UNIT-I

ENTREPRENEURSHIP

The capacity and willingness to develop, organize and manage a business venture along with any of its risks in order to make a profit. The most obvious example of entrepreneurship is the starting of new businesses. In economics, entrepreneurship combined with land, labor, natural resources and capital can produce profit. Entrepreneurial spirit is characterized by innovation and risk-taking, and is an essential part of a nation's ability to succeed in an ever changing and increasingly competitive global marketplace

Characteristics of Entrepreneurship:

1. Economic and dynamic activity:

Entrepreneurship is an economic activity because it involves the creation and operation of an enterprise with a view to creating value or wealth by ensuring optimum utilisation of scarce resources. Since this value creation activity is performed continuously in the midst of uncertain business environment, therefore, entrepreneurship is regarded as a dynamic force.

2. Related to innovation:

Entrepreneurship involves a continuous search for new ideas. Entrepreneurship compels an individual to continuously evaluate the existing modes of business operations so that more efficient and effective systems can be evolved and adopted. In other words, entrepreneurship is a continuous effort for synergy (optimization of performance) in organizations.

3. Profit potential:

"Profit potential is the likely level of return or compensation to the entrepreneur for taking on the risk of developing an idea into an actual business venture." Without profit potential, the efforts of entrepreneurs would remain only an abstract and a theoretical leisure activity.

4. Risk bearing:

The essence of entrepreneurship is the 'willingness to assume risk' arising out of the creation and implementation of new ideas. New ideas are always tentative and their results may not be instantaneous and positive.An entrepreneur has to have patience to see his efforts bear fruit. In the intervening period (time gap between the conception and implementation of an idea and its results), an entrepreneur has to assume risk. If an entrepreneur does not have the willingness to assume risk, entrepreneurship would never succeed.

Entrepreneurial Process:

Entrepreneurship is a process, a journey, not the destination; a means, not an end. All the successful entrepreneurs like Bill Gates (Microsoft), Warren Buffet (Hathaway), Gordon Moore (Intel) Steve Jobs (Apple Computers), Jack Welch (GE) GD Birla, Jamshedji Tata and others all went through this process.

To establish and run an enterprise it is divided into three parts – the entrepreneurial job, the promotion, and the operation. Entrepreneurial job is restricted to two steps, i.e., generation of an idea and preparation of feasibility report. In this article, we shall restrict ourselves to only these two aspects of entrepreneurial process.

The Entrepreneurial Process

1. Idea Generation:

To generate an idea, the entrepreneurial process has to pass through three stages:

a. Germination:

This is like seeding process, not like planting seed. It is more like the natural seeding. Most creative ideas can be linked to an individual's interest or curiosity about a specific problem or area of study.

b. Preparation:

Once the seed of interest curiosity has taken the shape of a focused idea, creative people start a search for answers to the problems. Inventors will go on for setting up laboratories; designers will think of engineering new product ideas and marketers will study consumer buying habits.

c. Incubation:

This is a stage where the entrepreneurial process enters the subconscious intellectualization. The sub-conscious mind joins the unrelated ideas so as to find a resolution.

2. Feasibility study:

Feasibility study is done to see if the idea can be commercially viable.

It passes through two steps:

a. Illumination:

After the generation of idea, this is the stage when the idea is thought of as a realistic creation. The stage of idea blossoming is critical because ideas by themselves have no meaning.

b. Verification:

This is the last thing to verify the idea as realistic and useful for application. Verification is concerned about practicality to implement an idea and explore its usefulness to the society and the entrepreneur.

Importance of Entrepreneurship:

1. Development of managerial capabilities:

The biggest significance of entrepreneurship lies in the fact that it helps in identifying and developing managerial capabilities of entrepreneurs. An entrepreneur studies a problem, identifies its alternatives, compares the alternatives in terms of cost and benefits implications, and finally chooses the best alternative. This exercise helps in sharpening the decision making skills of an entrepreneur. Besides, these managerial capabilities are used by entrepreneurs in creating new technologies and products in place of older technologies and products resulting in higher performance.

2. Creation of organisations:

Entrepreneurship results into creation of organisations when entrepreneurs assemble and coordinate physical, human and financial resources and direct them towards achievement of objectives through managerial skills.

3. Improving standards of living:

By creating productive organisations, entrepreneurship helps in making a wide variety of goods and services available to the society which results into higher standards of living for the people.

Possession of luxury cars, computers, mobile phones, rapid growth of shopping malls, etc. are pointers to the rising living standards of people, and all this is due to the efforts of entrepreneurs.

4. Means of economic development:

Entrepreneurship involves creation and use of innovative ideas, maximisation of output from given resources, development of managerial skills, etc., and all these factors are so essential for the economic development of a country.

Factors affecting Entrepreneurship:

Entrepreneurship is a complex phenomenon influenced by the interplay of a wide variety of factors.

Some of the important factors are listed below:

1. Personality Factors:

Personal factors, becoming core competencies of entrepreneurs, include:

(a) Initiative (does things before being asked for)

(b) Proactive (identification and utilisation of opportunities)

(c) Perseverance (working against all odds to overcome obstacles and never complacent with success)

(d) Problem-solver (conceives new ideas and achieves innovative solutions)

(e) Persuasion (to customers and financiers for patronisation of his business and develops & maintains relationships)

(f) Self-confidence (takes and sticks to his decisions)

(g) Self-critical (learning from his mistakes and experiences of others)

(h) A Planner (collects information, prepares a plan, and monitors performance)

(i) Risk-taker (the basic quality).

2. Environmental factors:

These factors relate to the conditions in which an entrepreneur has to work. Environmental factors such as political climate, legal system, economic and social conditions, market situations, etc. contribute significantly towards the growth of entrepreneurship. For example, political stability in a country is absolutely essential for smooth economic activity.

Frequent political protests, bandhs, strikes, etc. hinder economic activity and entrepreneurship. Unfair trade practices, irrational monetary and fiscal policies, etc. are a roadblock to the growth of entrepreneurship. Higher income levels of people, desire for new products and sophisticated technology, need for faster means of transport and communication, etc. are the factors that stimulate entrepreneurship.

Thus, it is a combination of both personal and environmental factors that influence entrepreneurship and brings in desired results for the individual, the organisation and the society.

Functions of an Entrepreneur:

1. Innovation:

An entrepreneur is basically an innovator who tries to develop new technology, products, markets, etc. Innovation may involve doing new things or doing existing things differently. An entrepreneur uses his creative faculties to do new things and exploit opportunities in the market. He does not believe in status quo and is always in search of change.

2. Assumption of Risk:

An entrepreneur, by definition, is risk taker and not risk shirker. He is always prepared for assuming losses that may arise on account of new ideas and projects undertaken by him. This willingness to take risks allows an entrepreneur to take initiatives in doing new things and marching ahead in his efforts.

3. Research:

An entrepreneur is a practical dreamer and does a lot of ground-work before taking a leap in his ventures. In other words, an entrepreneur finalizes an idea only after considering a variety of options, analyzing their strengths and weaknesses by applying analytical techniques, testing their applicability, supplementing them with empirical findings, and then choosing the best alternative. It is then that he applies his ideas in practice. The selection of an idea, thus, involves the application of research methodology by an entrepreneur.

4. Development of Management Skills:

The work of an entrepreneur involves the use of managerial skills which he develops while planning, organizing, staffing, directing, controlling and coordinating the activities of business. His managerial skills get further strengthened when he engages himself in establishing equilibrium between his organization and its environment.

However, when the size of business grows considerably, an entrepreneur can employ professional managers for the effective management of business operations.

5. Overcoming Resistance to Change:

New innovations are generally opposed by people because it makes them change their existing behavior patterns. An entrepreneur always first tries new ideas at his level.It is only after the successful implementation of these ideas that an entrepreneur makes these ideas available to others for their benefit. In this manner, an entrepreneur paves the way for the acceptance of his ideas by others. This is a reflection of his will power, enthusiasm and energy which helps him in overcoming the society's resistance to change.

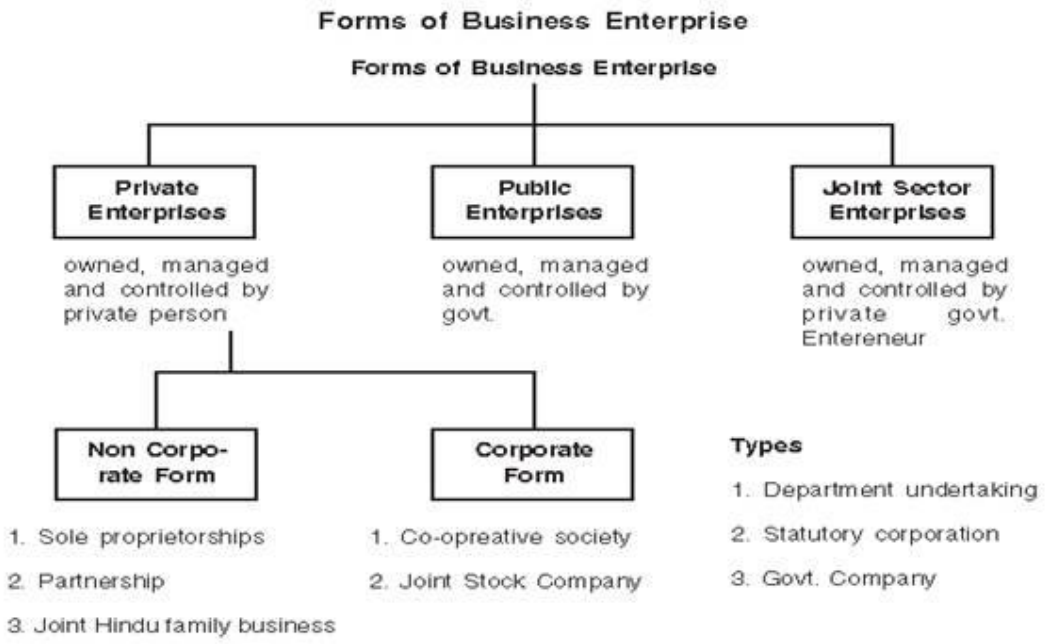
6. Catalyst of Economic Development:

An entrepreneur plays an important role in accelerating the pace of economic development of a country by discovering new uses of available resources and maximizing their utilization.To better appreciate the concept of an entrepreneur, it is desirable to distinguish him from an entrepreneur and promoter.

Difference between an Entrepreneur and a Manager:

Points	**Entrepreneur**	**Manager**
Motive	The main motive of an entrepreneur is to start a venture by setting up an enterprise. He understands the venture for his personal gratification.	But, the main motive of a manager is to render his services in an enterprise already set up by someone else.
Status	An entrepreneur is the owner of the enterprise.	A manager is the servant in the enterprise owned by the entrepreneur.
Risk-bearing	An entrepreneur being the owner of the enterprise assumes all risks and uncertainty involved in running the enterprise.	A manager as a servant does not bear any risk involved in the enterprise.

Rewards	The reward an entrepreneur gets for bearing risks involved in the enterprise is profit, which is highly uncertain.	A manager gets salary as reward for the services rendered by him in the enterprise. Salary of a manager is certain and fixed.
Innovation	Entrepreneur himself thinks over what and how to produce goods to meet the changing demands of the customers. Hence, he acts as an innovator also called a "change- agent."	But, what a manager does is simply to execute the plans prepared by the entrepreneur. Thus, a manager simply translates the entrepreneur's ideas into practice.
Qualifications	An entrepreneur needs to possess qualities and qualifications like high achievement motive, originally in thinking, foresight, risk- bearing ability and so on.	On the contrary, a manager needs to possess district qualifications in terms of sound knowledge in management theory and practice.



Sole Proprietorship

Sole proprietorship means a business owned, financed and controlled by a single person who is recipient of all profit and bearer of all risks.

It is SUITABLE IN AREAS OF PERSONALISED SERVICE like beauty parlour, hair cutting saloons & small scale activities like retail shops.

Features

1. Single ownership: It is wholly owned by one individual.

2. Control: Sole proprietor has full power of decision making.
3. No separate legal entity: Legally there is no difference between business& businessmen.
4. Unlimited liability: The liability of owner is unlimited. In case the assets of business are not sufficient to meet its debts, the personal property of owner can be used for paying debts
5. No legal formalities: Not required to start, manage and dissolve such business organization.
6. Sole risk bearer and profit recipient: He bears the complete risk and there is no body to share profit/loss with him.

Merits

1. Easy to start and close: It can be easily started and closed without any legal formalities.
2. Quick decision making: As sole trader is not required to consult or inform anybody about his decisions.
3. Sense of accomplishment: There is a sense of personal satisfaction.
4. Unlimited liability: The liability of owner is unlimited. In case the assets of business are not sufficient to meet its debts, the personal property of owner can be used for paying debts
5. No legal formalities: are required to start, manage and dissolve such business organization.
6. Sole risk bearer and profit recipient: He bears the complete risk and there is no body to share profit/loss with him.

LIMITATIONS

1. Limited financial resources: Funds are limited to the owner's personal savings and his borrowing capacity.
2. Limited Managerial ability: Sole trader can't be good in all aspects of business and he can't afford to employ experts also.
3. Unlimited liability: sole trader compels him to avoid risky and bold business decisions.
4. Uncertain life: Death, insolvency, lunacy or illness of a proprietor affects the business and can lead to its closure.
5. Limited scope for expansion:- Due to limited capital and managerial skills, it cannot expand to a large scale.

SUITABILITY:

Sole tradership is suitable-

• Where the personal attention to customer is required as in tailoring, beauty parlour.
• Where goods are unstandardized like artistic jewellery.
• Where modest capital and limited managerial skills are required as in case of retail store
• Business where risk is not extensive i.e. lesser fluctuation in price and demand i.e. stationery shop.

JOINT HINDU FAMILY BUSINESS

It is owned by the members of undivided joint Hindu family and managed by the eldest member of the family known as KARTA. It is governed by the provisions of Hindu law. The basis of membership is birth in a particular family.

1. Formation – For a joint Hindu family business there should be at least two members in the family and some ancestral property to be inherited by them.
2. Membership by birth –

There are two systems which govern membership

Dayabhaga System- It prevails in west Bengal and allows both male and female member to co-parcencers.

Mitakshara System- It prevails all over India except West Bengal and allows only male members to be coparceners.
3. Liability – Liability of Karta is unlimited but of all other members is limited to the extent of their share in property
4. Continuity – The business is not affected by death or incapacity of Karta in such cases the next senior male member becomes the Karta.
5. Minor members – A minor can also become full fledged member of Family business.
MERITS
1. Effective control- The Karta can promptly take decisions as he has the absolute decision making power.
2. Continued business existence- The death, Lunacy of Karta will not affect the business as next eldest member will then take up the position.
3. Limited liability – The liability of all members except Karta is limited. It gives them a relief.
4. Secrecy – Complete secrecy regarding business decisions can be maintained by Karta.
5. Loyalty and Co-operation: It helps in securing better co-operation and greater loyalty from all the members who run the business.
LIMITATION
1. Limited capital: There is shortage of capital as it is limited to the ancestral property.
2. Unlimited liability of karta – It makes him less enterprising.
3. Dominance of karta – Karta manages the business and sometimes he ignores the valuable advice of other members. This may cause conflict among the members and may lead to break down of the family limit.
4. Hasty decisions: As karta is overburdened with work, he may take hasty and unbalanced decisions.
5. Limited managerial skills of karta also pose a serious problem. The Joint Hindu family business is on decline because of the diminishing no. of joint Hindu families in the country.

PARTNERSHIP

Meaning: Partnership is a voluntary association of two or more persons who agree to carry on some business jointly and share its profits and losses.
FEATURES
1. Two or more persons: There must be at least two persons to form a partnership. The maximum no. of persons is 10 in banking business and 20 in non-banking business.
2. Agreement: It is an outcome of an agreement among partners which may be oral or in writing.
3. Lawful business- It can be formed only for the purpose of carrying on some lawful business.
4. Decision making & control – Every partner has a right to participate in management & decision making of the organisations.
5. Unlimited liability – Partners have unlimited liability.
6. Mutual Agency – Every partner is an implied agent of the other partners and of the firm. Every partner is liable for acts performed by other partners on behalf of the firm.
7. Lack of continuity – Firms existence is affected by the death, Lunacy and insolvency of any of its partner. It suffers from lack of continuity.
MERITS
1. Ease of formation & closure – It can be easily formed. Only an agreement among the partners is required.

2. Larger financial resources – There are more funds as capital is contributed by no. of partners.
3. Balanced Decisions – As decisions are taken jointly by partners after consulting each other.
4. Sharing of Risks – In it, risk get distributed among partners which reduces anxiety, burden and stress on individual partner.
5. Secrecy – Secrecy can be easily maintained about business affairs as they are not required to publish their accounts or to file any report to the govt.

LIMITATIONS

1. Limited resources – There is a restriction on the number of partners and hence capital contributed by them is also limited.
2. Unlimited liability- The liability of partners is unlimited and they are liable individually as well as jointly. It may prove to be a big drawback for those partners who have greater personal wealth. They will have to repay the entire debt in case the other partners are unable to do so.
3. Lack of continuity – Partnership comes to an end with the death, retirement, insolvency or lunacy of any of its partner.
4. Lack of public confidence – Partnership firms are not required to publish their reports and accounts. Thus they lack public confidence.

TYPES OF PARTNERS

1. General / Active Partner – Such a partner takes active part in the management of the firm.
2. Sleeping or Dormant Partner – He does not take active part in the management of the firm. Though he invested money, shares profit & Loss and unlimited liability.
3. Secret Partner – He participates in business secretly without disclosing his association with the firm to general public. His liability is also unlimited.
4. Nominal Partner – Such a partner only gives his name and goodwill to the firm. He neither invests money nor takes profit. But his liability is unlimited.
5. Partner by Estoppels – He is the one who by his words or conduct gives impression to the outside world that he is a partners of the firm whereas actually he is not. His liability is unlimited towards the third party who has entered into dealing with firm on the basis of his pretensions.
6. Partner by holding out – He is the one who is falsely declared partner of the firm whereas actually he is not. And even after becoming aware of it, he-does not deny it. His liability is unlimited towards the party who has deal with firm on the basis of this declaration.

Minor as a Partner

A minor is a person who has not attained the age of 18 years. Since a minor is not capable of enlarging into a valid agreement. He cannot become partner of firm. However, a minor can be admitted to the benefits of an existing partnership firm with the mutual consent of all other partners. He cannot be asked to bear the losses. His liability will be limited to the exilent of the capital contributed by him. He will not be eligible to take an active part in the management of the firm.

PARTNERSHIP DEED

The written agreement on a stamped paper which specifies the terms and conditions of partnership is called the partnership deed.

It generally includes the following aspects –

- Name of the firm
- Location / Address of the firm
- Duration of business.
- Investment made by each partner.

• Profit sharing ratio of the partners
• Terms relating to salaries, drawing, interest on capital and interest on drawing of partners.
• Duties & obligations of partners.
• Terms governing admission, retirement & expulsion of a partner, preparation on of accounts & their auditing.
• Method of solving dispute

Co-operative Society

A co-operative society is a voluntary association of persons of moderate means who unite together to protect & promote their common economic interests.

Features :

1. Voluntary association: Every one having a common interest is free to join a co-operative society and can also leave the society after giving proper notice.
2. Legal status: Its registration is compulsory and it gives it a separate legal identity.
3. Limited liability: The liability of the member is limited to the extent of their capital contribution in the society.
4. Democratic control: Management & Control lies with the managing committee elected by the members by giving vote. Every member has one vote irrespective of the number of shares held by him.
5. Service motive: The main aim is to serve its members and not to maximize the profit.
6. Bound by govt.'s rules: They have to be tide by the rules and regulations framed by govt. for them.
7. Distribution of surplus: The profit is distributed on the basis of volume of business transacted by a member and not on the basis of capital contribution of members.

MERITS

1. Excise of formation: It can be started with minimum of 10 members. Registration is also easy as it requires very few legal formations.
2. Limited Liability: The liability of members is limited to the extent of their capital contribution.
3. Stable existence: Due to registration it is a separate legal entity and is not affected by the death, luxury or insolvency of any of its member.
4. Economy in operations: Due to elimination of middlemen and voluntary services provided by its members.
5. Government Support: Govt. provides support by giving loans at lower interest rates, subsidies & by charging less taxes.
6. Social utility: It promotes personal liberty, social justice and mutual cooperation. They help to prevent concentration of economic power in few hands.

LIMITATIONS

1. Shortage of capital – It suffers from shortage of capital as it is usually formed by people with limited means.
2. Inefficient management – Co-operative society is managed by elected members who may not be competent and experienced. Moreover, it can't afford to employ expert and experienced people at high salaries.
3. Lack of motivation – Members are not inclined to put their best efforts as there is no direct link between efforts and reward.

4. Lack of Secrecy – Its affairs are openly discussed in its meeting which makes it difficult to maintain secrecy.
5. Excessive govt. control – it suffers from excessive rules and regulations of the govt. It has to get its accounts audited by the auditor and has to submit a copy of its accounts to registrar.
6. Conflict among members – The members are from different sections of society with different viewpoints. Sometimes when some members become rigid, the result is conflict.

TYPES OF CO-OPERATIVE SOCIETIES

1. Consumers co-operative Society – It formed to protect the interest of consumers.It seeks to eliminate middleman by establishing a direct link with the producers. It purchases goods of daily consumption directly from manufacturer or wholesalers and sells them to the members at reasonable prices.
2. Producer's Co-operative Society – The main aim is to help small producers who cannot easily collect various items of production and face some problem in marketing. These societies purchase raw materials, tools, equipments and other items in large quantity and provide these things to their members at reasonable price.
3. Marketing Co-operative Society – It performs various marketing function such as transportation, warehousing, packing, grading, marketing research etc. for the benefit of its members. The production of different members is pooled together and sold by society at good price.
4. Farmer's Co-operative Society – In such societies, small farmers join together and pool their resources for cultivating their land collectively. Such societies provide better quality seeds, fertilizers, machinery and other modern techniques for use in the cultivation of crops. It provides them opportunity of cultivation on large scale.
5. Credit co-operative Society – Such societies protect the members from exploitation by money lenders. They provide loans to their members at easy terms and reasonably low rate of interest.
6. Co-operative Housing Society – The main aim is to provide houses to people with limited means/income at reasonable price.

JOINT STOCK COMPANY

Meaning – Joint stock company is a voluntary association of persons for profit, having a capital divided into transferable shares, the ownership of which is the condition of membership.

FEATURES

1. Incorporated association – The company must be incorporated or registered tender the companies Act 1956. Without registration no company can come into existence.
2. Separate Legal Existence – It is created by law and it is a distinct legal entity independent of its members. It can own property, enter into contracts, can file suits in its own name.
3. Perpetual Existence – Death, insolvency and insanity or change of members as no effect on the life of a company. It can come to an end only through the prescribed legal procedure.
4. Limited Liability – The liability of every member is limited to the nominal value of the shares bought by him or to the amt. guaranteed by him. Transferability of shares – Shares of public Co. are easily transferable. But there are certain restrictions on transfer of share of private Co. Common Seal- It is the official signature of the company and it is affixed on all important documents of company.

5. Separation of ownership and control – Management of company is in the hands of elected representatives of shareholders known individually as director and collectively as board of directors.

MERITS

1. Limited Liability – Limited liability of shareholder reduces the degree of risk borne by him.
2. Transfer of Interest – Easy transferability of shares increases the attractiveness of shares for investment.
3. Perpetual Existence – Existence of a company is not affected by the death, insanity, Insolvency of member or change of membership. Company can be liquidated only as per the provisions of companies Act.
4. Scope for expansion – A company can collect huge amount of capital from unlimited no. of members who are ready to invest because of limited liability, easy transferability and chances of high return.
5. Professional management – A company can afford to employ highly qualified experts in different areas of business management.

LIMITATIONS

1. Legal formalities – The procedure of formation of Co. is very long, time consuming, expensive and requires lot of legal formalities to be fulfilled.
2. Lack of secrecy – It is very difficult to maintain secrecy in case of public company, as company is required to publish and file its annual accounts and reports.
3. Lack of Motivation – Divorce between ownership and control and absence of a direct link between efforts and reward lead to lack of personal interest and incentive.
4. Delay in decision making – Red papism and bureaucracy do not permit quick decisions and prompt actions. There is little scope for personal initiative.
5. Oligarchic management – Co. is said to be democratically managed but actually managed by few people i.e. board of directors. Sometimes they take decisions keeping in mind their personal interests and benefit, ignoring the interests of shareholders and Co.

TYPES OF COMPANIES

On the basis of ownership, companies can be divided into two categories –
Private & Public.

Difference between Private Company & Public Co.

Private Co.	Public Co.
It has minimum 2 and maximum 50 members.	It has minimum 7 and maximum unlimited.
It cannot invite general public to buy its shares and debentures.	It invites general public to buy its shares and debentures.
There are certain restrictions on transfer of its shares.	Its shares are freely transferable.
It can commence business after incorporation.	It can commence business after obtaining certificate of commencement of business.

