Production, planning and control: PPC can be defined as the process of planning the production in advance, setting the exact route of each item, fixing the starting and finishing dates for each item, to give production orders to shops and lastly to follow up the progress of products according to orders. The main aim of PPC is to produce the products of right quality, in right quantity, at the right time by using the best and least expensive methods.

Types of Productions: Following are the three main types of production :

1. Job or unit production
2. Mass or continuous production
3. Batch or quantity production

1. Job production :

1. This is the oldest method of production on a very small-scale.
2. With this method individual requirements of the consumers can be met.
3. Factories adopting this type of production, are generally small in size.
4. The layout of such factories is made flexible so that maximum varieties of work can be easily and efficiently carried out with slight adjustments.
5. Man working in unit production gets an opportunity to produce large type of products, enhance his skills, and can become expert in a very short time.

Advantages :

1. It meets the individual taste and requirement
2. No managerial problems, because of very less number of workers, and small size of concern.
3. It requires less money and easy to start.
4. Less risk of loss to the factory.
5. Because of flexibility, there is no chance of failure of factory due to reduction of demand in particular field.

Disadvantages :

1. There is no scope of commercial economy.

2. As the purchase of raw material is less, the cost of raw materials per unit will be slightly more.
3. For handling different types of jobs, only skilled and intelligent workers are needed, thus labour cost increases.

2. Mass production :

1. This method of production is a large scale production and is a continuous production.
2. The layout used is generally for only one type of product.
3. This type of production uses specially planned layout specialised (one purpose) machines and costly jigs and fixtures.
4. Sequence of flow of the product during manufacturing remains same.
5. In this type of production, different machines are assigned a definite nature of work.
6. To avoid the problem of material handling, conveyors of different types, cranes etc. can be used.
7. This production is used to those industries which are having (a) Continuous demand (b) High volume of production (c) Product standardisation.
8. Eg : Steel mills, automobiles, electricals, electronics, cycles, bolts, nuts and washers, bearings, tyres, soaps, papers, etc.

Advantages :

1. It gives better quality and increased production.
2. Wastage is minimum.
3. As raw materials are purchased on a large scale, and hence higher margin of profits can be made while purchasing them.
4. Sales and advertising do not prove to be costly as their expenses are spread over thousands of articles produced, hence cost per unit is low.
5. This production can be managed with only few skilled, and rest unskilled workers, hence labour cost is reduced.

Disadvantages :

1. During the period of less demand, heavy losses on the invested capital may take place.

2. As all the machines used are one purpose machines (fixed plant layout), this type of production cannot be used for other types of production.
3. As the workers are repeatedly doing the same operation. They feel bored with the work after a certain period.
4. It cannot fulfil the individual taste, it produces standardized products only.

3. Batch Production :

1. This type of production is generally adopted in medium size enterprises.
2. Batch production is bigger in scale than job production while it is smaller than that of mass production.
3. It requires more machines than of job production and less machines than that of mass production.
4. As in this type of production, two or more types of products are manufactured in lots (i.e ., batches) at regular interval, therefore this is known as batch production.
5. In this type of production, different products are manufactured and stocked and then sold on receipt of orders.
6. The items generally made under batch production are cars,drugs,forgingSnip machines, LPG cylinders, lathe machines, presses, etc.

Advantages :

1. While comparing with mass production, it requires less capital.
2. If demand for one product decreases then production for another product may be increased, thus the risk of loss is very less.
3. Comparing with job production, it is more advantageous commercially.

Disadvantages :

1. Raw material to be purchased are in less quantity than that in mass production, hence, the cost of the product is more.

Routing : Routing May be defined as the selection of path which each part of the product will follow while transformed from raw materials to finished products. In other words, routing means determination of most advantageous path to be followed from department to department and machine to machine till material gets its final shape.

Routing procedure : For a new product, the routing procedure is as follows:

1. The product and it's parts are analysed to determine the parts to be manufactured and the parts to be purchased; make or buy decisions are made
2. The parts to be manufactured are analysed to determine the type, specifications, quantity, and quality of materials required.
3. The product is analysed to determine possible methods of manufacturing and selection of the best method.
4. The manufacturing operations are determined with their sequence to produce the product (route sheets).
5. The economic lot size of production is determined.
6. Cost of product is determined.

Route sheet : It is used to specify the several operations to be performed, their path, sequence of operations, the department in which each operation is to be performed and the type of machine that is to be used in each case.

The following diagram shows a route sheet which provides a history of the progress of manufacturing processes. Route sheets check the subsequent steps of control and shop procedures.

They register the progress of parts or components from starting to completion of product and final delivery to the stores.

The particulars involved in route sheets is:

- Department No. & Operation No.
- Operation, machine & tools
- Number of men required.

Route-Sheet

Order No. : _____ Date of Completion : _____

Description of part : _____ Lot size : _____

Material symbol : _____ Scrap allowances : _____

Purchase order No. : _____ Quantity alloted : _____

Stores issue order No. : _____

Dept. No.	Operation No.	Operation	Machine	Tools	No. of Men	Time Allowance				Due Date		Move Order
						Per Piece	Lot	Setting	Total	Start	Finish	

Scheduling: The next phase of PPC is "scheduling" which involves the assignment of starting and ending times. While "routing" determines where the work should be done, "scheduling" determines when the work should be done.

Scheduling is defined as the determination of time that should be required to perform each operation and also time necessary to perform the entire series as routed, making allowances for all factors concerned. Scheduling involves preparation of time table which would indicate the total time needed for manufacturing a product and also time expected to be spent on each machine and process. Scheduling determines capacity of machines, allows set up time, idle time, maintenance time and break down time.

