OPERATIONS MANAGEMENT MODULE I – INTRODUCTION TO OPERATIONS MANAGEMENT

INTRODUCTION

Man started engaging in the activity of production soon after its existence. Agriculture was the first production activity. Since then the range of production and manufacturing activities has expanded in terms of capacity and efficiency. Today, machines have replaced men in basic production activities. Men only supervise machines and are supervised by them as well. Thus, production is a much more complex function. Also, it is one of the most critical functions of modern management.

Operations Management is the management of an organization's productive resources or its production system, which converts inputs into the organization's products and services.

Operation is that part of as organization, which is concerned with the transformation of a range of inputs into the required output (services) having the requisite quality level. Management is the process, which combines and transforms various resources used in the operations subsystem of the organization into value added services in a controlled manner as per the policies of the organization. The set of interrelated management activities, which are involved in manufacturing certain products, is called as production management. If the same concept is extended to services management, then the corresponding set of management activities is called as operations management.



Fig. 16.1 The operations model

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There are basically three schools of thought:

Classical

Behavioural

Modelling

Classical Management

Classical management emphasizes:

1. Economic efficiency as the overall production effectiveness of the organization scientific management.

2. Management as a continuous process of planning, organising and controlling: Process management.

Behavioural Management

Behavioural management emphasizes:

1. Human Relationship: Behavioral scientists recognise that people are complete and have multiple needs and that the subordinate-supervisor relationship directly affects productivity.

2. Behavioural Science: The science which explored how human behaviour is affected by leadership, motivation, communication, interpersonnel relationships and attitude change.

Modelling Management

Modelling management emphasises:

- 1. Decision-making
- 2. System Management
- 3. Mathematical Modeling

The objective of any operation is to use available resources productively. High productivity translates into lower costs and higher profits for a given price. Thus, operations are a function or system that transforms inputs into outputs of greater value. The ratio of the value of the output achieved to the inputs used is also used to express productivity, which is a measure of how efficiently the resources are used.

Productivity = Output/Input

Therefore in any operation, the economic value of output should be greater than the economic value of input. Resources used in an operation may include land or storage space, materials, labor, water, energy, and financial resources. To illustrate, a finished automobile has a higher value than raw steel or a graduating management student should have higher economic value than a fresher.

Objectives of Operations Management



1. Right Quality

Quality is a degree to which it confirms the design specification and satisfies the consumer in general. Right quality must lead to effectiveness of production process.

2. Right Quantity

The manufacturing organization should produce the products in right number. If they are produced in excess of demand, the capital will block up in the form of inventory, and if produced in short of demand, it leads to the shortage of products. Quantity produced always shows a measure of efficiency of production process.

3. Right Time

Right time delivery in one of the important parameter to judge the effectiveness of production department. Product and services should reach the consumer in time. If timeliness is not followed, then the product may be considered as waste, hence right time production leads to accuracy.

4. Right Manufacturing

In the era of competition, manufacturing costs play a very important role in the success of the organization. An organization cannot increase the sales price outright, nor can it reduce its profit margin. The only way to survive is either to reduce manufacturing cost or maintain it at the same level. Hence, right manufacturing costs lead to profitability.

5. Right Place

Delivery locations and manufacturing locations are very important. Manufacturing and delivering the goods at right place is very important. It can be taken as a key factor for success. Delivering the goods at right place ensures the perfectness of the production process.

6. Right Information

In the era of information technology, collecting and providing right information is the key to success for any business. Passing the information from right source to right receiver completes the fitness of information cycle.

Scope of Operations Management

Operations management is a very basic management concept. It focuses on the management relationship as a means of achieving better results for all members of the organization. Basically all the functions of management are evolved from production management. Operations management show flexibility and responsiveness to take care of varying customer demands, their timings, risk of product development efforts, and costs involved. The operation function involves a wide range of activities from plant location to the packing of products to be distributed by the marketing department of the enterprise. Some of the areas covered under the umbrella of operations management are:

1. Manufacturing process selection

Manufacturing process selection is concerned with processes that convert the inputs into outputs. Production manager must have sound knowledge of manufacturing methods and their properties so that he can select appropriate method of manufacturing. Operations management also deals with plant capacity planning and cost benefit analysis of production system.

- i. Process selection
- ii. Capacity planning
- iii. Cost benefit analysis

2. Selection of Location and Layout

Location of facilities for operations is a long-term capacity decision which involves a long term commitment about the geographically static factors that affect a business organization. It is an important strategic level decision-making for an organization. Plant should be located at such a place that production and distribution costs are minimum. Plant layout refers to the physical arrangement of facilities. It is the configuration of departments, work centers and equipment in the conversion process. The overall objective of the plant layout is to design a physical arrangement that meets the required output quality and quantity most economically. A good plant layout facilitates the flow of materials at the desired speed, plant layout deals with the arrangement of machines. According to **James Moore**, "Plant layout is a plan of an optimum arrangement of facilities including personnel, operating equipment, storage space, material handling equipment's and all other supporting services along with the design of best structure to contain all these facilities".

3. Production Planning and Control

Production planning and control 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 to follow up the progress of products according to orders. The production manager directs the activities of his department with a view to executing the production plans, policies and decisions.

4. Physical Environment

Physical environment involves following aspects:

- i. Lighting
- ii. Noise and vibration
- iii. Humidity
- iv. Fresh air and sanitation

5. Material Handling

Material Handling refers to the 'moving of materials from the store room to the machine and from one machine to the next during the process of manufacture'. It is also defined as the 'art and science of moving, packing and storing of products in any form'. It is a specialized activity for a modern manufacturing concern, with 50 to 75% of the cost of production.

6. Maintenance Management

The operations management department has to be ready for any types of problems that may arise during the production process. Hence, the operation management department must prepare a maintenance plan so that there should not be any break down of machines, and for the smooth flow of process.

7. Product and Process Design

Product design deals with conversion of ideas into reality. Every business organization has to design, develop and introduce new products as a survival and growth strategy. Developing the new products and launching them in the market is the biggest challenge faced by the organizations. Process design is a macroscopic decision-making of an overall process route for converting the raw material into finished goods. These decisions encompass the selection of a process, choice of technology, process flow analysis and layout of the facilities.

8. Plant Facilities

Plant facilities are the ancillary arrangements which contribute indirectly to the production function. The production facilities include machinery, power house, tool room, store keeping etc. Employee facilities include canteen, parking area, toilets etc.