It has to write Private Ltd. After its name Ex- Tata Sons, Citi Bank, Hyundai Motor India.	It has to write only limited after its name Ex- Reliance Industries Ltd., Wipro Ltd. , Raymond's Ltd.
In its minimum capital required is one lakh.	In its minimum capital required is five lakhs.

Industry

The term industry refers to the production of goods and service through the utilization of various resources like men, material, money and machines by completing some specific processes. There are two types of industries they are: Primary Industry , Secondary Industry

Primary Industry

The industries engaged in farming, fishing, oil extraction and other firms that extract natural resources whose products can be used to produce goods by other business are called primary industries. It can be classified into two types they are:

1. Genetic Industry

Those industries on which plants and animals are reproduced for generating value are called genetic Industries. Nurseries of plants for the reselling purpose, meat and eggs for poultry firm, silk and leather from animal husbandry, wool and meat from sheep, fish from pisciculture etc. are the example of genetic Industry.

2. Extractive Industry

Extraction of materials and products having the commercial value from the nature such as the air, climate and soil are called extractive industries. Coal, gold, oil, gas, fishing from sea, electricity from air and rivers, crops from soil and climate are the example of extractive industry.

Secondary Industry

Those industries which are generally involved in transforming raw materials or semi-processed materials into finished products are called secondary industry. It can be classified into two types they are:

1. Construction Industry

The industries which are involved in constructional developmental works are called construction industry. These industries construct roads, bridges, buildings, dams, canals etc. Construction industries use cement, iron, steel, bricks, concretes and tar coal as raw materials.

2. Manufacturing Industry

Those industries which are involved in converting or transforming raw materials or semi-processed materials into finished goods are known as manufacturing industry. Examples of manufacturing industries are iron and steel, machinery, automobile, electrical and electrons, sugar and textile mills etc. It is divided into the following categories:

i) Analytical Industries:

Analytical industries are those industries which employ analytical processes in the production of goods. The examples of analytical industries are paper mills that produce cardboard paper, newsprint paper, photocopy paper, notebook paper etc. Similarly, the next example may be oil refiners which produce kerosene, petrol, diesel, Mobil etc.

ii) Synthetic Industries:

Synthetic Industries are that industry which employs synthetic processes in the production of goods. For examples, cement is produced by mixing limestone, red soil, stones, chemicals etc.

iii) Processing Industries:

In this type of industries, raw materials are processed through different stage of production to obtain the final product. The example of such industries is the jute industry in which raw jute passes through different stages of spinning, weaving, sewing, and dying to produce jute bags.

iv) Assembling Industries:

Assembling industries are those industries which assemble or combine various types of components or parts to produce usable products. Manufacturers of radio, television, computer, vehicle etc. are the example of assembling industries.

v) Continuous Industries:

In this type of manufacturing industries, all the required raw materials are fed into the machine at one point from which successive operations are automatically performed to turn them into finished products. For example, Butwal spinning Mill, Bhirkuti paper Mill and Lumbini Sugar Mill are the examples of continuous Industries.

Startup Business:

A startup is a young company founded by one or more entrepreneurs to develop a unique product or service and bring it to market. By its nature, the typical startup tends to be a shoestring operation, with initial funding from the founders or their friends and families.

- A startup is an entrepreneurial venture in search of enough financial backing to get off the ground.
- The first challenge for a startup is to prove the validity of the concept to potential lenders and investors.
- Startups are always risky propositions but potential investors have several approaches to determining their value.

In the early stages, startup companies have little or no revenue coming in. They have an idea that they have to develop, test, and market. That takes considerable money, and startup owners have several potential sources to tap:

- Traditional funding sources include small business loans from banks or credit unions, government-sponsored Small Business Administration loans from local banks, and grants made by nonprofit organizations and state governments.
- So-called incubators, often associated with business schools and other nonprofits, provide mentoring, office space, and seed funding to startups.

- Venture capitalists and angel investors actively seek out promising startups to bankroll in return for a stake in the company once it gets off the ground.

Different features of Startup business :

Innovation

A **business** this type needs to have a **differentiator** competition in order to gain competitive advantage in the market. It is **innovation** may be present in their products or in the business model associated with **company**.
An **innovation** plays an essential role in the success of a **startup**, so all **entrepreneurs** should seriously consider this aspect.

Age

An **startup** is **new company** which is still in **early stages** brand management, sales and hiring employees. Too often the allocation of this concept to **Business** who have been on the market for less than 3 years, however, this is not true.

Growth

An **startup** is a **company** whose goal is **grow and expand rapidly**, taking up to sometimes drastic proportions. This is one of the points that distinguished **startup** a **Small business**.

Risk

Once a **startup** it has **shed innovative** strongly present, there are always several associated uncertainties about ensuring the success of the **business**. For this reason, these **Business** are considered **risk investments** with a high failure rate.

Solving a problem

Associated with your **shed innovative**, this **Type of company** focuses on solving any existing problem in the market. So they focus on making a difference not only in the marketplace but also in people's lives through your product or service.

Scalability

A **startup** is **company** in constant search of a **business model that is scalable and repeatable**, that is, it can grow without the need to increase human or financial resources.

Work team

These **Business** they are usually made up of very few people. Although not the only determining factor for the designation of **startup.** It is quite common to define it in your working team there **less than 100 people**.

In short, we can consider that a startup is a company that is in the early stages of development in order to solve real-life problems through a product or innovative service.

Does a startup have to be technological?

This is a very common issue in the world **entrepreneur**. The connection between this **Type of company** and technology comes from the 1990s because the **type startup** more common in "dotcom" companies.

Although much of the **startups** existing at present being technological in nature, the concept is not unique to them. The essence of **startup** is looking for **innovative ideas** that drastically reach a large number of people.

Types of startups

After clarified the question of what is a **startup**, it is time to identify the various **types of businesses** that they can present. Due to the increased demand in this market, it is necessary that future **entrepreneurs** know that **types of startups** exist and in which your idea fits.

According Steve Blank, a reputable **entrepreneur** of Silicon Valley, exist 6 **different types of startups**:

Lifestyle Startups

Founded by **entrepreneurs** they are working for themselves what else they like. Examples of these are freelancers or web designers who have passion for their *work.*

Small Business Startups

Small business where the owner follows less ambitious goals, to provide only a comfortable life for his family. Examples of these are hairdressing salons, grocery stores, bakeries, among others.

Scalable Startups

Founded by **entrepreneurs** who believe from the beginning that can change the world with their **business idea** and therefore worry about finding a **model scalable and repeatable business** in order to draw the attention of investors to boost your business. Examples of these are *Google, Uber and Facebook.*

Buyable Startups

These **Business** they are born with the goal of being sold to large companies after achieving positive results that catch their attention. This one **type startup** is very common in web solutions development companies and mobile. An example of this was the purchase of *Instagram by Facebook*.

Large Company Startups

These **business** they have the main objective of **innovation** and have a limited duration of life. **Business** fall into this category develop products or services that revolutionaries become quickly recognized by the market. However, due to market changes, the user preferences, competitive pressures,

these **business** they tend to create new **innovative products** for new users of different markets.

Social Startups

Finally, there **Business** whose **entrepreneurs** they want to make a difference in society and make a better world. Thus, the main objective is not to gain profit, but rather to contribute positively to the community. One example is the charity or charitable institutions.

Technology Business Incubators :

Incubators are highly supportive for startup businesses as they deliver much required financial assistance and technological introduction. If you are a new startup or just a growing business which needs a constant support, choosing TBI in India would help you to meet out of operational and routine expenses conveniently.

Technology business incubator in India and Telangana are particularly meant for sharing telephone, production, secretarial and operational expenses. Incubator have specialized ideas or businesses so that growth rate is quicker and better. You need to find out the best business incubator for your firm and select the same depending upon your business category and financial help required.

Business incubators refer to specialized companies who create a healthy environment for new ventures to grow better and work for a better tomorrow. The main objective of business incubators is who provide **administrative support, office equipment, potential investors and training** all less than one roof to the new organization. The temporal assistance of incubators helps rising businesses to climb ladder of success and fulfill all the Expectations through gradual effort. It is impossible for a young business to achieve skyrocketing success. However, once it receives expert acceleration through incubators, nothing seems impossible. People often refer incubator and accelerator because they enhance success rate within a limited time frame.

Business incubators analyze the exact concept and theme of a business for providing valuable feedback and guidance. Certain incubators consume up to two years for result in better stability and growth rate of the business. Accelerator/incubators are categorized in form of short term structured and fast paced programs. Structured and short term business incubators generally provide assistance for 4 months. On the other hand, long term incubators consume 2 years for polar achievement of success. It is assumed that companies who take the help of accelerator achieve aggressive growth rate and more possibility of success. Business incubators remove all the shortcomings and lacking of a business for a perfect success. The team of expert and seasoned individuals has a whole sole objective to serve the nation and struggling businesses.

How do incubators work?

Incubators particularly join hands with organizations, local colleges, government entities, Universities and nonprofit ventures for achieving financial assistance. You can call accelerators as collaborative or partnership who provide success rate to more than one business at a time.

Types of incubator in India

Business incubators particularly reference to a company which provide several varieties of assistance to the business startups. The delivered assistance is specialized and limited to a particular category. In other words, a single incubator cannot help all varieties of businesses. There are different types of incubators who provide assistance to a particular type of business. For instance, **biotechnology incubator** would provide assistance particularly to a Startup involved in biotechnology. Similarly, **home security incubator** would particularly lend help to those businesses who have begun with Homeland security start up.

A newbie business might lack the required **networks, skill, resources and expertise** which might restrict the overall growth. Hurdles like **space, funding and legal accounting** impose a big burden on rising companies. Taking the help

of technology incubator helps in solving the problem of research, networking activities, communication and financial assistance. With better management skills and advisory assistance, incubators quickly help businesses to climb the ladder of success.

Startup studio

Business incubators that target upon portfolio companies and have a particular style of workability are known as startup studio. The concept of startup Studio began in 2008.

Venture builder

Venture builders are quite a lot like startup Studio but they have a particular way of building companies. Venture builder implement certain ideas and take help of internal network to develop businesses and rising startup. They are involved in several projects at a single time. **The most fundamental form of a venture building is a holding company that owns equity from various corporate organizations.** Venture Builders are involved in designing business models, recruiting business managers, marketing campaigns and other assisting task.

Virtual business incubator

Virtual business incubators are available online and have existed since 1950. High tech business incubators can help in changing the overall business model with the advice and financial help received. Certain incubators work without maintaining a personal office or warehouse. They serve the businesses while remaining online.

Medical incubator

Medical incubators are particularly involved in medical industry. They deliver medical devices and biomaterials for better Innovation and medical assistance.

Kitchen incubators

Yet another variety of incubator that particularly focuses on **Food Industry.** Kitchen incubators are also known as food incubators as the particular early lend a helping hand in inventing food items and preserving them. Low cost

kitchen space and development of special food products involves the main role play of kitchen incubators. *Rising Entrepreneur who is struggling with packaging, marketing and management trouble require kitchen incubators to do the needful.*

Corporate incubators

Corporate incubators are somewhat like startup incubators but work at a larger scale. A corporate incubator is also known as corporate accelerator that is *sponsored by a well-established corporation*. Likewise startup incubators *corporate incubators help in Startup Company's right from the beginning*. They provide guidance and financial help throughout the trouble duration. Corporate accelerator is totally different from business incubators because they provide help for a particular time period.

Social incubators

Public or social incubator particularly pays attention on social entrepreneur for expanding their businesses. Economic challenges related with the production of social goods are encountered with the help of social incubators.

Seed accelerators

Seed accelerator for startup incubators lends support *for particular time duration*. They can provide that help for a fixed time period for culminating all the hindrances which reduce the possibility of success. Startup incubators are most of the time government funded. They focus on a wide range of industries and provide a competitive environment. Different types of startup incubators are involved in accelerating the growth of different varieties of organizations.

How to find a local incubator?

Finding the top incubators in India can help in several ways. A specialized incubator has a tie up with different sponsors worldwide. It is also connected with similar businesses and knows what it exactly it takes to run a particular business.

Eligibility criteria for TBI in India

Becoming a part of incubation program requires you to be an adult and submit a full-fledged business report. You should have a business idea in mind from beforehand. The dedicated community will be reviewing your report and to determine whether the admission criteria of your business is suitable or not. Incubator tends to look out for financial, space, equipment and resources of the businesses before choosing to nurture them. Top incubators in Telangana have resulted in success of several businesses so far. It is believed that the overall chances of growth rate increased manifold if correct TBI in India is selected.

Objectives of TBI

Supporting the development of a new form by providing administrative and advisory assistant is only possible through the best tbi in India. As per the national business incubation Association, it is believed that the prime objective of Business incubator is to produce successful and financially stable companies. The latest incubators run on dual technological parameters. They provide service and industrial assistance to the struggling companies.

How does it help employment opportunities?

Business incubator programs provide more business ideas and overall financial assistance. Boosting up of a business results in requirements of more Manpower and resources. Incubators can help startup businesses by providing expert and monetary help. Technological incubators purely pay attention on technological aspects of a business. It all began USA from 1959 onwards. Since then, the concept of business incubators has expanded far and wide.

Business incubators are also known as innovation centers because they enhance output and employment rate. They ensure employee wellbeing and better working environment all together.

Advantages and benefits of Technology incubator

Incubators help in the best possible financial technological assistant for the companies. It is assured that joining hands with top incubators in

Telangana can help your business to succeed in a lesser time duration and expense. The exceptional services of business incubators result in stamp of success on the young businesses.

Business incubators are also known as innovation centers because they enhance output and employment rate. They ensure employee wellbeing and better working environment all together.

What are the benefits of using **Technology business incubators** in India?

Management

Apart from providing financial assistance, incubators constantly guide the companies for executing things according to the latest scenario. Operational assistance and management guidance plays an important role in the success of companies. For instance, ***drug development, clinical approval procedure and firsthand experience assistant are provided if you are involved in a Bio technological startup***. Different companies require different varieties of Management assistance related to communication, manpower former finance, operational expenses and routine requirements. The invaluable connection of a business incubator with a Startup results in expertise execution of everything.

Synergy

Incubators teach everything related to business management so that even after the link between the struggling business and incubator breaks, there are no shortcomings at all. Apart from Technological, financial assistance, trainings are also given. Better management skills are automatically embedded within the businesses as a result of sharing ideas and up to date training. In fact, incubators can help the driving businesses to join marketing campaigns and product development initiatives. It is not necessary for the startup to know the companies who have been sponsoring it. Despite residing in different geographical locations, startups can receive funds as a result of constant efforts made by startup incubators. People who are interested in making investments are collected by the incubators for funding the growing businesses.

Economy

Technology business incubators in India have been creating a better India ever since they have existed. In other words, the creation of job and giving Wings into new companies in result in better infrastructure and overall financial state of a nation. Long lasting jobs for graduate and undergraduate spontaneously pushes better economic growth.

Technology business incubators are a powerful economic development tool. They promote the concept of growth through innovation and application of technology, support economic development strategies for small business development, and encourage growth from within local economies, while also providing a mechanism for technology transfer. Business incubation is the temporary, facilitative support provided to start-up enterprises through the delivery of complex services and special environment with the aim of improving their chance of survival in the early phase of the life span and establishing their later intensive growth. The term incubation refers to the process of support, while incubator stands for the organization and infrastructure that are set up for these purposes.

Science & Technology Entrepreneur Parks :

Science Park initiatives are meant to help in creating an atmosphere for innovation and entrepreneurship; for active interaction between academic institutions and industries for sharing ideas, knowledge, experience and facilities for the development of new technologies and their rapid transfer to the end user. The Science & Technology Entrepreneurs Park (STEP) programme was initiated by NSTEDB to provide a re-orientation in the approach to innovation and entrepreneurship involving education, training, research, finance, management and the government. A STEP creates the *necessary climate for innovation, information exchange, sharing of experience and facilities and opening new avenues for students, teachers, researchers and industrial managers to grow in a trans-disciplinary culture, each understanding and depending on the other's inputs for starting a successful economic venture. STEPs are hardware intensive with emphasis on common facilities, services and relevant equipment.*

The major objectives of STEP are to forge linkages among academic and R&D institutions on one hand and the industry on the other and also promote innovative enterprise through S&T persons many of whom were otherwise seeking jobs soon after their graduation, and also to:

• Provide R&D support to the small-scale industry mostly through interaction with research institutions.

• Promote innovation based enterprises. STEPs are autonomous bodies registered as societies under the Societies Registration Act or registered as not-for-profit companies under the provisions of Section 25 of the Companies Act, 1956. NSTEDB has so far catalysed 15 STEPs in different parts of India, which have promoted nearly 788 units generating annual turnover of around Rs. 130 crores and employment for 5000 persons. More than 100 new products and technologies have been developed by the STEPs / STEP promoted entrepreneurs. In addition, over 11,000 persons have been trained through various skill development programmes conducted by STEPs.

MEANING AND NATURE OF BUSINESS PLAN

Business Plan is a written document that describes the business idea and all the relevant internal and external elements involved in launching a new venture. It describes the nature and context of the business opportunities and the plans to exploit the opportunity. It is usually an integration of functional plans in finance, marketing, manufacturing, and human resources. It serves as a road map for the entrepreneur. The business plan is prepared by the entrepreneur in consultation with lawyers, accountants, consultants, engineers, etc. Investors, venture capitalists, bankers, and suppliers read the business plan. Each group reads it for a different purpose. The focus and contents of the business plan will differ from one venture to another depending on its nature and size.

Business plan is a formal document used for the long-range planning of a company's operation. It typically includes background information, financial information, and a summary of the business. Investors nearly always request a formal business plan because it is an integral part of their evaluation of whether to invest in a company. Although nothing in business is permanent, a business plan typically has components that are more "set in stone" than a business model canvas, which is more commonly used as a first step in the planning process and throughout the early stages of a nascent business. A business plan is likely to describe the business and industry, market strategies, sales potential, and competitive analysis, as well as the company's long-term goals and objectives. An in-depth formal business plan would follow at later stages after various iterations to business model canvases. The business plan usually projects financial data over a three-year period and is typically required by banks or other investors to secure funding. The business plan is a roadmap for the company to follow over multiple years.

Why Use a Business Plan?

Owing to the following benefits of a well-researched and comprehensive business plan, preparing one is highly recommended, but not a mandate.

1. Feasibility

Entrepreneurs use a business plan to understand the feasibility of a particular idea. It is important to contextualize the worth of the proposed product or service in the current market before committing resources such as time and money. It helps to expand the otherwise limited view of a passionate innovator-turned-entrepreneur.

2. Focusing device

Formulating a concrete plan of action enables an organized manner of conducting business and reduces the possibility of losses due to uncalculated risks. Business plans act as reference tools for management and employees as they solidify the flow of communication, authority, and task allocation.

3. Foresight

The process of preparing a business plan often creates many unintended yet desired results. It functions on the principle of foresight as it helps one realize future hurdles and challenges that aren't explicit. It also brings a variety of perspectives on the forefront, eventually leading to a more comprehensive future plan of action.

4. Raising capital

A business plan is an effective way of communicating with potential investors, and the level of expertise and time used in preparing a business plan also gives professional credibility to entrepreneurs. It analyzes and predicts the chances of success for the investor and helps to raise capital.

Features of a Good Business Plan

1. Executive Summary

The executive summary functions as a reading guide, as it highlights the key aspects of the plan and gives structure to the document. It must describe ownership and history of formation. It is an abstract of the entire plan, describes the mission statement of the organization, and presents an optimistic view about the product/service/concept.

2. Business Description

This section presents the mission and vision of an organization. Business descriptions provide the concept of one's place in the market and its benefits to future customers. It must include key milestones, tasks, and assumptions, popularly known as MAT. Big ideas are redundant without specifics that can be tracked. Fundamental questions to be answered include:

- Who are you?
- What is the product or service, and what are its differentiating characteristics?
- Where is the opportunity located?
- When will you start implementing your plan and expects cash flows or profits?
- Why should customers choose your company?
- How do you plan to run the business in terms of structure and regulatory compliance?

3. Market Strategies

The market strategies section presents the target consumer group and the strategies needed to tap into it. It requires meticulous analysis of all aspects of the market, such as demography, cultural norms, environmental standards, resource availability, prices, distribution channels, etc.

4. Competitive Analysis

The competitive analysis section aims to understand the entry barriers one could face due to other companies in the same or complementary sectors. The strengths of existing companies could be co-opted into one's strategy, and the weaknesses of existing product development cycles could be exploited to gain a distinct advantage.

5. Design and Development Plan

It outlines the technical details of the product and its development cycle within the realm of production. In the sphere of circulation, it focuses on marketing and the overall budget required to reach organizational objectives.

6. Operations and Management Plan

The operations and management plan describes the cycle of business functions needed for survival and growth. It includes management functions such as task division, hierarchy, employee recruitment, and operational functions such as the logistics of the value chain, distribution, and other capital and expense requirements. The managers' backgrounds must also be briefly included.

7. Financial Factors

The financials section should include the company's balance sheet and cash flow projections. Financial data is imperative to provide credibility to any assertions or claims made about the future profitability of the business. The aim is to provide an accurate idea of the company's value and ability to bear operational costs and earn profits.

MSME:

Manufacturing Enterprises-The enterprises engaged in the manufacture or production of goods pertaining to any industry specified in the first schedule to the industries (Development and regulation) Act, 1951) or employing plant and machinery in the process of value addition to the final product having a distinct name or character or use. The Manufacturing Enterprise are defined in terms of investment in Plant & Machinery.

Service Enterprises:-The enterprises engaged in providing or rendering of services and are defined in terms of investment in equipment.

An ancillary small industrial unit is the one who supplies not less than 50% of its production to another industry referred to as the parent unit and having the investment in plant/ machinery, which is not more than Rs 5 crore. On the other hand, a tiny industry is an industrial or business enterprise whose investment in fixed assets i.e., plant/machinery, that does not exceed Rs 25 lakh.

The limit for investment in plant and machinery / equipment for manufacturing / service enterprises, as notified are as under

Manufacturing Sector	
Enterprises	Investment in plant & machinery
Micro Enterprises	Does not exceed twenty five lakh rupees
Small Enterprises	More than twenty five lakh rupees but does not exceed five crore rupees
Medium Enterprises	More than five crore rupees but does not exceed ten crore rupees
Service Sector	
Enterprises	Investment in equipments
Micro Enterprises	Does not exceed ten lakh rupees:
Small Enterprises	More than ten lakh rupees but does not exceed two crore rupees
Medium Enterprises	More than two crore rupees but does not exceed five core rupees

WAYS TO IDENTIFY BUSINESS OPPORTUNITIES

With a foundational understanding of the types of opportunities that exist, you can dive into identifying them. Here are three ways you can do so and examples to learn from.

1. Identify Your Pain Points

When searching for potential market needs, start with yourself. In your everyday life, what processes or tasks bother you? What's the job to be done that you haven't quite found the perfect product to fulfill?

Many successful entrepreneurial ventures began with a personal problem in the founder's life. For instance, after Neil Blumenthal lost his prescription glasses and couldn't afford to buy new ones, he created an eyewear company that provides inexpensive, stylish glasses: Warby Parker.

Another example is the dating app Bumble, which Whitney Wolfe Herd created after leaving an abusive relationship. The app puts women first, requiring them to make the first move in heterosexual pairings, and advocates for gender equality and sexual harassment prevention.

Starting with personal questions can help determine if others have the same pain point and if opportunities are low-end or new-market disruptions.

2. Conduct Market Research

Another way to prove whether a business idea is viable is by conducting market research. This includes using industry research to define the competitive landscape and determine your target audience, as well as interviewing or surveying people who fit your target demographics.

Observing and gathering feedback from real people enables you to consider their perspectives and gain a deeper understanding of their motivations, frustrations, fears, and desires. This can help you conceptualize whether your product addresses a job to be done and the size of the audience that could benefit from it.

Once an opportunity is identified, you can utilize design thinking to create an innovative product that fits the job to be done you uncovered through research.

3. Question Processes

You can also identify business opportunities by examining the processes and delivery methods of existing product or service offerings. Try to evaluate each process with an open mind and ask questions about how you could improve it, such as:

- Could this process be faster?
- Could this process be executed using a cheaper business model?

- Is there a more sustainable way to execute this process?
- Does this process exclude certain groups of people? If so, is there a way to make the process accessible to all?

New Product Selection and Development Process

Product Selection and Development Process are very complex process, which begins with idea generation and continues till commercialization. The process requires coordination between various departments. The process can be broken up into the following stages:

1. Exploration:

New ideas are sought from the sales force, since that is the department which is in constant direct contact with customers.