Scheduling Methods: Generally schedules are of two types:

1. Master schedule
2. Manufacturing or shop schedule

Master schedule: Scheduling normally starts with master schedule. The following diagram shows the master schedule for a foundry shop. A master schedule resembles central office which possesses information about all the orders in hand. Master schedule is a weekly breakdown of the production requirements. The total capacity in a week is of 100 hours of work in foundry shop. As the orders are received, delivering upon their delivery dates or priorities if any, they are marked on the master schedule. When the shop capacity is full for the present week the newly acquired

Master schedule for the foundry shop			
		Maximum Production 100 hrs Minimum Production 8 hrs	
Week I	**Week II**	**Week III**	**Week IV**
15	18	20	15
25	25	12	10
20	28	32	-
35			

orders are carried over to the next week and so on.

Manufacturing or shop schedule : After preparing master schedule, shop schedules are prepared. It assign a definite period of time to a particular shop for manufacturing products in required quality. It also reflects the information regarding machine

Shop Schedule

Shop Name : **Target Details :**

Date :

S.No.	Component	Qty	Priority	Earliest Date of Completion	Remarks
1.	Bush	600	II	30.5.98	-
2.	Carburettor	300	I	2.6.98	M/C Breakdown
3.	Spark Plug	325	I	3.7.98 shortage	Filament
4.	Piston Ring	900	I	30.6.98 completed on 2/6	300 Nos.

breakdown, tools shortages, material shortage, earliest completion dates and priority of the component. Weekly manpower requirements are based on the manufacturing schedules.

Dispatching: Dispatch function executes planning function. It ensures that the plans are properly implemented. It is the physical handling over a manufacturing order to the worker through the release of orders and instructions in accordance with a previously developed plan of activity established by the PPC department. It creates direct link between production and sales.

Dispatching procedure:

Step-1: *Store issue order* : Authorise stores to deliver required raw material.

Step-2 : *Tool order* : Authorise tool store to release the necessary tools. The tools can be collected by the tool room attendant.

Step-3 *Job order* : Instruct the worker to proceed with the operation.

Step-4 *Time ticket* : it records the beginning and ending time of the operations and forms the basis of workers pay.

Step-5 *Inspection order* : Notify the inspectors to carry out necessary inspections and report the quality of the component.

Step-6 *Move order* : Authorise the movement of materials and components from one machine to another for further operations.

Follow-up or Expediting : After dispatching production orders to various shops, it is necessary to regulate the progress of job through various processes. For this purpose, a follow-up section is formed.

The function of follow-up section is to report daily the progress of work in each shop in as prescribed pro-forma and to investigate the causes of deviation from the planned performance. This section sees that production is being performed and tries to boost it.

Follow-up Procedure :

Step-1 *Material* : Material should reach to shops in required time, so that production could be started as per schedule.

Setp-2 *job progress* : For this, follow-up section sees that a particular product is passing through all its operations from raw material to final shape as per schedule. If there is any chances of delay, then this section tries to remove this delay.

Step-3 *Assembly* : Assembly shops are responsible for assembling the various components. Follow-up section sees that all the parts should remain ready for assembling purposes in required quantity at requires time.

Critical path method (CPM) : It has become very essential and popular in the developing countries like India. This was developed in 1957 land is suitable for the construction of civil and mechanical projects. CPM was first used by the research team, lead by Morgan R. Walker to determine how best to reduce the time required to perform routine for plant maintenance and construction. CPM is a project management algorithm that uses a **deterministic approach** to identify the critical path. It's ideal for projects where the activity durations are more predictable and well-defined, like construction or manufacturing projects.

Programme evaluation and review technique (PERT) : PERT is a project management technique that uses a **probabilistic approach** to analyze project tasks. It's best for projects with a high degree of uncertainty, such as research and development projects where the time required for each task is not precisely known.

- ✓ **Time Estimates:** PERT uses a three-point estimate for each activity:

    1. **Optimistic time (To)**: The shortest possible time.
    2. **Pessimistic time (Tp)**: The longest possible time, including potential delays.
    3. **Most likely time (Tm)**: The most probable time.

- ✓ **Formula:** PERT calculates the expected time (T_E) for an activity using a weighted average: TE = (To + 4Tm+ Tp) / 6

Terminology used in network techniques:

Network : It is a graphical representation of a sequence of activities that must be completed to reach the end objective of a project.

Event : It is the start or completion of a task.

Activity: It is the actual performance of a task.

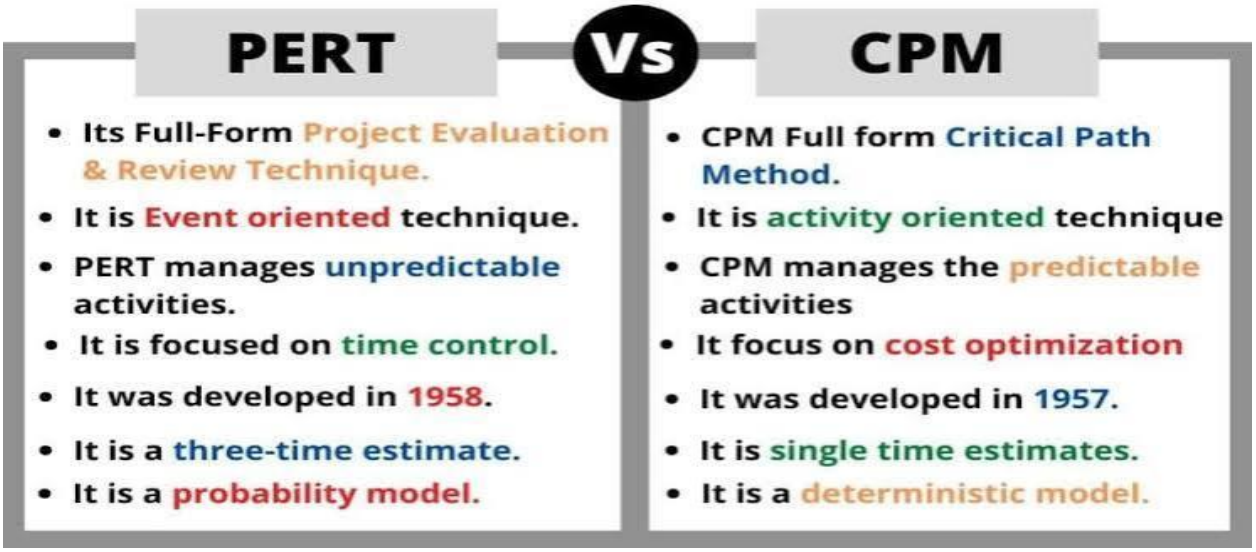
Earliest expected time: It is the algebraic sum of expected time (te) of all the activities along the longest path of the project.