9. Inventory Control

It deals with the control over raw materials, work-in-progress, finished products etc. the management of these items is closely related to production function, is included in the production management. The store keeping is an important aspect of inventory control.

10. Quality Control

Quality Control (QC) may be defined as 'a system that is used to maintain a desired level of quality in a product or service'. It is a systematic control of various factors that affect the quality of the product. Quality control aims at prevention of defects at the source, relies on effective feedback system and corrective action procedure. Quality control can also be defined as 'that industrial management technique by means of which product of uniform acceptable quality is manufactured'. It is the entire collection of activities which ensures that the operation will produce the optimum quality products at minimum cost.

11. Productivity Management

The operations management department must aim to deliver high productivity of conversion process. The department must employ work study, method study, and time study techniques to increase productivity.

12. Lean Management

The operations management department must aim to adopt newer innovations in the field. By adopting proper waste reduction tools, the department must try to make the process leaner and leaner.

13. Safety Management

The operations management department must aim to ensure maximum safety to workmen. It needs to employ safety officer and needs to lay down proper safety policy.

14. Interrelations with other functions

The operations management department must fix up the production targets and ensure delivery dates to keep the production costs at minimum. The department seeks information from marketing department, availability of materials from materials department, and judging the capacity of plant to devise production plan.

15. Employee Benefit

The operations management department must device policy for incentive scheme for workmen. It must ensure that all safety measures are available on the shop floor.

Role/Functions of Operations Management

The role of operations management depend on the size of the firm as it decides the organizational control and decision-making powers at different levels of management.

i. In small-sized firms, all other functions such as production, marketing, finance, personnel etc. are looked after by one manager.

ii. In medium-sized firms, different functions are performed by different managers.

iii. In large-sized firms, operations management looks after production activities only.

Some of the important functions of Operations Department are:

1. Selection of material

The operations manager selects appropriate material for the product. For that purpose, research on material is necessary to find out its availability and suitability to the process, budget and thus to the product.

2. Selection of appropriate method

Selecting a suitable method of production is the most important task. The appropriate method will be selected by the operations department subject to the available resources and constraints.

3. Selection of suitable machinery and equipment

The operations department selects the suitable machinery and equipment according to the design and requirement of the process and the layout of the shop floor.

4. Fixation of production targets and delivery dates to minimize the cost

The operations department has to keep the cost to the minimum for the survival in the competitive situation. Thus, the department has to decide what should be done in maintaining the cost at the desired level.

5. Scheduling of activities

To achieve the production target, it has to be specified clearly the exact start and finish time of different activities. Accordingly, the department has to manage the timings of purchase of the materials and to plan the activities of manpower.

6. Routing and making layout of lines

Fixing the route for raw material, components and various activities from the warehouse to the production facility and then to the finished goods warehouse and fixing the layouts of various lines of production to achieve the production target are also the major functions of the operations department.

7. Dispatching

Various documents such as routing sheet, inspection cards for the components of various products are planned and prepared by the production department for starting the production. Releasing of these documents is known as dispatching.

8. Follow-up

It is necessary for all the scheduled activities. The management wants to know whether the activities are being carried out as per the plans or not. The actual work is compared with the plan and thus an analysis of the progress of the work is also done by the operations department. If there is any deviation from the target, then it should be rectified.

9. Inspection

A separate Quality Control Department does the qualify inspection of the products to find out any chances of qualifying of the defective products. But many a time, this work is also done by the operations department.

MANUFACTURING SND SERVICES

Manufacturing does not just offer products, and service organizations do not just offer services. Both types of organizations normally provide a package of goods and services. Although service provides cannot inventory their outputs, they must inventory the inputs for their products.

As for customer contracts, many service operations have little outside customer contracts. Such as the backroom operations of a bank or the baggage handling area at an airport.

Manufacturing process: Manufacturing can be defined as the process of covering raw materials, components, or parts into finished goods that meet customer satisfaction.

Service process: A valuable action, deed, or effort performed to satisfy a need or to fulfill a demand.

Similarities between Manufacturing and Service

The similarities between manufacturing and service operations are given the following:

- Manufacturers do not just offer products, and service organizations do not just offer services. Both types of organizations normally provide a package of goods services.
- Generally, service organization cannot inventory their outputs, but manufacturing firms that make customized product also cannot inventory their output.
- Everyone in an organization has some customers, whether in service or manufacturing.
- Both of the organizations require hard labor.

- Both have a very good return on investment.
- Both have huge marketing potential.
- Both have forecasting and capacity planning to match supply and demand.

Difference between Manufacturing and Service

The difference between manufacturing and service operations fall into the eight categories as follows:

Key point	Manufacturing	Service
Physical nature of the product	Manufacturing organization provides physical and durable products.	Service organization provides the intangible and perishable product.
Inventory	Output can be inventoried.	Output cannot be inventoried.
Customer contact	It involves low customer contact.	It involves high customer contact.
Response time	It requires a long response time to meet customer demand.	It requires a short response time to meet the customer's demand.
Location and size of the operation	It serves the regional, national, even international market.	It serves in the local market.
Facilities	It requires a larger facility, more automation, and greater capital investment.	It requires small facilities.
Intensive	It is capital intensive organization.	It is a labor-intensive organization.

Quality	Quality can be easily measured.	Quality can't be easily measured.	
Nature	Manufactured goods are physical, durable products	Services are intangible, perishable products often being ideas, concepts, or information.	
Facilities	Manufactured goods are output that can be produced, stored, and transported in anticipation of future demand.	By contrast, service cannot be produced.	
Contact	Most customers for manufactured products have little or no contact with the production system.	However, in many service organizations, the customer is input and active participation.	
Time	While manufacturers generally have days or weeks to meet customer demand.	Many services must be offered within minutes of customer arrival.	
Transport	Manufacturing facilities often serve regional, national, or even international markets.	Service cannot be shipped to distant locations.	
Quality As manufacturing systems tend to have tangible products and less customer contact, quality is relatively easy to measure.		By contrast, the quality of service system which generally produces intangible is harder to measure.	

CAPACITY PLANNING

Capacity planning refers to determining what kind of labour and equipment capacities are required and when they are required. Capacity is usually planned on the basis of labour or machine hours available within the plant. Thus, capacity planning is planning for quantity or scale of output.

There are four major considerations in capacity planning:

- Level of demand
- Cost of production
- Availability of funds
- Management policy.

