OF ACCOUNTS excluded are **REPRESENTED BY COST LEDGER CONTROL ACCOUNT**.



Integrated Accounting System

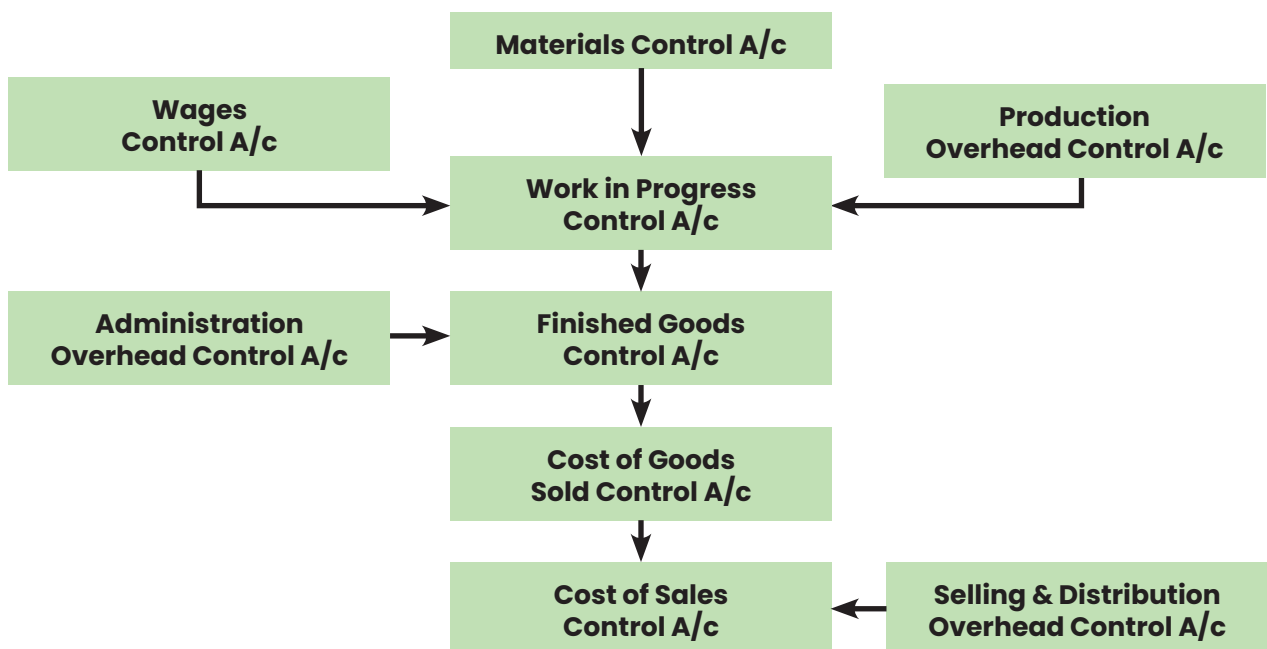
COST AND FINANCIAL ACCOUNTS are kept in the SAME SET of books.

PROVIDES RELEVANT INFORMATION necessary for preparing profit and loss account and the balance sheet.

Non-Integrated Accounting System



Flowchart



Cost Accounting Systems

Integrated Accounting System

Advantages

- No need for reconciliation
- Less efforts
- Less time consuming
- Economical process

In integrated system, all accounts necessary for showing classification of cost will be used but the cost ledger control account of nonintegrated accounting is replaced by use of following accounts:

Bank account

**Receivables
(Debtors) account**

**Payables
(Creditors) account**

**Provision for
depreciation account**

**Fixed assets
account**

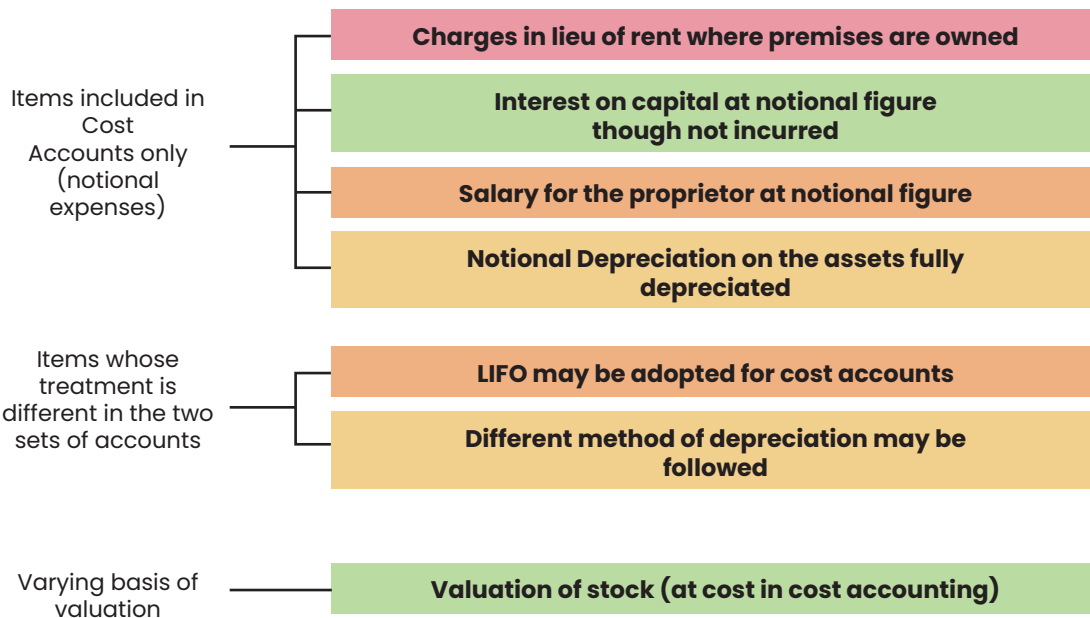
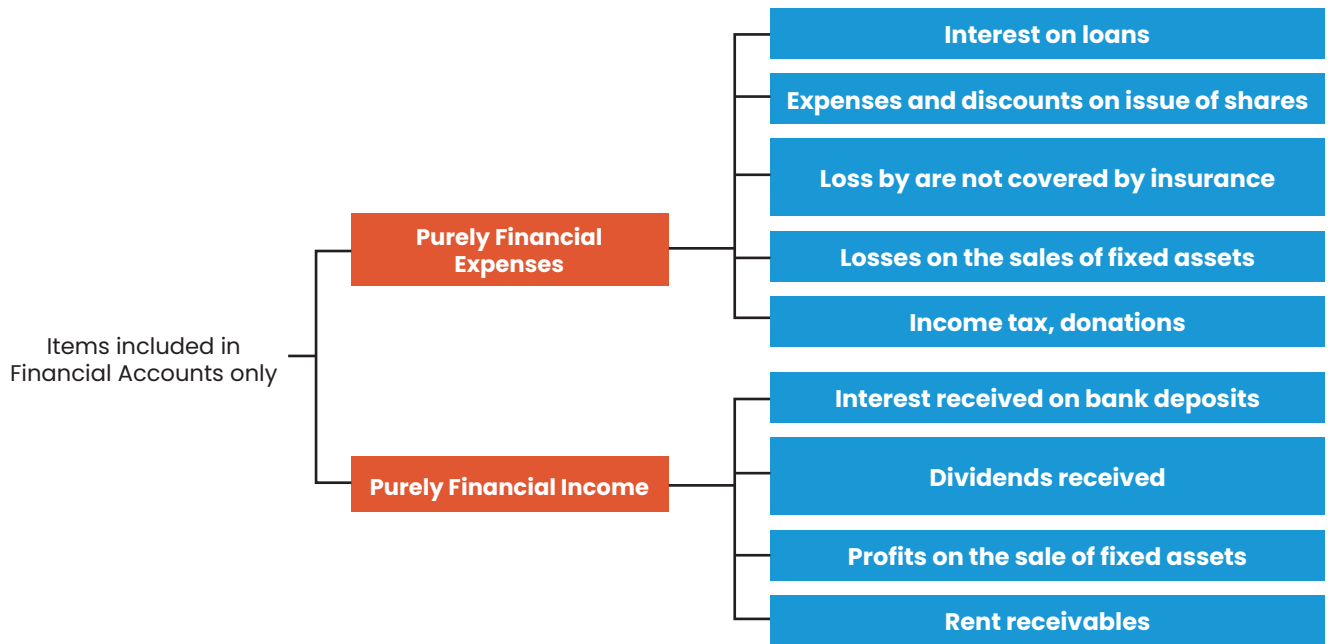
**Share capital
account**

Reconciliation Of Cost And Financial Accounts

Reconciliation is done when cost and financial accounts are kept separately

Reconciliation of the balances of two sets of accounts is possible by preparing a MEMORANDUM RECONCILIATION ACCOUNT

Causes of differences in Financial and Cost Accounts



Procedure for Reconciliation



Example:

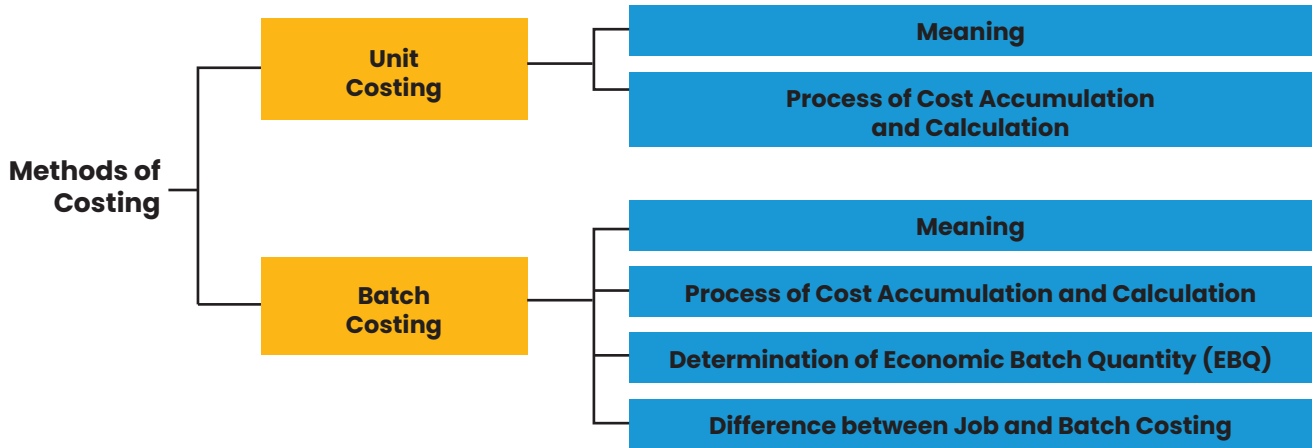
Profit as per Cost Accounts after following adjustment	₹3,00,000
Factory overheads absorbed	₹5,00,000
Selling & Distribution Overhead absorbed	₹2,00,000
Valuation of closing stock of finished goods	₹1,23,000
Administrative Overhead absorbed	₹1,93,000
Profit as per financial accounts after following adjustment	₹1,10,000
Factory overheads charged	₹4,50,000
Selling & Distribution Overhead charged	₹1,80,000
Valuation of closing stock of finished goods	₹1,50,000
Administrative Overhead charged	₹2,60,000
Interest on loan	₹2,20,000

Now, reconciliation between Financial and Cost Accounts can be done by preparing **RECONCILIATION STATEMENT** as follows:

	(Rs.)	(Rs.)
Profit as per Cost Accounts		3,00,000
Add: Factory overheads over-absorbed (₹5,00,000 – ₹4,50,000)	50,000	
Selling & Dist. Overhead over-absorbed (₹2,00,000 – ₹1,80,000)	20,000	
Difference in the valuation of closing stock of finished goods (₹1,50,000 – ₹1,23,000)	27,000	97,000
		3,97,000
Less: Admn. overhead under-absorbed (₹2,60,000 – ₹1,93,000)	67,000	
Interest on loan	2,20,000	2,87,000
Profit as per financial accounts		1,10,000

Unit & Batch Costing

Points of Discussion



Unit Costing

Meaning of Unit Costing

Unit Costing

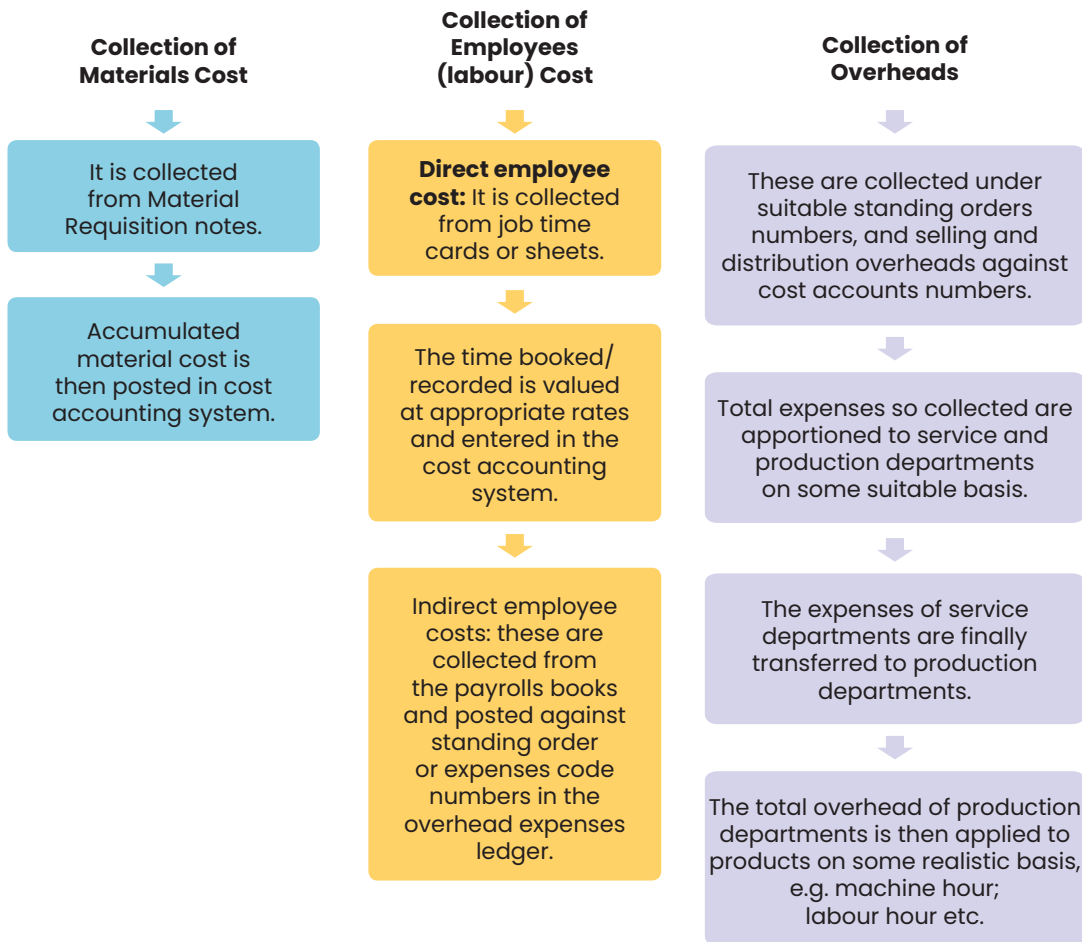
- where the output produced is identical and each unit of output requires identical cost.
- also known as single or output costing.
- applied in industries like PAPER, CEMENT, STEEL WORKS, MINING, BREWERIES ETC.

Here, costs are collected and analysed element wise and then total cost per unit is ascertained as follows:

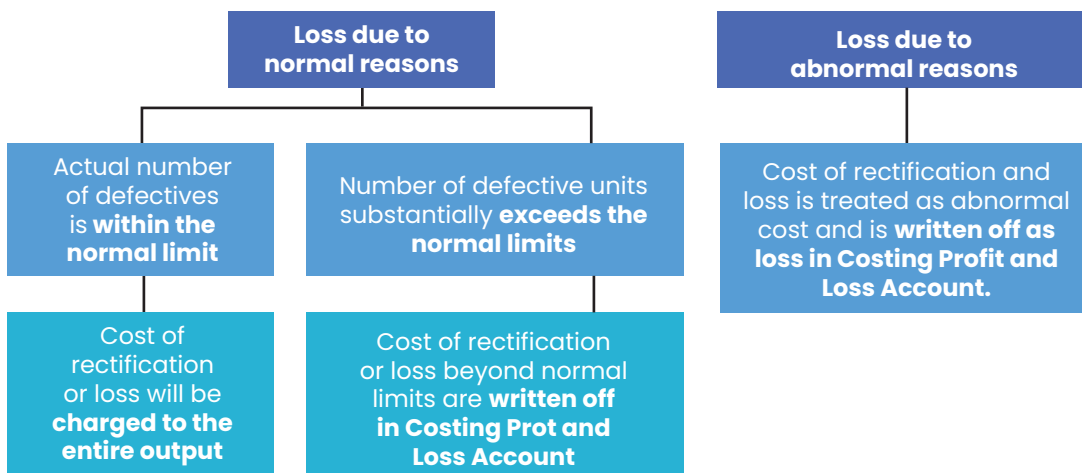
$$\text{Cost per unit} = \frac{\text{Total cost of production}}{\text{No. of units produced}}$$

Unit & Batch Costing

Cost Collection Procedure In Unit Costing



Treatment Of Spoiled And Defective



Batch Costing

Meaning of Batch Costing

Batch Costing

- is a type of specific order costing where articles are manufactured in predetermined lots, known as batch.
- the cost object for cost determination is a batch for production.
- example PEN MANUFACTURING INDUSTRY

A batch consists of certain number of units which are PROCESSED SIMULTANEOUSLY. Under this method of manufacturing, the inputs are accumulated in the assembly line till it reaches minimum batch size. Soon after a batch size is reached, all inputs in a batch is processed for further operations.

Costing Procedure In Batch Costing

Material cost

On the basis of material requisitions for the batch.

Labour cost

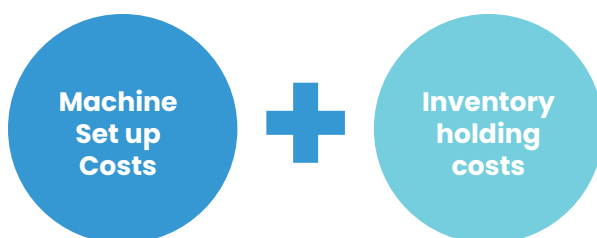
Multiplying the time spent on the batch by direct workers as ascertained from time cards or job tickets.

Overheads

Absorbed on some suitable basis like machine hours, direct labour hours etc.

Economic Batch Quantity (EBQ)

Primarily, the total production cost under batch production comprises of two main costs, namely,



Unit & Batch Costing

Balancing Machine set up cost and Inventory holding cost

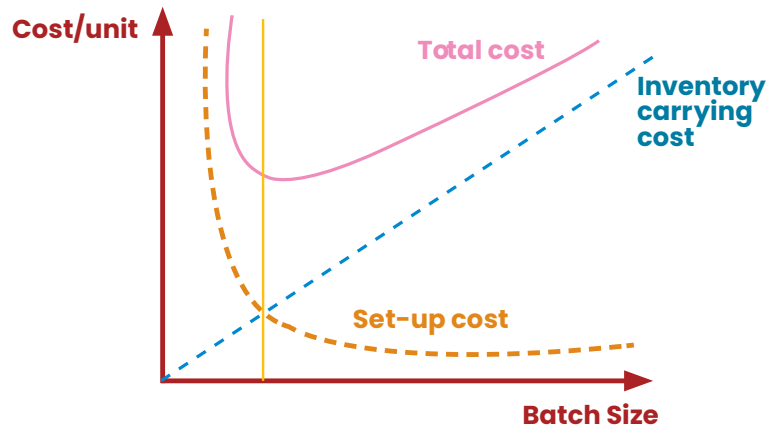
↑
Higher lot size

- **Set up cost** may decline due to lesser number of set ups.
- But units in inventory will go up leading to **higher holding costs**
- **Lower inventory holding costs.**
- But **higher set up costs** due to high number of set ups.