Latest allowable time: It is the largest possible time and event can take without delaying the final completion date.

Slack : it is the difference between earliest expected time and latest allowable time.

Critical path: This is the path on the network along which no slippage is allowed. In the path the slack is zero.

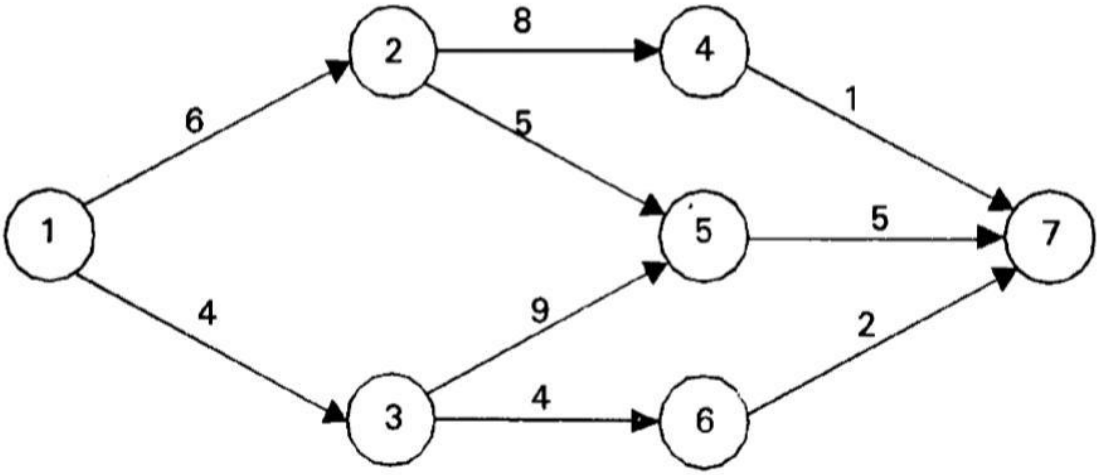
Difference between PERT & CPM :



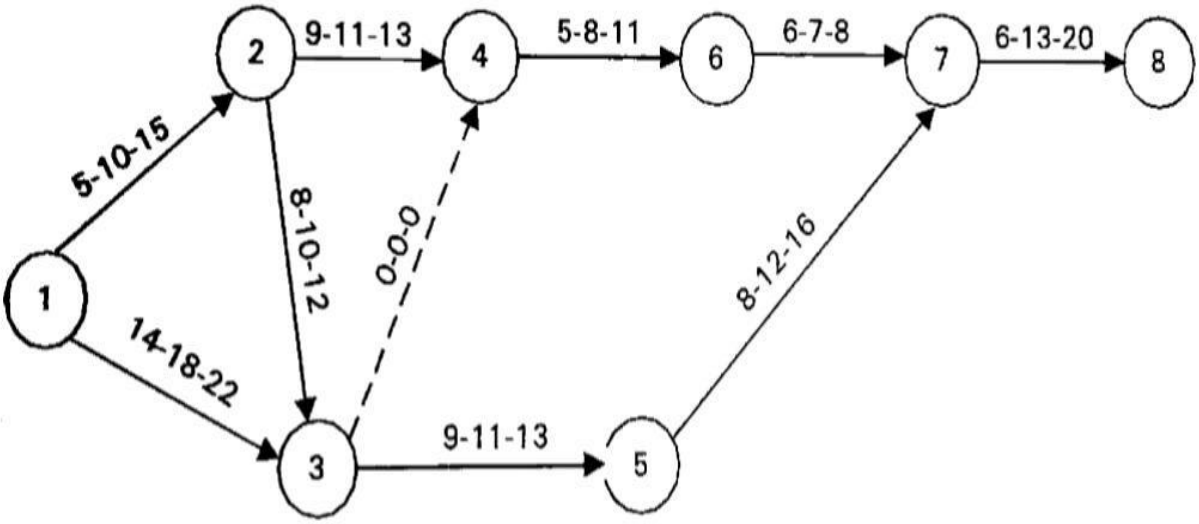
Applications of Network Techniques :

- Research and development projects
- Construction projects
- Setting up new industries
- Control of production in large shops
- Planning and launching of new products
- Design of plants, machines and systems
- Equipment maintenance

CPM Network Diagram :



PERT Network Diagram:



CPM Problem:

A project has nine activities. The expected time of each activity is as follows :

Activity	1-2	1-3	2-4	2-5	3-5	3-6	4-7	5-7	6-7
Expected time, (days)	6	4	8	5	9	4	1	5	2