Production has no meaning unless its products can be sold at a remunerative price. Generally, the capacity of plant is limited by the level of current demand. Stable demand makes the task of capacity planning simple while fluctuations in demand create problems concerning the acquisition of resources and matching them up with demand levels. Estimation of demand is, therefore, the first step in capacity planning. Size of the market depends upon the sales potential rather than on the geographical areas.

The effectiveness of a production system (system effectiveness) can be measured in two ways:

- Efficiency which is the rate of actual output to effective output, and
- Utilization which implies the rate of actual output to the design capacity.

Symbolically:

Efficiency = Actual Output / Effective Capacity

Utilization = Actual Output / Design Capacity

Every operating manager should try to increase capacity utilization by increasing effective capacity.

Types of capacity

1. Design Capacity

It means the optimum level of output that can be gotten within a specified period.

2. Effective Capacity

It means the optimum level of output, given the changes in product mix, equipment maintenance, programming and operating issues, labor problems, etc. It usually is less than the total design capacity.

3. Actual Output

It is the level of output that is achieved actually. It cannot be more than the sufficient capacity because of breakdowns in the machine, labor absenteeism, the inconsistent supply of raw materials, abnormal delay in supply of equipment, power outage, etc.

Need for Capacity Planning

- A firm can determine its facility location and choose the process technologies only after it has found out a need for new or expanded facilities by evaluating the capacity or capacity planning.
- Lack of capacity planning can result in under or over capacity and would incur unnecessary costs in exploring ways to reduce or increase capacity.
- Lack of capacity planning can also trigger a series of undesirable events such as poor delivery services, an increase in work-in-process and bring about dissatisfaction in the minds of the sales personnel and the team involved in manufacturing.
- Decision making such as producing new products, expanding production…etc can be difficult without proper capacity planning.

How important are capacity decisions?

Capacity decisions have its impacts on many different verticals of a firm. Firstly it affects the ability to meet future demands, as without capacity planning if not done keeping in mind the future demands leads to a shortage of products. If capacity is underestimated or overestimated it directly affects the operating costs as if capacity is overestimated the operating costs involved would get wasted and if underestimated the measures taken to fix it may cost a lot and so is the way it affects the initial costs too. And all these factors affect many other factors such as the competitiveness, management etc.

Procedure for Capacity planning decision

1. Assessment of Existing Capacity

Capacity of a unit can be measured in terms of output or inputs. Output measure is appropriate in case of manufacturing concerns, e.g., automobile plant (number of cars), iron and steel plant (tons of steel), brewery (barrels of bear), cannery (tons of food), power company, (megawatts of electricity), etc. Service concerns like hospitals (number of beds), airlines (number of seats), theatres (number of seats), restaurants (number of tables), university (number of students), warehouse (cubic feet of space), etc., can measure capacity in terms of inputs.

2. Forecasting Future Capacity Needs

Short term capacity requirements can be estimated by forecasting product demand at different stages of the product life cycle. It is more difficult to anticipate longterm capacity requirements due to uncertainties of market and technology. Capacity forecast helps to determine the gap between the existing capacity and estimated capacity so that necessary adjustments may be made. For example, a company engaged in manufacturing two products may find that one product has a low demand in summer (e.g. coffee or tea) while another product has low demand in winter (e.g. cold drink).

3. Identifying Alternative ways of Modifying Capacity

In case where the existing capacity is inadequate to meet the forecast demand capacity, the expansion is required to meet the shortage. Additional shifts may be employed to expand the capacity. Expansion will provide economies of scale and help in meeting the forecast demand. But it involves additional investment and danger of fall in forecast demand in future.

When the existing capacity exceeds forecast capacity, there is a need for reduction of excess capacity. Developing new products, selling of existing facilities, layout of workers or getting work from other firms are the methods of overcoming it.

4. Evaluation of Alternatives

Various alternatives for capacity expansion or reduction are evaluated from economic, technical and other viewpoints. Reactions of employees and local community should also be considered. Cost Benefit analysis, Decision theory and Queuing theory are the main techniques of evaluating alternatives.

5. Choice of Suitable Course of Action

After performing the cost-benefit analysis of various alternatives to expand or reduce the capacity, the most appropriate alternative is selected.

Importance of Capacity Planning



Capacity planning is essential because of the following:

1. It Ensures Availability:

Before you put pen on that paper to seal the next contract, are you sure you have the team readily available to work on it? Capacity planning explains what you need to do and how to carry out your projects. For example, you need people that can take care of the tasks or decide if you need extra hands to help you take over the projects. Capacity planning helps you determine all these and ensure you do not disappoint your clients.

2. Manage Your Skills

Capacity planning is also crucial in measuring the skill inventory of your team. A skill inventory is a piece of information about who can carry out a specific task and the skills they possess. This is especially important in a technical setting like a programming or software company. For example, you can list out each team member's core competency, such as:

- Mobile app development
- Website development
- Cloud computing
- Cybersecurity

When you have a task for someone, you can quickly determine if they meet up with what is needed. Whether you want to create a mobile app, or a beautiful and functioning website, you already know your go0to man and this will make work easier and straightforward. Also, you can easily update the skill inventory when a worker adds new skills or expertise.

3. It Helps to Identify Easily Any Skill Gap

A typical example of this is a situation where your firm has just won a big contract and it involves an extensive level of work with varying skills you might not have in your company. A great thing about capacity planning is that it allows you to identify any problem early. You don't need to begin the project before you know that you need to get people that can help you with it. When you plan effectively, you can see who fits in and what they have to offer to the cause.

When you can identify the skill gap, you have the opportunity to prepare your team in advance for future opportunities that may arise from that kind of gig. For example, if you don't have a mobile app developer in your team this year for a mobile app development gig, capacity planning can help you prepare for this in subsequent time.

EQUIPMENT SELECTION

Mill layout and equipment selection go hand in hand, in that the needs of the equipment with respect to the processes, flow direction, ease of operation and maintenance, etc. must be blended into the overall plan, with the ultimate objective of maximizing the productivity of each machine and minimizing handling.

On selecting equipment with energy in mind, due consideration should be given to:

(a) its relationship to other equipment in the process and to be balanced accordingly;

(b) its energy demands per unit of production must be acceptable;

(c) to be properly sized to meet production demands as well as having adequate capacity to cater for surge requirements, yet not to operate well below its rated capacity;

(d) to be robust in construction, reliable and permit ease of maintenance so as to ensure a minimum of downtime;

(e) to incorporate a correctly designed waste disposal system so as to avoid accumulation of residues which would otherwise be detrimental to both equipment and the overall plant operation.

