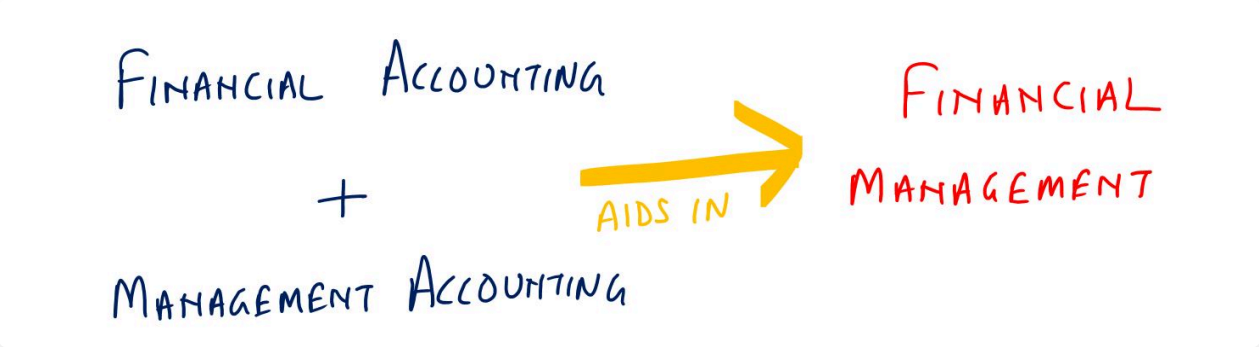
# Auditing Course Material

Part 11 of 61 (Chapters 1001-1100)

## 2. Introduction

The objective of Financial Management is to maximize the wealth of shareholders by taking effective Investment, Financing and Dividend decisions.




Investment decisions relate to the effective deployment of scarce resources in terms of funds while the Financing decisions are concerned with acquiring optimum finance for attaining financial objectives. The Dividend decisions relates to the determination of the amount and frequency of cash which can be paid out of profits to shareholders.

**1. Financial Management and Financial Accounting**

Financial Accounting focuses on recording, summarizing, and reporting a company's financial transactions to external stakeholders (e.g., investors, regulators). It provides financial statements like the balance sheet, income statement, and cash flow statement.

Financial Management uses the data from financial accounting to make strategic decisions related to capital structure, investment planning, risk management, and liquidity management. The insights from financial accounting help financial managers assess company performance and plan for future financial growth.

**2. Financial Management and Management Accounting**

Management Accounting provides detailed internal financial data and analysis that help managers make day-to-day operational decisions. It focuses on budgeting, cost control, and performance evaluation, providing real-time financial information to managers.

Financial Management uses the insights from management accounting for long-term financial planning, capital allocation, and assessing profitability. Management accounting data informs financial managers about internal efficiency, helping in cost management and resource optimization.

In summary, Financial Management relies on Financial Accounting for external financial reporting and on Management Accounting for internal decision-making, using data from both to manage a company's finances effectively.

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## 3. Objectives of Cost and Management Accounting


The objectives of Cost and Management Accounting are:

- To provide accurate cost information for decision-making and resource allocation.
- To classify and analyze costs based on behavior (fixed, variable) to enhance budgeting and planning.
- To use predetermined overhead rates and flexible budgets for efficient cost allocation and control.
- To implement activity-based costing (ABC) and activity-based management (ABM) for precise indirect cost allocation.
- To apply job order costing for customized production and process costing for mass production.
- To use standard costing and variance analysis to monitor and control costs against benchmarks.
- To develop comprehensive master budgets for financial planning and coordination.
- To perform cost-volume-profit (CVP) analysis for break-even points and profitability decision-making.
- To provide relevant cost information for short-term decisions, such as pricing and make-or-buy choices.
- To allocate joint costs and account for by-products and scrap accurately.
- To integrate cost management systems for operational efficiency.
- To implement responsibility accounting and proper cost allocation to support departments.
- To measure performance using balanced scorecards and link it with reward systems for motivation and alignment with business goals.

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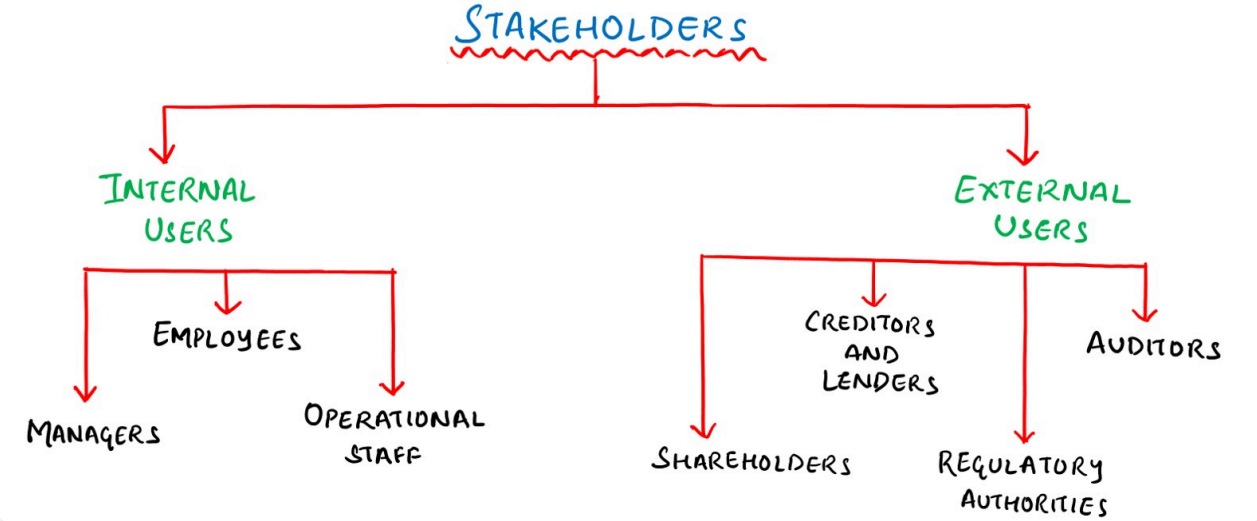
# 4. Stakeholders

Cost and management accounting information is used by different stakeholders. These stakeholders can be categorised into internal and external to the entity.




**Internal users**

Following can be categorised as internal users of cost and management accounting information:

**Managers**
The managers use the information to ascertain the cost and profit to be derived from the product or service. This helps in decision making whether to produce the product or not.

**Employees**
Employees utilise the information related to time and attendance, incentives for work, performance standards etc.

**Operational level staff** (first line managers, supervisors, foreman, etc.)

They need the information to assess their performance goals, to know the performance parameters against which their performance is measured, to know the profits of the responsibility centres etc.

**External users**

Following can be categorised as external users of cost and management accounting information:

**Shareholders**
Shareholders are concerned regarding the performance of an entity because they are the investors in the entity. Therefore, they require cost and management accounting information regarding new orders received, product expansion, market share for products etc.

**Creditors and Lenders**
Creditors and lenders are concerned with cost and management accounting information because the money lent by them is at stake. For example, any financial institution which gives loan to an entity is concerned with regular reporting on net debt position and stock balances.

**Auditors**
The auditors conduct audit of financial accounts, special audit like cost audit etc. Therefore, auditors require cost reports, reports reviewed by management etc. in order to conduct the audit.

**Regulatory Authorities**
Regulatory authorities require the entities to prepare the information in pre-determined formats. These authorities use the information for various purposes like tariff determination, providing subsidies, rate fixation etc.

# 5. Role of Information Technology


Information Technology (IT) plays a vital role in cost and management accounting by automating processes, enhancing data accuracy, and providing advanced tools for analysis and decision-making.

Here are the key roles IT plays in cost and management accounting:

**1. Automation of Data Collection and Cost Calculation**
IT systems such as ERP (Enterprise Resource Planning) software automatically gather and process financial data related to costs, such as labor, materials, and overhead. This automation reduces manual work, increases accuracy, and ensures that cost data is updated in real-time.

**2. Advanced Cost Tracking and Reporting**
IT provides management accountants with tools to track costs at a granular level. For example, activity-based costing (ABC) systems use IT to trace indirect costs to specific activities and allocate them to products or services accurately. This enables precise cost reporting, essential for pricing, budgeting, and cost control.

**3. Real-time Financial Reporting and Budgeting**
IT enables real-time financial reporting and budgeting, allowing management accountants to monitor costs and compare them against budgets continuously. Dashboards and BI (Business Intelligence) tools allow for immediate access to financial data, enabling quicker responses to cost variances and inefficiencies.

**4. Improved Cost Analysis and Decision-Making**
IT supports cost analysis through predictive analytics, trend analysis, and modeling. By using sophisticated software, management accountants can simulate various cost scenarios, helping managers make data-driven decisions on resource allocation, cost control, and process improvements.

**5. Integration of Financial Data Across Functions**
IT integrates financial data from various business departments (such as procurement, production, and sales) into a single system. This seamless integration ensures consistency in cost data across the organization and provides management accountants with a holistic view of cost structures.

**6. Cost Control and Optimization**
Through real-time data monitoring and analytics, IT helps identify cost-saving opportunities. For example, IT can analyze supply chain costs, labor efficiency, and resource utilization, highlighting areas where cost reductions can be made or where processes can be optimized.

**7. Enhanced Forecasting and Budget Planning**
IT systems provide tools for more accurate forecasting and budgeting. Predictive models help management accountants forecast future costs based on historical data and trends, improving long-term financial planning and resource allocation.

**8. Data Security and Compliance**
IT ensures the security and confidentiality of cost and financial data. It also helps in compliance with regulations and standards

by ensuring that financial reports are accurate and properly documented. Many IT systems include internal controls to prevent fraud and errors.

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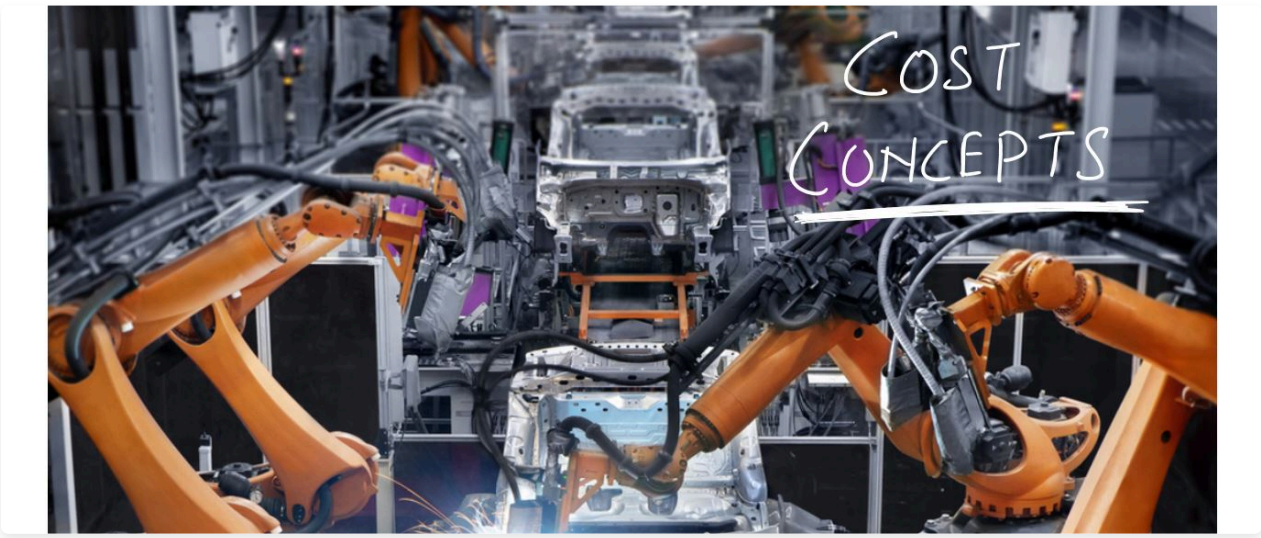
## 1. Introduction to Cost




In the context of managerial accounting, **Cost** refers to the monetary measure of the resources expended to achieve a specific objective, such as manufacturing a product or providing a service.

It represents the value of the inputs (like materials, labor, and overhead) consumed in the process of producing goods or delivering services.

Costs are tracked and analyzed to help managers make informed decisions, control operations, set prices, and evaluate the profitability of products or services.

Understanding and managing costs is essential for ensuring the financial health and efficiency of a business.

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## 2. Cost Object


A **cost object** refers to anything for which management wants to collect, accumulate, or measure costs separately. Essentially, it is the item or entity for which cost information is needed. A cost object can be any part of a business operation where costs need to be tracked or allocated to make informed decisions.

Cost object can range from an entire production operation to a specific product line.

For example, consider Apple's manufacturing plant that produces iPhones, iPads, and MacBooks. Management could define the entire plant as the cost object and request an overview of all production costs for a certain period. Alternatively, they could define the iPhone as the cost object and seek detailed cost information solely for that product. In the first case, the report would include production costs for all products (iPhones, iPads, and MacBooks), while in the second case, it would focus only on the iPhone, excluding the costs associated with iPads and MacBooks.

Cost objects can vary widely depending on the needs of the business. Some common examples include:

- *Product:* The cost of manufacturing a specific product, such as a smartphone or a piece of furniture.
- *Service:* The cost associated with providing a service, like consulting or customer support.
- *Project*: Costs related to a specific project, such as a construction project or a marketing campaign.
- *Customer:* Costs incurred to serve a particular customer, including sales and support activities.
- *Brand Category:* The costs associated with producing and marketing a specific brand or category of products.
- *Activity:* Costs linked to specific activities within a business, such as machine setups or quality inspections.
- *Department*: Costs associated with a particular department, like the HR or IT department.

Management assigns costs to cost objects for several important reasons:

- *Tracking Profitability*: By understanding the costs associated with different products, services, or customers, management can determine which ones are the most profitable and which may need improvement or discontinuation.
- *Evaluating Manager Performance*: Assigning costs to specific departments or projects allows management to evaluate how effectively managers are controlling costs and achieving financial goals.
- *Controlling Spending*: By tracking costs at a detailed level, management can identify areas where spending may be excessive or inefficient and take corrective action.
- *Making Pricing Decisions*: Understanding the cost structure of products or services is crucial for setting prices that ensure profitability while remaining competitive in the market.

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## 3. Cost Driver

A **cost driver** is a factor that directly causes changes in the cost of an activity. It is a measurable element that influences the cost behavior of a specific process or operation. Cost drivers are used to allocate costs more accurately to products, services, or departments based on the extent to which they consume resources.

Common Examples of Cost Drivers:

- *Direct Labor Hours:* The more hours worked, the higher the labor costs.
- *Machine Hours*: Increased machine usage leads to higher maintenance, electricity, and depreciation costs.
- *Number of Purchase Orders*: More orders increase purchasing department costs.
- *Number of Units Produced*: The total number of units impacts both variable production costs (like materials) and sometimes fixed costs (like machinery wear).
- *Material Handling Time*: Time spent moving raw materials influences costs in logistics and production.

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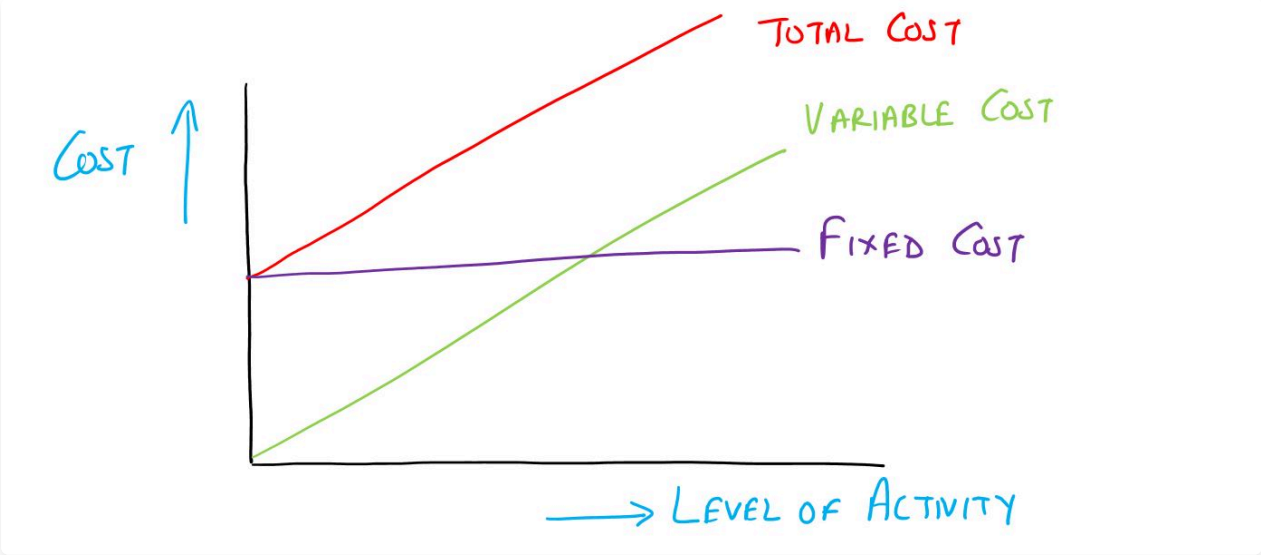
# 4. Variable and Fixed Costs

Understanding how costs behave in relation to production and activity levels is fundamental for effective cost management and decision-making in any business. Costs are generally categorized into three types based on their behavior: Variable Costs, Fixed Costs, and Mixed Costs.




Each of these cost types has distinct characteristics that impact budgeting, pricing, and overall financial planning.

**1. Variable Costs**

Variable costs are expenses that vary directly and proportionately with the level of production or activity. As production increases, total variable costs increase, and as production decreases, total variable costs decrease. However, the cost per unit remains constant.

For example, in a manufacturing setting, the cost of raw materials such as steel in car production is a variable cost. If it costs Rs. 500 to produce one car door, and the company produces 1,000 doors, the total cost for doors is Rs. 500,000. If production increases to 2,000 doors, the cost doubles to Rs. 1,000,000.

**2. Fixed Costs**

Fixed costs remain constant in total regardless of changes in the level of production or activity within a relevant range. These costs are not directly tied to production volume, so they do not fluctuate with the number of units produced.

For example, a company may rent machinery for Rs. 12,00,000 per year. Whether the company produces 50,000 units or 150,000 units, the rental cost remains Rs. 12,00,000.

However, the *fixed cost per unit* will decrease as production increases (e.g., Rs. 240 per unit at 50,000 units and Rs. 80 per unit at 150,000 units).

**3. Mixed Costs**

Mixed costs, also known as semi-variable costs, have both fixed and variable components. This means they remain constant up to a certain level of activity but begin to vary once that threshold is exceeded.

For example, a company's utility bill might consist of a fixed monthly charge of Rs. 5,000 plus a variable cost of Rs. 2 per kilowatt-hour (kWh) used. If the company uses 10,000 kWh in a month, the total cost would be Rs. 25,000 (Rs. 5,000 fixed + Rs. 20,000 variable). If usage increases to 15,000 kWh, the total cost rises to Rs. 35,000 (Rs. 5,000 fixed + Rs. 30,000 variable).

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## 5. Mixed Costs

Mixed costs must be broken down into their fixed and variable components.

This can be done using two primary methods: the **High-Low Method**, which uses the highest and lowest activity levels to estimate cost behavior, and **Least Squares Regression**, which provides a more accurate separation by fitting a line through data points. Let's discuss these methods further.

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## 5. Mixed Costs

The high-low method is a widely used technique for separating fixed and variable costs in a cost structure. Here's how it works:

1. *Identify Outliers:* Before analyzing costs, review the data for any outliers—points that fall outside the normal range of activity. Outliers may occur due to unusual circumstances, such as a special rush order requiring excessive labor or machine time, or cost distortions like a hidden leak in a water pipe. These non-representative observations should be removed to ensure a more accurate analysis.

2. *Identify High and Low Activity Levels:* Once outliers are removed, identify the highest and lowest activity levels (e.g., units produced or hours worked) within the relevant range for the remaining data.

3. *Calculate Total Costs at These Levels:* Determine the total costs associated with both the highest and lowest activity levels.

4. *Determine Variable Cost per Unit:* Calculate the variable cost per unit by subtracting the total cost at the low activity level from the total cost at the high activity level. Then, divide this difference by the change in activity levels (units or hours).

$$\text{Variable Cost Per Unit} = \frac{\text{Total Cost at High Level} - \text{Total Cost at Low Level}}{\text{High Level Activity} - \text{Low Level Activity}}$$

5. *Calculate Total Fixed Costs:* With the variable cost per unit determined, substitute either the high or low activity level into the total cost equation to calculate total fixed costs.

$$\text{Total Cost} = \left(\text{Variable Cost Per Unit} \times \text{Activity Level}\right) + \text{Fixed Costs}$$

OR

$$\text{Fixed Costs} = \text{Total Cost} - \left(\text{Variable Cost Per Unit} \times \text{Activity Level}\right)$$

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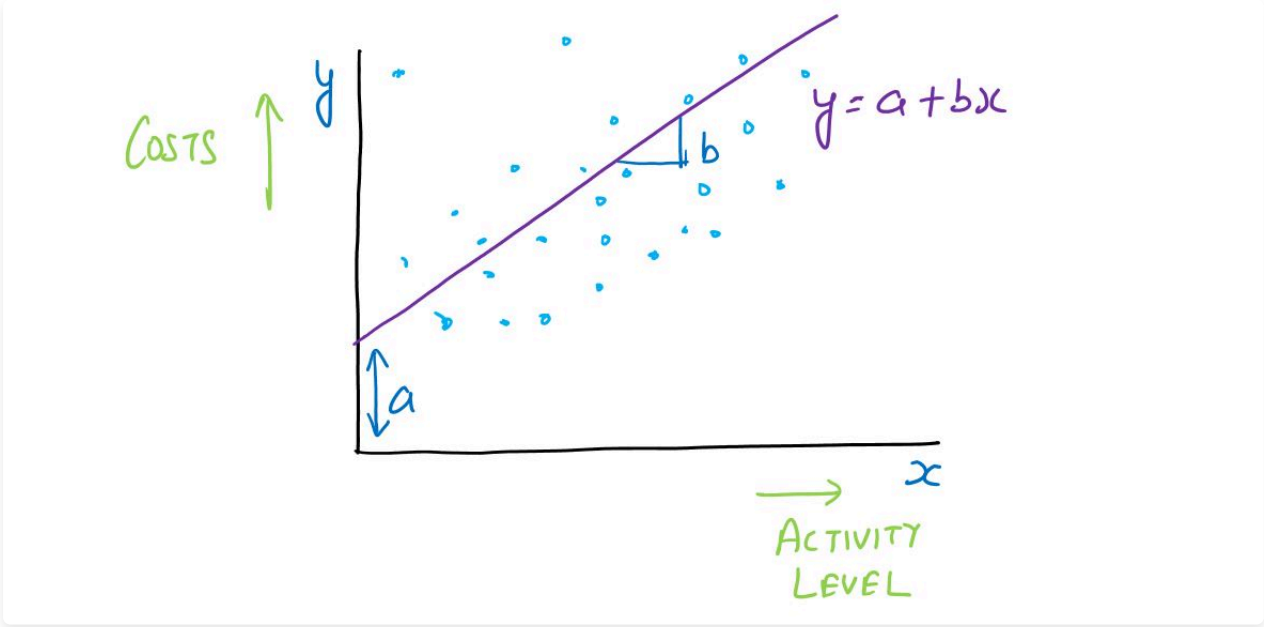
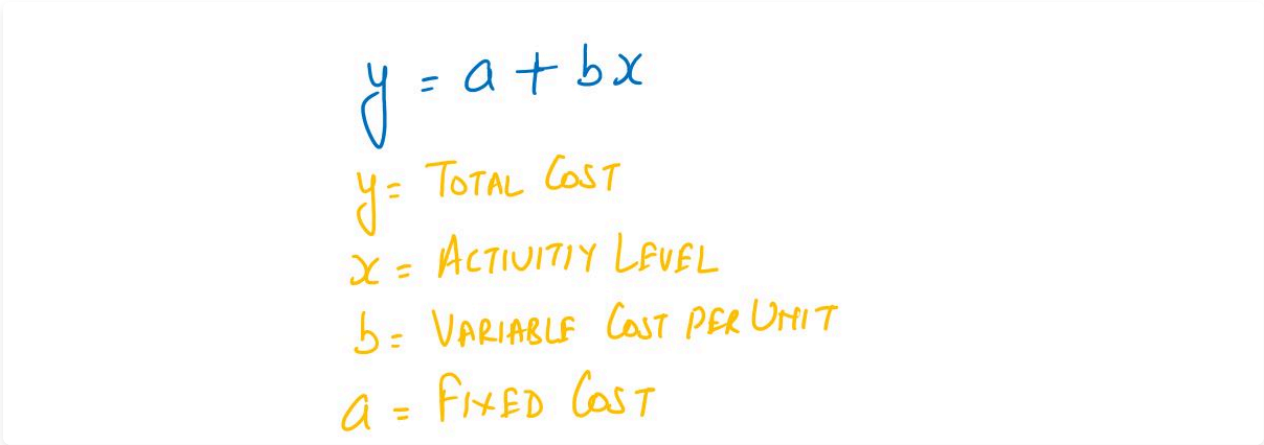
## 5. Mixed Costs




The Least Squares Regression method is used to separate mixed overhead costs into their variable and fixed components. Here's how it works:

1. *Data Collection:* Gather historical data on total costs and the corresponding activity levels (e.g., units produced or machine hours).

2. *Establish a Relationship:* The goal is to identify a linear relationship between the total costs (dependent variable) and the activity level (independent variable). The general equation for a linear relationship is:




3. *Perform Regression Analysis:* Using statistical software or a calculator/excel sheet, conduct a regression analysis on the collected data. The analysis will calculate the best-fitting line that minimizes the sum of the squared differences (errors) between the observed costs and the costs predicted by the regression line. This method is called "least squares" because it minimizes the squared deviations.

4. *Interpret Results:* The regression output will provide estimates for both the fixed and variable cost components. The y intercept gives the estimated fixed costs. The slope of regression line indicates the variable cost per unit of activity.

5. *Validate the Model:* It's important to assess the model's fit by examining statistics such as R-squared, which indicates how well the data points fit the regression line. A higher R-squared value suggests a better fit.

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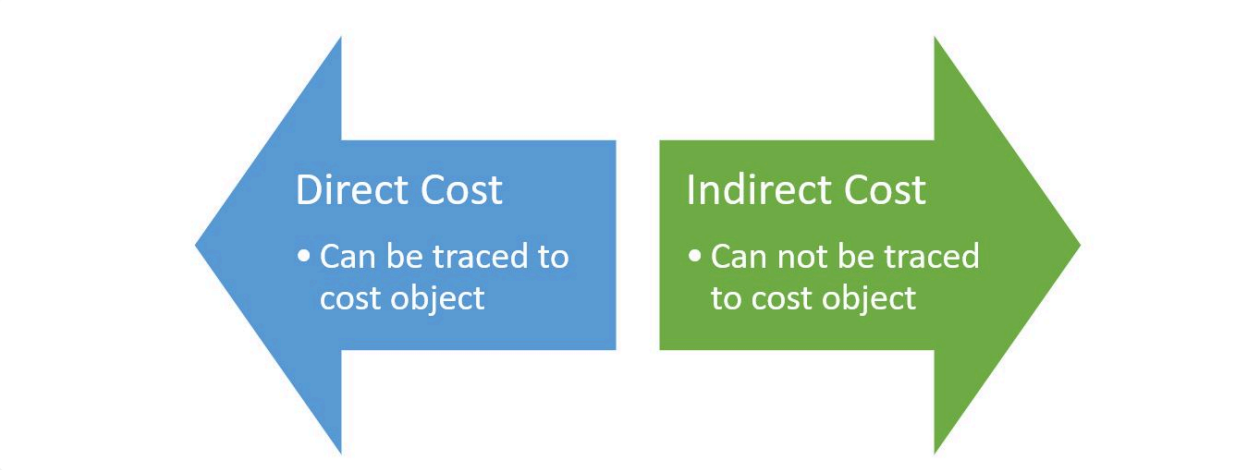
## 6. Direct and Indirect Costs

Costs associated with a cost object can be classified as either direct or indirect.




**Direct costs** are those that can be easily and economically traced to the cost object. For instance, if the iPhone is the cost object, direct costs would include components like screens, processors, and batteries, as well as assembly line labor specifically for iPhones.

**Indirect costs**, on the other hand, cannot be easily traced to a specific cost object and are therefore allocated. For example, while glue is used in assembling iPhones, tracking the exact amount used for each unit might not be cost-effective, so glue is considered an indirect cost.

Whether a cost is direct or indirect depends on how the cost object is defined. If the entire plant is the cost object, the plant's depreciation is a direct cost. However, if the cost object is just the iPhone, the plant's depreciation becomes an indirect cost that must be allocated across all products produced in the plant. This classification helps management in decision-making by providing a clearer picture of where resources are being used most efficiently.

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## 7. Unit Cost

Unit cost, also known as **average cost**, is the cost to produce or deliver one unit of a product or service. It is calculated by dividing the total cost by the number of units produced or provided.

For example, if the cost to organize an event in India is ₹40,00,000, and 50,000 people are expected to attend, the unit cost per attendee would be ₹80 (₹40,00,000 ÷ 50,000).

Calculating the unit cost is important in decision-making because it helps determine the price per unit that should be charged to recover costs and achieve profitability. For example, manufacturers in India often calculate unit cost to decide on product pricing that covers costs while remaining competitive. Similarly, an event organizer may need to know the unit cost to set the ticket price to ensure that the total costs are recovered and the event is profitable.

Without calculating unit costs, it's difficult to determine if the pricing or production level is feasible and profitable. Therefore, unit cost is a practical way to communicate the cost of providing each unit and helps in making informed pricing and operational decisions.

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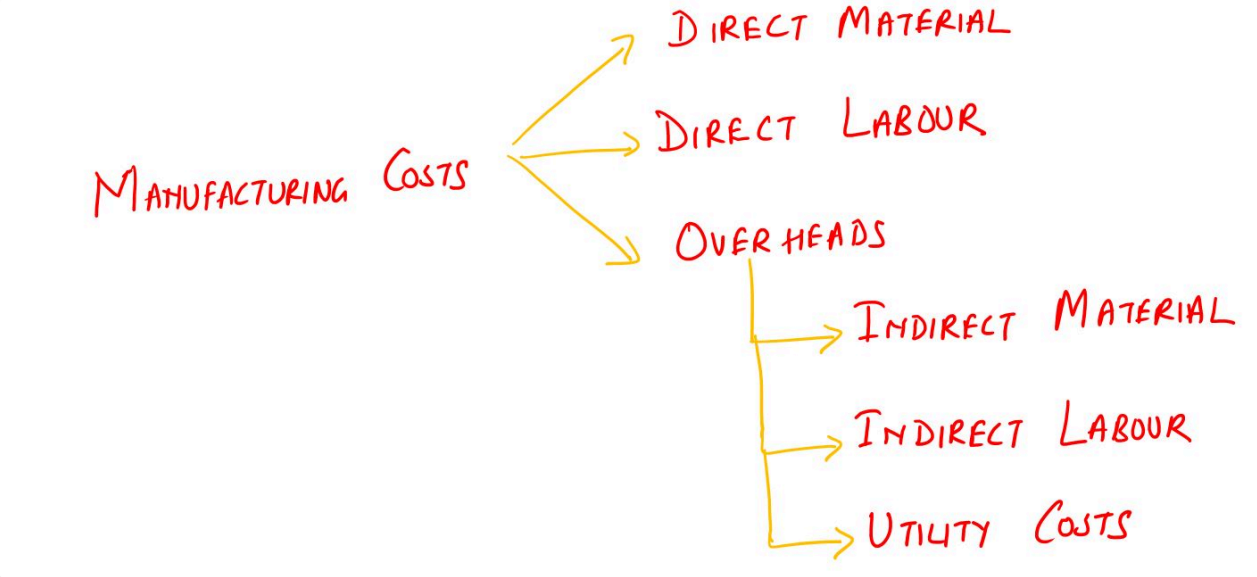
# 8. Manufacturing Costs

Manufacturing costs are the expenses associated with the production of goods.




These costs can be classified into three main categories: direct material, direct labor, and manufacturing overhead. Direct material and direct labor are costs that can be directly traced to specific products, while manufacturing overhead consists of indirect costs that support the production process but cannot be directly linked to individual units of production.

**1. Direct Material**

Direct materials (DM) are the raw materials that can be directly traced to the production of specific goods. They are essential components that become a part of the finished product. For example, in the production of a wooden table, wood is considered a direct material because it is the primary material used to create the table.

Direct materials include not only the cost of the raw materials themselves but also any additional costs required to acquire them, such as import duties, transportation costs, and handling fees. These costs are all included in the direct materials.

**2. Direct Labor**

Direct labor (DL) refers to the wages and benefits paid to workers who are directly involved in the manufacturing process. These workers' efforts can be easily traced to specific products. For example, the wages paid to a carpenter who assembles a wooden table are considered direct labor because the carpenter's work is directly connected to the production of the table.

**3. Manufacturing Overhead**

Manufacturing overhead (MOH) encompasses all manufacturing costs that are not classified as direct material or direct labor. These are indirect costs that support the production process but cannot be directly traced to any specific product.

The Manufacturing Overhead (MOH) is also called Indirect Manufacturing Cost, Factory Overhead or Factory Burden.

Manufacturing overhead can be further divided into 3 sub-categories:

*3.1 Indirect Material*

Indirect materials are materials used in the production process that are not directly traceable to specific goods. These materials are necessary for production but do not form a significant part of the finished product. For example, glue, nails, and varnish used in assembling a wooden table are considered indirect materials because they support the production process but are not primary components of the table.

*3.2 Indirect Labor*

Indirect labor includes wages paid to workers who support the production process but are not directly involved in manufacturing the product. These workers' efforts are essential to the production process, but their work cannot be directly traced to individual products. Examples include wages paid to factory supervisors who oversee the production process, maintenance staff who repair machinery, and security guards who ensure the safety of the factory.

*3.3 Utility Costs*

Utility costs refer to expenses related to the general upkeep and operation of the production facility. These costs are necessary

for maintaining the production environment but cannot be directly attributed to specific products. Examples of utility costs include Depreciation, Property Tax, Electricity or Insurance Premiums.

Overheads can also be categorized into four types:
(i) production or manufacturing overheads, which include costs related to the production process;
(ii) administration overheads, covering expenses for general management and administrative functions;
(iii) selling overheads, which involve costs associated with marketing and sales activities; and
(iv) distribution overheads, related to the expenses incurred in delivering products to customers.

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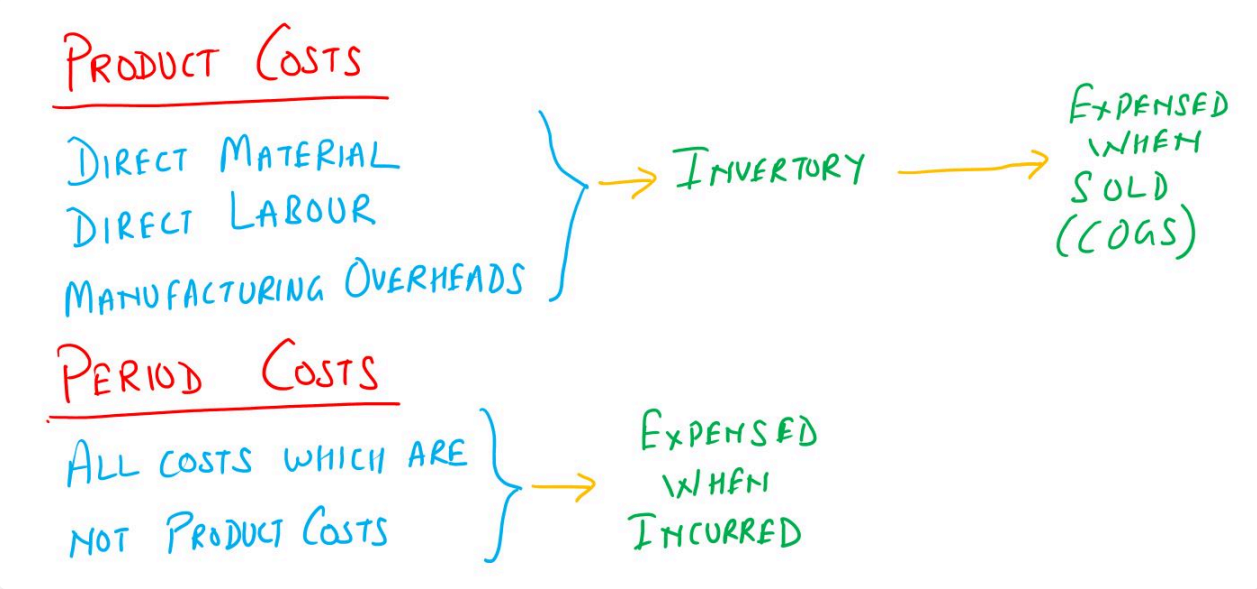
# 9. Product costs and Period costs

When a product is the cost object, all costs can be classified as either product costs or period costs. In general, product costs are incurred in the production area and period costs are incurred in all non-production areas.




### Product Costs

Product costs are directly associated with the production or acquisition of goods or services. These costs are also known as inventoriable costs because they are included in the cost of inventory and only expensed as cost of goods sold (CoGS) when the product is sold.

These costs are are recorded as assets on the balance sheet when incurred and become CoGS only when the product is sold. For manufacturing companies, all manufacturing costs are considered inventoriable costs or product costs.

For example, at Cellular Products, a manufacturer of cellular phones, costs like direct materials (such as computer chips), direct labor, and manufacturing overhead are inventoriable costs. These costs create new assets, first as work-in-process (WIP) and then as finished goods (FG). They are recorded as inventory on the balance sheet.

Once the phones are sold, the cost of manufacturing them is recorded as cost of goods sold on the income statement, matching them with the revenue generated. This matching ensures that the expenses of making the products are recognized in the same period when the revenue from selling them is recognized, even if the phones are sold in a different period from when they were made.

- *Direct Materials*: The raw materials directly used in the manufacturing of a product, such as the fabric in clothing production or steel in car manufacturing.
- *Direct Labor*: Wages paid to workers who are directly involved in the production process, like assembly line workers in a factory.
- *Manufacturing Overhead*: Indirect costs related to production, such as factory utilities, equipment depreciation, and factory rent.

### Period Costs

Period costs are related to non-production activities and are expensed in the period they are incurred. These costs are not included in inventory and do not directly contribute to the production of goods or services.

These comprise of all costs shown in the income statement except for the cost of goods sold (CoGS). They include marketing, distribution, and customer service costs and are treated as expenses in the period in which they are incurred since they are meant to benefit revenues for that specific period only.

Some costs, like R&D costs, are also treated as period costs because their potential benefits in the future are uncertain. This approach ensures that expenses are matched with revenues in the same accounting period.

For manufacturing companies, period costs include all non-manufacturing costs like design and shipping. For merchandising companies, period costs include costs unrelated to goods purchased for resale, such as labor and advertising expenses. In the service sector, there are no inventoriable costs, so all costs are period costs.

- *Selling Expenses:* Costs incurred to market, sell, and distribute a product, such as advertising expenses, sales commissions, and promotional materials.
- *Administrative Salaries:* Wages and benefits paid to employees in non-production roles, like office staff, managers, and executives.
- *Office Supplies:* Costs of supplies used in the administrative functions of the company, such as paper, pens, and computer software.
- *Depreciation on Office Equipment*: Depreciation expense related to office furniture, computers, and other non-production equipment.
- *Distribution Costs*: Expenses related to warehousing, transportation, and delivery of products to customers, including shipping fees and logistics costs.

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## 10. Fixed and Variable Overheads

Fixed and Variable Overhead are two main categories of Manufacturing Overhead (MOH), which includes all indirect costs involved in the production process, except for Direct Materials (DM) and Direct Labor (DL).

**1. Fixed Manufacturing Overhead**

These are overhead costs that do not fluctuate with changes in production levels. Whether the company produces a large number of units or only a few, these costs remain constant over time. They are generally long-term costs associated with the manufacturing facility itself.

Examples include:

- *Real Estate Taxes:* These are taxes the company pays on its factory or production property, and they remain the same regardless of how much the company produces.
- *Insurance:* Costs related to insuring the manufacturing plant and equipment remain constant, whether production is high or low.
- *Depreciation:* This is the allocation of the cost of long-term assets, like machinery, over their useful life. It does not change based on the level of production.

**2. Variable Manufacturing Overhead**

These overhead costs vary directly with the level of production. As the production volume increases or decreases, these costs fluctuate accordingly. They are linked to the actual output and operations on the factory floor.

Examples include:

*Indirect Materials:* These are materials used in the production process that cannot be directly traced to individual products, such as lubricants for machines or cleaning supplies. The more products produced, the more indirect materials will be used.

*Indirect Labor:* This refers to wages paid to workers who support the production process but do not directly contribute to the creation of the product (e.g., supervisors, maintenance staff). More production generally requires more indirect labor.

*Utilities*: Electricity, gas, and water costs often fluctuate based on how much machinery and equipment are being used during production. Higher production levels lead to higher utility costs.

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# 11. Non-manufacturing Costs

Non-manufacturing Costs, often referred to as **Selling, General, and Administrative (SG&A)** expenses, are costs that are not directly related to the production of goods or services. These expenses are incurred in the day-to-day operations of a business, outside the manufacturing process.


SG&A includes 2 main categories:

- *Selling Expenses:* These are costs directly associated with selling products or services, such as advertising, sales commissions, and distribution costs.
- *General and Administrative Expenses:* These cover the overall administrative and management costs of running the company, like salaries of executives and office staff.

Non-manufacturing costs include a variety of expenses beyond Selling, General, and Administrative (SG&A) costs. These can encompass research and development (R&D) expenses, marketing and advertising costs, and distribution expenses that are not directly tied to manufacturing. Additionally, non-manufacturing costs may cover overhead related to corporate functions, such as finance, human resources, and information technology.

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# 12. Flow of Inventory

In manufacturing and production, inventory is categorized into 3 main types based on the stage of the production process. These stages represent the flow of materials as they are transformed into finished goods.


**1. Raw Material Inventory**

Raw materials are the basic inputs that have not yet been used in the production process. They are the essential components needed to start manufacturing products but are still in their unprocessed form.

In a furniture manufacturing company, raw materials might include wood, nails, glue, and varnish. These materials have been acquired by the company but have not yet been used to produce any furniture.

**2. Work-in-Process (WIP) Inventory**

Work-in-process (WIP) inventory refers to goods that are in the process of being manufactured but are not yet complete. These items have moved beyond the raw material stage and are undergoing transformation into finished products.

In the same furniture manufacturing company, WIP inventory might include partially assembled tables or chairs. These products are not yet ready for sale, as they still require further processing, such as sanding, painting, or attaching components.

**3. Finished Goods Inventory**

Finished goods inventory consists of products that have completed the manufacturing process and are ready for sale. These goods have gone through all stages of production and are now in a state where they can be sold to customers.

For the furniture manufacturer, finished goods inventory includes fully assembled and packaged tables, chairs, and other pieces of furniture that are ready to be shipped to retailers or customers.