↓
Lower lot size

▶
Economic Batch Quantity (EBQ)

- It is the size of a batch where total cost of set-up and holding costs are at minimum.



Determination of EBQ

By calculating the total cost for a series of possible batch sizes and checking which batch size gives the minimum cost.

Mathematical formula:

$$EBQ = \sqrt{\frac{2DS}{C}}$$

Where, D = Annual demand for the product
S = Setting up cost per batch
C = Carrying cost per unit of production

Difference Between Job And Batch Costing

Sr. No	Job Costing	Batch Costing
1	Used for non- standard and non- repetitive products produced as per customer specifications and against specific orders.	Homogeneous products produced in a continuous production flow in lots.
2	Cost determined for each Job.	Cost determined in aggregate for the entire Batch and then arrived at on per unit basis.
3	Jobs are different from each other and independent of each other. Each Job is unique.	Products produced in a batch are homogeneous and lack of individuality.

Job Costing



Meaning Of Job Costing

Job Costing

- It is applicable where the work consists of separate contracts, jobs or batches, each of which is authorised by specific order or contract.
- Industry example: PRINTING; FURNITURE; HARDWARE; SHIP BUILDING; HEAVY MACHINERY; INTERIOR DECORATION.

Principles Of Job Costing

Analysis and ascertainment of cost of each unit of production

Control and regulate cost

Determine the profitability

Process Of Job Costing

Prepare a **separate cost sheet** for each job

Disclose cost of **materials** issued for the job

Employee costs incurred (on the basis of bill of material and time cards respectively)

When job is completed, **overhead charges** are added for ascertaining total expenditure

Suitability Of Job Costing

When jobs are executed for different customers according to their specifications.

When no two orders are alike and each order/job needs special treatment.

Where the work-in-progress differs from period to period on the basis of the number of jobs in hand.

Job Cost Card/ Sheet

Job Cost Card/Sheet

A cost sheet where,

- quantity of materials issued,
- hours spent by different class of employees,
- amount of other expenses and share of overheads are recorded.

Format of Job Cost Sheet

JOB COST SHEET					
Description: _____ Blue Print No.: _____ Material No.: _____ Reference No.: _____			Job No.: _____ Quantity: _____ Date of delivery: _____ Date commenced: _____ Date finished: _____		
Date	Reference	Details	Material	Labour	Overhead
		Total			
Summary of costs		Estimated (₹)	Actual (₹)	For the job _____ Units produced _____ Cost/unit _____ Remarks _____ Prepared by: _____ Checked by: _____	
Direct material cost					
Direct wages					
Production overhead					
PRODUCTION COST					
Administration and Selling & Distribution Overheads					
TOTAL COST					
PROFIT/LOSS					
SELLING PRICE					

Collection Of Costs For A Job

Materials cost

Traced to and identified with specific job or work order

Posted to individual job cost sheets or cards in the work-in-progress ledger

If the surplus material is utilised on some other job, instead of being returned to the stores first, a material transfer note is prepared.

Labour cost

Booked against specific jobs in the job time cards or sheets

Posted to the appropriate job cost card or sheet in working progress ledger



Overheads

Manufacturing overheads are collected under suitable standing order numbers

Selling and distribution overheads are collected against cost accounts numbers

Total overhead expenses are apportioned to service and production departments on some suitable basis.

The expenses of service departments are finally transferred to production departments.

The total production overhead is then applied to products on some realistic basis.

Spoiled And Defective Work

Meaning

Spoiled work

It is the quantity of production that has been totally rejected and cannot be rectified.

Defective work

It refers to production that is not as perfect as the saleable product but is capable of being rectified

Treatment

Where a percentage of defective work is ALLOWED in a particular batch AS IT CANNOT BE AVOIDED.

The cost of rectification will be charged to the whole job and spread over the entire output of the batch

Where defect is DUE TO BAD WORKMANSHIP.

The cost of rectification shall be written off as a loss being an abnormal cost

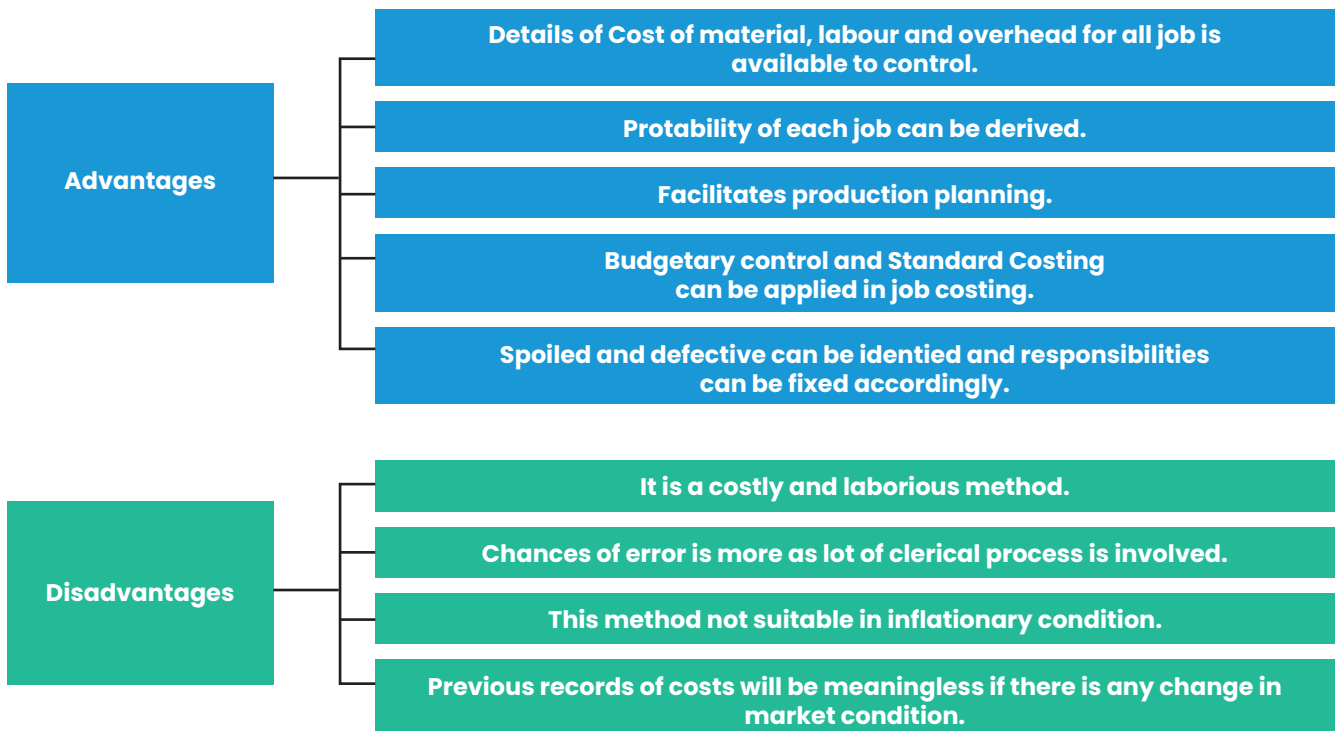
Where defect is due to the inspection department Wrongly ACCEPTING INCOMING MATERIAL OF POOR QUALITY.

Cost of rectification will be charged to the department and will not be considered as cost of manufacture of the batch

Accounting Of Costs For A Job

1.	For purchase of materials	
	Stores Ledger Control A/c	Dr.
	To Cost Ledger Control A/c	
2.	For the value of direct materials issued to jobs	
	Work-in-Process Control A/c	Dr.
	To Stores Ledger Control A/c	
3.	For return of direct materials from jobs	
	Stores Ledger Control A/c	Dr.
	To Work-in-Process Control A/c	
4.	For return of materials to suppliers	
	Cost Ledger Control A/c	Dr.
	To Stores Ledger Control A/c	
5.	For indirect materials	
	Factory Overhead Control A/c	Dr.
	To Stores Ledger Control A/c	
6.	For wages paid	
	Wages Control A/c	Dr.
	To Cost Ledger Control A/c	
7.	For direct wages incurred on jobs	
	Work-in-Process Control A/c	Dr.
	To Wages Control A/c	
8.	For indirect wages	
	Factory Overhead Control A/c	Dr.
	To Wages Control A/c	
9.	For any indirect expense paid	
	Factory Overhead Control A/c	Dr.
	To Cost Ledger Control A/c	
10.	For charging overhead to jobs	
	Work-in-Process Control A/c	Dr.
	To Factory Overhead Control A/c	
11.	For the total cost of jobs completed	
	Cost of Sales A/c	Dr.
	To Work-in-Progress Control A/c	
12.	The balance of Cost of Sales A/c is transferred to Costing Profit and Loss A/c; For such transfer	
	Costing Profit and Loss A/c	Dr.
	To Cost of Sales A/c	
13.	For the sales value of jobs completed	
	Cost Ledger Control A/c	Dr.
	To Costing Profit and Loss A/c	

Advantages And Disadvantages Of Job Costing

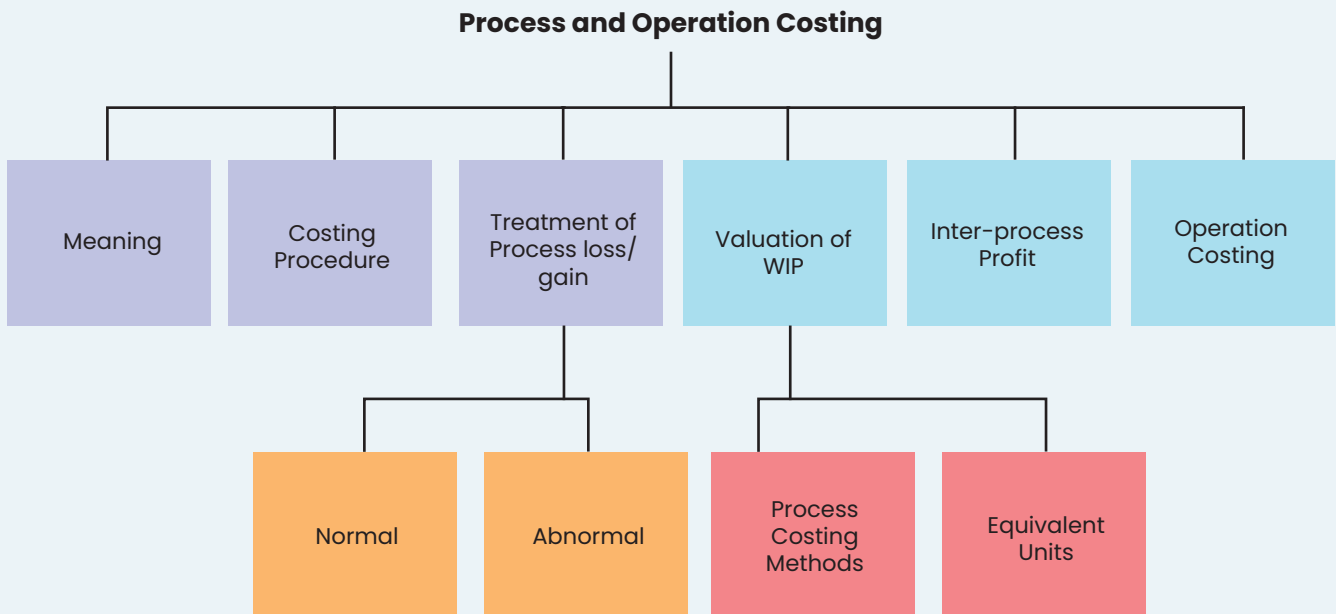


Difference Between Job Costing And Process Costing

Job Costing	Process Costing
A Job is carried out by specific orders.	Process of producing the product has a continuous flow and the product produced is homogeneous.
Costs determined for each job.	Costs are compiled on time basis i.e., for each process or department.
Each job is separate and independent.	Products lose their individual identity.
Each job has a number and costs are collected against the same job number.	The unit cost of process is an average cost for the period.
Costs are computed when a job is completed.	Costs are calculated at the end of the cost period.
More managerial attention is required for effective control.	Control here is comparatively easier.

Process and Operation Costing

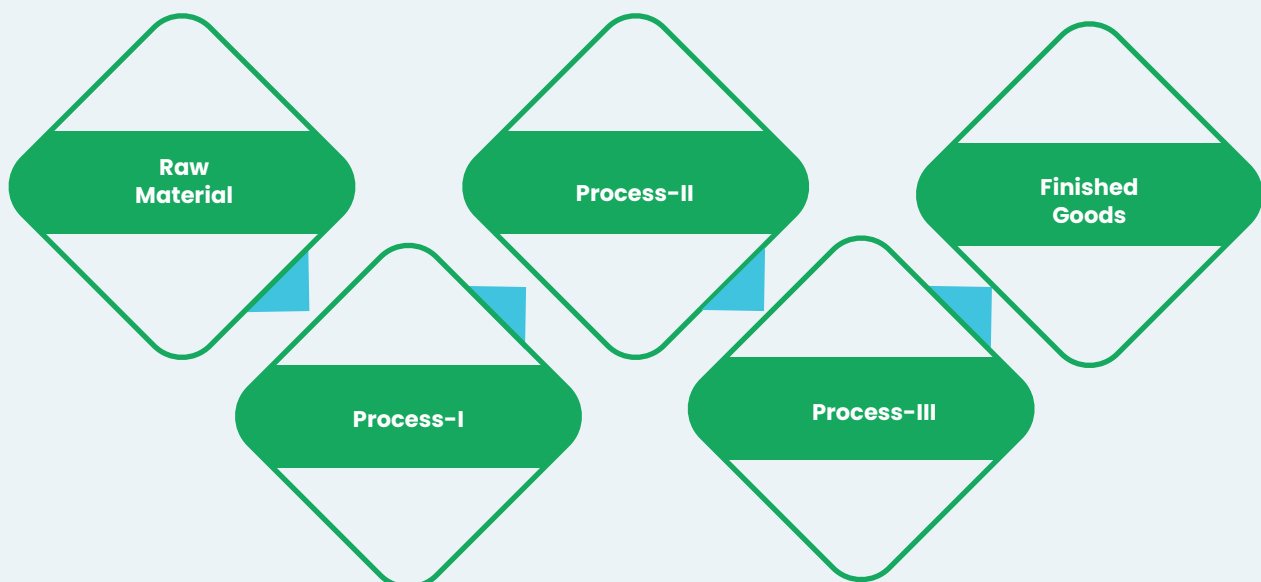
Chapter Overview



Meaning of Process Costing

Process Costing is a method of costing used in industries where the material has to pass through two or more processes for being converted into a final product. It is defined as “a method of Cost Accounting whereby costs are charged to processes or operations and averaged over units produced”.

This can be understood with the help of the following diagram:



Costing Procedure in Process Costing

Materials: Each process for which the materials are used, are debited with the cost of materials consumed on the basis of the information received from the Cost Accounting department.

Employee Cost (Labour): Each process account should be debited with the labour cost or wages paid to labour for carrying out the processing activities. Sometimes the wages paid are apportioned over the different processes after selecting appropriate basis.

Direct expenses: Each process account should be debited with direct expenses like depreciation, repairs, maintenance, insurance etc. associated with it.

Production Overheads: These expenses cannot be allocated to a process. The suitable way out to recover them is to apportion them over different processes by using suitable basis.

Steps in Process Costing

Step-1: Analyse the Physical Flow of Production Units

Step-2: Calculate Equivalent Units for each Cost Elements

Step-3: Determine Total Cost for each Cost Element

Step-4: Compute Cost Per Equivalent Unit for each Cost Element

Step-5: Assign Total Costs to Units Completed and Ending WIP

Process and Operation Costing

Treatment of Normal, Abnormal Loss and Abnormal Gain

Normal Process Loss

- The cost of normal process loss in practice is absorbed by good units produced under the process. The amount realised by the sale of normal process loss units should be credited to the process account.

Abnormal Process Loss

- The cost of an abnormal process loss unit is equal to the cost of a good unit. The total cost of abnormal process loss is credited to the process account from which it arises.
- Total cost of abnormal process loss is debited to costing profit and loss account.

Abnormal Process Gain/ Yield

- The process account under which abnormal gain arises is debited with the abnormal gain and credited to abnormal gain account which will be closed by transferring to the Costing Profit and Loss account.

Valuation of Work-in-process

The valuation of work-in-process presents a good deal of difficulty because it has units under different stages of completion from those in which work has just begun to those which are only a step short of completion.

(i) Equivalent Units

Equivalent units or equivalent production units, means converting the incomplete production units into their equivalent completed units. Under each process, an estimate is made of the percentage completion of work-in-process with regard to different elements of costs, viz., material, labour and overheads.

The formula for computing equivalent completed units is:

$$\text{Equivalent completed units} = \left(\frac{\text{Actual number of units in the process of manufacture}}{\text{the process of manufacture}} \right) \times \left(\frac{\text{Percentage of Work completed}}{\text{Work completed}} \right)$$

Input Details	Units	Output Particulars	Units	Equivalent Units					
				Material		Labour		Overhead	
				%	Units	%	Units	%	Units
			a	b	c = a×b	d	e = a×d	f	g = a×f
Opening W-I-P	xxx	Opening W-I-P*	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Unit Introduced	xxx	Finished output**	xxx	xxx	xxx	xxx	xxx	xxx	xxx
		Normal loss***	xxx	-	-	-	-	-	-
		Abnormal loss/ Gain****	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Total		Closing W-I-P	xxx	xxx	xxx	xxx	xxx	xxx	xxx
	xxx	Total	xxx		xxx		xxx		xxx

* Equivalent units for Opening W-I-P is calculated only under FIFO method. Under the Average method, it is not shown separately.

**Under the FIFO method, Finished Output = Units completed and transferred to next process less Opening WIP. Under Average method, Finished Output = Units completed and transferred.

***For normal loss, no equivalent unit is calculated.

****Abnormal Gain/ Yield is treated as 100% complete in respect of all cost elements irrespective of percentage of completion.

(ii) Methods for valuation of work-in-process**First-in-first-out (FIFO) method**

Under this method the units completed and transferred include completed units of opening work-in-process and subsequently introduced units. Proportionate cost to complete the opening work-in-process and that to process the completely processed units during the period are derived separately.

Weighted Average (Average) Method

Under this method, the cost of opening work-in-process and cost of the current period are aggregated and the aggregate cost is divided by output in terms of completed units.

Inter Process Profit

In some process industries the output of one process is transferred to the next process not at cost but at market value or cost plus a percentage of profit. The difference between cost and the transfer price is known as interprocess profits.

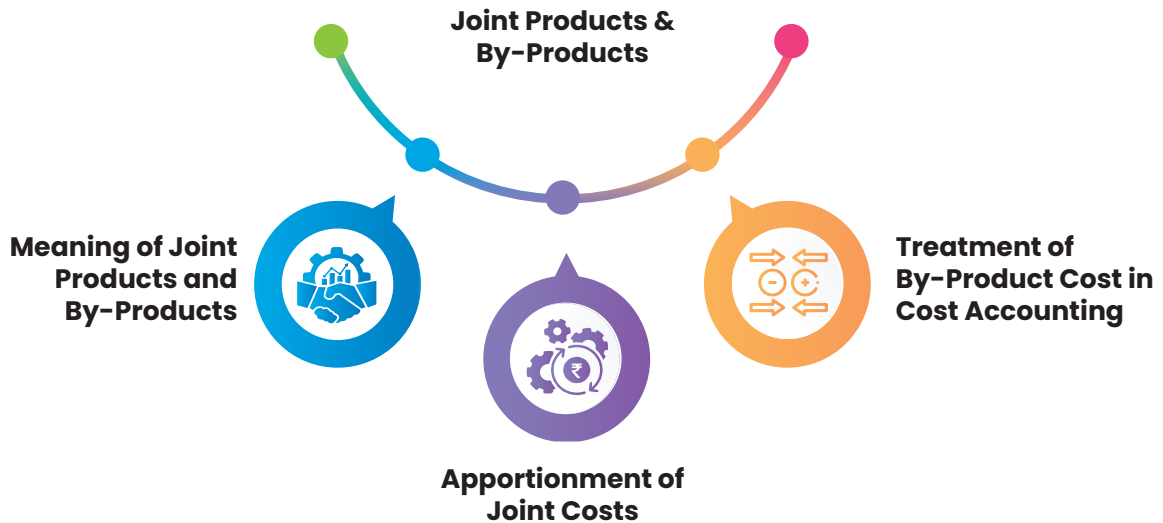
Operation Costing

This product costing system is used when an entity produces more than one variant of final product using different materials but with similar conversion activities. Which means conversion activities are similar for all the product variants but materials differ significantly. Operation Costing method is also known as Hybrid product costing system as materials costs are accumulated by job order or batch wise but conversion costs i.e. labour and overheads costs are accumulated by department, and process costing methods are used to assign these costs to products.