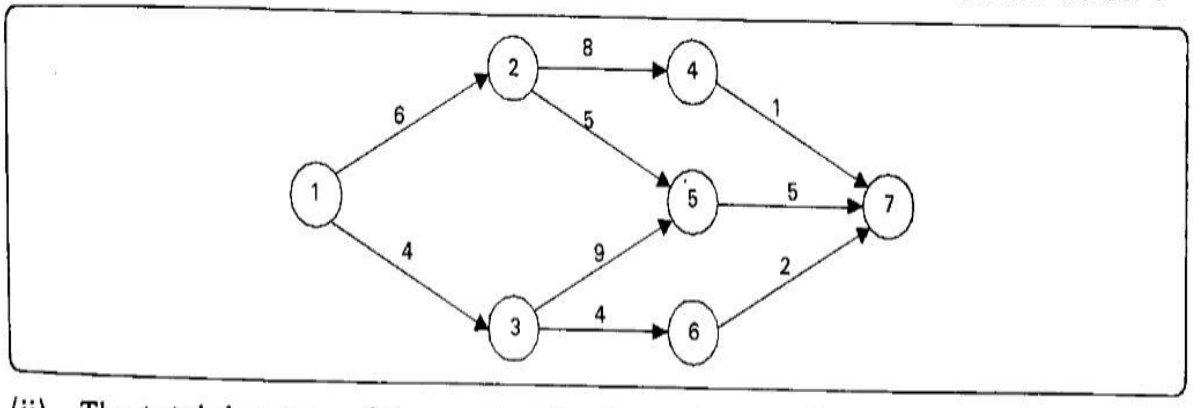
(i) Draw project network

(ii) Identify the critical path

(iii) Find project duration.

Solution :

(i) The project network, for the given activities can be drawn as shown below :



(ii) The total duration of the project for the various paths are :

Path	**Total duration (days)**
1 – 2 – 4 – 7	6 + 8 + 1 = 15
1 – 2 – 5 – 7	6 + 5 + 5 = 16
1 – 3 – 5 – 7	4 + 9 + 5 = 18
1 – 3 – 6 – 7	4 + 4 + 2 = 10

Critical path = 1 – 3 – 5 – 7.

(iii) Project duration = 18 days.

PERT Problem:

A small project is composed of Nine activities as given below.

Activity	1-2	1-6	2-3	2-4	3-5	4-5	6-7	5-8	7-8
Optimistic time, t_o (days)	2	2	5	1	5	2	3	2	7
Most likely time, t_m (days)	5	5	11	4	11	5	9	2	13
Pessimistic time, t_p (days)	14	8	29	7	17	14	27	8	31

(a) Draw the network for the given project.

(b) Identify the critical path. *(c) Find the project duration.*

(d) Find the slack at each event.

Solution :

(a) The expected time (t_e) is calculated below.

Activity	$t_e = \frac{t_o + 4t_m + t_p}{6}$
1 – 2	$\frac{2+5\times4+14}{6} = 6$
1 – 6	$\frac{2+5\times4+8}{6} = 5$
2 – 3	$\frac{5+11\times4+29}{6} = 13$
2 – 4	$\frac{1+4\times4+7}{6} = 4$
3 – 5	$\frac{5+11\times4+17}{6} = 11$
4 – 5	$\frac{2+5\times4+14}{6} = 6$
6 – 7	$\frac{3+9\times4+27}{6} = 11$
5 – 8	$\frac{2+2\times4+8}{6} = 3$
7 – 8	$\frac{7+13\times4+31}{6} = 15$