It has been estimated that on average between 10-20 percent (94) of operating time within the mechanical wood products industry is comprised of idle time, mainly attributed to mechanical troubles, interrupted flow of raw materials, congestion, etc. which could well have been avoided at the planning and design stage. It is axiomatic that a well-balanced mill that is running with a maximum throughput, with a minimum of idling time and waste is utilizing its energy to the maximum effect and it is towards this end that the designer must select and size his materials handling and process equipment.

Equipment Selection Criteria

- Technical criteria
- Economic Criteria

A) Technical criteria

The technical criteria to be taken into account in the choice of appropriate equipment are:

a) Production capacity

The equipment needed is determined by the requisite quantity, freshness and quality of products and the marketing constraints involved

b) Type of products

The type of product(s) is an important factor when it comes to choosing the equipment

c) Product diversity

When product diversity is required, in small or large quantities, appropriate equipment must be selected.

d) Level of automation of the equipment

The level of automation of the equipment is an essential factor with an influence on:

- The number, type and size of equipment (automatic lines always require more space than manually operated lines);
- Production speed and flexibility;
- The number of employees occupied;
- Equipment maintenance, etc.

B) Economic criteria

When choosing the equipment, it is necessary to consider the various costs:

price **a**) Equipment purchase (customs cleared) and transport costs: **b**) installation costs (including the of technical cost assistance); c) operating costs;

d) maintenance costs and the cost of spare parts.

PRODUCTION

"Production is the organised activity of transforming resources into finished products in the form of goods and services; the objective of production is to satisfy the demand for such transformed resources".

The essential characteristics of the business firm is that it purchases factors of production such as land, labour, capital, intermediate goods, and raw material from

households and other business firms and transforms those resources into different goods or services which it sells to its customers, other business firms and various units of the government as also to foreign countries.

TYPES OF PRODUCTION

There are 4 different types of productions which are most commonly used. Which type of production should be used by the company depends on the type of product being manufactured, the demand of the product as well as the supply of raw materials. Taking these factors into consideration, below are the 4 types of Production.



1) Unit or Job type of production

This type of production is most commonly observed when you produce one single unit of a product. A typical example of the same will be tailored outfits which are made just for you or a cake which is made just like you want it.

Example:

It is one of the most common types of products used because it is generally used by small businesses like restaurants, individual products providers or individual services providers. It is also a type of production used by very premium companies like Harley Davidson, or Dell. Harley Davidson actually has a lot of accessories which can be customized, and which suit the individual. Same ways, you can design your own DELL laptop on their website with the given specifications.

Features of Unit production or Job Production

- Depends a lot on skill
- Dependency is more on manual work than mechanical work
- Customer service and customer management plays an important role

2) Batch type of Production

It is one of the types of production most commonly used in consumer durables, FMCG or other such industries where there are large variety of products with variable demands. Batch production takes place in batches. The manufacturer already knows the number of units he needs to a manufacturer and they are manufactured in one batch.

So, if a manufacturer has the shortage of Product X and 100 units of this product is consumed in one month, then the manufacturer can give orders for batch production of 100 units of Product X.

Example

LG has many different types of home appliance products in its portfolio. It has to manufacture all these different variants of the same type of product. There would be 10-20 types of mixer grinders alone in the product portfolio of LG home appliances. Thus, a company like LG manufactures these variants via Batch production.First, one type of mixer will be manufactured completely and then the second type will be manufactured. They are manufactured on the basis of demand.

Depending on demand, the batch production can produce the number of units required in one batch.

The batches may be as small as 10 units or they may be as large as 1 lakh units of the same products. However, as long as there is a defined quantity of product which has to be manufactured before moving on to the next item in the list, it is known as batch production. Examples of batch production include FMCG like Biscuits, confectionaries, packaged food items etc. It is used in Medicines, Hardware, Consumer durables and many such industries.

Features of Batch production

- Production is done in batches
- The total number of units required is decided before the batch production starts
- Once a batch production starts, stopping it midway may cost a huge amount to the company.
- Demand plays a major role in a batch production. Example seasonality of products.

3) Mass Production or Flow production

One of the best examples of mass production is the manufacturing process adopted by Ford. Mass production is also known as flow production or assembly line production. It is one of the most common types of products used in the automobile industry and is also used in industries where continuous production is required. An Assembly line or mass production plant typically focus on specialization. There are multiple workstations installed and the assembly line goes through all the workstations turn by turn. The work is done in a specialized manner and each workstation is responsible for one single type of work. As a result, these workstations are very efficient and production due to which the whole assembly line becomes productive and efficient.

Products which are manufactured using mass production are very standardized products. High sophistication is used in the manufacturing of these products. If 1000 products are manufactured using mass production, each one of them should be exactly the same. There should be no deviation in the product manufactured.

Features of Mass Production

- Mass production is generally used to dole out huge volumes of the product
- It is used only if the product is standardized
- Demand does not play a major role in a Mass production. However, production capacity determines the success of a mass production.
- Mass production requires huge initial investment and the working capital demand is huge too.

4) Continuous production or Process production

There is a lot of confusion between mass production and continuous production. It can be differentiated by a single element. The amount of mechanical work involved. In Mass production, both machines and humans work in tandem. However, in continuous production, most of the work is done by machines rather than humans. In continuous production, the production is continuous, 24×7 hours, all days in a year.

A good example of the Continous production is brewing. In brewing, the production goes on 24 hours a day and 365 days a year. This is because brewing takes a lot of time and production is important. As a result, there is a continuous input of raw materials such as malt or water, and there is continuous output in the form of beer or other alcoholic drink. The key factor in this is that the brewing and fermentation process itself is time-consuming, and the maximum time is spent in the fermentation which is a continuous process. There are many chemicals which are manufactured in the form of a continuous process due to the huge demand across the world. Similarly, the Plastic industry is known to adopt the continuous production methodology where production can go continuously for weeks or months depending on the demand. Once the production starts, you only need to feed in the raw material, and the machines turn out the finalized products.

Features of Continuous production

- Majority of the work is done by machines rather than humans
- Work is continuous in nature. Once production starts, it cannot be stopped otherwise it will cause huge loss.
- A very controlled environment is required for continuous production.

PLANT LOCATION

Location of an industry is an important management decision. It is a two-step decision: first, choice of general area or region and second, the choice of site within the area selected. Location decision is based on the organisations long-term strategies such as technological, marketing, resource availability and financial strategies.