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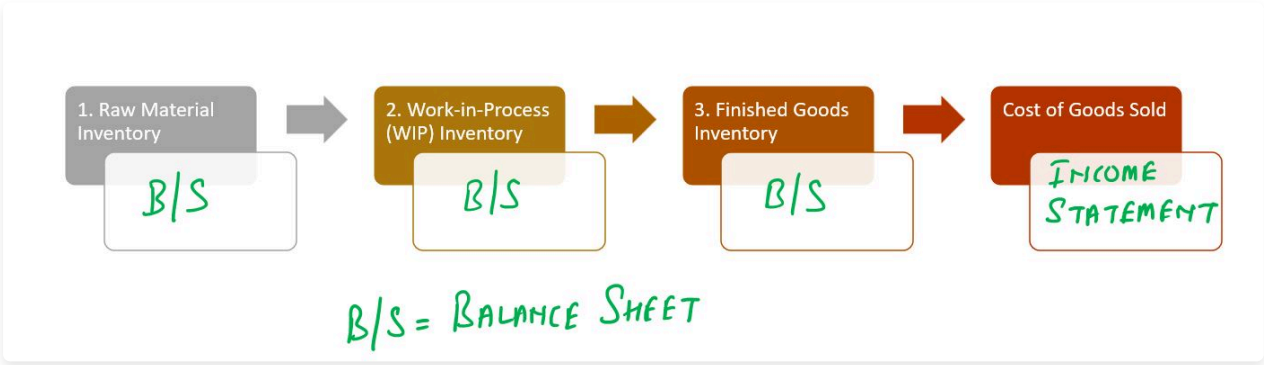
# 13. Flow of Costs




The flow of costs for a manufacturer describes how costs move through various stages of production and are eventually reflected in the financial statements. This flow traces the journey of costs from raw materials through work-in-process (WIP) to finished goods, and finally to the cost of goods sold (COGS).

**1. Raw Material Inventory**

The flow of costs begins with the acquisition of raw materials. These materials are purchased and recorded as an asset under "Raw Material Inventory". Since it is an asset, it is on the Balance Sheet.

When raw materials are purchased, the cost is debited to the raw material inventory account, reflecting that these resources are now owned by the company but have not yet been used in production.

**2. Work-in-Process (WIP) Inventory**

As production begins, raw materials are transferred from raw material inventory to work-in-process (WIP) inventory. At this stage, costs associated with direct labor and manufacturing overhead are also added to the WIP inventory. Since it is an asset, it is on the Balance Sheet.

The costs of raw materials, direct labor, and manufacturing overhead are accumulated in the WIP inventory account. This account represents the value of goods that are in the process of being manufactured but are not yet completed.

**3. Finished Goods Inventory**

Once the manufacturing process is complete, the products are transferred from WIP to finished goods inventory. Finished goods are products that are fully assembled and ready for sale. Since it is an asset, it is on the Balance Sheet.

The total cost of completed items is debited to the finished goods inventory account on the balance sheet. This represents the value of products available for sale.

**4. Cost of Goods Sold (COGS)**

When a product is sold, the cost associated with producing that product is transferred from finished goods inventory to cost of goods sold (COGS), an expense on the income statement.

The cost of the product that has been sold is credited from the finished goods inventory account and debited to the COGS account. This reduces the asset on the balance sheet and records the expense on the income statement.

---

## 13. Flow of Costs

Journalize the following transactions.

1. The production manager buys Rs 1,00,000 of wood and glue.
2. The production manager puts Rs 88,000 of wood (direct material) and Rs 2,000 (indirect material) of glue into production.
3. Direct labour of Rs 30,000 and Indirect labour of Rs 10,000 is used in production.
4. The manager applies Rs 15,000 of manufacturing overhead (MOH).
5. Goods of Rs 20,000 are finished and are ready for sale.
6. The company sells goods worth Rs 18,000.

**SOLUTION:**

1. The production manager buys Rs 1,00,000 of wood and glue.

| | | |
|---|---|---|
| Raw Material Inventory A/C Dr. | 1,00,000 | |
| To Cash A/C | | 1,00,000 |

2. The production manager puts Rs 88,000 of wood (direct material) and Rs 2,000 (indirect material) of glue into production.

| | | |
|---|---|---|
| WIP Inventory A/C Dr. | 88,000 | |
| Manufacturing Overhead A/C | 2,000 | |
| To Raw Material Inventory A/C | | 90,000 |

3. Direct labour of Rs 30,000 and Indirect labour of Rs 10,000 is used in production.

| | | |
|---|---|---|
| WIP Inventory A/C Dr. | 30,000 | |
| Manufacturing Overhead A/C | 10,000 | |
| To Cash A/C | | 40,000 |

4. The manager applies Rs 15,000 of manufacturing overhead (MOH).

| | | |
|---|---|---|
| WIP Inventory A/C Dr. | 15,000 | |
| To Manufacturing Overhead A/C | | 15,000 |

5. Goods of Rs 20,000 are finished and are ready for sale.

| | | |
|---|---|---|
| Finished Goods Inventory A/C Dr. | 20,000 | |
| To WIP Inventory A/C | | 20,000 |

6. The company sells goods worth Rs 18,000.

| | | |
|---|---|---|
| COGS A/C Dr. | 18,000 | |
| To Finished Goods Inventory A/C | | 18,000 |

# 13. Flow of Costs

Journalize the following transactions. Also prepare T-accounts for Raw Material Inventory, Work in Process Inventory, Variable Overhead Control, Fixed Overhead Control, Finished Goods Inventory, and Cost of Goods Sold.

1. The company's manager bought Rs 2,80,000 of direct material on account.
2. The warehouse manager transferred Rs 2,84,000 of direct material to the production area.
3. The production wages totaled Rs 5,30,000, of which Rs 4,36,000 was for direct labour.
4. The salaries for the production supervisors were Rs 20,000.
5. The utility cost of Rs 28,000 was accrued; an analysis indicated that Rs 16,000 was variable and Rs 12,000 was fixed.
6. Supplies costing Rs 5,200 were removed from inventory and used in production.
7. The company paid Rs 7,000 as the property taxes on the factory.
8. The company depreciated the factory assets by Rs 56,880.
9. Recorded the expiration of Rs 3,000 of prepaid insurance on the factory assets.
10. Assigned actual overhead cost to WIP Inventory for the given period.
11. Rs 10,58,200 of goods were completed and transferred to Finished Goods (FG) Inventory.
12. Total sales were Rs 14,60,000, all on account.
13. Goods that were sold had a total cost of Rs 10,54,000.

**SOLUTION:**

| | | | |
|---|---|---|---|
| (1) | Raw Material Inventory | 280,000 | |
| | Accounts Payable | | 280,000 |
| | *To record cost of raw material purchased on account* | | |
| (2) | Work in Process Inventory | 284,000 | |
| | Raw Material Inventory | | 284,000 |
| | *To record raw material transferred to production* | | |
| (3) | Work in Process Inventory | 436,000 | |
| | Variable Overhead Control | 94,000 | |
| | Salaries & Wages Payable | | 530,000 |
| | *To accrue factory wages for direct and indirect labor* | | |
| (4) | Fixed Overhead Control | 20,000 | |
| | Salaries & Wages Payable | | 20,000 |
| | *To accrue production supervisors' salaries* | | |
| (5) | Variable Overhead Control | 16,000 | |
| | Fixed Overhead Control | 12,000 | |
| | Utilities Payable | | 28,000 |
| | *To record mixed utility cost in its variable and fixed amounts* | | |
| (6) | Variable Overhead Control | 5,200 | |
| | Supplies Inventory | | 5,200 |
| | *To record supplies used* | | |
| (7) | Fixed Overhead Control | 7,000 | |
| | Cash | | 7,000 |
| | *To record payment for factory property taxes for the period* | | |

| | | | |
|---|---|---|---|
| (8) | Fixed Overhead Control | 56,880 | |
| | Accumulated Depreciation—Equipment | | 56,880 |
| | *To record depreciation on factory assets for the period* | | |
| (9) | Fixed Overhead Control | 3,000 | |
| | Prepaid Insurance | | 3,000 |
| | *To record expiration of prepaid insurance on factory assets* | | |
| (10) | Work in Process Inventory | 214,080 | |
| | Variable Overhead Control | | 115,200 |
| | Fixed Overhead Control | | 98,880 |
| | *To record the assignment of actual overhead costs to WIP Inventory* | | |
| (11) | Finished Goods Inventory | 1,058,200 | |
| | Work in Process Inventory | | 1,058,200 |
| | *To record the transfer of work completed during the period* | | |
| (12) | Accounts Receivable | 1,460,000 | |
| | Sales | | 1,460,000 |
| | *To record total sales of goods sold on account during the period* | | |
| (13) | Cost of Goods Sold | 1,054,000 | |
| | Finished Goods Inventory | | 1,054,000 |
| | *To record cost of goods sold for the period* | | |

**Raw Material Inventory**

| | | | |
|---|---|---|---|
| Beg. bal. | 73,000 | (2) | 284,000 |
| (1) | 280,000 | | |
| End. bal. | 69,000 | | |

**Variable Overhead Control**

| | | | |
|---|---|---|---|
| (3) | 94,000 | (10) | 115,200 |
| (5) | 16,000 | | |
| (6) | 5,200 | | |

**Work in Process Inventory**

| | | | |
|---|---|---|---|
| Beg. bal. | 145,000 | (11) | 1,058,200 |
| (2) DM | 284,000 | | |
| (3) DL | 436,000 | | |
| (10) OH | 214,080 | | |
| End. bal. | 20,880 | | |

**Fixed Overhead Control**

| | | | |
|---|---|---|---|
| (4) | 20,000 | (10) | 98,880 |
| (5) | 12,000 | | |
| (7) | 7,000 | | |
| (8) | 56,880 | | |
| (9) | 3,000 | | |

**Finished Goods Inventory**

| | | | | |
|---|---|---|---|---|
| Beg. bal. | 87,400 | (13) | CGS | 1,054,000 |
| (11) CGM | 1,058,200 | | | |
| End. bal. | 91,600 | | | |

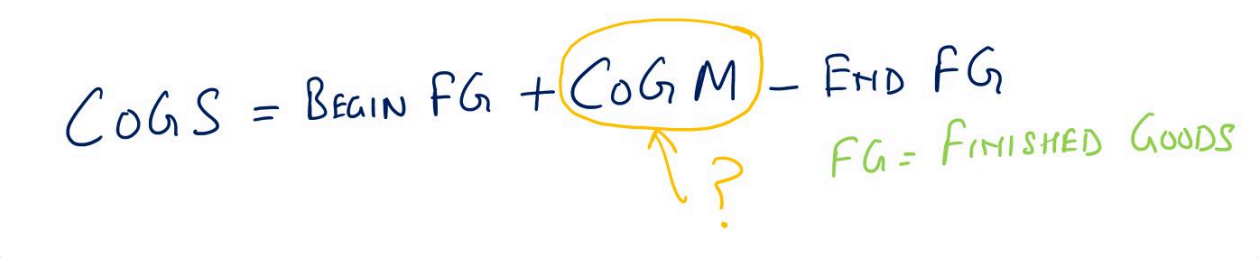
**Cost of Goods Sold**

| | | | |
|---|---|---|---|
| (13) | CGS | 1,054,000 | |

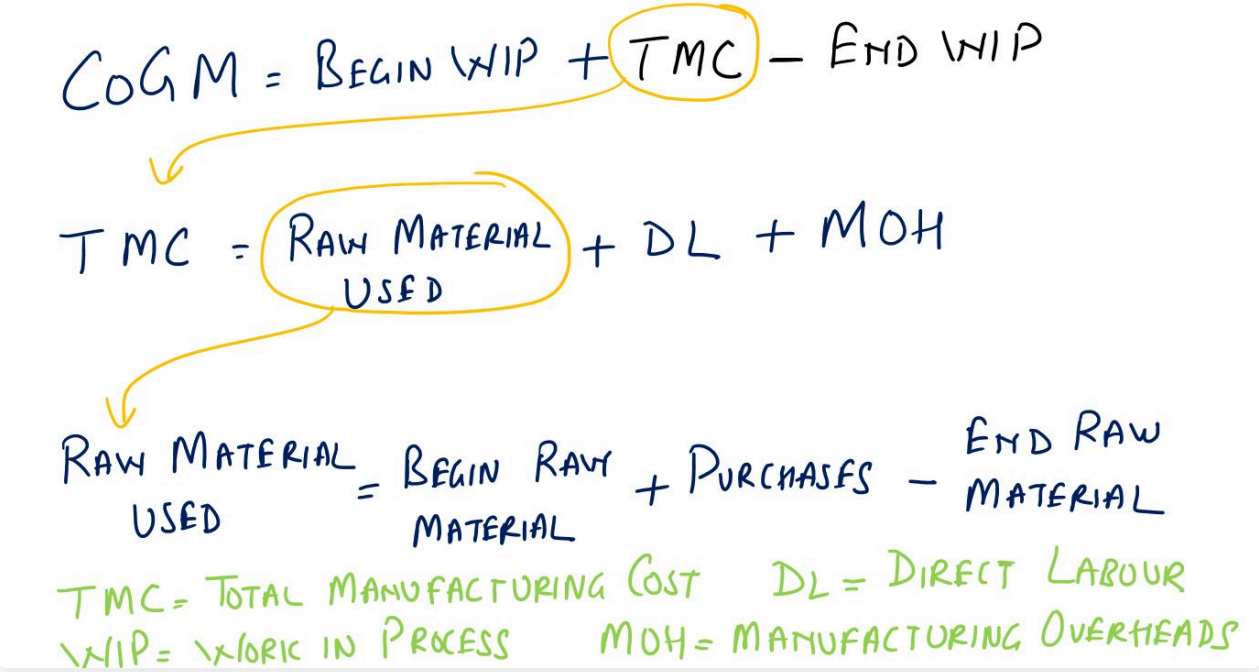
T-Accounts

## 14. COGM

Cost of Goods Manufactured (COGM) refers to the total production cost of goods completed within a specific period. It reflects the sum of all manufacturing costs incurred to produce goods that are ready for sale.




COGM is not reported on the balance sheet or income statement, but it is used to calculate the Cost of Goods Sold (COGS). It helps determine the cost of goods that will be transferred to finished goods inventory.



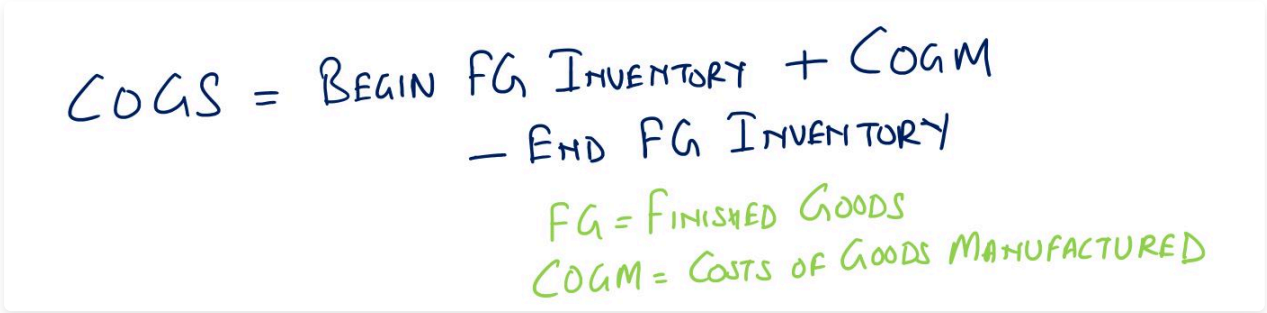

There are 4 components of COGM:
1. Direct Materials (DM)
2. Direct Labor (DL)
3. Manufacturing Overhead (MOH)
4. Work-in-Process (WIP) Inventory

The schedule of COGM with tentative figures is shown below.

| | | |
|---|---|---|
| DIRECT MATERIAL : | | |
| BEGIN RAW MATERIAL | 100 | |
| + PURCHASES | +30 | |
| − END RAW MATERIAL | − 10 | |
| RAW MATERIAL USED | | 120 |
| DIRECT LABOUR : | 75 | |
| MANUFACTURING OVERHEADS : | 150 | |
| TOTAL MANUFACTURING COST (TMC) | | 345 |
| + BEGIN WIP | +50 | |
| − END WIP | −65 | |
| COST OF GOODS MANUFACTURED (COGM) | | 330 |

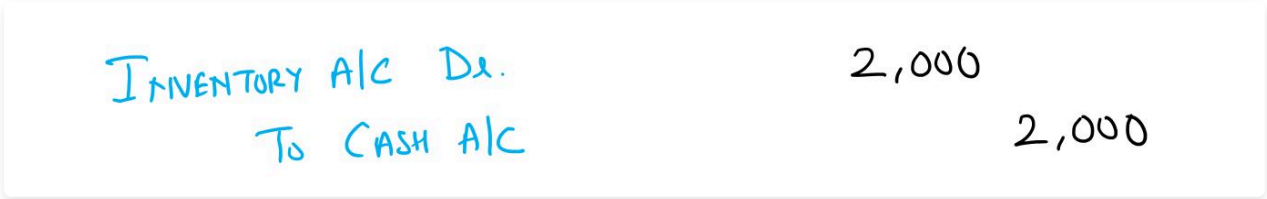
# 15. COGS

Cost of Goods Sold (COGS) represents the direct costs incurred in producing goods that are sold by a company during a specific period. These costs include the expenses directly tied to the production of the goods, such as raw materials, direct labor, and manufacturing overhead.

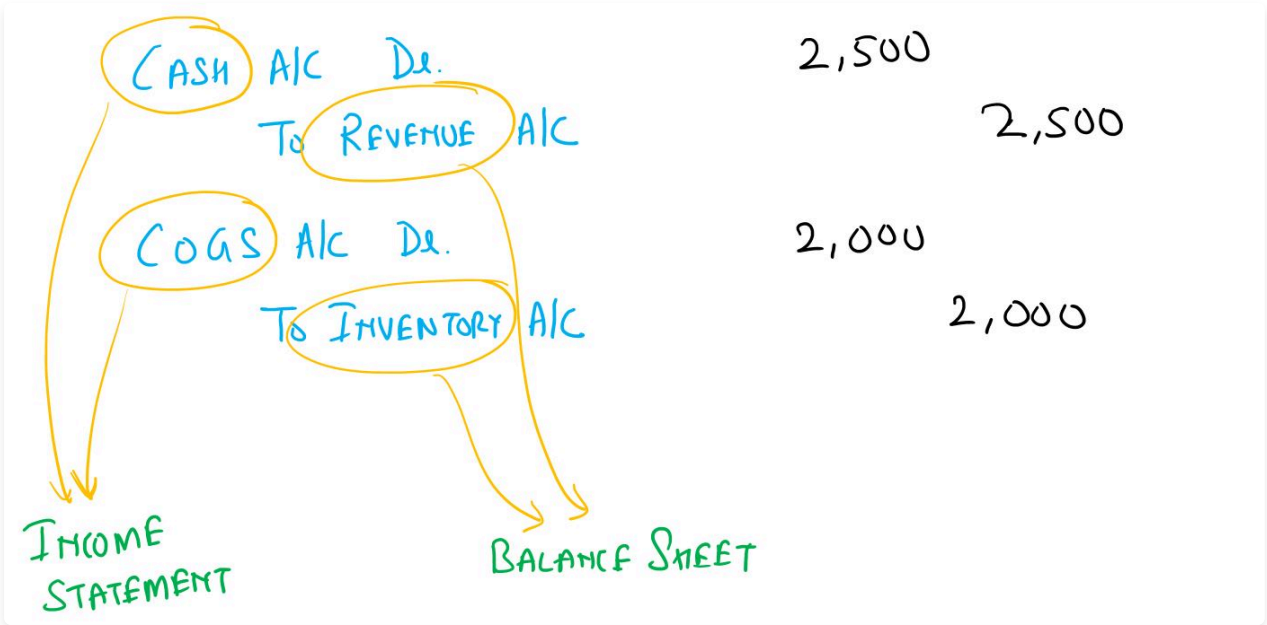



COGS is reported on the income statement and is subtracted from sales revenue to determine the company's gross profit. Let us understand how this reflects in Journal entries.

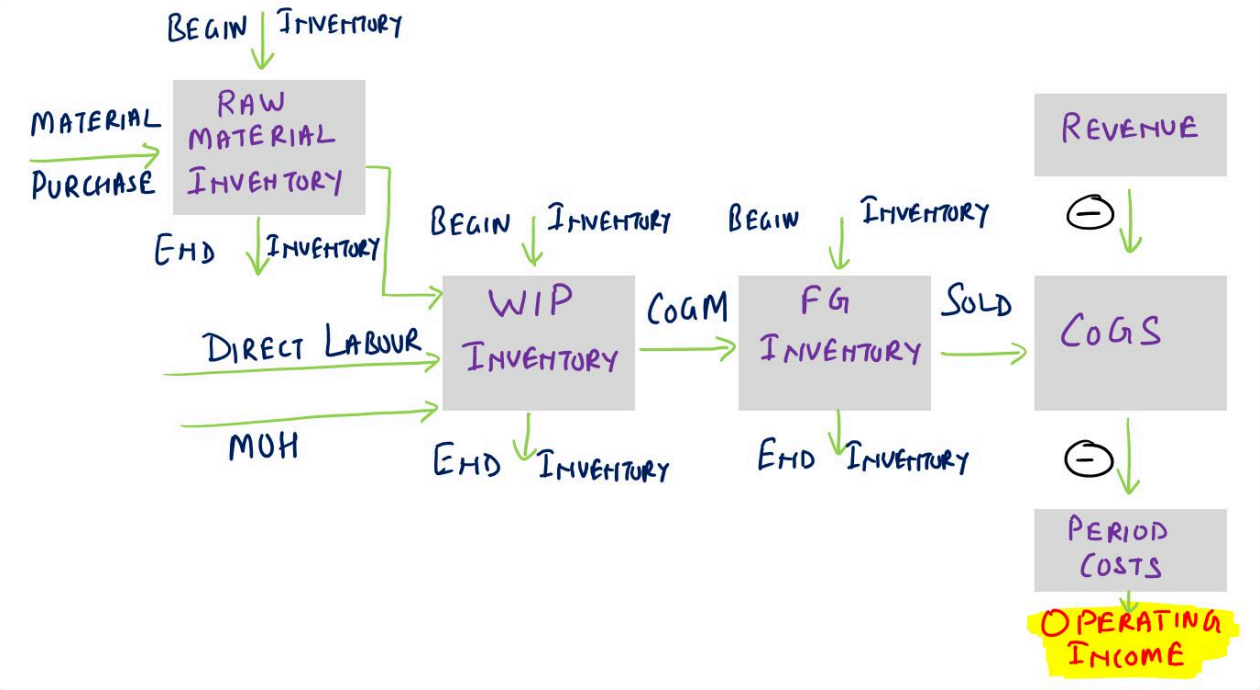
A firm purchases a TV from manufacturer for Rs 2000.




Then the firm sells the TV to a customer for Rs 2500.



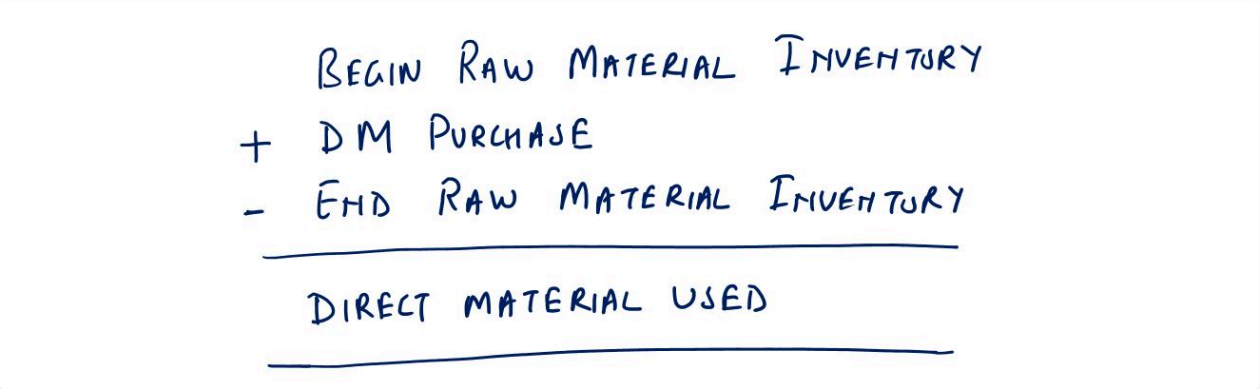
# 16. Flow of Costs and Income Statement




Let us understanding the flow of costs and then how income statement is prepared.

**Step 1: Cost of Direct Materials**

The cost of direct materials (DM) represents the cost of raw materials that are used in the production process. These costs are derived by adding up the beginning inventory of direct materials, adding any new purchases, and subtracting the ending inventory.




- *Beginning Inventory of Direct Materials* is the value of raw materials available at the start of the period.
- *Purchases of Direct Materials* includes any additional raw materials purchased during the period.
- *Ending Inventory of Direct Materials* is the value of raw materials remaining at the end of the period.

The difference is the total amount of direct materials used in the production process during the accounting period.

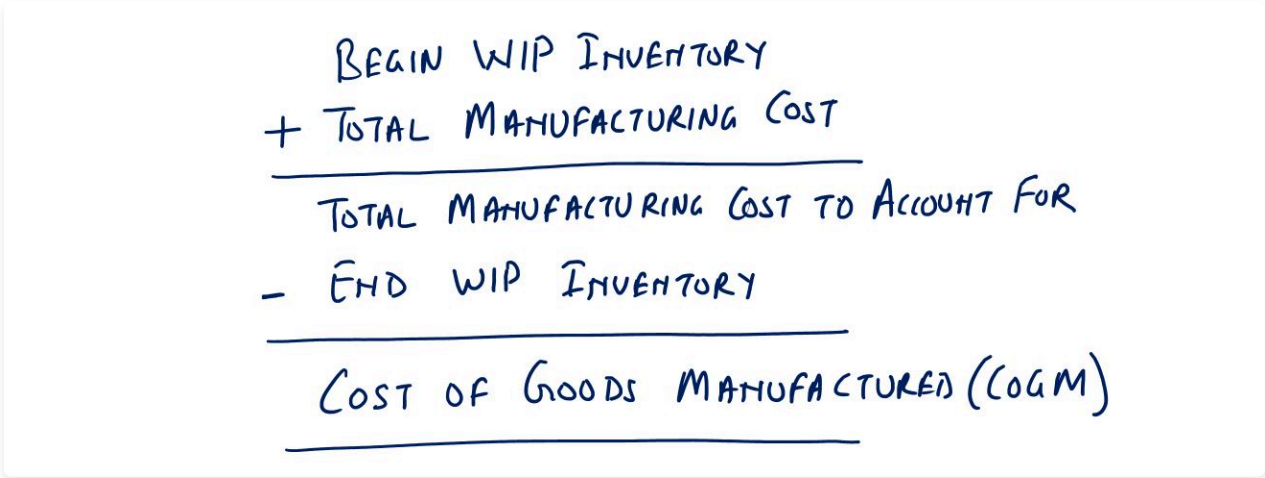
**Step 2: Total Manufacturing Costs**

Total manufacturing costs are all the costs incurred during the production of goods. These costs are composed of three components:

(i) *Direct Materials (DM):* The raw materials that can be directly traced to the production of goods.
(ii) *Direct Labor (DL):* The wages of employees who are directly involved in manufacturing the product. This includes factory workers, machinists, or any labor force that can be directly attributed to the creation of goods.
(iii) *Manufacturing Overhead (MOH):* All other indirect costs related to production, such as the cost of electricity, factory rent, depreciation on equipment, and factory supplies.

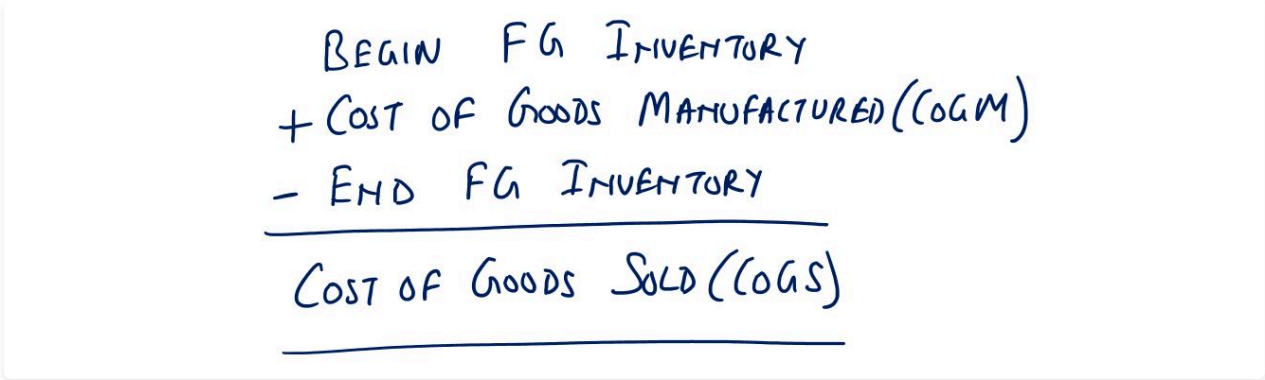

These costs collectively increase the work-in-process (WIP) inventory, which represents the products that are not yet finished but are in the process of being completed.

**Step 3: Cost of Goods Manufactured (COGM)**
Cost of Goods Manufactured (COGM) represents the total production costs of goods that were completed during the accounting period, regardless of whether production started in the previous period or during the current period. This calculation includes both the costs of new goods started during the period and any partially completed goods at the beginning.




The beginning work-in-process (WIP) inventory and total manufacturing costs together represent the total costs associated with goods in production. The ending work-in-process inventory is subtracted to determine the COGM—the cost of goods that were brought to completion. This figure is then transferred to the finished goods (FG) inventory.

**Step 4: Cost of Goods Sold (COGS)**
Cost of Goods Sold (COGS) represents the cost of finished goods that were sold during the accounting period. This cost includes goods that were completed in the current period, as well as those that were carried over from the previous period.



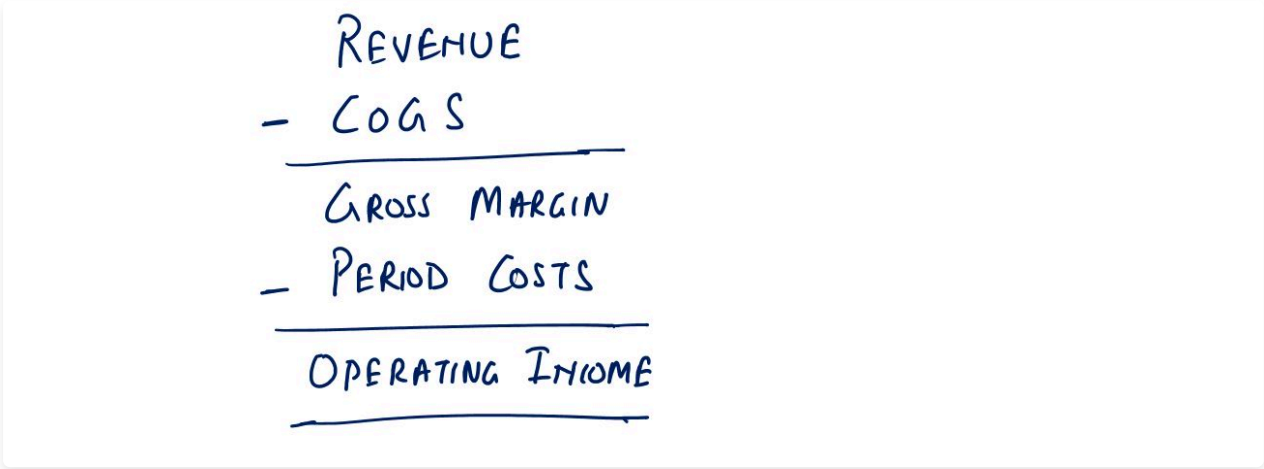

- *Beginning Inventory of Finished Goods* is the value of finished products on hand at the start of the period.
- *Cost of Goods Manufactured (CoGM)* is the cost of products completed during the period.
- *Ending Inventory of Finished Goods* is the value of finished products still available at the end of the period.

*COGS* represents the cost of the inventory that was actually sold to customers during the period. It is recorded as an expense in the income statement, and is used to calculate gross profit. The beginning and ending inventories help track changes in inventory levels over time.

Note that the cost of goods manufactured includes all inventoriable costs, which means costs directly related to production. When goods are sold, the associated costs are transferred from inventory to COGS in the income statement. This is in line with the matching principle in accounting, which aims to match expenses with the revenues they generate, ensuring a more accurate representation of profitability.

**Step 5: Income Statement**

With COGS determined, we can prepare the income statement for the accounting period. The income statement reflects the profitability of the business by comparing revenue earned against the costs incurred to generate that revenue.




*Gross Margin (Gross Profit)* is the difference between revenues and the cost of goods sold. The gross margin represents the income generated from selling goods before accounting for operating and other expenses.

| Income Statement (FOR PERIOD ENDED.....) | | |
|---|---|---|
| | | XXXX |
| Revenue (Sales) | | |
| Less: Cost of Goods Manufactured (CoGS) | | |
| Begin FG inventory | XXXX | |
| Cost of Goods Manufactured (CoGM) | XXXX | |
| Cost of Goods available for Sale | XXXX | |
| End FG inventory | XXXX | |
| Cost of Goods Manufactured (CoGS) | | XXXX |
| Gross Profit (Gross Margin) | | XXXX |
| Less: Operating Costs (Period Costs) | | |
| Variable costs | XXXX | |
| Fixed costs | XXXX | |
| Operating Costs | | XXXX |
| Net Profit (Operating Income) | | XXXX |

*Operating Income (Operating Profit)* is calculated by subtracting period costs (such as marketing, selling, and administrative expenses) from the gross margin. Operating income reflects the profit generated from normal operations after considering all operating expenses, but before interest and tax expenses.

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# 17. Cost of Revenue

Cost of Revenue refers to the total expenses directly related to producing and delivering a company's goods or services.

**Combined and Consolidated Statements of Income**
**For each of the years ended March 31, 2002, 2003 and 2004**

TATA CONSULTANCY SERVICES
TCS

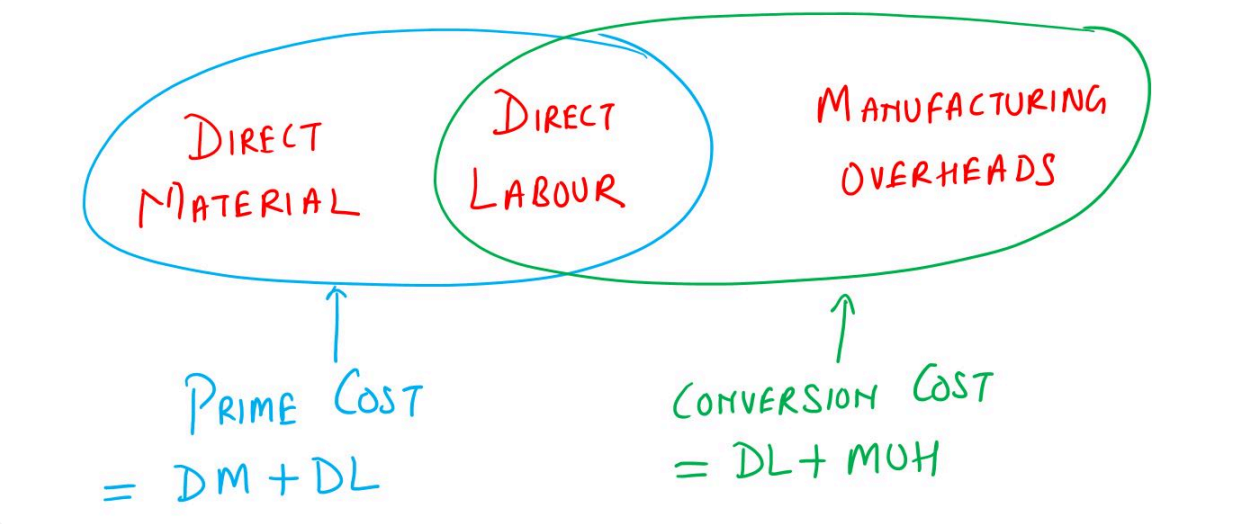
| | Years ended March 31, | | |
|---|---|---|---|
| | 2002 | 2003 | 2004 |
| | | (In millions) | |
| **Revenues:** | | | |
| Consultancy services | Rs.40,951.8 | Rs.50,956.8 | Rs.65,765.1 |
| Sale of equipment and software licenses | 2,388.6 | 3,699.0 | 4,868.8 |
| Other revenues | 365.9 | 522.8 | 593.4 |
| **Total revenues** | **43,706.3** | **55,178.6** | **71,227.3** |
| **Cost of Revenues:** | | | |
| Cost of services | 21,124.3 | 28,605.5 | 34,192.3 |
| Cost of equipment and software licenses | 2,092.4 | 3,331.9 | 4,344.5 |
| **Total cost of revenues** | **23,216.7** | **31,937.4** | **38,536.8** |
| **Gross margin** | **20,489.6** | **23,241.2** | **32,690.5** |
| **Operating Expenses:** | | | |
| Selling, general and administrative expenses | 7,773.8 | 10,616.8 | 14,292.7 |
| Research and development | 185.1 | 200.5 | 300.5 |
| **Total operating expenses** | **7,958.9** | **10,817.3** | **14,593.2** |
| **Operating Income** | **12,530.7** | **12,423.9** | **18,097.3** |
| **Other income (expense):** | | | |
| Interest and dividends (net) | 237.8 | 406.2 | 203.7 |
| Foreign exchange gain / (loss), net | 389.6 | 9.9 | (107.6) |
| Other, net | 331.4 | 364.0 | 841.0 |
| **Other income (expense), net** | **958.8** | **780.1** | **937.1** |
| **Income before income taxes, extraordinary item and minority interests** | **13,489.5** | **13,204.0** | **19,034.4** |
| Income tax expense | (2,567.6) | (2,444.7) | (2,884.3) |
| Minority interest, net of income taxes | 55.3 | (78.7) | (125.4) |
| Equity in net earnings of affiliates | 65.1 | 47.7 | 99.8 |
| **Income from continuing operations** | **11,042.3** | **10,728.3** | **16,124.5** |
| Extraordinary gain (See Note 4) | - | 211.0 | - |
| **Net income** | **Rs. 11,042.3** | **Rs.10,939.3** | **Rs.16,124.5** |

It is broader than Cost of Goods Sold (COGS), as it includes not only the direct costs of production (like materials and labor) but also additional costs associated with delivering products or services, such as distribution and marketing expenses (website, mobile app, data centres, depreciation of servers, customer acquistions costs).

Cost of revenue is most commonly used by companies in service-based industries or businesses with significant distribution expenses. It is reported on the income statement and is subtracted from revenue to determine gross profit.

## 18. Prime Cost and Conversion Cost

Let's understand the concepts of Prime Cost and Conversion Cost.




**Prime Cost**
Prime cost is the total of direct material and direct labor costs. These are the primary, or "prime," costs directly associated with the creation of a product.

Prime cost is a crucial metric for controlling and managing the most significant costs in production. By focusing on these costs, managers can make decisions to enhance efficiency and reduce expenses.

The higher the proportion of prime costs, the greater the accuracy of cost determination for each product since these costs are directly traceable to the production of individual goods.

**Conversion Cost**
Conversion cost is the total of direct labor costs and manufacturing overhead costs. These are the costs incurred to convert raw materials into finished goods.

Conversion cost is a key indicator of the efficiency of the production process. It helps managers understand how effectively the company is converting raw materials into finished products.

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## 19. Relevant Range

The relevant range  is the span of activity levels (such as production or sales volume) within which the assumptions about cost behavior—particularly fixed and variable costs—are valid and reliable. It represents a "normal" range of operations for a company where costs behave in a predictable and linear fashion.

Outside the relevant range, fixed costs may no longer remain fixed. If the company expands production significantly beyond the current capacity, it may need to rent additional space, hire more management, or buy new equipment, leading to an increase in fixed costs.

Similarly, outside the relevant range, the variable cost per unit might change. For example, purchasing materials in larger quantities might lead to discounts (economies of scale), lowering the variable cost per unit.

When analyzing cost behavior for decision-making (e.g., break-even analysis, cost-volume-profit analysis), it’s critical that companies consider the relevant range to avoid making erroneous assumptions.

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# 20. Pre-determined Costs

Costs can be divided into two main categories based on when they are determined: Historical Costs and Pre-determined Costs.

**1. Historical Costs**

Historical costs refer to costs that are determined after they have been incurred. These are actual costs recorded based on past transactions. Historical costs provide a factual basis for financial reporting and help in comparing actual performance with planned performance. They are crucial for post-event analysis, like variance analysis, which compares what was expected with what actually happened.

If a company produces 1,000 units of a product in a month, the actual costs of raw materials, labor, and overheads used during that period are historical costs. After the production is completed, the company can determine the exact cost of materials purchased, wages paid, and overheads allocated to these 1,000 units.

**2. Pre-determined Costs**

Pre-determined costs are estimated costs that are calculated before production begins. These costs are used for planning and budgeting, helping organizations set benchmarks and make informed decisions about pricing, budgeting, and cost control. There are 2 types of Pre-determined Costs:

*2.1 Estimated Costs*

Estimated costs are preliminary cost figures that are calculated before production begins, based on expected prices, quantities, and activities. These costs are less accurate than standard costs but provide a general idea of the expected expenses. Estimated costs are often used in budgeting, forecasting, and when making decisions about pricing, resource allocation, and production planning.

A company planning to manufacture a new product might estimate that the cost of materials will be Rs. 400 per unit, labor will be Rs. 200 per unit, and overheads will be Rs. 100 per unit. If they plan to produce 1,000 units, the estimated total cost would be Rs. 7,00,000. These figures are based on historical data, market trends, or expert judgment but may not reflect the exact costs incurred during production.

*2.2 Standard Costs*

Standard costs are carefully calculated cost benchmarks that are set for each element of cost, such as materials, labor, and overheads, before production begins. These costs are based on scientific analysis, past experiences, and expected future conditions. standard costs serve as a benchmark for comparing actual costs and are a key tool in cost control, variance analysis, and performance measurement.

Assume a company sets a standard cost of Rs. 500 per unit for materials, Rs. 300 per unit for labor, and Rs. 200 per unit for overheads, making the total standard cost per unit Rs. 1,000. If the company produces 1,000 units, the total standard cost for the production would be Rs. 10,00,000.

After production, the actual costs are compared to these standard costs. If the actual cost of materials is Rs. 5,20,000 instead of the Rs. 5,00,000 standard, a variance of Rs. 20,000 is identified. Management can then investigate the reasons for this variance, such as an increase in material prices or inefficiencies in usage.

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# 21. Unexpired costs and Expired costs

Unexpired costs and Expired costs refer to the treatment of costs over time and their recognition on financial statements.

**Unexpired Costs**
Unexpired costs are costs that have been incurred but not yet used up or consumed in the business operations. These costs are considered assets because they represent future economic benefits that the business expects to use in its operations.

Inventory, prepaid insurance, and equipment are examples of unexpired costs. These are recorded on the balance sheet as assets until they are used or consumed.

**Expired Costs**
Expired costs are costs that have been used up or consumed in the process of generating revenue. Once a cost has expired, it is no longer expected to provide future economic benefits and is recognized as an expense or loss in the income statement.

