Chapter 2
Basic Cost Terms, Concepts, and Estimation

INRODUCTION

- Profit maximization is one of the main goals/objectives of all profit-seeking organizations. To maximize profit, firm managers need to maximize ***revenues*** and/or minimize ***costs***.

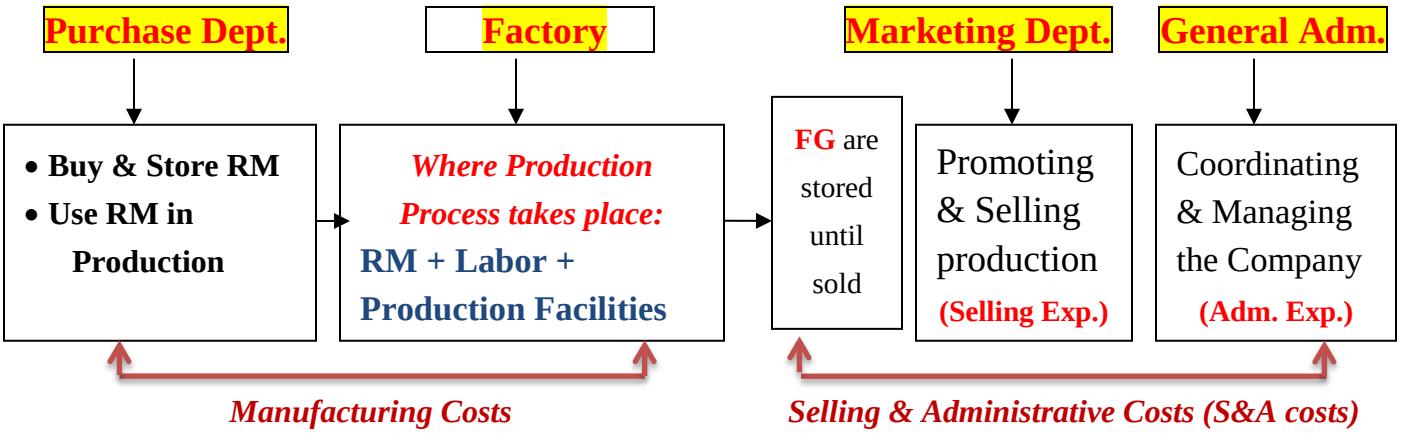
- Which of these two elements is more effective & efficient in achieving this goal? Why?

- There are three major types of *profit-seeking* organizations: manufacturing, merchandising and service companies. The underlying concepts, tools and techniques that we develop in this course are equally applicable to the three types of organizations. However, because most of the challenging managerial accounting problems occur in the ***manufacturing sector***, the primary focus and applications in this course will be on ***manufacturing companies***.

- In order to produce a product (e.g., cars, furniture, clothes, etc.), the company needs to acquire and use three major input factors (elements) of ***manufacturing costs***: raw materials, labor and production facilities.
  a. **Raw Materials** are the major substances that constitute the physical shape of the product.
  b. **Production Workers** that are involved directly or indirectly in the process of converting the raw materials into finished products.
  c. **Production facilities** required to help the production workers to transform the materials into finished goods. Examples include factory building, machines, etc.

- In addition to manufacturing costs, manufacturing companies incur two other types of ***non-manufacturing costs***: (i) Selling costs and (ii) Administrative costs.

Figure 1
Physical Components of a Manufacturing Company



Managers need to actively ***manage the costs*** incurred in their divisions.

COST

- A cost is the monetary value of economic resources sacrificed by a company in order to ***acquire*** and/or ***use*** resources (assets) to achieve a specific objective such as manufacturing a product or providing a client a service.