The concentration of a particular industry mainly in one area, as occurred with many industries in India, for example, textile industry in Mumbai is known as 'localisation of industries'. 'Planned location of industries' is a term whereby the location of industries is planned to give each industrial area a variety of industries so that large industries are dispersed and not localised.

It was Alfred Weber (1929) to whom the credit of enunciating the theory of industrial location went when his magnum opus "The Theory of the Location of Industry," was published in German in 1909 and English in 1929.

Need for selection of Plant location

The need for selecting a suitable location arises because of three situations.

- A. When starting a new organization, i.e., location choice for the first time.
- B. In case of existing organization.
- C. In case of Global Location.

A. In Case of Location Choice for the First Time or New Organizations

Cost economies are always important while selecting a location for the first time, but should keep in mind the cost of long-term business/ organizational objectives. The following are the factors to be considered while selecting the location for the new organizations:

1. Identification of region:

The organizational objectives along with the various long-term considerations about marketing, technology, internal organizational strengths and weaknesses, region-specific resources and business environment, legal-governmental environment, social environment and geographical environment suggest a suitable region for locating the operations facility.

2. Choice of a site within a region:

Once the suitable region is identified, the next step is choosing the best site from an available set. Choice of a site is less dependent on the organization's long-term strategies. Evaluation of alternative sites for their tangible and intangible costs will resolve facilities-location problem. The problem of location of a site within the region can be approached with the following cost-oriented non-interactive model, i.e., dimensional analysis.

3. Dimensional analysis:

If all the costs were tangible and quantifiable, the comparison and selection of a site is easy. The location with the least cost is selected. In most of the cases intangible costs which are expressed in relative terms than in absolute terms. Their relative merits and demerits of sites can also be compared easily. Since both tangible and intangible costs need to be considered for a selection of a site, dimensional analysis is used.

B. In Case of Location Choice for Existing Organization

In this case a manufacturing plant has to fit into a multi-plant operations strategy. That is, additional plant location in the same premises and elsewhere under following circumstances:

- 1. Plant manufacturing distinct products.
- 2. Manufacturing plant supplying to specific market area.
- 3. Plant divided on the basis of the process or stages in manufacturing.
- 4. Plants emphasizing flexibility.

The different operations strategies under the above circumstances could be:

1. Plants manufacturing distinct products:

Each plant services the entire market area for the organization. This strategy is necessary where the needs of technological and resource inputs are specialized or distinctively different for the different product-lines.

2. Manufacturing plants supplying to a specific market area: Here, each plant manufactures almost all of the company's products. This type of strategy is useful where market proximity consideration dominates the resources and technology considerations. This strategy requires great deal of coordination from the corporate office. An extreme example of this strategy is that of soft drinks bottling plants.

3. Plants divided on the basis of the process or stages in manufacturing: Each production process or stage of manufacturing may require distinctively different equipment capabilities, labor skills, technologies, and managerial policies and emphasis. Since the products of one plant feed into the other plant, this strategy requires much centralized coordination of the manufacturing activities from the corporate office that are expected to understand the various technological aspects of all the plants.

4. Plants emphasizing flexibility:

This requires much coordination between plants to meet the changing needs and at the same time ensure efficient use of the facilities and resources. Frequent changes in the long-term strategy in order to improve be efficiently temporarily, are not healthy for the organization. In any facility location problem the central question is: 'Is this a location at which the company can remain competitive for a long time?'

C. In Case of Global Location

Because of globalization, multinational corporations are setting up their organizations in India and Indian companies are extending their operations in other countries. In case of global locations there is scope for virtual proximity and virtual factory.

1. Virtual Proximity

With the advance in telecommunications technology, a firm can be in virtual proximity to its customers. For a software services firm much of its logistics is through the information/ communication pathway. Many firms use the communications highway for conducting a large portion of their business transactions. Logistics is certainly an important factor in deciding on a location whether in the home country or abroad. Markets have to be reached. Customers have to be contacted. Hence, a market presence in the country of the customers is quite necessary.

2. Virtual Factory

Many firms based in USA and UK in the service sector and in the manufacturing sector often out sources part of their business processes to foreign locations such as India. Thus, instead of one's own operations, a firm could use its business associates' operations facilities. The Indian BPO firm is a foreign-based

company's 'virtual service factory'. So a location could be one's own or one's business associates. The location decision need not always necessarily pertain to own operations.

FACTORS FOR SELECTING PLANT LOCAION

following only that influence the selection of the location of an enterprise:

(i) Availability of Raw Materials

(ii) Proximity to Market

- (iii) Infrastructural Facilities
- (iv) Government Policy
- (v) Availability of Manpower

(vi) Local Laws, Regulations and Taxation

(vii) Ecological and Environmental Factors

- (viii) Competition
- (ix) Incentives, Land costs. Subsidies for Backward Areas
- (x) Climatic Conditions

(xi) Political conditions.

(i) Availability of Raw Materials:

One of the most important considerations involved in selection of industrial location has been the availability of raw materials required. The biggest advantage of availability of raw material at the location of industry is that it involves less cost in terms of 'transportation cost.

If the raw materials are perishable and to be consumed as such, then the industries always tend to locate nearer to raw material source. Steel and cement industries can be such examples. In the case of small- scale industries, these could be food and fruit processing, meat and fish canning, jams, juices and ketchups, etc.

(ii) Proximity to Market:

If the proof of pudding lies in eating, the proof of production lies in consumption. Production has no value without consumption. Consumption involves market that is, selling goods and products to the consumers. Thus, an industry cannot be thought of without market. Therefore, while considering the market an entrepreneur has not only to assess the existing segment and the region but also the potential growth, newer regions and the location of competitors. For example, if one's products are fragile and susceptible to spoilage, then the proximity to market condition assumes added importance in selecting the location of the enterprise.

Similarly if the transportation costs add substantially to one's product costs, then also a location close to the market becomes all the more essential. If the market is widely scattered over a vast territory, then entrepreneur needs to find out a central location that provides the lowest distribution cost. In case of goods for export, availability of processing facilities gains importance in deciding the location of one's industry. Export Promotion Zones (EPZ) are such examples.

(iii) Infrastructural Facilities:

Of course, the degree of dependency upon infrastructural facilities may vary from industry to industry, yet there is no denying of the fact that availability of infrastructural facilities plays a deciding role in the location selection of an industry. The infrastructural facilities include power, transport and communication, water, banking, etc.