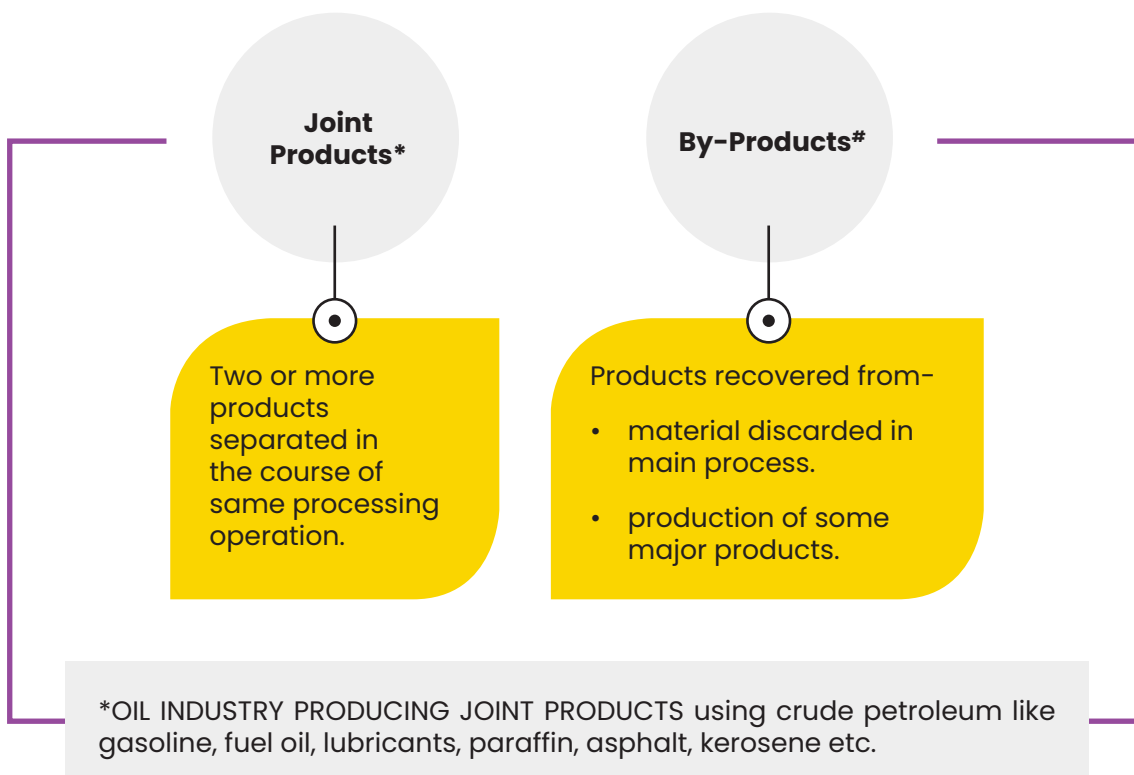


Joint Products And By Products

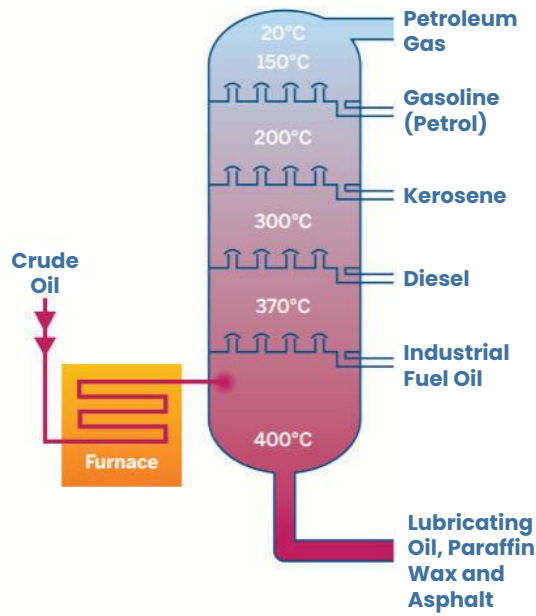
Points Of Discussion



Meaning of Joint Products and By-Products

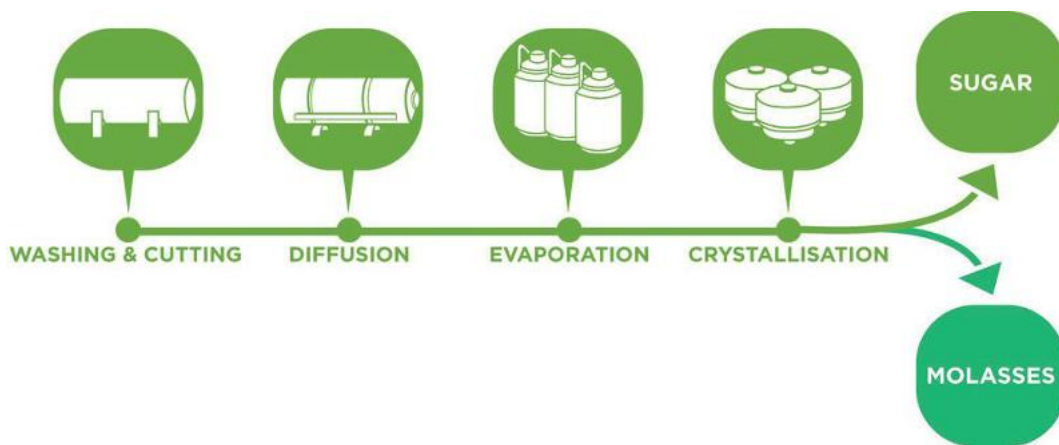


Joint Products And By Products



Petroleum Refining Processes¹

MOLASSES IS PRODUCED AS A BYPRODUCT in the process of sugar manufacturing



Sugar Manufacturing Process²

Point at which products are separated from the main product is known as **SPLIT-OFF POINT**.

Joint Products And By Products

Distinction Between Joint Products and By-Products

Joint Products

- Equal importance.
- Produced simultaneously.

By-Products

- Small economic value.
- Incidental to the main product.

Co-Products

Co-Products

Joint products and co-products are used synonymously, but a **distinction is there.**

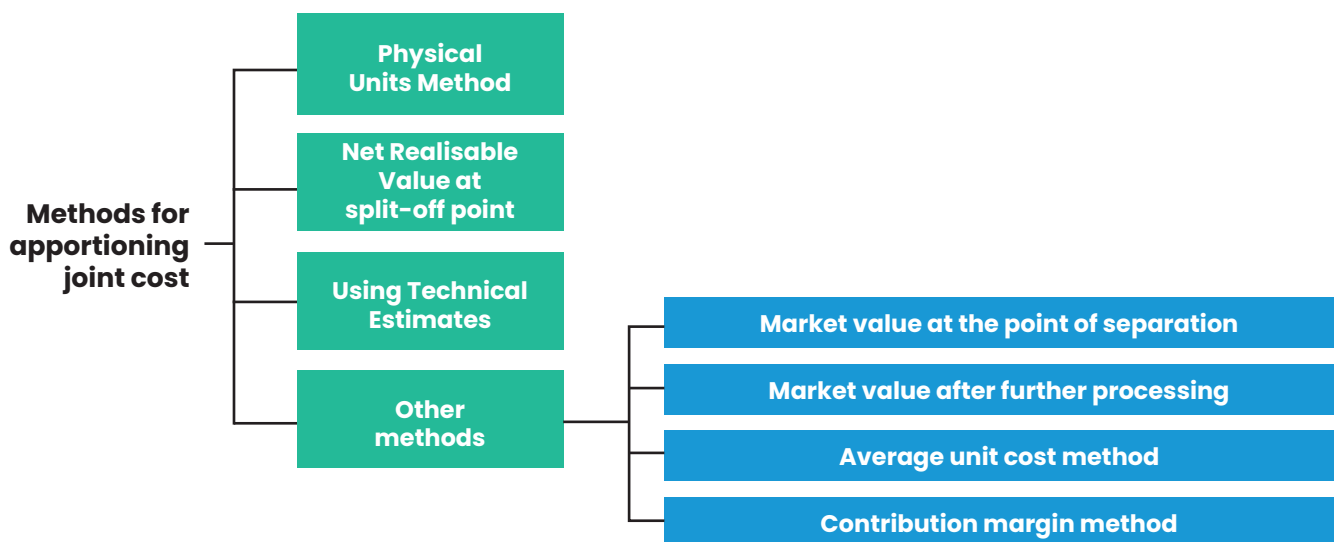
Co-products are two or more products which are **contemporary but do not** emerge necessarily **from the same material in the same process.**

For instance,

wheat and gram produced in two separate farms with separate processing of cultivation are co-products.

Timber boards made from different trees are co-products.

Methods Of Apportionment Of Joint Cost To Joint Products

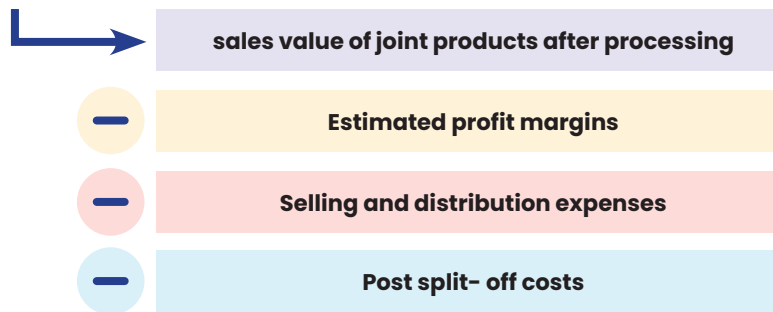


Physical Units Method:

Joint costs here are apportioned on the basis of some **physical base, such as weight, numbers etc.**

Net Realisable Value at Split-off Point Method:

Joint costs here are apportioned on the basis of **Net Realisable Value at Split-off Point.**

Net Realisable Value At Split-Off Point**Using Technical Estimates:**

This method is used **WHEN -**

Result obtained by above methods does not match with the resources consumed by joint products, or;

Realisable value of the joint products are not readily available.

Other Methods:**(i) Market value at the point of separation**

Useful method where further processing costs are incurred disproportionately.

To determine the apportionment of joint costs over joint products, a multiplying factor is determined as follows:

$$\text{Multiplying factor: } \frac{\text{Joint Cost}}{\text{Total Sales Revenue}} \times 100$$

Alternatively, joint cost may be apportioned in the ratio of sales values of different joint products.

Joint Products And By Products

(ii) Market value after further processing

Basis of apportionment of joint cost is the total sales value of finished products.

Use of this METHOD IS UNFAIR WHERE -

Further processing costs after the point of separation are disproportionate, or;

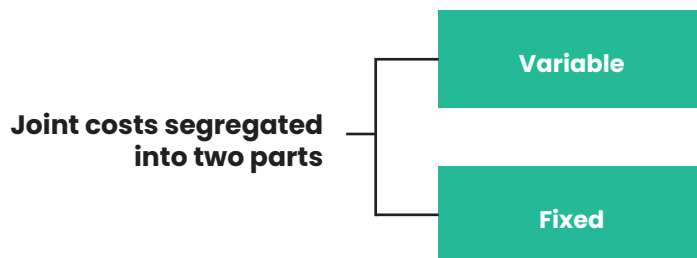
All the joint products are not subjected to further processing.

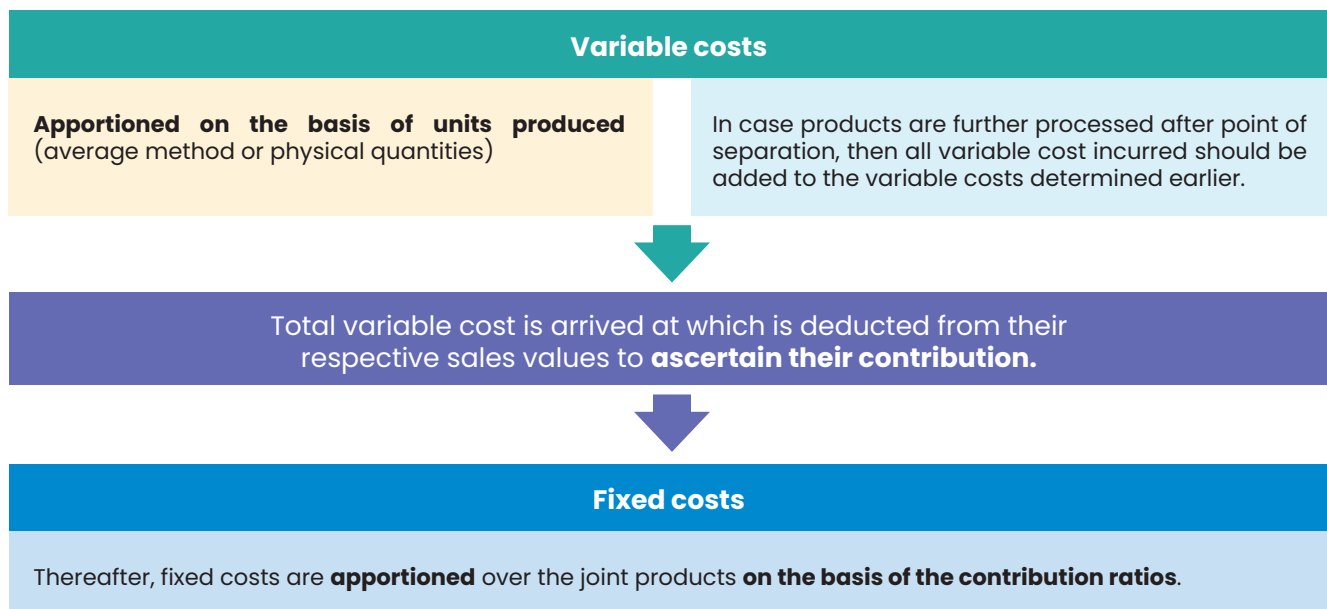
(iii) Average Unit Cost Method

$$\text{Average unit cost} = \frac{\text{Total process cost (up to the point of separation)}}{\text{Total units of joint product produced}}$$

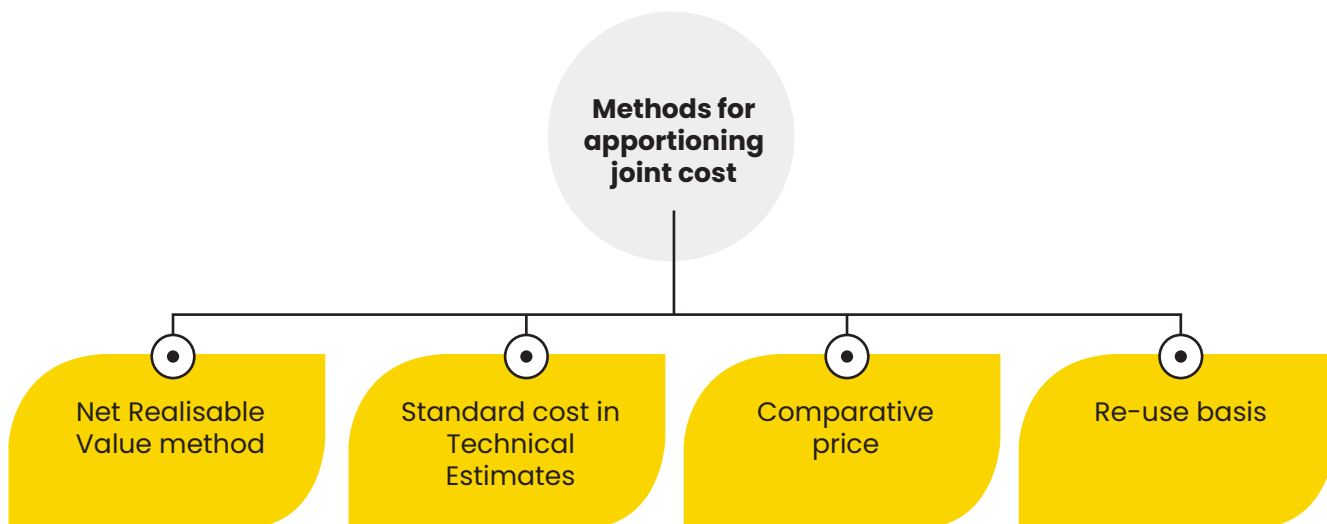
Physical unit method also follows the same steps of calculation as followed under Average unit cost method, ultimately giving the same outcome.