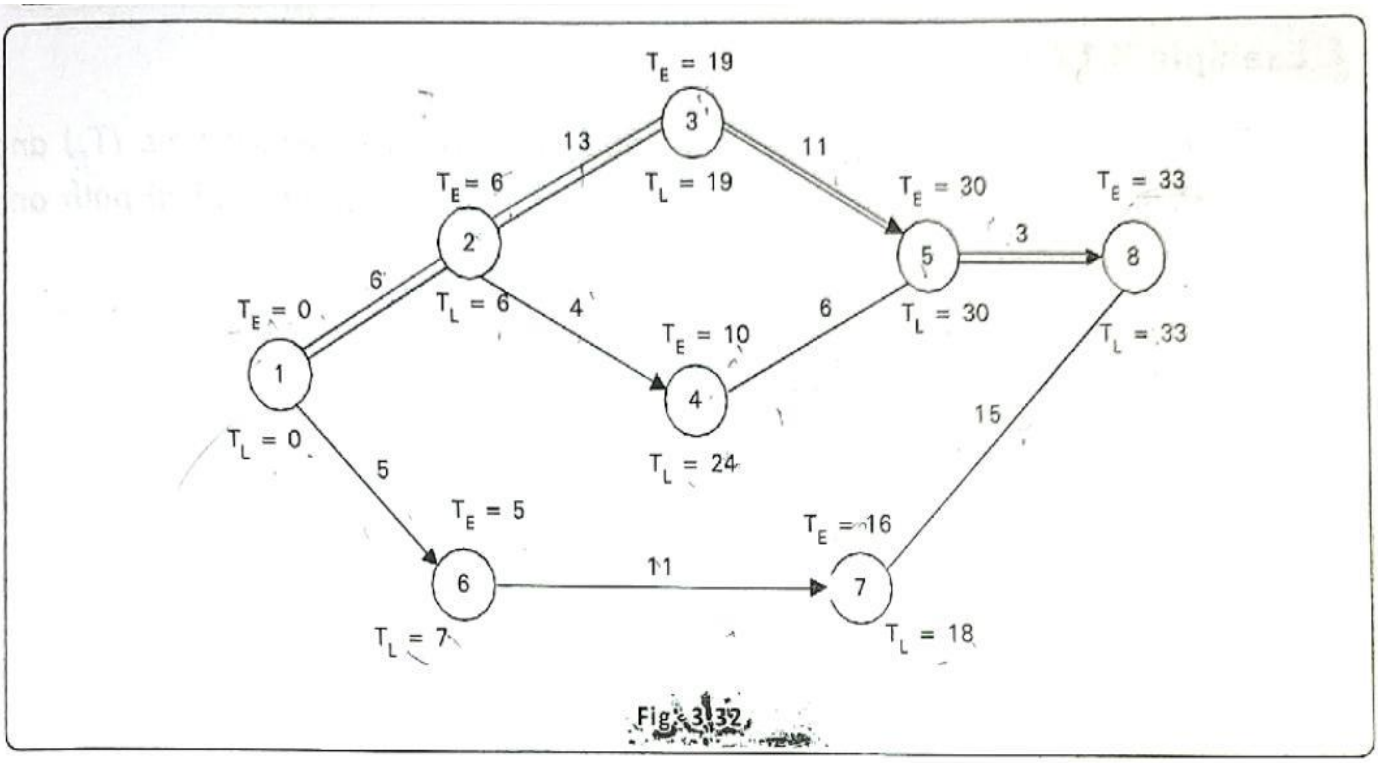


Fig. 3.32

(b) Total duration for the project for different paths are :

Path	Total duration (days)
1 – 2 – 3 – 5 – 8	6 + 13 + 11 + 3 = 33
1 – 2 – 4 – 5 – 8	6 + 4 + 6 + 3 = 19
1 – 6 – 7 – 8	5 + 11 + 15 = 31

Critical path = 1 – 2 – 3 – 5 – 8

(c) Projection duration = 33 days

(d) Slack for each activity is calculated as follows.

Event	1	2	3	4	5	6	7	8
Slack ($T_L - T_E$)	0	0	0	14	0	2	2	0

It is observed that along the critical path, the slack is zero.

Functions of materials management :

- Material planning
- Procurement or purchasing of materials
- Receiving and warehousing
- Store administration
- Inventory control
- Standardization
- External transportation (traffic, shipping etc) and materials handling
- Disposal of scrap

ABC Analysis of inventory :

As the size of industry increases, the number of items to be purchased and then to be taken care of also increases. It becomes difficult and costly to give equal attention to all the items of the industry. ABC Analysis, popularly known as 'Always Better Control', helps segregating the items from one another and tells how much valued the item is and controlling it to what extent is in the interest of the organisation. ABC analysis is meant for relative inventory control in which maximum attention can be given to items which consume more money and a fair attention can be given to medium valued items, while the attention for low value items can be reduced to routine procedure only. This policy can be applied in various other aspects of materials management such as purchase, sales, inspection, inventory control, store-keeping etc.

According to ABC Analysis method of inventory control, all the items of the industry are divided into three groups, based on the percent of items and percent of value of items. They are -

1. **A - Class Items :**

These are high valued but are limited or few in number. They constitute 10% of items but account for 70% of total inventory cost. They need careful and close inventory control, proper handling and storage facilities. Such items being costly are purchased in small quantities oftenly and just before their use. This of course increases the procurement costs and involves a little risk of non-availability. However, the locked up inventory cost decreases and the problems of storage and care taking are minimised.

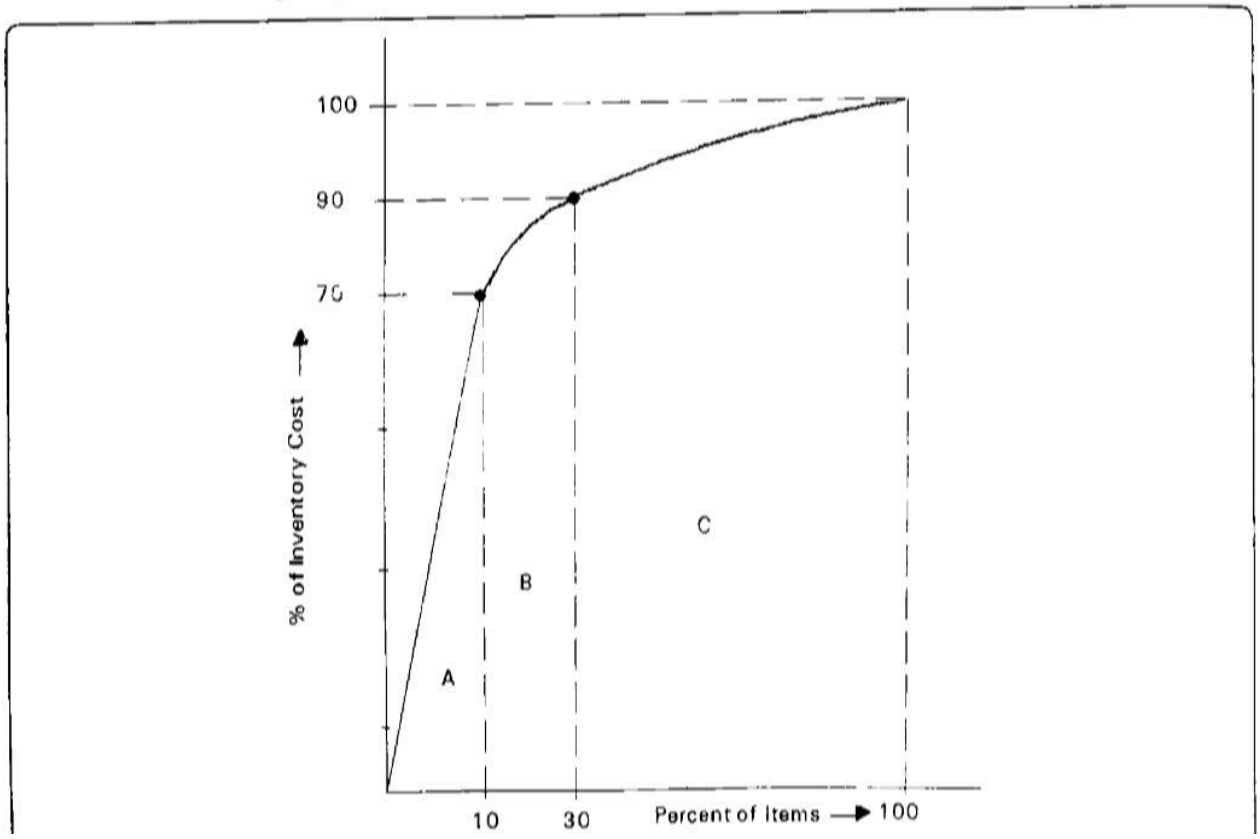
2. B - Class Items :

These are medium valued and their number lies in between A and C-items. They constitute 20% of total inventory cost and about 20% of the total items, they need moderate control. They are more important than C-items. They are purchased on the basis of past requirements. These items being comparatively less costly, a safety stock of upto 3 months may be kept. These items need every care but not so intensive as is required for A-items.