Yes, depending upon the types of industry these could assume disproportionate priorities. Power situation should be studied with reference to its reliability, adequacy, rates (concessional, if any), own requirements, subsidy for standby arrangements etc. If power contributes substantially to your inputs costs and it is difficult to break even partly using your own standby source, entrepreneur may essentially have to locate his/her enterprise in lower surplus areas such as Maharashtra or Rajasthan.

Similarly adequate water supply at low cost may become a dominant decisional factor in case of selection of industrial location for leather, chemical, rayon, food processing, chemical and alike. Just to give you an idea what gigantic proportions can water as a resource assumes. Note that a tone of synthetic rubber requires 60 thousand gallons, a tone of aluminum takes 3 lakhs gallons, and a tone of rayon consumes 2 lakh gallons of water.

Similarly, location of jute industry on river Hoogly presents an example where transportation media becomes a dominant decisional factor for plant location. Establishing sea food industry next to port of embarkation is yet another example where transportation becomes the deciding criteria for industrial location.

(iv) Government Policy:

In order to promote the balanced regional development, the Government also offers several incentives, concessions, tax holidays for number of years, cheaper power supply, factory shed, etc., to attract the entrepreneurs to set up industries in less developed and backward areas. Then, other factors being comparative, these factors become the most significant in deciding the location of an industry.

(v) Availability of Manpower:

Availability of required manpower skilled in specific trades may be yet another deciding factor for the location of skill- intensive industries. As regards the availability of skilled labour, the existence of technical training institutes in the area proves useful. Besides, an entrepreneur should also study labour relations through turnover rates, absenteeism and liveliness of trade unionism in the particular area.

Such information can be obtained from existing industries working in the area. Whether the labour should be rural or urban; also assumes significance in selecting the location for one's industry. Similarly, the wage rates prevalent in the area also have an important bearing on selection of location decision.

While one can get cheaper labour in industrially backward areas, higher cost of their training and fall in quality of production may not allow the entrepreneur to employ the cheap manpower and, thus, establish his/her enterprise in such areas.

(vi) Local Laws, Regulations and Taxes:

Laws prohibit the setting up of polluting industries in prone areas particularly which are environmentally sensitive. Air (Prevention and Control of Pollution) Act, 1981 is a classical example of such laws prohibiting putting up polluting industries in prone areas. Therefore, in order to control industrial growth, laws are enforced to decongest some areas while simultaneously encourage certain other areas. For example, while taxation on a higher rate may discourage some industries from setting up in an area, the same in terms of tax holidays for some years may become the dominant decisional factor for establishing some other industries in other areas. Taxation is a Centre as well as State Subject. In some highly competitive consumer products, its high quantum may turn out to be the negative factor while its relief may become the final deciding factor for some other industry.

(vii) Ecological and Environmental Factors:

In case of certain industries, the ecological and environmental factors like water and air pollution may turn out to be negative factor in deciding enterprise location. For example, manufacturing plants apart from producing solid waste can also pollute water and air. Moreover, stringent waste disposal laws, in case of such industries, add to the manufacturing cost to exorbitant limits.

In view of this, the industries which are likely to damage the ecology and environment of an area will not be established in such areas. The Government will not grant permission to the entrepreneurs to establish such industries in such ecologically and environmentally sensitive areas.

(viii) Competition:

In case of some enterprises like retail stores where the revenue of a particular site depends on the degree of competition from other competitors' location nearby plays a crucial role in selecting the location of an enterprise. The areas where there is more competition among industries, the new units will not be established in these areas. On the other hand, the areas where there is either no or very less competition, new enterprises will tend to be established in such areas.

(ix) Incentives, Land Costs, Subsidies for Backward Areas:

With an objective to foster balanced economic development in the country, the Government decentralizes industries to less developed and backward areas in the country. This is because the progress made in islands only cannot sustain for long. The reason is not difficult to seek."Poverty anywhere is dangerous for prosperity everywhere." That many have-not's will not tolerate a few haves is evidently clear from ongoing protests leading to problems like terrorism. Therefore, the Government offers several incentives, concessions, tax holidays, cheaper lands,

assured and cheaper power supply, price concessions for departmental (state) purchases, etc. to make the backward areas also conducive for setting up industries.

It is seen that good number of entrepreneurs considers these facilities as decisive factor to establish industries in these locations. However, it has also been observed that these facilities can attract entrepreneurs to establish industries in backward areas provided other required facilities do also exist there.

For example, incentives and concessions cannot duly compensate for lack of infrastructural facilities like communication and transportation facilities. This is precisely one of the major reasons why people in-spite of so many incentives and concessions on offer by the Government, are not coming forward to establish industries in some backward areas.

(x) Climatic Conditions:

Climatic conditions vary from place to place in any country including India. And, climatic conditions affect both people and manufacturing activity. It affects human efficiency and behaviour to a great extent. Wild and cold climate is conducive to higher productivity. Likewise, certain industries require specific type of climatic conditions to produce their goods. For example, jute and textiles manufacturing industries require high humidity.

As such, these can be established in Kashmir experiencing humidity-less climate. On the other hand, industrial units manufacturing precision goods like watches require cold climate and hence, will be established in the locations having cold climate like Kashmir and Himachal Pradesh.

(xi) Political Conditions:

Political stability is essential for industrial growth. That political stability fosters industrial activity and political upheaval derails industrial initiates is duly confirmed by political situations across the countries and regions within the same country. The reason is not difficult to seek. The political stability builds confidence and political instability causes lack of confidence among the prospective and present entrepreneurs to venture into industry which is filled with risks. Community attitudes such as the "Sons of the Soil Feeling" also affect entrepreneurial spirits and may not be viable in every case.

Besides, an entrepreneur will have also to look into the availability of community services such as housing, schools and colleges, recreational facilities and municipal services. Lack of these facilities makes people hesitant and disinterested to move to such locations for work.

Very closer to political conditions is law and order situation prevalent in an area also influences selection of industrial location. Hardly any entrepreneur will be interested to establish his / her industry in an area trouble-torn by nexalites and terrorists like Jharkhand, Nagaland and Jammu & Kashmir.

PLANT LAYOUT

Plant layout is the overall arrangement of the production process, store-room, stock-room, tool-room, material handling equipment, aisles, racks and sub-stores, employee services and all other accessories required for facilitation of the production in the factory.