(iv) Contribution Margin Method



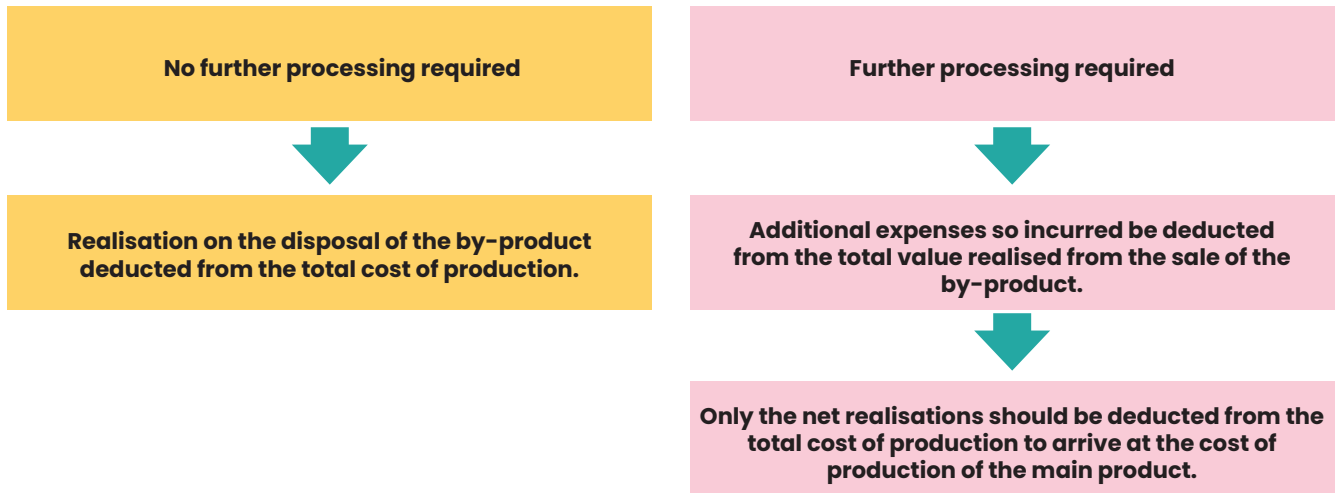


Methods of Apportionment of Joint Cost To By-Products

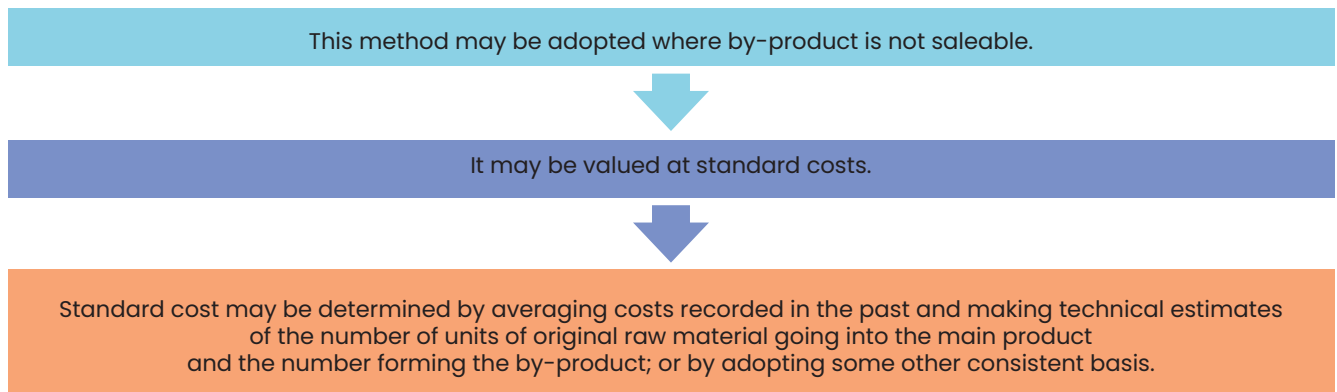


Joint Products And By Products

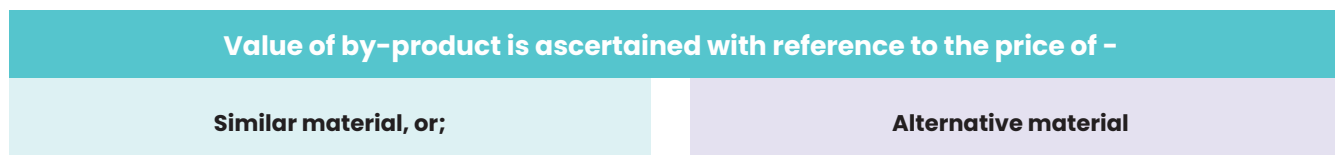
Net Realisable Value method:



Standard cost in Technical Estimates:



Comparative price:

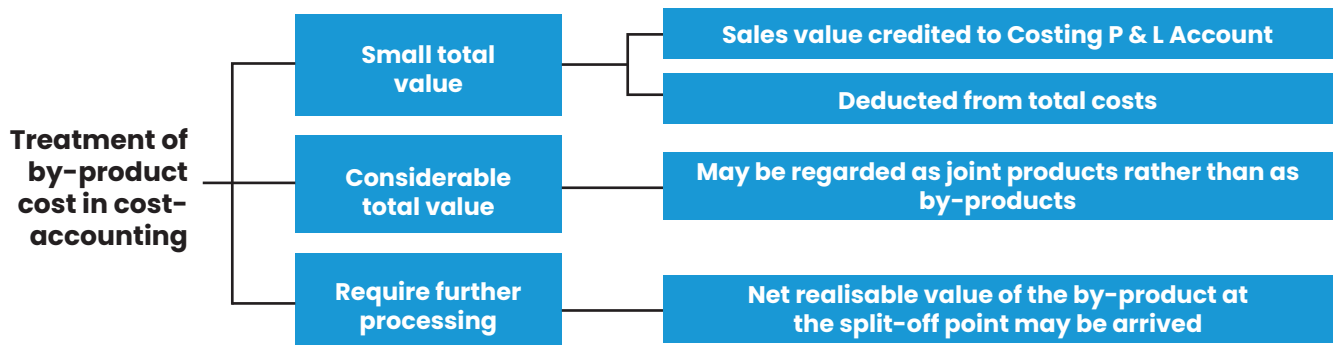


Re-use basis:

Sometimes, by-product may be of such a nature that it can be reprocessed in the same process as part of the input of the process.

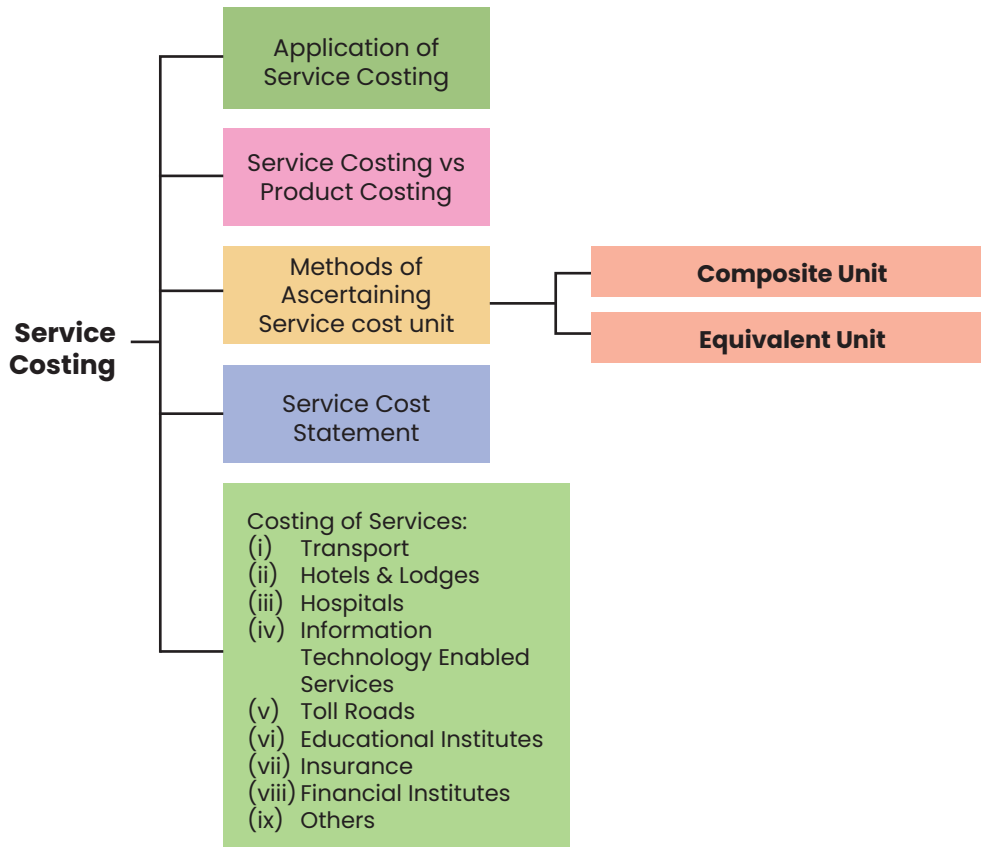
In that case, **value put on by-product should be same as that of the materials introduced into the process.**

However, **if the by-product can be put into an earlier process only, the value should be the same as for the materials introduced into the process.**

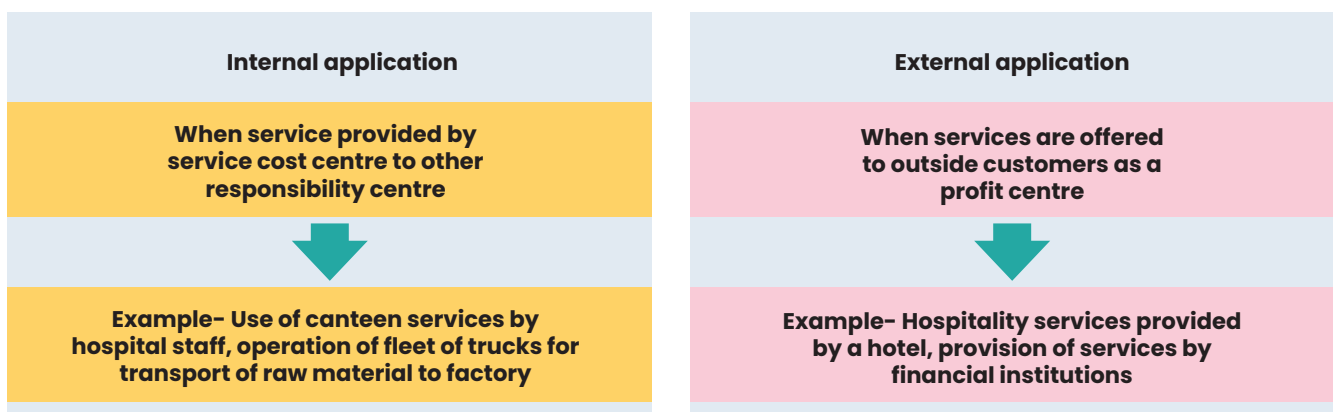
Treatment Of By-product Cost In Cost-Accounting

Service Costing

Points of Discussion



When Is Service Costing Applied?



Service Costing Vs. Product Costing

Unlike products,

- ▶ services are intangible.
- ▶ services cannot be stored.
- ▶ there are no inventory for the services.
- ▶ employee (labour) cost constitutes a major cost element than material cost.
- ▶ Indirect costs like administration overheads have significant proportion in total cost.
- ▶ service sector heavily depends on support services.

Composite cost units are used,

- ▶ for cost measurement.
- ▶ to express the volume of outputs.

WHAT is service cost UNIT?






All the costs incurred during a period are

collected






analyzed

expressed in terms of a cost per unit of service.

LIST of typical cost unit

Service industry	Unit of cost (examples)
Transport Services 	Passenger- km., (In public transportation) Quintal- km., or Ton- km. (In goods carriage)
Electricity Supply service 	Kilowatt- hour (kWh)
Hospital 	Patient per day, room per day or per bed, per operation, etc.
Canteen 	Per item, per meal, etc.
Cinema 	Per ticket

Service Costing

Hotels		Guest Days or Room Days
Bank or Financial Institutions		Per transaction, per services (e.g. per letter of credit, per application, per project, etc.)
Educational Institutes		Per course, per student, per batch, per lecture, etc.
Information Technology Enabled Services		Cost per project, per module, etc.
Insurance		Per policy, per claim, per TPA, etc.

What are the METHODS for ascertaining Service Cost Unit?

Composite Cost Unit



Two measurement units combined together



Example- transportation undertaking measuring operating cost per passenger per kilometre.
Other examples- Ton- km., Quintal- km., Passenger-km., Patient-day etc.

Composite unit may be computed in TWO WAYS

Absolute (Weighted Average) basis

Summation of the products of qualitative and quantitative factors

$$\begin{aligned} & \Sigma \text{Weight Carried (W)} \times \\ & \text{Distance (D)}_1 + (W \times D)_2 \\ & + \dots \\ & + (W \times D)_n \end{aligned}$$

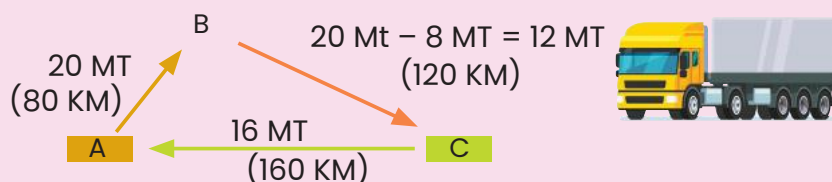
Commercial (Simple Average) basis

Product of average qualitative and total quantitative factors

$$\begin{aligned} & \Sigma \{ \text{Distance (D)}_1 + \text{D}_2 + \\ & \dots + \text{D}_n \} \times \\ & [(\text{Weight}_1 + \text{W}_2 + \dots + \text{W}_n) / n] \end{aligned}$$

Example: A Lorry starts with a load of 20 Metric Ton (MT) of Goods from Station 'A'. It unloads 8 MT in Station 'B' and balance goods in Station 'C'. On return trip, it reaches Station 'A' with a load of 16 MT, loaded at Station 'C'. The distance between A to B, B to C and C to A are 80 Kms, 120 Kms and 160 Kms, respectively.





Weighted Average or Absolute basis – MT – Kilometer would be calculated as follows:

$$= (20 \text{ MT} \times 80 \text{ Kms}) + (12 \text{ MT} \times 120 \text{ Kms}) + (16 \text{ MT} \times 160 \text{ Kms})$$

$$= 1,600 + 1,440 + 2,560 = 5,600 \text{ MT – Kilometer}$$

Simple Average or Commercial basis – MT – Kilometer would be calculated as follows:

$$= \left[\frac{(20+12+16)}{3} \text{ MT} \times (80 + 120 + 160) \text{ Kms} \right]$$

$$= 16 \text{ MT} \times 360 \text{ Kms} = 5,760 \text{ MT – Kilometer}$$

Equivalent Cost Unit/ Equivalent Service Unit



Each grade of service is assigned a weight and converted into equivalent units



Example- hotel having three types of suites for its customers, viz., Standard, Deluxe and Luxurious and tariff to be decided for one suite being double the rate of other suite.

Example: A hotel may decide tariff to their different type of suites as follows-



Type of suite	Number of rooms	Room Tariff
Standard	100	Amount X
Deluxe	50	2.5 times of the Standard suites
Luxurious	30	Twice of the Deluxe suites

Since, all three types of suites use same amount of overheads but to attach qualitative weight, these rooms are required to be converted into equivalent units.

(i) If Standard suite is taken as base:

Nature of suite	Occupancy (Room-days)	Equivalent single room suites (Room-days)
Standard	36,000 (100 rooms x 360 days)	36,000 (36,000 x 1)
Deluxe	18,000 (50 rooms x 360 days)	45,000 (18,000 x 2.5)
Luxurious	10,800 (30 rooms x 360 days)	54,000 (10,800 x 5)
		1,35,000

OR

(ii) If Luxurious suite is taken as base:

Nature of suite	Occupancy (Room-days)	Equivalent luxurious suites(Room-days)
Standard	36,000 (100 rooms x 360days)	7,200 (36,000 x 1/5)
Deluxe	18,000 (50 rooms x 360 days)	9,000 (18,000 x ½)
Luxurious	10,800 (30 rooms x 360 days)	10,800 (10,800 x 1)
		27,000

Statement Of Costs For Service Sectors

Cost sheet on the basis of variability is prepared classifying all the costs into three different heads.

Fixed costs or Standing charges

Variable costs or Operating expenses

Semi-variable costs or Maintenance expenses

Costing Of Transport Services

Types of transport services

Goods transport

Cost unit: Ton- Kilometer

Passenger transport

Cost unit: Passenger- Kilometre



Suggestive heads:

Standing charges or fixed costs (costs that remain constant irrespective of distance travelled)

- Insurance
- License fees
- Salary to Driver, Conductor, Cleaners, etc if paid on monthly basis
- Garage costs, including garage rent
- Depreciation (if related to efflux of time)
- Taxes
- Administration expenses, etc.

Variable costs or Running costs (costs associated with distance travelled)

- Petrol and Diesel
- Lubricant oils,
- Wages to Driver, Conductor, Cleaners, etc. if it is related to operations
- Depreciation (if related to activity)
- Any other variable costs identified.

Semi-variable costs or Maintenance costs

- Repairs and maintenance
- Tyres
- Spares, etc.

Costing Of Hotels And Lodges

Cost unit

Guest-day
or
Room-day

Costing Of Hospitals



A hospital may have different departments such as

- Out - Patient
- In Patient
- Medical services like X-Ray, Scanning, etc.
- General services like Catering, Laundry, Power house, etc.
- Miscellaneous services like Transport, Dispensary, etc.

Unit of Cost

- Out Patient – Per Out-patient
- In Patient – Per Room Day
- Scanning – Per Case
- Laundry – Per 100 items laundered

Costing Of Information Technology Enabled Services

EMPLOYEE COST constitutes SIGNIFICANT portion of total operating costs.



DIRECT EMPLOYEE COST is TRACEABLE to SERVICES RENDERED.

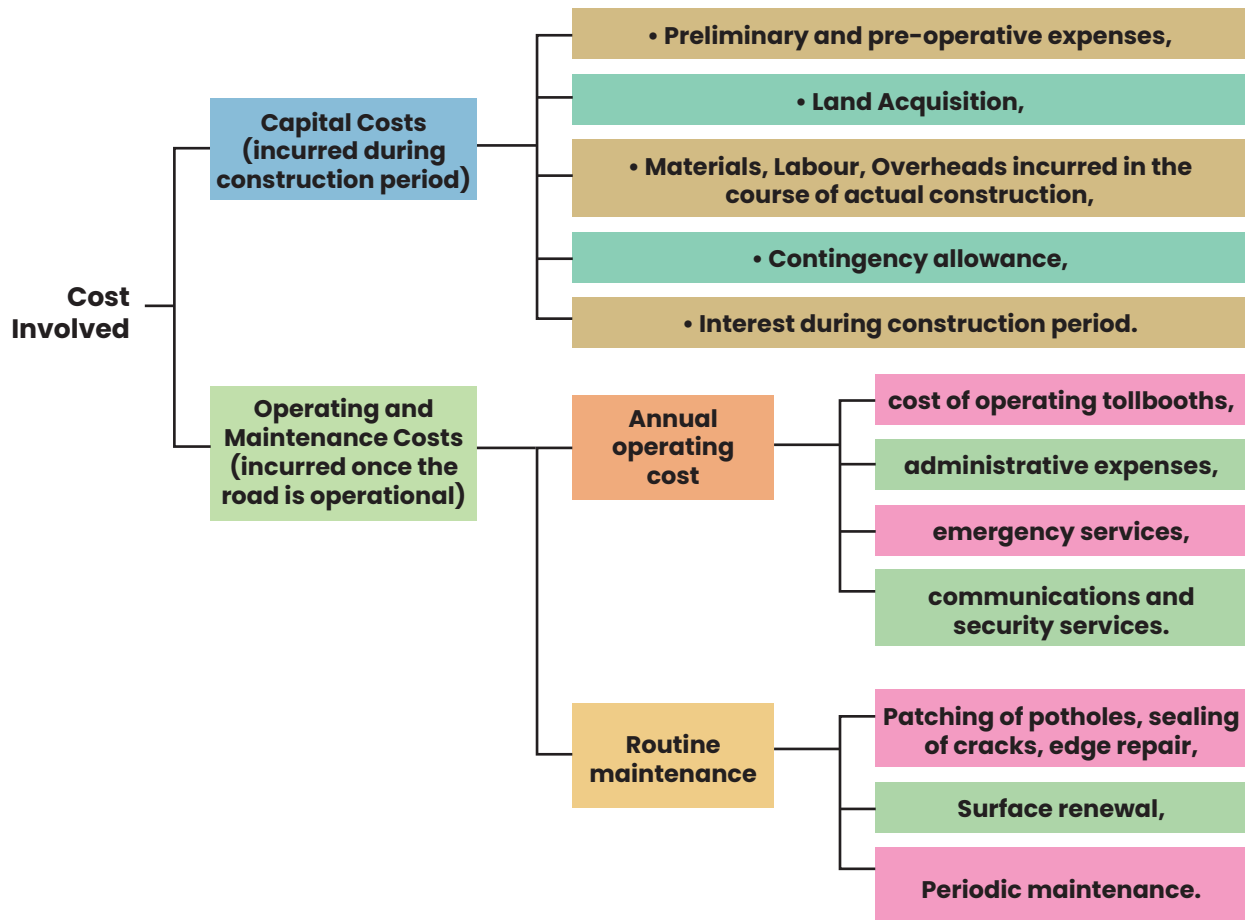
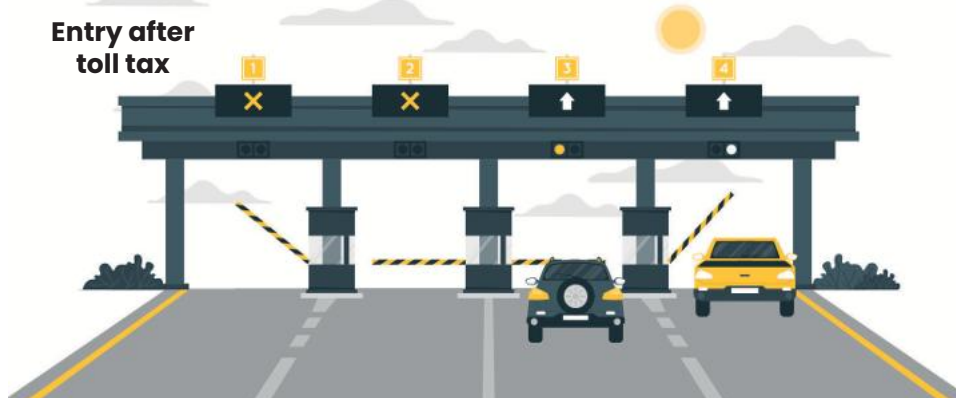
Typical MANPOWER DIRECTLY ENGAGED on a project:

- Software Engineers / Functional Consultants / Business Analysts,
- Project Leaders,
- Project Manager,
- Program Manager, etc.
- The COSTS are TRACEABLE with a project and hence forms part of DIRECT COSTS of the project.