3. C - Class Items :

These are low valued, but maximum numbered items. They constitute 10% of the total inventory cost and 70% of the total items. These items do not need any control, rather controlling them is uneconomical. These are the least important items like clips, all pins, washers, rubber bands, etc. They are generally procured just before they finish and a safety stock of 3 months or even more can be purchased at an instant.

The following Fig. 4.1 brings out clearly the concept of ABC Analysis.



Economic Order Quantity:

A problem which always remains is that how much material may be ordered at a time. An industry making bolts will definitely like to know the length of steel bars to be purchased at any one time. This length of steel bars is called 'Economic Order Quantity' and an economic order quantity is one which permits lowest cost per unit and is most advantageous. EOQ represents the quantity of material to be ordered and purchased at a time.

The evaluation of the most economic ordering quantity to be purchased involves calculation of the following two costs :

(a) Procurement cost or ordering cost or buying cost.

(b) Inventory carrying cost.

(a) Procurement cost or Buying cost :

The cost includes the expenditure made on :

(i) Calling quotations

(ii) Processing quotations

(iii) Placing purchase orders

(iv) Receiving and inspecting

(v) Verifying and payment of bills

(vi) Other incidental charges, etc.

(b) Inventory carrying cost :

This consists of expenditure made for :

(i) Insurance

(ii) Storage and handling

(iii) Obsolescence and Depreciation

(iv) Deterioration

(v) Taxes

(vi) Interest, etc.

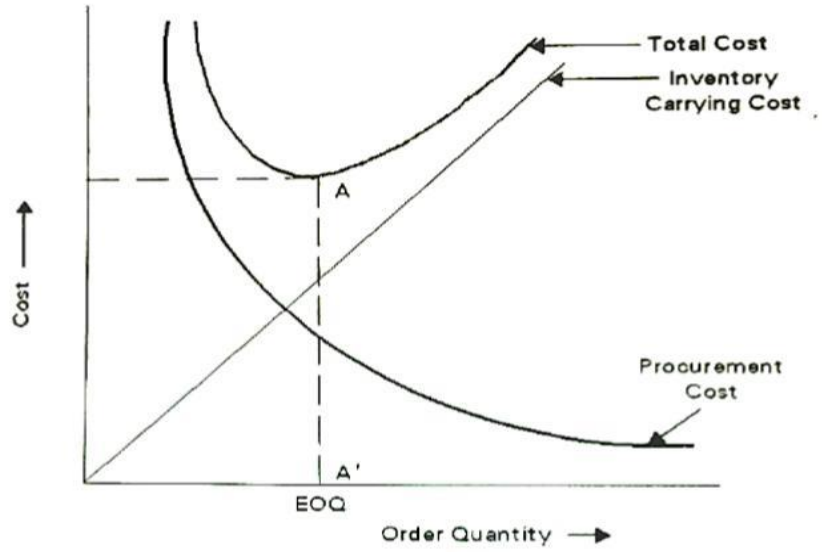


Fig. 4.4 *Relationship between Cost and Quantity*

The economic order quantity is obtained by the quantity whose procurement cost is equal to inventory carrying cost. Total cost is calculated by adding procurement cost and carrying cost.

In Fig. 4.4, the procurement cost, inventory carrying cost and total cost have been plotted with respect to quantity per order.

As EOQ, is the quantity to be ordered, at a time, by reducing the total cost. Thus from Fig. 4.4 total cost is minimum at the point A and A' represents the economic order quantity EOQ. And at procurement cost is equal to inventory carrying cost.

From Fig. 4.4, we can say that procurement cost decreases as the order quantity increases and inventory carrying cost increases as the order quantity increases.

EOQ is mathematically calculated, as given below :

Let Q is the economic lot size or EOQ.

P is the procurement cost per order.

C is the inventory carrying cost per unit.

A is the total items consumed per year.

and C_0 is the cost of each item.

Then, total procurement cost per year = No. of orders placed in a year × Procurement cost per order.

$$= \frac{A}{Q} \times P$$

Inventory carrying cost per year = Average Inventory × annual inventory carrying cost per unit

$$= \frac{Q}{2} \times C$$

$\therefore$ Total cost = Procurement cost + Inventory carrying cost

$$\text{Total cost} = \frac{A}{Q} \times P + \frac{Q}{2} \times C \qquad \ldots(i)$$

This total cost is minimum when,

Procurement cost = Inventory carrying cost

$$\frac{AP}{Q} = \frac{Q}{2} \times C$$

or $$Q^2 = \frac{2AP}{C}$$

$\therefore$ Economic Order Quantity, $$Q = \sqrt{\frac{2AP}{C}} \qquad \ldots(ii)$$

Substituting the value of Q, in equation (i), we get

$$\text{Total cost} = \frac{AP}{\left(\sqrt{\frac{2AP}{C}}\right)} + \sqrt{\frac{2AP}{C}} \times \frac{C}{2}$$

$$= \frac{\sqrt{APC}}{\sqrt{2}} + \frac{\sqrt{APC}}{\sqrt{2}} = \frac{2\sqrt{APC}}{\sqrt{2}} = \sqrt{2APC}$$

$\therefore$ Total inventory cost = $\sqrt{2APC}$ ...(iii)

and Total annual cost = $AC_0 + \sqrt{2APC}$ ...(iv)

Problems on EOQ :

Example 4.1 :

Find economic order quantity from the following data :

Average annual demand = 30,000 units

Inventory carrying cost = 12% of the unit value per year

Cost of placing an order = Rs. 70.