The analysis of customer needs also takes into account competitors' products and services. New ideas are also generated from the consultants, shareholders, management employees, report on foreign markets and products, trade journals, R&D laboratories, other research, etc. However, technical feasibilities and market potential have to be kept in mind while examining new ideas.

2. Screening:

While choosing the most effective ideas, guesswork or hunches are not reliable. To ensure a more scientific and less risky selection process, it is necessary to keep in mind all possible quantitative, as well as, qualitative information. Keeping in mind the organizational objectives and available facilities, the following must points be considered while selecting an idea—

i. Market potentiality

ii. Technical feasibility of the idea

iii. Does the idea fall under any intellectual property rights or patent regulations?

iv. Raw material supply position—at present and in the future

v. Do existing production facilities and resource availability remain suitable for commercialization of the new idea?

vi. The level of investment required

3. Business Analysis:

At this stage, technical and economic factors, like manhours, cash flow, inventory holding, etc., are analysed to evaluate commercial feasibility. This will ultimately facilitate the budgeting process.

4. Development:

A working model is developed at this stage to evaluate the practicability of the new idea, by studying the acceptability of customers to the working model. Most companies use product life cycle model at this stage.

5. Testing:

Redesigning of the working model into a production prototype and testing the market before bulk production.

6. Commercialization:

At the final stage of a new product planning, decisions have to be made whether to make or buy components; production methods have to be developed; distribution networks activated and the new product has to integrate with the organization's normal activity, and satisfactory sales volume and profitability have to be achieved.

Project Report:

Project Preliminary Report is a formal document that describes specific activities, events, occurrences, or subjects of a project to explain progress of the project up to a certain point in time (but not later than completion time). This document is presented and communicated at project status meetings to explain what goals, deliverables and results are produced and what activities are still in progress. The document serves as the basis for developing the final project report.

A typical preliminary report for projects highlights the following data:

- *Problem/need*: A clear description of the problem or need the project aims to handle.
- *Proposed solution*: a brief description of how to address the problem/need.
- *Work effort*: An analysis summary of work relevant to the project.
- *Status*: current state of project work, including activities completed and unfinished.
- *Evaluation*: an analysis and assessment of project work by specific criteria such as cost-effectiveness, feasibility, manageability, performance, others.
- *Schedule*: a timeline with specific milestones and events related to project work.

Meaning of Detailed Project Report (DPR):

Detailed Project Reports (DPRs) are the outputs of planning and design phase of a project. DPR is a very detailed and elaborate plan for a project indicating overall programme, different roles and responsibilities, activities and resources required for the project. To be more precise,

A DPR is a final, detailed appraisal report on the project and a blue print for its execution and eventual operation. It provide details of the basic programme the roles and responsibilities, all the activities to be carried out and the resources required and possible risk with recommended measure to counter them.

The success of project is measured on the basis of:-

- Whether the project was completed on time.
- Whether actual cost of project was within reasonable limits of escalation.
- Whether after completion of the project it was able to deliver the products of desired quality and in adequate quantity to clients satisfaction at profitable costs.
- Whether the project gestation period was within planned duration.

The design stage is a blue print which on paper gives a great length and detail what has to be done to convert the corporate investment in a feasible project idea and ultimately a profit making enterprise. The top management policy guidelines, its impact on the project life, appraisal in terms of financial viability are dealt in great detail. The DPR is the basic of specification, contract drawings, detailed technical feasibility, financial feasibility, execution of project from practical point of view. The DPR should also highlight the nature of inherent risks in the project & potential external risks that will influence the outcome of the project. Also the DPR should give the measures for risk management and risk mitigation.

The main sub-division in a DPR is:-

- General Information of the project.
- Background and the experience of the project promoters.
- Details and working result of industrial concerns already owned and promoted by the project promoters.

Details of the proposed project:-

1. Plant capacity
2. Manufacturing procedure adopted
3. Technical knowhow/ tie-ups.
4. Management teams for the project.
5. Details of land, buildings and plant and machinery.
6. Details of infrastructural facilities (power, water supply, transport facilities etc.)
7. Raw material requirement/ availability.
8. Effluents produced by the project & treatment procedures adopted.
9. Labour requirement and availability.

- Schedule of implement of the project.
- Project cost.
- Means of financial projects.
- Working capital requirement/arrangements made.
- Marketing and selling arrangement made.
- Profitability and cash flow estimates.
- Mode of repayment of loans.
- Government approvals. Local body consents and statutory permissions.
- Details of collaterals security that can offered to the financial institutions.

Preparation of DPR

The preparation of DPR requires wide variety of expertise. A number of decisions are mutually related. For example: requirement and training plan is dependent on the nature of the technology, availability in the general employment market in the region, need for foreign collaboration and training, extent of specialised plant and equipments supplied from abroad etc.

Financials requirements are dependent on the time schedule for the implementation of the project. The nature of issue to be included in the commercial terms and conditions depend on the extent of the spread of the contractors. If only local and regional parties are in picture, the scope and jurisdiction for disputes gets restricted.

A number of issues largely depend upon managerial perceptions and top management policies. On the whole preparation of DPR is a complete task. Therefore highly specialised agencies have come up in different areas, who undertake such task for the clients.

They are usually known as technical consultancy organisations. They specialise in some particular field. For example: Dastur & co specialises in metallurgical industries, Engineers India Ltd. specialises in oil sectors.

Even for medium sized project, it is necessary that a capable consulting firm is entrusted with the task of formulating the DPR.

Steps of preparation of DPR:

1. Client interacts with consultant.
2. Consultant takes all required inputs from client & do necessary first phase studies.

- Client evaluates it & makes all necessary changes & requests consultant to do the necessary modifications.

1. Consultant submits the revised draft for approval.
2. Consultant submits the final DPR after getting approval from client.

Evaluation of DPR:

The final responsibility of the project lies with the owners. Therefore, the owner's organisation must have an appropriate mechanism for project evaluation of a DPR submitted by the consultant. Apart from care in selecting the most suitable consultant in the first place the owner's must pose the following questions.

- What are the sources of critical data & information that have form the basic premises of the DPR, like demand, capital cost, input cost etc?
- The extent to which the strategic plan of top management have been reflected in the design and the repair?
- What were the various alternative considered, and the methodology followed for choosing one among them?
- The extent to which the design fulfils all applicable statutory requirements and regulations, both currently in force and those may be foreseen?
- Identification of potential problems, bottlenecks and/or major risks involved in the project.
- Degree of detailing.
- Influence of complementary/ completing projects.
- Scope for future expansion/modification/adaptation to new technologies and so on.

The above list is a simple of the types of question that the owner's may pose to the consultant during the process of selection, appraisal of the first draft and before giving the approval.

Location of the Project:

One of the important issues related to project decisions and in DPR preparation is the location of the project. The location of project can be:

- Input or supply oriented
- Output or market oriented.

Input or supply oriented: The major consideration governing the location decision concerns with the availability of various inputs for the project & their transportation from respective sources to the project site. Whenever a project entails processing of bulky raw materials and the processing reduces the bulk by refining/processing operation, it makes economic sense to

move the project nearer the supplies so as to cut down the transportation costs. The strategy of NTPC to locate major pit head thermal power plants stems from this logic. Instead of transporting coal over long distance, it may be more economical to convert coal into electrical energy at the pit head itself and transmit the electrical energy into high voltage transmission system to consumption centres. With the advent of high voltage direct current transmission technology, such options have become more cost effective.

Output or market oriented: The gas based power plants may be located near the consumption centres, particularly if gas pipelines have already been laid nearby for other projects. This enables saving on the transmission line costs and power losses in transmission.

The location strategy is largely governed by total transportation cost for entire chain, including transportation of all inputs of various sources to the processing site and that of all outputs to the consumption centres. This exercise needs the sources and quantities of all the supplies available , their unit transportation cost to each location and the demands at different consumption centres, coupled with the unit transportation cost to the finished goods to each consumption centre of each location.

The location strategy also depends on:

- The regulatory framework of thr region.
- Availability of skilled/unskilled manpower
- Industrial relations situation.
- Infrastructural support.

Layout of the project:

The layout itself has profound implication on the profitability and efficiency of any enterprises. Even safety considerations can lead to major changes in the layout.

The layout for a project determines the location of various departments, processes; work centres, machines & service function as well as transportation routes for the movement of materials through these facilities.

A good layout should try to reduce material handling cost to the minimum, ensure flow of men and materials between processes without any back tracking, provide adequate safety for men and equipment and enhance labour productivity & efficiency.

Safety must be a very important consideration for deciding locations of potentially hazardous facilities. For instance storage of hazardous & inflammable chemicals & materials must be located far away from the general centre of activities at economical & practically feasible distance.

Facilities which are prone to fire hazards should be located in a fashion that is easy and quick for multiple fire tenders to arrive & extinguish the fire. It may be worthwhile to give a specific safety check to a layout before finalising it.

Equipment & Process Technology (EPT):-

The equipment and process technology (EPT) decisions are related to design of facilities and system that produce and deliver goods, products and services of desired quality and required quantity. EPT are categorised as follows:

Output decisions are related to demand forecast and marketing strategy for achieving planned market share.

The input and process decisions are complementary to each other. The input and process decisions contribute significantly to "Make or Buy" type of decisions. The "Make or Buy" decisions lead to finalisation of various inputs as well as processing and assembly requirements.

Once the production processes are identified then next set of decisions are related to choice of technology. Choice of technology decisions has to be ajudicious mix of capital and labour components which are the major factor of production.

Use of modern state of art technology ensures more automation, requiring less labour but leads to high initial investment. On the contrary use of traditional technology and processes leads to lower automation with requirement of more labour and lower initial investment.

Therefore, the trade off lies between high capital and lower labour cost on one hand and l;ow capital and high labour cost on the other hand.

Apart from cost considerations and relative proportion of mechanisation, other factors that are to be considered are scale of operations: quality and level of skills required also influence the choice of technology decisions.

Depending on the market share & capacity forecasts, a particular level of technology may be the optimum choice. In event of low market demand & lack of availability of skilled work force to operate high end & high volume technology may lead to sub optimal utilisation of the said technology.

Also, there would be substantial increase in the subsequent maintenance costs which may raised affordability issues. Thus, the choice of EPT is a complex task, requiring wide knowledge & information about different options with relative merits and demerits of each option.

In case the procurement of EPT requires high initial investment or decision making process is taking unusually long time then the option of technology collaboration may be explored.

In this option, the organisation may explore possibilities of technical collaboration agreement with some organisation that has had considerable experience in use of the proposed technology and are in position to impart their knowledge to others. Such a collaborating organisation may be found in the country or may be from abroad.

Environmental Impact Assessment (EIA):-

EPT must have a dedicated section of environmental Impact Assessment (EIA). Such an assessment would have the specifications of the environment which is known as the base level specification before setting up a project.

Thereafter, an estimate should be made as to the impact of the project operations on various base level parameters. These could co0ver air, water and soil parameters. The disposal of soil, liquid and gaseous effluents generated by the project would lead to increase in pollution load over the base levels.

After estimating the impact of the project on the base level of the environment the DPR should recommend specific control measures & effluent treatment facilities so that the environment pollution can be controlled within permissible limits.

The DPR should ensure that the provisions are adequate for fulfilling the legal requirements in the locality where the project is scheduled to come up. This calls for the detailed knowledge of all the state level and national level provisions with respect to environmental protection.

Many of the provisions call for obtaining clearances from controlling bodies. The DPR should also include a time schedule for obtaining all the required clearances.

Commercial aspects:-

DPR is related to general guidelines and conditions that should govern all types of contractual relationships likely to be entered into during the project.

In particular, general guidelines for any eventual arbitration procedures are indicated, specifying the nature of issue that may be referred for arbitration, choice of arbitrator by both the parties and the place where such proceedings should be held.

DPR should also include guidelines related to supply, erection, and commissioning & guarantee test of various equipments required for the project.

DPR should also lay guidelines for tendering process whether to follow single stage or two stage tendering. It may also contain model document and formats related to invitation to tenders, specifications etc.

DPR will also contain guidelines for vendor short-listing and networking. Some points related to vender detailing that are highlighted in the DPR are as cited below:

- Commitment with respect to delivery period & penalty conditions, in case of failure to fulfil the commitment.
- General terms of payment including progress payment.
- Inspection and testing procedure and customer hold points.
- Network plan for the contract and monitoring and control system.
- Guarantee test, schedule, procedure, criteria for success and accompanying bank guarantee.
- Responsibility for damage in transit or during erection and/ or commissioning.
- Condition of admissibility of any increase in the price of the contract.

- Contract variations and the manner of handling them.
- Mobilisation advance to be paid initially.
- Responsibility to supply the equipments and necessary accessories and spare parts.

Financial Aspects:-

The DPR incorporates a much detailed projection of the costs and revenues expected during the projected lifespan of the operation phase. The principal input to this comes from operational costs.

Also the other financing cost like depreciation, interest on long term loans and short term working capital loans, writing off of pre-operative & preliminary expenses, guarantee commission etc. Income tax calculation are also included.

The DPR provides projections for the following statements:

1. Profit and loss statement.
2. The balance sheet.
3. The fund flow statement.

For the project phase, the DPR provides an estimate of the phase requirement of capital. This plan forms the basis of a strategic plan for raising the funds from external sources like terms lending institutions and through public issue of stocks and/or bonds.

The DPR would include a recommendation schedule for ensuring adequate flow of funds for the timely completion of the project with adequate provision for normal contingencies.

The DPR would also include for the project phase a recommended system of monitoring & control of the financial progress of the project, vis-a-vis the physical progress. The system is an essential ingredient for adequate financial control during the execution & the termination phase of the project.

Socio-economic Aspects:-

Morden day projects also analyse the socio-economic impacts on their immediate surroundings. The attitude of local residents plays a crucial role in the successful completion of the project in any new locality or region.

Generally, any medium to large type of project will lead to displacement of original residents and tenants of the land & bring about a significant change in the pattern of earning livelihood, brings in wide disparity in the standards of living between those who are employed in the project and those who are left out of it, raises large employment expectations among the local population.

The effect are more glaring based on the size of investments, level of technology used & innovation potential of the project. However not all factors contribute in the socio-economic influence but it is for sure that a combination of factors based on the size & type of project will surely lead to creation of social discontent.

The project is seen as a source of social turmoil & discontent & its progress gets affected severally through different forms of social unrest. It is, therefore, essential to make an effort at the early stage in planning process to reach out the population likely to be affected by the project.

Community based & community participated demographic surveys may be conducted for identifying the optons for direct as well as indirect source of employment. DPR should also highlight planning & execution methods of specific community development programmes which help in developing a symbiotic relationship with the local community.

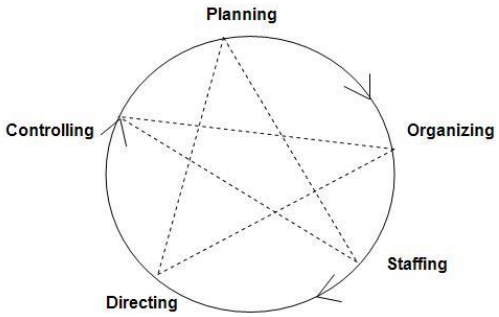
MANAGEMENT

Management has been described as a social process involving responsibility for economical and effective planning & regulation of operation of an enterprise in the fulfillment of given purposes. It is a dynamic process consisting of various elements and activities. These activities are different from operative functions like marketing, finance, purchase etc. Rather these activities are common to each and every manger irrespective of his level or status.

Different experts have classified functions of management. According to *George & Jerry*, "There are four fundamental functions of management i.e. planning, organizing, actuating and controlling".

According to Henry Fayol, "To manage is to forecast and plan, to organize, to command, & to control". Whereas Luther Gullick has given a keyword 'POSDCORB' where P stands for Planning, O for Organizing, S for Staffing, D for Directing, Co for Co-ordination, R for reporting & B for Budgeting. But the most widely accepted are functions of management given by KOONTZ and O'DONNEL i.e. Planning, Organizing, Staffing, Directing and Controlling.

For theoretical purposes, it may be convenient to separate the function of management but practically these functions are overlapping in nature i.e. they are highly inseparable. Each function blends into the other & each affects the performance of others.



1. Planning

   It is the basic function of management. It deals with chalking out a future course of action & deciding in advance the most appropriate course of actions for achievement of pre-determined goals. According to KOONTZ, "Planning is deciding in advance - what to do, when to do & how to do. It bridges the gap from where we are & where we want to be". A plan is a future course of actions. It is an exercise in problem solving & decision making. Planning is determination of courses of action to achieve desired goals. Thus, planning is a systematic thinking about ways & means for accomplishment of pre-determined goals. Planning is necessary to ensure proper utilization of human & non-human resources. It is all pervasive, it is an intellectual activity and it also helps in avoiding confusion, uncertainties, risks, wastages etc.

2. Organizing

   It is the process of bringing together physical, financial and human resources and developing productive relationship amongst them for achievement of organizational goals. According to Henry Fayol, "To organize a business is to provide it with everything useful or its functioning i.e. raw material, tools, capital and personnel's". To

organize a business involves determining & providing human and non-human resources to the organizational structure. Organizing as a process involves:

- Identification of activities.
- Classification of grouping of activities.
- Assignment of duties.
- Delegation of authority and creation of responsibility.
- Coordinating authority and responsibility relationships.

3. Staffing

It is the function of manning the organization structure and keeping it manned. Staffing has assumed greater importance in the recent years due to advancement of technology, increase in size of business, complexity of human behavior etc. The main purpose o staffing is to put right man on right job i.e. square pegs in square holes and round pegs in round holes. According to Kootz & O'Donell, "Managerial function of staffing involves manning the organization structure through proper and effective selection, appraisal & development of personnel to fill the roles designed un the structure". Staffing involves:

- Manpower Planning (estimating man power in terms of searching, choose the person and giving the right place).
- Recruitment, Selection & Placement.
- Training & Development.
- Remuneration.
- Performance Appraisal.
- Promotions & Transfer.

4. Directing

It is that part of managerial function which actuates the organizational methods to work efficiently for achievement of organizational purposes. It is considered life-spark of the enterprise which sets it in motion the action of people because planning, organizing and staffing are the mere preparations for doing the work. Direction is that inert-personnel aspect of management which deals directly with influencing, guiding, supervising, motivating sub-ordinate for the achievement of organizational goals. Direction has following elements:

- Supervision
- Motivation
- Leadership
- Communication

Supervision- implies overseeing the work of subordinates by their superiors. It is the act of watching & directing work & workers.

Motivation- means inspiring, stimulating or encouraging the sub-ordinates with zeal to work. Positive, negative, monetary, non-monetary incentives may be used for this purpose.

Leadership- may be defined as a process by which manager guides and influences the work of subordinates in desired direction.

Communications- is the process of passing information, experience, opinion etc from one person to another. It is a bridge of understanding.

5. Controlling

   It implies measurement of accomplishment against the standards and correction of deviation if any to ensure achievement of organizational goals. The purpose of controlling is to ensure that everything occurs in conformities with the standards. An efficient system of control helps to predict deviations before they actually occur. According to *Theo Haimann*, "Controlling is the process of checking whether or not proper progress is being made towards the objectives and goals and acting if necessary, to correct any deviation". According to Koontz & O'Donell "Controlling is the measurement & correction of performance activities of subordinates in order to make sure that the enterprise objectives and plans desired to obtain them as being accomplished". Therefore controlling has following steps:

   α. Establishment of standard performance.
   β. Measurement of actual performance.
   χ. Comparison of actual performance with the standards and finding out deviation if any.
   δ. Corrective action.

Co-ordination is the unification, integration, synchronization of the efforts of group members so as to provide unity of action in the pursuit of common goals. It is a hidden force which binds all the other functions of management. According to *Mooney and Reelay*, "Co-ordination is orderly arrangement of group efforts to provide unity of action in the pursuit of common goals". According to *Charles Worth*, "Co-ordination is the integration of several parts into an orderly hole to achieve the purpose of understanding".

Management seeks to achieve co-ordination through its basic functions of planning, organizing, staffing, directing and controlling. That is why, co-ordination is not a separate function of management because achieving of harmony between individuals efforts towards achievement of group goals is a key to success of management. Co-ordination is the essence of management and is implicit and inherent in all functions of management.

A manager can be compared to an orchestra conductor since both of them have to create rhythm and unity in the activities of group members. Co-ordination is an integral element or ingredient of all the managerial functions as discussed below: -

a. Co-ordination through Planning - Planning facilitates co-ordination by integrating the various plans through mutual discussion, exchange of ideas. e.g. - co-ordination between finance budget and purchases budget.
b. Co-ordination through Organizing - Mooney considers co-ordination as the very essence of organizing. In fact when a manager groups and assigns various activities to subordinates, and when he creates department's co-ordination uppermost in his mind.
c. Co-ordination through Staffing - A manager should bear in mind that the right no. of personnel in various positions with right type of education and skills are taken which will ensure right men on the right job.
d. Co-ordination through Directing - The purpose of giving orders, instructions & guidance to the subordinates is served only when there is a harmony between superiors & subordinates.

e. Co-ordination through Controlling - Manager ensures that there should be co-ordination between actual performance & standard performance to achieve organizational goals.

From above discussion, we can very much affirm that co-ordination is the very much essence of management. It is required in each & every function and at each & every stage & therefore it cannot be separated.

Levels of Management

The term "Levels of Management' refers to a line of demarcation between various managerial positions in an organization. The number of levels in management increases when the size of the business and work force increases and vice versa. The level of management determines a chain of command, the amount of authority & status enjoyed by any managerial position. The levels of management can be classified in three broad categories:

1. Top level / Administrative level
2. Middle level / Executory
3. Low level / Supervisory / Operative / First-line managers

Managers at all these levels perform different functions. The role of managers at all the three levels is discussed below:

LEVELS OF MANAGEMENT

1. Top Level of Management

   It consists of board of directors, chief executive or managing director. The top management is the ultimate source of authority and it manages goals and policies for an enterprise. It devotes more time on planning and coordinating functions.

   The role of the top management can be summarized as follows -

   a. Top management lays down the objectives and broad policies of the enterprise.
   b. It issues necessary instructions for preparation of department budgets, procedures, schedules etc.
   c. It prepares strategic plans & policies for the enterprise.
   d. It appoints the executive for middle level i.e. departmental managers.
   e. It controls & coordinates the activities of all the departments.
   f. It is also responsible for maintaining a contact with the outside world.
   g. It provides guidance and direction.

h. The top management is also responsible towards the shareholders for the performance of the enterprise.

2. Middle Level of Management

The branch managers and departmental managers constitute middle level. They are responsible to the top management for the functioning of their department. They devote more time to organizational and directional functions. In small organization, there is only one layer of middle level of management but in big enterprises, there may be senior and junior middle level management. Their role can be emphasized as -

a. They execute the plans of the organization in accordance with the policies and directives of the top management.
b. They make plans for the sub-units of the organization.
c. They participate in employment & training of lower level management.
d. They interpret and explain policies from top level management to lower level.
e. They are responsible for coordinating the activities within the division or department.
f. It also sends important reports and other important data to top level management.
g. They evaluate performance of junior managers.
h. They are also responsible for inspiring lower level managers towards better performance.

3. Lower Level of Management

Lower level is also known as supervisory / operative level of management. It consists of supervisors, foreman, section officers, superintendent etc. According to *R.C. Davis*, "Supervisory management refers to those executives whose work has to be largely with personal oversight and direction of operative employees". In other words, they are concerned with direction and controlling function of management. Their activities include -

a. Assigning of jobs and tasks to various workers.
b. They guide and instruct workers for day to day activities.
c. They are responsible for the quality as well as quantity of production.
d. They are also entrusted with the responsibility of maintaining good relation in the organization.
e. They communicate workers problems, suggestions, and recommendatory appeals etc to the higher level and higher level goals and objectives to the workers.
f. They help to solve the grievances of the workers.
g. They supervise & guide the sub-ordinates.
h. They are responsible for providing training to the workers.
i. They arrange necessary materials, machines, tools etc for getting the things done.
j. They prepare periodical reports about the performance of the workers.
k. They ensure discipline in the enterprise.
l. They motivate workers.
m. They are the image builders of the enterprise because they are in direct contact with the workers.

Principles of Management:

Henry Fayol, also known as the 'father of modern management theory' gave a new perception of the concept of management. He introduced a general theory that can be applied to all levels of management and every department. The Fayol theory is practised by the managers to organize and regulate the internal activities of an organization. He concentrated on accomplishing managerial efficiency.

The fourteen principles of management created by Henri Fayol are explained below.

1. Division of Work-

Henri believed that segregating work in the workforce amongst the worker will enhance the quality of the product. Similarly, he also concluded that the division of work improves the productivity, efficiency, accuracy and speed of the workers. This principle is appropriate for both the managerial as well as a technical work level.

2. Authority and Responsibility-

These are the two key aspects of management. Authority facilitates the management to work efficiently, and responsibility makes them responsible for the work done under their guidance or leadership.