SUPPORT MANPOWER ENGAGED on a project:

- Quality Assurance Team,
- Testing team,
- Version Control team,
- Staffing Manager, etc.
- If time is NOT TRACEABLE with a single project, then it may either be allocated or apportioned to various projects on some SUITABLE BASIS.

Costing Of Toll Roads



To compute the toll rate, following formula may be used: = $\frac{\text{Total Cost} + \text{Profit}}{\text{Number of Vehicles}}$

Costing Of Educational Institutions



INCOME of the Educational Institutions

One-time fees like Admission fee, Development fee, Annual fee etc

Recurring fees like tuition fee, laboratory, computer and internet fee, library fee, training fee, amenities fee, sports fee, extracurricular activities fee, etc.

Other incomes like transport, hostel, mess and canteen.

EXPENDITURE of the Educational Institutions

Operational Cost like teachers' salary, Building maintenance, Computer maintenance and internet charges.

Research and Development Cost like academic research on various fields of specialisations.



Costing Of Insurance Companies

INCOME of Insurance companies

Premium on policy (periodic or one time)

Commission on re-insurance

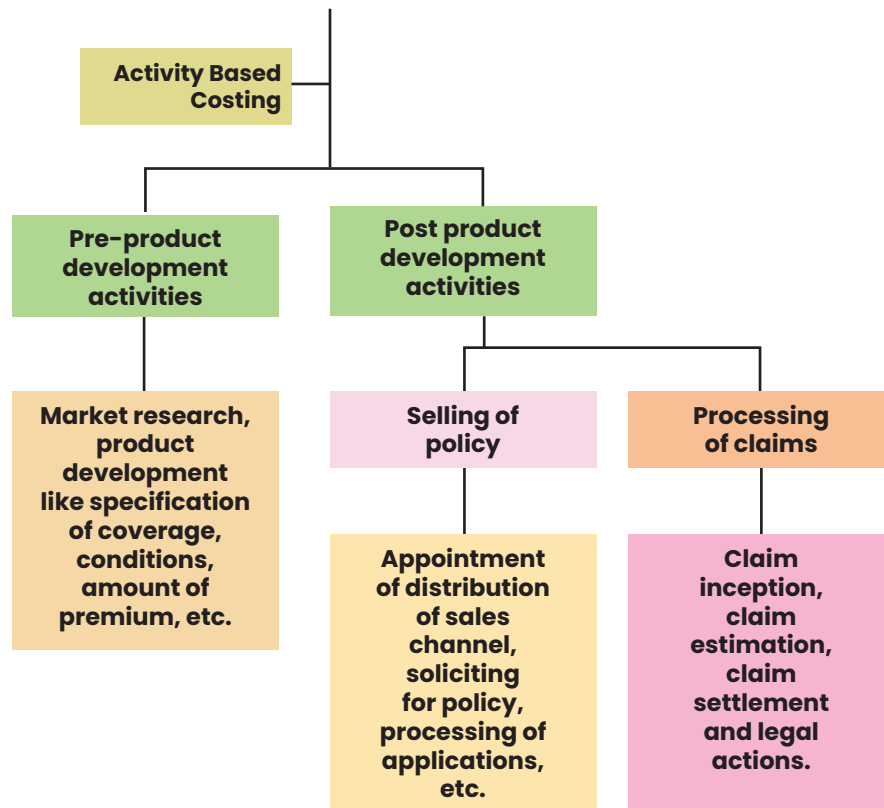
Fund administration fee and return on investment of funds, etc.

EXPENDITURE of Insurance companies

Direct costs like commission paid to agents, claim settlement, cost of valuation, premium for re-insurance, legal and other costs, etc.

Indirect costs like actuarial fees, market and product development costs, administration cost, asset management cost, etc.

Method of Costing



Costing Of Financial Institutions



COSTS TO BE IDENTIFIED with appropriate activities that have caused its occurrence.

Then costs must be **REASSIGNED FROM ACTIVITIES TO COST OBJECTS** based on identified cost drivers.

The concepts on **ACTIVITY BASED COSTING** under Costing of Insurance Companies is also applicable to financial institutions.

Costing Of Power Houses



Cost per
kilowatthour
(kWh)

Suggestive Heads:

Standing charges or Fixed costs
(costs that remain constant irrespective of power or stream generated)

- Rent, Rates & Taxes
- Insurance
- Depreciation
- Salaries, if paid on time (Monthly basis)
- Administration expenses, etc.

Variable costs or Running costs
(costs associated with power or stream generated)

- Fuel Charges
- Water Charges
- Wages/Labour charges, if paid on the basis of production
- Any other variable costs identified.

Semi-variable costs or Maintenance costs

- Meters
- Furnaces
- Service materials
- Tools, etc.

Standard Costing

Chapter Overview



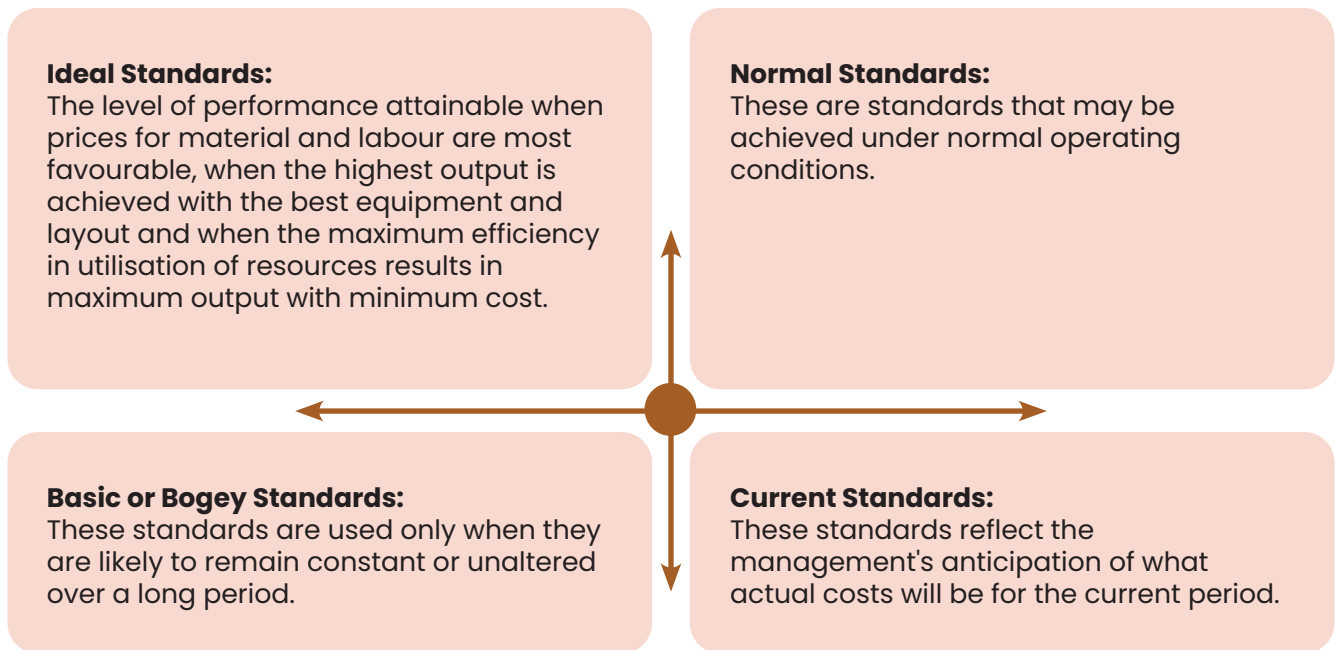
What is a Standard or Standard Cost?

Standard cost is defined in the CIMA Official Terminology as “the planned unit cost of the product, component or service produced in a period. The standard cost may be determined on a number of bases. The main use of standard costs is in performance measurement, control, stock valuation and in the establishment of selling prices.”

Standard Costing

Types of standards

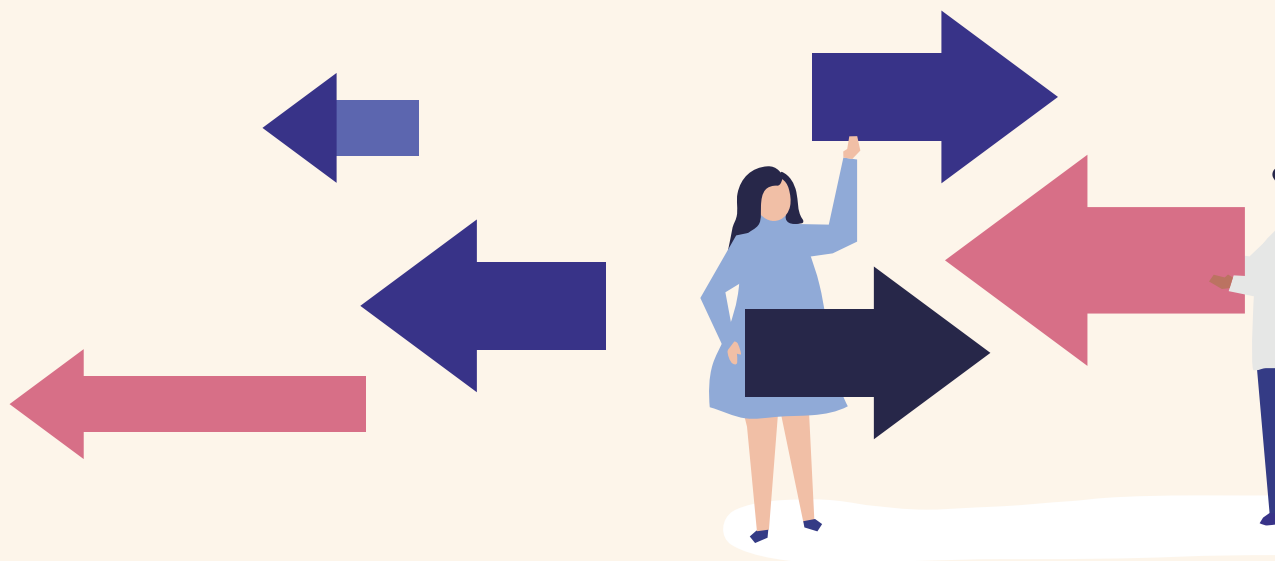
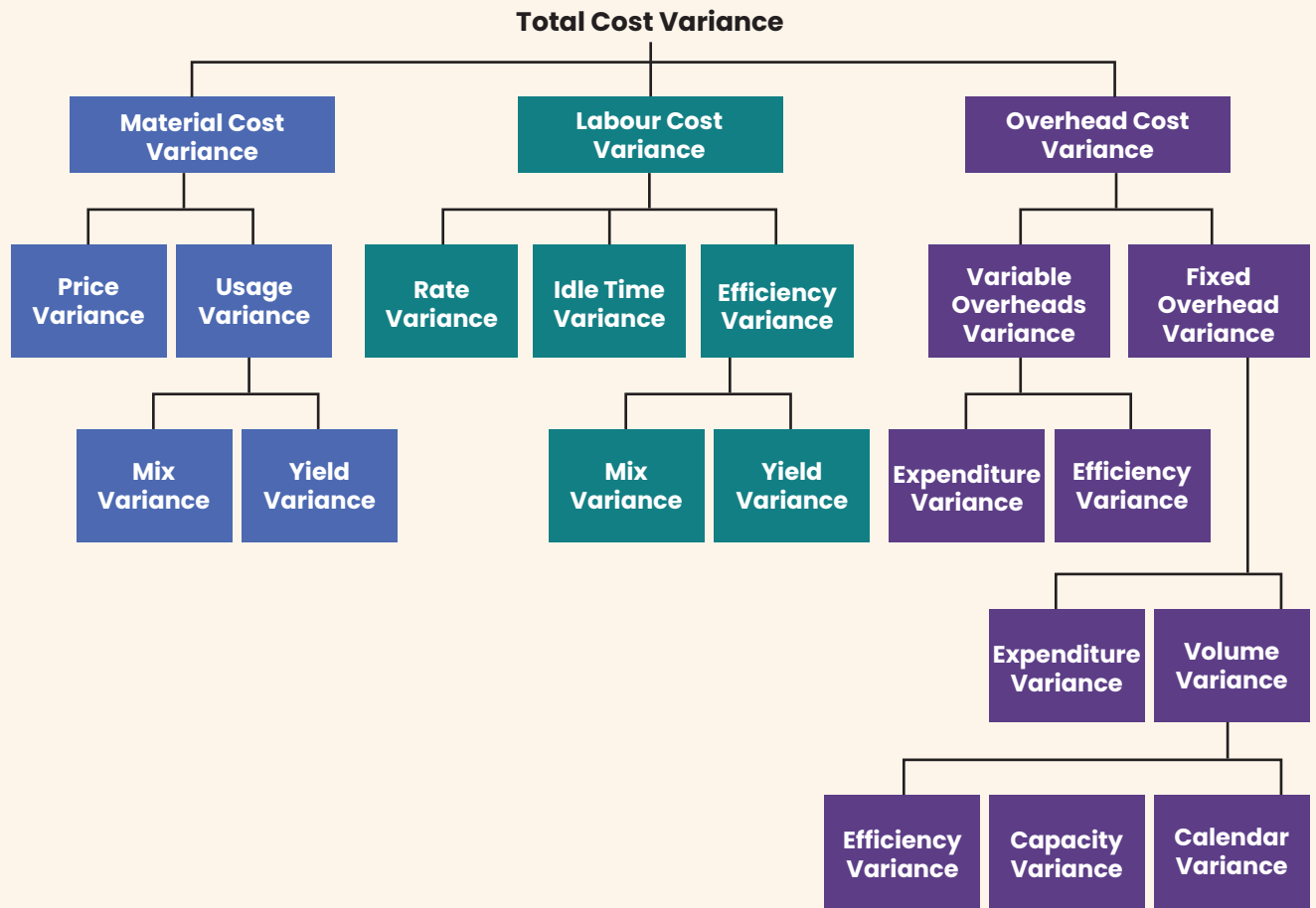
There are various types of standard which are illustrated below:



Process followed in Standard Costing

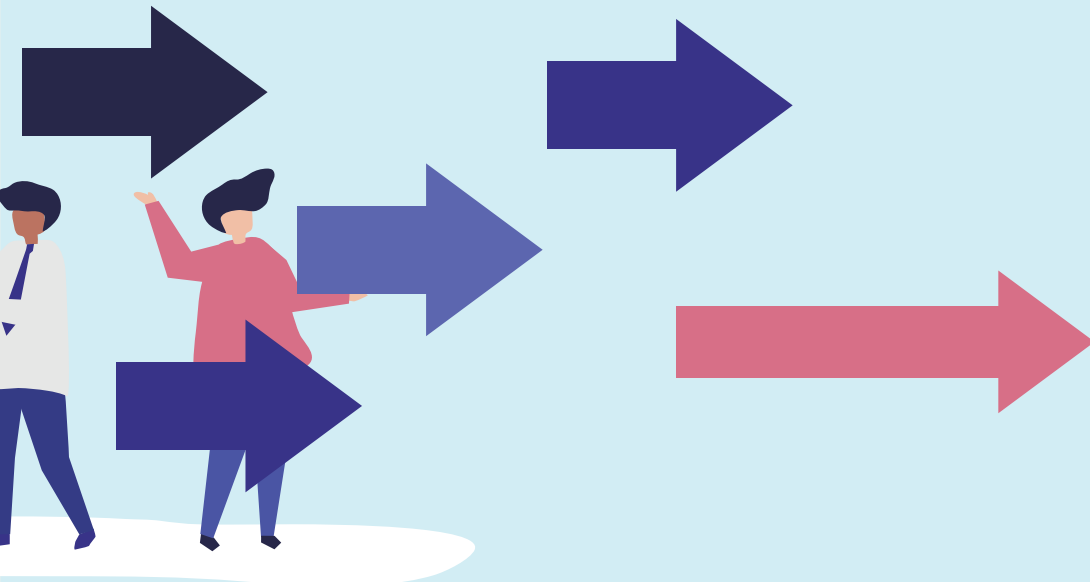
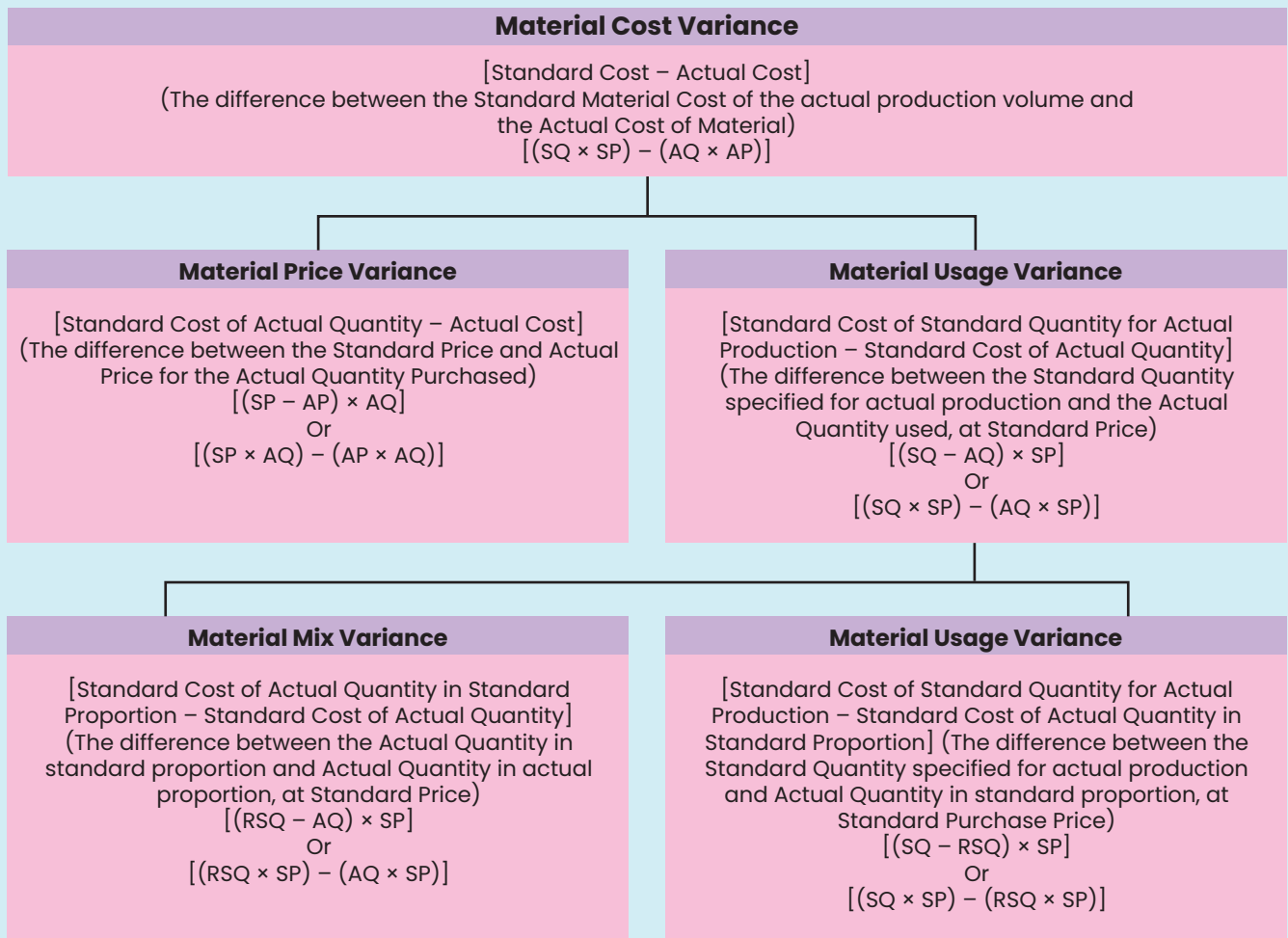