Cost of goods sold (COGS), depreciation, and rent expenses are examples of expired costs. These are recognized on the income statement as expenses in the period in which they help generate revenue.

The concept of matching revenues and expenses is central to financial accounting. According to the matching principle, expenses should be recognized in the same period as the revenues they help to generate. This principle helps determine when an unexpired cost becomes an expired cost. When an asset (unexpired cost) is used in the process of generating revenue, it is reclassified as an expense (expired cost). For instance, when inventory (an unexpired cost) is sold, it becomes part of the cost of goods sold (an expired cost) on the income statement.

**Expenses Vs Losses**
Expenses are expired costs that are intentionally incurred in the process of generating revenue. They are a normal part of business operations, like rent, utilities, and wages. Losses are expired costs that are unintentionally incurred and typically result from events that are not part of the regular business operations. Examples include losses from natural disasters, accidents, or selling an asset for less than its book value.

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# 22. Controllable Costs

Costs within a business can be classified into two categories: Controllable Costs and Non-Controllable Costs. This classification helps in understanding which costs can be influenced by management and which cannot, aiding in more effective budgeting and cost control.

**1. Controllable Costs**

Controllable costs are those expenses that can be directly influenced or regulated by a manager at a given level of authority within the organization. These costs are typically associated with decisions and actions taken by management, and therefore, can be adjusted based on those decisions.

For example, a production manager can control the cost of raw materials by negotiating better prices, optimizing usage, or selecting alternative suppliers. Similarly, the cost of overtime for labor can be controlled by efficient scheduling and workforce management.

**2. Non-Controllable Costs**

Non-controllable costs are those that cannot be easily influenced or regulated by a manager within a specific timeframe or at a certain level of the organization. These costs are usually fixed or are determined by external factors that management has little or no control over.

For example, rent for a factory or office space is typically a non-controllable cost for a department manager, as the rental agreement is often fixed and determined by higher-level management decisions. Similarly, depreciation on equipment is a non-controllable cost, as it is a function of the asset's useful life and the method of depreciation chosen, which the manager cannot easily alter.

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# 23. Other Cost Types

### Opportunity Costs

Opportunity cost is the value of the next best alternative that is foregone when a decision is made to choose one option over another. It represents the benefits that could have been gained if the alternative choice had been taken.

For example, suppose a company has Rs. 10,00,000 and decides to invest it in new machinery rather than putting it in a fixed deposit that earns 6% interest per year. The opportunity cost of purchasing the machinery is the Rs. 60,000 interest that the company could have earned if the money had been placed in the fixed deposit.

### Sunk Costs

Sunk costs are expenses that have already been incurred and cannot be recovered. These costs should not influence current or future decision-making because they remain the same regardless of the outcome of a decision.

For example, if a company spent Rs. 2,00,000 on research and development for a product that is later deemed unfeasible, the Rs. 2,00,000 is a sunk cost. The company should not consider this amount when deciding whether to proceed with the project or abandon it.

### Imputed Costs

Imputed costs, also known as notional costs, are hypothetical costs that are not recorded in the financial accounts but are relevant for decision-making. These costs represent the value of benefits foregone when resources are used in one way rather than another.

For example, if the owner of a business works without taking a salary, the imputed cost would be the salary they could have earned if they worked elsewhere. Although this cost is not recorded in the financial books, it is important for assessing the true profitability of the business.

### Normal Cost and Actual Cost

Normal cost refers to the cost that is typically incurred under normal operating conditions. It is the standard or expected cost of a product or service. For example, if a manufacturing process usually requires Rs. 50 per unit for materials under standard conditions, Rs. 50 is the normal cost of materials per unit.

Actual cost is the cost that is actually incurred during the production process. It includes all expenses, including any deviations from the normal cost due to inefficiencies, wastage, or unforeseen circumstances. For example, if due to a supply chain disruption, the cost of materials increases to Rs. 60 per unit, the actual cost of materials for that production run is Rs. 60 per unit.

### Explicit Costs and Implicit Costs

Explicit costs are direct, out-of-pocket expenses that a business incurs in the process of production. These costs involve actual cash payments and are recorded in the financial statements. For example, wages paid to employees, rent paid for office space, and the cost of raw materials are all explicit costs.

Implicit costs, also known as imputed or opportunity costs, represent the value of resources used in production that do not involve direct cash payments. These costs reflect the income that could have been earned if the resources were used in the next best alternative. For example, if a business owner uses a building they own for their business, the implicit cost is the rental income they could have earned if they had leased the building to someone else instead of using it themselves.

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# 24. Cost Allocation

Cost Allocation is the process of assigning indirect costs, such as overhead, to one or more cost objects (products or services) using a reasonable allocation base or driver. Unlike direct costs, which can be easily traced to a specific product or service, indirect costs are not directly attributable to a single cost object. Therefore, they must be distributed or allocated across multiple cost objects based on a logical and reasonable allocation base or cost driver.

This process is necessary to satisfy the matching principle in financial accounting, which requires that costs be recognized in the same period as the revenues they help generate. Proper cost allocation ensures that all costs associated with production or service delivery are accounted for, providing a true reflection of profitability and aiding in better decision-making.

There are 2 primary methods for allocating costs in a production environment: the Actual Cost System and the Normal Cost System.

### Actual Cost System

In an actual cost system, actual costs for direct materials and direct labor are accumulated in Work in Process (WIP) Inventory as these costs are incurred. Overhead costs, however, are accumulated separately in an Overhead Control account and then allocated to the WIP Inventory at the end of the period or upon the completion of production.

*Challenges*: The actual cost system is often impractical in a real-world setting because it requires all production overhead costs to be known before they can be allocated. This delay can be significant; for example, the total cost of products manufactured in May might not be calculated until the electricity bill for May is received in June. As a result, using an actual cost system can hinder timely financial reporting and decision-making.

### Normal Cost System

The normal cost system addresses the impracticalities of the actual cost system by using a predetermined overhead rate. This rate is calculated before the accounting period begins and is used to apply overhead costs to products or services as they are produced. The "predetermined overhead rate" is typically based on estimated overhead costs and estimated activity levels (such as labour hours or machine hours).

*Advantages*: By using a normal cost system, a company can allocate overhead costs throughout the accounting period, rather than waiting until the end. This system combines actual direct material and direct labor costs with overhead costs that are applied using the predetermined rate. This approach allows for more timely and consistent product costing, which is critical for pricing, budgeting, and financial reporting.

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# 25. Cost Control and Cost Reduction

The terms ‘cost control’ and ‘cost reduction’ are often used in cost and management accounting. The difference between these terms is summarised below.

| | Cost Control | Cost Reduction |
|---|---|---|
| 1. | Maintaining the costs according to pre-determined standards is called cost control. | Cost reduction refers to reducing costs. It aims at improving the standards continuously. |
| 2. | Cost control emphasis on past and present. | Cost reduction emphasis on present and future. |
| 3. | It seeks to attain lowest possible cost under existing condition. | It recognizes no condition as ‘permanent’ since a change will result in lower cost. |
| 4. | Cost control comes to an end when targets are achieved. | Cost reduction is a continuous process and does not have any end. |
| 5. | Cost control is a preventive function. | Cost reduction is a corrective function. It operates even when an efficient cost control system exists. |

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# 1. Introduction

**Overhead** refers to any cost incurred in making products or providing services that is not related to direct materials (the raw materials used to create the product) or direct labor (the wages paid to workers who directly manufacture the product or deliver the service). It is usually referred as Manufacturing Overhead (MOH).

MOH includes costs like utilities, rent, salaries of support staff, and depreciation of equipment, which are necessary for the production process but not directly tied to a specific product.

Overhead costs occur in various areas within a company, including both the production area and the selling and administrative departments. This means that overhead costs are not only tied to the manufacturing process but also to the overall operation of the business, including marketing, administration, and customer service.

Traditionally, manufacturing firms viewed direct material (DM) and direct labor (DL) as the main production costs. Overhead (MOH) was considered an additional but relatively minor expense.

However, with the rise of automation in manufacturing, the cost of overhead has increased significantly. Automation involves using advanced machinery and technology, which requires substantial investment and maintenance, thus increasing overhead costs.

For a company to be profitable, the prices at which it sells its products or services must cover all costs, including overhead. If prices do not cover these costs, the company will not be able to sustain its operations.

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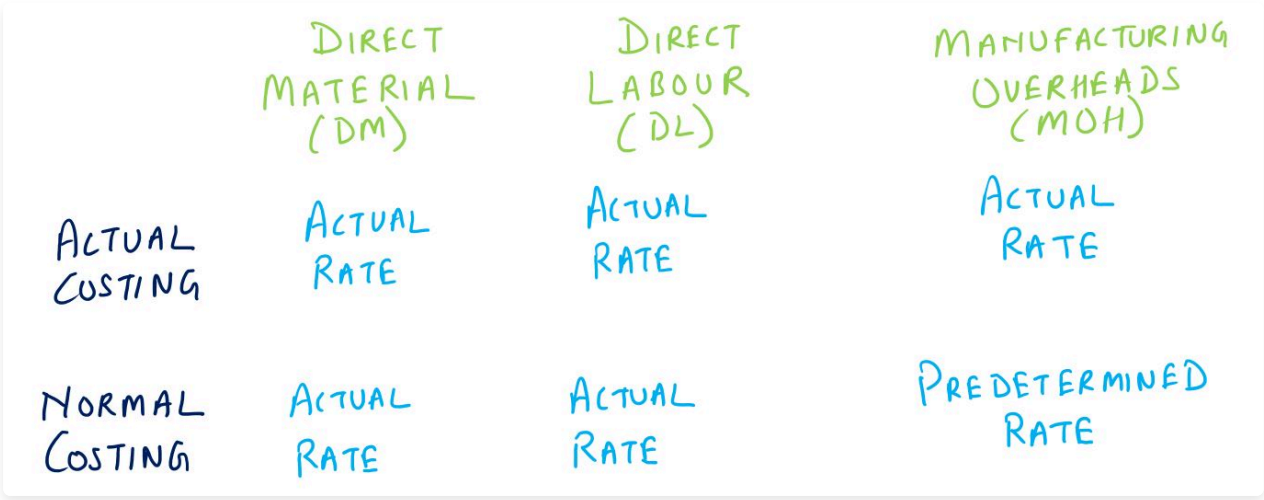
## 2. Normal Costing

Normal costing is an alternative method to actual costing, used to determine product costs.

In case of **Actual Costing** method, the overhead costs (MOH) is assigned to products using the actual overhead costs incurred. Overhead is calculated at the end of the period when actual overhead costs are known. This can delay costing analysis, as it depends on final figures of overhead costs.

However in case of **Normal Costing**, the overhead costs (MOH) are applied to products using a predetermined overhead rate, which is based on estimated overhead costs and estimated activity levels (e.g., labor hours, machine hours). The predetermined overhead rate is calculated at the beginning of the period, allowing companies to apply overhead costs during the production process (rather than waiting for the end of the period).




In normal costing, actual direct material (DM) and direct labor (DL) costs are assigned to products, but manufacturing overhead (MOH) is allocated using a predetermined rate. This overhead allocation can take place in real-time as products are produced or services are delivered.

This approach adheres to the cost principle, which says that all production or acquisition costs be attached to the units produced, services rendered, or units purchased.

There are 4 main reasons for using predetermined OH rates in product costing:

1. **Timeliness of Information:** A predetermined overhead rate allows for the timely assignment of overhead costs (MOH) as goods are produced or sold, and services are rendered. This improves the availability of cost information during the period, enabling better decision-making.

2. **Adjustment for Overhead Variations:** Predetermined OH rates help smooth out variations in actual overhead costs that are not related to changes in production activity. For example, overhead costs like factory utilities might spike in the summer due to air conditioning usage. If actual overhead were assigned directly to production, this seasonal increase would cause the product cost per unit to be higher in summer than at other times. Using a predetermined rate prevents these fluctuations.

3. **Consistency Despite Activity Level Changes:** Predetermined OH rates address the issue of fluctuations in activity levels that do not affect fixed overhead costs. Even if total manufacturing overhead remains consistent, changes in production volume could lead to significant variations in per-unit overhead costs. By applying a consistent annual predetermined OH rate, these variations are minimized, leading to more stable unit costs.

4. **Enhanced Profitability Awareness:** Using predetermined OH rates, especially when these rates accurately reflect the cost drivers, helps managers better understand the profitability of individual products, product lines, and business relationships with specific customers or vendors. This insight can lead to more informed strategic decisions.

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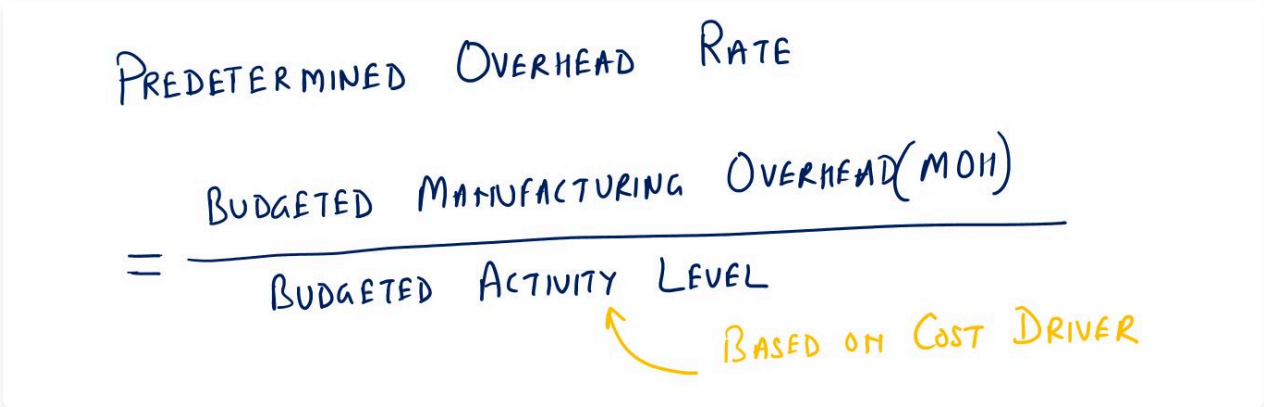
## 3. Predetermined Overhead Rate

In a Normal Costing system, the process of recording journal entries is nearly identical to that in an Actual Costing system, with one key difference. In an actual costing system, the total actual overhead cost is transferred from the overhead account to Work in Process (WIP) Inventory using actual rate at the end of the period. However, in a normal costing system, overhead is allocated to WIP Inventory using a predetermined overhead (OH) rate, during the production.

The **predetermined OH rate** is calculated by dividing the total budgeted manufactoring overhead (MOH) cost by the budgeted activity level.




It is essential for companies to select an activity base that logically corresponds to the actual incurrence of overhead costs. While production volume might seem like an obvious choice, it only makes sense if the company produces a single type of product or offers just one type of service. In cases where a company produces multiple products or offers multiple services, production volumes can't be simply summed up to represent "activity" due to the diverse nature of the outputs.

To effectively allocate overhead in such situations, a common measure of activity that applies to all outputs should be selected. This activity base should be a *cost driver* that directly influences overhead costs. Common activity measures include direct labor hours and direct labor dollars, but these may be less suitable for highly automated companies. In such cases, using direct labor as a base can result in excessively high overhead rates because the overhead costs are spread over a relatively small activity base. For automated plants, machine hours might be a more appropriate basis for allocating overhead.

Other potential activity measures include:

- Number of purchase orders
- Product-related physical characteristics such as kgs or litres
- Number of machine setups or the time spent on setups
- Number of parts
- Material handling time
- Product complexity
- Number of product defects

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# 4. Types of Capacity

The two primary causes of underapplied or overapplied overhead are:
(i) A difference between budgeted and actual costs.
(ii) A discrepancy between the activity level used to calculate the predetermined manufacturing overhead (MOH) rate and the actual activity level experienced.

The activity level chosen for setting the predetermined MOH rate typically reflects considerations of organizational capacity.

### Theoretical Capacity

Theoretical capacity represents the estimated maximum potential activity for a specific time period, assuming all production factors are operating perfectly. This measure does not account for real-world factors such as machinery breakdowns or reduced operations during holidays. Using this activity level to set the predetermined overhead rate can lead to significant underapplied overhead costs, as it reflects the gap between actual capacity and theoretical capacity.

### Practical Capacity

Practical capacity reduces theoretical capacity by accounting for regular operational interruptions, such as holidays, downtime, and startup time. This measure reflects the maximum activity achievable during normal working conditions.

### Normal Capacity

Normal capacity takes into account historical and projected future production levels along with cyclical fluctuations. It represents a long-term (2–5 years) average level of activity that is attainable. While it may lead to notable differences between actual and applied overhead in the short term, using this capacity measure is generally required by accounting standards. It is the level of capacity utilization that satisfies average customer demand over a period (say 2–5 years) that includes seasonal, cyclical, and trend factors.

### Expected Capacity

Expected capacity is a short-run concept that reflects the anticipated activity level for the upcoming period based on projected product demand. This level is determined during the budgeting process. When actual results align closely with budgeted outcomes in terms of both dollars and volume, this measure tends to produce product costs that accurately reflect actual costs, resulting in minimal underapplied or overapplied overhead.

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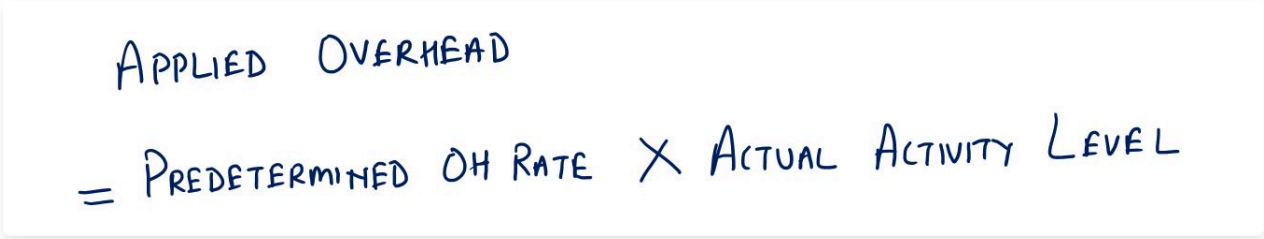
## 5. Applying Overheads

Once predetermined OH rate is calculated, this rate is used throughout the production period to apply overhead cost to WIP Inventory. Thus, the applied overhead amount is the dollar amount of overhead assigned to WIP Inventory using the activity measure that was selected to develop the predetermined OH rate.

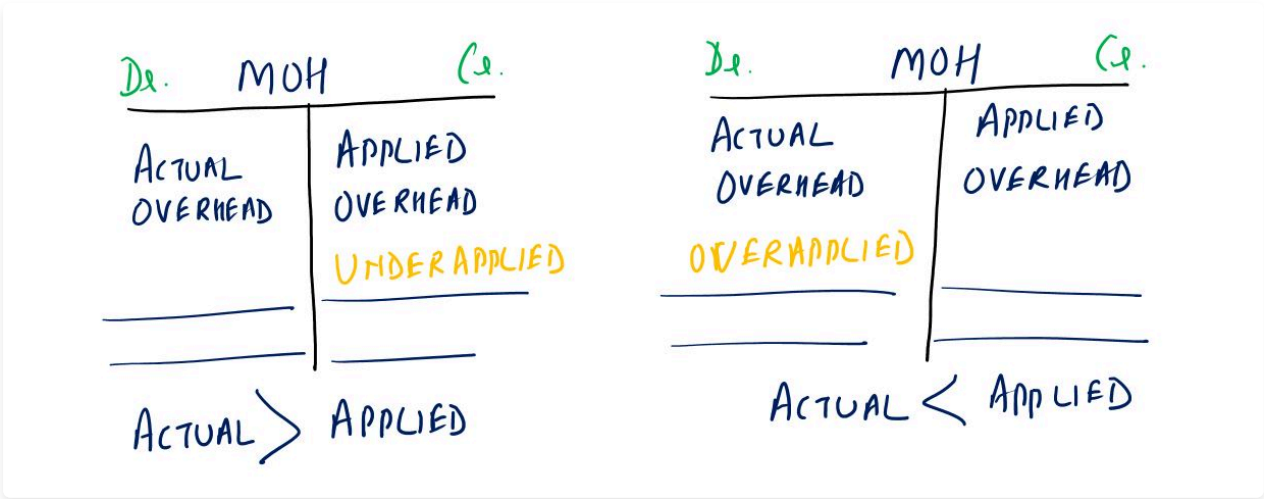



Overhead can be applied when goods or services are transferred out of WIP Inventory or at the end of each month if financial statements are to be prepared.

Applied overhead is debited to WIP Inventory account and credited to the manufacturing overhead account (MOH).

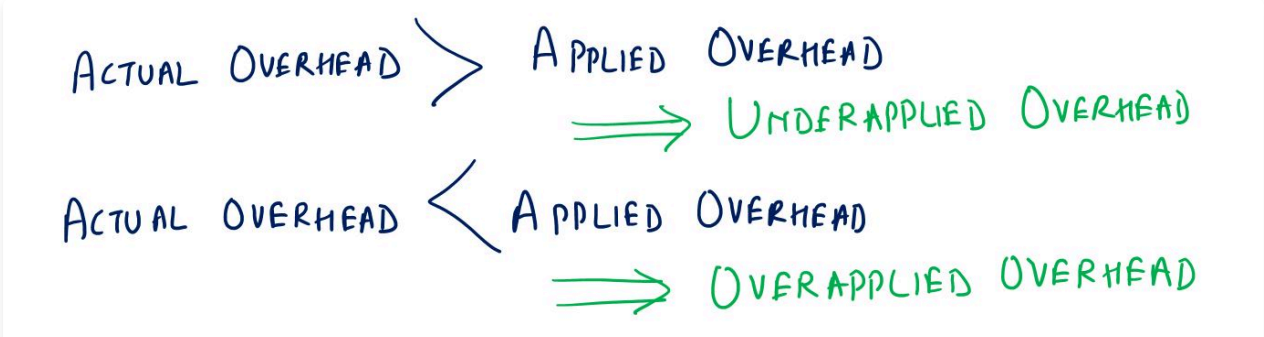
Variable and fixed overhead may be recorded either in a single account or in separate accoun.

At year-end, total actual overhead will differ from total applied overhead. The difference is called underapplied or overapplied overhead.



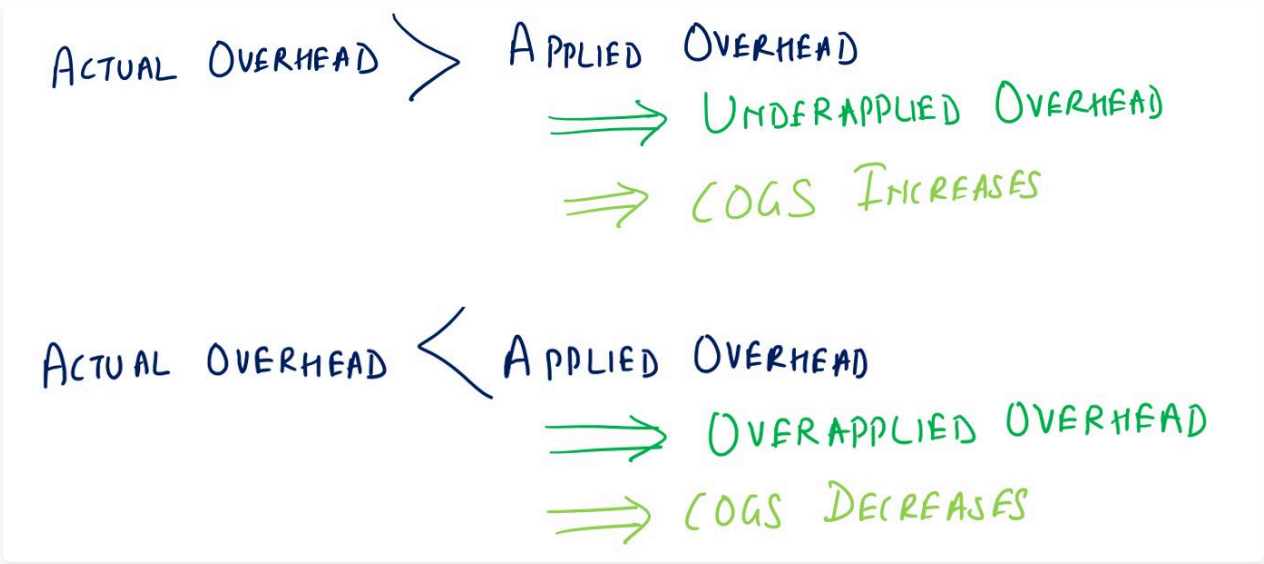

In a T account for Manufacturing Overhead (MOH), the debit side records the actual overhead costs, while the credit side records the applied overhead to work-in-process (WIP).

**Underapplied overhead** means that the overhead applied to WIP Inventory is less than the actual overhead incurred. **Overapplied overhead** means that the overhead applied to WIP Inventory is more than actual overhead incurred. Underapplied or overapplied overhead must be closed at the end of production period.




When overhead is underapplied (debit balance), an insufficient amount of overhead was applied to production and the closing process causes Cost of Goods Sold (COGS) to increase. Alternatively, overapplied overhead (credit balance) reflects the fact that

too much overhead was applied to production, so closing overapplied overhead causes COGS to decrease.

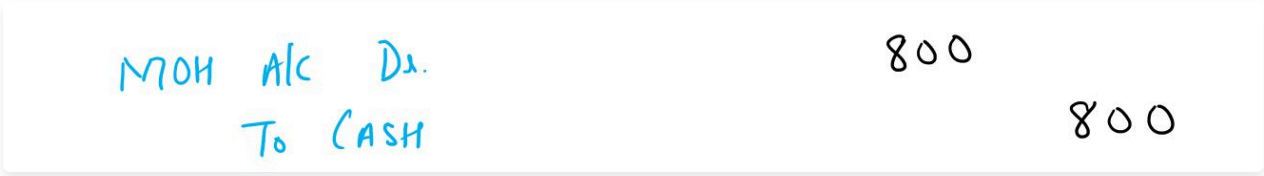


## 5. Applying Overheads

Let us understand the process of application of overheads with the help of an example.

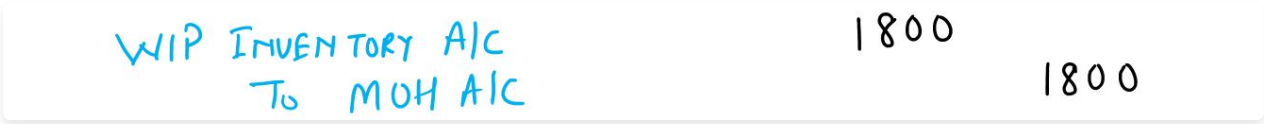
1. The firm consumes Rs 500 worth of indirect materials.


2. The firm pays Rs 800 to a vendor for disinfecting the factory during the rainy season.

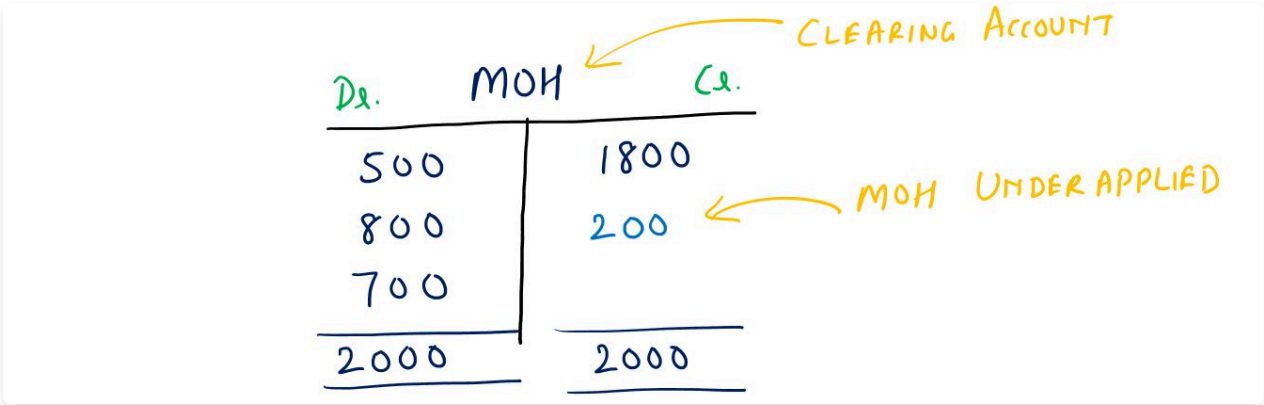



3. The firm receives an electricity bill amounting to Rs 700.


4. The firm allocates Rs 1800 of manufacturing overhead (MOH) during the production process based on predetermined rates.




The T-account for Manufacturing Overhead (MOH) account is given below.




We can see from the MOH T-account that the MOH of Rs 200 was underapplied during production process, so we will make the following journal entry at the end of production period.


If there would have been overapplication of MOH (say Rs 300), then the journal entry would have been as below.

| | | | |
|---|---|---|---|
| MOH A/C | Dr. | 300 | |
| To COGS A/C | | | 300 |

# 5. Applying Overheads

A company manufactures skateboards. The company has a highly automated production process, so it allocates manufacturing overhead based on machine hours. The company expects to incur Rs 2,40,000 of manufacturing overhead costs and to use 4,000 machine hours during coming year.

At the end of previous year, the company reported the following inventories:

| | |
|---|---|
| Raw Materials Inventory | Rs 20,000 |
| Work in Process Inventory | Rs 17,000 |
| Finished Goods Inventory | Rs 11,000 |

During first month of upcoming year, the company actually used 300 machine hours and recorded the following transactions:
a. Purchased materials on account = Rs 31,000.
b. Used direct materials = Rs 39,000.
c. Manufacturing labor cost incurred was = Rs 40,000.
d. Manufacturing labor was 90% direct labor and 10 indirect labor.
e. Used indirect materials = Rs 3,000.
f. Incurred other manufacturing overhead = Rs 13,000 (credit Accounts Payable).
g. Allocated manufacturing overhead.
h. Completed skateboards = Rs 99,000.
i. Sold skateboards on account = Rs 172,000;
j. Cost of skateboards sold = Rs 91,400.

Compute the followings:
1. Compute company's predetermined manufacturing overhead rate for upcoming year.
2. Record the transactions in the general journal.
3. Post the transactions and inventory balances to the following accounts:
(i) Raw Materials Inventory
(ii) Work in Process (WIP)
(iii) Finished Goods (FG)
(iv) Cost of Goods Sold (COGS)
(v) Manufacturing Wages
(vi) Manufacturing Overhead (MOH)
4. Record the journal entry to close the ending balance of Manufacturing Overhead. Post your entry to the T-accounts.
5. What are the ending balances in the three inventory accounts and Cost of Goods Sold?

**SOLUTION:**

1. Compute company's predetermined manufacturing overhead rate for upcoming year.

$$\text{Predetermined MOH Rate} = \frac{\text{Budgeted MOH Cost}}{\text{Budgeted Quantity of Cost Allocation Base}}$$

$$= \frac{2,40,000}{4000} = \text{Rs } 60 \text{ per machine hour}$$

2. Record the transactions in the general journal.

| | | | |
|---|---|---|---|
| (1) | Raw Material Inventory A/C Dr | 31,000 | |
| | To Accounts Payable A/C | | 31,000 |
| (2) | WIP Inventory A/C Dr | 39,000 | |
| | To Raw Material Inventory A/C | | 39,000 |
| (3) | Manufacturing Wages A/C Dr | 40,000 | |
| | To Wages Payable A/C | | 40,000 |
| (4) | WIP Inventory A/C | 36,000 | |
| | MOH A/C | 4,000 | |
| | To Manufacturing Wages A/C | | 40,000 |
| (5) | MOH A/C Dr | 3,000 | |
| | To Raw Material Inventory A/C | | 3,000 |
| (6) | MOH A/C Dr | 13,000 | |
| | To Accounts Payable A/C | | 13,000 |
| (7) | WIP Inventory A/C Dr | 18,000 | |
| | To MOH A/C | | 18,000 |
| (8) | FG Inventory A/C Dr | 99,000 | |
| | To WIP Inventory A/C | | 99,000 |
| (9) | Accounts Receivable A/C Dr | 1,72,000 | |
| | To Sales Revenue | | 1,72,000 |
| (10) | COGS A/C Dr | 91,400 | |
| | To FG Inventory A/C | | 91,400 |

3. Post the transactions and inventory balances to the following accounts:

(i) Raw Materials Inventory

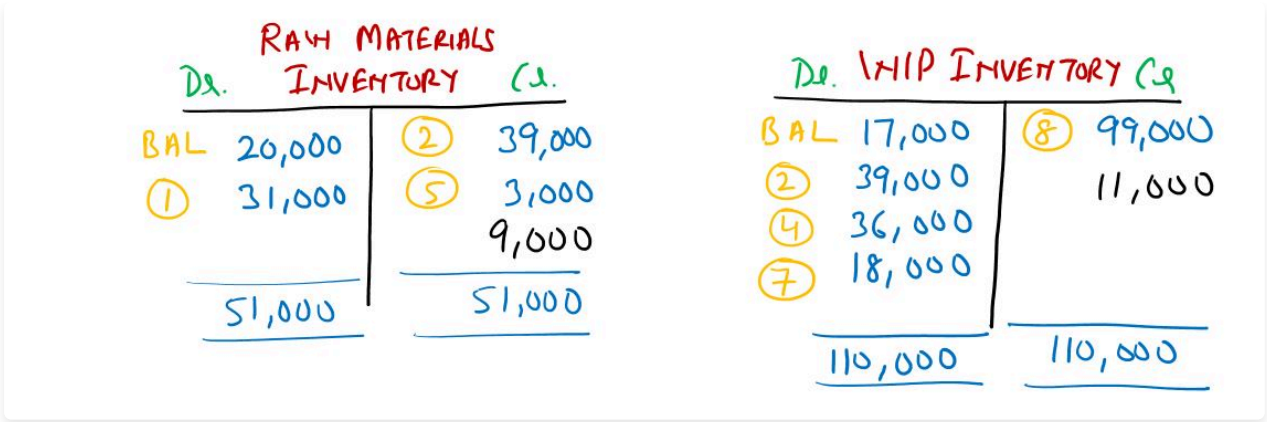
(ii) Work in Process (WIP)

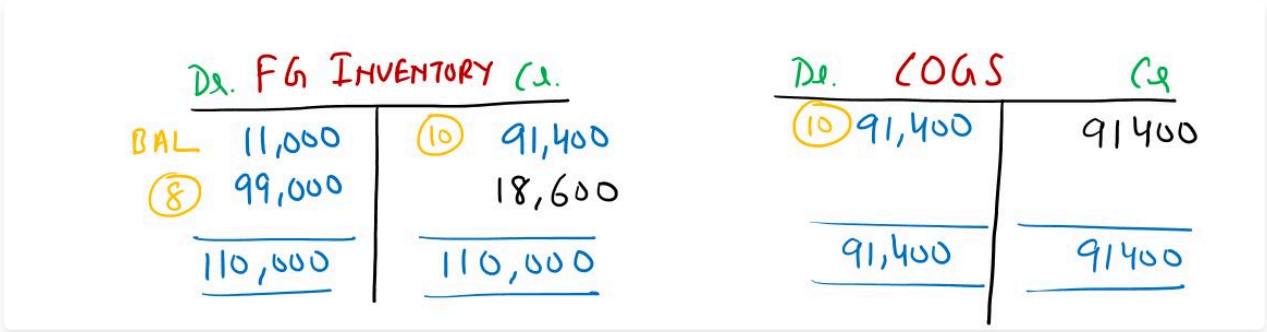
(iii) Finished Goods (FG)

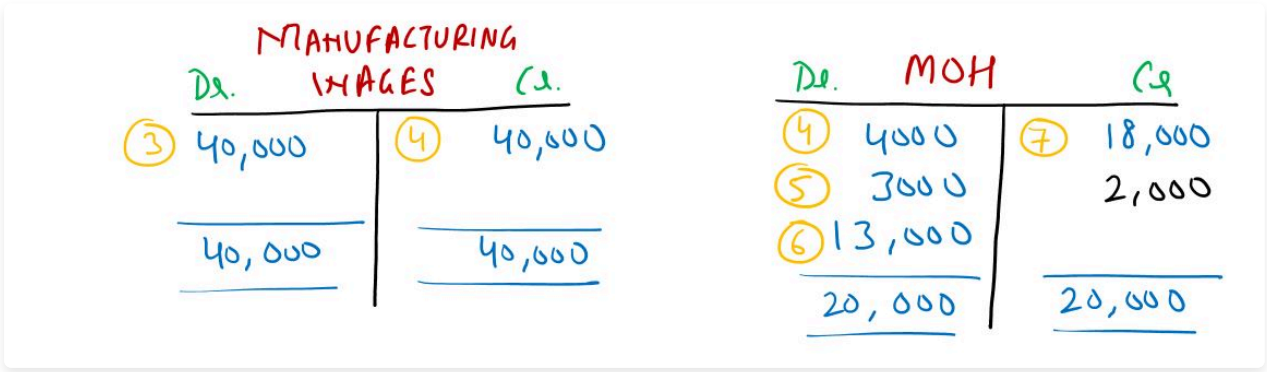
(iv) Cost of Goods Sold (COGS)

(v) Manufacturing Wages

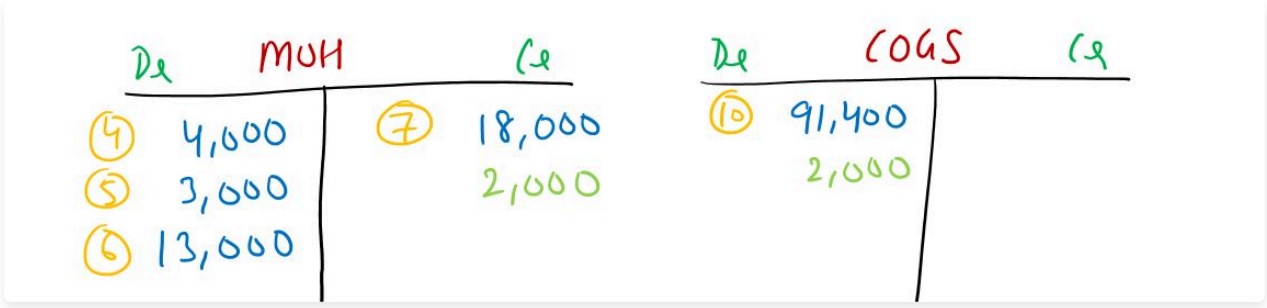
(vi) Manufacturing Overhead (MOH)




4. Record the journal entry to close the ending balance of Manufacturing Overhead. Post your entry to the T-accounts.


5. What are the ending balances in the three inventory accounts and Cost of Goods Sold?

## Ending Balances

Raw Materials Inventory = 9,000

WIP Inventory = 11,000

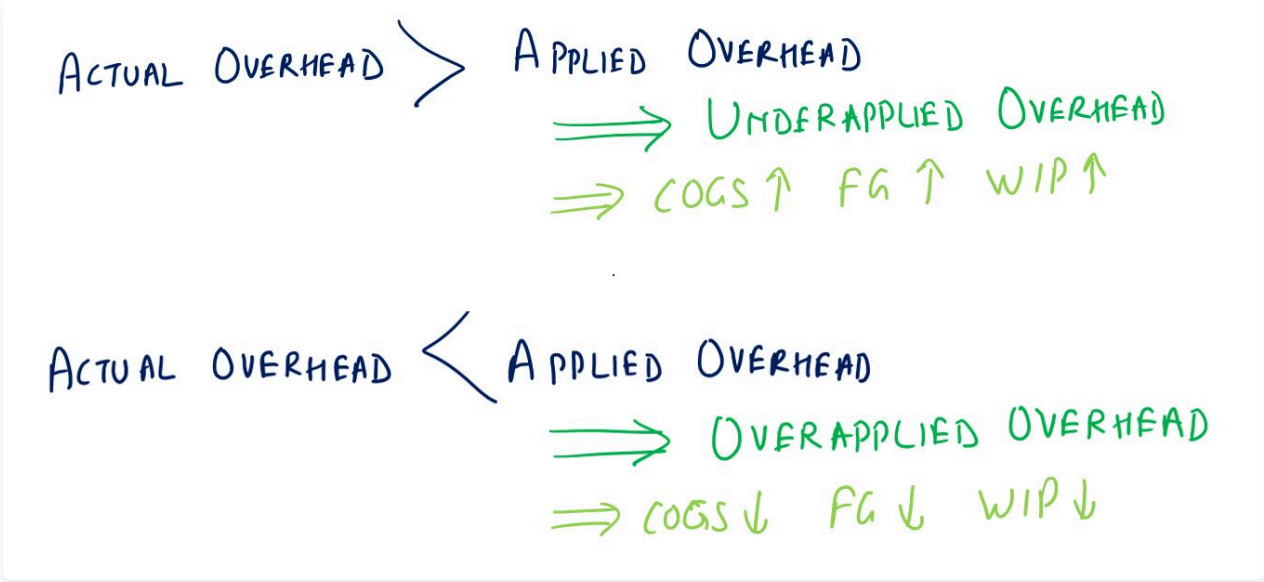
FG Inventory = 18,600

COGS = 93,400

## 6. Another approach - Prorating MOH

We have seen that if the difference between the actual overhead (the actual overhead incurred during the period) and the applied overhead (the overhead assigned to products using a predetermined rate) is relatively small or immaterial, the simplest approach is to close the entire difference directly to the Cost of Goods Sold (COGS) account. This is because the small difference won't significantly impact the overall financial results or the accuracy of inventory valuations.

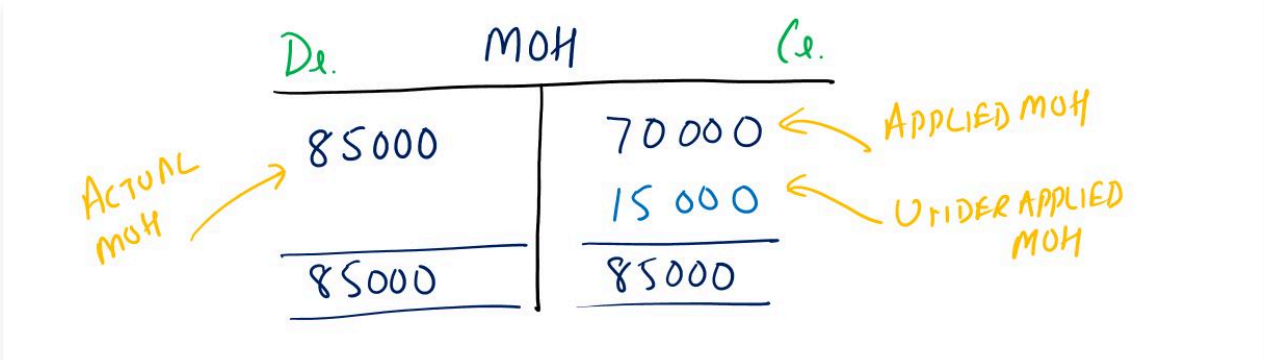
However, when the difference between applied overhead and actual overhead is material or significant, it can distort the true COGS. In such cases, simply closing the difference to COGS is not appropriate, as it will lead to inaccurate financial reporting and inventory valuation.