3. Discipline-

Without discipline, nothing can be accomplished. It is the core value for any project or any management. Good performance and sensible interrelation make the management job easy and comprehensive. Employees good behaviour also helps them smoothly build and progress in their professional careers.

4. Unity of Command-

This means an employee should have only one boss and follow his command. If an employee has to follow more than one boss, there begins a conflict of interest and can create confusion.

5. Unity of Direction-

Whoever is engaged in the same activity should have a unified goal. This means all the person working in a company should have one goal and motive which will make the work easier and achieve the set goal easily.

6. Subordination of Individual Interest-

This indicates a company should work unitedly towards the interest of a company rather than personal interest. Be subordinate to the purposes of an organization. This refers to the whole chain of command in a company.

7. Remuneration-

This plays an important role in motivating the workers of a company. Remuneration can be monetary or non-monetary. However, it should be according to an individual's efforts they have made.

8. Centralization-

In any company, the management or any authority responsible for the decision-making process should be neutral. However, this depends on the size of an organization. Henri Fayol stressed on the point that there should be a balance between the hierarchy and division of power.

9. Scalar Chain-

Fayol on this principle highlights that the hierarchy steps should be from the top to the lowest. This is necessary so that every employee knows their immediate senior also they should be able to contact any, if needed.

10. Order-

A company should maintain a well-defined work order to have a favourable work culture. The positive atmosphere in the workplace will boost more positive productivity.

11. Equity-

All employees should be treated equally and respectfully. It's the responsibility of a manager that no employees face discrimination.

12. Stability-

An employee delivers the best if they feel secure in their job. It is the duty of the management to offer job security to their employees.

13. Initiative-

The management should support and encourage the employees to take initiatives in an organization. It will help them to increase their interest and make then worth.

14. Esprit de Corps-

It is the responsibility of the management to motivate their employees and be supportive of each other regularly. Developing trust and mutual understanding will lead to a positive outcome and work environment.

Scientific Management by Taylor

Fredrick Winslow Taylor (March 20, 1856 - March 21, 1915) commonly known as 'Father of Scientific Management' started his career as an operator and rose to the position of chief engineer. He conducted various experiments during this process which forms the basis of scientific management. It implies application of scientific principles for studying & identifying management problems.

According to Taylor, "Scientific Management is an art of knowing exactly what you want your men to do and seeing that they do it in the best and cheapest way". In Taylors view, if a work is analysed scientifically it will be possible to find *one best way* to do it.

Hence scientific management is a thoughtful, organized, dual approach towards the job of management against hit or miss or Rule of Thumb.

Principles of Scientific Management

1. Development of Science for each part of men's job (replacement of rule of thumb)

   a. This principle suggests that work assigned to any employee should be observed, analyzed with respect to each and every element and part and time involved in it.
   b. This means replacement of odd rule of thumb by the use of method of enquiry, investigation, data collection, analysis and framing of rules.
   c. Under scientific management, decisions are made on the basis of facts and by the application of scientific decisions.
2. Scientific Selection, Training & Development of Workers
   a. There should be scientifically designed procedure for the selection of workers.
   b. Physical, mental & other requirement should be specified for each and every job.
   c. Workers should be selected & trained to make them fit for the job.
   d. The management has to provide opportunities for development of workers having better capabilities.
   e. According to Taylor efforts should be made to develop each employee to his greatest level and efficiency & prosperity.
3. Co-operation between Management & workers or Harmony not discord
   a. Taylor believed in co-operation and not individualism.
   b. It is only through co-operation that the goals of the enterprise can be achieved efficiently.
   c. There should be no conflict between managers & workers.
   d. Taylor believed that interest of employer & employees should be fully harmonized so as to secure mutually understanding relations between them.
4. Division of Responsibility
   a. This principle determines the concrete nature of roles to be played by different level of managers & workers.
   b. The management should assume the responsibility of planning the work whereas workers should be concerned with execution of task.
   c. Thus planning is to be separated from execution.
5. Mental Revolution
   a. The workers and managers should have a complete change of outlook towards their mutual relation and work effort.
   b. It requires that management should create suitable working condition and solve all problems scientifically.
   c. Similarly workers should attend their jobs with utmost attention, devotion and carefulness. They should not waste the resources of enterprise.
   d. Handsome remuneration should be provided to workers to boost up their moral.
   e. It will create a sense of belongingness among worker.
   f. They will be disciplined, loyal and sincere in fulfilling the task assigned to them.
   g. There will be more production and economical growth at a faster rate.
6. Maximum Prosperity for Employer & Employees
   a. The aim of scientific management is to see maximum prosperity for employer and employees.
   b. It is important only when there is opportunity for each worker to attain his highest efficiency.
   c. Maximum output & optimum utilization of resources will bring higher profits for the employer & better wages for the workers.
   d. There should be maximum output in place of restricted output.
   e. Both managers & workers should be paid handsomely.

UNIT-IV

Meaning of Financial Management

Financial Management means planning, organizing, directing and controlling the financial activities such as procurement and utilization of funds of the enterprise. It means applying general management principles to financial resources of the enterprise.

Scope/Elements

1. Investment decisions includes investment in fixed assets (called as capital budgeting). Investment in current assets are also a part of investment decisions called as working capital decisions.
2. Financial decisions - They relate to the raising of finance from various resources which will depend upon decision on type of source, period of financing, cost of financing and the returns thereby.
3. Dividend decision - The finance manager has to take decision with regards to the net profit distribution. Net profits are generally divided into two:
    a. Dividend for shareholders- Dividend and the rate of it has to be decided.
    b. Retained profits- Amount of retained profits has to be finalized which will depend upon expansion and diversification plans of the enterprise.

Objectives of Financial Management

The financial management is generally concerned with procurement, allocation and control of financial resources of a concern. The objectives can be-

1. To ensure regular and adequate supply of funds to the concern.
2. To ensure adequate returns to the shareholders which will depend upon the earning capacity, market price of the share, expectations of the shareholders.
3. To ensure optimum funds utilization. Once the funds are procured, they should be utilized in maximum possible way at least cost.
4. To ensure safety on investment, i.e, funds should be invested in safe ventures so that adequate rate of return can be achieved.
5. To plan a sound capital structure-There should be sound and fair composition of capital so that a balance is maintained between debt and equity capital.

Functions of Financial Management

1. Estimation of capital requirements: A finance manager has to make estimation with regards to capital requirements of the company. This will depend upon expected costs and profits and future programmes and policies of a concern. Estimations have to be made in an adequate manner which increases earning capacity of enterprise.
2. Determination of capital composition: Once the estimation have been made, the capital structure have to be decided. This involves short- term and long- term debt equity analysis. This will depend upon the proportion of equity capital a company is possessing and additional funds which have to be raised from outside parties.
3. Choice of sources of funds: For additional funds to be procured, a company has many choices like-
    a. Issue of shares and debentures

b. Loans to be taken from banks and financial institutions
c. Public deposits to be drawn like in form of bonds.

Choice of factor will depend on relative merits and demerits of each source and period of financing.

4. Investment of funds: The finance manager has to decide to allocate funds into profitable ventures so that there is safety on investment and regular returns is possible.
5. Disposal of surplus: The net profits decision have to be made by the finance manager. This can be done in two ways:
    a. Dividend declaration - It includes identifying the rate of dividends and other benefits like bonus.
    b. Retained profits - The volume has to be decided which will depend upon expansional, innovational, diversification plans of the company.
6. Management of cash: Finance manager has to make decisions with regards to cash management. Cash is required for many purposes like payment of wages and salaries, payment of electricity and water bills, payment to creditors, meeting current liabilities, maintainance of enough stock, purchase of raw materials, etc.
7. Financial controls: The finance manager has not only to plan, procure and utilize the funds but he also has to exercise control over finances. This can be done through many techniques like ratio analysis, financial forecasting, cost and profit control, etc.

Definition of Financial Planning

Financial Planning is the process of estimating the capital required and determining it's competition. It is the process of framing financial policies in relation to procurement, investment and administration of funds of an enterprise.

Objectives of Financial Planning

Financial Planning has got many objectives to look forward to:

a. Determining capital requirements- This will depend upon factors like cost of current and fixed assets, promotional expenses and long- range planning. Capital requirements have to be looked with both aspects: short- term and long- term requirements.
b. Determining capital structure- The capital structure is the composition of capital, i.e., the relative kind and proportion of capital required in the business. This includes decisions of debt- equity ratio- both short-term and long- term.
c. Framing financial policies with regards to cash control, lending, borrowings, etc.
d. A finance manager ensures that the scarce financial resources are maximally utilized in the best possible mannerat least cost in order to get maximum returns on investment.

Importance of Financial Planning

Financial Planning is process of framing objectives, policies, procedures, programmes and budgets regarding the financial activities of a concern. This ensures effective and adequate financial and investment policies. The importance can be outlined as-

1. Adequate funds have to be ensured.

2. Financial Planning helps in ensuring a reasonable balance between outflow and inflow of funds so that stability is maintained.
3. Financial Planning ensures that the suppliers of funds are easily investing in companies which exercise financial planning.
4. Financial Planning helps in making growth and expansion programmes which helps in long-run survival of the company.
5. Financial Planning reduces uncertainties with regards to changing market trends which can be faced easily through enough funds.
6. Financial Planning helps in reducing the uncertainties which can be a hindrance to growth of the company. This helps in ensuring stability an d profitability in concern.

Finance Functions

Investment Decision

One of the most important finance functions is to intelligently allocate capital to long term assets. This activity is also known as capital budgeting. It is important to allocate capital in those long term assets so as to get maximum yield in future. Following are the two aspects of investment decision

a. Evaluation of new investment in terms of profitability
b. Comparison of cut off rate against new investment and prevailing investment.

Since the future is uncertain therefore there are difficulties in calculation of expected return. Along with uncertainty comes the risk factor which has to be taken into consideration. This risk factor plays a very significant role in calculating the expected return of the prospective investment. Therefore while considering investment proposal it is important to take into consideration both expected return and the risk involved.

Investment decision not only involves allocating capital to long term assets but also involves decisions of using funds which are obtained by selling those assets which become less profitable and less productive. It wise decisions to decompose depreciated assets which are not adding value and utilize those funds in securing other beneficial assets. An opportunity cost of capital needs to be calculating while dissolving such assets. The correct cut off rate is calculated by using this opportunity cost of the required rate of return (RRR)

Financial Decision

Financial decision is yet another important function which a financial manger must perform. It is important to make wise decisions about when, where and how should a business acquire funds. Funds can be acquired through many ways and channels. Broadly speaking a correct ratio of an equity and debt has to be maintained. This mix of equity capital and debt is known as a firm's capital structure.

A firm tends to benefit most when the market value of a company's share maximizes this not only is a sign of growth for the firm but also maximizes shareholders wealth. On the other hand the use of debt affects the risk and return of a shareholder. It is more risky though it may increase the return on equity funds.

A sound financial structure is said to be one which aims at maximizing shareholders return with minimum risk. In such a scenario the market value of the firm will maximize and hence an optimum capital structure would be achieved. Other than equity and debt there are several other tools which are used in deciding a firm capital structure.

Dividend Decision

Earning profit or a positive return is a common aim of all the businesses. But the key function a financial manger performs in case of profitability is to decide whether to distribute all the profits to the shareholder or retain all the profits or distribute part of the profits to the shareholder and retain the other half in the business.
It's the financial manager's responsibility to decide a optimum dividend policy which maximizes the market value of the firm. Hence an optimum dividend payout ratio is calculated. It is a common practice to pay regular dividends in case of profitability Another way is to issue bonus shares to existing shareholders.
Liquidity Decision

It is very important to maintain a liquidity position of a firm to avoid insolvency. Firm's profitability, liquidity and risk all are associated with the investment in current assets. In order to maintain a tradeoff between profitability and liquidity it is important to invest sufficient funds in current assets. But since current assets do not earn anything for business therefore a proper calculation must be done before investing in current assets.
Current assets should properly be valued and disposed of from time to time once they become non profitable. Currents assets must be used in times of liquidity problems and times of insolvency.
Following are the main functions of a Financial Manager:

1. Raising of Funds

   In order to meet the obligation of the business it is important to have enough cash and liquidity. A firm can raise funds by the way of equity and debt. It is the responsibility of a financial manager to decide the ratio between debt and equity. It is important to maintain a good balance between equity and debt.
2. Allocation of Funds

   Once the funds are raised through different channels the next important function is to allocate the funds. The funds should be allocated in such a manner that they are optimally used. In order to allocate funds in the best possible manner the following point must be considered

   - The size of the firm and its growth capability
   - Status of assets whether they are long-term or short-term
   - Mode by which the funds are raised

   These financial decisions directly and indirectly influence other managerial activities. Hence formation of a good asset mix and proper allocation of funds is one of the most important activity
3. Profit Planning

   Profit earning is one of the prime functions of any business organization. Profit earning is important for survival and sustenance of any organization. Profit planning refers to proper usage of the profit generated by the firm.

Profit arises due to many factors such as pricing, industry competition, state of the economy, mechanism of demand and supply, cost and output. A healthy mix of variable and fixed factors of production can lead to an increase in the profitability of the firm.
Fixed costs are incurred by the use of fixed factors of production such as land and machinery. In order to maintain a tandem it is important to continuously value the depreciation cost of fixed cost of production. An opportunity cost must be calculated in order to replace those factors of production which has gone thrown wear and tear. If this is not noted then these fixed cost can cause huge fluctuations in profit.

4. Understanding Capital Markets

Shares of a company are traded on stock exchange and there is a continuous sale and purchase of securities. Hence a clear understanding of capital market is an important function of a financial manager. When securities are traded on stock market there involves a huge amount of risk involved. Therefore a financial manger understands and calculates the risk involved in this trading of shares and debentures.
Its on the discretion of a financial manager as to how to distribute the profits. Many investors do not like the firm to distribute the profits amongst share holders as dividend instead invest in the business itself to enhance growth. The practices of a financial manager directly impact the operation in capital market.

Meaning of Capital: Fixed Capital, Working Capital

The term capital is used in economics in various senses. In ordinary language and sometimes in economics also capital is used in the sense of money.

But when we talk of capital as a factor of production, to confuse capital with money is quite wrong. Of course, money is used to purchase various factors such as raw materials, machinery, labour which help to produce goods, but money itself does not directly help in the production of goods. The money which is available for investment and productive purposes has been called money capital or financial capital by some economists. But money capital is not the real capital. The real capital consists of machinery, tools, tube well, factories; tractors, etc., which directly assist in the production of goods.

Capital may be classified into fixed capital and working capital. Fixed Capital is durable-use producer goods which are used in production again and again till they wear out. Machinery, tools, railways tractors, factories etc., are all fixed capital.

Fixed capital does not mean fixed in location. Capital like plant, tractors, and factories are called fixed because money spent upon these durable goods, remains fixed or unrealised for a long period in contrast with the money spent on purchasing raw materials which is recovered as soon as goods made with them are sold.

Working Capital, on the other hand, are the single-use producers' goods like raw materials, fertilizers, goods in process and fuel. They are used up in a single act of production. Moreover, money spent on them is fully recovered when goods made with them are sold in the market.

The working capital cycle (WCC) is the amount of time it takes to turn the net current assets and current liabilities into cash. The longer the cycle is, the longer a business is tying up capital in its working capital without earning a return on it. Therefore, companies strive to reduce its working capital cycle by collecting receivables quicker or sometimes stretching accounts payable.

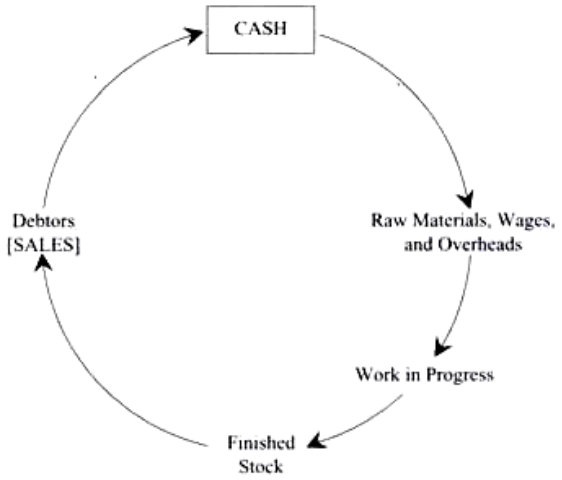


FIGURE 7.3 Working Capital Cycle

Components of working capital :

1. Cash Management:

Cash is one of the important components of current assets. It is needed for performing all the activities of a firm, i.e. from acquisition of raw materials to marketing of finished goods. Therefore it is essential for a firm to maintain an adequate cash balance. One of the important functions of a finance manager is to match the inflows and outflows of cash so as to maintain adequate cash.

2. Receivables Management:

The term receivable is defined as any claim for money owed to the firm from customers arising from sale of goods or services in normal course of business. The term account receivable

represents sundry debtors of a firm. It is one of the significant components of working capital next to cash and inventories. The total volume of accounts receivable depends on its credit sale and debt collection policy—these two significantly influence the requirement of working capital. Liberal credit policy increases the volume of sales but at the same time it also increases the investment in receivables. Therefore, examination of costs and benefits associated with credit policy is one of the important tasks of a finance manager.

3.Inventory Management:

Inventory constitutes a major part of total working capital. Efficient management of inventory results in maximization of earnings of the shareholders. Efficient inventory management consists of managing two conflicting objectives: Minimization of investment in inventory on the one hand; and maintenance of the smooth flow of raw materials for production and sales on the other.Therefore the objective of a finance manager is to calculate the level of inventory where these conflicting interests are reconciled. Like cash, a firm holds inventory for transaction, precautionary and speculative motives.

4. Accounts Payable Management:

Payables or creditors are one of the important components of working capital. Payables provide a spontaneous source of financing of working capital. Payable management is very closely related with the cash management. Effective payable management leads to steady supply of materials to a firm as well as enhances its reputation.It is generally considered as a relatively cheap source of finance as suppliers rarely charge any interest on the amount owed. However, trade creditors will have a cost as a result of loss of enjoying cash discount on cash purchases.

UNIT- V

The term inventory control is used to cover functions which are quite different and are related to one another only in that they both require the maintenance of adequate records of inventory as well as receipt and issue corresponding to these two functions. It is interpreted as accounting control and operating control.

Accounting control of inventories is concerned with the proper recording of the receipt and consumption of the material as well as the flow of goods through the plant into finished stock and eventually to customers.

Importance of Inventory Control:

The aim of holding inventories is to allow the firm to separate the process of purchasing, manufacturing, and marketing of its primary products. Inventories are a component of the firm's working capital and as such represent a current account.

Inventories are also viewed as a source of near all cash. The purpose is to achieve efficiencies in areas where costs are involved. The scientific inventory control results in the reduction of stocks on the one hand and substantial decline in critical shortages on the other.

(i) Reducing Risk of Production Shortages:

Firms mostly manufacture goods with hundreds of components. The entire production operation can be halted if any of these are missing. To avoid the shortage of raw material the firm can maintain larger inventories.

(ii) Reducing Order Cost:

Where a firm places an order, it incurs certain expenses. Different forms have to be completed. Approvals have to obtained, and goods that arrive must be accepted, inspected and counted. These costs will vary with the number of orders placed. Smaller the inventories lesser the capital needed to carry inventories.

(iii) Minimise the Blockage of Financial Resources:

The importance of inventory control is to minimise the blockage of financial resources. It reduces the unnecessary tying up of capital in excess inventories. It also improves the liquidity position of the firm.

(iv) Avoiding Lost Sales:

Most firms would lose business without goods on hand. Generally a firm must be prepared to deliver goods on demand. By ensuring timely availability of adequate supply of goods, inventory control helps the firm as well as consumers.

(v) Achieving Efficient Production Scheduling:

The manufacturing process can occur in sufficiently long production runs and with preplanned schedules to achieve efficiencies and economies. By maintaining reasonable level of inventory production scheduling becomes easier for the management.

(vi) Gaining Quantity Discounts:

While making bulk purchases many suppliers will reduce the price of supplies and component supplies will reduce the price of supplies and component parts. The large orders may allow the firm to achieve discounts on regular basis. These discounts in turn reduce the cost of goods and increase the profits.

(vii) Taking the Advantage of Price Fluctuations:

When the prices of the raw materials are low the firm makes purchases in economic lots and maintains continuity of operations. By reducing the cost of raw materials and procuring high prices for its goods the firm maximises profit. This with the help of inventory control the firm takes advantage of price fluctuations.

(viii) Tiding over Demand Fluctuations:

Inventory control also helps the firm in tiding over the demand fluctuation. These are taken care of by keeping a safety stock by the firm. Safety stock refers inventories carried to protect against variations in sales rate, production rate and procurement time. Inventory control aims at keeping the cost of maintaining safety stock minimum.

(ix) Deciding timely Replenishment of Stocks:

Inventory control results in the maintenance of necessary records, which can help in maintaining the stocks within the desired limits. With the help of adequate records the firm can protect itself against thefts, wastes and leakages of inventories. These records also help in deciding about timely replenishment of stocks.

Methods of Inventory Control:

Inventory control is concerned with the periodic review of materials in stock to detect those not required for planned production or for other purposes not required and whether obsolete materials continue to occupy storage space until removed from stores.

The inventory control methods give us a means for determining an optimal level of inventory as well as how much should be ordered and when. There are several methods suggested for inventory controls.

The following are the most important systems used for inventory control:

(a) ABC System:

A firm using ABC system segregates its inventory in to three groups-A, B and C. The ‘A’ items are those in which it has the largest rupee investment. This group consists of the 20 per cent of the firm’s rupee investment. The B group consists of the items accounting for the next largest investment, i.e., the B group consists of the 30 per cent of the items accounting for about 8 per cent of the firm’s rupee investment.

The C group typically consists of a large number of item accounting for small rupee investment. C group consist of approximately 50 per cent of all the items of inventory but only about 2 per cent of the firm's rupee investment.

(b) Budgetary Control System:

Budgetary control is a tool of management used to plan, carry- out and control the operations of business. It establishes pre-determined objectives and provide the basis for measuring performance against these objectives. Under this system the number of units of the materials to produce a finished product and the level of inventory to be maintained and the quantities to be purchased during the period are all pre-determined.

When these plans are projected in advance they are called budgets. Control over inventories is exercised on the basis of budgeted figures. Successful inventory budgeting depends upon the sales forecast. The budget on control system has the advantage of the co-ordination on the inventory consumption level and the expected consumption.

This system integrates and ties together all activities of the enterprise right from the planning to controlling. Control helps to eliminate or reduce unproductive activities and minimising waste. It is an effective method of controlling activities of the business unit since it provides standards against which actual performance is measured.

(c) Minimum-Maximum System:

This is one of the oldest methods used in most of the business for controlling inventories. It is essential that proper control should be exercised on the level of the inventory to be maintained. Efficient management of inventory demands that both over and under investment in stock be avoided.

If higher levels of inventories are maintained stock level will be influenced by obsolescence, change in fashion and improvements in technicalities. Too much capital tied up in inventories results in the lower rate of return and the possibility of substantial loss from decline in market value.

Too small a quantity is likely to reduce the value of the business and proper servicing of the customers. According to this, a maximum level of inventory based upon the demand and the minimum level to prevent out of stock conditions for each item of stock are established. An order is placed when the minimum level is reached which will bring the quantity to the maximum level.

(d) The Economic Order Quantity Approach:

The Economic order quantity (EOQ) refers to the optimal order size that will result in the lowest total of order and carrying costs for an item of inventory given its expected usage, carrying cost and ordinary cost. By calculating an economic order quantity, the firm attempts to determine the order size that will minimise the total inventory costs.

Assumptions:
(i) Constant or uniform demand.
(ii) Independent orders.
(iii) Instantaneous delivery.
(iv) Constant ordering costs.
(v) Constant carrying costs.
(vi) Constant unit price.

Finding Economic Order Quantity:

The EOQ model assumes that the finished goods are sold at a constant rate overtime. The important decision in inventory management is to balance the cost of holding inventories with the cost of placing inventory replenishment orders. When the holding costs and ordering costs are balanced, the inventory costs are minimised and resulting order quantity is called the economic order quantity.

Total inventory cost = Ordering cost + Carrying cost

Total ordering cost = Number of orders x Cost per order

= Rs.U/Q x F

Where

u = Annual usage

Q = Quantity ordered

f = fixed cost per order

Total carrying cost = Average level of inventory x price per unit x carrying cost.

Total carrying cost = Rs. Q/2 x P x C

= Rs. QPC/2

where

Q = Quantity ordered

P = Purchasing Price per unit

C = Carrying cost.

Inventory Level and Order Point for Replenishment:

From Fig. 1., it can be noticed that the level of inventory will be equal to the order quantity (Q units) to start with. It declines to level 0 by the end of period 1. At that point an order for replenishment will be made for Q units. In view of zero lead time the inventory level jumps to Q and the same procedure follows in the subsequent periods. As a result of this the average level of inventory will remain at Q/2 units, the simple average of the two end points Q and Zero.