Variations at a Glance

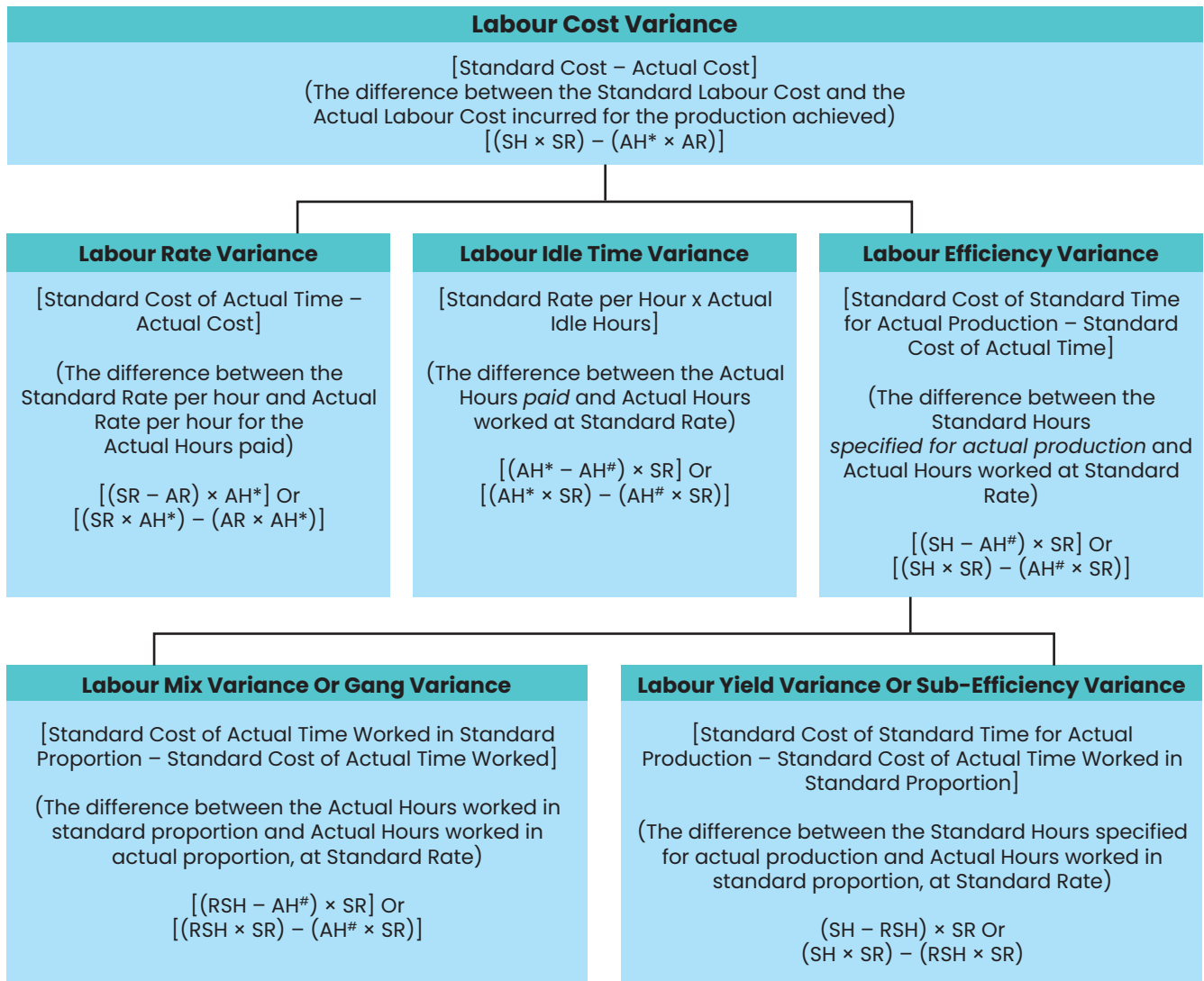


Variance Analysis

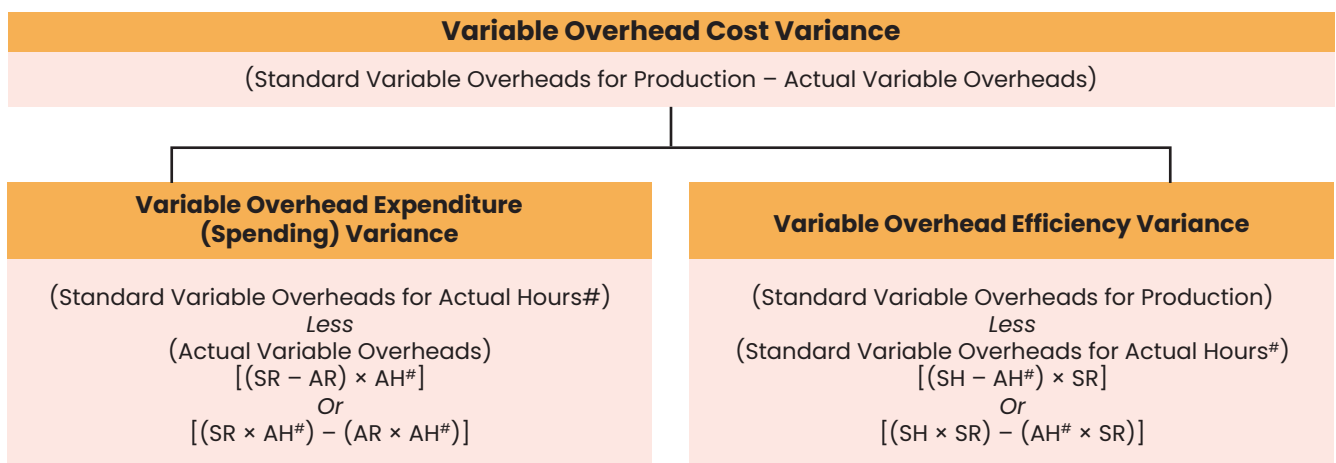
(i) Material Cost Variance



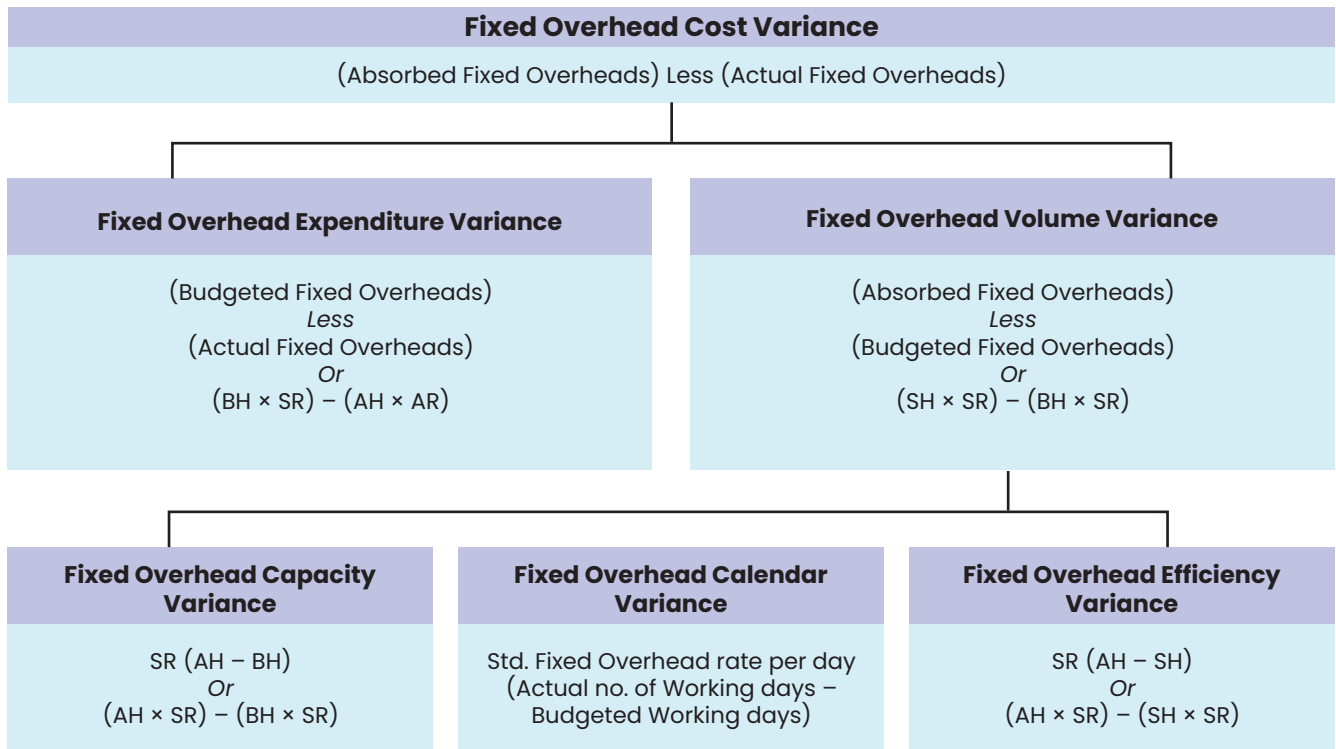
(ii) Labour Cost Variances



(iii) Variable Overhead Variances



(iv) Fixed Overhead Variances

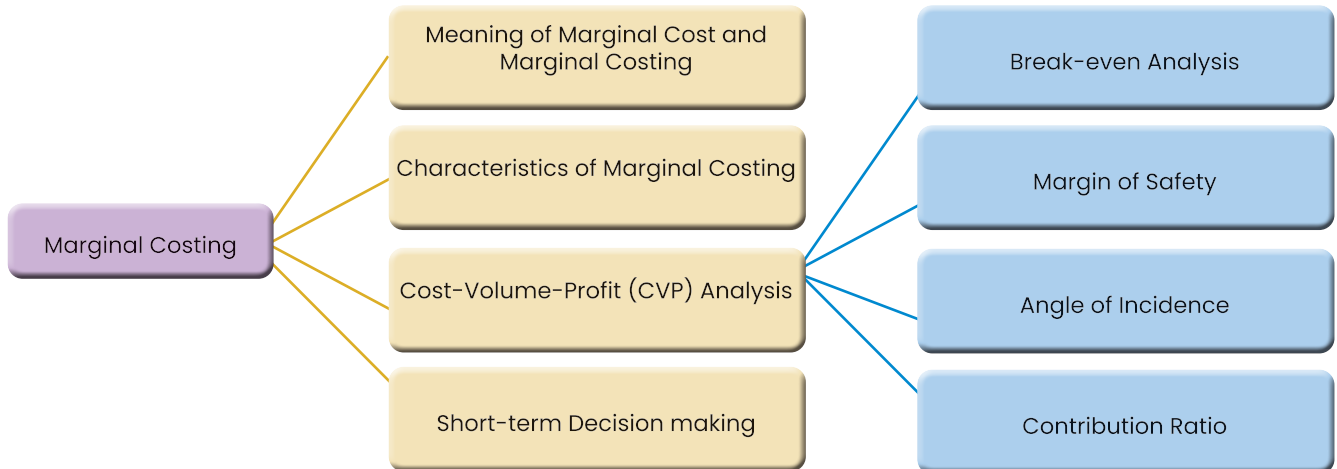


AH* – Actual Hours paid
AH# – Actual Hours worked



Marginal Costing

Chapter Overview



Important Terms

In order to understand the concept of Marginal Costing, let us understand various terms associated with Marginal Costing

Marginal Cost

Marginal Cost as understood in economics is the incremental cost of production which arises due to one-unit increase in the production quantity.

Marginal Cost

It is a costing system where products or services and inventories are valued at variable costs only.

Direct Costing

Direct Costing and Marginal Costing are used synonymously at various places. But the relation of costs with respect to activity level must be understood.

Differential Cost

Differential Cost is difference between the costs of two different production levels.

Characteristics of Marginal Costing

All elements of cost are classified into fixed and variable components. Semi-variable costs are also analyzed into fixed and variable elements.

The marginal or **variable costs** (as direct material, direct labour and variable factory overheads) **are treated as the cost of product**

Under Marginal Costing, **the value of finished goods and work-in-progress is also comprised only of Marginal Costs.** Variable selling and distribution are excluded for valuing these inventories.

Fixed costs are treated as period costs and are charged to profit and loss account for the period in which they were incurred

Prices are determined with reference to **Marginal Costs and contribution margin**

Profitability of departments and products is determined with reference to their contribution margin



Determination of Cost And Profit Under Marginal Costing

For the determination of cost of a product or service under Marginal Costing, costs are classified into variable and fixed. All the variable costs are part of product and services while fixed costs are charged against contribution margin.

Cost and Profit Statement under Marginal Costing

		Amount (₹)	Amount (₹)
Revenue	(A)		xxx
Product Cost:			
- Direct Materials		xxx	
- Direct employee (labour)		xxx	
- Direct expenses		xxx	
- Variable manufacturing overheads		xxx	
Product (Inventoriable) Costs:	(B)	xxx	xxx
Product Contribution Margin {A – B}			xxx
- Variable Administration overheads		xxx	
- Variable Selling & Distribution overheads		xxx	xxx
Contribution Margin:	(C)		xxx
Period Cost:	(D)		
Fixed Manufacturing expenses		xxx	
Fixed non-manufacturing expenses		xxx	xxx
Profit/ (loss) {C – D}			xxx

Advantages and Limitations of Marginal Costing



Advantages of Marginal Costing

- Simplified Pricing Policy
- Proper recovery of Overheads
- Shows Realistic Profit
- How much to produce
- More control over expenditure
- Helps in Decision Making
- Short term profit planning

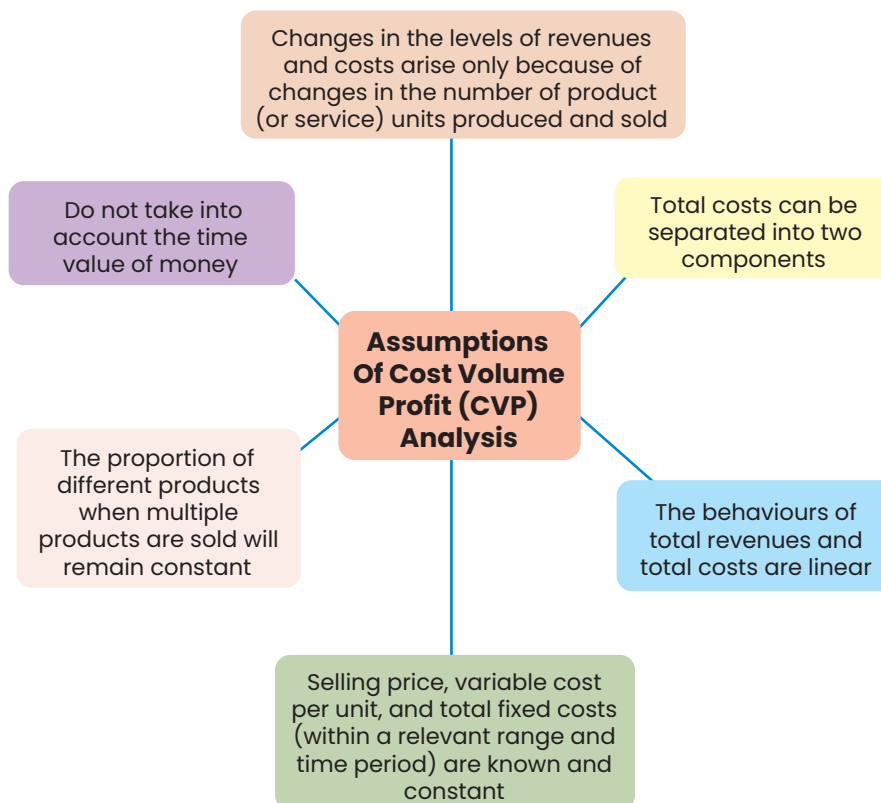


Limitations of Marginal Costing

- Difficulty in classifying fixed and variable elements
- Dependence on key factors
- Scope for Low Profitability
- Faulty valuation
- Unpredictable nature of Cost
- Marginal Costing ignores time factor and investment
- Understating of W-I-P

Cost-Volume-Profit (CVP) Analysis

It is a managerial tool showing the relationship between various ingredients of profit planning viz., cost, selling price and volume of activity



Marginal Cost Equation

Marginal Cost Equation = $S - V = C = F \pm P$

Where,

S = Selling price per unit, V = Variable cost per unit,

C = Contribution, F = Fixed Cost, P = Profit/Loss

Marginal Costing

Marginal Cost Statement

	(₹)
Sales	XXXX
Less: Variable Cost	XXXX
Contribution	XXXX
Less: Fixed Cost	XXXX
Profit	XXXX

Contribution to Sales Ratio (Profit Volume Ratio or P/V ratio)

This ratio shows the **proportion of sales available to cover fixed costs and profit**. This ratio is usually expressed in percentage:

$$P/V \text{ Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

or

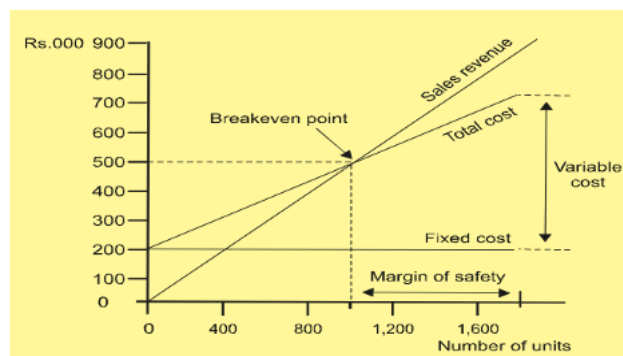
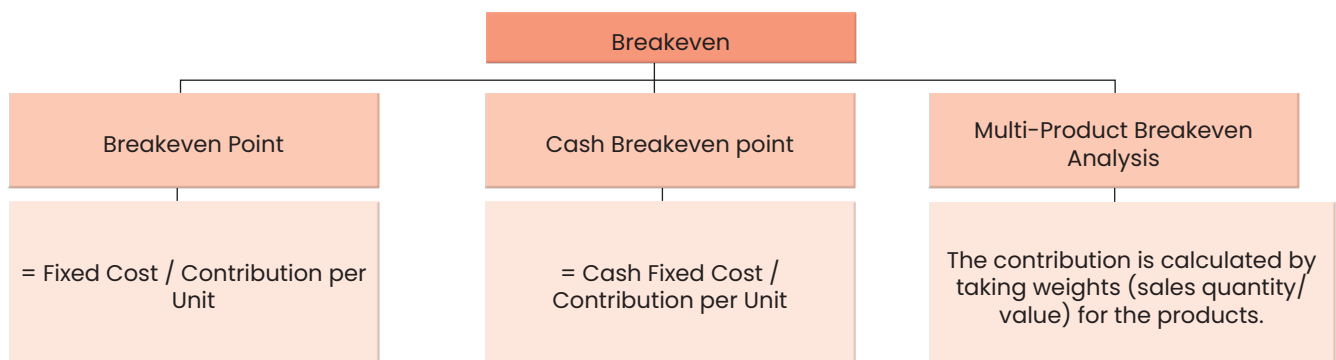
$$P/V \text{ Ratio} = \frac{\text{Change in contribution/ Profit}}{\text{Change in sales}} \times 100$$

Breakeven Analysis



Breakeven analysis is a generally used method to study the CVP analysis. This technique can be explained in two ways:

- In narrow sense it is concerned with computing the break-even point.
- In broad sense this technique is used to determine the possible profit/loss at any given level of production or sales.