Cost of each unit = Rs. 2.

Solution :

A = 30,000 units

C = 12% of unit value

$$= 12\% \text{ of } 2 = \frac{12}{100} \times 2 = \text{Rs. } 0.24.$$

P = Rs. 70.

$$\therefore \text{EOQ}, \quad Q = \sqrt{\frac{2AP}{C}} = \sqrt{\frac{2 \times 30000 \times 70}{0.24}}$$

$$= 4183.3 \text{ say } 4184 \text{ units}$$

∴ Economic order quantity, Q = 4184 units **Ans.**

Example 4.2 :

The rate of use of a particular raw material from stores is 20 units per year. The cost of placing and receiving an order is Rs. 40. The cost of each unit is Rs. 100. The cost of carrying inventory in percent per year is 0.16 and it depends upon the average stock. Determine the Economic Order Quantity. If the lead time is 3 months, calculate the reorder point.

Solution :

A = 20 units/year

P = Rs. 40

Cost of each unit = Rs. 100

Cost of carrying inventory = 0.16 of each unit

Lead time, L = 3 months

Inventory carrying cost, C = 0.16 × 100 = Rs. 16

$$\text{EOQ, } Q = \sqrt{\frac{2AP}{C}} = \sqrt{\frac{2\times 20\times 40}{16}} = 10 \text{ units } \textbf{Ans.}$$

We know,

Re-order point = Lead time × Annual consumption per month

$$= 3 \times \frac{20}{12} = 5 \text{ units } \textbf{Ans.}$$

Example 4.3 :

Annual production of a particular product is 1800 units. Procurement cost is Rs. 450. Manufacturing cost is Rs. 45. Inventory cost is 10% per item. Calculate economic order quantity and total number of orders per year.

[March/April 2009, D.M.E]

Solution :

Annual production, A = 1800 units

Procurement cost, P = Rs. 450

Manufacturing cost, P = Rs. 45

Inventory cost, C = 10% per item

$$= \frac{10}{100}\times 45 = \text{Rs. } 4.5$$

Ecnomic order quantity, $EOQ = \sqrt{\frac{2AP}{C}}$

$$= \sqrt{\frac{2\times 1800\times 450}{4.5}} = \sqrt{360000} = 600 \text{ units.}$$

Number of orders per year

$$= \frac{\text{Annual production}}{EOQ} = \frac{1800}{600} = 3 \text{ orders.}$$

Example 4.4 :

Annual demand (requirement) of a particular product is 18,000 units. Ordering cost is Rs. 400 per order. Inventory carrying cost is Rs. 1.20 per unit per year. Cost per unit is Re.1.00.

Assuming no shortages, determine.

(a) Economic Order Quantity

(b) *Number of orders per year*

(c) *Time between orders*

(d) *Total inventory cost.*

(e) *Total annual cost*

Solution :

Given, A = 18000 units/year

P = Rs. 400 per order

C = Rs. 1.20 per unit per year

(a) EOQ, $Q = \sqrt{\frac{2AP}{C}} = \sqrt{\frac{2 \times 18000 \times 400}{1.2}}$

$= 3464.1$ say 3465 units.

(b) Number of orders per year $= \frac{A}{Q} = \frac{18000}{3465}$

$= 5.2$ say 6 orders

(c) Time between orders,

$$t_o = \frac{Q}{A} = \frac{3465}{18000} \text{ years}$$

$$= \frac{3465 \times 365}{18000} = 70.2 \text{ or } 71 \text{ days.}$$

(d) Total inventory cost,

$$= \sqrt{2APC} = \sqrt{2 \times 18000 \times 400 \times 1.2}$$

$= 4156.9$ say Rs. 4157 per year

(e) Total annual cost

$= 18000 \times 1 + 4157 =$ Rs. 22,157/-

Functions of stores department:

1. To identify all items of stock and plan the store for optimum utilisation of the cubic space (i.e., length, breadth and height).
2. To receive all types of materials, goods and equipment including manufactured products in the factory and record them with their cost.
3. Correct positioning of all materials and supplies in the stores.
4. To maintain stocks safely and in good condition by taking all precautions to ensure that they do not suffer from damage, theft and deterioration.
5. To issue items to the users only on the receipt of authorised stores requisitions.
6. To record and updates and issues of materials.
7. To check the bin card balances with the physical quantities in the bins.
8. To make sure that stores are kept clean and in good order.
9. To prevent unauthorised persons from entering the stores.
10. To inform the purchase department, whenever the existing stock of any item is likely to be exhausted, for its purchase.
11. To coordinate and co-operate with the purchasing, manufacturing inspection and PPC departments.

Supply chain management :

A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. The supply chain includes not only the manufacturer and suppliers, but also transporters, warehouses, retailers and even customers themselves. Within each organisation, such as a manufacturer, the supply chain includes all functions involved in receiving and filling a customer request.

A supply chain is defined as a set of three or more companies directly linked by one or more of the upstream and downstream flows of products, services, finances and information from a source to a customer. **Supply chain management** is the implementation of a supply chain orientation across suppliers and customers. **Supply chain management** is the systematic, strategic coordination of the traditional business functions within a particular company and across businesses within the supply chain, for the purpose of improving the long-term performance of the individual companies and the supply chain as a whole.