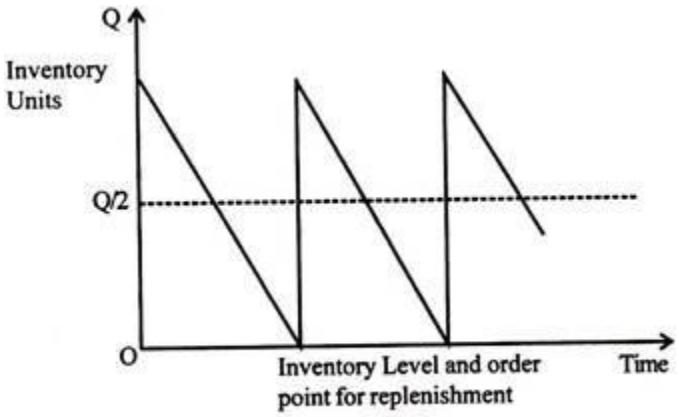


Fig. 1.

Purchasing: 6 Major Principles of Purchasing

1. Right Quality:

The term right quality refers to a suitability of an item for the purpose it is required. For producing the goods of best quality, the best grade of raw material may be the right quality whereas for producing items of medium quality, the average lowest grade may be the right quality.

The quality of the item is called as grades. It can be measured by physical tests, chemical analysis or by any other methods depending upon the nature of a product. The use of standard specification, brand name or trade name helps in purchasing the squired qualities of materials. 'The quality must be built into the product'. It is the duty of the purchasing department to ensure that materials are purchased from those suppliers.

For creating goodwill, right production, standardisation, elimination of waste and for better results, right quality purchases are very essential. Quality for different materials is decided by the concerned departments.

In case of workshop equipment, the decision is taken by the plant engineer and for stationery it is the user department. However, purchase department may question the requirements of the different departments on the basis of its experience and suggest various alternatives. The inspection department must verify whether the goods supplied are in accordance with the order placed.

Thus, the right quality is the suitability of items purchased for a given purpose. The best quality of materials purchased need not be the right quality.

2. Right Quantity:

Materials purchased should be of right quantity. The right quantity is the quantity that may be purchased at a time with the minimum total cost and which obviates shortage of materials. Ensuring and maintaining a regular flow of materials for carrying the production activity is the vital aim of any purchase organisation. Excess purchases should be avoided, it results in overstocking and capital is unnecessarily blocked and inventory carrying cost goes up.

Economic Order Quantity (EOQ) helps in determining the right quantity of materials to be ordered. It is calculated by applying the following formula:

EOQ =

A stands for annual consumption of material, C for cost of placing an order and S for Annual Storage and carrying cost per unit.

For deciding the amount of right quantity to be purchased, certain important factors must be considered by the management. These are the nature of the manufacturing process, the nature of

material to be used, prevailing market conditions i.e., changes in the tastes and preferences of the people, cost of materials to be purchased, cost of possession and storing capacity of the organisation.

Along with the economic order quantity, there are two more concepts, viz.; bulk order quantity and arbitrary order quantity which needs to be understood.

Bulk Order Quantity is the quantity which is larger than the economic order quantity. It combines the ordering quantity of more than one order so as to round off to 3, 6 or 12 monthly requirements and place a single order for the full requirements of a period under consideration.

Bulk order quantity ensures various economies of price, lesser operational cost in the purchase department. Inexpensive and slow moving items are generally purchased in bulk quantity.

Arbitrary Order Quantity is the outcome of the weaknesses of economic order quantity and bulk order quantity. Due to varying market conditions, it is not advisable to always strictly adhere to the economic and bulk order quantities.

Certain factors viz.; uncertain order from the market, uncertain financial position, uncertain production schedule and uncertain lead time are responsible for the adoption of arbitrary order quantity on the part of the purchase manager.

3. Right Time:

The time at which the purchases are to be made is of vital importance. In case of items used regularly, right time means the time when the stock reaches the minimum level. The reorder level of material is fixed for each item under the principle of right time.

Action for the purchase of new supplies should be immediately initiated, when the material reaches the reorder level. Reorder level for each type of material is calculated by applying the following formula.

Reorder level = Maximum Consumption x Maximum Reorder Period. The materials control department sends the purchase requisition to be purchase department for the purchase of materials. In case materials are required for special jobs, the Purchase Department ensures that the materials are delivered in time.

Another important factor to be considered is the delivery of materials from stores to production departments. Any under delay in supplying the materials on different jobs delays the production.

4. Right Source:

Selecting the right source for the purchase of materials is an important consideration in the purchase procedure. The right source for the procurement of materials is that supplier who can supply the material of right quality as ordered, in right quantity as ordered, at a right time at which the materials were required to be supplied, at an agreed price with the supplier, who is in a position to honour the commitment without much follow- up, who has necessary financial resources and adequate man-power to handle the order and who is well established with higher reputation and proven business integrity.

The source of material should be located within a reasonable distance from the buyer's organisation. This will minimise the delivery delays, higher transportation charges and improve the personal contact between the buyer and the supplier and enable better after-sales service etc.

As far as possible the middlemen and brokers should be avoided in the purchase of materials. A direct liaison should be established with the supplier. It would be helpful in improving the quality of the material in future.

While selecting the supplier certain factors must be kept in mind, viz., location of the supplier, warehousing facilities available with the supplier, relations of the employers with the labour, credit worthiness of the supplier, size of the supplier's firm and quality control observed by the

employer etc. A personal visit to prospective supplier's premises will be helpful in assessing the capabilities of the supplier.

5. Right Price:

Determination of right price is a difficult task. It is the main object of any organisation to procure the material items at the right price. It is that price which brings the best ultimate value of the money invested in purchasing the materials.

Deciding the right price of a product depends on variety of factors, viz.; quality, delivery time and ultimate life of the material, demand and supply curve, extent of competition, government restrictions, after sales services, discount offered, and terms of purchase etc. It may be pointed out here that the determination of proper price depends not only on market knowledge but also a clear understanding of the pricing process.

The buyer should keep in touch himself with the above mentioned factors in the process of determination of price. He must consider that whether a proposed item to be purchased represents the best value for money or not.

This is known as "value analysis". The prevailing market prices also provide basis for the price determination. There should be negotiation between the purchase department and the suppliers for the determination of proper price.

6. Right Place:

Besides obtaining the materials of the right quality and quantity from the right source at the right price, it should be ensured that the materials are available at the right place. Transportation and material handling costs are greatly affected by the selection of the right place from where the materials are to be acquired. For minimising these costs, selection of right place for the acquisition of material is of utmost importance. If local as well as outside supplier fulfills these conditions, the former should be preferred. The above mentioned principles of purchasing can be summed up as the six R's of purchasing. These are also known as the "essentials" to be followed by the purchasing executive.

UNIT-VI

Production :

Production/Operation management is the process which combines and transforms various resources used in the production/operation subsystem of the organization into value added products/services in a controlled manner as per the policies of the organization.

Productivity :

Productivity is a relationship between the output (product/service) and input (resources consumed in providing them) of a business system. The ratio of aggregate output to the aggregate input is called productivity.

Productivity = output/Input

Plant layout means the disposition of the various facilities (equipment, material, manpower etc.) and services of the plant within the area of site located.

Objectives of plant layout :

- Material handling and transportation is minimized and effectively controlled.
- Bottlenecks and points of congestions are eliminated (by line balancing) so that the rawmaterial and semi-finished goods move fast from one workstation to other.
- Workstations are designed suitable and properly.
- Suitable spaces are allocated to production centers and service centers.
- The movements made by the workers minimized. Layout can be classified into the following four categories: a. process layout b. product layout c. Group layout(combination layout) d. Fixed position layout

Layout can be classified into the following four categories: a. process layout b. product layout c. Group layout(combination layout) d. Fixed position layout .

<u>Process layout:</u>

• It is also known as functional layout.

• Here similar machines and services located together Ex. All the lathe machines will be at one place and all milling machines at another place and so on.

• This type of layout generally employed for industries engaged in job-shop production and non-repetitive kind of production.

• When there variety of products manufactured at low volume we prefer this type of layout.

• Ex. furniture manufacturer company, restaurant etc.

<u>Product layout</u>

• It is also known as line (type) layout.

• The flow of product will smooth and logical.

• When the machines and auxiliary services are located according to the processing sequence we prefer this layout.

• It implies that various operations raw material are performed in a sequence and the machines are placed along the product flow line.

• The product layout is selected when the volume of production of a product is high such that separate production line to manufacture it can be justified.

• Assembly line production or mass production prefer this type layout. Ex. Assembly of television sets assembly of computer key-board etc.

Group layout:

• It is the combination of both process and product layout.

• In this type of layout a set of machinery or equipment is grouped together in a section so that each group of machines or equipment is used to perform similar operations to produce a family of components. These machines grouped in to cells.

• It minimizes the sum of cost of transport and the cost of equipment.

Fixed position layout

- It is also called static product layoutin which the physical characterstics of the product dictate as to which type of machine and men are brought to the product.
- This type layout is inherent in ship building,aircraft manufacture and big pressure vessels fabrication.
- In other type layout the product moves past stationary production equipment where as in this case men and equipment are moved to the material at one place and the product is completed at the place where the material lies.

Production Planning :

It is an organized activity of converting raw materials into useful products. But before starting the actual production, production planning is done to anticipate possible difficulties and to decide in advance as to how the production process should be carried out in a best and economical way to satisfy customers. Since only planning of production is not sufficient, hence management takes all possible steps to see that plans chalked out by planning department are properly adhered to and the standard set are attained. In order to achieve it, control over production is exercised. The ultimate aim of production planning and control (PPC) is to produce the products of right quality in right quantity at the right time by using the best and least expensive methods.

Production planning and control can thus be defined as:

- The process of planning the production in advance.
- Setting the exact route of each item.
- Fixing the starting and finishing date for each item.
- To give production orders to different shops.
- To see the progress of products according to order.

Objectives of Production planning and control :

1. To determine the sequence of operations to continue production.
2. To issue co-ordinated work schedule of production to the supervisor/foreman of various shops.
3. To plan out the plant capacity to provide sufficient facilities for future production programme.
4. To maintain sufficient raw materials for continuous production.
5. To follow up production schedule to ensure delivery promises.
6. To evaluate the performance of various shops and individuals.
7. To give authority to right person to do right job.

UNIT-VIII

Human Resource Management (HRM) is a modern approach of maintaining people at workplace which focuses on acquisition, development, utilization and maintenance of human resource. HRM is development oriented. It is concern of managers of all level and provides space for employee involvement, performance and growth. Several companies nowadays prefer HRM to personnel management because HRM plays vital role in maintaining quality team of working experts.

Importance of Human Resource Management :

Human Resource Planning is a Process by which an organization ensures that

- Right number of people
- Right kind of people
- At the Right time
- At the Right place

Doing the Right things for which they are suited for achieving the goals of the organization

- They are In-charge of Overall Recruitment and Training of the Workforce: In collaboration with hiring managers of employers, the HR provides leadership training, teamwork management, scheduling assistance, a systematic hiring process, recruitment planning processes, interview expertise, selection monitoring, and more.

- Monitors Company Culture: Every organization has a distinct company culture. Some actions say that HR owns the culture, but as in all other employee relation matters, the ownership is generally with the management and employees. HR must also make sure that the company culture will allow creativity and productivity to thrive the most.

- Supervises Overall Talent Management Processes: This is one of the leading functions of the HR department. In collaboration with other managers, HR is on top of management development, performance management, succession planning, career paths, and other aspects of talent management. HR can't do it alone and rely heavily on managers and executive staff to help plan and execute strategies. However, HR has to bring new ideas and effective practices in the organization.

- Develops Standardized, Fair, and Strategic Compensation Plan: The HR department is knowledgeable in terms of rules and policies involving pay , depending on the city, state, or region. This must be applied when trying to evaluate salary grades for all levels of the organization. They guide managers as they determine the salary range within their organizations.

- Finds Out, Recommends, and Implements Employee Benefits and Compensation Programs That Would Help Attract and Retain Superior Employees: HR keeps track of these trends especially regarding employee benefits and compensation perks. They are also responsible for controlling costs and considering various options before recommending adoption of such measures.
- Recommends and Implements HR Strategies in the Organization: HR must always merge the current with future goals. This must be aligned to make sure that the momentum does not slow down at some point. If your organization is changing directions, developing new products, changing mission, vision, or goals, HR must lead the way with employee programs and processes. They must supervise with expansion and growth in mind, at all times.
- Ensures an Active Workplace Environment Complete with Events, Celebrations, Field Trips, Celebrations, and Team Building Activities: HR should be able to actively engage and keep employees nurtured and happy in the work environment. HR is generally responsible for monitoring the budget and providing committee oversight in terms of these activities planned and implemented in the calendar year.

- Be Proactive in Terms of Resolving Issues or Conflict Within the Organization or Mapping Out an Effective Approach to Enhancing Productivity in the Workplace: Conflicts are a part of any healthy and robust organization. Not everyone would feel the same way about each other, but they need to develop effective working relationships for contribution and productivity. HR can help by knowing the players and taking on the necessary role of an advocate, coach or mediator.

The importance of HR is easily overlooked in the organization ,especially in the busy day-to-day hustle and bustle of the workplace, but without an effective human resource management contribution in each of these areas, the organization would not be able to achieve its fullest potential and expand its horizon. Think of talent management as a business strategy that will help you retain exceptional employees. For effective talent management, every aspect of recruiting, hiring, and developing employees is affected positively.

Every HR department has its eye set on providing every company the best services and systems that would work to drive not just profit but team synergy. The goal of talent management is a ensuring a superior workforce. Here are systems that the organization must include for best practices in talent management.

Functions of Human Resource Management:

- Design and come up with clear job descriptions, so you know the skills, abilities, and experience needed for every role in the organization.

- Recruitment and selection of the right employees who have superior potential and fit your organization's culture, with an appropriate selection process.
- Lead and negotiate varied requirements and accomplishment-based performance standards, outcomes, and measures within a performance development planning system.
- Map out and initiate effective employee on-boarding and ongoing training and development opportunities that would reflect both the benefits and response to the employee's and the organization's overall needs.
- Be steadfast in providing continuous coaching, mentoring, and feedback, so the employee feels valued and important.
- Conduct quarterly performance development planning discussions that focus on the employee's interests for career development.
- Discuss with management and be able to design an up-to-date and effective compensation and recognition systems that reward people for their contributions. Even if all of the rest of your employment processes are employee-oriented, people still work for money. Employers of choice aim to pay above the market to talented employees.
- Provide promotional and career development opportunities for employees within a system that includes career paths, succession planning, and on-the-job training opportunities.
- Hold exit interviews to understand why a valued employee decided to leave the organization. Make the necessary changes, if the reasons provide information about company systems that you can improve.

Streamlining every aspect in the workplace processes and systems is important to produce an effective human resource management strategy that will give you exactly the results you need in an organization in real-time.

Human resource management, when handled strategically, flows steadily from the organization's mission, vision, values, and goals. This, in turn, enables every employee to see where he or she fits within the organization. This helps further shape and define his or her role in the company.This, in turn, enables employees to participate in the overall direction of the company. From a strategic perspective, an effective talent management system helps crucial employees feel as if they are part of something bigger than their current job.

Recruitment :
Recruitment is the process of searching for prospective employees and stimulating them for jobs in the organisation, Thus, the recruitment of employees involves the identification of the sources of personnel, evaluation of different sources available, selection of a particular source and stimulating the prospective candidates to apply for the job so that right candidates may be obtained for right job.
The various sources of recruitment can be broadly classified into two categories:
A. Internal Recruitment B. External Recruitment.

Internal Sources of Recruitment:

1. Promotions:

The promotion policy is followed as a motivational technique for the employees who work hard and show good performance. Promotion results in enhancements in pay, position, responsibility and authority. The important requirement for implementation of the promotion policy is that the terms, conditions, rules and regulations should be well-defined.

2. Retirements:

The retired employees may be given the extension in their service in case of non-availability of suitable candidates for the post.

3. Former employees:

Former employees who had performed well during their tenure may be called back, and higher wages and incentives can be paid to them.

4. Transfer:

Employees may be transferred from one department to another wherever the post becomes vacant.

5. Internal advertisement:

The existing employees may be interested in taking up the vacant jobs. As they are working in the company since long time, they know about the specification and description of the vacant job. For their benefit, the advertisement within the company is circulated so that the employees will be intimated.

Benefits of Internal Sources of Recruitment:

1. The existing employees get motivated.
2. Cost is saved as there is no need to give advertisements about the vacancy.
3. It builds loyalty among employees towards the organization.
4. Training cost is saved as the employees already know about the nature of job to be performed.
5. It is a reliable and easy process.

Limitations of Internal Sources of Recruitment:

1. Young people with the knowledge of modem technology and innovative ideas do not get the chance.
2. The performance of the existing employees may not be as efficient as before.
3. It brings the morale down of employees who do not get promotion or selected.
4. It may leads to encouragement to favouritism.
5. It may not be always in the good interest of the organization.

External Sources of Recruitment:

1. Press advertisement:

A wide choice for selecting the appropriate candidate for the post is available through this source. It gives publicity to the vacant posts and the details about the job in the form of job description and job specification are made available to public in general.

2. Campus interviews:

It is the best possible method for companies to select students from various educational institutions. It is easy and economical. The company officials personally visit various institutes and select students eligible for a particular post through interviews. Students get a good opportunity to prove themselves and get selected for a good job.

3. Placement agencies:

A databank of candidates is sent to organizations for their selection purpose and agencies get commission in return.

4. Employment exchange:

People register themselves with government employment exchanges with their personal details. According to the needs and request of the organization, the candidates are sent for interviews.

5. Walk in interviews:

These interviews are declared by companies on the specific day and time and conducted for selection.

6. E-recruitment:

Various sites such as jobs.com, naukri.com, and monster.com are the available electronic sites on which candidates upload their resume and seek the jobs.

7. Competitors:

By offering better terms and conditions of service, the human resource managers try to get the employees working in the competitor's organization.

Benefits of External Sources of Recruitment:

1. New talents get the opportunity.
2. The best selection is possible as a large number of candidates apply for the job.
3. In case of unavailability of suitable candidates within the organization, it is better to select them from outside sources.

Limitations of External Sources of Recruitment:

1. Skilled and ambitious employees may switch the job more frequently.
2. It gives a sense of insecurity among the existing candidates.
3. It increases the cost as advertisement is to be given through press and training facilities to be provided for new candidates.

SELECTION PROCESS :

Employee **selection** is a process of matching organization's requirements with the skills and the qualifications of individuals.

Brief details of the various steps in selection procedure are given as follows:

1. Inviting applications:

The prospective candidates from within the organization or outside the organization are called for applying for the post. Detailed job description and job specification are provided in the advertisement for the job. It attracts a large number of candidates from various areas.

2. Receiving applications:

Detailed applications are collected from the candidates which provide the necessary information about personal and professional details of a person. These applications facilitate analysis and comparison of the candidates.

3. Scrutiny of applications:

As the limit of the period within which the company is supposed to receive applications ends, the applications are sorted out. Incomplete applications get rejected; applicants with un-matching job specifications are also rejected.

4. Written tests:

As the final list of candidates becomes ready after the scrutiny of applications, the written test is conducted. This test is conducted for understanding the technical knowledge, attitude and interest of the candidates. This process is useful when the number of applicants is large.Many times, a second chance is given to candidates to prove themselves by conducting another written test.

5. Psychological tests:
These tests are conducted individually and they help for finding out the individual quality and skill of a person. The types of psychological tests are aptitude test, intelligence test, synthetic test and personality test
6. Personal interview:
Candidates proving themselves successful through tests are interviewed personally. The interviewers may be individual or a panel. It generally involves officers from the top management.
The candidates are asked several questions about their experience on another job, their family background, their interests, etc. They are supposed to describe their expectations from the said job. Their strengths and weaknesses are identified and noted by the interviewers which help them to take the final decision of selection.
7. Reference check:
Generally, at least two references are asked for by the company from the candidate. Reference check is a type of crosscheck for the information provided by the candidate through their application form and during the interviews.
8. Medical examination:
Physical strength and fitness of a candidate is must before they takes up the job. In-spite of good performance in tests and interviews, candidates can be rejected on the basis of their ill health.
9. Final selection:
At this step, the candidate is given the appointment letter to join the organization on a particular date. The appointment letter specifies the post, title, salary and terms of employment. Generally, initial appointment is on probation and after specific time period it becomes permanent.
10. Placement:
This is a final step. A suitable job is allocated to the appointed candidate so that they can get the whole idea about the nature of the job. They can get adjusted to the job and perform well in future with all capacities and strengths.

TRAINING :

A. On-the-job Training Methods:
1. Coaching
2. Mentoring
3. Job Rotation
4. Job Instruction Technology
5. Apprenticeship
6. Understudy
B. Off-the-Job Training Methods:
1. Lectures and Conferences
2. Vestibule Training
3. Simulation Exercises
4. Sensitivity Training
5. Transactional Training

A. On-the-job training Methods:

Under these methods new or inexperienced employees learn through observing peers or managers performing the job and trying to imitate their behaviour. These methods do not cost much and are less disruptive as employees are always on the job, training is given on the same machines and experience would be on already approved standards, and above all the trainee is learning while earning. Some of the commonly used methods are:

1. Coaching:

Coaching is a one-to-one training. It helps in quickly identifying the weak areas and tries to focus on them. It also offers the benefit of transferring theory learning to practice. The biggest problem is that it perpetrates the existing practices and styles. In India most of the scooter mechanics are trained only through this method.

2. Mentoring:

The focus in this training is on the development of attitude. It is used for managerial employees. Mentoring is always done by a senior inside person. It is also one-to- one interaction, like coaching.

3. Job Rotation:

It is the process of training employees by rotating them through a series of related jobs. Rotation not only makes a person well acquainted with different jobs, but it also alleviates boredom and allows to develop rapport with a number of people. Rotation must be logical.

4. Job Instructional Technique (JIT):

It is a Step by step (structured) on the job training method in which a suitable trainer (a) prepares a trainee with an overview of the job, its purpose, and the results desired, (b) demonstrates the task or the skill to the trainee, (c) allows the trainee to show the demonstration on his or her own, and (d) follows up to provide feedback and help. The trainees are presented the learning material in written or by learning machines through a series called ‘frames’. This method is a valuable tool for all educators (teachers and trainers). It helps us:

a. To deliver step-by-step instruction

b. To know when the learner has learned

c. To be due diligent (in many work-place environments)

5. Apprenticeship:

Apprenticeship is a system of training a new generation of practitioners of a skill. This method of training is in vogue in those trades, crafts and technical fields in which a long period is required for gaining proficiency. The trainees serve as apprentices to experts for long periods. They have to work in direct association with and also under the direct supervision of their masters.

The object of such training is to make the trainees all-round craftsmen. It is an expensive method of training. Also, there is no guarantee that the trained worker will continue to work in the same organisation after securing training. The apprentices are paid remuneration according the apprenticeship agreements.

6. Understudy:

In this method, a superior gives training to a subordinate as his understudy like an assistant to a manager or director (in a film). The subordinate learns through experience and observation by participating in handling day to day problems. Basic purpose is to prepare subordinate for assuming the full responsibilities and duties.

B. Off-the-job Training Methods:

Off-the-job training methods are conducted in separate from the job environment, study material is supplied, there is full concentration on learning rather than performing, and there is freedom of expression. Important methods include:

1. Lectures and Conferences:

Lectures and conferences are the traditional and direct method of instruction. Every training programme starts with lecture and conference. It's a verbal presentation for a large audience. However, the lectures have to be motivating and creating interest among trainees. The speaker must have considerable depth in the subject. In the colleges and universities, lectures and seminars are the most common methods used for training.

2. Vestibule Training:

Vestibule Training is a term for near-the-job training, as it offers access to something new (learning). In vestibule training, the workers are trained in a prototype environment on specific jobs in a special part of the plant.

An attempt is made to create working condition similar to the actual workshop conditions. After training workers in such condition, the trained workers may be put on similar jobs in the actual workshop.

This enables the workers to secure training in the best methods to work and to get rid of initial nervousness. During the Second World War II, this method was used to train a large number of workers in a short period of time. It may also be used as a preliminary to on-the job training. Duration ranges from few days to few weeks. It prevents trainees to commit costly mistakes on the actual machines.

3. Simulation Exercises:

Simulation is any artificial environment exactly similar to the actual situation. There are four basic simulation techniques used for imparting training: management games, case study, role playing, and in-basket training.

(a) Management Games:

Properly designed games help to ingrain thinking habits, analytical, logical and reasoning capabilities, importance of team work, time management, to make decisions lacking complete information, communication and leadership capabilities. Use of management games can encourage novel, innovative mechanisms for coping with stress.