EXPENSE

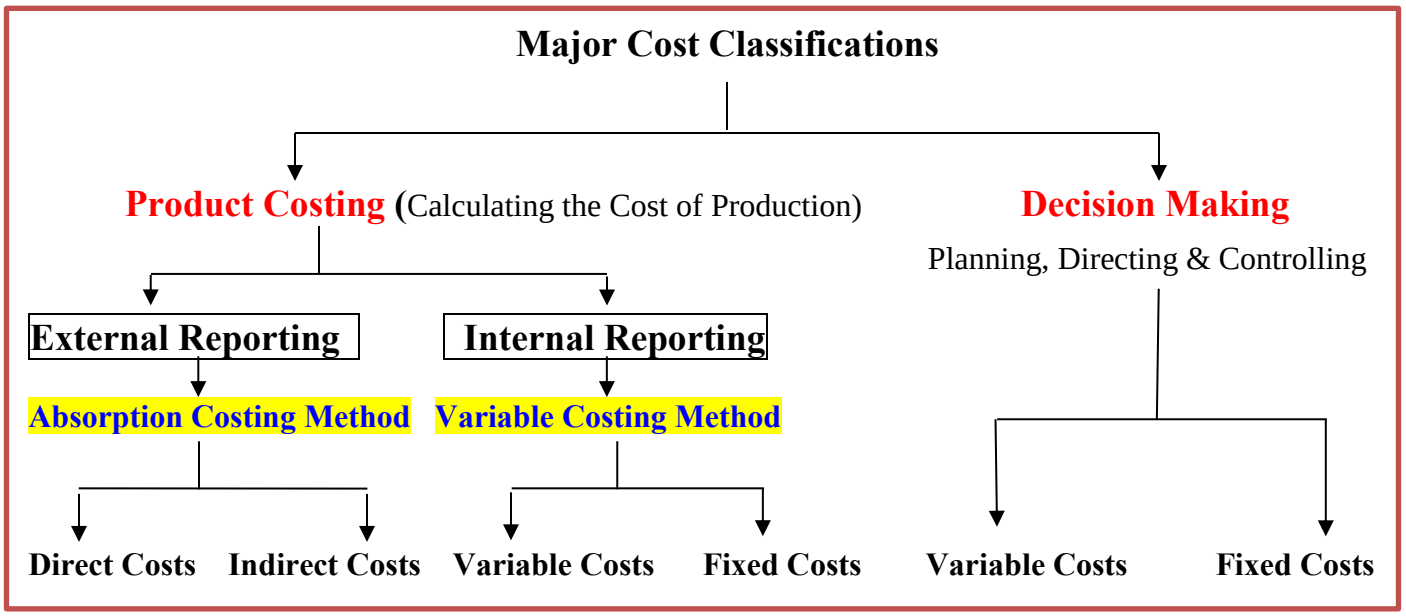
- An ***expense*** is the monetary value of economic resources sacrificed/used up by a firm in the process of ***generating Revenues.***

- *Cost data* constitutes the primary ingredients in ALL managerial decisions.

- The word ***cost*** is a very broad term that can have different meanings depending on the context in which it is used. In other words, the term cost has so many different characteristics, where some attributes that are ***relevant*** (useful) for one decision could be totally ***irrelevant*** (inappropriate) for another decision. This feature is referred to as **"different costs for different purposes".** In other words, the way we should measure and classify cost information depends on the *purpose* for which cost is needed.

- There are a variety of dimensions on which costs can be measured and classified. In this course we will focus on two major classifications of costs so to achieve two different purposes: *Product Costing* & *Decision Making*. See Figure 1.

Figure 2



I. Classifying Costs For the Purpose of Designing Product Costing Systems

1. **Cost**
2. Cost Object
3. Cost Assignment
4. Cost Accumulation
5. **Direct Costs vs. Indirect Costs**
6. Cost Tracing
7. Common costs
8. Cost Pool
9. Cost Allocation
10. Cost Allocation Base
11. Product Costing
12. Product Costing System
13. Manufacturing Costs
14. Direct Materials cost **(DM)**
15. Direct Labor cost **(DL)**
16. Manufacturing (Factory)Overhead Cost **(MOH or FOH)**
17. Prime Costs
18. Conversion Costs
19. Cost of Goods Manufactured **(CGM)**
20. Cost of Goods Sold **(CGS)**

Ch. 3: ***Job-Order*** **Costing System**
Ch. 4: ***Activity-Based*** **Costing System**
Ch. 5: ***Process*** **Costing System**

II. Classifying Costs Information for the Purpose of Decision-Making:

21. Cost Behavior
22. Cost Driver
23. **Variable Costs vs. Fixed Costs**
24. Mixed Costs
25. Step-fixed Costs
26. Piecewise variable Costs
27. Average Cost
28. Cost Estimation
29. Linear Cost Functions
30. Relevant Range

Ch. 6: ***Cost-Volume Profit*** **(CVP) Analysis**
Ch. 7: ***Decision-Making*** **Analysis**

Ch. 11: ***Performance Evaluation*** **(Var. Analysis I)**
Ch. 12: ***Performance Evaluation*** **(Var. Analysis II)**

III. Alternative Approaches for Product Costing Systems:

31. **Absorption Costing Method**
32. **Variable Costing Method**
33. Product (Inventoriable) Costs
34. Period Costs
35. Gross margin (gross profit)
36. Contribution margin

Chapter 8 Product Costing Methods

COST OBJECT

- A ***cost object*** is anything for which the firm manager wants to know the cost of. If a manager wants to know the cost of something, this something is called a cost object.
- A cost object can be defined as any activity or item for which you want to separately measure costs. Examples of cost objects are a product, a research project, a customer, a sales region, an entire organization, etc.
- Measuring the cost of a cost object involves two basic stages: (i) cost ***accumulation*** and (ii) cost ***assignment***.