When the difference between applied and actual overhead is significant, the appropriate accounting treatment is to allocate or prorate the underapplied or overapplied overhead across the 3 main accounts where overhead costs are recorded:
(i) Work in Process (WIP) Inventory: This account represents the costs of production for products that are still being worked on but have not yet been completed.
(ii) Finished Goods (FG) Inventory: This account contains the costs for products that have been completed but are not yet sold.
(iii) Cost of Goods Sold (COGS): This account reflects the total cost of producing the goods that have been sold during the period.

Let us understand the process with the help of an example.

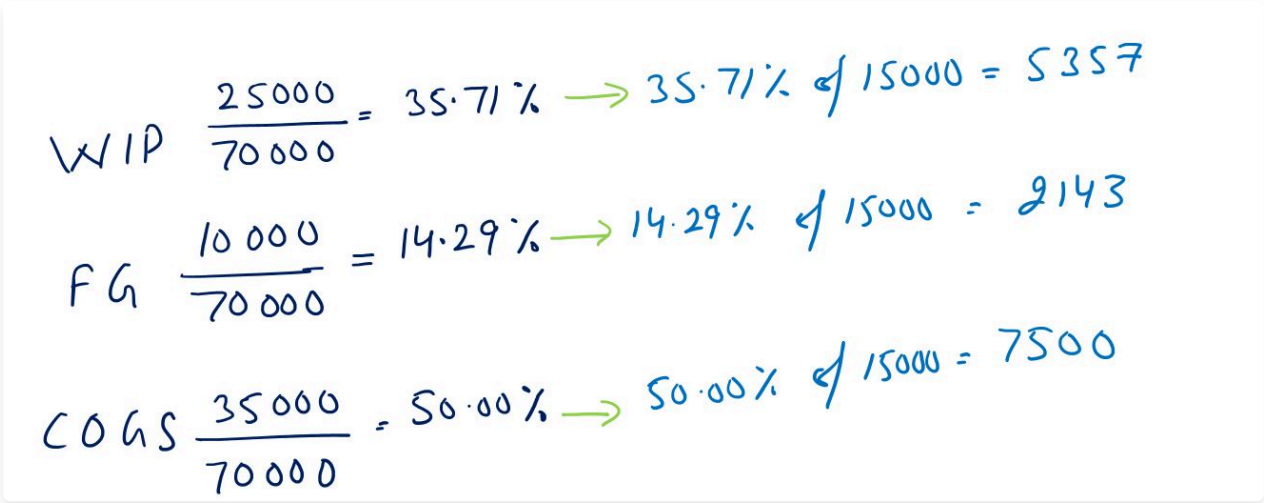
Actual overhead incurred: Rs 85,000
Applied overhead: Rs 70,000
Work in Process (WIP) Inventory: Rs 25,000
Finished Goods (FG) Inventory: Rs 10,000
Cost of Goods Sold (COGS): Rs 35,000



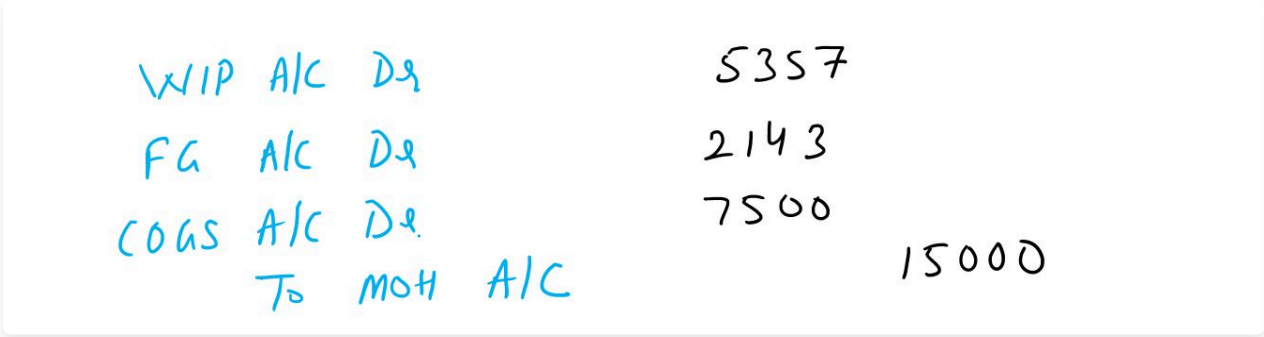

In this example, the firm has underapplied its overhead by Rs 15,000 (Rs 85,000 actual overhead – Rs 70,000 applied overhead).

As per classical approach we close underapplied MOH directly to the Cost of Goods Sold (COGS) account.


As per second approach we want to distribute the underapplied overhead across the three relevant accounts—WIP, FG, and COGS—in proportion to the overhead already applied to each of them.




To prorate the underapplied overhead, we will calculate the percentage of total applied overhead represented by each account and then allocate the Rs 15,000 underapplied overhead proportionally.




The Rs 15,000 underapplied overhead will be distributed as follows:

- Work in Process (WIP) Inventory will increase by Rs 5,357.
- Finished Goods (FG) Inventory will increase by Rs 2,143.
- Cost of Goods Sold (COGS) will increase by Rs 7,500.

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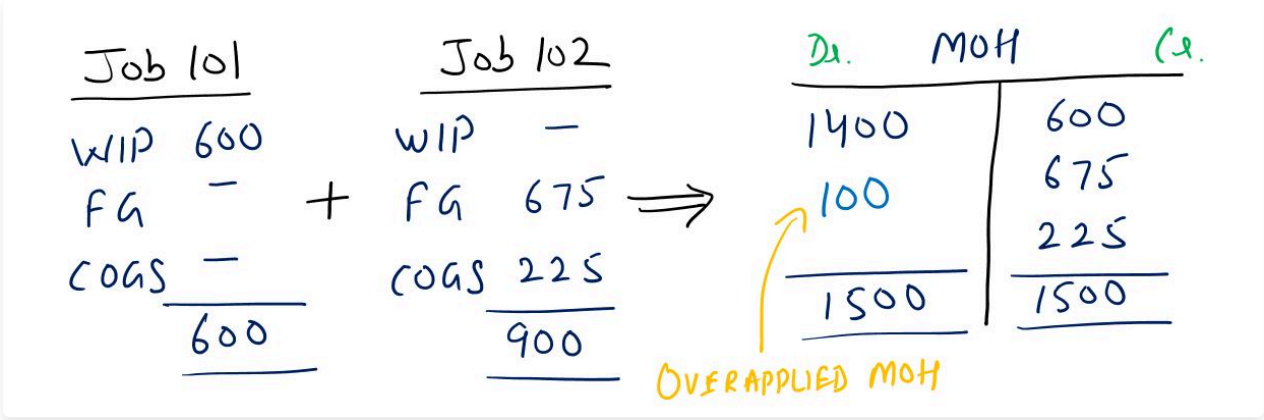
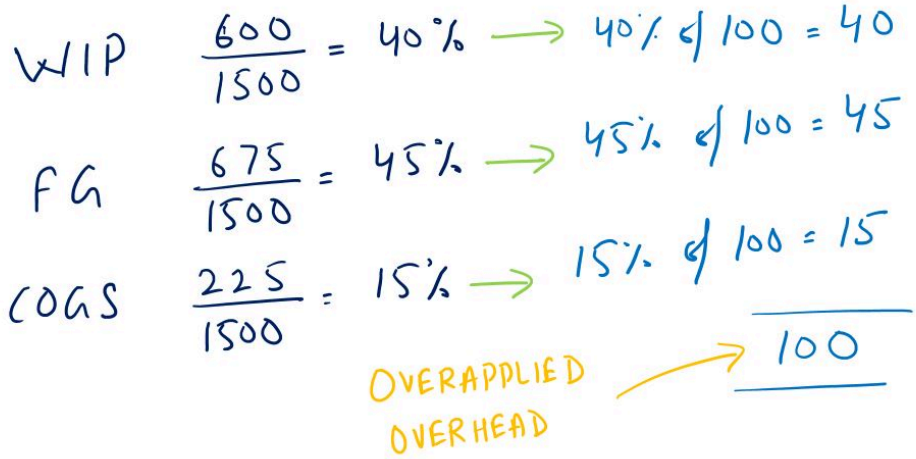
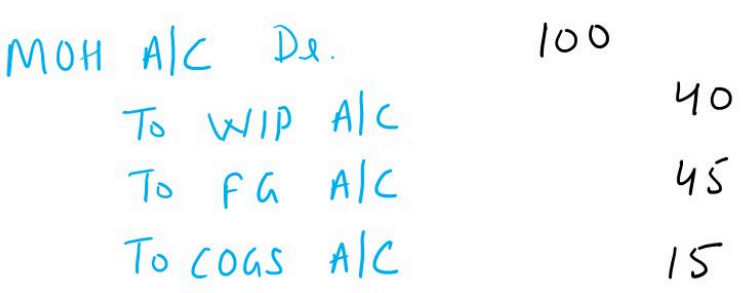
## 6. Another approach - Prorating MOH

A company that manufactures custom, high-end designer clothing, worked on two jobs during the period: Job 101 and Job 202. The accountant applied Rs 600 of manufacturing overhead to Job 101 and Rs 900 of manufacturing overhead to Job 202. Job 202 was completed and transferred to Finished Goods. One quarter of the units produced in Job 202 were then transferred to Cost of Goods Sold, as a customer purchased them. The entirety of Job 101 remained in Work-in-Process Inventory at the end of the period. The actual total manufacturing overhead for the period turned out to be Rs 1,400. The company wants to addresses over or under-applied manufacturing overhead by prorating it among relevant accounts.

**Solution:**



## 7. Adjusted Allocation Rate Approach

The Adjusted Allocation Rate Approach method is used to correct the allocation of overhead costs after the production period ends, once the actual overhead rates are determined.

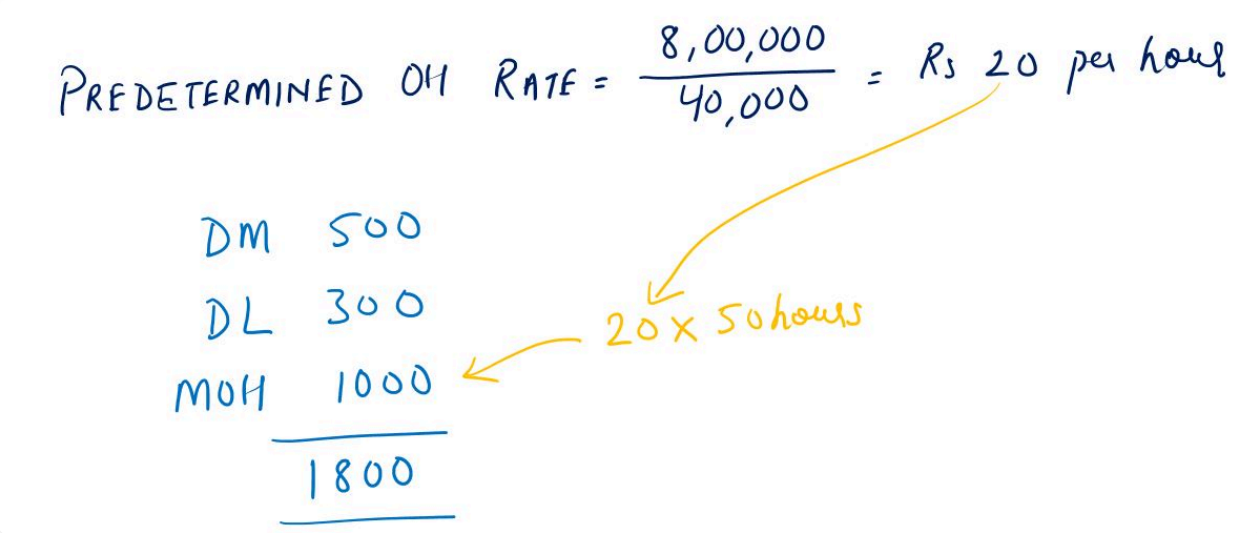
This approach is applied when a company uses predetermined overhead rates during the period, which are based on estimated overhead costs and expected activity levels. At the end of the production period, when the actual overhead costs are known, the company adjusts the initially applied overhead to reflect the actual overhead rate.

Once the actual rate is determined, the company recalculates and adjusts the overhead previously applied using the predetermined rate. This adjustment ensures that the overhead costs recorded in Work-in-Process (WIP) Inventory, Finished Goods (FG) Inventory, and Cost of Goods Sold (COGS) align with the actual overhead costs incurred.

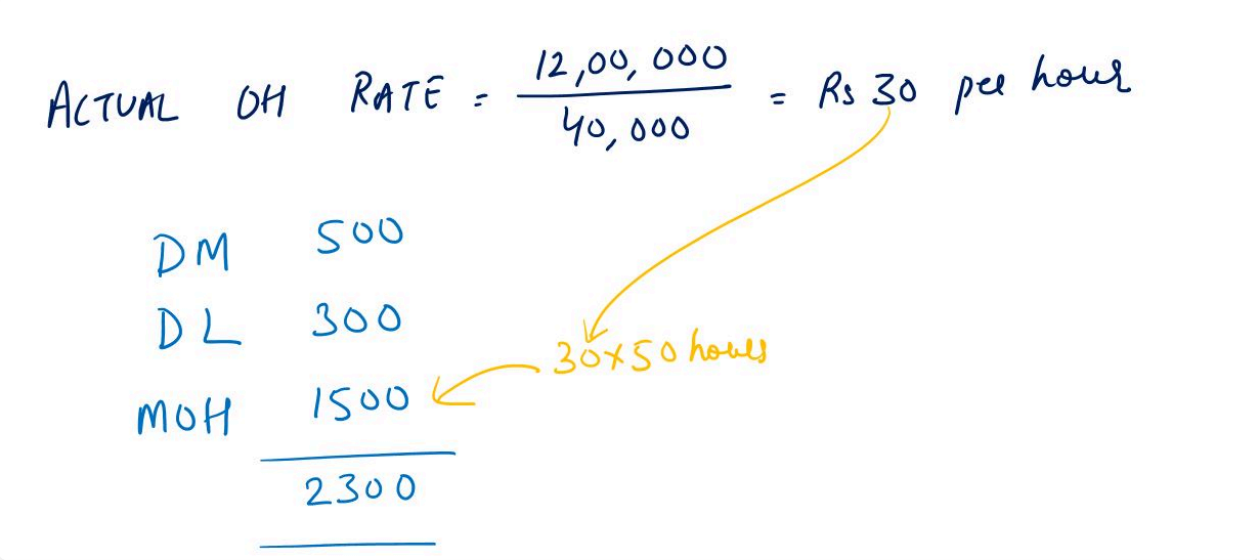
By correcting the differences between the applied overhead and actual overhead, this approach ensures more accurate overhead allocation across relevant accounts.

Let us understand with an example.

Suppose the company estimates its budgeted manufacturing overhead (MOH) at Rs 8,00,000 for an expected activity level of 40,000 man-hours. Using these estimates, the predetermined overhead rate would be Rs 20 per hour.

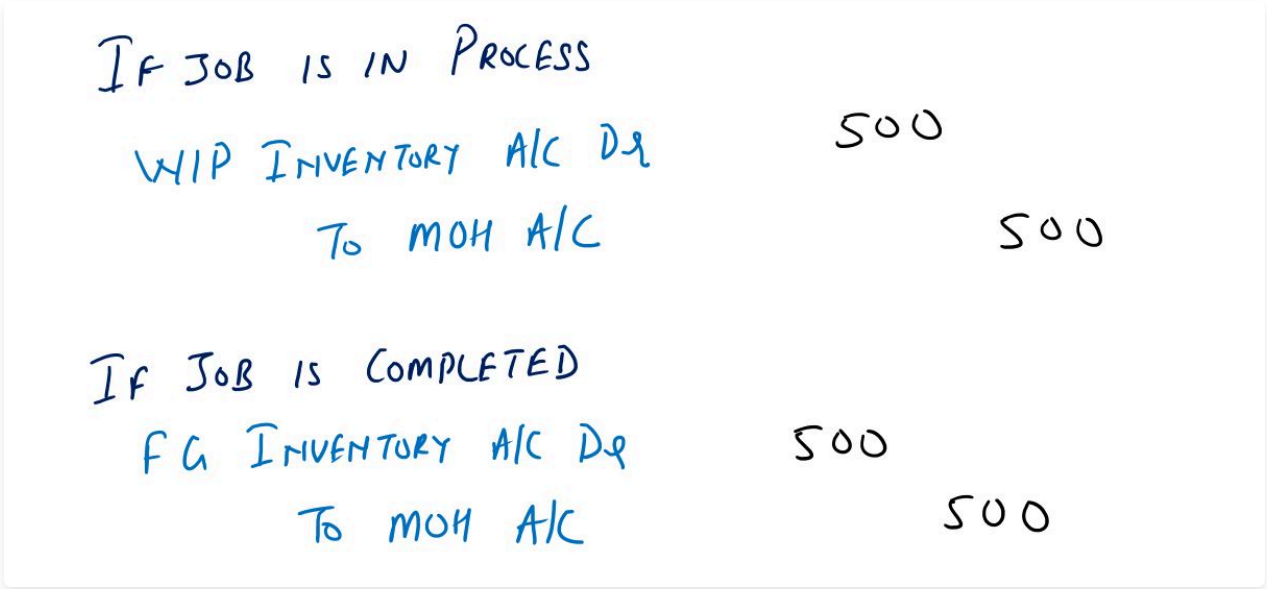



However, at the end of the period, the actual manufacturing overhead (MOH) turns out to be Rs 12,00,000. This results in an actual overhead rate of Rs 30 per hour.




In this case, the difference between the applied overhead (based on Rs 20/hour) and actual overhead (Rs 30/hour) would need to be adjusted using the Adjusted Allocation Rate Approach to ensure that the actual costs are accurately reflected in the

financial records.



# 1. Background

Before diving into Job Order Costing, it's important to understand/revise some fundamental cost terminology. These concepts will help clarify how costs are tracked, traced, and allocated in different costing systems.

**1. Cost Object**
A cost object is anything for which a measurement of costs is desired. It can be a product, service, project, customer, or any other segment of the business.

In a car manufacturing company, each car model (e.g., Sedan, SUV) could be considered a cost object. The company wants to measure the costs associated with producing each specific model.

**2. Direct Costs**
Direct costs are costs that are directly related to a particular cost object and can be easily traced to it without needing to allocate costs.

The cost of the steel used in manufacturing a specific car model is a direct cost. The amount of steel used can be directly traced to each car produced, making it straightforward to assign this cost to the car model.

**3. Indirect Costs**
Indirect costs are costs that are related to a particular cost object but cannot be directly traced to it. Instead, these costs must be allocated to the cost object using some basis.

The salary of the factory supervisor is an indirect cost. The supervisor oversees the production of all car models, so their salary cannot be directly traced to a specific car. Instead, the cost is allocated across all car models based on a suitable allocation base, such as the number of cars produced.

**4. Cost Pool**
A cost pool is a grouping of individual indirect cost items. It is used to accumulate indirect costs that will later be allocated to cost objects. Cost pools are organized in conjunction with cost-allocation bases.

In the car manufacturing plant, all the indirect costs related to operating the paint shop (e.g., electricity, maintenance, and salaries of painters) might be grouped into a cost pool. This cost pool will then be allocated to the different car models based on an appropriate allocation base, such as the number of cars painted.

**5. Cost-Allocation Base**
A cost-allocation base is a systematic way to link an indirect cost or a group of indirect costs to cost objects. It serves as the criterion for allocating indirect costs from the cost pool to the cost objects.

In the car manufacturing example, if the plant uses machine hours as the cost-allocation base, the operating costs of the metal-cutting machines (an indirect cost) would be allocated to each car model based on the number of machine hours required to produce each model.

**Cost Tracing and Cost Allocation**

*Cost Tracing* refers specifically to the assignment of direct costs to cost objects. Since direct costs can be directly linked to a cost object, they are traced rather than allocated.

*Cost Allocation* refers to the assignment of indirect costs to cost objects. Because indirect costs cannot be traced directly, they are allocated based on a chosen cost-allocation base.

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# 2. Job Costing and Process Costing

Management accountants use two basic types of costing systems to assign costs to products or services.


### Job Costing System

In a job costing system ( also called Job Order Costing), the cost object is a specific unit or batch of units that represent a unique product or service, often referred to as a "job." Each job is distinct and typically requires varying amounts of resources.

This system is ideal for businesses that produce customized products or provide tailored services. For example, a custom-designed piece of furniture created by a carpenter, a tailored software solution developed by a tech company, a unique wedding event organized by an event planner, or a custom legal case handled by a law firm are all considered jobs. Each of these jobs is unique, with specific requirements and associated costs.

In a job-costing system, costs are accumulated individually for each job, ensuring that the expenses associated with each specific product or service are accurately recorded and tracked.

| Aspect | Job Costing | Process Costing |
|---|---|---|
| Nature of Product | Used for unique, customized products or services. | Used for homogeneous, mass-produced products or services. |
| Cost Object | Specific job or order, where each job is distinct. | Large quantities of identical units. |
| Cost Tracking | Costs are tracked individually for each job. | Costs are accumulated and averaged across all units produced in a period. |
| Industry Examples | Custom furniture making, legal services, special-order manufacturing. | Textile production, chemical processing, food and beverage production. |
| Cost Calculation | Costs are calculated per job. | Costs are calculated per unit by dividing total costs by total units produced. |
| Production Process | Production is based on specific orders, often discontinuous. | Production is continuous, producing identical units. |
| Cost Control | Focuses on controlling costs for each individual job. | Focuses on controlling costs across the entire production process. |

### Process Costing System

A process costing system, on the other hand, is used when the cost object consists of large quantities of identical or similar units of a product or service. This system is commonly employed in industries where products are mass-produced in a continuous flow, and each unit is indistinguishable from the next.

For instance, a dairy company that produces gallons of milk, a pharmaceutical firm manufacturing a specific medication, a textile mill producing fabric rolls, or a utility company delivering electricity to households all use process costing.

In a process-costing system, the total production costs for a given period are spread evenly across all units produced, resulting in a per-unit cost. This per-unit cost represents the average cost for each unit, allowing the company to standardize the cost measurement for all identical units produced during that time.

To summarize, the primary difference between job-costing and process-costing systems lies in the nature of the output. Job-costing is used for unique, customized jobs, where costs are tracked individually for each job. Process-costing, on the other

hand, applies to mass-produced, homogeneous products or services, where costs are averaged across all units produced.

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# 3. Approach to Job Costing

Job costing is a costing method used when products or services are produced based on specific customer requirements, where each job is unique and identifiable. It involves accumulating costs—direct materials, direct labor, and overhead—specific to each job. This method is particularly useful in industries where products are custom-made or manufactured in small batches, such as construction, specialized machinery, or custom manufacturing.

Let's illustrate job costing with an example.

Elite Furnishings is a company that designs and produces custom-made furniture for clients, such as dining tables, cabinets, and bookshelves. Each piece is made to the customer's specific requirements, making job costing the most suitable costing method for the business.

Recently, Elite Furnishings received a request from a client for a custom-made dining table. The management team used the five-step decision-making process to determine the cost and whether to accept the order.

**Step 1: Identify Problems and Uncertainties**
The first step was to identify the problems and uncertainties involved. Elite needed to determine the total cost of producing the custom dining table, including materials, labor, and overhead, to provide an accurate quote. Additionally, the company considered uncertainties like material availability and labor requirements.

**Step 2: Obtain Information**
The management team gathered detailed information on the client's specifications, such as the type of wood, dimensions, and finish required. They also evaluated the company's production schedule to determine if they had the capacity to take on this custom project. Additionally, they analyzed their previous experience with similar projects to estimate how much labor and resources would be needed.

**Step 3: Make Predictions About the Future**
Elite's managers estimated the cost of direct materials (like wood and paint), direct labor (carpentry work), and overhead (such as factory utilities and equipment maintenance). They considered qualitative factors like the availability of skilled labor, potential delays in sourcing high-quality wood, and the risks of cost overruns due to unexpected changes in design or client requirements.

**Step 4: Make Decisions by Choosing Among Alternatives**
Based on the cost estimates, Elite Furnishings decided to quote ₹50,000 for the custom dining table. This bid included a 30% markup over the estimated production costs to ensure profitability. They considered other alternatives, such as not taking on the job due to capacity issues or suggesting changes to the design that would reduce the cost. Ultimately, they decided to proceed with the quote, confident that it would cover both costs and risks.

**Step 5: Implement, Evaluate Performance, and Learn**
After the client approved the quote, Elite Furnishings began working on the dining table. Throughout the production process, they closely monitored the actual costs incurred, including labor hours and material usage. Upon completion, they compared the actual costs to their initial estimates to evaluate performance. They noted any variances between predicted and actual costs to learn from the experience and improve future cost estimates.

Thus, Elite Furnishings uses a job-costing system to allocate costs to individual jobs. For the dining table project, they tracked:

- *Direct Materials:* Cost of wood, varnish, and other materials used.
- *Direct Labor:* Wages paid to carpenters and workers who worked directly on crafting the dining table.
- *Manufacturing Overhead:* Costs that could not be directly traced to the dining table, like electricity usage and depreciation of woodworking equipment.

The five-step decision-making process helps the company decide whether to accept a job, estimate costs, and ensure profitability. By comparing actual costs to initial estimates, Elite can continually improve its costing accuracy, make informed decisions, and successfully handle custom projects in the future.

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# 4. Steps of Job Costing

Job costing is an accounting method used to track and allocate the costs associated with a specific job, project, or order. It is particularly useful in industries where products or services are customized or produced in small batches, such as construction, manufacturing, consulting, or any other business where each job is unique.

Here is an explanation of the steps in job costing.

**1. Identify the Job**

Start by clearly defining the specific job or project that you'll be tracking costs for. This job could be anything from a customized product order to a particular service provided. It becomes the focal point or "cost object" for accumulating all related costs.

**2. Identify the Direct Costs**

The direct costs are specific and easily traceable to the job.

(i) Direct Materials (DM): Determine the exact materials used for this job, such as raw materials that can be directly traced to it.

(ii) Direct Labor (DL): Identify the labor involved in working directly on the job. This includes wages paid to employees who are actively contributing to the job.

Any costs that don't fall into these categories are considered indirect costs.

**3. Select the Cost-Allocation Bases for allocating Indirect Costs**

Indirect costs, which support multiple jobs or the overall business, need to be allocated to this specific job. To do this, you'll select one or more cost-allocation bases. A cost-allocation base is a measurable factor that helps allocate these indirect costs. Common bases include machine hours, labor hours, or square footage, depending on what drives the costs in your business.

**4. Identify the Indirect Costs Associated with each cost-allocation base**

Once you've chosen your cost-allocation bases, the next step is to identify all the indirect costs related to each base. For example, if you're using labor hours as a base, costs like factory utilities or supervisor salaries might be allocated through this base. These identified costs are grouped into a pool, often referred to as Manufacturing Overhead (MOH), for that allocation base.

**5. Compute the Rate per unit of each cost-allocation base**

To allocate the indirect costs to the job, calculate the rate per unit of your chosen cost-allocation base. This rate is determined by dividing the total budgeted indirect costs in each pool by the total budgeted quantity of the allocation base.

$$\text{Predetermined MOH Rate} = \frac{\text{Budgeted MOH Cost}}{\text{Budgeted Quantity of Cost Allocation Base}}$$

**6. Compute the Indirect Costs Allocated to the Job**

Apply the rate you calculated to the actual usage of the allocation base for the job. Multiply the actual quantity of each allocation base used by the job by the rate.

**7. Compute the Total Cost of the Job**

Finally, add together all the direct costs (materials and labor) and the allocated indirect costs to find the total cost of the job. This total gives you a clear picture of how much it cost to complete the job, which you can then use to assess profitability by comparing it to the revenue earned from the job.

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# 5. Actual and Normal Costing

We have learnt that the Job Order Costing (also called Job Costing) is a cost accumulation method used when products or services are produced based on specific customer orders, and each job or batch is unique. It is common in industries like construction, custom manufacturing, specialized machinery, and professional services. The goal is to assign the appropriate direct materials, direct labor, and overhead costs to each specific job.

When applying overhead costs in job order costing, there are two main methods used: Actual Costing and Normal Costing. Both methods use actual costs for direct materials and direct labor, but they differ in how they treat overhead costs.

### 1. Actual Costing

Actual costing assigns costs to each job based on the actual costs of direct materials, direct labor, and overhead that are incurred during the production process.

- *Direct Materials:* Costs for raw materials are tracked in real time, based on actual invoices or purchase records for each job.
- *Direct Labor:* Labor costs are recorded based on actual wages and hours worked by employees involved in the production process for a specific job.
- *Manufacturing Overhead:* Actual overhead costs are accumulated during the period and applied to each job at the end of the period. Overhead includes all indirect costs such as factory utilities, factory rent, maintenance, and indirect materials.

Actual costing provides a highly accurate picture of the true cost incurred for each job because it uses the real costs of materials, labor, and overhead.

The main drawback of actual costing is that the actual overhead costs are only known after the production period ends, resulting in delays in calculating the total job cost. This makes it impractical for timely pricing decisions or performance evaluation during production.

Actual overhead costs may vary significantly from one period to another due to changes in factory utility usage, repair needs, or seasonal fluctuations, which can make it difficult to predict and manage costs.

| Characteristic | Actual Costing | Normal Costing |
|---|---|---|
| **Overhead Cost** | Uses **actual overhead costs** after the period ends | Uses **predetermined overhead rate** during production |
| **Timeliness** | Calculated **after production** is complete | Overhead costs are applied **during production** |
| **Accuracy** | High accuracy, but not available until later | Provides timely estimates, requires adjustment later |
| **Stability of Cost Data** | Subject to **fluctuations** in actual costs | More **stable** as it uses an average rate |
| **End-of-Period Adjustment** | Not required (uses actual costs) | **Adjustment required** for over/under-applied overhead |

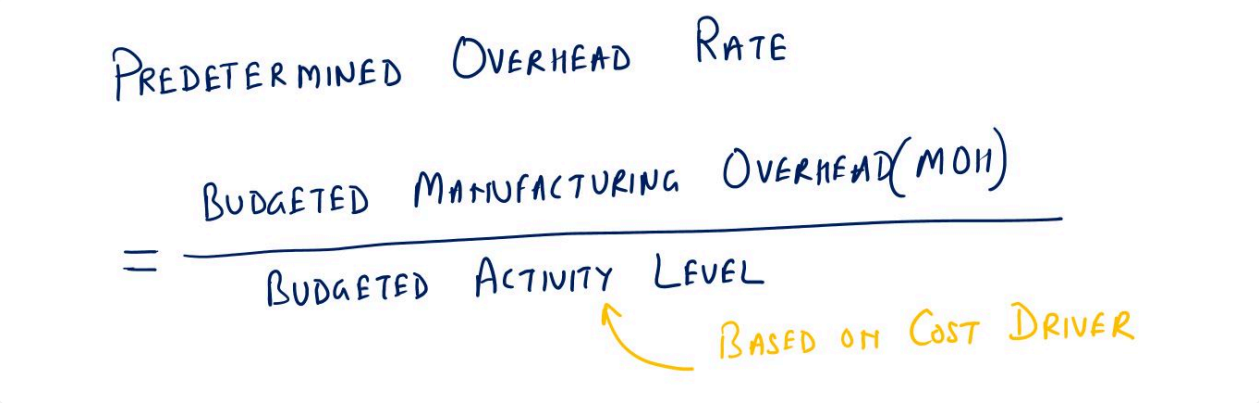
### 2. Normal Costing

Normal costing is a method used to apply overhead to jobs based on an estimated overhead rate rather than waiting for the actual overhead to be known. This allows companies to apply overhead to each job during production, enabling more timely cost calculations.

- *Direct Materials:* Similar to actual costing, direct materials are recorded at their actual cost based on purchases made for a specific job.
- *Direct Labor:* Labor costs are recorded at the actual cost of wages paid to workers involved in a specific job.

- *Manufacturing Overhead:* Unlike actual costing, normal costing uses a predetermined overhead rate to apply overhead costs to each job during production.

  The predetermined overhead rate is calculated before the production period begins, based on estimates of total overhead costs and an allocation base such as labor hours or machine hours:




This rate is then used to allocate overhead to each job during production, based on the actual amount of the allocation base used for that job.

Normal costing allows overhead costs to be applied during the production process, which provides quicker information for decision-making and cost control.

Using a predetermined rate helps smooth out fluctuations in overhead costs, which might arise due to seasonality or unexpected changes. This makes it easier to plan and manage production costs.

Since the predetermined rate is based on estimates, there is typically a difference between the applied overhead and the actual overhead incurred. This difference is known as over-applied or under-applied overhead, and adjustments must be made at the end of the period to reconcile these differences.

Most companies prefer Normal Costing as it provides more timely cost information, allowing for better planning and control throughout the production process. It is especially useful in ensuring that costs are applied consistently across jobs and that management has a clear idea of ongoing costs and profitability.

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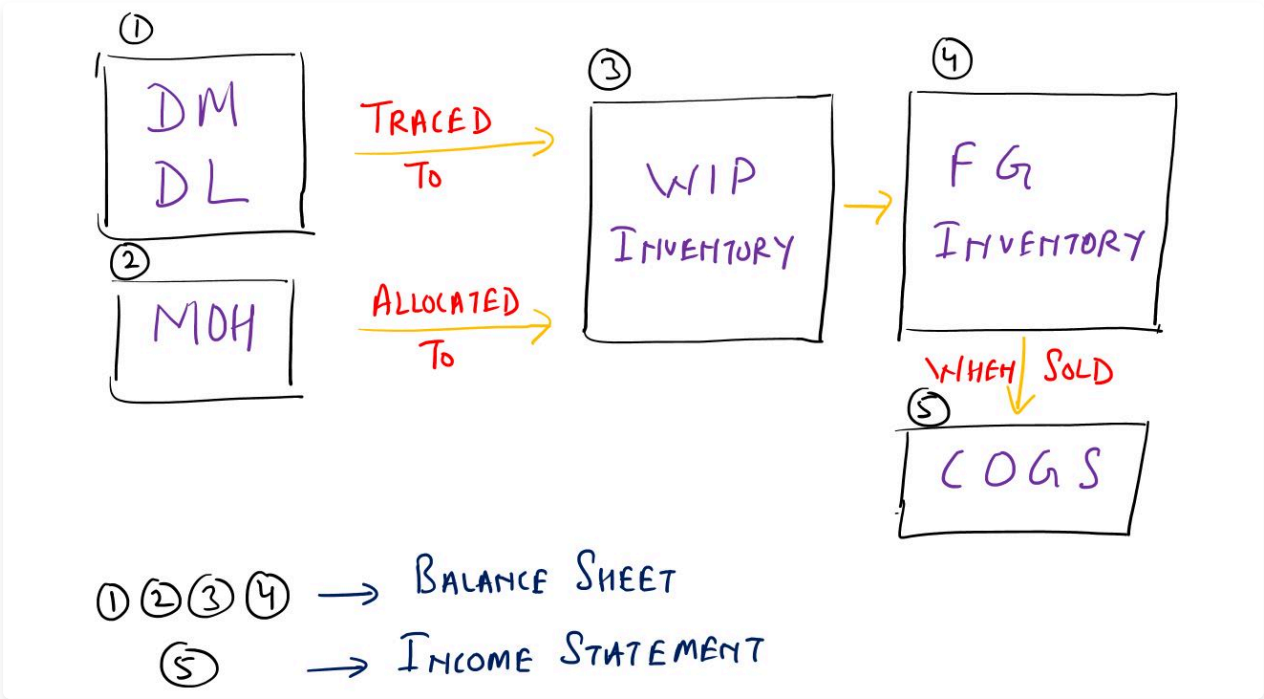
## 6. Flow of costs in Job Costing




Let us understand the flow of costs in Job Costing.

**Direct Materials and Direct Labor**

In job costing, direct materials (DM) and direct labor (SL) are the primary costs directly traceable to a specific job. Direct Materials (DM) are the raw materials specifically used for a job (e.g., wood for custom furniture). Because they're exclusively used for that particular job, they're easily traced to it. Direct Labor (DL) refers to the wages paid to workers directly involved in producing the job. This labor cost is directly assigned to the job because it is also job-specific.

When these direct costs (direct materials and direct labor) are incurred, they are initially recorded as work-in-process (WIP) inventory on the balance sheet. This is because direct manufacturing labor transforms the raw materials into a partially finished product, creating value that's considered an asset (WIP) until the product is completed.

**Manufacturing Overhead and Indirect Costs**

Besides direct materials and labor, production incurs manufacturing overhead (MOH) costs like indirect materials (e.g., glue, screws) and indirect labor (e.g., supervision, maintenance). These costs support the production process but aren't easily linked to individual jobs, as they benefit all jobs collectively.

To handle these indirect costs, they are first accumulated in a Manufacturing Overhead account. These costs are then allocated to each job using a predetermined rate (such as a rate based on machine hours or labor hours). Once allocated, they also become part of WIP inventory, reflecting the resources consumed to make the job.

**From Work-in-Process to Finished Goods**

As work on each job is completed, its accumulated costs (direct materials, direct labor, and allocated overhead) are transferred from work-in-process inventory to finished goods inventory (FG) on the balance sheet. Finished goods represent the completed product ready for sale.

**Finished Goods to Cost of Goods Sold (Income Statement)**

When a finished product (FG) is sold, the cost moves from finished goods inventory to cost of goods sold (COGS) on the income statement. This transition from the balance sheet to the income statement allows COGS to be matched with the revenue earned from the sale, following the matching principle in accounting.

This process ensures that all costs involved in producing a job are properly recorded and transferred through inventory accounts on the balance sheet until the product is sold, at which point they impact the income statement as an expense. This flow helps businesses keep accurate records of production costs and evaluate the profitability of each job.

# 7. Ledger Entries in Job Order Costing

Let's consider Precision Tools Ltd., a company that manufactures custom machine parts. We will walk through the ledger entries required in a job order costing system as costs flow through the production process.

**1. Purchasing Direct and Indirect Materials**
When materials (both direct and indirect) are purchased, they are recorded as part of the materials inventory.
Journal Entry: Debit Materials Inventory and Credit Accounts Payable.

*Example:*
Materials Inventory: Debit ₹1,00,000
Accounts Payable: Credit ₹1,00,000

**2. Direct Material Issuance to Jobs**
Direct materials requisitioned specifically for Job #2201 are transferred to the Work-in-Process (WIP) account.
Journal Entry: Debit Work-in-Process Inventory for Job #2201 and Credit Materials Inventory.

*Example:*
Work-in-Process Inventory (Job #2201): Debit ₹65,000
Materials Inventory: Credit ₹65,000

**3. Indirect Material Usage**
Indirect materials used across various jobs are transferred to the Manufacturing Overhead account.
Journal Entry: Debit Manufacturing Overhead and Credit Materials Inventory.

*Example:*
Manufacturing Overhead: Debit ₹8,000
Materials Inventory: Credit ₹8,000

**4. Recording Direct and Indirect Labor**
Direct Labor: Wages paid to workers specifically working on Job #2201 are recorded directly in WIP.
Indirect Labor: Wages paid to supervisors or maintenance staff that benefit all jobs are recorded in Manufacturing Overhead.

Journal Entry for Direct Labor:
Debit Work-in-Process Inventory (Job #2201) and Credit Wages Payable.

*Example:*
Work-in-Process Inventory (Job #2201): Debit ₹25,000
Wages Payable: Credit ₹25,000

Journal Entry for Indirect Labor:
Debit Manufacturing Overhead and Credit Wages Payable.

*Example:*
Manufacturing Overhead: Debit ₹12,000
Wages Payable: Credit ₹12,000

**5. Recording Other Manufacturing Overhead Costs**
This includes costs like factory utilities, equipment depreciation, and other indirect costs.
Journal Entry: Debit Manufacturing Overhead and Credit relevant accounts like Utilities Payable or Accumulated Depreciation.

*Example:*
Manufacturing Overhead: Debit ₹18,000
Utilities Payable: Credit ₹6,000
Accumulated Depreciation: Credit ₹12,000

**6. Allocating Manufacturing Overhead to Jobs**
Overhead is allocated to Job #2201 based on a predetermined rate (e.g., per machine hour).
Journal Entry: Debit Work-in-Process Inventory (Job #2201) and Credit Manufacturing Overhead Allocated.

*Example:*
Work-in-Process Inventory (Job #2201): Debit ₹20,000

Manufacturing Overhead Allocated: Credit ₹20,000

**7. Transferring Completed Job Costs to Finished Goods**

Once Job #2201 is complete, its costs are transferred from WIP to Finished Goods Inventory.
Journal Entry: Debit Finished Goods Inventory and Credit Work-in-Process Inventory (Job #2201).

*Example:*
Finished Goods Inventory: Debit ₹1,08,000
Work-in-Process Inventory (Job #2201): Credit ₹1,08,000

**8. Sale of Finished Goods**

Upon sale, the cost of the finished goods is moved to Cost of Goods Sold, and revenue is recorded.
Journal Entry for Cost of Goods Sold: Debit Cost of Goods Sold and Credit Finished Goods Inventory.
Journal Entry for Sale: Debit Accounts Receivable and Credit Sales Revenue.

*Example:*
Cost of Goods Sold: Debit ₹1,08,000
Finished Goods Inventory: Credit ₹1,08,000
Accounts Receivable: Debit ₹1,50,000
Sales Revenue: Credit ₹1,50,000

This example illustrates how Precision Tools Ltd. uses job order costing ledger entries to accurately track and allocate costs as they flow through materials, labor, overhead, and sales, ultimately matching production costs to sales revenue.

---

## 8. T accounts

Custom Cabinet Co. manufactures custom cabinets for kitchens. In March, Job #345 is started for a client. The following costs are incurred for Job #345:
Purchased materials (both direct and indirect) on credit: ₹90,000.
Issued direct materials to Job #345: ₹55,000.
Issued indirect materials for factory use: ₹7,000.
Direct labor incurred on Job #345: ₹30,000.
Indirect labor for factory supervisors and maintenance: ₹12,000.
Other manufacturing overhead costs (factory utilities and depreciation): ₹16,000.
Allocated manufacturing overhead to Job #345 at a rate of ₹50 per direct labor hour, with 200 direct labor hours worked.

Let's go through the journal entries and then set up the T-accounts.