Example : Consider a customer walking into a mall to purchase detergent. The supply chain begins with the customer and his or her need for detergent. The next stage of this supply chain is the mall, that the customer visits. Mall stocks its shelves using inventory that may have been supplied from a finished-goods warehouse or a distributor. The distributor, in turn, is stocked by the manufacturer. The manufacturing plant receives raw material from a variety of suppliers. This **supply chain** is illustrated in Fig. 3.15, with the arrows corresponding to the direction of physical product flow.

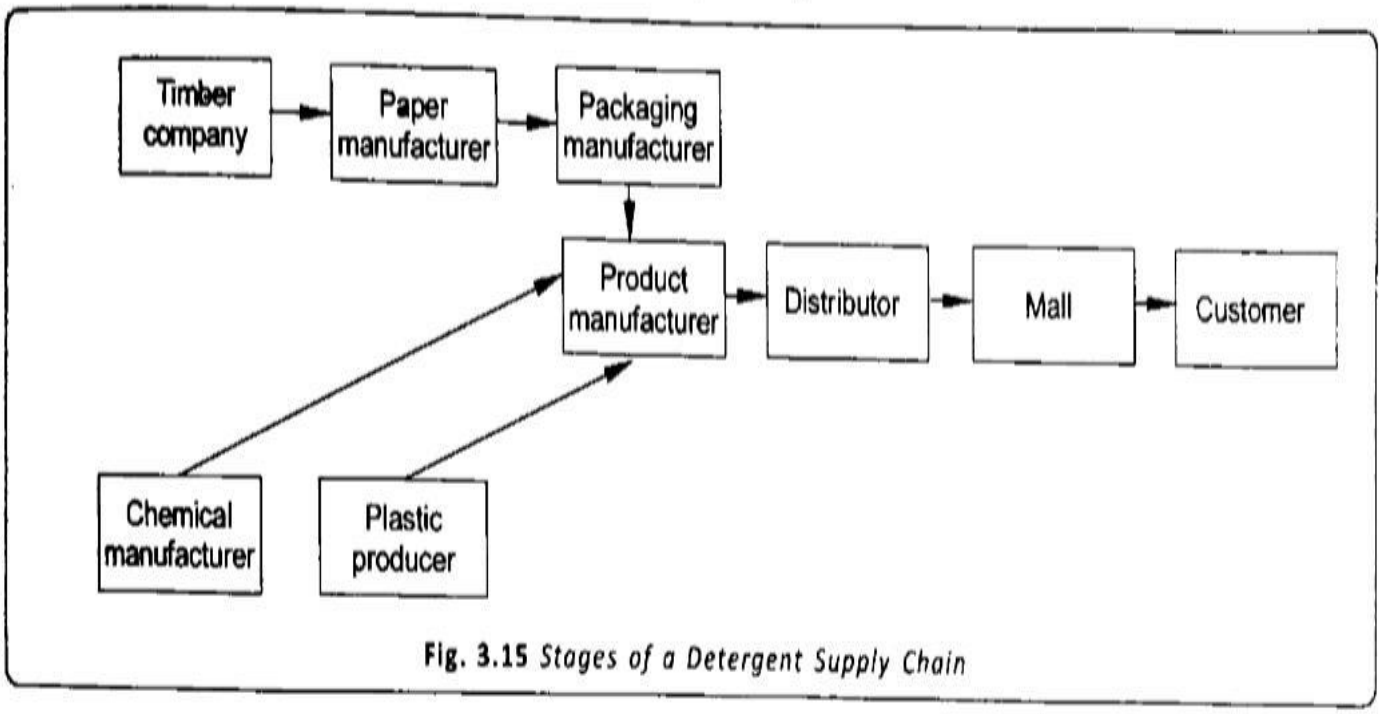


Fig. 3.15 *Stages of a Detergent Supply Chain*

The primary purpose of any supply chain is to satisfy customer needs, and, in the process, generate profit for itself. Thus, supply chain, visualize information, funds, and product flow, along both directions, i.e., product or supply moving from suppliers to manufacturers to distributors to retailers to customers and vice-versa.

Functions of purchasing department:

Purchasing department has to perform certain functions in order to achieve the above mentioned objectives. They are -

1. Maintain records of available and reliable suppliers, and prices of materials.
2. To prepare and update list of materials required by different departments of the organisation within a specified span of time.
3. Place and follow-up purchase orders.
4. Maintain records of all purchases.
5. To make sure through inspection that right kind (i.e., quantity, quality, etc.) of material has been purchased.
6. To act as a mediator between the vendors and different departments of the concern such as production, quality control, finance, maintenance, etc.
7. To check if the material has been purchased at right time and at economical rates.
8. To keep an uninterrupted supply of materials so that production continues with least capital tied in inventories.
9. To prepare purchasing budget.
10. To ensure that prompt payments are made to the suppliers in the interest of good public relations.

Bin Card :

This is a card which is attached to each bin, rack, shelf or other container for stores. A record of all materials entering or leaving the bin and balance of material in hand, is kept in this card. These agree with the quantities of material as shown in the relevant account in the stores ledger. This will enable the store keeper to ascertain the quantity of any material in stock and remind him to requisition from fresh stock, when the minimum stock has been reached.

In some factories duplicate bincards are used. In such cases one card is attached to the bin and the duplicate card is kept by the store keeper on his table for ready reference. Bin cards are checked from time to time by the inspectors and they put their initials on these cards and note down the discrepancies.

Bin Card

Bin. No._____ Maximum Quantity : _____

Article : _____ Ordering Quantity : _____

Code No. _____ Minimum Quantity : _____

Stores Ledger Folio :

Date	Quantity Received	Quantity Issued	Balance	Remarks

Checked by Date :

_____ Signature :