It encompasses production and service facilities and provides for the most effective utilization of the men, materials and machine' constituting the process, it is a master blueprint for coordinating all operations performed inside the factory.

Objectives of Plant Layout

A good plant layout strives to attain the following objectives:

- 1. Minimization of material handling.
- 2. Elimination of bottlenecks through the balancing of plant capacities.
- 3. High material turnover through a shorter operating cycle.
- 4. Effective utilization of installed capacity so that the returns on the investments may be maximized.
- 5. Effective utilization of cubic space in the factory area.
- 6. Effective utilization of manpower resources through the elimination of idle time.

- 7. Elimination, improvement or confinement of objectionable operations e.g., operations with bad odour, vibrating operations etc.
- 8. Elimination of physical efforts required by operative workers.
- 9. Avoidance of industrial accidents.
- 10.Better working conditions for the employees like lighting, ventilation, control of noise and vibrations etc.
- 11.Decency and orderliness inside the plant area.
- 12.Better customer services through cheaper and better product supplies according to the delivery promises.

Factors Affecting the Plant Layout Decision

The decision of the plant layout is affected by the following factors:

- 1. Type of production: The layout for an engineering unit will be quite different from that of a flour factory, similarly layout of a paper mill will be different from a tool room and layout of an engine assembly line is different from the toy-making facility.
- 2. Production System: The plant layout in a continuous production system will be totally different from the intermitted production system.
- 3. Scale of Production: The plant layout and material handling equipment in the large scale organization will be different from that in the small scale manufacturing activity.
- 4. Type of Machines: The use of single-purpose and multipurpose machines substantially affects the plant layout. Similarly, noisy and vibrating machines require special attention in the plant layout decision.
- 5. Type of building facilities: The plant layout in a single storey building will be different from that in a multi-storey building.

- 6. Availability of Total Floor Area: The allocation of space for machines, workbenches sub stores, aisles, etc is made on the basis of the available floor area. Use of overhead space is made in case of shortage of space.
- 7. Possibility of Future Expansion: Plant layout is mad in the light of the future requirements and installation of additional facilities.
- 8. Arrangement of Material Handling Equipment: The plant layout and the material handling services are closely related and the latter has a decisive effect on the arrangement of the production process and plant services.

Types of Plant Layout:

Two basic plans of the arrangement of manufacturing facilities are – product layout and process layout. The only other alternative is a combination of product and process layouts, in the same plant.

Following is an account of the various types of plant layout: (a) Product Layout (or Line Layout):

In this type of layout, all the machines are arranged in the sequence, as required to produce a specific product. It is called line layout because machines are arrange in a straight line. The raw materials are fed at one end and taken out as finished product to the other end. Special purpose machines are used which perform the required jobs (i.e. functions) quickly and reliably.

Product layout is depicted below:



Advantages:

1. Reduced material handling cost due to mechanized handling systems and straight flow

2. Perfect line balancing which eliminates bottlenecks and idle capacity.

3. Short manufacturing cycle due to uninterrupted flow of materials

4. Simplified production planning and control; and simple and effective inspection of work.

5. Small amount of work-in-progress inventory

6. Lesser wage cost, as unskilled workers can learn and manage production.

Disadvantages:

1. Lack of flexibility of operations, as layout cannot be adapted to the manufacture of any other type of product.

2. Large capital investment, because of special purpose machines.

3. Dependence of whole activity on each part; any breakdown of one machine in the sequence may result in stoppage of production.

4. Same machines duplicated for manufacture of different products; leading to high overall operational costs.

5. Delicate special purpose machines require costly maintenance / repairs.

(b) Process Layout (or Functional Layout):

In this type of layout, all machines performing similar type of operations are grouped at one location i.e. all lathes, milling machines etc. are grouped in the shop and they will be clustered in like groups.

A typical process layout is depicted below:



Advantages:

Greater flexibility with regard to work distribution to machinery and personnel.
 Adapted to frequent changes in sequence of operations.

2. Lower investment due to general purpose machines; which usually are less costly than special purpose machines.

3. Higher utilisation of production facilities; which can be adapted to a variety of products.

4. Variety of jobs makes the work challenging and interesting.

5. Breakdown of one machine does not result in complete stoppage of work.

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Disadvantages:

1. Backtracking and long movements occur in handling of materials. As such, material handling costs are higher.

2. Mechanisation of material handling is not possible.

3. Production planning and control is difficult

4. More space requirement; as work-in-progress inventory is high-requiring greater storage space.

5. As the work has to pass through different departments; it is quite difficult to trace the responsibility for the finished product.

(c) Combination Layout:

In practice, plants are rarely laid out either in product or process layout form. Generally a combination of the two basic layouts is employed; to derive the advantages of both systems of layout. For example, refrigerator manufacturing uses a combination layout. Process layout is used to produce various operations like stamping, welding, heat treatment being carried out in different work centres as per requirement. The final assembly of the product is done in a product type layout.

(d) Fixed Position Layout:

It is also called stationary layout. In this type of layout men, materials and machines are brought to a product that remains in one place owing to its size. Ship-

building, air-craft manufacturing, wagon building, heavy construction of dams, bridges, buildings etc. are typical examples of such layout.

TYPES OF SERVICE LAYOUT



1. Warehouse/Storage layout

A warehouse is understood as a planned and structured place for the control and management of a company's merchandise. But what do we hope to obtain from a facility such as a warehouse or distribution centre? Answering this question will give us the keys to designing a correct layout of the warehouse or distribution centre. The design or layout of the warehouse is about the process of distribution of both the external and internal space of the facility drawn on a plan. This is a complex task that greatly impacts the supply chain, which may be motivated by the acquisition of a new warehouse, an expansion or a partial or complete remodelling of the warehouse.

The warehouse layout must reflect the most efficient way of managing the stocks that it will store. For example, the design of a warehouse of raw materials or finished products.

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Objectives of warehouse layout

- Optimisation of the warehouse space to achieve an efficient operation that will result in minimum investment for maximum potential productivity.
- Eliminate all processes that do not add value to the product or goods.
- Enable stock management suited to the characteristics of the warehouse and the products themselves.
- Achieve not only a viable but also a profitable stock rotation rate for the company.
- Facilitate access and control of the stored units.
- Improve the flow of information on materials and people for optimisation of material and human resources.
- Provide flexibility in case of possible structural changes of a spatial or organisational nature.