To record purchase of materials:
Materials Inventory: Debit ₹90,000
Accounts Payable: Credit ₹90,000

To issue direct materials to Job #345:
Work-in-Process Inventory: Debit ₹55,000
Materials Inventory: Credit ₹55,000

To issue indirect materials:
Manufacturing Overhead: Debit ₹7,000
Materials Inventory: Credit ₹7,000

To record direct labor costs for Job #345:
Work-in-Process Inventory: Debit ₹30,000
Wages Payable: Credit ₹30,000

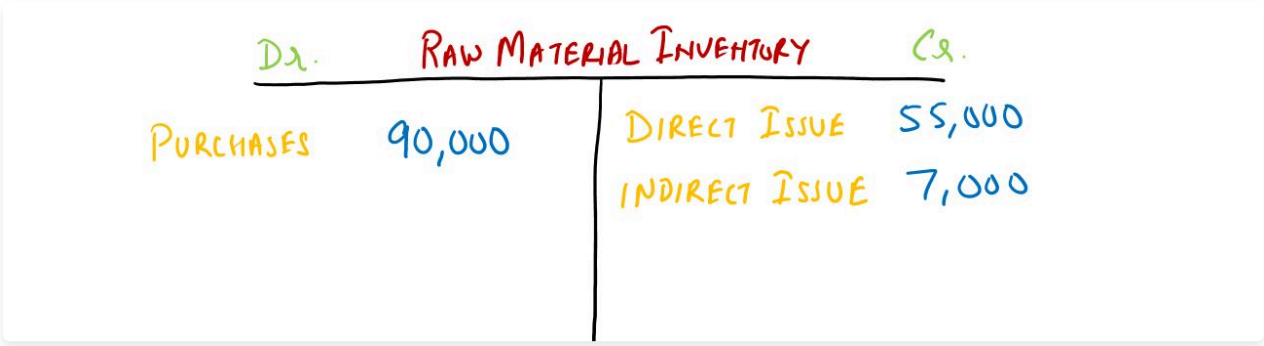
To record indirect labor costs:
Manufacturing Overhead: Debit ₹12,000
Wages Payable: Credit ₹12,000

To record other manufacturing overhead costs:
Manufacturing Overhead: Debit ₹16,000
Cash (or respective accounts, like utilities): Credit ₹16,000

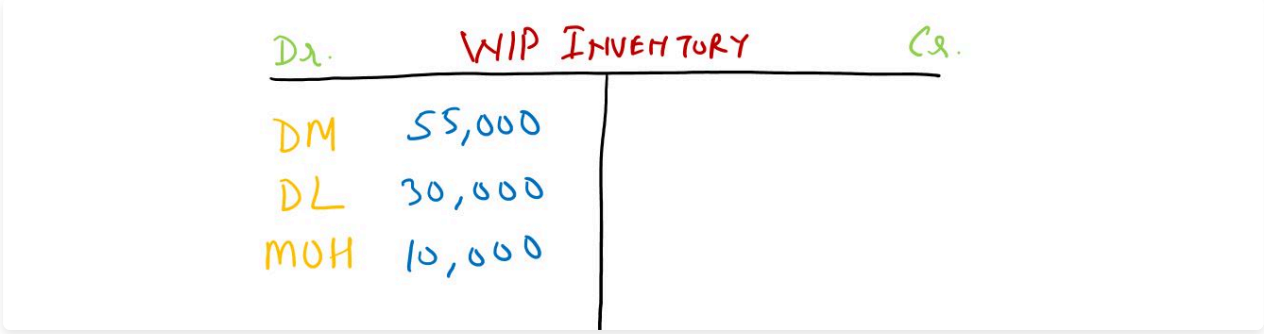
To allocate manufacturing overhead to Job #345:
Work-in-Process Inventory: Debit ₹10,000 (200 hours x ₹50 per hour)
Manufacturing Overhead: Credit ₹10,000

Using these journal entries, let's now prepare **T-accounts** to show how costs flow through the system.

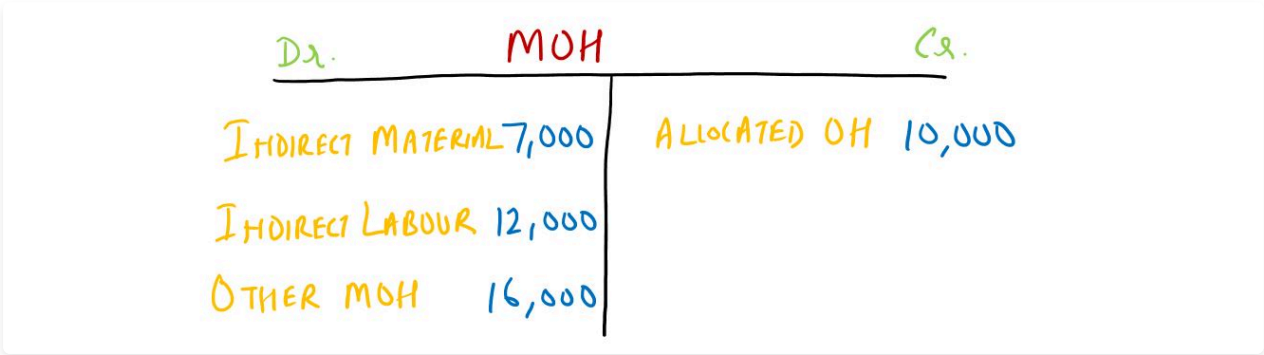
T account for Raw Material Inventory is given below.




T account for WIP Inventory is given below.




T account for MOH is given below.



## 8. T accounts

ABC Manufacturing Co. produces custom machine parts. In January, Job 101 is started. The estimated manufacturing overhead for the year is ₹6,00,000, and the estimated machine hours are 15,000. The budgeted overhead rate is calculated based on these estimates.

The following data for Job 101 are available:
Direct Materials Used: ₹1,50,000
Direct Labor Cost: ₹80,000
Direct Labor Hours Worked: 200 hours
Actual Machine Hours Used: 400 hours

Compute the total cost based on Normal Costing.

**SOLUTION:**

*Step 1: Identify the Job That Is the Chosen Cost Object*
The chosen cost object is Job 101.

*Step 2: Identify the Direct Costs of the Job*
Direct Materials: ₹1,50,000
Direct Labor: ₹80,000

*Step 3: Identify the Cost-Allocation Base for Allocating Indirect Costs to the Job*
The cost-allocation base chosen is machine hours.

*Step 4: Identify the Indirect Costs Associated with the Cost-Allocation Base*
The total budgeted manufacturing overhead is ₹6,00,000.

*Step 5: Compute the Budgeted Allocation Rate*

$$\text{BUDGETED OVERHEAD RATE} = \frac{\text{BUDGETED MOH}}{\text{BUDGETED MACHINE HOURS}} = \frac{6,00,000}{15,000}$$

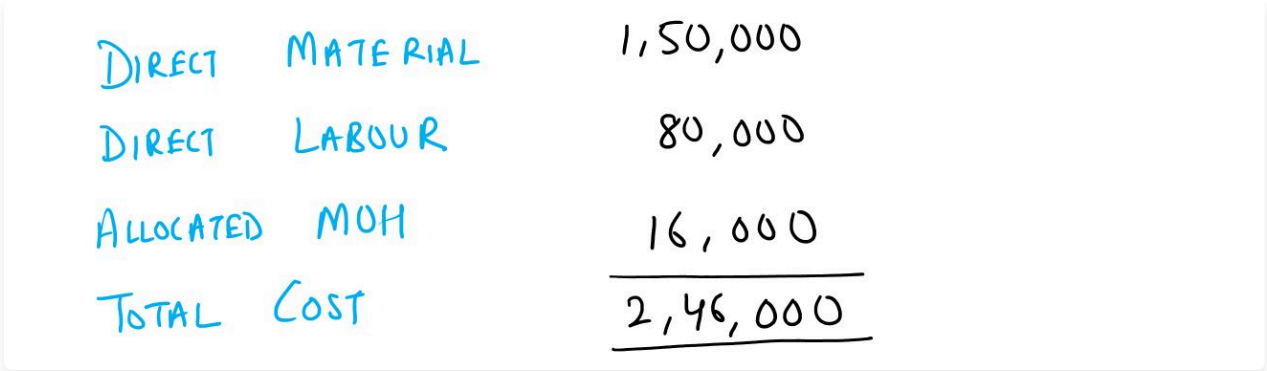
$$= \text{Rs } 40 \text{ PER MACHINE HOUR}$$

*Step 6: Allocate Indirect Costs to the Job*

$$\text{ALLOCATED OVERHEAD} = \text{BUDGETED OH RATE} \times \text{ACTUAL MACHINE HOURS}$$

$$= 400 \times 40 = \text{Rs } 16,000$$

*Step 7: Compute the Total Cost of the Job*




Thus, the total cost for Job 101 is ₹2,46,000. This calculation follows the normal costing approach using a budgeted overhead rate to allocate indirect costs.

---

## 8. T accounts

XYZ Manufacturing Co. produces custom furniture. In February, Job 202 is started. The actual manufacturing overhead for February is ₹90,000, and the actual machine hours for the month are 1,800.
Here is the data for Job 202:
Direct Materials Used: ₹2,20,000
Direct Labor Cost: ₹1,00,000
Direct Labor Hours Worked: 250 hours
Actual Machine Hours Used by Job 202: 600 hours

**SOLUTION:**

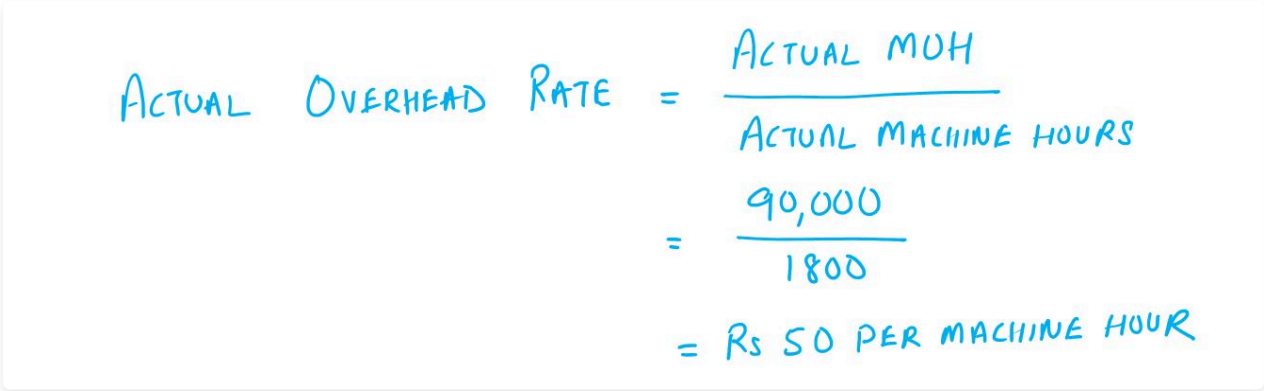
Step 1: Identify the Job That Is the Chosen Cost Object
The chosen cost object is Job 202.

Step 2: Identify the Direct Costs of the Job
Direct Materials: ₹2,20,000
Direct Labor: ₹1,00,000

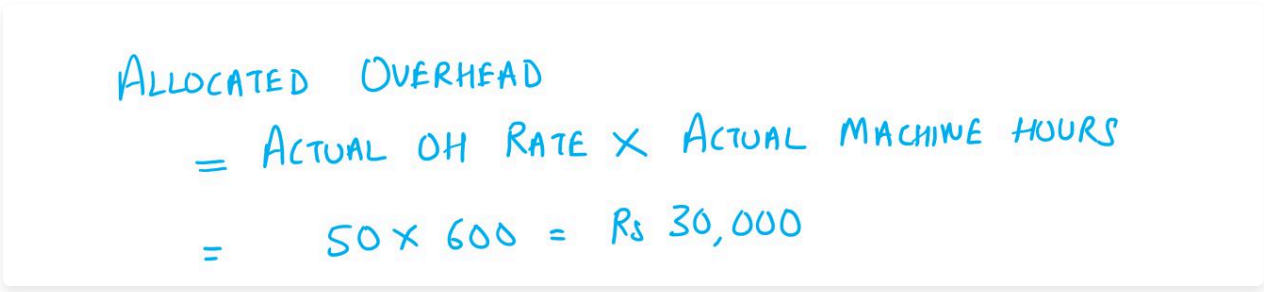
Step 3: Identify the Cost-Allocation Base for Allocating Indirect Costs to the Job
The cost-allocation base is machine hours.

Step 4: Identify the Indirect Costs Associated with the Cost-Allocation Base
Actual Manufacturing Overhead for February: ₹90,000
Actual Total Machine Hours for February: 1,800 hours

Step 5: Compute the Actual Allocation Rate




Step 6: Allocate Indirect Costs to the Job




Compute the Total Cost of the Job

| | |
|---|---|
| DIRECT MATERIAL | 2,20,000 |
| DIRECT LABOUR | 1,00,000 |
| ALLOCATED OH | 30,000 |
| TOTAL COST | 3,50,000 |

Thus, the total cost for Job 202 using actual costing is ₹3,50,000.

---

# 8. T accounts

BHEL builds steam turbines as per clients' specifications. The company has two departments: Fabrication and Assembly.

The Fabrication Department designs and cuts the major components of the turbine and is highly automated. The Assembly Department assembles and installs the components and this department is highly labor intensive. The Assembly Department begins work on the turbines as soon as the components are available from the Fabrication Department.

In its first month of operations, BHEL obtained contracts for three turbines:
Job 1: Mini Turbine
Job 2: Small Turbine
Job 3: Large Turbine

BHEL bills its customers on a cost-plus basis, with profit set equal to 25% of costs. The company uses a job order costing system based on normal costs.

Overhead is applied in Fabrication department at a predetermined rate of Rs 100 per machine hour (MH).
In the Assembly Department, overhead is applied at a predetermined rate of Rs 10 per direct labor hour (DLH).

The following transactions occurred in the given month.

Direct material was purchased on account: Rs 80,000.
Direct material was issued to the Fabrication Department for use in the three jobs:
Job 1 = Rs 8,000
Job 2 = Rs 14,000
Job 3 = Rs 45,000.
Direct material was issued to the Assembly Department:
Job 1 = Rs 500
Job 2 = Rs 1,200
Job 3 = Rs 6,600.

Time sheets and payroll summaries indicated that the following direct labor costs were incurred:

| | Fabrication Department | Assembly Department |
|---|---|---|
| Job 1 | 1,000 | 2,400 |
| Job 2 | 3,000 | 3,500 |
| Job 3 | 5,000 | 9,500 |

The following indirect costs were incurred in each department. The labor and utilities/fuel costs were accrued at the time of the journal entry.

| | Fabrication Department | Assembly Department |
|---|---|---|
| Labour | 4,200 | 4,500 |
| Utilities/Fuel | 5,900 | 2,300 |
| Depreciation | 10,3003 | 3,600 |

Overhead was applied based on the predetermined rates in effect in each department. The Fabrication Department had 200 MHs (20 MHs on Job 1, 35 MHs on Job 2, and 145 MHs on Job 3), and the Assembly Department worked 950 DLHs (40 DLHs on Job 1, 110 DLHs on Job 2, and 800 DLHs on Job 3) for the month.

Job 1 was completed and sold for cash in the amount of the cost-plus contract. At month-end, Jobs 2 and 3 were only partially complete.

Any underapplied or overapplied overhead at month-end is considered immaterial and is assigned to Cost of Goods Sold.

(i) Record the journal entries for all transactions.

(ii) As of the end of the month, determine the total cost assigned to Jobs 2 and Job 3.

**SOLUTION:**

| | | |
|---|---|---|
| RAW MATERIALS INVENTORY A/C Dr | 80,000 | |
| To ACCOUNTS PAYABLE A/C | | 80,000 |

To record purchase of direct material

| | | |
|---|---|---|
| WIP INVENTORY (FABRICATION) - Job 1 A/C Dr | 8,000 | |
| WIP INVENTORY (FABRICATION) - Job 2 A/C Dr | 14,000 | |
| WIP INVENTORY (FABRICATION) - Job 3 A/C Dr | 45,000 | |
| To RAW MATERIALS INVENTORY A/C | | 67,000 |

To record requisition and issuance of direct material to Fabrication Department

| | | |
|---|---|---|
| WIP INVENTORY (ASSEMBLY) - Job 1 A/C Dr | 500 | |
| WIP INVENTORY (ASSEMBLY) - Job 2 A/C Dr | 1,200 | |
| WIP INVENTORY (ASSEMBLY) - Job 3 A/C Dr | 6,600 | |
| To RAW MATERIALS INVENTORY A/C | | 8,300 |

To record requisition and issuance of direct material to Assembly Department

| | | |
|---|---|---|
| WIP INVENTORY (FABRICATION) - Job 1 A/C Dr | 2,000 | |
| WIP INVENTORY (FABRICATION) - Job 2 A/C Dr | 3,500 | |
| WIP INVENTORY (FABRICATION) - Job 3 A/C Dr | 14,5000 | |
| To MOH (FABRICATION) A/C | | 20,000 |

To apply overhead in Parts Fabrication Department

| | | |
|---|---|---|
| WIP INVENTORY (ASSEMBLY) - Job 1 A/C Dr | 400 | |
| WIP INVENTORY (ASSEMBLY) - Job 2 A/C Dr | 1,100 | |
| WIP INVENTORY (ASSEMBLY) - Job 3 A/C Dr | 8,000 | |
| To MOH (ASSEMBLY) A/C | | 9,500 |

To apply overhead in Assembly Department

| | | |
|---|---|---|
| FG INVENTORY A/C Dr | 14,300 | |
| To WIP INVENTORY (FABRICATION) A/C | | 11,000 |
| To WIP INVENTORY (ASSEMBLY) A/C | | 3,300 |

To record completion of Job 1

| | | |
|---|---|---|
| CASH A/C Dr | 17,875 | |
| To SALES REVENUE | | 17,875 |

To record sale of Job 1

COGS A/C DR 14,300
To FG INVENTORY A/C 14,300

To record COGS for Job 1

COGS A/C DR 1,300
To MOH (FABRICATION) A/C 400
To MOH (ASSEMBLY) A/C 900

To assign underapplied overhead to COGS

TOTAL COST (Job 1) = 8,000 + 500 + 1,000 + 2,400 + 2,000 + 400 = 14,300

REVENUE (Job 1) = 14,300 × 1·25 = 17,875

| Job Costing | Job 2 | Job 3 |
|---|---|---|
| Direct Costs | | |
| Direct Materials (Fabrication) | 14,000 | 45,000 |
| Direct Materials (Assembly) | 1,200 | 6,600 |
| Direct Labour (Fabrication) | 3,000 | 5,000 |
| Direct Labour (Assembly) | 3,500 | 9,500 |
| Indirect Costs | | |
| MOH Costs (Fabrication) | 3,500 | 14,500 |
| MOH Costs (Assembly) | 1,100 | 8,000 |
| Total Costs | 26,300 | 88,600 |

# 9. Accounting for Losses

In job order costing, production processes may experience losses due to shrinkage, defects, and spoilage.

**Shrinkage** represents unavoidable losses like evaporation, leakage, or oxidation, occurring naturally during production. Since shrinkage is inherent to the process, its costs are included in manufacturing overhead and then allocated across all jobs, reflecting standard operating conditions. Reducing shrinkage often requires substantial changes in production and may not be cost-effective.

**Defects** arise when units fail initial quality checks but can be economically reworked to meet specifications. Rework costs due to normal defects are treated as product costs and added to manufacturing overhead. In contrast, rework costs for abnormal defects (unexpected or excessive failures) are expensed as period costs, indicating inefficiencies beyond regular production levels. Normal defects are thus accounted for within product costs, while abnormal ones highlight issues needing corrective action.

**Spoilage** refers to units failing quality standards beyond practical rework. Normal spoilage is within acceptable limits, like a 2% loss in a 98% quality target, and these costs are allocated to all jobs as a routine part of production. Abnormal spoilage, resulting from issues like equipment failure or human error, exceeds set tolerance levels and is treated as a period expense. This approach highlights operational inefficiencies and prompts corrective action.

The **accounting treatment** for these losses depends on whether:
(i) they are general to all jobs or specific to one job and
(ii) whether they are normal or abnormal.

General losses (normal shrinkage, defects, spoilage) are included in manufacturing overhead and distributed across jobs. If losses are unique to one job, such as specific spoilage, they are assigned directly to that job's Work-in-Process (WIP) Inventory account, ensuring accurate cost assignment and enhancing production transparency. This structured approach allows for effective quality management, cost control, and the identification of areas for process improvement.

---

## 9. Accounting for Losses

If a normal loss is anticipated on all jobs within a job order costing system, the predetermined overhead rate should account for the net loss—defined as the cost of defective or spoiled goods minus any disposal value of those goods. This method considers such losses as inherent and unavoidable in producing good units, and thus, the estimated loss is allocated across the cost of the units produced.

WoodWorks Furniture Co. produces custom wooden tables. Due to the natural characteristics of wood, some spoilage (like warping or cracking) occurs during production, which is anticipated for all jobs.

Here's the estimated data for normal spoilage:
Estimated Overhead Costs (excluding spoilage): ₹4,50,000
Estimated Spoilage Costs: ₹25,000
Revenue from Selling Defective Tables: ₹5,000

The net spoilage cost is therefore ₹20,000, which will be included in the predetermined overhead rate calculation.

1. **Total Estimated Overhead** = Overhead Costs + Net Spoilage Cost

$$= ₹4,50,000 + ₹20,000 = ₹4,70,000$$

2. **Total Estimated Direct Labor Hours (for example)** = 5,000 hours
3. **Predetermined Overhead Rate** = Total Estimated Overhead / Total Estimated Direct Labor Hours

$$= \frac{₹4,70,000}{5,000 \text{ hours}} = ₹94 \text{ per labor hour}$$

Suppose Job #45 is to produce 30 custom tables. During production, 2 tables spoil due to natural wood defects. Each table costs ₹2,000 in production, but defective tables can be sold at ₹800 each.

| Item | Quantity | Cost per Unit (₹) | Total (₹) |
|---|---|---|---|
| Direct Materials (Tables) | 30 | 2,000 | 60,000 |
| Revenue from Spoilage | 2 | 800 | -1,600 |
| Net Spoilage Cost | | | 58,400 |

#### Journal Entries

Record Direct Material Costs in Work-in-Process (WIP) Inventory:
Work-in-Process Inventory: Debit ₹60,000
Materials Inventory: Credit ₹60,000

Record Revenue from Spoiled Tables:
Cash or Accounts Receivable: Debit ₹1,600
Manufacturing Overhead Control: Credit ₹1,600

Allocate Manufacturing Overhead to Job #45 (including normal spoilage):
Work-in-Process Inventory: Debit ₹58,400 (allocated spoilage cost as part of overhead)
Manufacturing Overhead Control: Credit ₹58,400

Transfer Completed Job #45 to Finished Goods:
Finished Goods Inventory: Debit ₹60,000

Work-in-Process Inventory: Credit ₹60,000

---

## 9. Accounting for Losses

When a loss or defect is unique to a particular job and not anticipated in regular production, it should not be included in the predetermined overhead rate. Instead, the cost associated with such defects is directly attached to that job, adjusting its overall cost.

Custom Artisans Co. received a special order from Design Studio Ltd. for 200 hand-crafted ceramic bowls under Job #102. Each bowl costs ₹300 to produce. During production, an error occurred where the kiln overheated, causing 10 bowls to crack. These defective bowls were determined to have no resale value, thus adding a specific loss to Job #102.

Since this loss is specific to Job #102, we need to adjust its total cost by incorporating the defect costs.

Direct Cost of Defective Bowls:
Total defective units: 10
Cost per bowl: ₹300
Total defect cost: 10 * ₹300 = ₹3,000

Journal Entry to reflect the cost of defects
Work-in-Process Inventory—Job #102: Debit ₹3,000

This entry increases the cost of Job #102 by ₹3,000 due to the specific defect.

---

## 9. Accounting for Losses

Abnormal Spoilage refers to spoilage that is not expected under efficient operating conditions, meaning it arises from unforeseen issues such as equipment malfunction or operator errors. Since abnormal spoilage is avoidable, it is generally treated as a separate cost and written off in the accounting period it occurs, unlike normal spoilage, which is considered a regular part of production costs.

Consider Glassworks Ltd., a company producing custom glass panels for architectural projects. For Job #75, which involved producing 100 glass panels, a malfunction in the kiln led to 5 panels cracking. Each glass panel has a production cost of ₹1,500, totaling ₹7,500 for the damaged units. As these panels represent abnormal spoilage, their cost is not absorbed into production costs but instead recorded separately to highlight the loss.

Journal Entry to Record Abnormal Spoilage
The cost of the spoiled units is recorded as a loss for the period:
Loss from Abnormal Spoilage: Debit ₹7,500
Work-in-Process Inventory (Job #75): Credit ₹7,500

This journal entry records the cost of abnormal spoilage separately, ensuring it does not inflate the cost of remaining good units in Job #75. By isolating this cost, Glassworks Ltd. emphasizes inefficiencies and maintains accurate records for assessing production performance. This approach ensures only the cost of successfully produced units is included in the predetermined application rate, keeping pricing fair and reflective of efficient operations.

---

# 10. Batch Costing

Batch costing is a costing method used when similar products are produced together as a group or batch rather than individually.

It's a form of job costing where each batch is treated as a single job, and all costs related to producing the entire batch are tracked collectively.

Each batch, consisting of identical items, is considered one cost unit and is assigned a specific batch number. This way, the entire batch's costs are calculated together, rather than calculating costs for each item individually.

Materials, labor, and overheads are recorded batchwise, meaning each batch's production costs are tracked and collected separately from other batches. Each batch goes through the same manufacturing process, so it's efficient to gather all costs related to it collectively.

*Unit Cost Calculation*
To find the cost per unit within a batch, the total cost of the batch is divided by the number of units produced in that batch. This helps in determining the unit cost without calculating individual costs for each item.

Batch costing is especially useful in industries where identical items are produced, such as in the manufacturing of machine parts or consumer goods, where individual cost tracking per unit would be impractical.

---

# 10. Batch Costing

A company produces metal bolts in batches. Each batch consists of 500 bolts. The following costs are incurred for one batch:

Direct Materials: ₹750
Direct Labor: ₹400
Factory Overheads: ₹350
Calculate the total cost for producing one batch and determine the cost per bolt.

**SOLUTION:**

*Step 1: Calculate Total Batch Cost*
Add up all costs related to producing the batch.

Total Batch Cost = Direct Materials + Direct Labor + Factory Overheads
= 750 + 400 + 350 = 1500
So, the total cost to produce the batch of 500 bolts is ₹1,500.

*Step 2: Determine Cost Per Unit (Per Bolt)*
Now, calculate the cost per bolt by dividing the total batch cost by the number of bolts in the batch.

Cost per Bolt = Total Batch Cost / Number of Bolts
= 1500/500
= 3

Total Cost of the Batch: ₹1,500
Cost per Bolt: ₹3
Thus, each bolt in this batch costs ₹3 to produce.

---

# 10. Batch Costing

A company manufactures small electronic components in batches. Each batch consists of 1,000 components. For a recent batch, the following costs were incurred:

Direct Materials:
Microchips: ₹5,000
Wiring: ₹1,500
Plastic Casings: ₹2,000

Direct Labor:
Assembly Workers (10 hours at ₹150 per hour): ₹1,500
Quality Control (5 hours at ₹200 per hour): ₹1,000

Factory Overheads:
Fixed Overheads: ₹1,200
Variable Overheads: ₹800
Additionally, there was a batch-level cost for testing equipment setup of ₹500.

Calculate the total cost of producing the batch, and determine the cost per component.

**SOLUTION:**

*Step 1: Calculate Total Direct Material Cost*
Sum all material costs involved in producing the batch.

Total Direct Materials = Microchips + Wiring + Plastic Casings
= 5000 + 1500 + 2000 = 8500
So, the total direct materials cost is ₹8,500.

*Step 2: Calculate Total Direct Labor Cost*
Sum all labor costs involved in producing the batch.

Total Direct Labor = (Assembly Workers) + (Quality Control)
= 1500 + 1000 = 2500
So, the total direct labor cost is ₹2,500.

*Step 3: Calculate Total Factory Overheads*
Sum both fixed and variable overheads.

Total Factory Overheads
= Fixed Overheads + Variable Overheads
= 1200 + 800 = 2000
So, the total factory overheads are ₹2,000.

*Step 4: Calculate Total Batch-Level Costs*
Include any additional costs incurred specifically for this batch, such as the testing equipment setup.

Total Batch-Level Costs = Testing Equipment Setup
= 500
So, the total batch-level cost is ₹500.

*Step 5: Calculate Total Cost of the Batch*
Add up all costs to find the total cost for producing the batch.

Total Batch Cost
= Total Direct Materials + Total Direct Labor + Total Factory Overheads + Total Batch-Level Costs
= 8500 + 2500 + 2000 + 500
= 13500
The total cost to produce the batch of 1,000 components is ₹13,500.

| Particulars | Amount (₹) |
|---|---|
| **Direct Materials** | |
| - Microchips | 5,000 |
| - Wiring | 1,500 |
| - Plastic Casings | 2,000 |
| **Total Direct Materials** | 8,500 |
| **Direct Labor** | |
| - Assembly Workers (10 hours at ₹150/hour) | 1,500 |
| - Quality Control (5 hours at ₹200/hour) | 1,000 |
| **Total Direct Labor** | 2,500 |
| **Factory Overheads** | |
| - Fixed Overheads | 1,200 |
| - Variable Overheads | 800 |
| **Total Factory Overheads** | 2,000 |
| **Batch-Level Cost** | |
| - Testing Equipment Setup | 500 |
| **Total Batch Cost** | 13,500 |

*Step 6: Determine Cost Per Unit (Per Component)*
Now, calculate the cost per component by dividing the total batch cost by the number of components.

Cost per Component = Total Batch Cost / Number of Components
= 13500/1000
= 13.5

Total Cost of the Batch: ₹13,500
Cost per Component: ₹13.5
Thus, each component in this batch costs ₹13.5 to produce.

---

# 11. Contract Costing

Contract costing, also known as terminal costing, is a method of costing used for large, specific projects where each contract is treated as its own unit of cost. It's commonly used in industries like construction, civil engineering, and other large-scale projects where each contract has unique requirements and a separate cost structure.

**Key Features of Contract Costing:**

- *Separate Cost Unit for Each Contract*: Each contract is handled as an individual cost unit, with costs recorded specifically for each one. This allows for precise tracking of expenses and profitability.
- *Contract Ledger*: Since most companies don't take on many contracts simultaneously, they can maintain a separate ledger for each contract. This ledger is a part of the company's main financial books, simplifying financial management.
- *Recording Costs and Revenue*: All direct and indirect costs related to the contract (like materials, labor, and specific overheads) are debited to the contract account. When the contract is completed, the contract price is credited to this account. The remaining balance shows the profit or loss from that contract, which is then transferred to the company's profit and loss account.
- *Incomplete Contracts*: If a contract is not completed by the end of the accounting period, a portion of the total profit (earned so far) may be transferred to the profit and loss account based on the progress made.

**Differences Between Job Costing and Contract Costing:**

*Cost Allocation:*

- Job Costing: Costs are allocated to cost centers and then to specific jobs.
- Contract Costing: Most costs are directly assigned to the contract itself, with overheads only representing a small part (like head office or central storage costs).

*Pricing Influence:*

- Job Costing: Pricing can vary based on internal policies and conditions specific to each job.
- Contract Costing: Pricing is typically determined by detailed contract clauses and agreed-upon terms.

*Cost Unit:*

- Job Costing: Each job is a cost unit.
- Contract Costing: Each contract is treated as a unique cost unit.

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# 1. Introduction

Marginal Costing and Absorption Costing are two methods used in managerial accounting to value inventory and determine the cost of goods sold.

The Marginal Costing is also called Variable Costing.

Let us understand both these methods.

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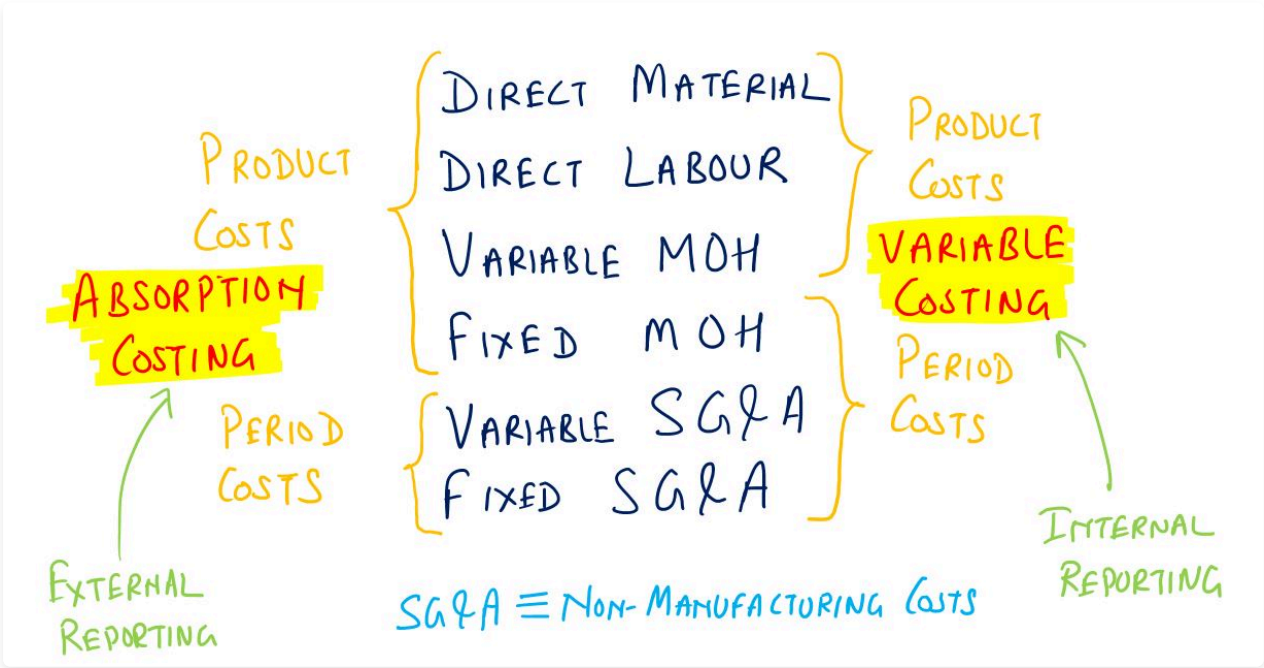
## 2. Absorption Costing and Variable Costing




**Absorption Costing**

Absorption costing method encompasses all manufacturing costs, including direct materials (DM), direct labor (DL), variable manufacturing overhead (VMOH), and fixed manufacturing overhead (FMOH), as inventoriable costs (product costs). This approach allows for the complete allocation of manufacturing expenses to the products being produced.

Under absorption costing, costs that arise in non-manufacturing areas of the organization, such as marketing, sales, and administrative functions, are classified as period costs. One component of non-manufacturing costs is SG&A (Selling, General, and Administrative expenses), which encompasses a variety of expenses not directly tied to production. The terms SG&A and non-manufacturing costs are frequently used interchangeably.

The name "absorption costing" derives from the concept that inventory “absorbs” all manufacturing costs. This means that both variable and fixed manufacturing costs are assigned to the products, which remain on the balance sheet as inventory until sold. Once sold, these costs are then transferred to the income statement as cost of goods sold (COGS). This method is often referred to as full costing, emphasizing its comprehensive approach to cost allocation.

Absorption costing is used for external financial reporting and inventory valuation, as it aligns with generally accepted accounting principles. It provides a comprehensive view of all manufacturing costs associated with products, making it essential for financial statements and tax reporting.

| Aspect | Absorption Costing | Variable Costing |
| --- | --- | --- |
| **Cost Components** | Includes Direct Materials (DM), Direct Labor (DL), Variable Manufacturing Overhead (VMOH), and Fixed Manufacturing Overhead (FMOH) | Includes only Direct Materials (DM), Direct Labor (DL), and Variable Manufacturing Overhead (VMOH) |
| **Treatment of Fixed Manufacturing Overhead** | Treated as a product cost and included in inventory until products are sold | Treated as a period cost and expensed in the period incurred |
| **Non-Manufacturing Costs (SG&A)** | Treated as period costs and expensed in the current period | Treated as period costs and expensed in the current period |
| **Cost Classification** | Full/Absorption Costing: All manufacturing costs are assigned to products | Direct/Variable Costing: Only variable manufacturing costs are assigned to products |
| **Use Cases** | Primarily used for external financial reporting and inventory valuation as it complies with GAAP | Used for internal decision-making, like pricing, budgeting, and short-term financial forecasting |

### Variable Costing

In contrast, variable costing is a cost accumulation method that includes only direct materials (DM), direct labor (DL), and variable manufacturing overhead (VMOH) as product costs. This approach recognizes that fixed manufacturing overhead (FMOH) should be treated as a period cost rather than being allocated to the products. As a result, FMOH costs are expensed in the period they are incurred.

Similar to absorption costing, variable costing also categorizes non-manufacturing costs, including SG&A, as period costs. This means that while variable manufacturing costs can be inventoried, any variable non-manufacturing costs are still treated as period costs and expensed in the current period.

Variable costing is often referred to as direct costing or marginal costing, highlighting its focus on the variable aspects of production costs. This method can be particularly useful for internal decision-making, such as pricing strategies, budgeting, and financial forecasting, as it provides a clear view of the incremental costs associated with production.

Variable costing is often used for internal decision-making, such as pricing strategies, budgeting, and performance evaluation. It helps managers analyze the impact of variable costs on profitability and make more informed short-term operational decisions.

### Summary

The absorption costing treats fixed manufacturing overhead costs (FMOH) as a product cost; variable costing treats it as a period cost. Absorption costing advocates contend that products cannot be made without the production capacity provided by fixed manufacturing overhead costs (FMOH), and, therefore, these costs "belong" to the product. Variable costing advocates contend that FMOH costs would be incurred whether any products are manufactured; thus, such costs are not caused by production and cannot be product costs.

---

# 3. Income Statements

The primary difference in cost presentation between absorption costing and variable costing lies in how expenses are classified on the income statement.

Absorption costing organizes expenses by function, categorizing them into manufacturing and non-manufacturing costs. In contrast, variable costing first classifies expenses based on their behavior, distinguishing between variable and fixed costs, and then organizes them by function. This fundamental difference affects how financial performance is analyzed under two methods.

### Variable Costing (Marginal Costing)

Under variable costing, the cost of goods sold is more accurately referred to as variable cost of goods sold (VCOGS). This terminology highlights that VCOGS includes only the variable production costs associated with the goods sold. When sales revenue is subtracted by VCOGS, the result is termed the product contribution margin. This margin reflects how much revenue is available to cover all period expenses, including fixed costs, and ultimately contribute to net income.

| Income Statement (**Variable Costing**) | | | |
|---|---|---|---|
| Sales | | | |
| Less: Variable COGS (VCOGS) | | | |
| | Begin FG inventory | | |
| | Variable Cost of Produced Goods | | |
| | Variable Cost of Goods available for Sale | | |
| | End FG inventory | | |
| | Variable COGS (VCOGS) | | |
| Product Contribution Margin | | | |
| Less: Variable SG&A | | | |
| Contribution Margin | | | |
| Less: Fixed Costs | | | |
| | Fixed manufacturing Overheads (FMOH) | | |
| | Fixed SG&A (FSG&A) | | |
| | Fixed Costs | | |
| Net Profit | | | |

Then variable non-manufacturing period expenses are deducted from the product contribution margin to determine the total contribution margin. This total represents the difference between total revenues and total variable expenses, indicating the funds available to cover all fixed expenses—both manufacturing and non-manufacturing—and generate net income. This structured approach provides a clear view of how variable costs contribute to overall profitability.

In a variable costing income statement, all variable costs are subtracted before calculating the contribution margin, while all fixed costs are deducted afterward.

For these reasons, the variable costing income statement is commonly referred to as a contribution income statement. This title emphasizes its focus on the contribution margin, which is a key metric for managers looking to understand the impact of variable costs on profitability.

### Absorption Costing

On the other hand, the absorption costing income statement presents costs grouped by function, with a clear distinction between manufacturing costs and non-manufacturing costs. In this format, the manufacturing cost of goods sold (COGS) is subtracted from sales revenue to yield gross profit.

| Income Statement (**Absorption Costing**) | | |
|---|---|---|
| Sales | | |
| Less: COGS | | |
| | Begin FG inventory | |
| | Cost of Goods Produced | |
| | Cost of Goods available for Sale | |
| | End FG inventory | |
| | COGS | |
| Gross Profit | | |
| Volume Variance | | |
| Adjusted Gross Profit | | |
| Less: SG&A | | |
| | Variable SG&A (VSG&A) | |
| | Fixed SG&A (FSG&A) | |
| | SG&A | |
| Net Profit | | |

Sometimes volume variance is subtracted/added from/to gross profit to get adjusted gross profit. A volume variance reflects the monetary impact of a difference between the budgeted capacity used to determine the predetermined FMOH rate and the actual capacity at which the company operated.

Following this, all non-manufacturing expenses (both Fixed and variable) are deducted from gross profit to calculate operating income. Notably, manufacturing costs are deducted prior to calculating gross profit, while non-manufacturing costs are accounted for afterward. This sequential approach highlights the importance of gross profit as a measure of operational efficiency. The non-manufacturing expenses are sometimes termed as SG&A.

### Comparison

The absorption costing income statement thus subtracts the total cost of goods sold, which includes both variable and fixed manufacturing costs, from sales to derive gross profit. In contrast, the variable costing income statement subtracts all variable costs, encompassing both manufacturing and non-manufacturing expenses, to arrive at the contribution margin.

Despite its utility, the absorption costing income statement has its limitations. It does not differentiate between variable costs, which increase with sales, and fixed costs, which remain unchanged within a certain relevant range. This lack of separation can obscure the underlying cost behavior and make it more challenging for managers to understand how changes in sales volume will affect profitability.

By contrast, the variable costing income statement's ability to separate variable and fixed costs equips managers with valuable insights. This separation allows for more precise estimations of how fluctuations in sales, costs, or production volume will impact overall profits. Consequently, businesses can make better strategic decisions based on this clearer understanding of cost behavior and profitability dynamics.

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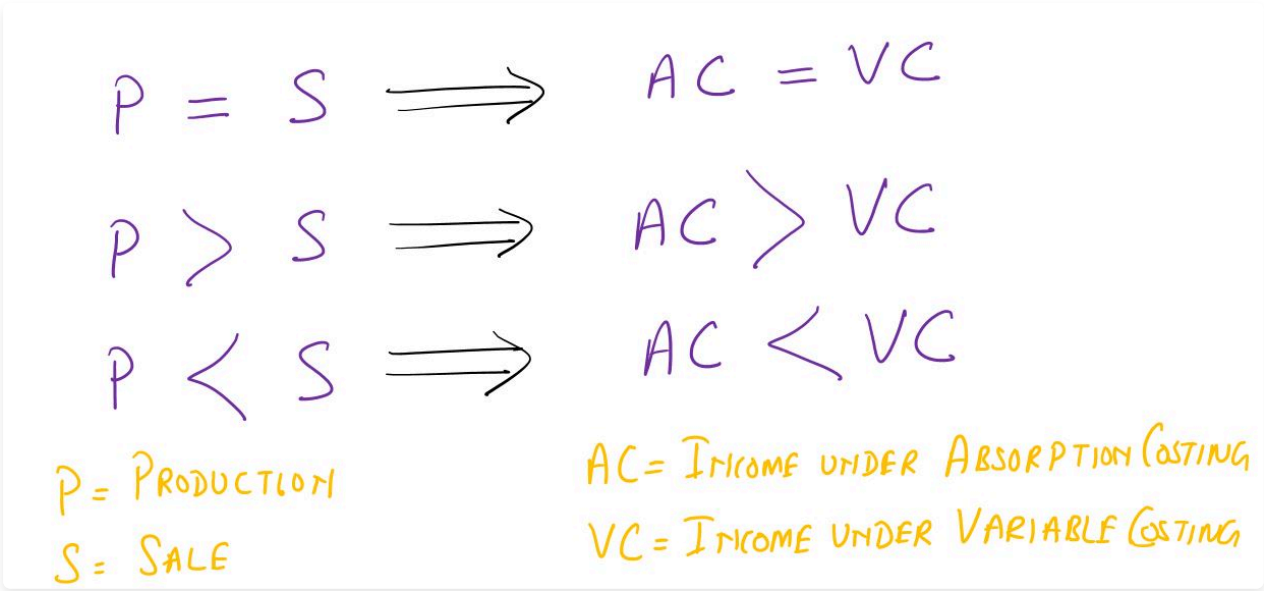
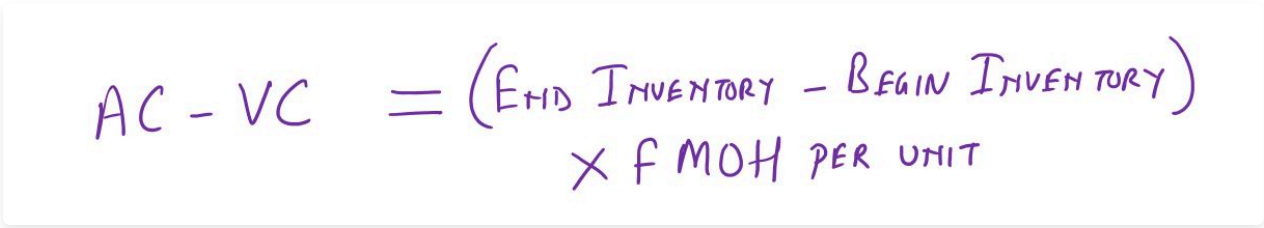
## 4. Comparing Income Statements

An analysis of the two sets of income statements (absorption costing and variable costing) reveals that the difference in reported income arises solely from the differing treatment of fixed manufacturing overhead (FMOH).