Management games orient a candidate with practical applicability of the subject. These games help to appreciate management concepts in a practical way. Different games are used for training general managers and the middle management and functional heads – executive Games and functional heads.

(b) Case Study:

Case studies are complex examples which give an insight into the context of a problem as well as illustrating the main point. Case Studies are trainee centered activities based on topics that demonstrate theoretical concepts in an applied setting.

A case study allows the application of theoretical concepts to be demonstrated, thus bridging the gap between theory and practice, encourage active learning, provides an opportunity for the development of key skills such as communication, group working and problem solving, and increases the trainees" enjoyment of the topic and hence their desire to learn.

(c) Role Playing:

Each trainee takes the role of a person affected by an issue and studies the impacts of the issues on human life and/or the effects of human activities on the world around us from the perspective of that person.
It emphasizes the "real- world" side of science and challenges students to deal with complex problems with no single "right" answer and to use a variety of skills beyond those employed in a typical research project.
In particular, role-playing presents the student a valuable opportunity to learn not just the course content, but other perspectives on it. The steps involved in role playing include defining objectives, choose context & roles, introducing the exercise, trainee preparation/research, the role-play, concluding discussion, and assessment. Types of role play may be multiple role play, single role play, role rotation, and spontaneous role play.
(d) In-basket training:
In-basket exercise, also known as in-tray training, consists of a set of business papers which may include e-mail SMSs, reports, memos, and other items. Now the trainer is asked to prioritise the decisions to be made immediately and the ones that can be delayed.
4. Sensitivity Training:
Sensitivity training is also known as laboratory or T-group training. This training is about making people understand about themselves and others reasonably, which is done by developing in them social sensitivity and behavioral flexibility. It is ability of an individual to sense what others feel and think from their own point of view.
It reveals information about his or her own personal qualities, concerns, emotional issues, and things that he or she has in common with other members of the group. It is the ability to behave suitably in light of understanding.
A group's trainer refrains from acting as a group leader or lecturer, attempting instead to clarify the group processes using incidents as examples to clarify general points or provide feedback. The group action, overall, is the goal as well as the process.
Sensitivity training Program comprises three steps (see Figure 18.7)

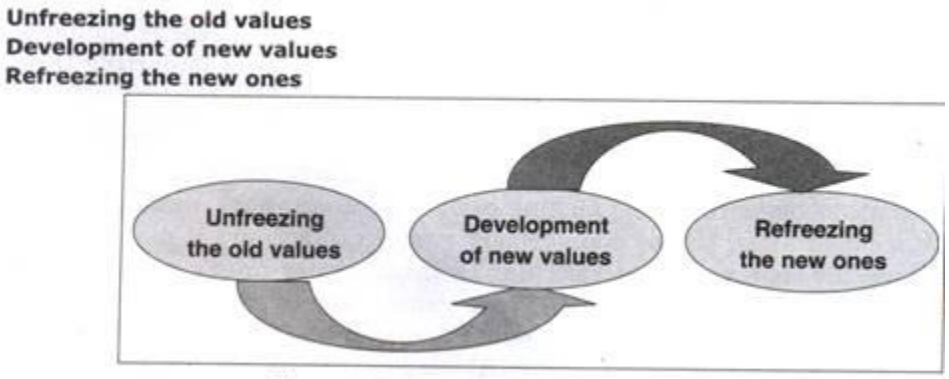


Figure 18.7 Procedure for Sensitivity Training

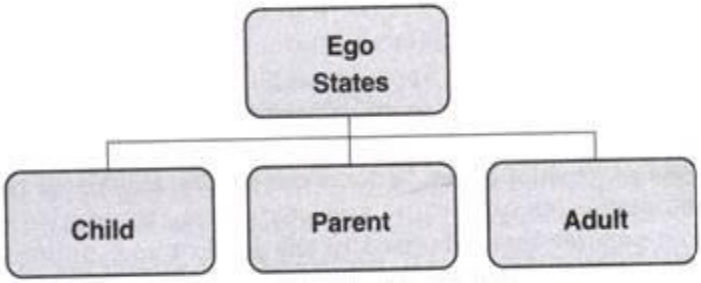
5. Transactional Analysis:
It provides trainees with a realistic and useful method for analyzing and understanding the behavior of others. In every social interaction, there is a motivation provided by one person and a reaction to that motivation given by another person.
This motivation reaction relationship between two persons is known as a transaction. Transactional analysis can be done by the ego (system of feelings accompanied by a related set of behaviors states of an individual).
Child:

It is a collection of recordings in the brain of an individual of behaviors, attitudes, and impulses which come to him/her naturally from his/her own understanding as a child. The characteristics of this ego are to be spontaneous, intense, unconfident, reliant, probing, anxious, etc. Verbal clues that a person is operating from its child state are the use of words like "I guess", "I suppose", etc. and non verbal clues like, giggling, coyness, silent, attention seeking etc.

Parent:

It is a collection of recordings in the brain of an individual of behaviors, attitudes, and impulses imposed on her in her childhood from various sources such as, social, parents, friends, etc.

The characteristics of this ego are to be overprotective, isolated, rigid, bossy, etc. Verbal clues that a person is operating from its parent states are the use of words like, always, should, never, etc and non-verbal clues such as, raising eyebrows, pointing an accusing finger at somebody, etc.



Adult:

It is a collection of reality testing, rational behaviour, decision making, etc. A person in this ego state verifies, updates the reaction which she has received from the other two states. It is a shift from the taught and felt concepts to tested concepts.

All of us show behaviour from one ego state which is responded to by the other person from any of these three states.

Performance Appraisal :

A performance appraisal is a systematic and objective method of judging the quality of an employee in performing his job and a part of guiding and managing career development. It is the process to obtain, analyze, and record the information about the relative worth of an employee to the organization. Performance appraisal is an analysis of an employee's recent successes and failures, personal strengths and weaknesses, and his/her suitability for promotion or further training.

Need of Performance Appraisal :

- To provide employees feedback on their performance.
- Identify employee training needs.
- Document criteria used to allocate organisational rewards.
- A basis for decisions relating to salary increases, promotions, disciplinary actions, bonuses, etc.
- Provide the opportunity for organisational diagnosis and development.
- Facilitate communication between employee and employer.
- Validate selection techniques and human resource policies to meet regulatory requirements.
- To improve performance through counseling, coaching and development.
- To motivate employees through recognition and support.

UNIT-VII

Sales & Marketing :

According to Philip Kotler, “Marketing management is the analysis, planning, implementation and control of programmes designed to bring about desired exchanges with target markets for the purpose of achieving organisational objectives.

It relies heavily on designing the organisations offering in terms of the target markets needs and desires and using effective pricing, communication and distribution to inform, motivate and service the market.” Marketing management is concerned with the chalking out of a definite programme, after careful analysis and forecasting of the market situations and the ultimate execution of these plans to achieve the objectives of the organisation.

Further, their sales plans to a greater extent rest upon the requirements and motives of the consumers in the market. To achieve this objective, the organisation has to pay heed to the right pricing, effective advertising and sales promotion, distribution and stimulating the consumers through the best services.

To sum up, marketing management may be defined as the process of management of marketing programmes for accomplishing organisational goals and objectives. It involves planning, implementation and control of marketing programmes or campaigns.

Importance of Marketing Management:

Marketing management has gained importance to meet increasing competition and the need for improved methods of distribution to reduce cost and to increase profits. Marketing management today is the most important function in a commercial and business enterprise.

The following are the other factors showing importance of the marketing management:

(i) Introduction of new products in the market.

(ii) Increasing the production of existing products.

(iii) Reducing cost of sales and distribution.

(iv) Export market.

(v) Development in the means of communication and modes of transportation within and outside the country.

(vi) Rise in per capita income and demand for more goods by the consumers.

Consultative Selling

This approach is meant to create long-term, mutually beneficial sales relationships. Consultative selling is a problem solving technique through which the salesperson helps the customer to improve their profit by selling the right products and services. In the mean time the salesperson gains profit from selling its products and creates an advantage over competitors, by using this approach. This method requires long-term planning instead of quick sale, but creates a good customer relationship.

Application of Consultative Selling

The process of consultative selling is concerned with solving customer's problems. In order to do so four steps have to be followed:

Identifying the customers problem in financial terms- What the problem is costing the customer, or what could have been earned without the problem?
Quantifying a profit improvement solution, without mentioning your product yet. In this stage the process is still strictly focussed on benefiting the customer.
Fitting the products or services in the customer's needs in order to contribute to the customer's profit.
Proposing a long-term relationship in order to continue to benefit both parties.
Selling Methods :
High Octane/Creative Selling
High octane selling is a systematic process, stressing optimum performance, by being extraordinary in order to impress and challenge the prospective customer to buy your product or service. This involves selling in a creative manner. Creativity is essentially a process and behavior that produces new and useful ideas. The purpose of this method is to impress the prospects and make them remember the sales message by using an original approach of presenting the product.
Application of High Octane/Creative Selling
Creativity is a process, not just a behavior. Each creative idea should go through a six step process:
1. Preparation: absorption of information to make up an idea.
2. Incubation: this contains the period in which you store the idea in your subconscious's in order to 'brew' the idea.
3. Illumination: an unexpected moment when the answer to an approach pops out.
4. Evaluation: the judgment stage of the idea, and identifying all the pros and cons.
5. Transformation: Modifying and enhancing the idea to make it more acceptable.
6. Implementation: turning the idea into a product or method.
For small businesses it is recommended to train staff to be creative while selling. In retail selling prospects are very sensitive to new and convincing approaches. This is another opportunity to grab and gain a competitive advantage.
Non Manipulative Selling
Different sources of literature may call this method collaborative or guilt-free selling, but these methods have one collective objective:
In contrast to the traditional salesperson, the non manipulative salesperson takes time up front to build a sincere, committed relationship and to learn in depth about the customer's needs. This approach demonstrates how to eliminate pressure and tension from the sale process and select the solutions that reward both the salesperson and the customer. In the long run this approach works more effectively than the high-pressured traditional selling. When a longer lasting sincere relationship is created a higher customer satisfaction can be generated, which will eventually result in an increase of revenues.
Application of Non Manipulative Selling
To reduce the tension during non manipulative selling it is important to build a relation of trust. The most effective way to reach this is by sequencing the following process:
1. Define the needs/problems: Establishing the trust bond. Identifying the current situation, client goals, objectives, needs and problems.

2. Find solution: Determine discussion making criteria, solicit and suggest potential solutions and finally agree upon the best solution. A possible solution might be to match customers needs to products.
3. Implement the solution: Outline the tasks and responsibilities and work out an implementation schedule. A schedule gives answers to questions like; How to meet the customers needs? How to adjust the product or service to the customer needs?
4. Track the results: Identify the criteria for successful results and monitor them.

Compelling/Traditional Selling

This method of selling is going by the statement, "Selling is the art of communication for persuasion". Compelling selling is salesperson oriented and is focussed on 'persuading' the customer to buy. Clearly this relationship with the customer is neither based on trust nor focussed on customer satisfaction and contains a high level of pressure.

Application of compelling/traditional selling

1. Composing a sales plan: This includes personal requirements for a salesperson, product knowledge and sales techniques;
2. Identifying the customer: Prospecting the market for the product;
3. Preparation phase: Adjusting the selling techniques and styles to the identified customer features;
4. Approaching the customer: The actual contact through, e.g. interview, presentation, telephone contact, etc.
5. Apply techniques: Handle at the right moment;
6. Closing the sale: Close the sale at the appropriate time and in the appropriate way.

This method is on the long run not the most effective one and is not recommended for small businesses or any business types, looking at the fact that this will not create a long-term relationship. It is cheaper to maintain relationship than it is to create new ones. By avoiding this method costs of constantly having to attract new customers can be reduced.

Cross selling

Cross selling is the situation in which a salesperson gets a referral from a colleague within the company to increase the revenue of the relationship by selling parallel products or services in the company. Cross selling requires cooperation for everybody in order to enhance customers retention. The company's database can indicate which customers are the best cross selling candidates. Salespersons are expected to recognize cross selling opportunities when interacting with customers.

Application of Cross selling

1. Nurture and manage a good customer relationship;
2. Define a written cross selling plan;
3. Sales as well as all other employees in the company must be engaged. Cross selling is everyone's job!
4. Measure the results;
5. Give positive feedback to fellow employees to stimulate them and involve them in future engagements.

The word “Brand” has its origin in the Norwegian work “Brand”, which means to burn. In ancient times, farmers used to put burn marks as identification on livestock to distinguish their possessions.

Definition of Branding

According to American Marketing Association - Brand is “A name, term, design, symbol, or any other feature that identifies one seller’s good or service as distinct from those of other sellers. The legal term for brand is trademark. A brand may identify one item, a family of items, or all items of that seller. If used for the firm as a whole, the preferred term is trade name.”

According to Philip Kotler - “Brand is a name, term, sign, symbol, design, or a combination of them, intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors”

Branding is “a seller’s promise to deliver a specific set of features, benefits and services consistent to the buyers.”

Meaning of Branding

Branding is a process of creating a unique name and image for a product in the mind of consumer, mainly through advertising campaigns. A brand is a name, term, symbol, design or combination of these elements, used to identify a product, a family of products, or all products of an organisation. Branding is an important component of product planning process and an important and powerful tool for marketing and selling products.

Elements of Branding

Brand includes various elements like - brand names, trade names, brand marks, trade marks, and trade characters. The combination of these elements form a firm's corporate symbol or name.

Brand Name - It is also called Product Brand. It can be a word, a group of words, letters, or numbers to represent a product or service. For example - Pepsi, iPhone 5, and etc.

Trade Name - It is also called Corporate Brand. It identifies and promotes a company or a division of a particular corporation. For example - Dell, Nike, Google, and etc.

Brand Mark - It is a unique symbol, colouring, lettering, or other design element. It is visually recognisable, not necessary to be pronounced. For example - Apple's apple, or Coca-cola's cursive typeface.

Trade Mark - It is a word, name, symbol, or combination of these elements. Trade mark is legally protected by government. For example - NBC colourful peacock, or McDonald's golden arches. No other organisation can use these symbols.

Trade Characters - Animal, people, animated characters, objects, and the like that are used to advertise a product or service, that come to be associated with that product or service. For example - Keebler Elves for Keebler cookies

Branding Strategies

There are various branding strategies on which marketing organisations rely to meet sales and marketing objectives. Some of these strategies are as following :-

Brand Extension - According to this strategy, an existing brand name is used to promote a new or an improved product in an organisation's product line. Marketing organisations uses this strategy to minimise the cost of launching a new product and the risk of failure of new product. There is risk of brand diluting if a product line is over extended.

Brand Licensing - According to this strategy, some organisations allow other organisations to use their brand name, trade name, or trade character. Such authorisation is a legal licensing agreement for which the licensing organisation receives royalty in return for the authorisation. Organisations follow this strategy to increase revenue sources, enhance organisation image, and sell more of their core products.

Mixed Branding - This strategy is used by some manufacturers and retailers to sell products. A manufacturer of a national brand can make a product for sale under another company's brand. Like this a business can maintain brand loyalty through its national brand and increase its product mix through private brands. It can increase its profits by selling private brands without affecting the reputation and sales of its national brand.

Co-Branding - According to this strategy one or more brands are combined in the manufacture of a product or in the delivery of a service to capitalise on other companies' products and services to reach new customers and increase sales for both companies' brands.

Packaging may be defined as formulating a design of the package and producing an appropriate and attractive container or wrapper for a product. The container itself can act a forceful though silent and powerful salesman at the point of purchase or an effective medium of advertisement encouraging impulse buying.

Many a time, package design itself can act as a registered brand. Packing is necessary to prevent flowing out of such liquids as milk, drinks, etc. It is essential to maintain freshness and quality, e.g., ghee, sauce, etc. It can prevent the danger of adulteration, e.g., butter, cheese, spices, edible oil, etc.

However, packaging is much more than mere packing. Packaging is a marketing necessity. The public does not want just the product. They want explanation, assurance, encouragement, confidence, and praise, i.e., pat-on-the-back, all integrated or combined with a pleasant and eye-catching get-up appearance on the top to gain action, i.e., close the sale.

Thus, a good package ensures ultimate success of the product as a commercial venture. Under keen competition, the consumer needs an effective means to recognise a difference and establish preference that will ensure repeated repurchases. Packaging does this job in a competitive market.

A label is also a part of a package or it may be attached directly to the product. There is a very close relationship between labelling and packaging as well as labelling and branding or grading.

Labelling is the act of attaching or tagging labels. Label is anything — may be a piece of paper, printed statement, imprinted metal, leather — which is either a part of a package or attached to it indicating contents, price names of product and produces and such useful information beneficial to the consumer. Example- labels on drugs and dangerous products contain factual information.

Labels are classified as- (a) brand, (b) grade, (c) descriptive, and (d) informative. Brand label mentions the brand name or mark. Grade label identifies the quality by a letter, number, or word, e.g., AAA, Fancy Grade, Grade No.1 and 2. Descriptive and informative labels are similar.

They give helpful information on the following-

(a) Brand name, (b) Name and address of producer, (c) Weight, measure, count,

(d) Ingredients by percentages where possible, (e) Directions for the proper use of the product, (f) Cautionary measures concerning the product and its use, (g) Special care of the product, if necessary, (h) Recipes on food products, (i) Nutritional guidelines, (j) Date of packing and date of expiry, (k) Retail price, and (l) Unit price for comparison.

Labelling, in general, is not a very reliable guide to quality or an assurance of uniformity. The printing of labels costs very little and the superlatives given on the label cost nothing. Hence, consumers should guard against deceptive labels.

A leader is an individual person who is assigned or delegated to be the leader of a group, team, organization or similar. To be a leader, that person must be perceived by the group members as having a legitimate position of power in the group. Leadership is a matter of action, not position. We often confuse leadership and authority. For instance, a person can be assigned as the leader of a group, but without exhibiting leadership behaviour. And wise versa, a person, who is not assigned as a leader, can still exhibit leadership behaviour.

Leadership Styles:

1. Autocratic Style

The phrase most illustrative of an autocratic leadership style is "Do as I say." Generally, an autocratic leader believes that he or she is the smartest person at the table and knows more than others. They make all the decisions with little input from team members.

This command-and-control approach is typical of leadership styles of the past, but it doesn't hold much water with today's talent.

That's not to say that the style may not be appropriate in certain situations. For example, you can dip into an autocratic leadership style when crucial decisions need to be made on the spot, and you have the most knowledge about the situation, or when you're dealing with inexperienced and new team members and there's no time to wait for team members to gain familiarity with their role.

2. Authoritative Style

The phrase most indicative of this style of leadership (also known as "visionary") is "Follow me." The authoritative leadership style is the mark of confident leaders who map the way and set expectations, while engaging and energizing followers along the way.

In a climate of uncertainty, these leaders lift the fog for people. They help them see where the company is going and what's going to happen when they get there.

Unlike autocratic leaders, authoritative leaders take the time to explain their thinking: They don't just issue orders. Most of all, they allow people choice and latitude on how to achieve common goals.

3. Pacesetting Style

"Do as I do!" is the phrase most indicative of leaders who utilize the pacesetting style. This style describes a very driven leader who sets the pace as in racing. Pacesetters set the bar high and push their team members to run hard and fast to the finish line.

While the pacesetter style of leadership is effective in getting things done and driving for results, it's a style that can hurt team members. For one thing, even the most driven employees may become stressed working under this style of leadership in the long run.

4. Democratic Style

Democratic leaders are more likely to ask "What do you think?" They share information with employees about anything that affects their work responsibilities. They also seek employees' opinions before approving a final decision.

There are numerous benefits to this participative leadership style. It can engender trust and promote team spirit and cooperation from employees. It allows for creativity and helps employees grow and develop. A democratic leadership style gets people to do what you want to be done but in a way that they *want* to do it.

5. Coaching Style

When you having a coaching leadership style, you tend to have a "Consider this" approach. A leader who coaches views people as a reservoir of talent to be developed. The leader who uses a coach approach seeks to unlock people's potential. Leaders who use a coaching style open their hearts and doors for people. They believe that everyone has power within themselves. A coaching leader gives people a little direction to help them tap into their ability to achieve all that they're capable of.

6. Affiliative Style

A phrase often used to describe this type of leadership is "People come first." Of all the leadership styles, the affiliative leadership approach is one where the leader gets up close and personal with people. A leader practicing this style pays attention to and supports the emotional needs of team members. The leader strives to open up a pipeline that connects him or her to the team.

Ultimately, this style is all about encouraging harmony and forming collaborative relationships within teams. It's particularly useful, for example, in smoothing conflicts among team members or reassuring people during times of stress.

7. Laissez-Faire Style

The laissez-faire leadership style is at the opposite end of the autocratic style. Of all the leadership styles, this one involves the least amount of oversight. You could say that the autocratic style leader stands as firm as a rock on issues, while the laissez-faire leader lets people swim with the current.

On the surface, a laissez-faire leader may appear to trust people to know what to do, but taken to the extreme, an uninvolved leader may end up appearing aloof. While it's beneficial to give people opportunities to spread their wings, with a total lack of direction, people may unwittingly drift in the wrong direction—away from the critical goals of the organization.

MOTIVATION :

In the words of Michael Jucious, ‘motivation is the act of stimulating someone or oneself to get a desired course of action, to push the right button to get a desired reaction’.

Following are the importance of motivation in an organization:
1. Greater efficiency:
Motivation enhances the efficiency of the employees and of organization. When employees are motivated, they can perform with commitment and dedication.

2. Reduction in absenteeism and labour turnover:
Motivated employees may not remain absent or leave the organization. They develop a sense of belonging towards the organization and thus improve their overall performance.

3. Team spirit:
Motivation improves team spirit of employees, and this improves the work environment and the overall performance of the employee and the organization.

4. Reduction in wastages and breakages:
Motivated employees take great care in handling machines and other resources. This will reduce wastages and breakages, thus resulting in higher benefits to the organization.

5. Cordial relations:
Motivation enables cordial and healthy relationship in the organization. Motivation helps reduce labour grievances and disputes. It ensures sound relations between the management and the labour. It improves the overall efficiency of the organization.

6. Promotion of innovation:
Motivated employees use their initiative to find out innovative ways in the performance of their operations. Such employees are more creative and help the organization to gain the competitive advantage.

7. Optimum use of resources:
Motivation leads to greater employee involvement and lesser wastages. This leads to optimum utilization of resources.

8. Corporate image:
Motivated employees are more loyal to the organization. They work with a sense of commitment and dedication. This improves the overall performance of the employee, which enables better results for the company. This results in better relations with all the stakeholders.

Characteristics/Features of Motivation:
1. Interaction between the individual and the situation:
Motivation is not a personal trait but an interaction between the individual and the situation.

2. Goal-directed behaviour:
Motivation leads to an action that is goal oriented. Motivation leads to accomplishment of organizational goals and satisfaction of personal needs.

3. Systems oriented:
Motivation is influenced by two forces:
1. Interaction between the individual and the situation:
Motivation is not a personal trait but an interaction between the individual and the situation.

2. Goal-directed behaviour:
Motivation leads to an action that is goal oriented. Motivation leads to accomplishment of organizational goals and satisfaction of personal needs.

3. Systems oriented:
Motivation is influenced by two forces:

a. Internal forces:
These forces are internal to the individual, i.e., their needs, wants and nature.

b. External forces:
These forces are external to the individual, which may be organizational related such as management philosophy, organizational structure, and superior-subordinate relationship, and also the forces found in the external environment such as culture, customs, religion and values.

4. Positive or negative:
Positive motivation or the carrot approach offers positive incentives such as appreciation, promotion, status and incentives. Negative motivation or stick approach emphasizes penalties, fines and punishments.

Factors affecting motivation :

1. Reward and recognition

Reward and recognition come hand in hand. Recognition for good work has a limited shelf life; praise begins to lose its impact if not accompanied by reward. Exceptional work deserves reward and while recognition is sufficient in certain cases, employees begin to lose motivation if they are not rewarded for extra effort.

There are many ways to reward employees. Rewards can vary in both cost and impact and it is best to offer a portfolio of rewards, examples include once in a lifetime trips and experiences, vouchers or something as simple as an extra day off. The aim of rewarding and recognising employees is to encourage and motivate them to exceed within their roles and promote positive behaviours.

2. Development

Development is very important for motivating employees; studies have shown that 20% of employees prefer career development opportunities and training to monetary reward. Development makes an employee self-dependent and allows them to contribute more effectively in the workplace, it also helps employees to enhance their input to your business.

When an organisation invests in their employees, it breeds loyalty, retention and motivation. A study in the Harvard Business Review found that employees are appreciate and value when managers take a genuine interest in their development; it demonstrates to the employee that the organisation believes in them and wants them to progress within the company. Development inspires employees to work harder so as not to let down the company that has invested in them.

3. Leadership

A study by Gallup found that, only 2 in 10 employees strongly agree that their performance is managed in a way that motivates them to do outstanding work – this clearly displays how much a good leader motivates employees. A good leader has the

knowledge of what truly inspires loyal and motivated humans to perform at a high level. It is important that a good leader has reasonable expectations, gives credit where credit is due and appreciates their staff.