COST ACCUMULATION

- Cost accumulation is the process of tracking, recording, and classifying the actual costs incurred into meaningful groups.

COST ASSIGNMENT

- Cost assignment is the process of assigning the accumulated costs to the ***cost objects*** that are responsible for incurring the costs.
- There are two procedures for assigning costs incurred to cost objects:

  (A) ***Tracing*** the accumulated costs that have a ***direct*** relationship to a specific cost object.
  (B) ***Allocating*** the accumulated costs that have an ***indirect*** relationship to a cost objects.

- A key question in cost assignment is whether costs have a direct or an indirect relationship with the cost objects. This distinction is important because costing systems handle these two types of costs very differently

A. DIRECT COSTS:

- Direct costs refer to the costs that are incurred or spent on a single cost object. In other words, there is a cause-and-effect relationship between the incurrence of direct costs and the amount of cost consumed by the designated cost object.
- The direct costs, therefore, can be ***traced*** (assigned entirely) to *that* cost object in an ***accurate*** and ***economically feasible*** (cost-effective) manner.
- The term cost tracing describes the assignment of direct costs to the particular cost object.

B. INDIRECT COSTS

- Indirect costs (also called common costs) are the cost of resources that are shared by several cost objects, where the cost objects might differ significantly in their utilization of the shared resources.
- The link between the indirect costs incurred and the related cost objects is not based on a cause-and-effect relationship but rather based on correlation/association.
- Therefore, it is impossible to ***accurately*** measure the exact amount of the indirect costs that should be assigned to each specific cost object.
- In this case, the assignment of indirect costs to cost object is achieved by applying a technique called "***cost allocation***".

COST ALLOCATION

- Cost allocation is the method used to assign indirect costs of shared resources to the related cost objects that consume the resources. The process of cost allocation involves two steps:

Step 1: Forming Activity Cost Pools

- An activity **cost pool** is a collection of activities grouped together in a cost pool based to some common attributes.

Step 2: Identifying an Allocation Base

- An allocation base is the basis upon which an entity allocates the indirect costs accumulated in the cost pool to the cost objects based on their relative consumption of the allocation base.
- An allocation base takes the form of a quantity, such as machine hours used, kilowatt hours consumed, or square footage occupied.

Note the following:

- The term "allocation" implies that cost allocation is an approximate method and that there is no precise method for charging a cost to a cost object.
- The goal of whichever cost allocation method you use is to either spread the cost in the fairest way possible.
- The selection of allocation base is subjective and arbitrary.
- The classification of costs into direct and indirect are defined with reference to a **specific** cost object. A particular cost can be classified as direct with respect to a certain cost object and indirect with respect to another cost object.

Example:

- John, Raj and Adam rented a 3-bderoom appartment for the Winter Term. The contract is signed by John.
- They decided to share all the accomodation related expenses. Everyone pays $1,000 in advance. At end of each month, the actual costs incurred are assigned (charged) to each person. As a result of these cost assignment, each person will either get a refund or pays
- Following is a list of the shared expenses that they spent during month Januar 2017.

Required:

Calcuate the amount of the costs incurred during January that should be assigned to each roomate.

Cost Accumulation

Parking (for two spots)	**200**
Internet Serivce	**100**
Rent	**$1,000**
Utilities	**300**
Cleaning Service	**200**
Grocery	**900**
Total	**2,700**

Additional Information:

Parking spots are used by Jhon and Adam

The Interent Service is used exclusivy by John.

Cost Assignment to Cost Objects

John

Adam

Raj

Cost Flows in a Manufacturing Company

Costs incurred in manufacturing companies can be classified into two categories: manufacturing costs and non-manufacturing costs.

1. Manufacturing (Production) costs

Manufacturing costs are the costs incurred to make a product or service. These costs consist of three main categories: direct materials, direct labor, and manufacturing overhead.

a. **Direct materials**.