Whether income under absorption costing is greater or less than that under variable costing depends on the relationship between production and sales. If inventory increases during an accounting period, operating income reported under variable costing will be lower than that under absorption costing. Conversely, if inventory decreases, operating income under variable costing will be higher than that under absorption costing. This difference in reported operating income stems from two key factors: (a) fixed manufacturing costs being moved into inventories when inventories increase, and (b) fixed manufacturing costs being moved out of inventories when inventories decrease.

The relationships can be summarized as follows:

(i) *If production equals sales:* Absorption costing income will equal variable costing income. In this scenario, if there are no beginning or ending inventories, the cumulative total income reported under both methods will be identical.

(ii) *If production exceeds sales:* Absorption costing income will be greater than variable costing income. This occurs because some fixed manufacturing overhead costs are deferred as part of the inventory cost on the balance sheet under absorption costing, while all fixed manufacturing overhead costs are expensed as period costs under variable costing.

(iii) *If production is less than sales:* Absorption costing income will be lower than variable costing income. In this case, absorption costing expenses all current period fixed manufacturing overhead costs and releases some fixed manufacturing overhead costs from beginning inventory, where they had been deferred from a prior period.

The general rule is straightforward: When inventories increase (indicating that more units are produced than sold), absorption costing income will be higher than variable costing income. Conversely, when inventories decrease (indicating that fewer units are produced than sold), absorption costing income will be lower than variable costing income.

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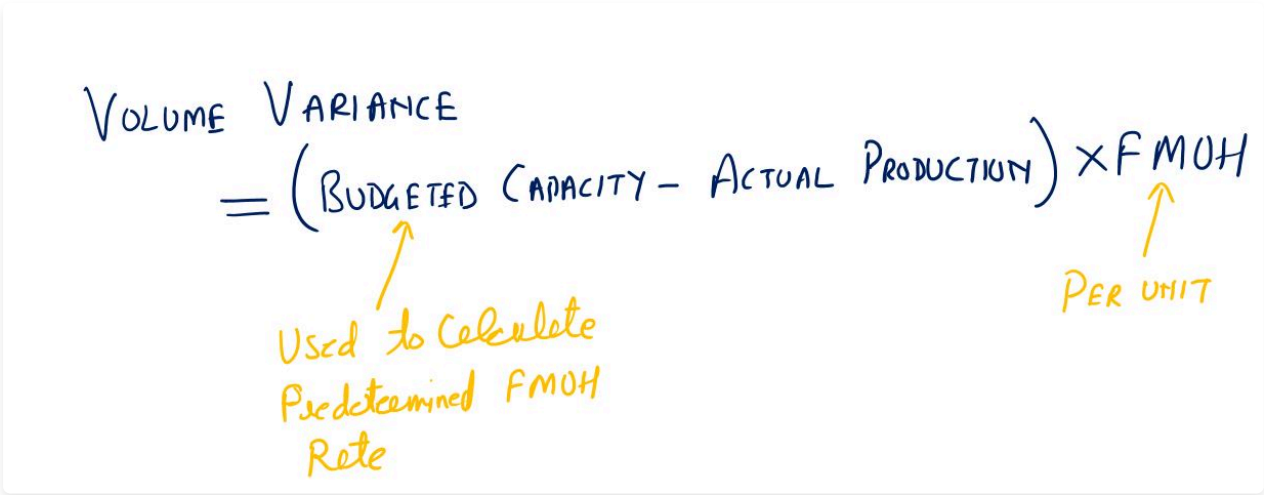
## 5. Volume Variance

A volume variance reflects the financial impact of the difference between the budgeted capacity used to calculate the predetermined fixed manufacturing overhead (FMOH) rate and the actual capacity at which the company operated.




The fixed manufacturing overhead cost rate (FMOH) is determined based on the budgeted capacity level. Whenever actual production (the quantity produced, not sold) deviates from this budgeted capacity, a production-volume variance arises. This variance is calculated by multiplying the FMOH per unit by the difference between the actual level of production and the budgeted capacity level.

If the actual production level is less than the budgeted capacity, it results in an unfavorable production-volume variance. Conversely, if the actual production level exceeds the budgeted capacity, it leads to a favorable production-volume variance.

The production-volume variance specifically relates to fixed manufacturing overhead (FMOH) and exists under absorption costing. It does not appear under variable costing, where fixed manufacturing costs are treated as an expense in the period incurred, regardless of production or sales levels.

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# 6. Throughput Costing

**Throughput costing**, also known as **super-variable costing**, is a variation of variable costing. It takes an extreme approach by considering only direct material costs as inventoriable (product) costs, while all other manufacturing costs, including direct labor and variable manufacturing overhead, are treated as period costs and expensed in the period they occur.

| Aspect | Absorption Costing | Variable Costing | Throughput Costing |
|---|---|---|---|
| **Inventoriable Costs** | DM, DL, Variable and Fixed Manufacturing Overhead | DM, DL, and Variable Manufacturing Overhead | Only Direct Materials (DM) |
| **Treatment of Other Costs** | DL, VMOH, and FMOH capitalized until sale | Fixed Manufacturing Overhead as period cost | DL, VMOH, and FMOH treated as period costs |
| **Inventory Valuation** | Highest due to full cost allocation | Moderate | Lowest due to minimal cost allocation |
| **Production Incentive** | Higher (incentivizes producing for inventory) | Moderate | Lower (discourages inventory buildup) |

In this method, only direct materials are counted as part of the product cost. This means:

- Direct labor and variable manufacturing overhead are not assigned to inventory but are instead recorded as expenses immediately.
- All fixed manufacturing overhead is also treated as a period cost, similar to variable costing.

Throughput costing results in fewer costs being capitalized as inventory on the balance sheet, compared to variable or absorption costing. As a result, it shows lower inventory values and emphasizes the true incremental cost of producing each unit, which aligns with the philosophy that direct materials are the only truly variable cost in production.

Key Advantages and Considerations are:

*Reduced Inventory Incentive*
Throughput costing minimizes the incentive to overproduce just to capitalize additional costs in inventory. Since most costs are expensed in the period incurred, there's less motivation to inflate production numbers, a concern especially present under absorption costing.

*Focus on Contribution Margin*
This method supports decision-making by focusing on the contribution of each unit sold, emphasizing direct material costs, and encouraging efficiency in materials usage rather than fixed cost absorption through high production levels.

*Lean Manufacturing Alignment*
Throughput costing aligns with lean manufacturing principles by encouraging the efficient use of resources and discouraging excess inventory.

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# 7. Limitations of Absorption Costing

Critics of absorption costing point to a phenomenon known as "illusionary" or "phantom profits."

These phantom profits occur when a company produces more inventory than it sells, resulting in temporary increases in reported profits. This can create a misleading picture of financial health. When the previously produced inventory is eventually sold, these phantom profits vanish, revealing a more accurate—but often less favorable—financial position.

In contrast, variable costing accounts for all fixed manufacturing overhead (FMOH) as an expense in the year it is incurred, providing a clearer view of the company's operating performance.

Sometimes managers choose to increase finished goods inventory when using absorption costing. When absorption costing is used, managers have the ability to boost current operating income by producing additional units for inventory. This strategy allows for a greater portion of fixed manufacturing costs to be absorbed into inventory, effectively reducing the costs that are expensed during the period. This manipulation can create an artificially inflated operating income, leading critics to argue that it is a significant downside of treating fixed manufacturing costs as inventoriable costs. This practice not only distorts the true financial picture but also incentivizes production over sales, potentially resulting in excess inventory and inefficiencies.

---

# 7. Limitations of Absorption Costing

Consider the following data regarding a firm, which produced 10,000 units of health drink as planned but sold only 8,000 units, at a price of Rs 30 per unit. There were no beginning inventories.

| COSTS DATA (in Rs) | | |
|---|---|---|
| | *Per Unit* | *Total* |
| Selling Price | 30 | |
| | | |
| Direct Material (DM) | 6 | |
| Direct Labour (DL) | 3 | |
| Variable MOH (VMOH) | 2 | |
| Fixed MOH (FMOH) | | 50,000 |
| Variable SG&A (VSG&A) | 2.5 | |
| Fixed SG&A (FSG&A) | | 25,000 |

| PRODUCTION AND SALES DATA (in Units) | |
|---|---|
| | *December 2024* |
| Begin FG Inventory | 0 |
| Production | 10,000 |
| Sales | 8,000 |
| | |
| | |
| Production Capacity | 10,000 |

(a) What is product cost per unit under absorption costing and variable (marginal) costing.
(b) Prepare an income statement using absorption costing.
(c) Prepare an income statement using variable costing (marginal costing).
(d) Reconcile between operating income under absorption versus variable costing.

SOLUTION:

(a) What is product cost per unit under absorption costing and variable (marginal) costing.

| Costs Per Unit | | |
|---|---|---|
| | Absorption Costing | Marginal Costing |
| DM | 6 | 6 |
| DL | 3 | 3 |
| VMOH | 2 | 2 |
| FMOH | 5 | – |
| UNIT COST | 16 | 11 |

50,000 / 10,000

| Inventory Position | |
|---|---|
| | December 2024 |
| Begin FG Inventory | 0 |
| Production | 10,000 |
| Sales | 8,000 |
| End FG Inventory | 2,000 |

(b) Prepare an income statement using absorption costing.

| Income Statement (**Absorption Costing**) for month ending Dec 2024 | | | |
|---|---|---|---|
| Sales (8000 x 30) | | | 2,40,000 |
| Less: COGS | | | |
| | Begin FG inventory | 0 | |
| | Cost of Goods Produced | 1,60,000 | |
| | Cost of Goods available for Sale | 1,60,000 | |
| | End FG inventory | (32,000) | |
| | COGS | | (1,28,000) |
| Gross Profit | | | 1,12,000 |
| Volume Variance | | | - |
| Adjusted Gross Profit | | | 1,12,000 |
| Less: SG&A | | | |
| | Variable SG&A (VSG&A) | (20,000) | |
| | Fixed SG&A (FSG&A) | (25,000) | |
| | SG&A | | (45,000) |
| Net Profit | | | 67,000 |

10,000 x 16

2,000 x 16

8,000 x 2.5

(c) Prepare an income statement using variable costing (marginal costing).

| Income Statement (**Marginal Costing**) for month ending Dec 2024 | | | |
|---|---|---|---|
| Sales (8000 x 30) | | | 2,40,000 |
| Less: Variable COGS | | | |
| | Begin FG inventory | 0 | |
| | Variable Cost of Produced Goods | 1,10,000 | |
| | Variable Cost of Goods available for Sale | 1,10,000 | |
| | End FG inventory | (22,000) | |
| | variable COGS | | (88,000) |
| Less: Variable SG&A | | | (20,000) |
| Contribution Margin | | | 1,32,000 |
| Less: Fixed Costs | | | |
| | Fixed manufacturing Overheads (FMOH) | 50,000 | |
| | Fixed SG&A (FSG&A) | 25,000 | |
| | Fixed Costs | | (75,000) |
| Net Profit | | | 57,000 |

10,000 x 11

2,000 x 11

8,000 x 2.5

(d) Reconcile between operating income under absorption versus variable costing.

ABSORPTION COSTING PROFIT
− VARIABLE COSTING PROFT
= 67,000 − 57,000
= 10,000

(END INVENTORY − BEGIN INVENTORY)
× F MOH
= (2000 − 0) × 5
= 10,000

BOTH ARE SAME

# 7. Limitations of Absorption Costing

Consider the following data regarding a firm, which produced 1,000 units of a product and sold all products in same month (Feb 2025). There were no beginning inventories.

| **COSTS DATA (in Rs)** | | |
|---|---|---|
| | *Per Unit* | *Total* |
| Selling Price | 200 | |
| | | |
| Direct Material (DM) | 20 | |
| Direct Labour (DL) | 20 | |
| Variable MOH (VMOH) | 20 | |
| Fixed MOH (FMOH) | | 40,000 |

| **PRODUCTION AND SALES DATA (in Units)** | |
|---|---|
| | *Feb 2025* |
| Begin FG Inventory | 0 |
| Production | 1,000 |
| Sales | 1,000 |
| | |
| | |
| Production Capacity | 1,000 |

(a) What is product cost per unit under absorption costing and marginal costing.
(b) Prepare an income statement using absorption costing.
(c) Prepare an income statement using marginal costing.
(d) Prepare both income statements again, if the production came down to 900 units and sales came down to 600 units.
(e) Reconcile between operating income (net profit) under absorption versus marginal costing.

**SOLUTION:**

(a) What is product cost per unit under absorption costing and marginal costing.

| **Costs Per Unit** | | |
|---|---|---|
| | Absorption Costing | Marginal Costing |
| DM | 20 | 20 |
| DL | 20 | 20 |
| VMOH | 20 | 20 |
| FMOH | 40 | — |
| UNIT COST | 100 | 60 |

40,000 / 10,000

| **Inventory Position** | |
|---|---|
| | Feb 2025 |
| Begin FG Inventory | 0 |
| Production | 1,000 |
| Sales | 1,000 |
| End FG Inventory | 0 |

(b) Prepare an income statement using absorption costing.

| Income Statement (**Absorption Costing**) for month ending Feb 2025 | | | |
|---|---|---|---|
| Sales (1000 X 200) | | | 2,00,000 |
| Less: COGS | | | |
| | Begin FG inventory | 0 | |
| | Cost of Goods Produced | 1,00,000 | |
| | Cost of Goods available for Sale | 1,00,000 | |
| | End FG inventory | 0 | |
| | COGS | | (1,00,000) |
| Gross Profit | | | 1,00,000 |
| Volume Variance | | | – |
| Adjusted Gross Profit | | | 1,00,000 |
| Less: SG&A | | | |
| | Variable SG&A (VSG&A) | | |
| | Fixed SG&A (FSG&A) | | |
| | SG&A | | 0 |
| Net Profit | | | 1,00,000 |

1000 X 100

(c) Prepare an income statement using marginal costing.

| Income Statement (**Marginal Costing**) for month ending Feb 2025 | | | |
|---|---|---|---|
| Sales (1000 X 200) | | | 2,00,000 |
| Less: Variable COGS | | | |
| | Begin FG inventory | 0 | |
| | Variable Cost of Produced Goods | 60,000 | |
| | Variable Cost of Goods available for Sale | 60,000 | |
| | End FG inventory | 0 | |
| | variable COGS | | (60,000) |
| Less: Variable SG&A | | | 1,40,000 |
| Contribution Margin | | | |
| Less: Fixed Costs | | | |
| | Fixed manufacturing Overheads (FMOH) | 40,000 | |
| | Fixed SG&A (FSG&A) | – | |
| | Fixed Costs | | (40,000) |
| Net Profit | | | 1,00,000 |

1000 X 60

(d) Prepare both income statements again, if the production came down to 900 units and sales came down to 600 units.

| **Inventory Position** | |
|---|---|
| | Feb 2025 |
| Begin FG Inventory | 0 |
| Production | 900 |
| Sales | 600 |
| End FG Inventory | 300 |

| Income Statement (**Absorption Costing**) for month ending Feb 2025 | | | |
|---|---|---|---|
| Sales (600×200) | | | 1,20,000 |
| Less: COGS | | | |
| | Begin FG inventory | 0 | |
| | Cost of Goods Produced | 90,000 | |
| | Cost of Goods available for Sale | 90,000 | |
| | End FG inventory | (30,000) | |
| | COGS | | (60,000) |
| Gross Profit | | | 60,000 |
| Volume Variance (UNDER ABSORBED) (-ve) | | | (4,000) |
| Adjusted Gross Profit | | | 56,000 |
| Less: SG&A | | | |
| | Variable SG&A (VSG&A) | - | |
| | Fixed SG&A (FSG&A) | - | |
| | SG&A | - | |
| Net Profit | | | 56,000 |

900×100

300×100

(1000 − 900) × 40

(CAPACITY − PRODUCTION) × FMOH

| Income Statement (**Marginal Costing**) for month ending Feb 2025 | | | |
|---|---|---|---|
| Sales (600×200) | | | 1,20,000 |
| Less: Variable COGS | | | |
| | Begin FG inventory | 0 | |
| | Variable Cost of Produced Goods | 54,000 | |
| | Variable Cost of Goods available for Sale | 54,000 | |
| | End FG inventory | (18,000) | |
| | variable COGS | | (36,000) |
| Less: Variable SG&A | | | 84,000 |
| Contribution Margin | | | |
| Less: Fixed Costs | | | |
| | Fixed manufacturing Overheads (FMOH) | 40,000 | |
| | Fixed SG&A (FSG&A) | | |
| | Fixed Costs | | (40,000) |
| Net Profit | | | 44,000 |

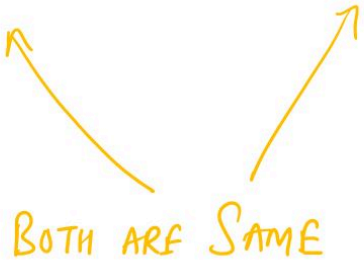
900×60

300×60

(e) Reconcile between operating income (net profit) under absorption versus marginal costing.

Absorption Costing Profit
− Variable Costing Profit
= 56,000 − 44,000
= 12,000

(End Inventory − Begin Inventory)
× F MOH
= (300 − 0) × 40
= 12,000



Both are Same

# 7. Limitations of Absorption Costing

Based on below data, prepare the income statements for year 2009 using both absorption costing and variable costing approaches. Also reconcile the profit for 2009 between absorption and variable costing.

| COSTS DATA (in Rs) | | |
|---|---|---|
| | *Per Unit* | *Total* |
| Selling Price | 10,000 | |
| | | |
| Direct Material (DM) | 1,100 | |
| Direct Labour (DL) | 400 | |
| Variable MOH (VMOH) | 500 | |
| Fixed MOH (FMOH) | | 1,08,00,000 |
| Variable SG&A (VSG&A) | 1850 | |
| Fixed SG&A (FSG&A) | | 1,38,00,000 |

| PRODUCTION AND SALES DATA (in Units) | | | |
|---|---|---|---|
| | *2009* | *2010* | *2011* |
| Begin FG Inventory | 0 | | |
| Production | 8,000 | 5,000 | 10,000 |
| Sales | 6,000 | 6,500 | 7,500 |
| | | | |
| Production Capacity *(Budgeted)* | 8,000 | | |

SOLUTION:

| Costs Per Unit | | |
|---|---|---|
| | Absorption Costing | Marginal Costing |
| DM | 1100 | 1100 |
| DL | 400 | 400 |
| VMOH | 500 | 500 |
| FMOH | 1350 | – |
| UNIT COST | 3350 | 2000 |

1,08,00,000 / 8,000

| Income Statement (**Absorption Costing**) | | | 2009 |
|---|---|---|---|
| Sales | 6000 × 10,000 | | 6,00,00,000 |
| Less: COGS | | | |
| | Begin FG inventory | 0 | |
| | Cost of Goods Produced | 2,68,00,000 ← 8000 × 3350 | |
| | Cost of Goods available for Sale | 2,68,00,000 | |
| | End FG inventory | (67,00,000) ← 2000 × 3350 | |
| | COGS | | (2,01,00,000) |
| Gross Profit | | | 3,99,00,000 |
| Volume Variance | | | – |
| Adjusted Gross Profit | | | 3,99,00,000 |
| Less: SG&A | | | |
| | Variable SG&A (VSG&A) | 1,11,00,000 ← 6000 × 1850 | |
| | Fixed SG&A (FSG&A) | 1,38,00,000 | |
| | SG&A | | (2,49,00,000) |
| Net Profit | | | 1,50,00,000 |

| Income Statement (**Marginal Costing**) | | 2009 | |
|---|---|---|---|
| Sales | (6000×10,000) | | 6,00,00,000 |
| Less: Variable COGS | | | |
| | Begin FG inventory | 0 | 8000×2000 |
| | Variable Cost of Produced Goods | 1,60,00,000 | |
| | Variable Cost of Goods available for Sale | 1,60,00,000 | 2000×2000 |
| | End FG inventory | (40,00,000) | |
| | Variable COGS | | (1,20,00,000) |
| Less: Variable SG&A | | | (1,11,00,000) 6000×1850 |
| Contribution Margin | | | 3,69,00,000 |
| Less: Fixed Costs | | | |
| | Fixed manufacturing Overheads (FMOH) | 1,08,00,000 | |
| | Fixed SG&A (FSG&A) | 1,38,00,000 | |
| | Fixed Costs | | (2,46,00,000) |
| Net Profit | | | 1,23,00,000 |

ABSORPTION COSTING PROFIT
− VARIABLE COSTING PROFT
= 1,50,00,000 − 1,23,00,000
= 27,00,000

(END INVENTORY − BEGIN INVENTORY)
× FMOH
= (2000 − 0) × 1350
= 27,00,000

YEAR 2009

BOTH ARE SAME

# 7. Limitations of Absorption Costing

Based on below data, prepare the income statements for years 2009, 2010 and 2011 using both absorption costing and variable costing approaches. Also reconcile the profit for 2010 and 2011 years between absorption and variable costing.

| **COSTS DATA (in Rs)** | | |
|---|---|---|
| | *Per Unit* | *Total* |
| Selling Price | 10,000 | |
| | | |
| Direct Material (DM) | 1,100 | |
| Direct Labour (DL) | 400 | |
| Variable MOH (VMOH) | 500 | |
| Fixed MOH (FMOH) | | 1,08,00,000 |
| Variable SG&A (VSG&A) | 1850 | |
| Fixed SG&A (FSG&A) | | 1,38,00,000 |

| **PRODUCTION AND SALES DATA (in Units)** | | | |
|---|---|---|---|
| | *2009* | *2010* | *2011* |
| Begin FG Inventory | 0 | | |
| Production | 8,000 | 5,000 | 10,000 |
| Sales | 6,000 | 6,500 | 7,500 |
| | | | |
| Production Capacity *(Budgeted)* | 8,000 | | |

SOLUTION:

| **Costs Per Unit** | | |
|---|---|---|
| | Absorption Costing | Marginal Costing |
| DM | 1100 | 1100 |
| DL | 400 | 400 |
| VMOH | 500 | 500 |
| FMOH | 1350 | — |
| UNIT COST | 3350 | 2000 |

1,08,00,000 / 8,000

| **Inventory Position** | | | |
|---|---|---|---|
| | *2009* | *2010* | *2011* |
| Begin FG Inventory | 0 | 2000 | 500 |
| Production | 8000 | 5000 | 10 000 |
| Sales | 6000 | 6500 | 7500 |
| End FG Inventory | 2000 | 500 | 3000 |

Income Statement (**Absorption Costing**)

| | 2009 | 2010 | 2011 |
|---|---|---|---|
| Sales | 6,00,00,000 | 6,50,00,000 | 7,50,00,000 |
| Less: COGS | | | |
| Begin FG inventory | 0 | 57,00,000 | 16,75,000 |
| Cost of Goods Produced | 2,68,00,000 | 1,67,50,000 | 3,35,00,000 |
| Cost of Goods available for Sale | 2,68,00,000 | 2,34,50,000 | 3,51,75,000 |
| End FG inventory | (67,00,000) | (16,75,000) | (1,00,50,000) |
| COGS | (2,01,00,000) | (2,17,75,000) | (2,51,25,000) |
| Gross Profit | 3,99,00,000 | 4,32,25,000 ① | 4,98,75,000 |
| Volume Variance | — | (40,50,000) | 27,00,000 ② |
| Adjusted Gross Profit | 3,99,00,000 | 3,91,75,000 | 5,25,75,000 |
| Less: SG&A | | | |
| Variable SG&A (VSG&A) | 1,11,00,000 | 1,20,25,000 | 1,38,75,000 |
| Fixed SG&A (FSG&A) | 1,38,00,000 | 1,38,00,000 | 1,38,50,000 |
| SG&A | (2,49,00,000) | (2,58,25,000) | (2,76,75,000) |
| Net Profit | 1,50,00,000 | 1,33,50,000 | 2,49,00,000 |

VOLUME VARIANCE = (CAPACITY − PRODUCTION) × FMOH

① (8000 − 5000) × 1350 ⇒ UNDER ABSORBED (Unfavourable)

② (8000 − 10000) × 1350 ⇒ OVER ABSORBED (Favourable)

Income Statement (**Marginal Costing**)

| | | 2009 | 2010 | 2011 |
|---|---|---|---|---|
| Sales | | 6,00,00,000 | 6,50,00,000 | 7,50,00,000 |
| Less: Variable COGS | | | | |
| | Begin FG inventory | 0 | 40,00,000 | 10,00,000 |
| | Variable Cost of Produced Goods | 1,60,00,000 | 1,00,00,000 | 2,00,00,000 |
| | Variable Cost of Goods available for Sale | 1,60,00,000 | 1,40,00,000 | 2,10,00,000 |
| | End FG inventory | (40,00,000) | (10,00,000) | (60,00,000) |
| | Variable COGS | (1,20,00,000) | (1,30,00,000) | (1,50,00,000) |
| Less: Variable SG&A | | (1,11,00,000) | (1,20,25,000) | (1,38,75,000) |
| Contribution Margin | | 3,69,00,000 | 3,99,75,000 | 4,61,25,000 |
| Less: Fixed Costs | | | | |
| | Fixed manufacturing Overheads (FMOH) | 1,08,00,000 | 1,08,00,000 | 1,08,00,000 |
| | Fixed SG&A (FSG&A) | 1,38,00,000 | 1,38,00,000 | 1,38,00,000 |
| | Fixed Costs | (2,46,00,000) | (2,46,00,000) | (2,46,00,000) |
| Net Profit | | 1,23,00,000 | 1,53,75,000 | 2,15,25,000 |

ABSORPTION COSTING PROFIT
− VARIABLE COSTING PROFT
= 1,33,50,000 − 1,53,75,000
= − 20, 25, 000

(END INVENTORY − BEGIN INVENTORY)
× F MOH
= (500 − 2000) × 1350
= − 20, 25, 000

YEAR 2010

BOTH ARE SAME

ABSORPTION COSTING PROFIT
− VARIABLE COSTING PROFT
= 2,49,00,000 − 2,15,25,000
= 33,75,000

(END INVENTORY − BEGIN INVENTORY)
× F MOH
= (3000 − 500) × 1350
= 33,75,000

YEAR 2011

BOTH ARE SAME

# 7. Limitations of Absorption Costing

Based on below data, prepare the income statements for years 2019, 2020 and 2021 on both absorption costing and variable costing basis. Also reconcile income for 2020 and 2021 between absorption and variable costing.

| **COSTS DATA (in Rs)** | | |
|---|---|---|
| | *Per Unit* | *Total* |
| Selling Price | 6 | |
| | | |
| Direct Material (DM) | 2.04 | |
| Direct Labour (DL) | 1.50 | |
| Variable MOH (VMOH) | 0.18 | |
| Fixed MOH (FMOH) | | 1,62,000 |
| Variable SG&A (VSG&A) | 0.24 | |
| Fixed SG&A (FSG&A) | | 23,400 |

| **PRODUCTION AND SALES DATA (in Units)** | | | |
|---|---|---|---|
| | *2019* | *2020* | *2021* |
| Begin FG Inventory | 0 | | |
| Production | 3,00,000 | 2,90,000 | 3,10,000 |
| Sales | 3,00,000 | 2,70,000 | 3,30,000 |
| | | | |
| Production Capacity | 3,00,000 | | |

SOLUTION:

| **Costs Per Unit** | | |
|---|---|---|
| | Absorption Costing | Marginal Costing |
| DM | 2.04 | 2.04 |
| DL | 1.50 | 1.50 |
| VMOH | 0.18 | 0.18 |
| FMOH | 0.54 | – |
| UNIT COST | 4.26 | 3.72 |

1,62,000 / 3,00,000

| **Inventory Position** | | | |
|---|---|---|---|
| | *2019* | *2020* | *2021* |
| Begin FG Inventory | 0 | 0 | 20,000 |
| Production | 3,00,000 | 2,90,000 | 3,10,000 |
| Sales | 3,00,000 | 2,70,000 | 3,30,000 |
| End FG Inventory | 0 | 20,000 | 0 |

Income Statement (**Absorption Costing**)

| | | 2019 | | 2020 | | 2021 | |
|---|---|---|---|---|---|---|---|
| Sales | | | 18,00,000 | | 16,20,000 | | 19,80,000 |
| Less: COGS | | | | | | | |
| | Begin FG inventory | 0 | | 0 | | 85,200 | |
| | Cost of Goods Produced | 12,78,000 | | 12,35,400 | | 13,20,600 | |
| | Cost of Goods available for Sale | 12,78,000 | | 12,35,400 | | 14,05,800 | |
| | End FG inventory | 0 | | (85,200) | | 0 | |
| | COGS | | (12,78,000) | | (11,50,200) | | (14,05,800) |
| Gross Profit | | | 5,22,000 | | 4,69,800 | | 5,74,200 |
| Volume Variance | | | 0 | | (5400) | | 5400 |
| Adjusted Gross Profit | | | 5,22,000 | | 4,64,400 | | 5,79,600 |
| Less: SG&A | | | | | | | |
| | Variable SG&A (VSG&A) | 72,000 | | 64,800 | | 79,200 | |
| | Fixed SG&A (FSG&A) | 23400 | | 23,400 | | 23,400 | |
| | SG&A | | (95,400) | | (88,200) | | (1,02,600) |
| Net Profit | | | 4,26,600 | | 3,76,200 | | 4,77,000 |

Income Statement (**Marginal Costing**)

| | | 2019 | | 2020 | | 2021 | |
|---|---|---|---|---|---|---|---|
| Sales | | | 18,00,000 | | 16,20,000 | | 19,80,000 |
| Less: Variable COGS | | | | | | | |
| | Begin FG inventory | 0 | | 0 | | 74,400 | |
| | Variable Cost of Produced Goods | 11,16,000 | | 10,78,800 | | 11,53,200 | |
| | Variable Cost of Goods available for Sale | 11,16,000 | | 10,78,800 | | 12,27,600 | |
| | End FG inventory | 0 | | (74,400) | | 0 | |
| | Variable COGS | | (11,16,000) | | (10,04,400) | | (12,27,600) |
| Less: Variable SG&A | | | (72,000) | | (64,800) | | (79,200) |
| Contribution Margin | | | 6,12,000 | | 5,50,800 | | 6,73,200 |
| Less: Fixed Costs | | | | | | | |
| | Fixed manufacturing Overheads (FMOH) | 1,62,000 | | 1,62,000 | | 1,62,000 | |
| | Fixed SG&A (FSG&A) | 23,400 | | 23,400 | | 23,400 | |
| | Fixed Costs | | (1,85,400) | | (1,85,400) | | (1,85,400) |
| Net Profit | | | 4,26,600 | | 3,65,400 | | 4,87,800 |

ABSORPTION COSTING PROFIT
− VARIABLE COSTING PROFT
= 3,76,200 − 3,65,400
= 10,800

(END INVENTORY − BEGIN INVENTORY)
× FMOH
= (20,000 − 0) × 0.54
= 10,800

YEAR 2020

BOTH ARE SAME

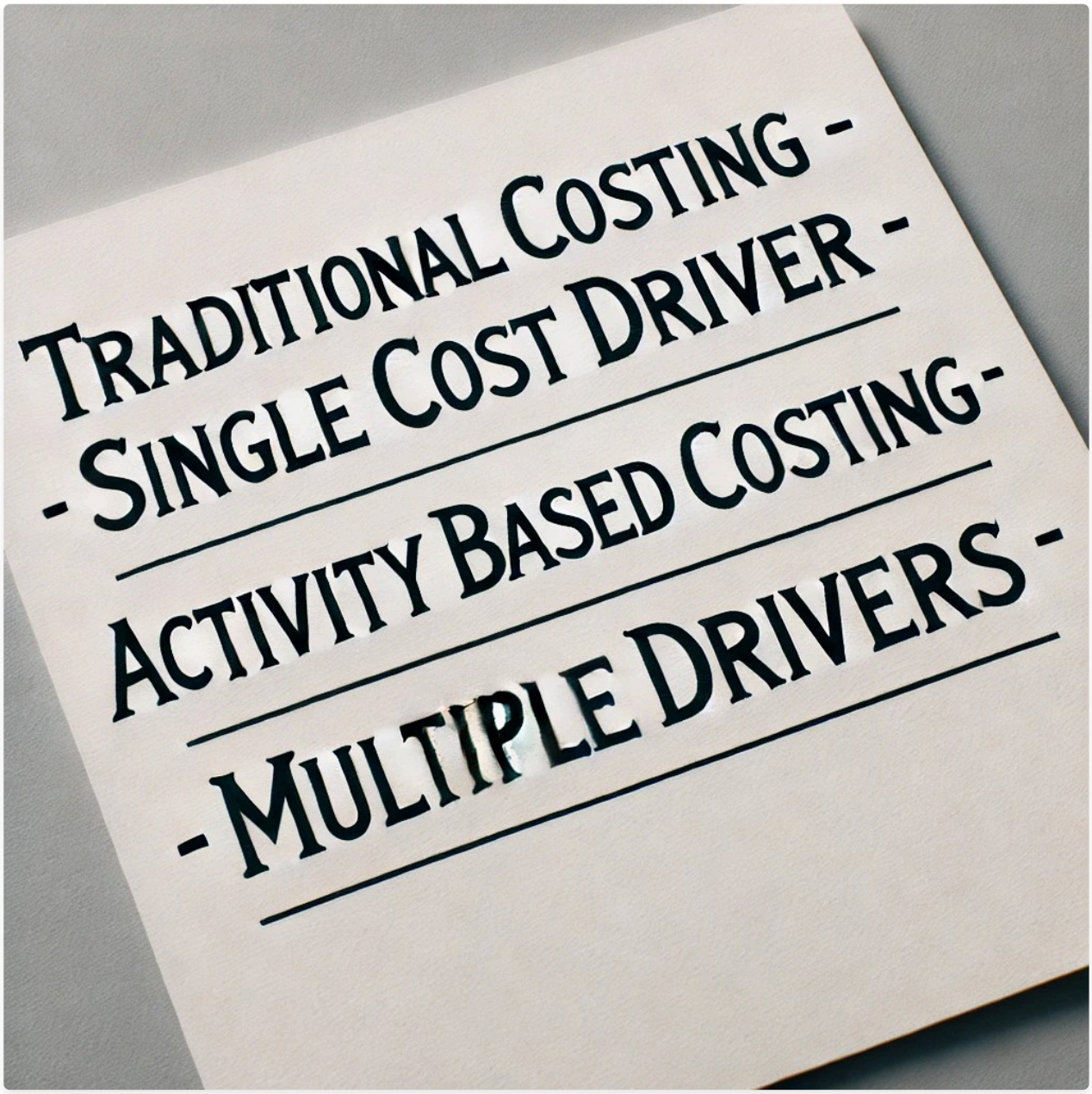
ABSORPTION COSTING PROFIT
− VARIABLE COSTING PROFT
= 4,77,000 − 4,87,800
= − 10,800

(END INVENTORY − BEGIN INVENTORY)
× F MOH
= (0 − 20,000) × 0.54
= − 10,800

YEAR 2021

BOTH ARE SAME

# 1. Introduction




The Traditional Costing System is a method of allocating costs to products or services based on a single or limited number of cost drivers, usually related to production volume, such as direct labor hours or machine hours. This system is straightforward and commonly used in industries where overhead costs are relatively low or where the production processes are simple and homogenous.

Direct Costs such as direct materials (DM) and direct labor (DL) are easily traced to the specific products or services being produced. These costs are directly charged to the cost objects without the need for allocation.

Indirect Costs or overheads are not directly traceable to a single product. In a traditional costing system, these costs are pooled together and then allocated to products based on a predetermined overhead rate (also called allocation rate).

The Predetermined Overhead Rate is calculated by dividing the estimated total overhead costs by an estimated activity level, such as total labor hours or machine hours.

Traditional costing often relies on a single cost driver, such as machine hours or labor hours, to allocate overhead costs to products. This approach works well in environments where products are similar and overhead costs are proportional to the chosen cost driver.

A significant drawback of the traditional costing system is its potential to distort product costs, particularly in companies with a wide range of products or where overhead costs are not proportional to the chosen cost driver. This can lead to inaccurate

product pricing and profitability analysis.

The Traditional Costing System is easy to implement and suitable for simple production environments, it may not provide accurate cost information in more complex operations where overhead costs vary significantly across products. In such cases, more sophisticated costing methods like Activity-Based Costing (ABC) might be necessary to ensure precise cost allocation and better decision-making.

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## 2. Refining a Costing System

A refined costing system enhances cost accuracy by minimizing the use of broad averages when assigning resource costs to cost objects, such as jobs, products, and services. It provides more precise measurement of indirect costs and aligns costs with the specific resource consumption of each cost object, even if different objects use resources in varying ways.

Some of the reasons, where there is need to refine our costing systems are:

- **Increase in Product Diversity:** Companies now produce a greater variety of products, each with different production requirements and resource demands. Traditional broad averages don't reflect these unique requirements, leading to cost distortions. A refined costing system addresses this diversity by matching costs to the actual resource usage of each product.
- **Increase in Indirect Costs:** With advanced technology and automation, indirect costs (like maintenance, testing, and quality assurance) have grown relative to direct costs. Refined costing systems allocate these indirect costs more accurately by linking them to the activities that drive these expenses.
- **Heightened Competition in Product Markets:** In competitive markets, accurate cost data is essential for pricing and product strategy. A refined costing system provides detailed cost information, allowing companies to make informed pricing and product decisions and respond strategically to market changes.

There are 3 broad guidelines for Refining a Costing System

**1. Direct-Cost Tracing**
Identify and directly trace as many costs as possible. This reduces reliance on indirect cost allocations, providing a more accurate view of individual product costs. By treating more costs as direct, the system limits the impact of allocation assumptions on the overall cost structure.

**2. Expanding Indirect-Cost Pools**
Increase the number of indirect-cost pools, grouping costs into homogeneous pools that reflect similar causes or activities. This grouping ensures that each pool can be assigned based on a specific driver. For example, rather than grouping machining and distribution costs in one pool, separating them allows for more relevant cost drivers—like machine hours for machining and shipment count for distribution.

**3. Use of Cost-Allocation Bases**
Whenever possible, use specific cost drivers that cause indirect costs as the allocation base. This approach aligns each cost pool with a driver that reflects its underlying cost behavior. For example, in a refined costing system, indirect costs related to inspections would be assigned based on the number of inspections performed, providing a more accurate measure of costs across different products.

**Activity-based costing (ABC)** is one of the most effective tools for refining a costing system. ABC enhances cost accuracy by focusing on individual activities as core cost elements. Each activity represents a specific event, task, or unit of work—like product design, machine setup, operation, and product distribution. In essence, activities are actions a company performs to create value.

To aid in strategic decision-making, ABC systems map out activities across all stages of the value chain, calculate the cost of each activity, and then allocate these costs to products or services based on the unique mix of activities required for each. This approach ensures that costs more accurately reflect the resources used to produce each specific product or service.

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# 3. Need for ABC Costing

Historically, industries like household appliance and tool manufacturing produced a limited variety of products, with relatively low overhead costs, making simple cost allocation methods effective. However, as these industries began expanding their product ranges—adding features and customization options—the simplicity of broad, average-based costing started to fall short.

This broad approach, often termed "peanut-butter costing," allocates overhead costs evenly across products, regardless of the unique resources they require.

While it provides a straightforward method for assigning costs, it can lead to:

- **Undercosting:** Suppose a high-tech refrigerator with advanced cooling features and special parts is produced. Under peanut-butter costing, this product may appear cheaper than it is, causing underpricing that could erode profits.
- **Overcosting:** A simpler product, like a basic cordless drill, ends up looking more costly due to overhead spread. This can lead to overpricing, possibly pushing customers toward competitors for this product type.

Thus rise in product diversity and the varied resource demands of modern manufacturing reveal the limitations of broad averaging. In this context, Activity-Based Costing (ABC) is essential to accurately assign costs based on the specific activities each product requires, providing better insights for strategic pricing and production decisions.

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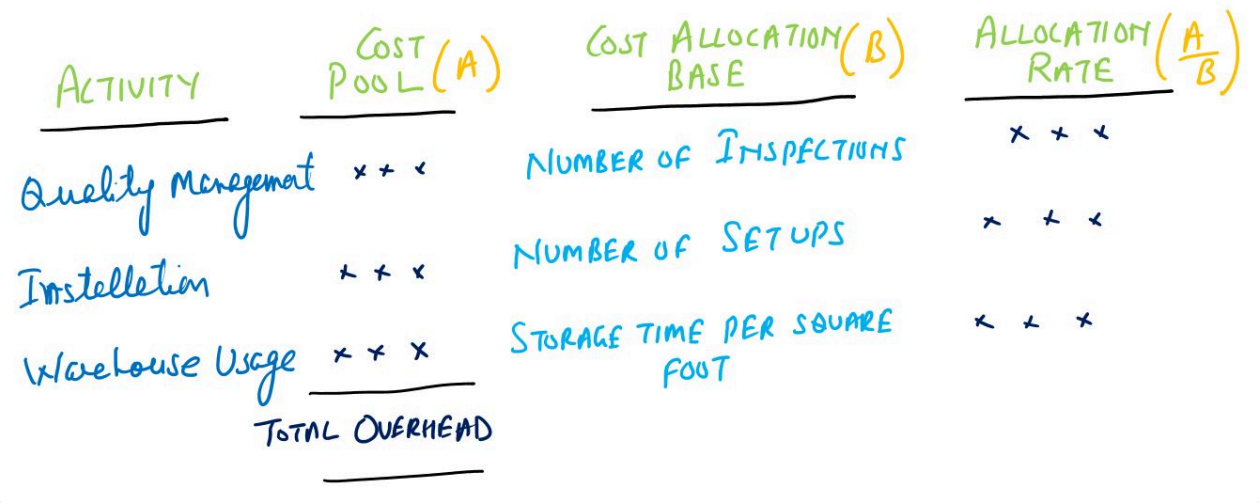
# 4. Activity Based Costing

Activity Based Costing (ABC) is a method of overhead allocation that focuses on activities as the primary cost objects. The costs associated with these activities serve as the foundation for determining the indirect costs of products, services, and customers.