Problem

FERRERO ROCHER is a new entrant in the Indian market for chocolates. It has introduced a new product— LITTLE JOY. This is a small rectangular chocolate bar. The bars are wrapped in aluminium foil and packed in attractive cartons containing 50 bars. A carton, is therefore, considered the basic sales unit. Although management had made detailed estimates of costs and volumes prior to undertaking this venture, new projections based on actual cost experience are now required. Income Statements for the last two quarters are each thought to be representative of the costs and productive efficiency we can expect in the next few quarters. There were virtually no inventories on hand at the end of each quarter. The income statements reveal the following:—



	First Quarter (₹)	Second Quarter (₹)
Sales :		
50,000 × ₹24	12,00,000	—
70,000 × ₹24	—	16,80,000
Less: Cost of Goods Sold	7,00,000	8,80,000
Gross Margin	5,00,000	8,00,000
Less: Selling and Administration	6,50,000	6,90,000
Net Income / (Loss) before Taxes	(1,50,000)	1,10,000
Less: Tax	(60,000)	44,000
Net Income / (Loss)	(90,000)	66,000

The firm's overall marginal and average income tax rate is 40%. This 40% figure has been used to estimate the tax liability arising from the chocolate operations.

Required

- Management would like to know the breakeven point in terms of quarterly carton sales for the chocolates.
- Management estimates that there is an investment of ₹30,00,000 in this product line. What quarterly carton sales and total revenue are required in each quarter to earn an after-tax return of 20% per annum on investment?
- The firm's marketing people predict that if the selling price is reduced by ₹1.50 per carton (₹0.03 off per chocolate bar) and a ₹1,50,000 advertising campaign among schoolchildren is mounted, sales will increase by 20% over the second quarter sales. Should the plan be implemented?



Solution

- Estimation of the Fixed and Variable Costs.
Variable Manufacturing Cost per carton:

$$\begin{aligned}
 &= \frac{\text{Change in Costs}}{\text{Change in Activity}} \\
 &= \frac{\text{₹8,80,000} - \text{₹7,00,000}}{70,000 - 50,000} \\
 &= \frac{\text{₹1,80,000}}{20,000} \\
 &= \text{₹9 per carton}
 \end{aligned}$$

Fixed Manufacturing Costs:

Costs of Goods Sold

₹7,00,000

Fixed Manufacturing Cost

$$\begin{aligned}
 &= \text{Fixed Manufacturing Cost} + \text{Variable Manufacturing Cost} \\
 &= \text{Fixed Manufacturing Cost} + (50,000 \text{ Cartons} \times \text{₹9}) \\
 &= \text{₹7,00,000} - \text{₹4,50,000} \\
 &= \text{₹2,50,000}
 \end{aligned}$$

Variable Selling and Administration Cost per unit:

$$\begin{aligned}
 &= \frac{\text{₹6,90,000} - \text{₹6,50,000}}{70,000 - 50,000} \\
 &= \frac{\text{₹40,000}}{20,000}
 \end{aligned}$$

Fixed Selling & Administration Costs:

Total Selling & Admn. Costs

₹6,50,000

Fixed Selling & Admn. Cost

$$\begin{aligned}
 &= \text{₹2 per unit} \\
 &= \text{Fixed Selling & Admn. Cost} + \text{Variable Selling & Admn. Costs} \\
 &= \text{Fixed Selling & Admn. Costs} + (50,000 \text{ Cartons} \times \text{₹2}) \\
 &= \text{₹6,50,000} - \text{₹1,00,000} \\
 &= \text{₹5,50,000}
 \end{aligned}$$

So the Total Variable Costs per unit are ₹11 per unit (₹9 + ₹2).

Total Fixed Costs are ₹8,00,000 per quarter (₹2,50,000 + ₹5,50,000).

Given Sale Price of ₹24 per carton and Variable Costs of ₹11 per carton, the Contribution per carton is ₹13 (₹24 – ₹11).

Breakeven Point (in terms of carton units)

$$\begin{aligned}
 &= \frac{\text{Fixed cost (per quarter)}}{\text{Contribution per Carton}} \\
 &= \frac{\text{₹8,00,000}}{\text{₹13}} \\
 &= 61,539 \text{ Cartons}
 \end{aligned}$$

(ii) To earn an After Tax Return of 20% on ₹30,00,000, the Desired Annual After Tax Net Income is ₹6,00,000 (₹30,00,000 × 20%). The Quarterly After Tax Net Income will be ₹1,50,000. Given the Tax Rate of 40%, the Pre-tax Return will be ₹2,50,000 (₹1,50,000 × 100/60).

$$\begin{aligned}
 \text{Quarterly Sales (units)} &= \frac{\text{Fixed Cost} + \text{Desired Return}}{\text{Contribution per unit}} \\
 &= \frac{\text{₹8,00,000} + \text{₹2,50,000}}{\text{₹13}} \\
 &= \frac{\text{₹10,50,000}}{\text{₹13}} \\
 &= 80,769 \text{ Cartons} \\
 \text{Quarterly Sales Revenue} &= \text{₹19,38,456} \text{ (80,769 Cartons} \times \text{₹24)}
 \end{aligned}$$

(iii) The proposal involves reducing Selling Price from ₹24 per carton to ₹22.50 per carton. Hence the Contribution per carton will be ₹11.50 (₹22.50 – ₹11.00).

The increase in Advertising Costs will push Fixed Costs up by ₹1,50,000 to ₹9,50,000.

A 20% increase over second quarter's Sales would increase Sales from 70,000 cartons to 84,000 cartons.

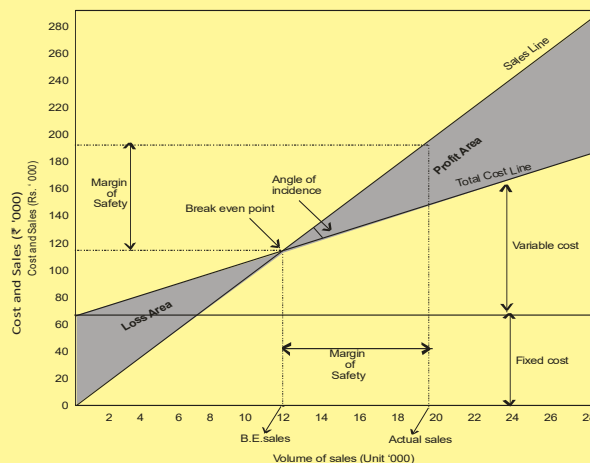
The Expected Earnings Before Taxes will be ₹16,000 [(84,000 Cartons × ₹11.50) – ₹9,50,000].

After deducting Tax at 40%, the Net Income will be ₹9,600 (₹16,000 – ₹6,400).

Earning has reduced from ₹66,000 to ₹9,600, accordingly this plan should not be implemented.

Angle of Incidence

This angle is formed by the intersection of sales line and total cost line at the breakeven point. This angle shows the rate at which profit is earned once the breakeven point is reached. The wider the angle the greater is the rate of earning profits. A large angle of incidence with a high margin of safety indicates extremely favourable position.



Margin of Safety

MOS is the difference between the expected level of sale and the breakeven sales. The larger is the margin of safety higher is the profit and vice versa.

$$\text{Margin of Safety (MOS)} = \text{Projected sales} - \text{Breakeven sales}$$



Variations of Basic Marginal Cost Equation and other formulae

i.	Sales – Variable cost = Fixed cost ± Profit/ Loss
	By multiplying and dividing L.H.S. by S
ii.	$\frac{S(S-V)}{S} = F+P$
iii.	$S \times P/V \text{ Ratio} = F + P$ or Contribution (QP/V Ratio = $\frac{(S-V)}{S}$)
iv.	$BES \times P/V \text{ Ratio} = F$ (\because at BEP profit is zero)
v.	$BES = \frac{\text{Fixed Cost}}{P/V \text{ Ratio}}$
vi.	$P/V \text{ Ratio} = \frac{\text{Fixed Cost}}{BES}$
vii.	$S \times P/V \text{ Ratio} = \text{Contribution}$ (Refer to iii)
viii.	$P/V \text{ Ratio} = \frac{\text{Contribution}}{\text{Sales}}$
ix.	$(BES + MS) \times P/V \text{ Ratio} = \text{Contribution}$ (Total sales = BES + MS)
x.	$(BES \times P/V \text{ Ratio}) + (MS \times P/V \text{ Ratio}) = F + P$ By deducting $(BES \times P/V \text{ Ratio})$ from L.H.S. and F from R.H.S. in (x) above, we get:
xi.	$M.S. \times P/V \text{ Ratio} = P$
xii.	$P/V \text{ Ratio} = \frac{\text{Change in profit}}{\text{Change in sales}}$
xiii.	$P/V \text{ Ratio} = \frac{\text{Change in contribution}}{\text{Change in sales}}$
xiv.	$\text{Profitability} = \frac{\text{Contribution}}{\text{Key factor}}$
xv.	Margin of Safety = Total Sales – BES or $\frac{\text{Profit}}{P/V \text{ ratio}}$
xvi.	$BES = \text{Total Sales} - MS$ Margin of Safety Ratio = $\frac{\text{Total sales} - BES}{\text{Total sales}}$

Effect of some independent situations on the P/V ratio

Situation	P/V Ratio	Reason
An decrease in the physical sales volume	Will not change	The ratio of sales value and variable cost will remain same irrespective of change in sales volume.
A increase in the fixed cost	Will not change	Fixed cost is not considered in calculation of P/V ratio.
A 10% decrease in both selling price and variable cost per unit	Will not change	The decrease in selling price and variable cost by the same ratio will not change the P/V ratio.
A 10% increase in the selling price per unit and 10% decrease in the physical sales volume	Will increase	The increase in selling price will increase the contribution margin but the change in sales volume in any direction will not affect P/V ratio. Thus, increase in selling price with decrease in sales volume will increase the P/V ratio.
A 50% increase in the variable cost per unit and 50% decrease in the fixed cost	Will decrease	The increase in variable cost reduces the contribution margin thus decreases the PV ratio. Increase or decrease in fixed cost will not affect the P/V ratio.
An increase in the angle of incidence	Will increase	Increase in angle of incidence means increase in rate of profit earning which is nothing but the P/V ratio that contributes towards the profitability after recovering the fixed cost.

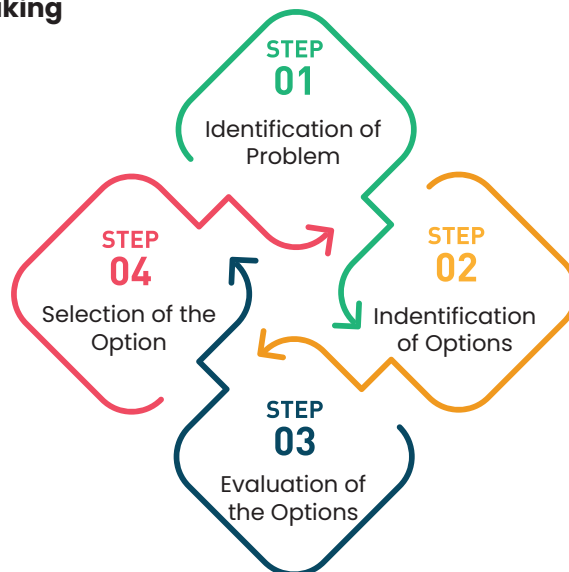


Application of CVP Analysis in Decision Making

Decision Making

In traditional costing methods, total cost is classified as the sum total of the cost of direct material, direct labour, direct expenses, manufacturing overheads, administration overheads, selling and distribution overheads. In this system, total cost per unit will remain constant irrespective of the level of output. This causes a problem to the management in taking sound decisions. Now the management will identify all possible options to answer the problem and to achieve its goal.

Framework for Decision Making



Analysis of Few Cost and Its Relevance

Abhi Ltd, a company that builds houses presents the following facts relating to a certain housing contract that it wishes to undertake:

The Marketing person's food and hotel expenses of ₹2,400 were incurred for a meeting with a prospective client.

1,000 kg of raw material X will be required for the house. Inventory of X available is 500 kg. It was purchased at ₹490 per kg. It is used by Abhi Ltd in other projects. Its current market price is ₹540 per kg. Its resale value is ₹310 per kg.

The house will require 100 hours of engineer's time. The engineers are paid a fixed monthly salary of ₹55,000 per engineer who can work 170 hours a month. Spare time is not available now and an engineer has to be hired for this house for one month. He cannot be used in any other project once he does this contract.

Abhi Ltd will use a special earthquake proof foundation material. This was developed by Abhi Ltd at a cost of ₹35,000 for some other project that had to be abandoned. If it does not use it in this project, it can use it in some other project and charge the client ₹50,000 for it.

Sl. No.	Item	Type of Cost	Relevant / Irrelevant
1	Food and hotel expenses ₹2,400	Sunk Cost	Irrelevant
2(i)	Material X: 500 kg × ₹490 per kg	Historical Cost/Sunk Cost	Irrelevant
(ii)	Material X: 500 kg × ₹540 per kg	Replacement Cost	Relevant
3(i)	Engineer's salary ₹55,000	Period Cost	Relevant
(ii)	Engineer's free time cost $70/170 \times ₹55,000$	Committed Cost / Unavoidable Cost	Irrelevant
4(i)	Design cost ₹35,000	Sunk Cost	Irrelevant
(ii)	Design cost ₹50,000	Opportunity Cost	Relevant



Short-term Decision Making using Concepts of CVP Analysis

Decisions related with excess supply

- Processing of Special Order
- Determination of price for stimulating demand
- Local vs Export sale
- Determination of minimum price for price quotations
- Shut-down or continue decision, etc.

Decisions related with excess demand

- Make or Buy/ In-house-processing vs Outsourcing
- Product mix decision under resource constraints (limiting factors)
- Sales mix decisions
- Sale or further processing, etc.

Marginal Costing

Absorption Costing

Absorption Costing is the practice of charging all costs, both variable and fixed to operations, processes or product. In Absorption Costing the classification of expenses is based on functional basis and the fixed expenses are distributed over products on Absorption Costing basis that is, based on a pre-determined level of output. This will lead to over or under-recovery of expenses since actual output may be greater or lesser than the estimate used for recovery. In this method, the fixed cost per unit produced decreases with increase in production.

Income Statement (Absorption Costing)

Item		(₹)
Production Costs:		XXXXX
<i>Direct material consumed</i>		
<i>Direct labour cost</i>		XXXXX
<i>Variable manufacturing overhead</i>		XXXXX
<i>Fixed manufacturing overhead</i>		XXXXX
Cost of Production		XXXXX
Add: <i>Opening stock of finished goods</i>		XXXXX
<i>(Value at cost of previous period's production)</i>		XXXXX
Less: <i>Closing stock of finished goods</i>		XXXXX
<i>(Value at production cost of current period)</i>		XXXXX
Cost of Goods Sold		XXXXX
Add: <i>(or less) Under (or over) absorption of fixed</i>		XXXXX
<i>Manufacturing overhead</i>		
Add: <i>Administration costs</i>		XXXXX
<i>Selling and distribution costs</i>		
Total Cost	XXXXX	XXXXX
<i>Profit (Sales – Total cost)</i>	XXXXX	XXXXX

Product Mix Decision under Resource Constraints i.e Limiting Factor

Limiting Factor

Limiting Factor is anything that restricts a business from maximizing its sales due to constraints in demand or the availability of production resources. It may be raw material, machine capacity, regulatory and environmental requirement, etc. Limiting factor analysis will help business to optimise the key resources up to maximum possible extent.

Decision Making under CVP Analysis



Problem

Elegance Pvt Ltd is considering three possible countries for the sole manufacturing site of leather purse: Poland, France, and Spain. All leather purses are to be sold to retail outlets for ₹350 per unit. These retail outlets add their own markup when selling to the customers. Fixed costs and variable cost per unit differ in the three countries are given below:



Country	Poland (₹)	France (₹)	Spain (₹)
Sales Price to Retail Outlets	350	350	350
Annual Fixed Costs	80,00,000	60,00,000	90,00,000
Variable Manufacturing per unit	120	130	110
Variable Marketing & Distribution Cost per unit	25	30	40

Required:

1. Compute the breakeven point in each country in terms of: (a) Units Sold and (b) Sales.
2. If Elegance Pvt Ltd, plans to produce and sell 1,00,000 leather purses in 2024, what is the budgeted operating income for each of the three countries? Comment on the results.

**Solution**

Country	Poland (₹)	France (₹)	Spain (₹)
Sales Price to Retail Outlets (1)	350	350	350
Annual Fixed Cost (2)	80,00,000	60,00,000	90,00,000
Variable Manufacturing Cost per Unit (3)	120	130	110
Variable Marketing and Distribution Cost per Unit (4)	25	30	40
Contribution Margin Per Unit (5) = (1) – (3) – (4)	205	190	200
Breakeven Units (6) = (2) ÷ (5)	39,024	31,579	45,000
Breakeven Sales (6) × (1)	1,36,58,537	1,10,52,632	1,57,50,000

Breakeven point in each country in terms of**(a) Units Sold**

Poland	39,024
France	31,579
Spain	45,000

(b) Sales (₹)

Poland	1,36,58,537
France	1,10,52,632
Spain	1,57,50,000

Operating Income for Budgeted Sales of 1,00,000 Units

Items/Country	Poland (₹)	France (₹)	Spain (₹)	Total (₹)
Contribution Margin Per Unit	205	190	200	
Total Contribution for 1,00,000 units	2,05,00,000	1,90,00,000	2,00,00,000	
Annual Fixed Cost	80,00,000	60,00,000	90,00,000	
Operating Income	1,25,00,000	1,30,00,000	1,10,00,000	3,65,00,000

Comparison of fixed Cost, Contribution Margin, Break-even point, Operating Income at Budgeted sales

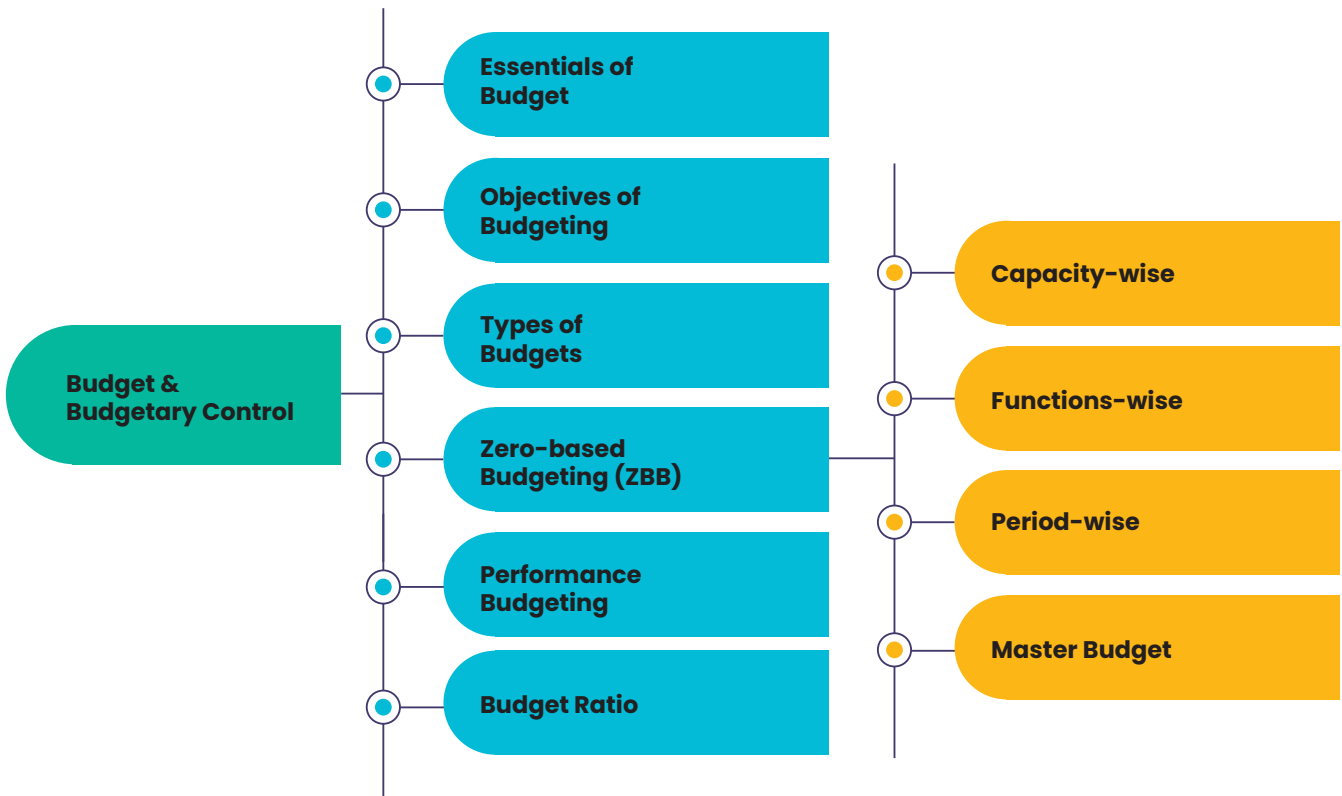
Country	Fixed Cost	Contribution Margin	Breakeven point	Operating income at Budgeted sales
Poland	In Between	Highest	Middle	2nd Best
France	Lowest	Lowest	Lowest	Best
Spain	Highest	In Between	Highest	Worst

Even though France has the lowest contribution margin per unit, it has the lowest breakeven point as fixed costs is only ₹60,00,000. Spain has better contribution margin but has a very high fixed cost. Spain also has the highest breakeven in terms of sales as well as in units. Fixed costs of Poland are in between Spain and France, resulting in it to be in the middle in terms of breakeven sales.