Direct materials (DM) are the costs of raw materials and parts that become an integral part of the finished product and that can be easily and accurately traced to each unit of output in an economically feasible way. An example of direct materials in a furniture manufacturing company is wood and in clothing manufacturing company is fabric.

b. **Direct Labor**

Direct labor (DL) are the wages paid to production line workers who are involved directly in manufacturing the product and can be easily and accurately traced to each unit of output in an economically feasible way. An example of direct labor in a clothing manufacturer is the wages paid to the workers who operate the sewing machines. .

c. **Manufacturing Overhead**

Manufacturing overhead (MOH) or Factory Overhead (FOH) consists of ***all manufacturing costs*** other than direct materials and direct labor. These costs cannot be easily and conveniently traced to products. Therefore, they are classified as INDIRECT costs. This group of manufacturing costs includes INDIRECT MATERIALS, INDIRECT LABOR, all production facilities such as factory rent, factory insurance, depreciation of equipment, etc.

2. Non-manufacturing costs

A manufacturing company incurs many other costs in addition to manufacturing costs. For financial reporting purposes most of these other costs are typically classified as selling (marketing) costs and administrative costs.

Figure 4
Cost Assignments in a Manufacturing Setting

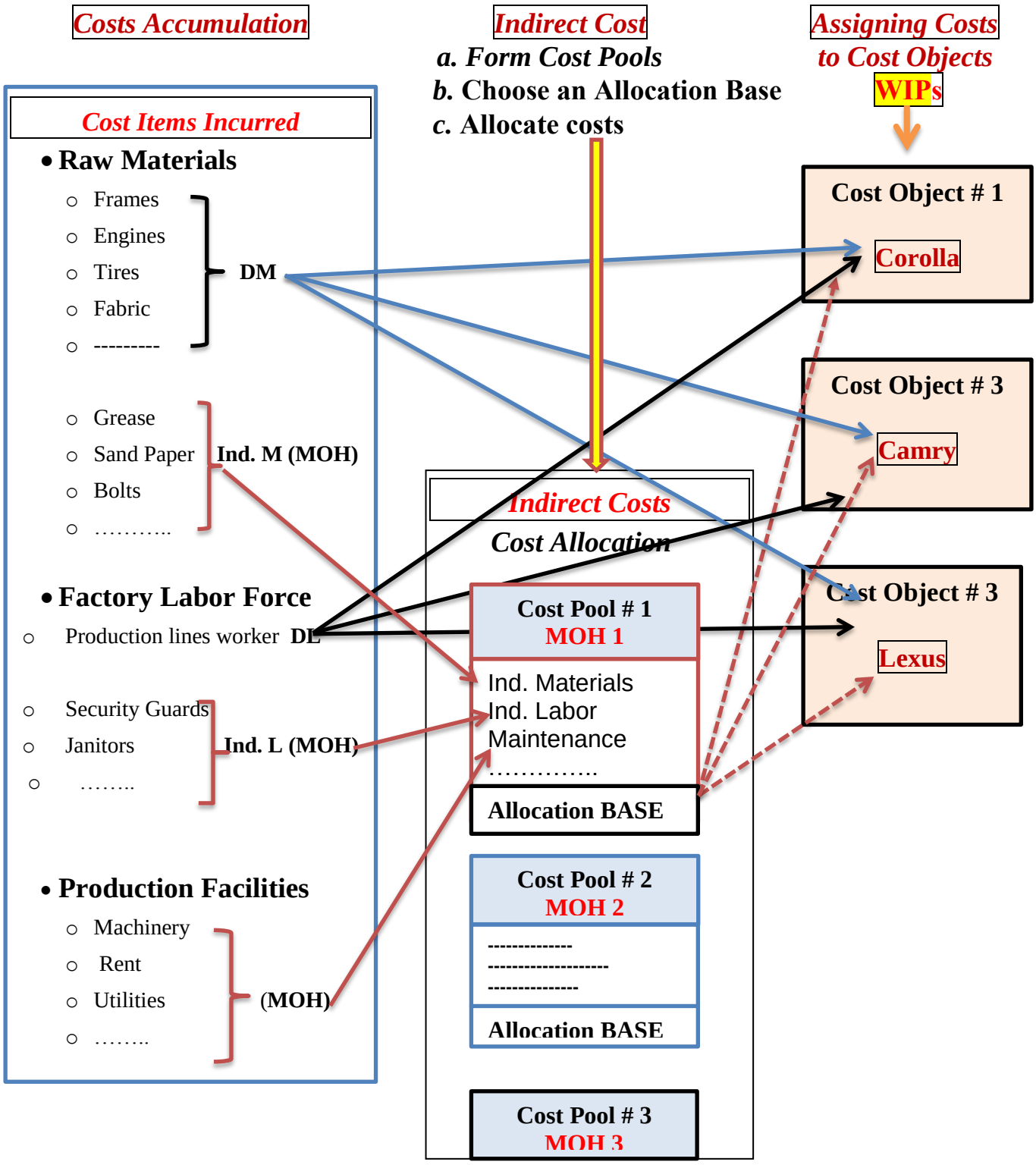
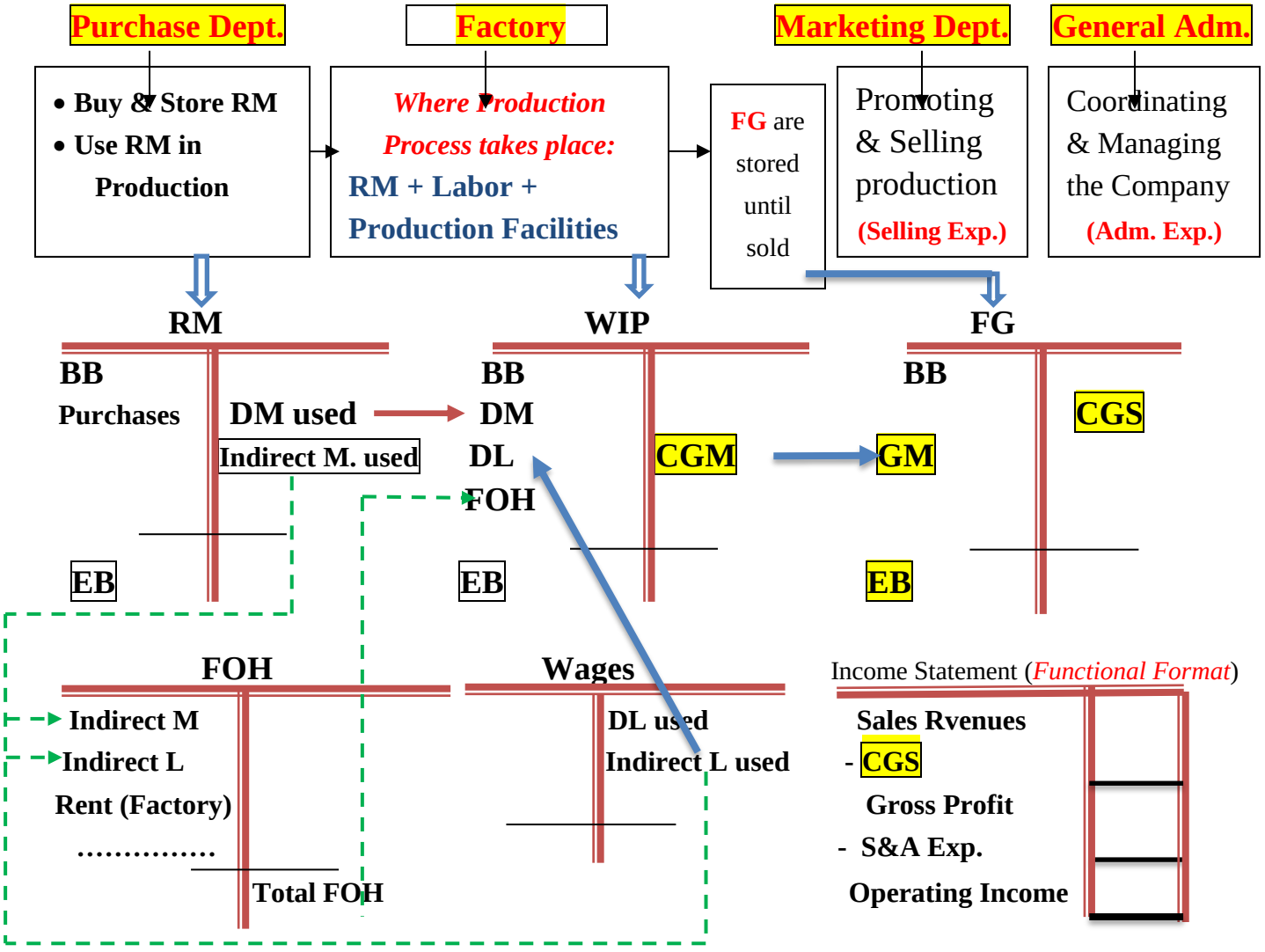


Figure 5 – Cost Flows in a Manufacturing Company



Manufacturing Costs

1. Direct Material (DM) + 2. Direct Labor (DL) → Direct cost or **Prime Costs** (1 + 2)
2. Direct Labor (DL) + 3. Manufacturing Overhead (MOH) → **Conversion Costs** (2 + 3)
3. Manufacturing Overhead (MOH)
   - Indirect Material
   - Indirect Labor
   - Other manufacturing overhead (Production Facilities)
4. **Total Manufacturing Costs** = DM + DL+ MOH (1+ 2 + 3)
5. **Total Costs of WIP** = Total Manufacturing Costs + BB (WIP)