Similar to Traditional Costing, companies using ABC trace direct materials (DM) and direct labor (DL) to cost objects.

The key difference is that ABC Costing allocates indirect costs—such as manufacturing overhead (MOH)—to the specific products, services, or customers that generate those costs. This is achieved by separately estimating the indirect costs for each activity and allocating them based on the cost drivers.

ABC involves the following seven steps:

**1. Identify Activities**
Determine the key activities involved in the production or service process.

**2. Estimate Total Indirect Costs**
Calculate the total indirect costs for each activity, creating a cost pool based on the underlying nature and extent of these activities.

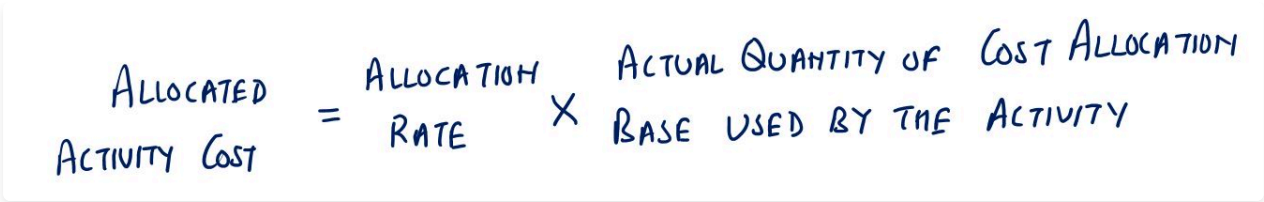
**3. Determine Allocation Base**
Identify the primary cost driver for each activity's indirect costs.

**4. Estimate Total Quantity of Allocation Base**
Calculate the total amount of each allocation base.

**5. Compute Cost Allocation Rate**
Determine the cost allocation rate for each activity by dividing the total indirect costs by the total quantity of the allocation base.


**6. Measure Actual Usage**
Obtain the actual quantity of each allocation base used by the cost object (e.g., a specific product).

**7. Allocate Costs**
Allocate the costs to the cost object based on the actual usage of the allocation base.




It is important to note that ABC may classify some costs, traditionally considered product costs for external reporting, as period costs. Conversely, some costs traditionally considered period costs may be classified as product costs under ABC.

Overall, ABC provides a more accurate and realistic representation of actual production costs compared to traditional absorption costing methods.

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# 5. Value Added Activities

Let us differentiate between activities that add value to the product or service (Value-Added) and those that do not (Non-Value-Added). Understanding this distinction helps businesses streamline processes, reduce costs, and improve overall efficiency.

Let us explore both types of activities with examples to clarify the differences.

#### Value-Added (VA) Activity

A Value-Added activity directly increases the worth of a product or service from the customer's perspective. It is an essential part of the production or service delivery process that customers are willing to pay for because it enhances the final product or service.

**Characteristics of Value-Added (VA) Activity are:**

- *Increases Product or Service Worth:* A VA activity enhances the intrinsic value of the product or service.
- *Customer Willingness to Pay:* The customer sees this activity as necessary and is willing to pay for it.
- *Direct Production or Service Task:* It is an integral part of producing the product or delivering the service.

**Examples of Value-Added (VA) Activity are:**

- *Assembly of a Product:* In a car manufacturing plant, the actual assembly of the car is a VA activity. It directly contributes to creating the final product that the customer wants to purchase.
- *Cooking in a Restaurant:* The preparation and cooking of food in a restaurant kitchen are VA activities because they create the dish the customer ordered, which they are willing to pay for.
- *Software Development:* Writing code for a software application is a VA activity as it directly contributes to the creation of a product that customers need and are willing to buy.

#### Non-Value-Added (NVA) Activity

A Non-Value-Added activity does not contribute directly to the final value of the product or service. Instead, it often increases the time, cost, or complexity of production or service delivery without enhancing the product or service in a way that customers value.

**Characteristics of Non-Value-Added (NVA) Activity are:**

- *Lengthens Production or Performance Time*: NVA activities add unnecessary steps or delays in the process.
- *Increases Cost Without Adding Value:* These activities consume resources without contributing to the product's value from the customer's perspective.
- *Not Willing to Pay:* Customers would not willingly pay for these activities because they do not enhance the product or service they receive.

**Examples of Non-Value-Added (NVA) Activity are:**

- *Inspection*: In a manufacturing process, inspecting products after they are made does not add value from the customer's perspective. Customers expect products to be made correctly the first time, without needing additional inspection.
- *Moving Materials*: Moving raw materials from one part of a factory to another adds no value to the final product. It's simply a necessary step due to layout or process inefficiencies.
- *Waiting Time*: Any time spent waiting for machines to become available, for materials to arrive, or for approvals, is NVA. This delays production and increases costs without benefiting the customer.
- *Excessive Packaging*: Packaging that exceeds what is necessary for the safe and convenient delivery of a product is NVA. For instance, over-packaging a product might increase the cost without adding any perceived value to the customer.
- *Rework*: Reworking a product because of errors in the initial production phase is an NVA activity. Customers would not choose to pay for mistakes to be fixed; they expect the product to be made correctly from the start.

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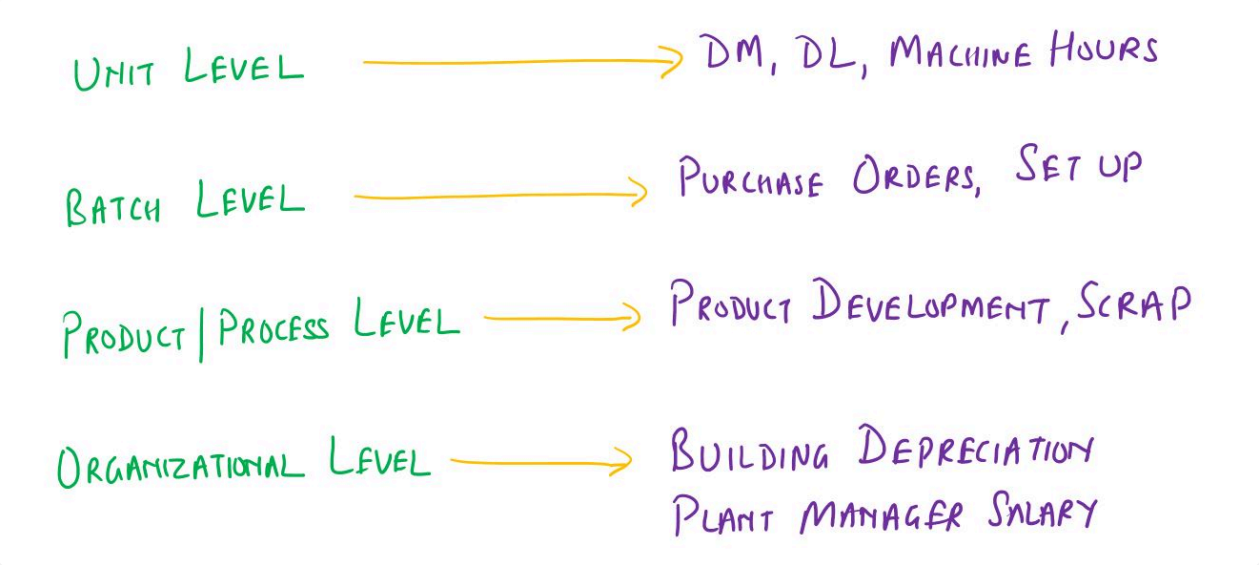
# 6. Level of Cost Drivers

*Cost drivers* are the factors that cause costs to be incurred in an organization. They help in identifying, analyzing, and controlling costs by pinpointing the underlying reasons for those costs.

**Levels of Cost Occurrence**

Cost drivers should indicate at what level a cost occurs. Costs can be incurred at various levels, including unit, batch, product/process, and organizational levels. For example, in a bakery, the cost of flour would be a unit cost driver, as it is directly tied to the production of a single loaf of bread. On the other hand, the cost of setting up the oven for a batch of cookies would be a batch cost driver.




There can be 4 types of Cost Drivers:

**1. Unit Level Costs**
Unit level costs are incurred for every single unit produced. These costs vary with the number of units produced, increasing as production volume rises.

Examples:

- Direct Labor: The cost of wages for assembly line workers for each unit produced.
- Energy for Machine Operations: The electricity used to run machines for every unit produced, such as in plastic molding.
- Direct Materials: The raw materials used for each unit, like wood for individual furniture pieces.
- Machine Depreciation: Depreciation costs based on machine hours per unit produced, such as in an automated molding machine.

**2. Batch Level Costs**
Batch level costs are related to a batch or group of units produced together, rather than to individual units. These costs increase with the number of batches, not the number of units.

Examples:

- Setup Costs: Costs to prepare machines for each production batch, such as setting up a press for printing a batch of books.
- Material Handling: Costs for moving materials for each batch, such as transporting ingredients for a batch of packaged snacks.
- Quality Inspection Costs: The cost of testing each batch for quality, like inspecting a batch of pharmaceutical tablets.
- Order Processing: Costs for processing each batch's purchase order, such as ordering components for a batch of electronic devices.

**3. Product Costs (Process Costs)**
Product or Process costs support individual products regardless of the quantity or number of batches produced. These costs are based on the product's complexity or specific requirements.

Examples:

- Design Costs: Costs of designing a product or modifying its design, such as creating molds for a new plastic part.
- Research and Development (R&D): Expenses for developing a new product, like R&D for a new skincare product.
- Product-Specific Marketing: Marketing campaign costs unique to launching a product, such as the launch of a new car model.
- Engineering Changes: Costs for modifying product specifications, like changing the formula for a cosmetic product.

**4. Facility Costs (Organizational Costs)**

Facility costs (Organizational Costs) support the organization as a whole and aren't tied to individual products or batches. These are generally fixed and do not change with production levels or the number of products.

Examples:

- Building Rent and Utilities: The cost of maintaining the facility, such as rent and utilities for the manufacturing plant.
- Administrative Salaries: Salaries of upper management, like the CEO's and CFO's compensation.
- Security and Safety: Costs for building security and safety measures across the entire facility.
- Depreciation on Office Equipment: Depreciation of equipment that serves the entire facility, like computers and office furniture.

**Cost Pooling and Allocation**

Cost drivers allow costs to be pooled together such that they have a common activity base that can be used to allocate those costs to products or services. This helps in more accurate and fair distribution of costs across different products or services.

In a hospital, the cost of operating the X-ray machine might be pooled together and then allocated to the different departments (like emergency, orthopedics, etc.) based on the number of X-rays taken. The number of X-rays is the cost driver that helps in distributing the machine's operating costs.

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# 7. Activity-Based Management

Activity Based Management (ABM) is a management approach that focuses on improving the efficiency and effectiveness of an organization by managing and analyzing its activities. It leverages data from Activity Based Costing (ABC) to gain insights into how resources are used in different activities and how these activities contribute to the overall performance of the organization.

Let us understand ABM with help of examples.

**1. Analyzes activities and identifies cost drivers**
ABM starts by analyzing all the activities that an organization undertakes. Each activity is examined to identify the cost drivers—factors that cause costs to increase or decrease.

Example: In a manufacturing company, the cost driver for assembly might be the number of labor hours. If the company finds that labor hours are a significant driver of costs, it might look for ways to automate certain assembly processes to reduce labor costs.

**2. Classifies activities relative to customer value and strives to eliminate or minimize those activities for which customers would choose not to pay**
ABM classifies activities as either value-added or non-value-added from the customer's perspective. Value-added activities are those that directly contribute to the customer's satisfaction or the product's quality, while non-value-added activities do not directly add value and might be wasteful.

Example: A retail company might find that extensive internal reporting processes do not add value to the customer and instead increase operational costs. The company could streamline reporting to reduce these costs, thereby lowering product prices or improving profit margins.

**3. Helps assure that customers perceive an equitable relationship between product price and value she/he gets**
ABM ensures that the costs of activities are aligned with the value they provide to customers. This helps in pricing products or services in a way that customers feel they are getting good value for their money.

Example: If a car manufacturer invests heavily in high-end materials for car interiors, ABM would analyze whether customers are willing to pay a premium for these materials. If customers do not perceive the added value, the company might opt for more cost-effective materials that still meet customer expectations.

**4. Improves processes and operational controls**
By identifying inefficiencies and non-value-added activities, ABM helps organizations improve their processes and operational controls.

Example: A hospital might use ABM to analyze the patient admission process. If it finds that patients spend unnecessary time filling out redundant paperwork, the hospital can streamline the admission process, reducing both the time patients spend waiting and the associated administrative costs.

**5. Analyzes performance problems**
ABM is a powerful tool for diagnosing and addressing performance issues within an organization. It can help pinpoint where processes are breaking down or where resources are not being used effectively.

Example: In a service-based company, ABM might reveal that a significant amount of time is spent on rework due to errors in initial service delivery. By addressing the root causes of these errors, the company can improve overall service quality and reduce costs associated with rework.

**6. Translates company goals into organizational activities**
ABM helps ensure that company goals are effectively translated into specific activities that align with those goals. This creates a direct link between strategic objectives and day-to-day operations.

Example: If a company's goal is to become the market leader in customer satisfaction, ABM might identify critical activities that impact customer service, such as order processing time and product quality checks. By focusing resources on these activities, the company can better achieve its strategic objective.

Thus the, **Activity-Based Management (ABM)** is a comprehensive approach that allows organizations to focus on the activities that drive costs and create value for customers. Through detailed analysis, classification of activities, and continuous process improvement, ABM helps organizations optimize their operations, reduce waste, and align their activities with both customer

expectations and strategic goals. This results in more efficient processes, better customer satisfaction, and improved financial performance.

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# 8. Comparison - Traditional Costing and Activity Based Costing (ABC)

Traditional Costing is simpler and more straightforward but may not provide accurate cost information in complex environments. In contrast, Activity-Based Costing (ABC) offers greater accuracy and detail by using multiple cost drivers, making it more suitable for businesses with diverse and complex operations.

| Aspect | Traditional Costing | Activity-Based Costing (ABC) |
|---|---|---|
| **Levels of Costs** | Categorizes costs as either variable or fixed, aligned with production volume. | Uses multiple levels: unit, batch, product, and organizational, for a detailed cost view. |
| **Cost Pools Based on Activities** | Uses broad cost pools, generally organized by departments or production volume. | Uses multiple pools based on specific activities, offering precise cost tracking. |
| **Assignment of Costs Using Multiple Drivers** | Typically assigns costs using a single driver (e.g., labor or machine hours). | Assigns costs with multiple drivers, including both volume and non-volume factors like setups or inspections. |
| **Classification of Costs** | Conventional classifications for reporting, with fixed categories for product and period costs. | Allows flexible classifications, reassigning costs based on specific activities and usage patterns. |
| **Realistic Representation of Production Costs** | General estimation of costs, less accurate in complex settings. | Provides an accurate view aligned with actual activities and associated expenses. |
| **Suitability** | Works well for straightforward production environments with limited cost complexity. | Best for diverse, complex production setups where overhead costs and product differences are significant. |

Here's how ABC differs from traditional methods:

### 1. Levels of Costs

- *Traditional Costing:* Typically categorizes costs as either variable (which change with production volume) or fixed (which remain constant regardless of production levels).
- *Activity Based Costing:* Identifies several levels of costs, including unit-level, batch-level, product-level, and organizational-level costs. This multi-tiered approach provides a more refined understanding of how different activities contribute to overall costs.

### 2. Cost Pools Based on Activities

*Traditional Costing*: Usually collects costs into broad categories, often based on departments or overall production volume.

*Activity Based Costing*: Groups costs into multiple cost pools based on the underlying activities that generate those costs. This approach allows for a more accurate allocation of costs by focusing on the specific actions or processes that drive expenses.

### 3. Assignment of Costs Using Multiple Drivers

*Traditional Costing*: Typically uses a single or limited number of cost drivers, usually related to production volume, such as labor hours or machine hours.

*Activity Based Costing*: Assigns costs from the multiple cost pools to products or services using a variety of cost drivers. These drivers can be both volume-related (like machine hours) and non-volume-related (like the number of setups or quality inspections), which better reflect the factors that actually cause the costs to be incurred.

### 4. Classification of Costs

*Traditional Costing*: Follows conventional classifications for external reporting, treating certain costs as product costs and others as period costs.

*Activity Based Costing*: May reclassify some costs differently than traditional methods. For example, costs typically considered as product costs for external reporting might be treated as period costs in ABC, and vice versa. This reclassification is based on a more nuanced understanding of what drives costs within the organization.

**5. Realistic Representation of Production Costs**

*Traditional Costing*: Provides a general estimate of production costs, which might not fully capture the complexity of the actual cost structure, especially in diverse or complex environments.

*Activity Based Costing*: Can, under certain conditions, offer a more realistic and accurate picture of actual production costs. By closely aligning cost allocations with the specific activities that generate costs, ABC provides more detailed insights that can lead to better cost management and pricing decisions.

**6. Suitability**

*Traditional Costing:* Best suited for companies with simple, uniform production processes where overhead costs are closely related to a single cost driver like labor or machine hours.

*Activity-Based Costing (ABC):* Better suited for companies with complex, varied production processes and a diverse product range. ABC is particularly useful in environments where overhead costs are a significant portion of total costs.

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# 9. ABC Costing usage

Activity-Based Costing (ABC) costing is most effective and appropriate under the following organizational conditions:

**Product/Service Variety**
The organization produces and sells a wide range of products or services. ABC helps accurately allocate costs across diverse offerings by using multiple cost drivers specific to each product.

**Product Customization**
ABC is valuable when products are customized to customer specifications. This customization often leads to different resource demands, which ABC can better track through activity-based cost pools.

**Diverse Manufacturing/Service Techniques**
When a company employs various techniques for production or service delivery, ABC provides more precise cost allocations by considering the unique activities associated with each technique.

**Lack of Commonality in Overhead Costs**
In cases where overhead costs vary significantly across products or services, ABC's multiple cost drivers help assign costs more accurately, reflecting each product's or service's unique cost structure.

**Issues with Existing Overhead Allocation**
If a company faces problems or inaccuracies in its current overhead allocation system, particularly if costs are not reflective of actual resource usage, ABC can help improve accuracy and decision-making.

**Business Environment Changes**
Companies that have experienced significant changes, such as adopting new technologies or entering more competitive markets, benefit from ABC's detailed costing approach, which adapts to new cost structures and activities introduced by these changes.

By meeting one or more of these conditions, a business can benefit from the detailed, activity-focused approach that ABC offers, leading to better cost management and strategic decision-making.

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# 10. Criticisms of ABC

Here are some common criticisms of Activity-Based Costing (ABC):

**High Implementation Time and Cost**
ABC requires significant time, resources, and financial investment to implement effectively. Identifying activities, assigning costs to each, and maintaining an accurate cost allocation system can be resource-intensive.

**Non-Conformity with GAAP**
ABC does not always align with generally accepted accounting principles (GAAP). This can make it difficult for external financial reporting, as adjustments may be required to meet compliance standards.

**Limited Impact on Business Challenges**
ABC is a tool for analyzing and allocating costs but cannot directly solve issues like product failures, declines in sales volume, or overall financial losses. While ABC offers detailed insights, it does not inherently address root causes of performance issues.

**No Reduction in Overhead Costs**
ABC provides more accurate cost allocation but does not inherently reduce overhead costs. Instead, it aims to enhance understanding of where costs are incurred, which can support more informed cost management and operational decisions.

These criticisms highlight some practical challenges and limitations of ABC, suggesting that while it can improve cost accuracy, it is not a comprehensive solution for all business or financial challenges.

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## 11. Illustration 1

Samsung manufactures two types of TVs namely, LED and QLED. The company is considering producing only the QLED TVs because they appear to be substantially more profitable than the LED TVs. The company's total production overhead is Rs 50,17,500. Some additional data is given below.

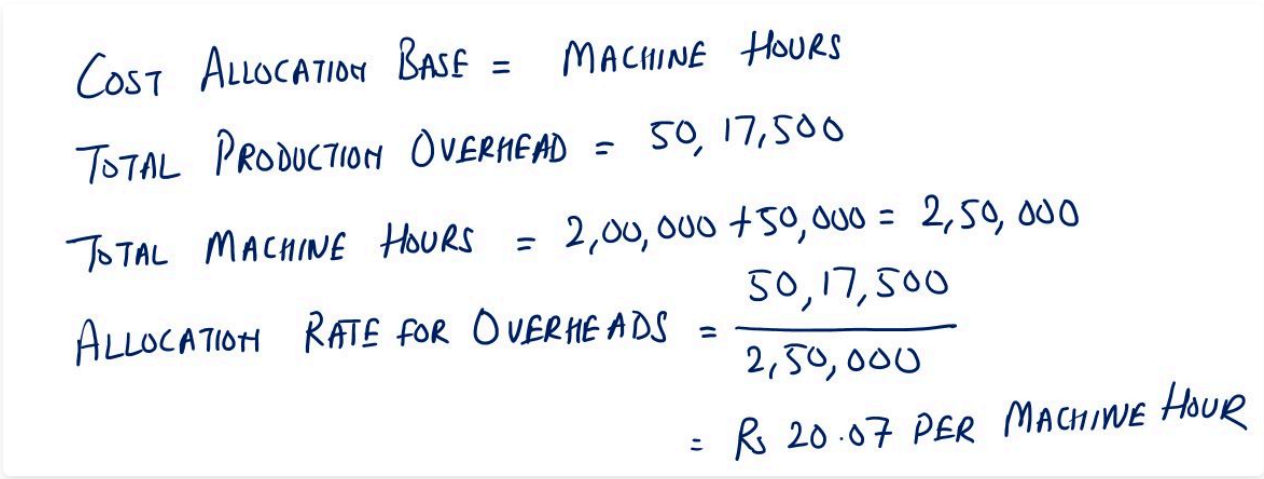
| | LED TV | QLED TV |
|---|---|---|
| Revenue | 150,00,000 | 168,00,000 |
| Direct costs | 82,50,000 | 87,50,000 |
| Production | 15,00,000 | 3,50,000 |
| Machine hours | 2,00,000 | 50,000 |
| Direct labour hours | 34,500 | 1,53,626 |
| Inspections | 1000 | 6500 |

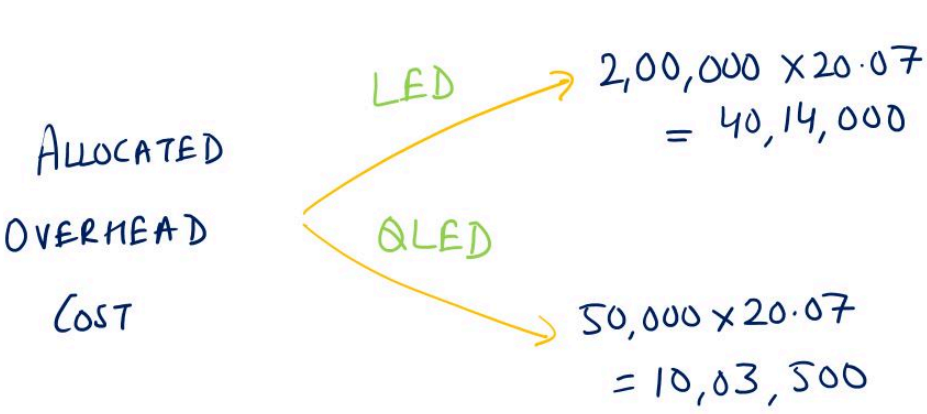
(i) Samsung has consistently used machine hours to allocate overhead. Determine the profitability of each line of TV, and decide whether the company should stop producing the LED TVs.

(ii) The cost accountant has determined that production overhead costs can be assigned to three separate cost pools. Pool 1 contains Rs 12,60,000 of overhead costs for which the most appropriate cost driver is machine hours; Pool 2 contains Rs 22,57,500 of overhead costs for which the most appropriate cost driver is direct labor hours; and Pool 3 contains Rs 15,00,000 of overhead costs for which the most appropriate cost driver is number of inspections. Compute the overhead cost that should be allocated to each type of TV.

(iii) Discuss whether the company should continue to manufacture both types of TVs.

**SOLUTION:**



| Income Statement (**Traditional Costing**) | | | | |
|---|---|---|---|---|
| | *LED TVs* | | *QLED TVs* | |
| Sales Revenue | | 150,00,000 | | 168,00,000 |
| Less: Total Costs | | | | |
| COGS | 82,50,000 | | 87,50,000 | |
| Overhead Costs (allocated) | 40,14,000 | | 10,03,000 | |
| Total Costs | | (122,64,000) | | (97,53,500) |
| Operating Income | | 27,36,000 | | 70,46,000 |
| Operating Income (%) | | 18 % | | 42 % |

| Activity | Cost Pool | Cost Allocation Base | Allocation Rate |
|---|---|---|---|
| Pool 1 | 12,60,000 | 2,50,000 Machine Hours (2,00,000 + 50,000) | 5.04 |
| Pool 2 | 22,57,500 | 1,88,125 Direct Labour Hours (34,500 + 1,53,625) | 12 |
| Pool 3 | 15,00,000 | 7500 Inspections (1000 + 6500) | 200 |

| Income Statement (**ABC Costing**) | | | | |
|---|---|---|---|---|
| | *LED TVs* | | *QLED TVs* | |
| Sales Revenue | | 150,00,000 | | 168,00,000 |
| Less: Total Costs | | | | |
| Direct Costs | 82,50,000 | | 87,50,000 | |
| Machine Hours (Pool 1) 2,00,00 X 5.04 → | 10,08,000 | | 2,52,000 ← 5000 X 5.04 | |
| Labour Hours (Pool 2) 34,500 X 12 → | 4,14,000 | | 18,43,500 ← 1,53,625 X 12 | |
| Inspection (Pool 3) 1000 X 200 → | 2,00,000 | | 13,00,000 ← 6500 X 200 | |
| Total Costs | | (98,72,000) | | (121,45,500) |
| Operating Income | | 51,28,000 | | 46,54,500 |
| Operating Income (%) | | 34 % | | 28 % |

Given the new allocations, management should continue to produce both types of TVs because both appear to be profitable.

However, the cost accountant could consider developing additional overhead pools because of the large number of costs charged to Pool 2.

## 12. Illustration 2

Amul wants to assess the profitability of three product lines: Cold Drinks, Milk, and Lassi. The company has provided the following data for for each product line:

| | Cold Drink | Milk | Lassi |
|---|---|---|---|
| Revenue | 3,17,400 | 8,40,240 | 4,83,960 |
| Cost of Goods Sold | 2,40,000 | 6,00,000 | 3,60,000 |
| | | | |
| Cost of bottles returned | 4800 | 0 | 0 |
| Number of purchase orders placed | 144 | 336 | 144 |
| Number of deliveries received | 120 | 876 | 264 |
| Hours of Shelf Stocking time | 216 | 2,160 | 1,080 |
| Items Sold | 50,400 | 4,41,600 | 1,22,400 |

(i) Amul currently allocates store support costs (all costs other than COGS) to product lines on the basis of COGS of each product line. Calculate the operating income and operating income as a percentage of revenues for each product line.
(ii) If Amul allocates store support costs (all costs other than COGS) to product lines using an ABC system, calculate the operating income and operating income as a percentage of revenues for each product line.

| Activity | Description of Activity | Total Support Costs | Cost-Allocation Base |
|---|---|---|---|
| 1. Bottle returns | Returning of empty bottles to company | 4,800 | Direct tracing to product line |
| 2. Ordering | Placing of orders | 62,400 | 624 purchase orders |
| 3. Delivery | Physical delivery of the product | 1,00,800 | 1,260 deliveries |
| 4. Shelf-stocking | Stocking of merchandise on store shelves | 69,120 | 3,456 hours of shelf-stocking time |
| 5. Customer support | Assistance provided to customers | 1,22,880 | 614,400 items sold |
| Total | | 3,60,000 | |

(ii) Comment on your answers in both cases.

SOLUTION:

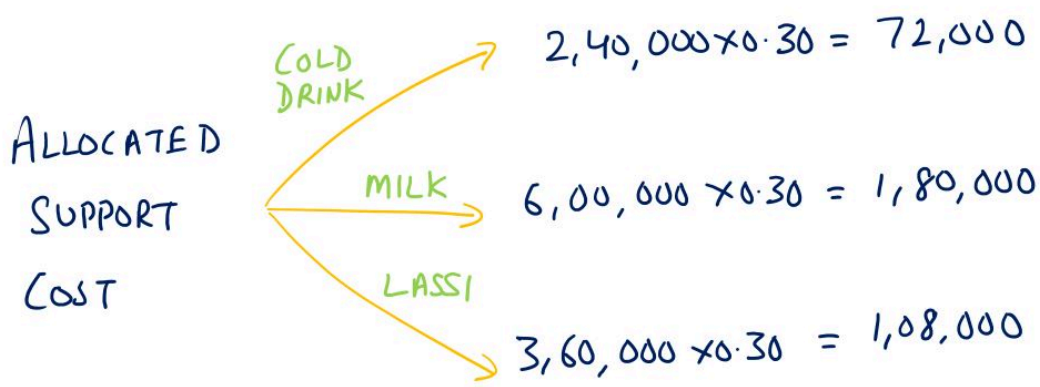
COST ALLOCATION BASE = COST OF GOODS SOLD

TOTAL SUPPORT COSTS = 3,60,000

TOTAL COGS = 2,40,000 + 6,00,000 + 3,60,000

= 12,00,000

$$\text{ALLOCATION RATE} = \frac{3,60,000}{12,00,000} = \text{Rs } 0.30 \text{ PER COGS}$$




Income Statement (**Traditional Costing**)

| | *Cold Drink* | | *Milk* | | *Lassi* | |
|---|---|---|---|---|---|---|
| Sales Revenue | | 3,17,400 | | 8,40,240 | | 4,83,960 |
| Less: Total Costs | | | | | | |
| COGS | 2,40,000 | | 6,00,000 | | 3,60,000 | |
| Store Support Costs (allocated) | 72,000 | | 1,80,000 | | 1,08,000 | |
| Total Costs | | (3,12,000) | | (7,80,000) | | (4,68,000) |
| Operating Income | | 5400 | | 60,240 | | 15,960 |
| Operating Income (%) | | 1·70% | | 7·17% | | 3·30% |

| ACTIVITY | COST POOL | COST ALLOCATION BASE | ALLOCATION RATE |
|---|---|---|---|
| BOTTLE RETURN | 4800 | DIRECT TRACING | — |
| ORDERING | 62,400 | 624 PURCHASE ORDERS | 100 |
| DELIVERY | 1,00,800 | 1260 DELIVERIES | 80 |
| SHELF-STOCKING | 69,120 | 3456 SHELF STOCKING HOURS | 20 |
| CUSTOMER SUPPORT | 1,22,880 | 6,14,400 ITEMS SOLD | 0·20 |

| Income Statement (**ABC Costing**) | | | | | | |
|---|---|---|---|---|---|---|
| | *Cold Drink* | | *Milk* | | *Lassi* | |
| Sales Revenue | | 3,17,400 | | 8,40,240 | | 4,83,960 |
| Less: Total Costs | | | | | | |
| COGS | 2,40,000 | | 6,00,000 | | 3,60,000 | |
| Bottle Return Costs | 4,800 | | — | | — | |
| Ordering Costs | 14,400 | | 33,600 | | 14,400 | |
| Delivery Costs | 9,600 | | 70,080 | | 21,120 | |
| Shelf Stocking Costs | 4,320 | | 43,200 | | 21,600 | |
| Customer Support Costs | 10,080 | | 88,320 | | 24,480 | |
| Total Costs | | (2,83,200) | | (8,35,200) | | (4,41,600) |
| Operating Income | | 34,200 | | 5,040 | | 42,360 |
| Operating Income (%) | | 10.78% | | 0.60% | | 8.75% |

The ABC system is more credible than the simple costing system (traditional costng system). The ABC system distinguishes the different types of activities more precisely. It also tracks more accurately how individual product lines use resources. Rankings of relative profitability—operating income as a percentage of revenues—of the three product lines under the simple costing system and under the ABC system are given below.

TRADITIONAL COSTING

1. MILK = 7.17%
2. LASSI = 3.30%
3. COLD DRINK = 1.70%

ABC COSTING

1. COLD DRINK = 10.78%
2. LASSI = 8.75%
3. MILK = 0.60%

## 13. Illustration 3

Bharat Ltd makes car seats for various automobile manufacturing companies. Each seat has 20 parts; direct materials cost per seat is Rs 11.

Suppose Maruti has asked for a bid on 50,000 seats that would be installed on its cars. Bharat Ltd will use a total of 200 purchase orders if Maruti accepts Bharat's bid.

| Activity | Cost-Allocation Base | Allocation Rate |
|---|---|---|
| 1. Purchasing | Number of Purchase Orders | Rs 60 per Purchase Order |
| 2. Assembling | Number of Parts | Rs 0.50 per Part |
| 3. Packaging | Number of Seats | Rs 0.90 per Seat |

(i) Using ABC costing, compute the total cost Bharat will incur to purchase the needed materials and then assemble and package 50,000 seats. Also compute the average cost per seat.

(ii) For bidding, Bharat adds a 30% markup to total cost. What price will the company bid for the Maruti order?

(iii) Suppose that instead of an ABC system, Bharat has a traditional product costing system that allocates all costs other than direct materials at the rate of Rs 65 per direct labor hour. The seat order will require 10,000 direct labor hours. What price will Bharat bid using this system's total cost?

(iv) Use your answers to explain how ABC can help Bharat make a better decision about the bid price it will offer Maruti.

**SOLUTION:**

| Total Cost (**ABC Costing**) | | |
|---|---|---|
| Direct Materials | 50,000 X 11·00 | 5,50,000 |
| Indirect Costs | | |
| Purchasing | 200 X 60·00 | 12,000 |
| Assembling | 50,000 X 20X 0·50 | 5,00,000 |
| Packaging | 50,000 X 0·90 | 45,000 |
| Total Cost | | 11,07,000 |
| Average Cost per Seat | | 22.14 |

11,07,000 / 50,000

BID PRICE FOR 30% MARK UP (ABC COSTING)

= 11,07,000 X 1·30 = 14,39,100

| Total Cost (**Traditional Costing**) | | |
|---|---|---|
| Direct Materials | 50,000 X 11·00 | 5,50,000 |
| Indirect Costs | 10,000 X 65 | 6,50,000 |
| Total Cost | | 12,00,000 |
| Average Cost per Seat | | 24·00 |

12,00,000 / 50,000

BID PRICE FOR 30% MARK UP (TRADITIONAL COSTING)
= 12,00,000 X 1·30 = 15,60,000

Bharat's bid would be Rs 120,900 higher using the direct labor single-allocation-base system (traditional costing) than using ABC (15,60,000 − 14,39,100). Assuming the ABC system more accurately captures the costs caused by the order, the traditional direct labor system overcosts the order. This leads to a higher bid price that reduces Bharat's chance of winning the bid. The ABC system shows that Bharat can increase its chance of winning the bid by bidding a lower price and still make a profit.

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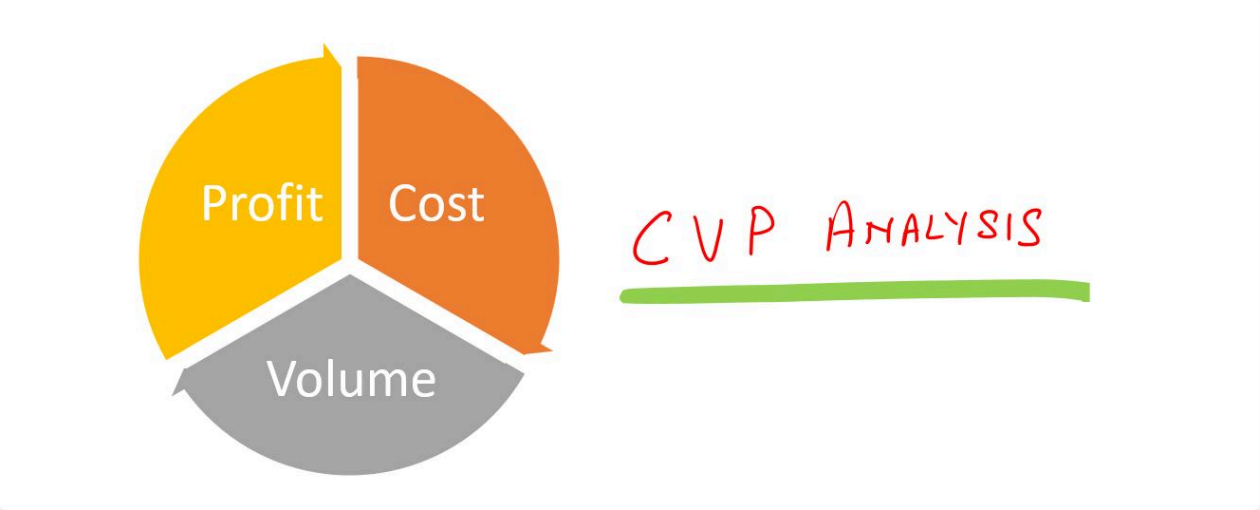
# 1. Introduction

Controlling is the process of ensuring that actual performance aligns with the company's plans or goals. For effective control, managers need timely and accurate information.

Much of this information revolves around understanding the relationships between product costs (C), selling prices (P), and sales volumes (V). These elements are interconnected, meaning that a change in one will affect the others.




For instance, if a manager considers increasing advertising expenses for a specific product, they must assess whether the expected increase in sales volume and contribution margin (sales minus variable costs) will justify the additional costs. This involves analyzing how much of a boost in product sales is needed to cover the higher advertising spend and still maintain or improve profitability.

Understanding the interactions between costs, volume, and profit is critical in decision-making. Changing production volumes affects costs, while adjusting prices influences sales volumes, and together these factors impact overall profit. Managers need to comprehend how these variables work together to make informed choices about pricing, production, marketing, and other strategic areas.

**Cost-Volume-Profit (CVP)** analysis assists managers in understanding the behavior of a product's or service's total costs, total revenues, and operating income as changes occur in the output level, selling price, variable costs, or fixed costs.

CVP (Cost-Volume-Profit) analysis and Break-even analysis are closely related, but they have distinct focuses and purposes in financial analysis.

**CVP Analysis**
CVP analysis is broader in scope. It examines how changes in costs (both fixed and variable), sales volume, and price affect a company's profit. It helps in understanding the relationships between these factors and allows businesses to predict profits at different levels of production or sales.

CVP analysis provides insights into how profit is affected by changes in variables such as price, volume, fixed costs, variable costs, and sales mix. It answers questions like "How will a price increase impact profits?" or "What volume of sales is needed to achieve a certain profit?"

**Break-even Analysis**
Break-even analysis is a subset of CVP analysis. It focuses specifically on determining the point where total revenue equals total costs (i.e., no profit or loss). The break-even point indicates the minimum sales level a company needs to cover its costs.

Break-even analysis specifically provides the break-even point in units or sales dollars. It tells the business the exact point where revenues cover all costs, but it doesn't provide detailed profit information beyond that point.

---

# 2. Variable Costing

**Absorption costing** is the traditional method of product costing and is primarily used for external financial reporting. This method allocates all manufacturing costs, both variable and fixed, to the cost of producing a product. It complies with generally accepted accounting principles and is required for external reporting, but it can sometimes obscure how costs behave because it lumps together both variable and fixed costs.

| Income Statement (**Variable Costing**) | | |
|---|---|---|
| Sales | | |
| Less: Variable Costs | | |
| | Production | |
| | Selling | |
| | Total Variable Costs | |
| Contribution Margin | | |
| Less: Fixed Costs | | |
| | Production | |
| | SG&A | |
| | Total Fixed Costs | |
| Net Profit | | |

In contrast, **variable costing** (also called marginal costing) is more commonly used for internal management purposes because it provides a clearer picture of how costs behave. Under variable costing, only variable costs—those that change with production volume—are assigned to products. Fixed costs, such as rent or salaries, are treated as period expenses and are not included in product cost. This separation of variable and fixed costs helps managers better understand cost behavior, making it easier to analyze profitability and make informed decisions.

A variable costing income statement clearly distinguishes between variable and fixed costs, which facilitates several important analyses that managers often use in decision-making, such as:

- **Break even Point**: The level of sales at which total revenues equal total costs, meaning the company neither earns a profit nor incurs a loss.
- **Cost Volume Profit (CVP) Analysis:** This helps managers understand how changes in costs, sales volume, and prices impact profit.
- **Margin of Safety:** This shows how much sales can drop before the company reaches its break-even point.
- **Degree of Operating Leverage:** This measures how sensitive profits are to changes in sales volume, helping managers assess the risks and potential rewards of increasing sales.

We will understand these concepts one by one.

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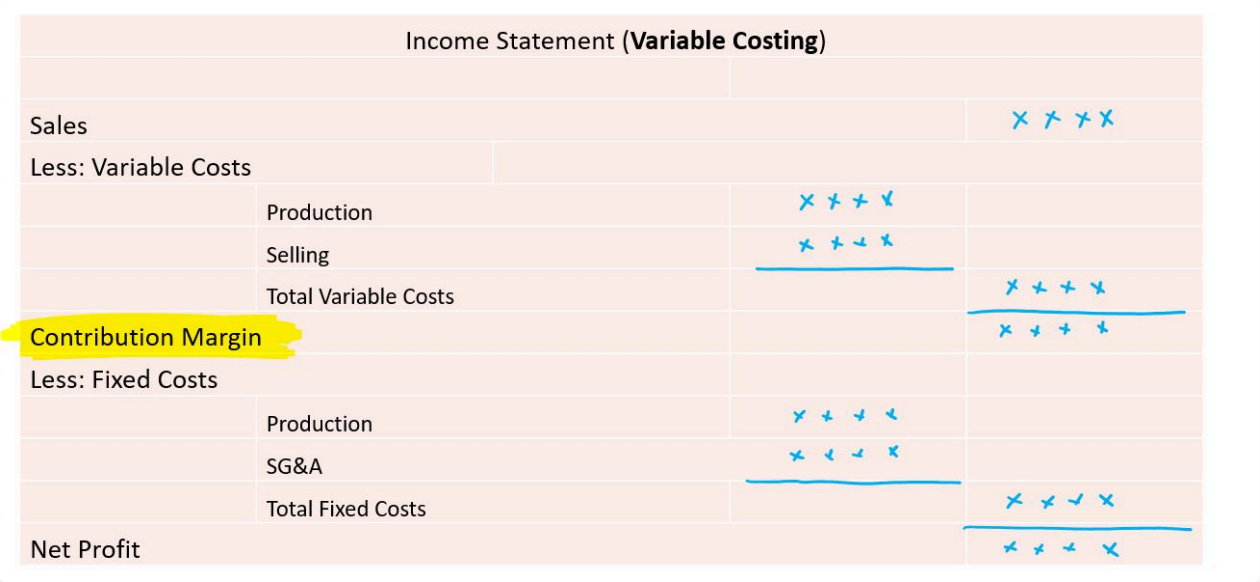
# 3. Contribution Margin




Before diving into break-even analysis, it's essential to understand the concept of Contribution Margin (CM), which is a key measure of profitability. Contribution margin can be defined on either a per-unit basis or a total basis and is used to understand how much revenue is left after coveringall variable costs.