4. Work life balance

Providing a good work life balance nurtures employees. Motivated employees are less likely to take sick days, leave the organisation and will be more prepared to work longer hours. Equally these same employees are more likely to 'burn out' and will feel less motivated if there is not a healthy work life balance. Whilst motivated employees will go above and beyond for the company, wanting to do their best, if exhaustion strikes they may start to lose the passion for their job. As an organisation, it is important to ensure that employees are working reasonable hours and are combining work with activities that promote health and wellbeing.

5. Work environment

Motivated employees thrive in a positive work environment. This refers to the physical and non-physical environment – the physical environment is the office space and surrounding areas. Employees work better in open spaces that stimulate the senses, look at Google, they are known for their extraordinary office spaces that focus on employee wellbeing – with green spaces, quiet areas, beach volleyball, to name but a few! Google spare no expense on the employee environment believing that the space you work in greatly affects employee motivation. Google's philosophy is that "life at Google is not all work", therefore they promote casual collusion between employees, demonstrating how collaboration promotes creativity, drives production and increases motivation.

Regarding the intangible environment, motivated employees value engagement and communication. Engagement is achieved through many different factors such as, giving regular feedback, development and daily challenges. Effective communication is created through a continuous open dialogue, dependent on trust. Honest and open communication throughout the business is the foundation of creating a workplace where all employees can thrive.

To conclude, motivated employees can aid in increasing productivity, engagement and even profit! It is important not to take motivated employees for granted and continue to nurture them and ensure that they feel motivated and valued to do their best work for the organisation.

Theories of Motivation :

Some of the most important theories of motivation are as follows: 1. Maslow's Need Hierarchy Theory 2. Herzberg's Motivation Hygiene Theory 3. McClelland's Need Theory 4. McGregor's Participation Theory 5. Urwick's Theory Z 6. Argyris's Theory 7. Vroom's Expectancy Theory 8. Porter and Lawler's Expectancy Theory.

1. Maslow's Need Hierarchy Theory:

It is probably safe to say that the most well-known theory of motivation is Maslow's need hierarchy theory Maslow's theory is based on the human needs. Drawing chiefly on his clinical experience, he classified all human needs into a hierarchical manner from the lower to the higher order.

In essence, he believed that once a given level of need is satisfied, it no longer serves to motivate man. Then, the next higher level of need has to be activated in order to motivate the man. Maslow identified five levels in his need hierarchy as shown in figure 17.2.

Fig. 17.2: Maslow's Need Hierarchy

These are now discussed one by one:

1. Physiological Needs:

These needs are basic to human life and, hence, include food, clothing, shelter, air, water and necessities of life. These needs relate to the survival and maintenance of human life. They exert tremendous influence on human behaviour. These needs are to be met first at least partly before higher level needs emerge. Once physiological needs are satisfied, they no longer motivate the man.

2. Safety Needs:

After satisfying the physiological needs, the next needs felt are called safety and security needs. These needs find expression in such desires as economic security and protection from physical dangers. Meeting these needs requires more money and, hence, the individual is prompted to work more. Like physiological needs, these become inactive once they are satisfied.

3. Social Needs:

Man is a social being. He is, therefore, interested in social interaction, companionship, belongingness, etc. It is this socialising and belongingness why individuals prefer to work in groups and especially older people go to work.

4. Esteem Needs:

These needs refer to self-esteem and self-respect. They include such needs which indicate self-confidence, achievement, competence, knowledge and independence. The fulfillment of esteem needs leads to self-confidence, strength and capability of being useful in the organisation. However, inability to fulfill these needs results in feeling like inferiority, weakness and helplessness.

5. Self-Actualisation Needs:

This level represents the culmination of all the lower, intermediate, and higher needs of human beings. In other words, the final step under the need hierarchy model is the need for self-actualization. This refers to fulfillment.

According to Maslow, the human needs follow a definite sequence of domination. The second need does not arise until the first is reasonably satisfied, and the third need does not emerge until the first two needs have been reasonably satisfied and it goes on. The other side of the need hierarchy is that human needs are unlimited. However, Maslow's need hierarchy-theory is not without its detractors.

2. Herzberg's Motivation Hygiene Theory:

The psychologist Frederick Herzberg extended the work of Maslow and propsed a new motivation theory popularly known as Herzberg's Motivation Hygiene (Two-Factor) Theory. Herzberg conducted a widely reported motivational study on 200 accountants and engineers employed by firms in and around Western Pennsylvania.

He asked these people to describe two important incidents at their jobs:

(1) When did you feel particularly good about your job, and

(2) When did you feel exceptionally bad about your job? He used the critical incident method of obtaining data.

The responses when analysed were found quite interesting and fairly consistent. The replies respondents gave when they felt good about their jobs were significantly different from the replies given when they felt bad. Reported good feelings were generally associated with job satisfaction, whereas bad feeling with job dissatisfaction. Herzberg labelled the job satisfiers motivators, and he called job dissatisfies hygiene or maintenance factors. Taken together, the motivators and hygiene factors have become known as Herzberg's two-factor theory of motivation

Herzberg's motivational and hygiene factors have been shown in the Table 17.1

Table 17.1: Herzberg's Motivational and Hygiene Factors

Hygiene: Job Dissatisfaction	Motivators: Job Satisfaction
	Achievement
	Recognition
	Work itself
	Responsibility
	Advancement
	Growth
Company Policy and Administration	
Supervision	
Interpersonal Relations	
Working Conditions	
Salary*	
Status	
Security	

According to Herzberg, the opposite of satisfaction is not dissatisfaction. The underlying reason, he says, is that removal of dissatisfying characteristics from a job does not necessarily make the job satisfying. He believes in the existence of a dual continuum. The opposite of 'satisfaction' is 'no satisfaction' and the opposite of 'dissatisfaction' is 'no dissatisatisfaction'.

According to Herzberg, today's motivators are tomorrow's hygiene because the latter stop influencing the behaviour of persons when they get them. Accordingly, one's hygiene may be the motivator of another.

3. McClelland's Need Theory:

Another well-known need-based theory of motivation, as opposed to hierarchy of needs of satisfaction-dissatisfaction, is the theory developed by McClelland and his associates'. McClelland developed his theory based on Henry Murray's developed long list of motives and manifest needs used in his early studies of personality. McClelland's need-theory is closely associated with learning theory, because he believed that needs are learned or acquired by the kinds of events people experienced in their environment and culture.

He found that people who acquire a particular need behave differently from those who do not have. His theory focuses on Murray's three needs; achievement, power and affiliation. In the literature, these three needs are abbreviated "n Ach", "n Pow", and "n Aff" respectively'.

Need for Achievement:

This is the drive to excel, to achieve in relation to a set of standard, and to strive to succeed. In other words, need for achievement is a behaviour directed toward competition with a standard of excellence. McClelland found that people with a high need for achievement perform better than those with a moderate or low need for achievement, and noted regional / national differences in achievement motivation.

Need for Power:

The need for power is concerned with making an impact on others, the desire to influence others, the urge to change people, and the desire to make a difference in life. People with a high need for power are people who like to be in control of people and events. This results in ultimate satisfaction to man.

Need for Affiliation:

The need for affiliation is defined as a desire to establish and maintain friendly and warm relations with other people'. The need for affiliation, in many ways, is similar to Maslow's social needs.

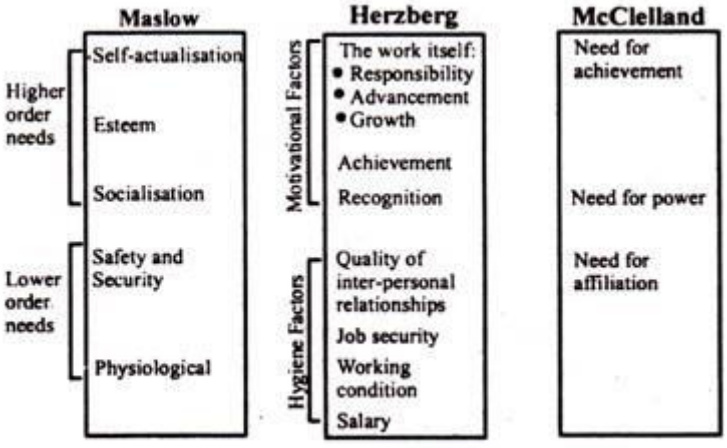


Fig. 17.2 : Three Need Theories of Motivation

4. McGregor's Participation Theory:

Douglas McGregor formulated two distinct views of human being based on participation of workers. The first basically negative, labeled Theory X, and the other basically positive, labled Theory Y.

Theory X is based on the following assumptions:

1. People are by nature indolent. That is, they like to work as little as possible.

2. People lack ambition, dislike responsibility, and prefer to be directed by others.

3. People are inherently self-centered and indifferent to organisational needs and goals.

4. People are generally gullible and not very sharp and bright.

On the contrary, Theory Y assumes that:

1. People are not by nature passive or resistant to organisational goals.

2. They want to assume responsibility.

3. They want their organisation to succeed.

4. People are capable of directing their own behaviour.

5. They have need for achievement.

5. Urwick's Theory Z:

Much after the propositions of theories X and Y by McGregor, the three theorists Urwick, Rangnekar, and Ouchi-propounded the third theory lebeled as Z theory.

The two propositions in Urwicks's theory are that:

(i) Each individual should know the organisational goals precisely and the amount of contribution through his efforts towards these goals.

(ii) Each individual should also know that the relation of organisational goals is going to satisfy his/her needs positively.

In Urwick's view, the above two make people ready to behave positively to accomplish both organisational and individual goals.

However, Ouchi's Theory Z has attracted the lot of attention of management practitioners as well as researchers. It must be noted that Z does not stand for anything, is merely the last alphabet in the English Language.

Theory Z is based on the following four postulates:

1. Strong Bond between Organisation and Employees

2. Employee Participation and Involvement

3. No Formal Organisation Structure

4. Human Resource Development

Ouchi's Theory Z represents the adoption of Japanese management practices (group decision making, social cohesion, job security, holistic concern for employees, etc.)by the American companies. In India, Maruti-Suzuki, Hero-Honda, etc., apply the postulates of theory Z.

6. Argyris's Theory:

Argyris has developed his motivation theory based on proposition how management practices affect the individual behaviour and growth In his view, the seven changes taking place in an individual personality make him/her a mature one. In other words, personality of individual develops

Immaturity	*Maturity*
Passivity	Activity
Dependence	Independence
Capable of behaving in a few ways	Capable of behaving in many ways
Shallow interest	Deep interest
Short-term perspective	Long-term perspective
Subordinate position	Superordinate position
Lack of self-awareness	Self-awareness and control

Argyris views that immaturity exists in individuals mainly because of organisational setting and management practices such as task specialisation, chain of command, unity of direction, and span of management. In order to make individuals grow mature, he proposes gradual shift from the existing pyramidal organisation structure to humanistic system; from existing management system to the more flexible and participative management.

He states that such situation will satisfy not only their physiological and safety needs, but also will motivate them to make ready to make more use of their physiological and safety needs. But also will motivate them to make ready to make more use of their potential in accomplishing organisational goals.

7. Vroom's Expectancy Theory:

One of the most widely accepted explanations of motivation is offered by Victor Vroom in his Expectancy Theory" It is a cognitive process theory of motivation. The theory is founded on the basic notions that people will be motivated to exert a high level of effort when they believe there are relationships between the effort they put forth, the performance they achieve, and the outcomes/ rewards they receive.

The relationships between notions of effort, performance, and reward are depicted in Figure 17.3

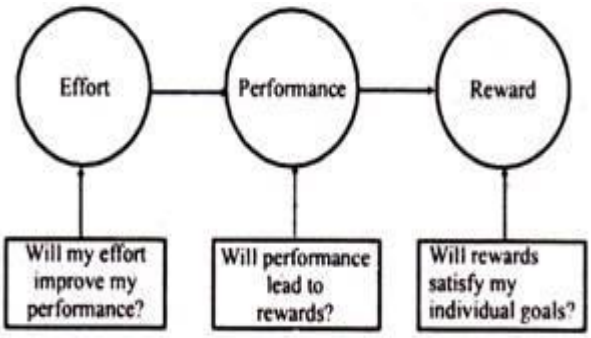


Fig 17.3: Vroom's Expectancy Model of Motivation

Thus, the key constructs in the expectancy theory of motivation are:

1. Valence:

Valence, according to Vroom, means the value or strength one places on a particular outcome or reward.

2. Expectancy:

It relates efforts to performance.

3. Instrumentality:

By instrumentality, Vroom means, the belief that performance is related to rewards.

Thus, Vroom's motivation can also be expressed in the form of an equation as follows: Motivation = Valence x Expectancy x Instrumentality

Being the model multiplicative in nature, all the three variables must have high positive values to imply motivated performance choice. If any one of the variables approaches to zero level, the possibility of the so motivated performance also touches zero level.

Methods of improving motivation :

1. Recognize great work
2. Set small, measurable goals
3. Celebrate results
4. Stay positive

5. Stay fueled

6. Take regular breaks

7. Stay healthy

8. See and share the big picture

9. Be transparent

10. Provide clarity

12. Provide a sense of security

13. Encourage teamwork

14. Offer small, consistent rewards

TYPES OF INTELLECTUAL PROPERTY

The different types of Intellectual Property Rights are: • Patents • Copyrights • Trademarks • Industrial designs • Geographical indications of goods • Trade Secrets

According to section 2, sub-section (1) of the Trade Marks Act 1999, "Trade Mark" means a mark capable of being represented graphically and which is capable of distinguishing the goods or services of one person from those of others and may include shape of goods, their packaging and combination of colours.

Copyright law is designed to protect interests and balance the rights of the following stake holders • Authors/ Creators • Publishers/ Entrepreneurs • Users /Audiences

Patent is a grant for an invention by the Government to the inventor in exchange for full disclosure of the invention. A patent is an exclusive right granted by law to applicants / assignees to make use of and exploit their inventions for a limited period of time (generally 20 years from filing). The patent holder has the legal right to exclude others from commercially exploiting his invention for the duration of this period. In return for exclusive rights, the applicant is obliged to disclose the invention to the public in a manner that enables others, skilled in the art, to replicate the invention.

Factories Act:

Important Definitions:

Term	Definition	Section
Adult	An 'Adult' means a person who has completed his eighteenth year of age.	Sec.2(a)
Adolescent	An "Adolescent" means a person, who completes his fifteenth year of age but not his eighteenth year. Hence, he is someone who crosses the age of a child but is not an adult yet.	Sec. 2(b)
Child	A 'child' means a person who has not completed his 15th year of age.	Sec. 2 (c)
Competent Person	A "competent person", in relation to any provision of this Act, means a person or an institution recognized as such by the Chief Inspector for the purposes of carrying out tests, examinations and inspections required to be done in a factory	Sec. 2(ca)
Calendar year	'Calendar Year' means the period of 12 months beginning with the first day of January in any year. Hence, it is different from the Financial Year (starts from 1st April).	Sec.2(bb)
Week	It means a period of seven days beginning at midnight on Saturday night or such other night (which CIF certifies).	Sec. 2(f)
Day	It means a period of 24 hours beginning at midnight.	Sec. 2(e)
Transmission machinery	It means any shaft, wheel, drum, pulley, a system of pulleys, coupling, clutch, driving belt or other appliance or device by which the motion of a prime mover reaches any machinery or appliance.	Sec. 2 (i)
Worker	"Worker" means a person employed, directly or by or through any agency (including a contractor) with or without the knowledge of the principal	Sec. 2(l)

	employer, whether for remuneration or not, in any the manufacturing process, or in cleaning any part of the machinery or premises used for a manufacturing process, or in any other kind of work incidental to, or connected with, the manufacturing process, or the subject of the manufacturing process but does not include any member of the armed forces of the union.	
Shift and relay	Where work of the same kind is carried out by 2 or more sets of workers working during different periods of the day, each of such sets is called a 'relay' and each of such periods is called a 'shift'.	Sec. 2(r)
Manufacturing Process	"Manufacturing process" means any process for— (i) Making, altering, repairing, ornamenting, finishing, packing, oiling, washing, cleaning, breaking up, demolishing, or otherwise treating or adapting any article or substance with a view to its use, sale, transport, delivery or disposal, or (ii) Pumping oil, water, sewage or any other substance; or; iii) Generating, transforming or transmitting power; or (iv) Composing types for printing, printing by letterpress, lithography, photogravure, other similar process or bookbinding; (v) Constructing, reconstructing, repairing, refitting, finishing or breaking up ships or vessels; (Inserted by the Factories (Amendment) Act, 1976, w.e.f. 26-10-1976.) (vi) Preserving or storing any article in cold storage	Sec. 2(k)

Health Provisions:

Health Provisions: - Provisions relating to the health and cleanliness under the Factories Act, 1948 are contained in Chapter III of the Act.

1. Cleanliness: - Section 11 of the Act deals with Cleanliness it prescribes certain standard of cleanliness which every factory has to maintain. It says that every factory shall be kept clean and free form effluvia arising from any drain, privy or other nuisance. The duties in particular are as follows:

a) Accumulation of dirt and refuse shall be removed daily by sweeping or by any other effective method from the floors and benches of workrooms and from staircases and passages, and disposed of in a suitable manner;

b) The floor of every workroom shall be cleaned at least once in every week by washing, using disinfectant, where necessary, or by some other effective method;

c) Where a floor is liable to become wet in the course of any manufacturing process to such extent as in capable of being drained, effective means of drainage shall be provided and maintained;

d) All inside walls and partitions, all ceilings or tops of rooms and all walls, sides and tops of passages and staircases where they are painted otherwise than with washable water paint or varnished, be repainted or revarnished at least

once in every period of five years. ia. Where they are washable water paint, be repainted with at least one coat of such paint at least once in every period of three years and washed at least once in every period of six months. ii. Where they are painted or varnished where they have smooth impervious surfaces, be cleaned at least once in every period of fourteen months by such method as may be prescribed; iii. In any other case, be kept white washed or colour washed, and the white washing or colour washing shall be carried out at least once in every period of fourteen months. dd) all doors and window frames and other wooden or metallic frame work and shutters shall be kept painted or varnished and the painting or varnishing shall be carried out at least once in every period of five years.

e) The date on which the processes required by clause (d) are carried out shall be entered in the prescribed register. Section 11(2) lays down, if in view of the nature of the operations carried out in a factory or class or description off factories or any part of a factory or any class or description of factories, it is not possible for the occupier to comply with all or any of the provisions of sub section (1), the state government may by order exempt such factory or class or description of factories or part thereof from any of the provisions of that sub-section and specify alternate methods for keeping the factory in a clean state.

2. Disposal of wastes and effluents: - Section 12 of the Act deals with Disposal of wastes and effluents. It states that effective arrangements must be made in every factory for the treatment of wastes and effluents due to the manufacturing process carried on it, so as to render them innocuous. Where the drainage system of a factory is proposed to be connected to the public sewage system, prior approval of the arrangements must be obtained from the local authority. In case of other factories prior approval of the arrangements made for the disposal of trade-wastes and effluents must be obtained from the Health Officer.

3. Ventilation and temperature: - Section 13 of the Act deals with Ventilation and temperature. It states that effective and suitable provisions must be made in every workroom for securing and maintaining:

a) Adequate ventilation by circulation of fresh air, and

b) Such temperature as will secure to workers reasonable comfort and prevent injury to their health. The walls and roofs should be of such type as to keep the temperature low. Where the nature of work carried on in the factory is likely to produce excessively high temperatures, practicable measures should be taken to protect the workers by separating such process from the work-room by insulting hot parts or by other means. The state Government may prescribe a) Standards of adequate ventilation and reasonable temperature and direct a thermometer to be maintained as specified. b) Where excessive high temperatures can be reduced by white-washing, spraying or insulating and screening outside walls or roofs or windows, or by raising the level of the roof or by insulating the roof, such or other methods as shall be adopted in the factory.

4. Dust and fume: - Section 14 of the Act deals with Dust and fume. According to Section 14, where dust or fume or impurity of such a nature is given off as a result of the manufacturing process which is likely to be injurious or offensive, effective measures must be taken to prevent its inhalation and accumulation in a workroom and if an exhaust appliance is necessary for this purpose, it shall be applied very near to the point of origin which must be enclosed. An internal combustion engine which is stationary shall not be operated unless the exhaust is conducted into the open air. No internal combustion engine shall be operated in any rooms unless effective measures have been taken to prevent accumulation of fumes which are injurious.

5. Artificial humidification: - Section 15 of the Act deals with artificial humidification. It says that in respect of all factors in which the humidity of the air is artificially increased, the State Government may make rulesa) Prescribing standards of humidification; b) Regulating the methods used for artificially increasing the humidity of the air.; c)

Directing prescribed test for determining the humidity of the air to be correctly carried out and recorded; d) Prescribing methods to be adopted for securing adequate ventilation an d cooling of the sir in the workrooms. Section 15(2) states that in any factory in which the humidity of the air is artificially increased, the water used for the purpose shall be taken from a public supply, or other source of drinking water, or shall be effectively purified before it is so used. Section 15(3) further states that if it appears to an Inspector that the water used in a factory for increasing humidity which is required to be effectively purified under Sub-Section (2) is not effectively purified he may serve on the manager of the factory an order in writing, specifying the measures which in his opinion should be adopted, and requiring that they be carried out before the specified date.

6. Overcrowding: - Section 16 of the Act deals with overcrowding in the factories. According to it-

- No room in any factory shall be overcrowded to an extent injurious to the health of the workers employed there.
- There shall be an every workroom of a factory in existence on the date of the commencement of the Act at least 9.9 cubic meters and of a factory built after the commencement of the Act at least 14.2 cubic meters of space for every worker employed in it.
- If the Chief Inspector by order in writing so requires, there shall be posted in each workroom of a factory a notice specifying the maximum number of workers who may, in compliance with the provisions of this section, be employed in the room.
- The Chief Inspector by order in writing exempt, subject to such conditions, if any, as he may think fit to impose, any workroom from the provisions of this section, if he is satisfied that compliance with it in respect of the room is unnecessary in the interest of the health of the workers employed there.

7. Lighting: - Regarding lightning in the factories, section 17 of the Act provides that in every part of a factory where workers are working or passing, there shall be provided and maintained sufficient and suitable lighting, natural or artificial, or both. Section 17(2) states that in every factory all glazed windows and skylights used for the lighting of the workrooms shall be kept clean on both the inner and outer surfaces and this is subject to the requirements of Section 13 as to ventilation and temperature. Section 17(3) states that in every factory effective provision shall, so far as is practicable, be made for the prevention of – a) Glare, either directly from a source of light or by reflection from a smooth or polished surface; b) The formation of shadows to such an extent as to cause eye-strain or the risk of accident to any worker. The State Government shall prescribe standards of sufficient and suitable lighting for factories of any class or description of factories or for any manufacturing process.

8. Drinking water: - Section 18 provides that a sufficient supply of wholesome drinking water must be provided and maintained at suitable and convenient points which shall be marked ‘drinking water’ in the language understood by a majority of workers. No such point shall be within 7.5 meters of any working place, urinal or latrine unless a shorter distance is approved in writing by the Chief Inspector. In the factory where more than 250 workers are ordinarily employed, effective arrangements must be made for cooling drinking water during hot weather, and its distribution. The State Government may make rules for securing compliance with above provisions and for examination of the supply and distribution of drinking water in factories.

9. Latrines and Urinals: - According to section 19, in every factory sufficient and separate latrines and urinals as prescribed for male and female workers must be provided. The State Government is empowered to prescribe the number of latrine and urinals to be provided in any factory, in proportion to the number of male and female workers employed. Further these must be adequately lighted and ventilated and no latrine or urinal shall, unless specially exempted by the Chief Inspector in writing, communicate with any workroom except, through an intervening open space or ventilated passage. Such accommodation must be kept in a clean and sanitary condition,

and sweepers must be employed for keeping latrines, urinals and washing places clean. In factories where more than250 workers are ordinarily employedi) All latrines and urinals accommodation shall be prescribed sanitary types, ii) The floors and walls up to height of 90 cms of the latrines and urinals and the sanitary blocks shall be in glazed tiles or otherwise provided with a smooth polished impervious surface. iii) The floors, portions of the walls and blocks and sanitary pans of latrines and urinals shall be thoroughly washed and clean at least once in every 7 days with suitable detergents or disinfectants or both. The State Government may provide for further matters of sanitation including the obligation of workers in this regard.

10. Spittoons: - Spittoons as prescribed by the State Government shall be provided at such convenient places and shall be kept in a clean and a hygienic condition. Section 20 provides that no person shall spit within the premises of the factory except in Spittoons and a notice containing this [provision and the penalty for its violation shall be prominently displayed at suitable places. Contraventions of this provision are punishable with a fine.