Example 1:

Ryder Company incurred the following costs last month: (in thousands**)**

Purchases of raw materials.....		$200
Direct labor		270
Manufacturing overhead:		
Indirect materials	$ 5	
Indirect labor.....	100	
Other MOH.....	315	420

Additional data:

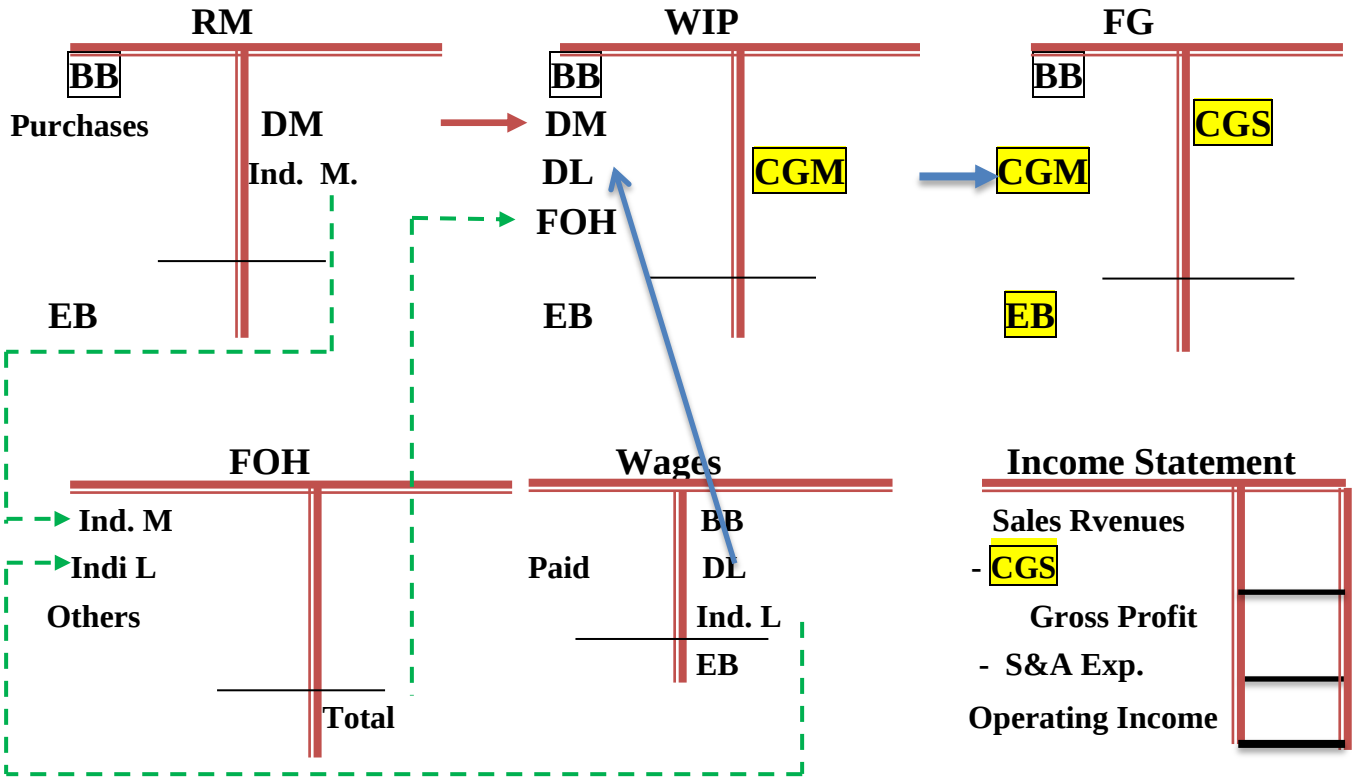
	Beginning Balance	Ending Balance
Raw materials inventory	$10	$30
Work in process inventory	$40	$60
Finished goods inventory	$130	$80
Wages Payable	$50	$100

Total Sales Revenues during the period …….. $1,200

Total Selling & Administrative (S&A) Expenses …… … $100

Required:

1. Calculate the net operating income for the period
2. The total amount wages paid during the period

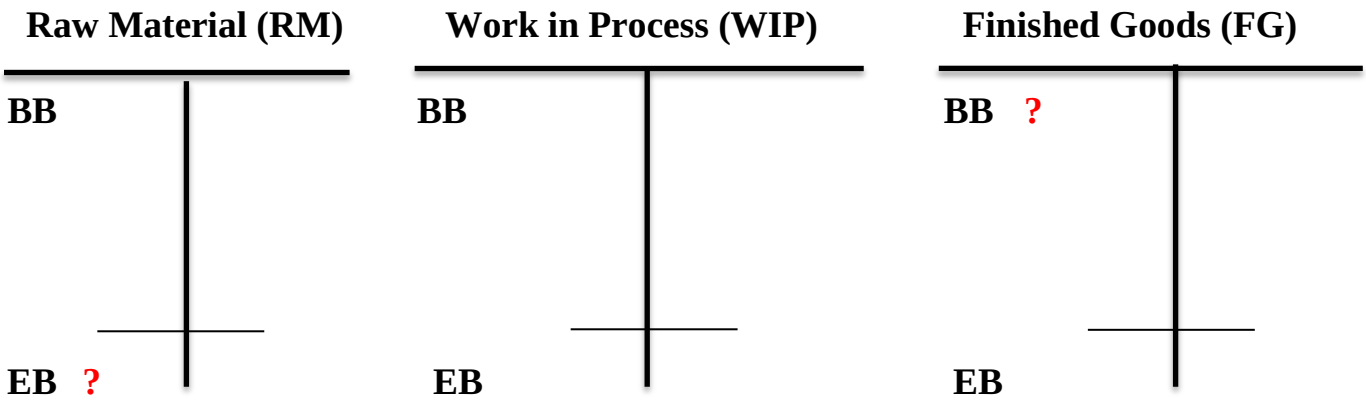


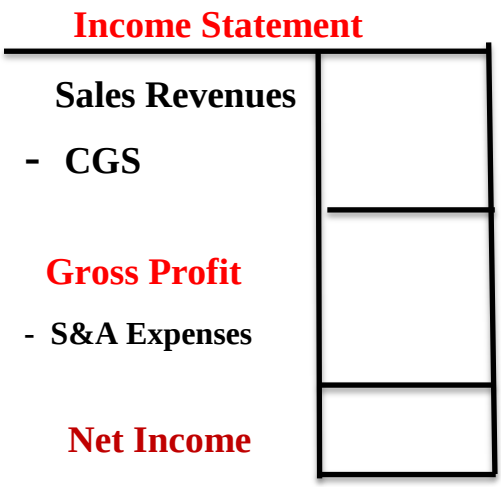
Example 2:
Rexfield Company recorded the following transactions for the month of February:

	Materials	Work in Process	Finished Goods
Purchases	$100,000		
Beginning Inventory	18,000	$ 8,000	(e)
Ending Inventory	(a)	20,000	20,000
Direct Materials		90,000	
Used Direct Labour		(b)	
MOH (including Ind. M. of $10,000)		115,000	
Transferred to Finished Goods		(c)	
Cost of Goods Sold			(d)

- Sales were $420,000 for the month.
- Sales prices are determined by a markup on manufacturing cost of 40%.
- Total manufacturing costs incurred during the month were $285,000.
- Total S&A Expenses $70,000

Required:
1. Find the missing values.
2. Prepare the Income Statement at the end of January.





Practice Questions

T/F

1. The process of assigning costs to cost objects is known as cost assignment.
2. The process of assigning indirect costs to cost objects is known as cost allocation.
3. The process of assigning direct costs to cost objects is known as cost tracing.

Multiple Choices:

1. Last month a manufacturing company had the following operating results:

.. Beginning finished goods inventory	$84,000
Ending finished goods inventory	$71,000
Sales	$505,000
Gross margin	$63,000

What was the cost of goods manufactured for the month?

a. $492,000
b. $442,000
c. $429,000
d. $455,000

Use the following to answer the next two questions

Beginning inventories – March 1	
Direct materials (DM)	$ 20,000
Work in process (WIP)	$ 40,000
Finished goods (FG)	$ 102,000
Ending inventories – March 31	
Direct materials (DM)	$ 26,000
Work in process (WIP)	$ 36,000
Finished goods (FG)	$ 105,000
Purchases of DM during March	$ 110,000
Direct labor cost	$ 160,000
Manufacturing (Factory) OH	$ 80,000

2. The amount of direct materials used during March was:

a. 130,000
b. 110,000
c. 156,000
d. 104,000

3. The cost of goods manufactured for the month was:

a. 348,000
b. 346,000
c. 345,000
d. 384,000

4. In April direct labor was 70% of conversion cost. If the manufacturing overhead cost for the month was $42,000 and the direct materials cost was $28,000, the direct labor cost was:
   a. $98,000
   b. $65,333
   c. $18,000
   d. $12,000

Following are the abbreviations used in this part:

BB	= Beginning Balance of an account.
EB	= Ending Balance of an account.
RM	= Raw Materials.
Purchases	= Purchases of raw materials during the period.
RM Used	= The total amount of raw materials used in production. It consists of two components:
DM	= Cost of direct material used in production.
Ind. M	= Cost of indirect material used in production
DL	= Cost of direct labor used.
MOH (FOH)	= Cost of factory overhead incurred.
TMC	= Total manufacturing costs incurred during the period = DM + DL + MOH
Prime Cost	= DM + DL
Conversion Costs	= DL + MOH
CGM	= Cost of goods manufactured, i.e., the cost of the completed products transferred to finished goods.
CGS	= Cost of goods sold.
Sales	= Sales Revenues dollars.
GP	= Gross profit.
S&A	= Selling and administrative expenses.

Answer Key

1. c
2. d
3. a
4. a

SOME ISSUES RELATED TO MEASURING THE COST OF LABOR

IDLE TIME

- Idle time represents the wages paid to direct labor workers for unproductive time caused by lack of orders, machine breakdowns, material shortages, poor scheduling, and the like. Although the cost of the idle time can be traced to direct labor, it should be treated as indirect labor added to overhead.
- Although the cost of the idle time is paid to direct workers, it should be treated as indirect cots and charged to manufacturing overhead because it is a normal cost of the manufacturing operation. Consequently, it should be spread out among all of the manufactured products.
- However, if the ***customer is responsible*** for causing the idle time, then the cost paid to direct workers for unproductive time should be treated as direct labor and charged to the customer. Note that this case has to be ***explicitly stated*** in the problem; otherwise it should be treated indirect labor. In the absence of this explicit information, **idle time** cost is treated as indirect labor cost.

EXAMPLE 3:

An assembly line worker is idle for 2 hours during the week due to a power failure. If the worker is paid $15 per hour and works a normal 40 hour week, labor cost would be assigned as follows between direct labor and manufacturing overhead:

Direct labor cost ($15 X 38 hours)	$570
Manufacturing overhead cost ($15 x 2 hours)	30
Total cost for the week.....	$600

EXAMPLE 4:

Aramco is an Auto Repair Garage in Hamilton. Andrew is an auto mechanic who is paid $20 per hour. One week he worked 40 hours, which included 4 hours of idle time. 3 hours of the idle time are caused by machine breakdown and one hour is caused by a car that needed a special part that had been requested to be rushed from a local supplier.

The labor cost paid to Andrew for the 40 hours he worked during the week would be assigned as follows between direct labor and manufacturing overhead:

Direct labor cost ($20 X hours)	
Manufacturing overhead cost ($20 x hours)	
Total cost for the week.....	

OVERTIME PREMIUM

- ***Overtime premium*** is the wage rate paid to workers (for both direct labor and indirect labor) in excess of their straight-time wage rates.

- Overtime premium is usually treated as indirect cost and considered to be part of manufacturing overhead even if we can trace the overtime charge to the particular job in process during overtime. If we charge the overtime premium to the job that happened to be in process during overtime, this would overstate the cost of that job since it is only coincidental that particular job happened to be done on overtime. The normal case is that all jobs should be completed during regular hours.

- However, if the ***customer is responsible*** for causing the overtime, then the overtime premium paid to direct workers will be treated as direct labor and assigned to the customer.
  Note that this case has to be *explicitly stated* **in the problem; otherwise it should be treated indirect labor.** In the absence of this explicit information, **overtime premium** cost is treated as indirect labor cost.

EXAMPLE 5:

Assume that an assembly line worker is paid $15 per hour. The worker is paid time and a half for overtime (i.e., time in excess of 40 hours per week). During a given week this employee works 46 hours and has no idle time. Total amount paid to this worker is $735.
How much of Labor cost would be assigned to DL and the amount to be assigned MOH?

Direct labor cost .....

Manufacturing overhead cost .....

Total cost for the week..... $735

EXAMPLE 6:

Assume that an assembly line worker is paid $15 per hour. The worker is paid time and a half for overtime (i.e., time in excess of 40 hours per week). During a given week this employee works a total of 46 hours; of which 4 hours of idle time. The total labor Costs is $735. Labor cost would be assigned as follows:

Example 7:

Randy Smith is paid $40 an hour for straight-time and $60 an hour for overtime. One week he worked 50 hours, which included 40 hours of regular time and 10 hours of overtime. The total amount of Labor cost incurred was $2,200.

The 10 hours of overtime include: 4 hours of idle time caused by material shortages; 4 hours of overtime due to bad scheduling; and 2 hours caused by a special request from a customer who made a late order. How much is charged as direct labour and indirect labour?