Contribution Margin is the difference between total revenues and total variable costs. It shows how much money is left after paying for the variable costs of production, which then contributes to covering fixed costs and generating profit. Contribution Margin highlights why operating income changes as the number of units sold increases or decreases.

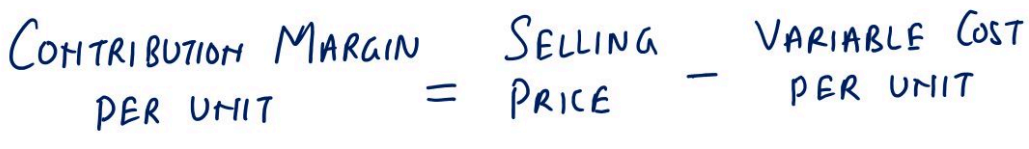
**Total Contribution Margin**

The total contribution margin is the difference between total revenue and total variable costs for all units sold. It fluctuates directly with changes in sales volume.


For example, if a company sells more units, the total contribution margin increases in proportion to the sales increase.

**Unit Contribution Margin**

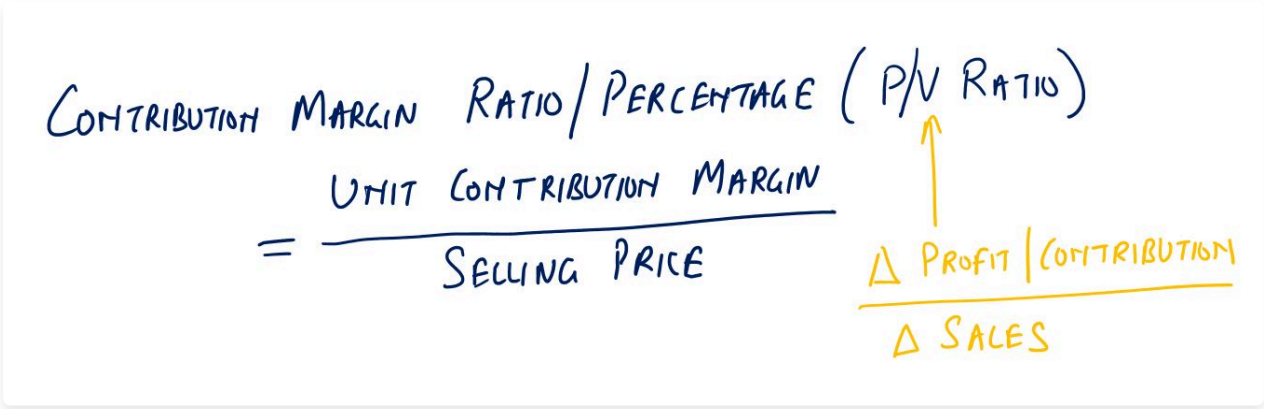
The unit contribution margin (Contribution Margin per unit) is the difference between the selling price per unit and the variable cost per unit.




This is a constant amount because the selling price and variable costs per unit are typically fixed for a given level of production.


**Contribution Margin Percentage**

The contribution margin percentage (or contribution margin ratio) is another way to express contribution margin, not as a dollar amount but as a percentage. It indicates what proportion of each dollar of sales is available to cover fixed costs and contribute to profit. The Contribution Margin Ratio is also called **Price Volume Ratio (PV ratio)**.




Understanding contribution margin is critical because it helps managers see how much of the revenue from each sale is contributing to fixed costs and profits. For example, if a company's unit contribution margin is Rs 20, then each additional unit sold contributes Rs 20 towards covering fixed costs and profit generation.

---

## 4. Break Even Point

The Break Even Point (BEP) helps businesses determine the sales volume needed to cover all costs—both fixed and variable.


At the break-even point, a company neither makes a profit nor incurs a loss, as total revenues are exactly equal to total costs. Understanding the break-even point allows managers to assess how much they need to sell to cover their expenses and helps in setting pricing strategies, evaluating new projects, and making other key business decisions.

In other words, a company's break-even point (BEP) is that level of activity, in units or dollars, at which total revenue equal total cost.

---

# 5. Assumptions of Break Even Analysis

Break Even analysis relies on several important assumptions to simplify the relationship between costs, revenues, and sales volume. These assumptions help establish a clear framework for calculating the break-even point, but they also impose certain limitations on its accuracy. Below are the key assumptions:

### Relevant Range

It is assumed that the company is operating within a specified relevant range of activity. The relevant range is the volume of activity over which fixed costs remain constant and the cost behaviors are predictable. All the cost and revenue information used in the analysis applies only within this range.

### Revenue

The revenue per unit is assumed to remain constant throughout the analysis. This means that factors such as bulk discounts or changes in pricing strategy are ignored. Therefore, total revenue increases in direct proportion to the number of units sold. For example, if each unit is sold for Rs 100, and the company sells 10 units, the total revenue will be Rs 1,000, and if it sells 20 units, the total revenue will be Rs 2,000.

### Variable Costs

The variable cost per unit is also assumed to remain constant. This means that total variable costs change directly with changes in production or sales volume. For example, if the variable cost per unit is Rs 5 and the company produces 1,000 units, the total variable cost would be Rs 5,000. Variable costs include direct materials, direct labor, variable manufacturing overhead, and variable selling expenses such as commissions and shipping.

### Fixed Costs

Total fixed costs are assumed to remain unchanged regardless of the level of production or sales volume. As a result, the fixed cost per unit decreases as the volume increases. For instance, if fixed costs are Rs 10,000, producing more units will spread these costs across more units, reducing the fixed cost per unit. Conversely, producing fewer units will increase the fixed cost per unit. Fixed costs include fixed manufacturing overhead and fixed selling and administrative expenses.

### Mixed Costs

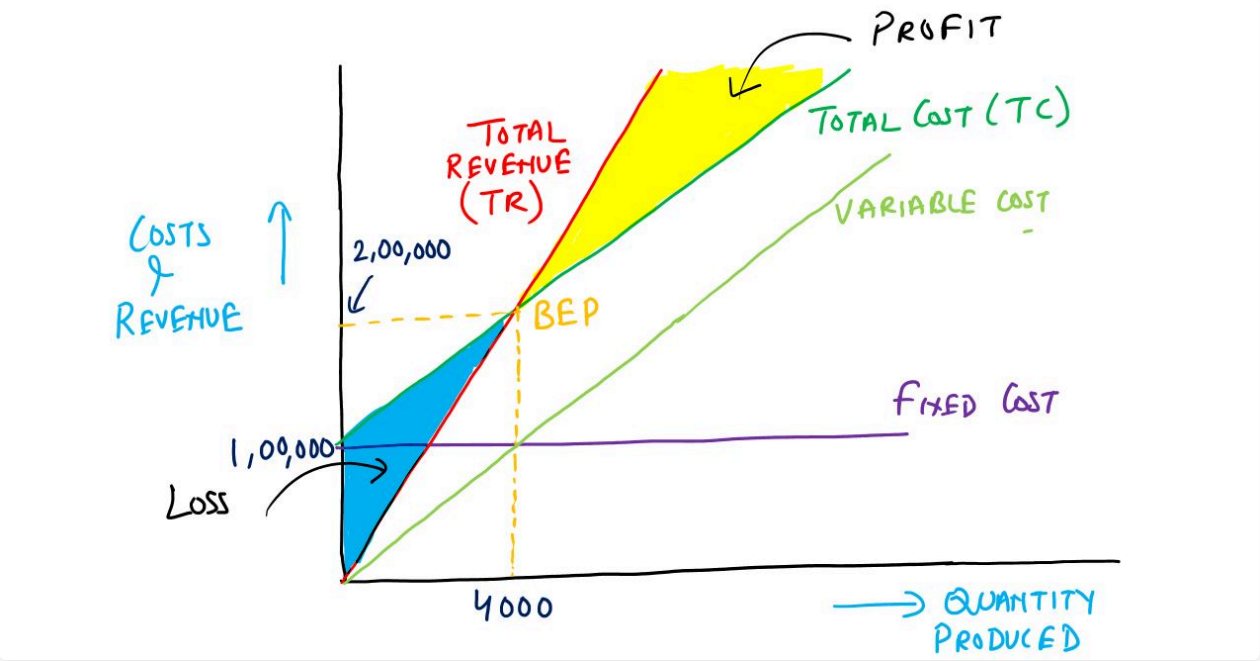
Mixed costs (which have both variable and fixed components) must be separated into their variable and fixed elements before they can be used in break even analysis. This can be done using methods like the high-low method or regression analysis, which allow businesses to accurately analyze how mixed costs behave in relation to production or sales activity.

---

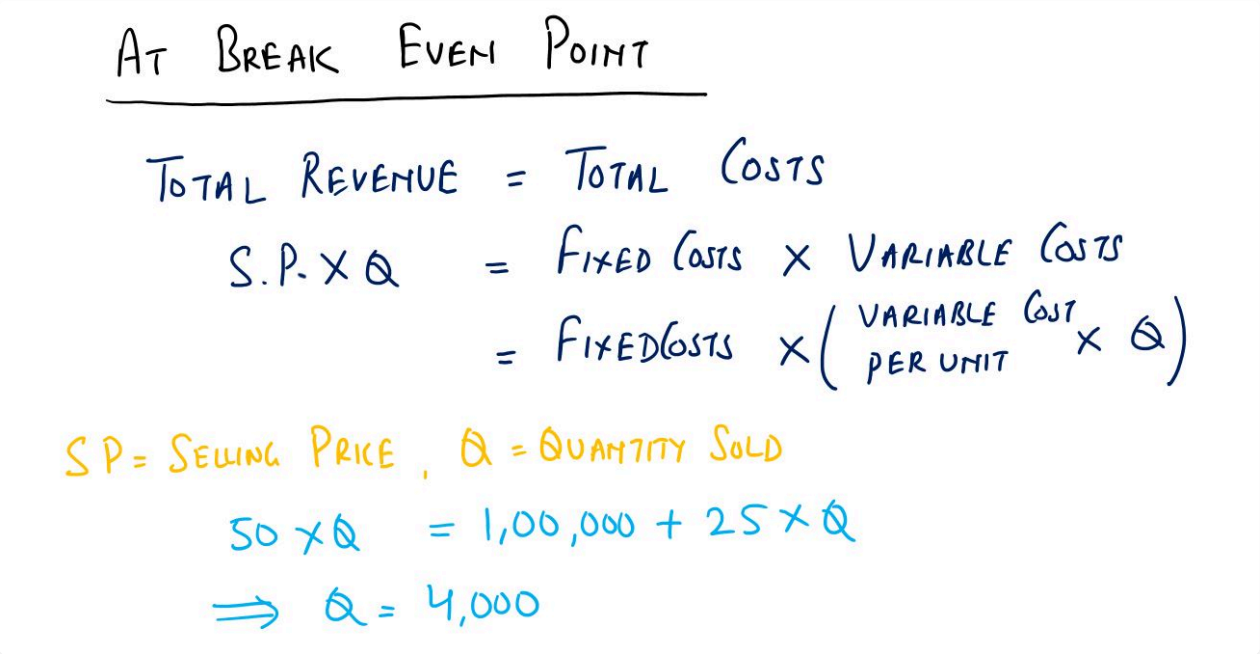
# 6. Break Even - Graphical understanding

Let us look at graphical understanding of Break Even analysis.

Consider a firm that produces shirts, which are sold at Rs 50 per shirt. The company has annual fixed operating costs of Rs 1,00,000, and variable operating costs are Rs 25 per shirt.




We wish to study the relationship between total operating costs and total revenues. One means for doing so is with the break-even chart in figure, which shows the relationship among total revenues (TR), total operating costs (TC), and profits for various levels of production and sales. As we are concerned only with operating costs at this point, we define profits here to mean operating profits before taxes.




The intersection of the total costs (TC) line with the total revenues (TR) line determines the break-even point (BEP). The BEP is the sales volume required for total revenues to equal total operating costs or for operating profit to equal zero.

In our figure, this BEP is 4,000 shirts of output (or Rs 2,00,000 in sales since each shirt sells for Rs 50).

Profit or Loss (Operating Income) at any sales level can be determined by the vertical distance between the two lines (Total Cost and Total Revenue). For quantities fewer than 4000 units sold, total costs exceed total revenues, and the blue area indicates

operating losses. For quantities greater than 4000 units sold, total revenues exceed total costs, and the yellow area indicates operating incomes (profit). At 4000 units sold, total revenues equal total costs.

---

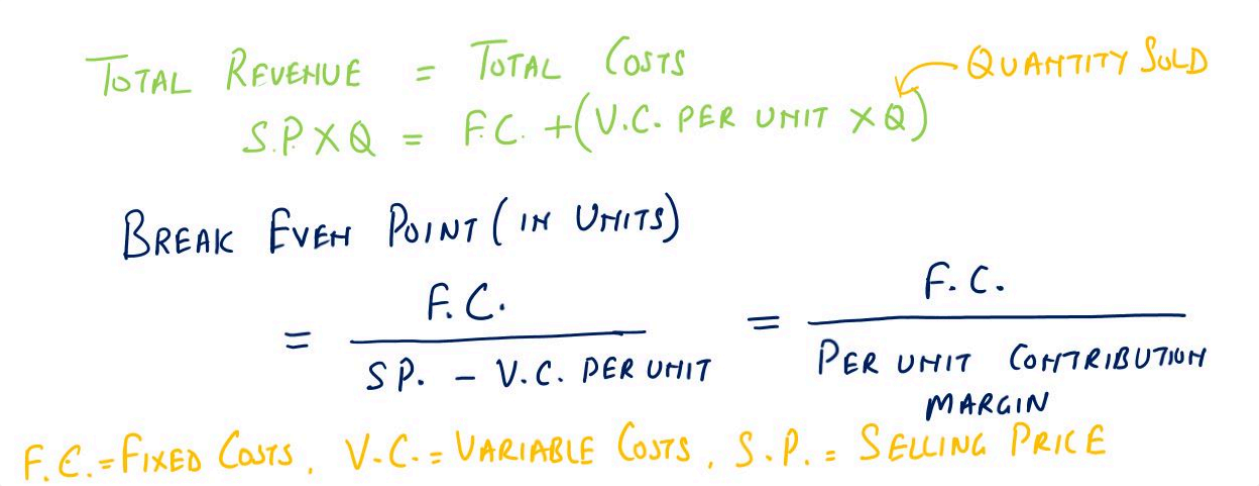
# 7. Break Even - Equation method

Let us now understand the formula to find out break even point.

The Break Even Point (BEP) is the sales volume required for total revenues to equal total operating costs or for operating profit to equal zero.

Contribution per unit refers to the revenue generated from the sale of each shirt, which is available to cover fixed costs. Any amount remaining after covering fixed costs contributes to operating profits.

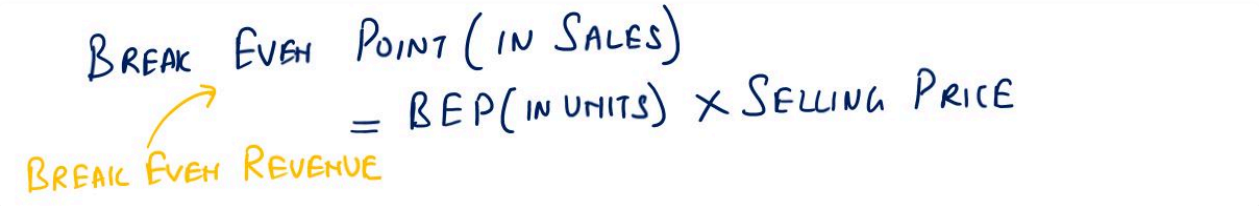
The Break-Even Point (BEP) is when a business covers all its fixed costs but makes no profit. It's like reaching the point where you just break even, neither making money nor losing any.




Once a business sells more than the break-even quantity, it starts making a profit. But if it sells less than that, it starts losing money because it can't cover all its fixed costs.

We have calculated the Break-Even Point in terms of how many units need to be sold.

Another way to look at it is in terms of total sales volume. To find this, we just multiply the Break-Even Point (in units) by the price of each unit sold.




Another formula to compute the Break-Even Point (sales) is given by:

## Break Even Point (in Sales)

$$= \frac{\text{F. C.}}{\text{Contribution Margin Percentage}}$$

Unit Contribution Margin / Selling Price

$$= \frac{\text{F. C.}}{\text{P/V Ratio}}$$

## 8. Target Operating Income

While the breakeven point indicates how much needs to be sold to prevent a loss, managers are equally focused on reaching specific operating income goals.

In other words, they want to determine the required sales volume to achieve a targeted level of operating income.

$$\text{Required Sale (in Units)} = \frac{\text{F.C.} + \text{Target Operating Income}}{\text{Per unit contribution margin}}$$

$$\text{Required Sale (in Sales)} = \frac{\text{F.C.} + \text{Target Operating Income}}{\text{Contribution Margin Percentage}}$$

**Effect of Taxes**

Until now, we have ignored the effect of income taxes in our analysis. In many companies, the income targets for managers in their strategic plans are expressed in terms of net income. That's because top management wants subordinate managers to take into account the effects their decisions have on operating income after income taxes.

Net income is operating income plus non-operating revenues (such as interest revenue) minus nonoperating costs (such as interest cost) minus income taxes. For simplicity, throughout this discussion we assume non-operating revenues and non-operating costs are zero.

$$\text{Net Income} = \text{Operating Income} - \text{Taxes}$$

To make net income evaluations, the calculations for target income must be stated in terms of target net income instead of target operating income. The key step is to take the target net income number and convert it into the corresponding target operating income number.

$$\text{Target Operating Income} = \frac{\text{Target Net Income}}{1 - \text{Tax Rate}}$$

## 9. Incremental Analysis

The break even point (BEP) can increase or decrease, depending on revenue and cost changes.

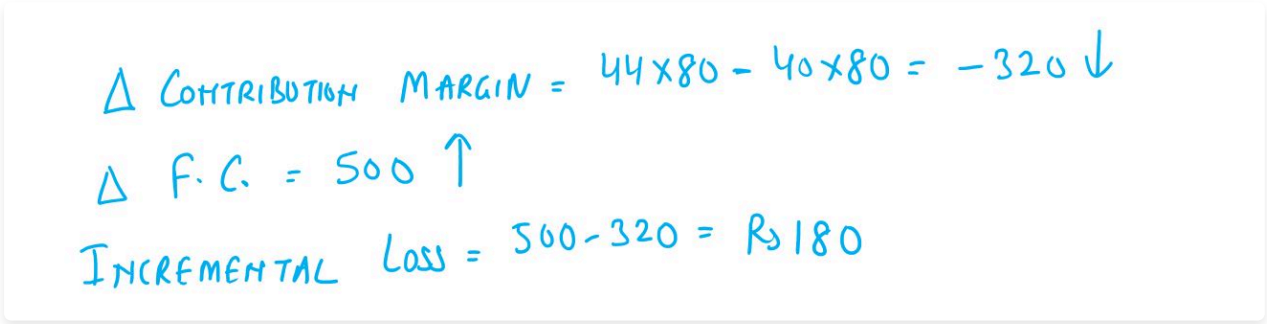
Other things being equal, the BEP will increase if there is an increase in the total fixed cost or a decrease in the unit (or percentage) contribution margin. A decrease in contribution margin could arise because of a reduction in selling price, an increase in variable cost per unit, or a combination of the two.


The BEP will decrease if total fixed cost decreases or unit (or percentage) contribution margin increases.

A change in the BEP will also cause a shift in total profit or loss at any level of activity. **Incremental analysis** is a process that focuses only on factors that change from one course of action or decision to another. The incremental analysis is focused on changes occurring in revenue, cost, and/or volume.

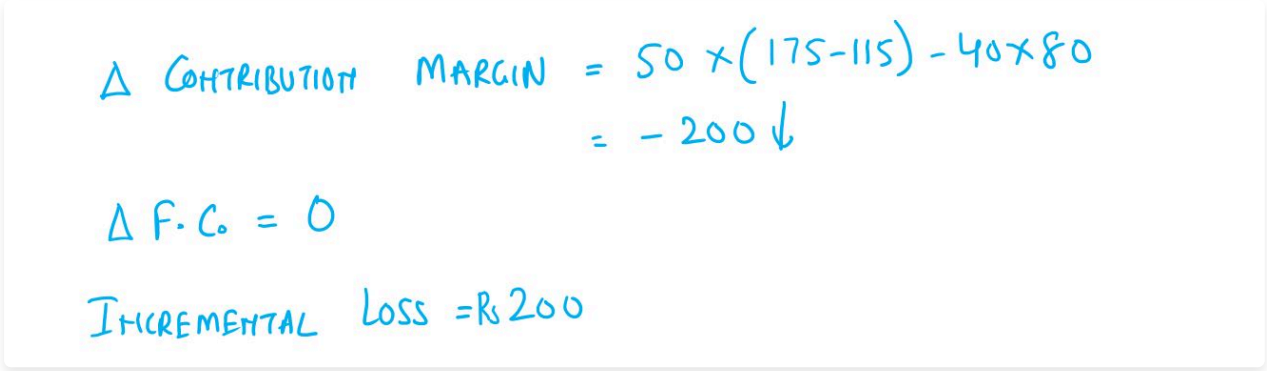
In most situations, incremental analysis is sufficient to determine the feasibility of contemplated changes, and a complete income statement need not be prepared.

Suppose we anticipate selling 40 units of product with operating income will be Rs 1,200. The selling price is Rs 200 and the variable cost per unit is Rs 120. We are considering placing an advertisement describing the product. The advertisement will be a fixed cost of Rs 500. We think that advertising will increase sales by 10% to 44 packages. Should we advertise?



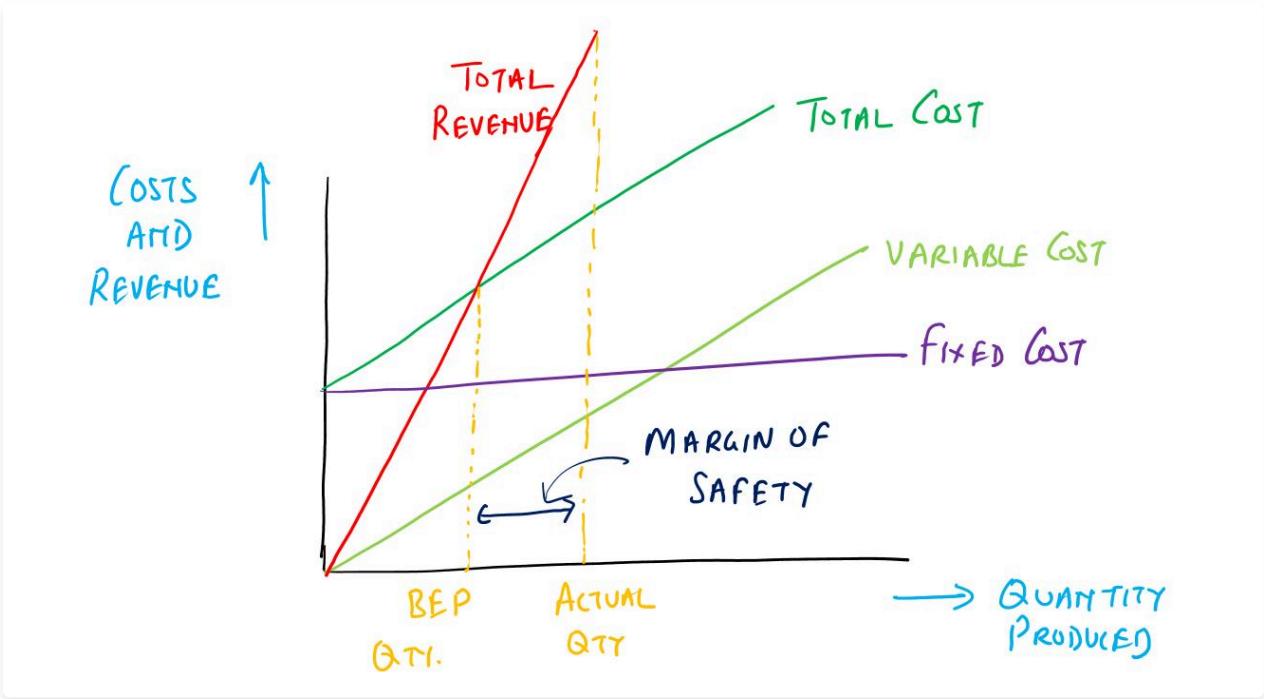

Thus, it is recommended, not to advertise.

Having decided not to advertise, we are contemplating whether to reduce the selling price to Rs 175. At this price, we think we will sell 50 units. At this quantity, the variable cost per unit will decrease to Rs 115. Should we reduce the selling price?



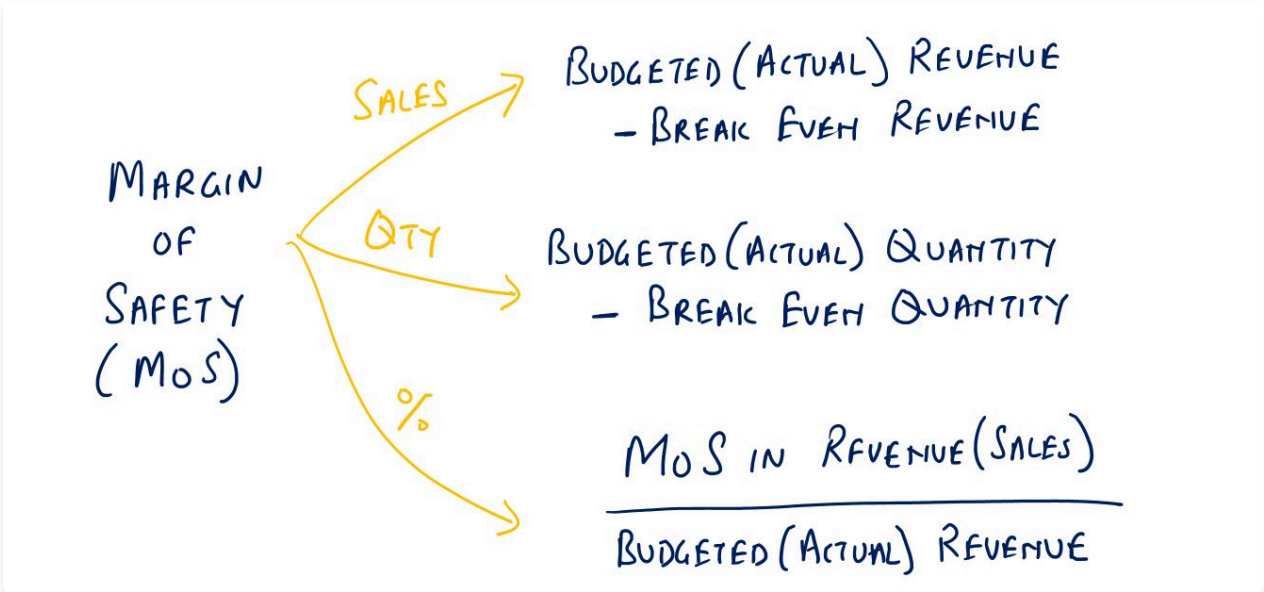

Thus, it is recommended, not to reduce selling price.

## 10. Margin of Safety




When making decisions about business opportunities and changes in the sales mix, managers often consider the **margin of safety** (MoS). This metric represents the difference between budgeted or actual sales and the break-even sales. The MoS indicates how much sales can decline before the business reaches its break-even point, providing a buffer or "cushion" against potential losses.

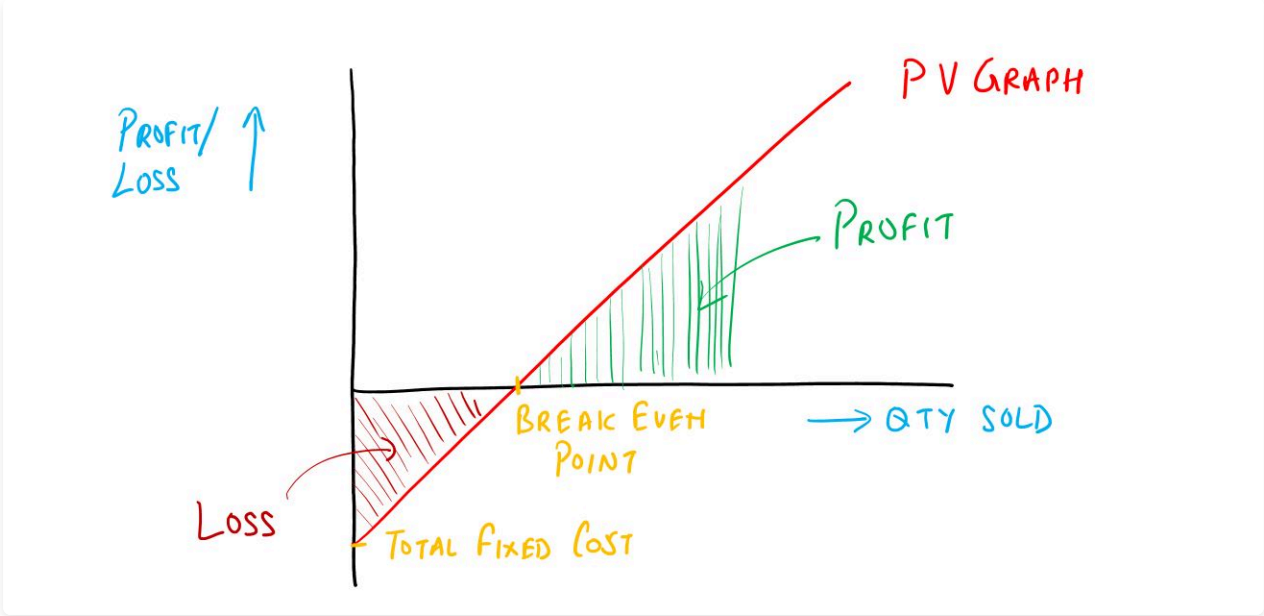
By calculating the MoS, management can assess how close the company is to reaching a critical "danger level" and gauge the associated risk. A lower MoS signals that the company is operating with a smaller cushion, requiring management to closely monitor revenues and control costs to prevent losses. When the margin of safety is low, managers are less inclined to pursue opportunities that, if misjudged, could result in a loss.




The MoS can be expressed in units, dollars (sales), or as a percentage (MoS%).

# 11. Profit Volume Graph

The **Profit Volume (PV) graph** visually represents the profit or loss associated with different sales levels. On the graph, the horizontal (x) axis shows sales volume (quantity sold), while the vertical (y) axis displays the profit or loss in dollars. Any values above the x-axis indicate profit, while those below represent losses.




Key points can be identified on the graph, such as total fixed costs and the Break Even Point (BEP). Total fixed costs appear on the y-axis as a negative value because these costs would still be incurred even if no products are sold, resulting in a loss of that amount. The break-even point, where profit equals zero, is located at the point where the profit line crosses the x-axis, indicating no profit or loss.

The slope of the profit line is determined by the unit contribution margin, which reflects the profit contribution per unit sold. The diagonal line shows how much contribution margin is earned at each sales level. No profit is achieved until the total contribution margin equals the total fixed costs, at which point the business breaks even.

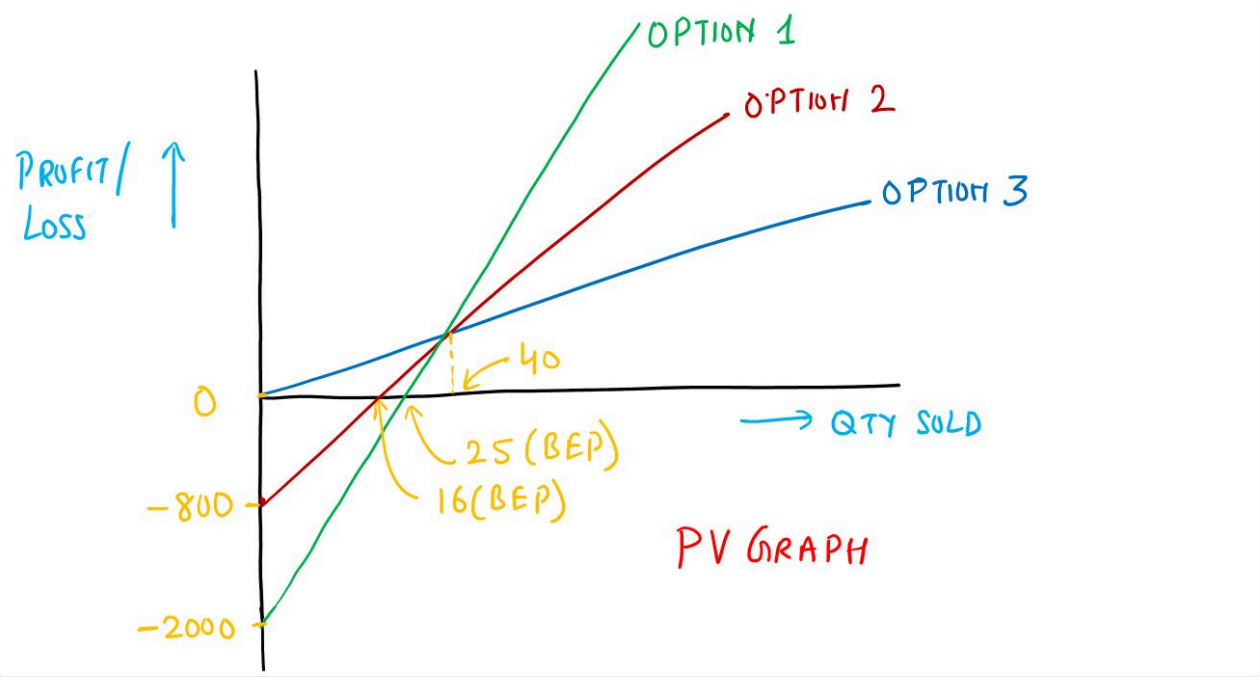
*Let us understand this with an example.*

Riya, an entrepreneur preparing to sell her educational product, "CAT Success Kit," at a major college fair in Mumbai, is presented with three booth rental options by the fair organizers. She must choose the best option based on projected sales.

Here's the breakdown of the three alternatives:
Option 1: Pay a fixed booth rental fee of ₹2,000.
Option 2: Pay a fixed fee of ₹800 plus 15% of her revenue from "CAT Success Kit."
Option 3: Pay 25% of her revenue without any fixed fee.

Riya's variable cost per unit of the "CAT Success Kit" is ₹120. The seling price is ₹200 per unit. Which rental option will be most favorable based on her expected sales?

Using the Profit-Volume (PV) graph, the sales volume is shown on the horizontal axis, and the profit or loss is represented on the vertical axis.




*Option 1:* With a fixed fee of ₹2,000, Riya needs to sell at least 25 units to cover the fixed costs. Beyond 25 units, her profit per unit is ₹80, making this option the most profitable if she can sell more than 40 units.

*Option 2:* This option reduces the fixed cost to ₹800 but adds a 15% revenue share, resulting in a lower profit margin of ₹50 per unit. The breakeven point (16 units) is lower than in Option 1, but the profit is also reduced.

*Option 3:* Here, Riya avoids any fixed cost but sacrifices a significant portion of her revenue, earning only ₹30 per unit. This option carries no risk of loss, as she breaks even with zero sales, but offers the lowest profit potential.

Riya's decision will depend on her expectations for sales volume and her tolerance for risk. Higher fixed costs (Option 1) mean higher profits if sales are strong but greater risk if sales are low. Lower fixed costs (Option 3) minimize financial risk but limit profit if sales exceed expectations.

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## 12. Degree of Operating Leverage

Another useful metric closely related to the Margin of Safety (MoS) that provides valuable management insights is the company's **degree of operating leverage** (DOL).

Operating leverage reflects the balance between a company's variable and fixed costs and shows the impact that fixed costs have on changes in operating income (EBIT) as the number of units sold and the contribution margin fluctuate.

Typically, companies with high labor costs and lower fixed costs (e.g., labor-intensive organizations) exhibit *low operating leverage*. In contrast, companies that are highly automated or capital-intensive, with low variable costs and high fixed costs, have *high operating leverage*.

In businesses with high operating leverage, where variable costs are low compared to the selling price, the contribution margin is high. While these companies need to reach a higher sales volume to cover fixed costs, every unit sold beyond the breakeven point significantly boosts profits. As a result, even a small increase in sales can lead to a substantial rise in profits.

The **degree of operating leverage** (DOL) quantifies this effect by measuring how a percentage change in sales will affect the company's profits. In essence, DOL indicates the sensitivity of a company's profits to changes in sales volume, highlighting the potential for profit increases or decreases based on sales fluctuations.

This formula compares the percentage change in EBIT to the percentage change in sales revenue. A higher DOL indicates that a firm has a greater proportion of fixed costs in its cost structure, resulting in higher operating leverage. Conversely, a lower DOL suggests that a firm has fewer fixed costs relative to variable costs, resulting in lower operating leverage.

$$\text{Degree of Operating Leverage (DOL)} = \frac{\%\ \text{Change in EBIT}}{\%\ \text{Change in Sales}}$$

Above formula is good for defining and understanding DOL, but we would need a few simple alternative formulas for actually computing DOL values:

$$\text{Degree of Operating Leverage (DOL)} = \frac{Q}{Q - Q_{BEP}} = \frac{EBIT + FC}{EBIT} = \frac{\text{Contribution Margin}}{EBIT}$$

$Q$ = Quantity Sold, $Q_{BEP}$ = Break Even Quantity

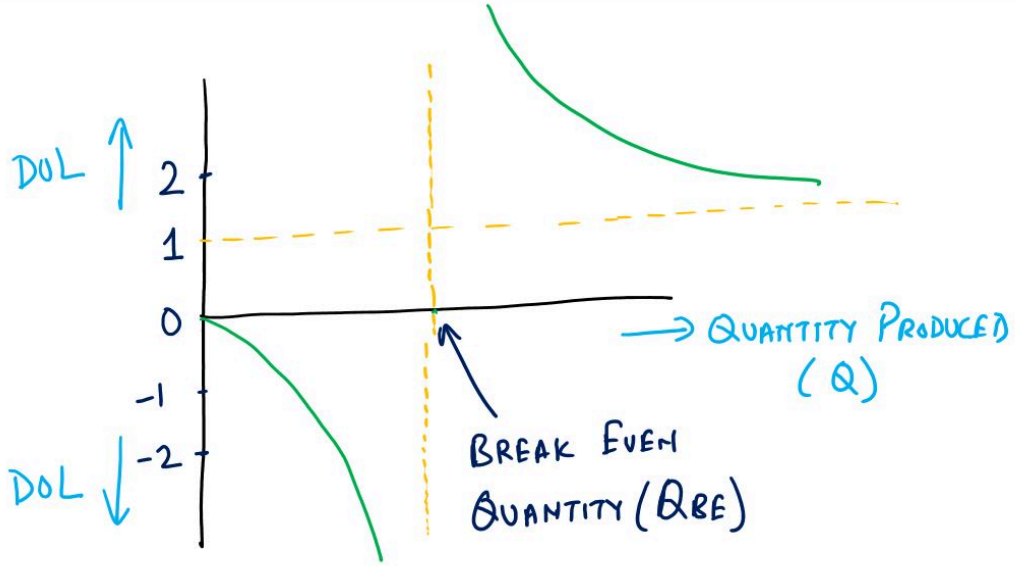
## 12. Degree of Operating Leverage

The Degree of Operating Leverage (DOL) decreases as sales rise above the break-even point (BEP). Therefore, when the Margin of Safety (MoS) is low, the DOL is high. In fact, at the BEP, DOL becomes infinite, as any increase in sales from zero represents an infinite percentage change.

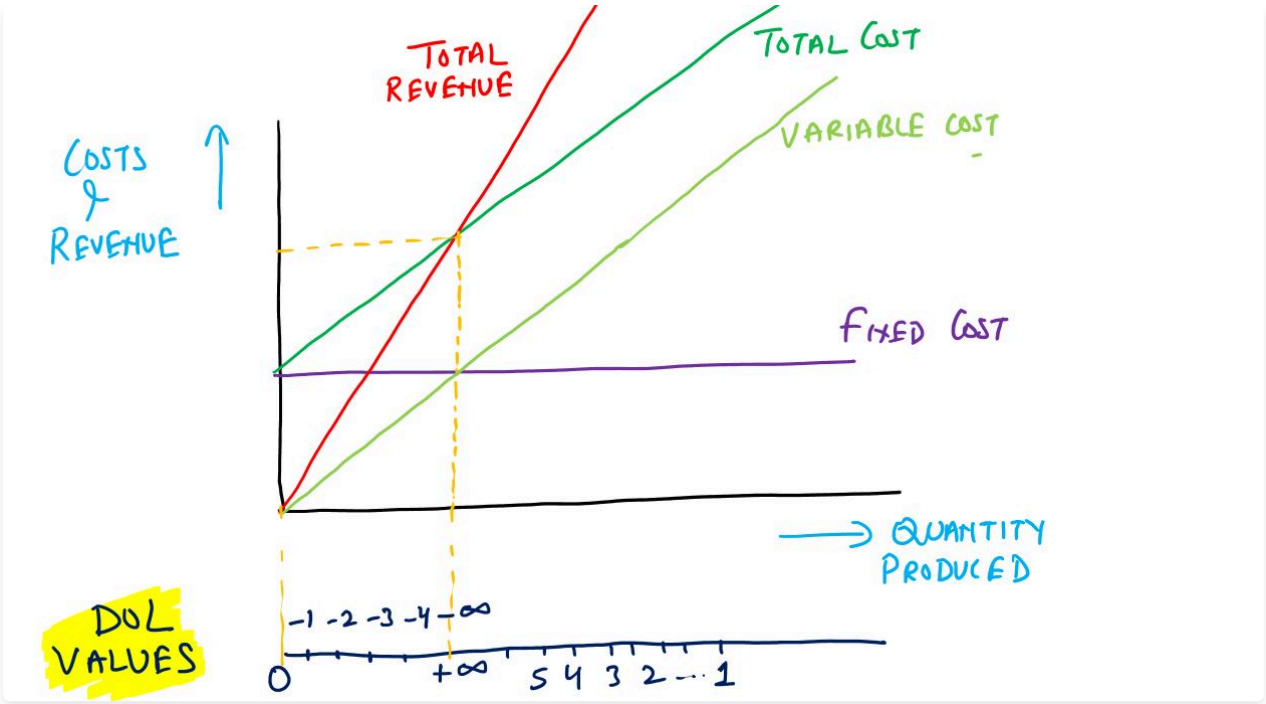
When a company is operating close to the BEP, even a small percentage increase in sales can have a significant impact on net income. However, as sales increase beyond the BEP, the Margin of Safety grows, while the Degree of Operating Leverage decreases.

The relationship between the Margin of Safety percentage (MoS%) and DOL can be described as follows:

$$\text{Degree of Operating Leverage (DOL)} = \frac{1}{\text{Margin of Safety \%}}$$




From figure, we can see that as DOL approaches positive (or negative) infinity as sales approach the break-even point from above (or below) that point. DOL approaches 1 as sales grow beyond the break-even point. This implies that the magnification effect on operating profits caused by the presence of fixed costs diminishes toward a simple 1-to-1 relationship as sales continue to grow beyond the break-even point.




Even firms with large fixed costs will have a low DOL if they operate well above their break-even point. By the same token, a firm with very low fixed costs will have an enormous DOL if it operates close to its breakeven point.

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