Components of a warehouse layout

- The **loading and unloading zone** is where inventory is brought into or taken away from the warehouse. A loading zone can exist within the physical warehouse building, or it can be a separate location or building placed elsewhere on the grounds.
- The **reception area** is where incoming inventory is processed as it comes in. Here, the warehouse team identifies, inspects, and documents all incoming items for QA and logistical purposes. Once a shipment is "officially" received, the warehouse team will determine the optimal storage space for the inventory.
- A warehouse's **storage area** is where inventory is held in preparation for outgoing delivery. Depending on the physical makeup of the items in question, inventory may be stored directly on the floor, stacked together, or placed on racking units whichever method provides the most convenience (without sacrificing quality assurance).
- The **picking area** is where inventory lives before being delivered, allowing your team to make any necessary modifications to orders as placed. This may involve picking multiple items to be shipped together or picking items to be personalized before shipping (such as jewelry to be engraved). Picking areas typically exist and operate within or adjacent to storage areas.

- Within the **dispatch area**, fully-prepared shipments are housed before being delivered. Unlike storage, the items being held in dispatch have already been ordered, and are guaranteed to be sent out within a relatively short period of time. Dispatch areas should be placed in a location that allows flow of inventory from storage to loading.
- Finally, most warehouses include **offices and facilities** such as restrooms, dining areas, and break rooms. Strategic placement of these different areas depend on their operational purpose, as well as who uses them most often. For example, restrooms should be placed in convenient spots so as to minimize foot travel time, while offices and break rooms may need to be placed further away from noisy operational zones.

2. Retail Service Layout

Service facility layout will be designed based on degree of customer contact and the service needed by a customer. These service layouts follow conventional layouts as required. For example, for car service station, product layout is adopted, where the activities for servicing a car follows a sequence of operation irrespective of the type of car. Hospital service is the best example for adaptation of process layout. Here, the service required for a customer will follow an independent path The other issues which are deal with the service layout are the location of special displays, protection from pilferage, allocation of space to departments, the efficiency of checkout procedures. The sales per square foot of a product or the willingness of the vendor to pay for the replacement of the product versus product line can be used to determine the space allocation.

There can be front office or back office elements in the services. Having greater functionality and efficiency are the main objective behind the back office while in front office, the main focus remain on the aesthetic appearance which is pleasing to the customers along with the functional aspects. This is the main reason behind the service layouts to be considered as a part of the service design process.

The layout of hospital is shown in figure;



Objectives of service operation layout

- 1. Facilitating customer comfort and convenience
- 2. Facilitating attractive setup for customers
- 3. Providing attractive display of merchandise
- 4. Minimize travel of personnel or customer
- 5. Ensure privacy in work areas
- 6. Ensure better stock rotation for shelf life
- 7. Facilitate better communication

3. Office Layout

An office layout reflects the corporate statement of your business. More than that, it creates a wholesome environment that can make everybody at ease but efficient in their work at the same time. Hence, it is best to plan your office floor plan as per the atmosphere you want to create in your office.

The term office layout deals with the design and décor of an office. It takes into account all the equipment, supplies, accessories, and designs an arrangement needed for the proper functioning of an office. All are within the available floor space so that all procedures and personnel can work efficiently and effectively.

In simpler words, it is the blueprint of the office floor, and hence, called the office floor plan. An office layout can be practical only when it makes your employees more efficient in their tasks. Let's say, for example, an office floor plan where all the employees in your accounts department get grouped into one area or floor depending on the space available. It will help them to carry out their tasks more efficiently as they can now communicate within themselves much better than before.

Objectives of Office Layouts.

- To ensure proper and effective use of the floor space available;
- To facilitate managers with better supervision and control of their workforce;
- To ensure steady and effective workflow to increase production;
- To provide a wholesome environment to employees to make them feel safe and comfortable at the workplace;
- To facilitate better inter-communication between various departments by interlinking them as needed;
- To provide adequate privacy for your staff working on confidential projects;
- To ensure a disturbance-free working environment by insulating the office floor from external noises;
- To include provisions for future expansion of the company.

Different Types of Office Layouts

1. Open-Plan Office Layout

In an Open-Plan office layout, there are no walls or separators between workstations. Instead, they get defined by furniture in the office area, including cupboards, shelves, cabinets, etc. The desks may get stacked up side-by-side or replaced altogether with work-tables capable of facilitating multiple employees at one go.

Pros & Cons:

Pros		Cons	
~	Reduces cost and saves space;	A lot of distractions;	
~	Encourages collaboration and communications	Lack of privacy;	
	among team members;	Increases anxiety among employees for being	
~	Flexible seating arrangements and easily	watched continuously.	
	reconfigurable.		

2. Private Office Layout

A private office layout uses a cellular style workstation, with the interior walls reach up to the ceiling. It means that these parts are completely sealed off from the rest of the office floor. It is the most widely preferred seating arrangement for the senior managers of an organization. Sometimes more than one manager would share a private office.

Pros & Cons:

Pros	Cons
✔ A lot of privacy for confidential projects and	Uses a lot of space and it is very
discussions;	uneconomical;
 Concentration is uninterrupted; 	Communication with the rest of the teams
 More comfortable to work on projects that 	and subordinates become a bit hampered;
require time and focus.	Supervision becomes tough as you are
	somewhat isolated from your underlings.

3. Cubicle Office Layout

A cubicle office layout is the most used type. It is a type of open plan layout where the workspaces are separated from one another using partitioning walls to form a shape of a cube, hence cubicle. It is the most cost-efficient type of office layout. You can see this type of plan in combination with private offices for senior staff and built-in meeting rooms.

Pros & Cons:

Pros	Cons	
 Provides more privacy at the workstation; 	Hinders interactions and communications	
 Allows for a personalized workstation; 	between employees;	
 Very much cost-efficient. 	Claustrophobic people may feel	
	uncomfortable;	
	Not suitable for a supervisor as it provides a	
	visual barrier.	

4. Co-Working Office Layout

It is one of the greatest innovations in office layout designing in this century. These plans are best for the self-employed who generally are mobile with their work. What's more, is that you don't need to create this workspace; but pay a small fee and find a workstation you like or a spot on the lounge.

Pros & Cons:

Pros		Cons
V	Flexible plans, costing and space options;	Too many distractions;
V	Best suited for start-ups and freelancers;	Lack of customization of the workspace that
V	Higher chance of networking and prospect	can lead to a negative impact on work;
	networking.	The cultural growth of a company might be
		affected by the culture of the workspace.