Elegance Pvt Ltd should move its production to France because even though it has the lowest contribution margin per unit, it also has very low (compared to the other countries) fixed costs. At budgeted unit sales of 1,00,000 units, the Company will maximize operating income by producing in France.

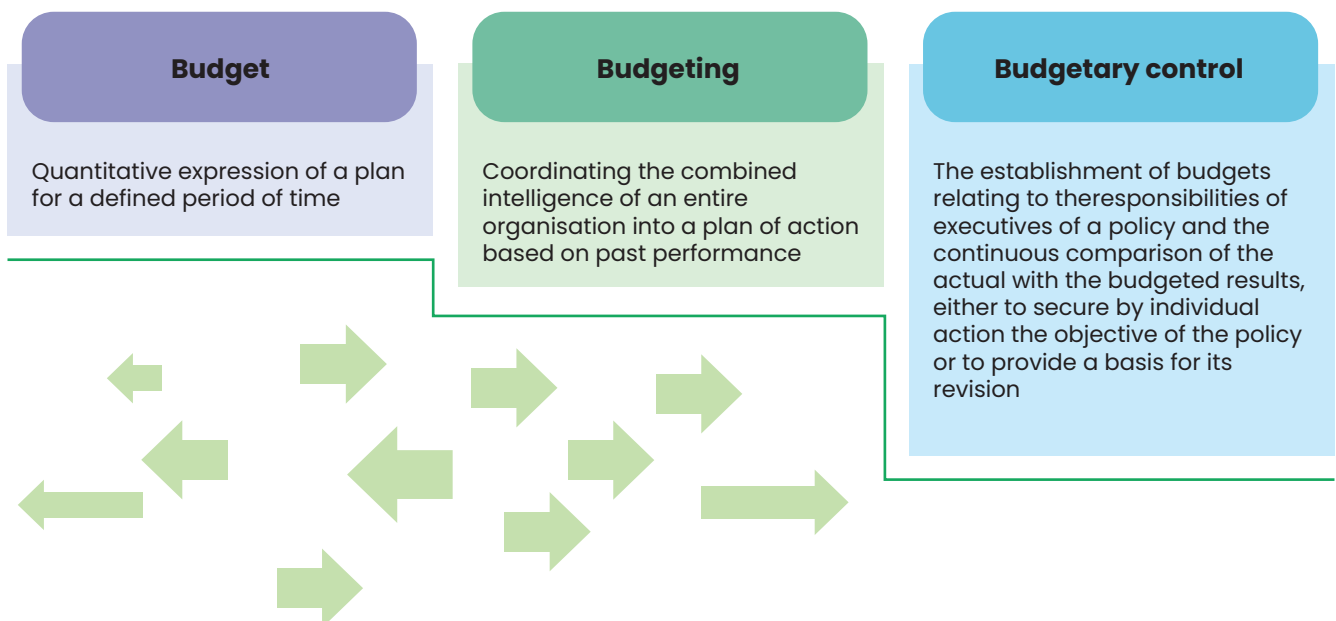
Budget & Budgetary Control

Chapter Overview



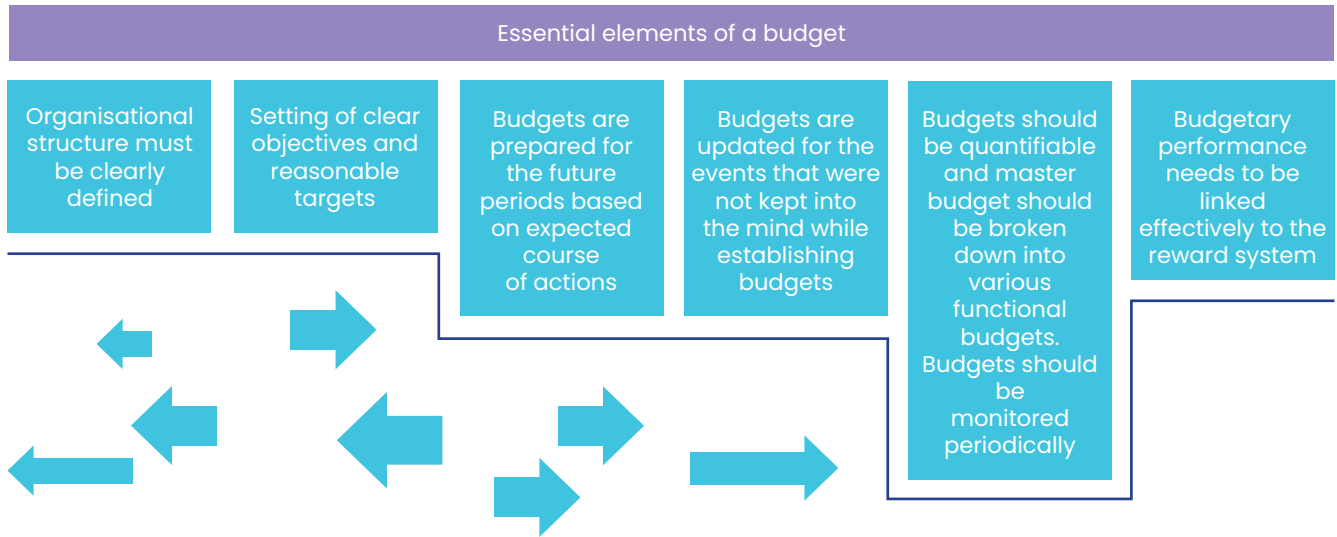
Definition and Terminology

Let us first define various important terminologies used in budget and budgetary control.



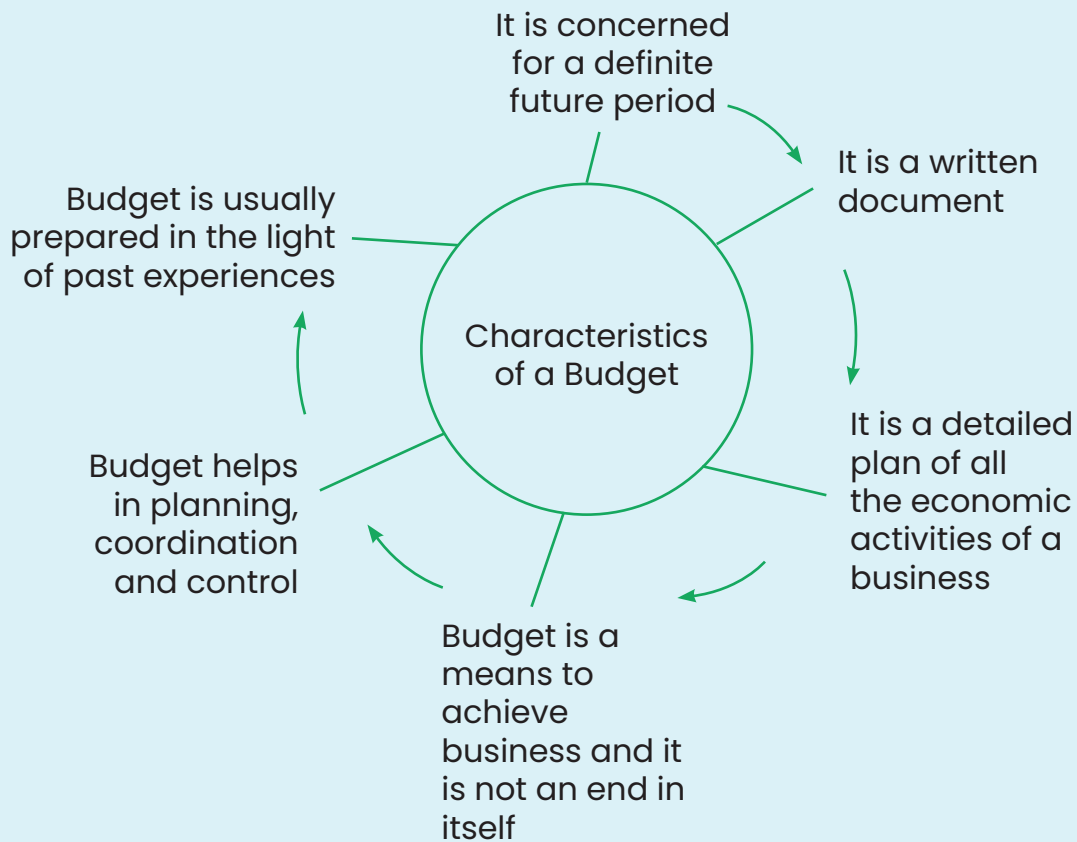
Essentials of Budget

Essential elements of budget are illustrated below:



Characteristics of Budget

Main characteristics of budget are as below:



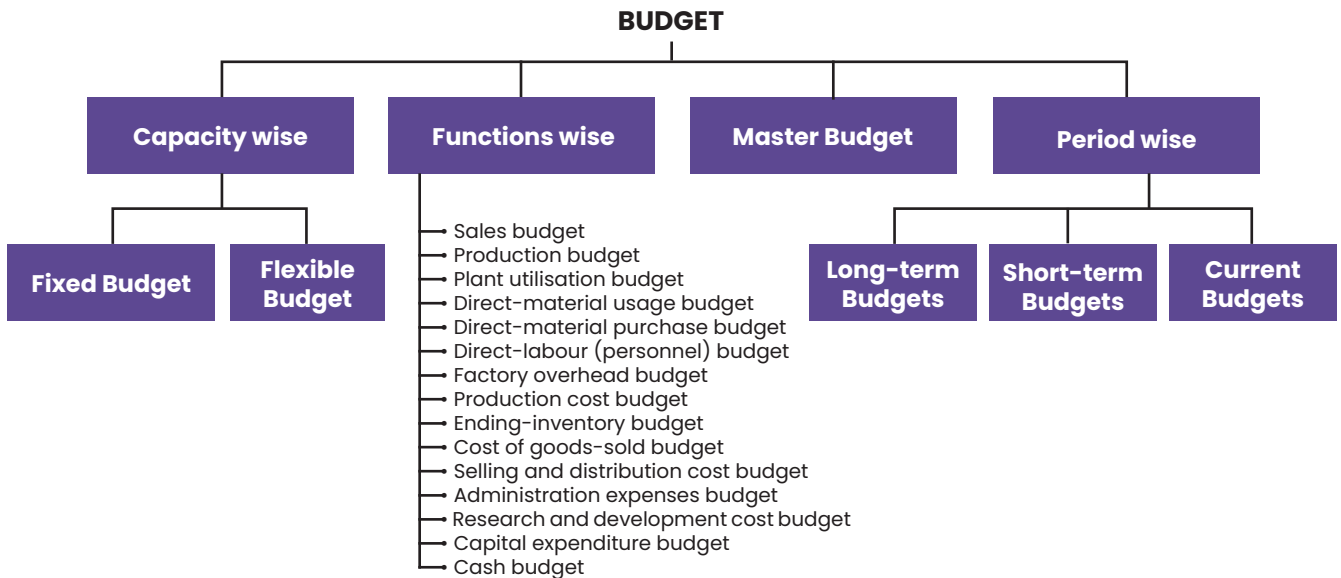
Budget & Budgetary Control

Advantages of Budgetary Control System

There are many advantages of budgetary control system, and some of the them are illustrated below:

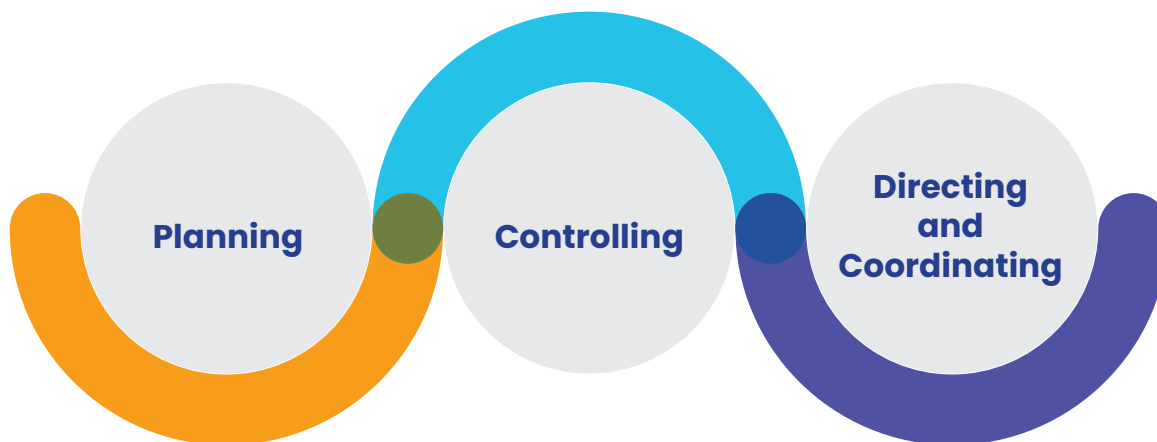


Classification of Budget



Objectives of Budgeting

The objectives of budgeting begin with planning and ends with controlling. Once the planning is done, they can be used for directing and controlling operations so that the stated targets in planning are achieved.



Definition of different types of Budget

Functional Budgets	Budgets which relate to the individual functions in an organisation are known as Functional Budgets. For example, purchase budget; sales budget; production budget; plant-utilisation budget and cash budget.
Master Budget	It is a consolidated summary of the various functional budgets. It serves as the basis upon which budgeted P & L A/c and forecasted Balance Sheet are built up.
Long-term Budgets	The budgets which are prepared for periods longer than a year are called long-term budgets. Such budgets are helpful in business forecasting and forward planning. Capital expenditure budget and Research and Development budget are examples of long-term budgets.
Short-term Budgets	Budgets which are prepared for periods less than a year are known as short-term budgets. Cash budget is an example of short-term budget. Such types of budgets are prepared in cases where a specific action has to be immediately taken to bring any variation under control, as in cash budgets.
Basic Budgets	A budget which remains unaltered over a long period of time is called basic budget.
Current Budgets	A budget which is established for use over a short period of time and is related to the current conditions is called current budget.
Fixed Budget	According to CIMA official terminology, "a fixed budget, is a budget designed to remain unchanged irrespective of the level of activity actually attained".
Flexible Budget	According to CIMA official terminology, "a flexible budget is defined as a budget which, by recognizing the difference between fixed, semi-variable and variable costs is designed to change in relation to the level of activity attained."

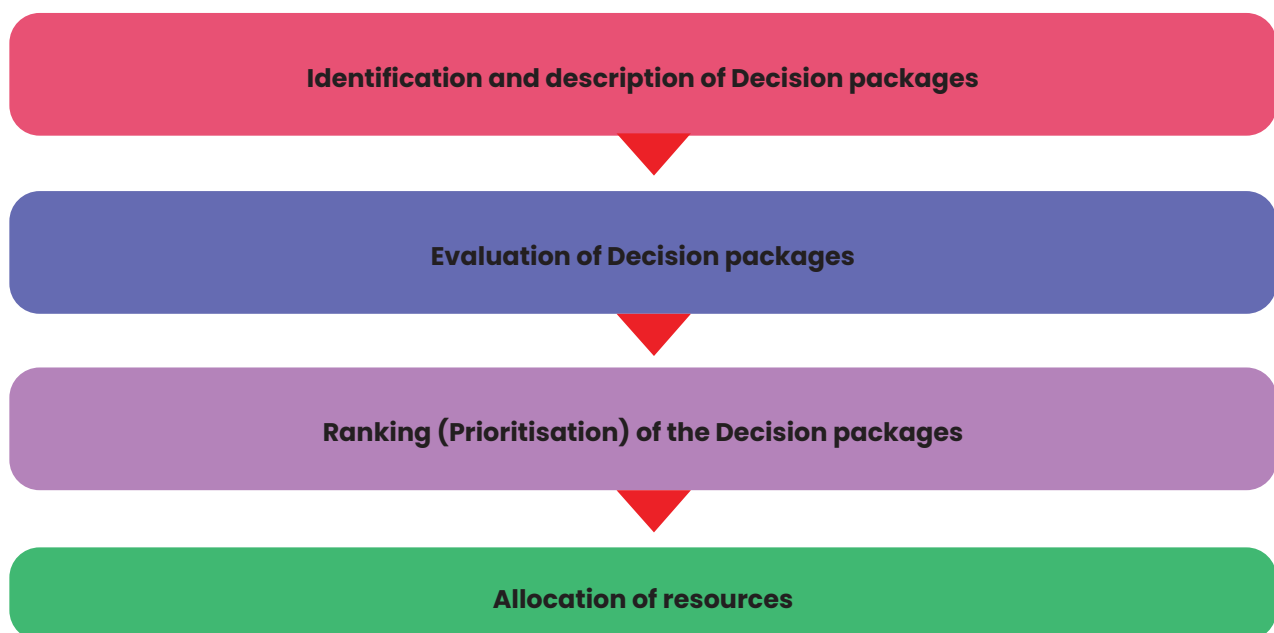
Differences between Fixed Budget and Flexible Budget

Sl. no.	Fixed Budget	Flexible Budget
1.	It does not change with actual volume of activity achieved. Thus it is known as rigid or inflexible budget	It can be re-casted on the basis of activity level to be achieved. Thus it is not rigid.
2.	It operates on one level of activity and under one set of conditions. It assumes that there will be no change in the prevailing conditions, which is unrealistic.	It consists of various budgets for different levels of activity.
3.	Here as all costs like - fixed, variable and semi-variable are related to only one level of activity, so variance analysis does not give useful information.	Here, analysis of variance provides useful information as each cost is analysed according to its behaviour.
4.	If the budgeted and actual activity levels differ significantly, then the aspects like cost ascertainment and price fixation do not give a correct picture.	Flexible budgeting at different levels of activity facilitates the ascertainment of cost, fixation of selling price and tendering of quotations.
5.	Comparison of actual performance with budgeted targets will be meaningless specially when there is a difference between the two activity levels.	It provides a meaningful basis of comparison of the actual performance with the budgeted targets.

Zero-Based Budgeting (ZBB)

It is defined as 'a method of budgeting which requires each cost element to be specifically justified, although the activities to which the budget relates are being undertaken for the first time, without approval, the budget allowance is zero'.

Stages in Zero-based budgeting



Performance Budgeting

A performance budget is one which presents the purposes and objectives for which funds are required, the costs of the programmes proposed for achieving those objectives, and quantitative data measuring the accomplishments and work performed under each programme.

Steps in Performance Budgeting





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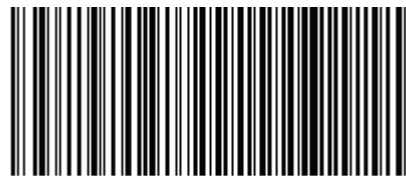
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