Provisions related to Welfare (Under Factories Act, 1948)

Section 42: Washing facilities

This section states that every factory should:

(a) Firstly, provide and maintain adequate and suitable facilities for washing for all the workers in the factory
(b) Secondly, provide separate and adequately screened facilities separately for men and women.
(c) Thirdly, make accessible all the facilities to all the workers

Section 43: Facilities for storing and drying clothes

This section contests some powers with the State Government. It states that the State Government has the powers to direct the factories regarding the place of storing the clothes of the workers.

Moreover, they can also direct them regarding the manner of drying the clothes of the workers. It applies to the situation when workers are not wearing their working clothes.

Section 44: Facilities for sitting

There are various kinds of jobs in a factory. Some of them require the workers to stand for a longer period of time. There is no doubt that human power to stand has limits. Looking at such case, this section states:

(a) Firstly, the factory should provide suitable arrangements for sitting for the workers. This is important because whenever the worker gets some free time, he/she may be able to take some rest by sitting. This will also enhance their efficiency.

(b) Secondly, if the Chief Inspector finds that any worker can do his work more efficiently while sitting, then he can direct the factory officials to arrange sitting arrangements for him.

Section 45: First-aid-appliance

Injuries are somehow an inescapable part of life for the workers especially working in the factories. Looking at the safety and welfare of the workers this section provides that:

(a) The factory should provide and maintain proper first-aid boxes at every workroom. Under this Act, the number of boxes should not be less than one for every 100 or 50 workers. Moreover, the first-aid boxes should have all the relevant contents according to the Act.

(b) There should be nothing except the prescribed contents in a first-aid box.

(c) Each box should be under control of a first-aid in-charge who will handle all its requirements and its utilization. The in-charge should be an expert in First-aid field.

(d) In case the number of workers exceeds 500, then the factory should arrange an 'Ambulance Room' with the availability of all necessary equipment.

Section 46: Canteens

This section states:

(a) Every factory where the number of workers exceeds 250, then the State Government may direct the factory owners to provide and maintain a canteen for the workers.

(b) Moreover, the government may lay down certain conditions in the construction of canteen, like:

- the standard in respect of construction, accommodation, furniture and other equipment of the canteen
- the foodstuffs to be served therein
- the date by which such canteen shall be provided
- the constitution of a managing committee for the canteen
- the delegation to Chief Inspector subject to such conditions as may be prescribed

Section 47: Shelters, rest-rooms, and lunch-rooms

This section states:

(a) If the number of workers in a factory crosses 150, then the factory owners should construct and maintain shelters, rest-rooms and lunch rooms for the workers. It allows the workers to eat the food which they bring along with them.

(b) The shelters, rest-rooms and lunch rooms should be properly ventilated and lighted.
(c) The State Government may prescribe the standards, in respect of construction accommodation, furniture, and other equipment.

Section 48: Creches

Due to workforce diversity nowadays, women's participation is increasing in all the sectors especially the industrial sector.

One of the factors that stop women to work in factories or any other sector is lack of care for their children during their working hours. In order to solve this problem and increase the engagement of women in factories, section 48 states:

(a) Where numbers of women workers exceed 30, then the factory should arrange a special room for the worker's kids who are below the age of 6 years.

(b) The room should be properly lighted and ventilated

Safety Provisions :

Safety measures result in improving the conditions under which workers are employed and work. It improves not only their physical efficiency, but also provides protection to their life and limb. Inadequate provision of safety measures in factories may lead to increase in the number of accidents. Human failure due to carelessness, ignorance, inadequate skill, and improper supervision have also contributed to accidents, and the consequent need for safety measures.

Fencing of machinery (Section-21)

Section 21 provides for the fencing of the machinery in the factory. It provides that in every factory the things mentioned below shall be securely fenced by safeguard of substantial construction which shall be constantly maintained and kept in position while the parts of machinery they are fencing are in motion or in use —

(i) every moving part of a prime mover and every flywheel connected to a prime mover, whether the prime mover or flywheel is in the engine house or not:

(ii) headrace and tailrace of every water-wheel and water-turbine

(iii) any part of a stock bar which projects beyond the head stock of a lathe; and

(iv) unless they are in such position or of such construction as to be safe to every person employed in the factory as they would be if they were securely fenced, namely —

(a) every part of an electric generator, a motor or rotary. converter;

(b) every part of transmission machinery; and

(c) every dangerous part of any other machinery.

This section further provides that for the purpose of determining whether any part of machinery is in such position or is of construction as to be safe as aforesaid account shall not be taken of any occasion when--

(i)it is necessary to make an examination of any part of the machinery aforesaid while it is in motion or. as a result of such examination, to carry out lubrication or other adjusting operation while the machinery is in motion, being an examination or operation which it is necessary to be carried out while that part of the machinery is in motion, or

(ii)in the case of any part of a transmission machinery used in such process as may be promised (being a process of a continuous nature) the carrying on of which shall be, or is likely to be, substantially interfered with by the stoppage of the part of the machinery, it is necessary to make an examination of such part of the machinery while it is in motion, or as result of such examination, to carry out any mounting or shipping of belt or lubrication or other adjusting operation while the machinery is in motion and such examination or operation is made or carried out in accordance with the provisions of sub-section (1) of section22.

Under sub-section (2) of section 21, the State Government is empowered to prescribe by way of rules such precautions as it may consider necessary in respect of any particular machinery or part thereof, or exempt, subject to such condition as may be prescribed, for securing the safety of the workers, any particular machinery or part thereof from the provisions of this section.

Employment of young persons on dangerous machines (Section-23)

Section 23 of the Act prohibits for the employment of young person on dangerous machines. Section 23(1) provides that no young person shall be required or allowed to work at any machine to which this section applies, unless he has been fully instructed as to the dangers arising in connection with the machine and the precautions to be observed and—

(a)has received sufficient training in work at the machine, or

(b)is under adequate supervision by a person who has a thorough knowledge and experience of the machine.

Section 23(2) further provides that sub-section (1) shall apply to such machines as may be prescribed by the State Government, being machines which in its opinion are of such a dangerous character that young persons ought not to work at them unless the foregoing requirements are complied with.

Prohibition of employment of women or children near cotton openers(Section-27)

This section prohibits the employment of woman and children near cotton openers. It provides that no woman or child shall be employed in any part of a factory-for pressing cotton in which a cotton-opener is at work.

Provided that if the feed-end of a cotton-opener is in a room separated from the delivery end by a partition extending to the roof or to such height as the Inspector may in any particular case specify in writing, women and children may be employed on the side of the partition where the feed-end is situated.

Excessive weights (Section-34)

Section 34(1) provides that no person shall be employed in any factory to lift, carry or move any load so heavy as to be likely to cause him injury. Section 34(2) further provides that the State Government may make rules prescribing the maximum weights which may be lifted, carried or moved by adult men, adult women, adolescents and children employed in factories or in any class or description of factories or in carrying on any specified process.

Therefore, it is clear that the maximum load permissible to be lifted or moved about shall be determined by the State Government by making rules which would prescribe the maximum weight which may be lifted or carried by adult men, women, adolescents and children employed in factories or any class or description of factories.

Protection of eyes (Section-35)

The spirit of section 35 is to provide effective and suitable measures for the protection of eyes of the workers who are engaged in a manufacturing process where particles or fragments are thrown off in the course of process or where there is excessive light likely to cause risk to eyes of the workers in any factory. Section 35 provides that in respect of any such manufacturing process carried on in any factory as may be prescribed, the State Government may by rules require that effective screens or suitable goggles shall be provided for the protection of persons employed on, or in the immediate vicinity of the process, provided such process involves :-

(a) risk of injury to the eyes from particles or fragments thrown off in the course of the process, or

(b) risk to the eyes by reason of exposure to excessive light.

Section 49 of the (English) Factories Act, 1937 imposed similar obligation on the employers. The word 'suitable' as used in section 49 of the Act does not mean ‘perfect’ but means well-adapted.[4] Where the employers provide the goggles and are not in breach of their statutory duty, they are not liable for damages to a worker who suffers injury on his eye.

Precautions against dangerous fumes, gases etc. (Section-36)

Section 36 provides protection and precaution against dangerous fumes. Section 36(1) provides that no person shall be required or allowed to enter any chamber, tank, vat, pit, pipe, flue or other confined space in any factory in which any gas, fume, vapor or dust is likely to be present to such an extent as to involve risk to persons being overcome thereby, unless it is provided with a manhole of adequate size or other effective means of egress.

It has been laid down under sub-section (2) of section 36 that no person shall be required or allowed to enter any confined space as is referred to in sub-section (1), until all practicable measures have been taken to remove any gas, fume, vapor or dust, which may be present so as to bring its level within the permissible limits and to prevent any ingress of such gas, fume, vapor or dust and unless---

(a) a certificate in writing has been given by a competent person, based on a test carried out by himself that the space is reasonably free from dangerous gas, fume, vapor or dust; or

(b) such person is wearing suitable breathing apparatus and a belt securely attached to a rope the free end of which is held by a person outside the confined space.

Precaution in case of fire (Section-38)

It has been provided by section 38 that precautions must be taken in every factory for escape in case of fire. Section 38(1) provides that in every factory, all practicable measures shall be taken to prevent outbreak of fire and its spread, both internally and externally, and to provide and maintain —

(a)safe means of escape for all persons in the event of a fire. and

(b)the necessary equipment and facilities for extinguishing fire.

Section 38(2) lays down that effective measures shall be taken to ensure that in every factory all the workers are familiar with the means of escape in case of fire and have been adequately trained in the routine to be followed in such cases. Under sub-section (3) of section 38. the state Government has the power to make rules, in respect of any factory or class or description of factories, requiring the measures to be adopted to give effect to the provisions of sub-sections (1) and (2). Section 18(4) provides that notwithstanding anything contained in clause (a) of sub-section (1) or subsection (2), if the Chief Inspector, having regard to the nature of the work carried on in any factory, the construction of such factory, special risk to life or safety, or any other circumstances., is of the opinion that the measures provided in the factory whether as prescribed or not, for the purposes of clause (a) of sub-section (1) or sub-section (2), are inadequate, he may, by, order in writing, require that such additional measures as he may consider reasonable and necessary, be provided in the factory before such date as is specified in the order.

Therefore, where it appears to the Chief inspector, that any factory is not so provided. or additional means of escape or other measures are ensured, he may serve on the manager of factory an order in writing specifying the measures which, in his opinion should be adopted to bring the factory into conformity with the provisions of the section and any rules made there under.

Conclusion

Due to health & safety provisions of Factories Act, 1948, the worker's life is protected. If they were exposed to serious accidents due to not properly screened machines then they have right to compensation. Without a valid reason the labours are not discharged, suspended or dismissed. Due to health provisions of Factories Act, 1948, labours have proper sanitation and healthy working environment.

Factory Inspector :

The State Government is empowered to appoint Inspectors/ Additional Chief Inspector of Factories and as many officers, it thinks fit to ensure that provisions of the Act are complied with (Commercial Law Publications, 1998). These Inspectors are empowered to:

1) enter any factory or any place which he believes is being used as a factory,
2) make examination of the premises, plant, machinery, article or substance,
3) inquire into any accident or dangerous occurrence,
4) inspect registers or any other document relating to the factory,
5) seize, any register, or other document, in respect of any offence under this Act,
6) direct the occupier to leave undisturbed any part of the factory for the purpose of an enquiry into violation of the Factories Act.,
7) take measurements and photographs necessary for inquiry into violations of the Factories Act.

Powers & duties of factory inspector:

1. Entry in to the Factory:-

According the factories act inspector can visit the factory premises with his assistants without getting any permission.

2. Power of Examination:-

Inspector has power to get necessary evidence at the sport or otherwise such evidence of a person for the purpose of factories act.

3. Powers of Evidence:-

According the act inspector has power to examine the prescribed registers plants and premises of the factory.

4. Other Powers:-

Keeping in view the purposes of the factories act inspector can use other powers also.

5. Within the limits:-

Inspector is allowed to use his powers within the district or allocated specified area. He cannot use his powers in other areas.

6. Lawful Direction:-

It is the duty of the inspector that he should issue the directions to the manager of factory, not to do unlawful actions. He can direct the manager not to employ the children as a worker.

7. Prohibition of any person:-

Inspector can prohibit the employment of any person and manager of factory will obey his orders.

8. Subordination of Authority:-
Inspector can act as subordinate to specified authority. His all actions relating to factory will be according the law of factories act.

Payment of Wages Act:

Payment of Wages Act, 1936

The Payment of Wages Act, 1936 regulates the payment of wages of certain classes of employed persons. It extends to the **whole of India** and it came into force on **28th March 1937**. The essential goal for the advent of the Payment of Wages Act, 1936, is to keep away from needless put off withinside the charge of wages and to save you unauthorized deductions from the wages. There are three kinds of wages **minimum wage, fair wage & living wage** covered under this Act.

Highlights of the Payment of Wages Act

1) This act applies to an employed person whose wage does not exceed twenty-four thousand rupees per month.

2) A wage-period shall not exceed one month.

3) The total amount of fine imposed in a wage-period on any employed person shall not exceed an amount equal to three percent of the wages.

4) A fine shall not be imposed on any employed person who is under the age of fifteen years.

5) If the authority is satisfied that the application is either malicious or vexatious, it may direct the person who presented the application to pay a penalty not exceeding three hundred seventy-five rupees to the employer.

6) If a person who is required to nominate or designate a person under section 3 (responsibility for payment of wages) fails to do so, such person shall be punishable with a maximum fine of three thousand rupees.

7) If a person wilfully obstructs an inspector or refuses to produce any register or document demanded by the inspector or refuses to afford an inspector any reasonable facility for making the inspection shall be punishable with a fine which shall not be less than one thousand five hundred rupees but may extend to seven thousand five hundred rupees.

8) If any person is convicted again of an offence involving contravention of the same provision, then he shall be punishable with imprisonment for a term or with fine which shall not be less than three thousand seven hundred fifty rupees but may extend to twenty-two thousand five hundred rupees.

9) If any person fails or wilfully neglects to pay the wages by the date fixed by the authority, he shall be punishable with an additional fine which may extend to seven hundred fifty rupees for each day for which such neglect continues.

10) Industrial or other establishment includes the following:

- Tramway or motor transport service engaged in carrying passengers or goods or both for hire or reward.

- Air transport service other than such service which is exclusively employed in the military, naval or air forces or the civil aviation department.
- Dock, wharf, or jetty.
- Inland vessel, mechanically propelled.
- Mine, quarry, or oilfield.
- Plantation
- Any workshop or establishment is included if it involves the production, adaption, or manufacturing of articles for use, transport, or sale.
- Any establishment in which work relating to the construction, development, or maintenance of buildings, roads, bridges or canals, navigation, irrigation, or distribution of electricity or any other form of power is being carried on.
- Any other establishment notified by the appropriate government.

11) Wages shall be paid before the expiry of the seventh day and tenth day if the person is employed in an establishment in which less than one thousand persons and more than one thousand are employed respectively.

- If a person is employed on a dock, wharf or jetty or in a mine, the balance of wages shall be paid before the expiry of the seventh day from the day of such completion.
- If the employment of any person is terminated by the employer, the wages shall be paid before the expiry of the second working day.
- If the employment of any person is terminated due to the closure of the establishment, the wages shall be paid before the expiry of the second day.

12) The total amount of deductions from the wages of an employed person shall not exceed:

- seventy-five percent, if the deductions include payments to co-operative societies.
- fifty percent, in any other case.

13) The appropriate government may appoint the following as the authority to hear and decide the claims related to the deductions or delay in wages:

- Any commissioner for Workmen's Compensation or
- Regional Labour Commissioner (central) or
- Assistant Labour Commissioner (central) with at least two years' experience or
- Assistant Labour Commissioner (state) with at least two years' experience or
- A presiding officer of any Labour Court or Industrial Tribunal constituted under the Industrial Disputes Act, 1947 or under any corresponding law or

- Judge of a Civil Court or a Judicial Magistrate.

14) The authority may direct the employer:

- To refund the deducted amount together with the compensation not exceeding ten times the amount deducted.
- To pay the delayed wages together with the compensation not exceeding three thousand rupees but not less than one thousand five hundred rupees.
- The authority may direct the employer to pay the maximum compensation of two thousand rupees, even if the amount deducted or delayed wages are paid before the disposal of the application.

15) If a person who is required to maintain records or registers or to furnish any information or return, does the following, then he shall be punishable with fine which shall not be less than one thousand five hundred rupees but may extend to seven thousand five hundred rupees:

- Fails to maintain such a register or record.
- Wilfully refuses to furnish such information or furnishes false information or return or refuses to answer some information that is required to be furnished under this act.

Smart Technology • Concept of IOT, How IOT works • Components of IOT, Characteristics of IOT, Categories of IOT • Applications of IOT- Smart Cities, Smart Transportation, Smart Home, Smart Healthcare, Smart Industry, Smart Agriculture, Smart Energy Management etc.

Meaning : The word “SMART” refers to “self-monitoring, analysis, and reporting technology” .It is a technology that uses artificial intelligence, machine learning, and big data analysis to provide cognitive awareness to objects that were in the past considered inanimate.

Examples of Smart Technology

Smart technology can be divided into three different kinds:

1) Internet of Things (IoT) devices

A network of devices that make use of sensors, chips, software, online connectivity, analytics, and applications to bring static physical objects to life. These devices create substantial value, and they are futuristic, scalable, and automated.

Some prominent examples include smart cities, smart homes, and smart factories.

2) Smart Connected Devices

Controlled via a remote and connected via the internet or Bluetooth, smart connected devices can offer a customised experience but have to be handled given that they don’t adapt to the extent IoT devices do.

Smart security cameras, smart bulbs, and smartphones are some examples of smart connected devices.

3) Smart Devices

With limited automation, no need for internet connectivity, and programmable nature, smart devices, for instance, smart coffeemakers, provide certain personalised services at a particular time.

Benefits of Smart Technology

Some of the key benefits of using smart technology are as follows:

1) Convenience

Never has it been possible to do so many tasks simultaneously with minimal effort, such as just using your voice, as it is today. This has become possible due to smart technology. Whether it be adjusting the lighting of a room, securing your home, or ordering your favourite food online, smart technology is available at your beck and call. It takes convenience to a whole new level.

What's even better is that the latest smart technologies are:

- Well-equipped to understand your preferences by analysing them in order to provide you an automated, personalised service.
- Able enough to take into account external factors such as traffic and the condition of, for instance, your vehicle or the environment to inform you in advance as well as guide you safely to your destination.

2) Ensures Sustainability

With the pressing need to 'go green' and save planet Earth as well as avoid high energy costs, industrial and domestic sectors are trying hard to deploy smart technology.

Given that, more often than not we do not optimise our use of energy and instead waste it by forgetting to turn off domestic appliances, smart technology can play a pivotal role in helping conserve energy.

It can regulate and automate the use of energy, for example by switching off or adjusting lights, heating, and cooling appliances when they are not in use, or when the required conditions have been achieved. This saves money and at the same time helps conserve energy, a true win-win.

3) Security

Smart technology offers more reliable security than traditional, manually operated security systems. Smart security gadgets such as door sensors, alarm systems, security cameras, and video doorbells help warn building owners about the various threats to their property. Apart from alerting the owners, law enforcement agencies are also informed, and protective measures such as, blocking certain pathways or locking rooms, are taken.

In addition to this, smart digital smoke, gas, water and sewerage leakage can not only be detected, but also the technology enables real-time preventive action, potentially saving one from discomfort and even bodily harm.

4) Efficiency

Smart technology makes use of data to understand how improvements can be made. It tracks and analyses what's going on to deliver better results in the future. This entails that processes and systems become more efficient, and you as a person become more productive.

Imagine waking up exactly on time after having slept comfortably to find that everything is ready for your needs to start your day well, eliminate distractions and leave for work on time.

5) Saves Money and Time

Energy bills can be reduced by using smart technological devices such as a smart thermostat, smart lighting, remote power management, water heaters, washing machines, and fridges as they can optimise the use of energy and in turn, use less of it to do more. Smart technology automates repetitive chores and eliminates lost or wasted time.

IOT

The Internet of Things (IoT) refers to a system of interrelated, internet-connected objects that are able to collect and transfer data over a wireless network without human intervention.

The personal or business possibilities are endless. A 'thing' can refer to a connected medical device, a biochip transponder (think livestock), a solar panel, a connected automobile with sensors that alert the driver to a myriad of possible issues (fuel, tire pressure, needed maintenance, and more) or any object, outfitted with sensors, that has the ability to gather and transfer data over a network.

Today, businesses are motivated by IoT and the prospects of increasing revenue, reducing operating costs, and improving efficiencies. Businesses also are driven by a need for regulatory compliance. Regardless of the reasons, IoT device deployments provide the data and insights necessary to streamline workflows, visualize usage patterns, automate processes, meet compliance requirements, and compete more effectively in a changing business environment.

Pretty much any physical object can be transformed into an IoT device if it can be connected to the internet to be controlled or communicate information.

A lightbulb that can be switched on using a smartphone app is an IoT device, as is a motion sensor or a smart thermostat in your office or a connected streetlight. An IoT device could be as fluffy as a child's toy or as serious as a driverless truck. Some larger objects may themselves be filled with many smaller IoT components, such as a jet engine that's now filled with thousands of sensors collecting and transmitting data back to make sure it is operating efficiently. At an even bigger scale, smart cities projects are filling entire regions with sensors to help us understand and control the environment.

The term IoT is mainly used for devices that wouldn't usually be generally expected to have an internet connection, and that can communicate with the network independently of human action. For this reason, a PC isn't generally considered an IoT device and neither is a smartphone -- even though the latter is crammed with sensors. A smartwatch or a fitness band or other wearable device might be counted as an IoT device, however.

IoT Explained

A complete IoT system integrates four distinct components: sensors/devices, connectivity, data processing, and a user interface. Below I will briefly explain each component and what it does.

1) Sensors/Devices

First, sensors or devices collect data from their environment. This could be as simple as a temperature reading or as complex as a full video feed.
I use “sensors/devices,” because multiple sensors can be bundled together or sensors can be part of a device that does more than just sense things. For example, your phone is a device that has multiple sensors (camera, accelerometer, GPS, etc), but your phone is not *just* a sensor.
However, whether it’s a standalone sensor or a full device, in this first step data is being collected from the environment by *something*.

2) Connectivity

Next, that data is sent to the cloud (*what’s the cloud?*), but it needs a way to get there!
The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet via ethernet.

Each option has tradeoffs between power consumption, range and bandwidth (here's a simple explanation). Choosing which connectivity option is best comes down to the specific IoT application, but they all accomplish the same task: getting data to the cloud.

3) Data Processing

Once the data gets to the cloud, software performs some kind of processing on it.

This could be very simple, such as checking that the temperature reading is within an acceptable range. Or it could also be very complex, such as using computer vision on video to identify objects (such as intruders in your house).

But what happens when the temperature is too high or if there *is* an intruder in your house? That's where the user comes in.

4) User Interface

Next, the information is made useful to the end-user in some way. This could be via an alert to the user (email, text, notification, etc). For example, a text alert when the temperature is too high in the company's cold storage.

Also, a user might have an interface that allows them to proactively check in on the system. For example, a user might want to check the video feeds in their house via a phone app or a web browser.

However, it's not always a one-way street. Depending on the IoT application, the user may also be able to perform an action and affect the system. For example, the user might remotely adjust the temperature in the cold storage via an app on their phone.

And some actions are performed automatically. Rather than waiting for you to adjust the temperature, the system could do it automatically via predefined rules. And rather than just call you to alert you of an intruder, the IoT system could also automatically notify relevant authorities.

Components of an IoT Ecosystem

Here are the main components based on which an internet of things ecosystem works on.

1. Sensing and embedding components

This is the first tier of an IoT ecosystem and it forms the backbone of the entire Internet of Things network. Data is indispensable for IoT and sensors are an important factor to ensure the accuracy and credibility of data. This essential layer consists of physical, micro appliances, embedded in an **IoT device**, which are responsible for collecting data or controlling a mechanism.

Sensors

Sensors work to gather minute data from the surrounding environment. They are sometimes also known as ‘detectors’ as the primary function of sensors is to detect even the slightest changes in the surrounding environment. This allows an IoT device to capture relevant data for real-time or post-processing.

Actuators

Actuators work opposite to that of sensors. While sensors, sense; actuators act. They receive a signal or a command and on its basis they cause an action. They are as crucial as sensors as once the sensors have detected a change in the environment, an actuator is required to make something happen based on the trigger.

2. Connectivity

IoT is a network involving devices, sensors, cloud and actuators and all these needs to interconnect with one another to be able to decipher data and consequently perform an action. Connectivity forms the second piece of the puzzle in the complex world of the IoT ecosystem.

Protocols

Once the data has been collected by the sensors, it requires a medium for transport. In other words, a communication channel is necessary between sensors and the cloud. IoT protocols are responsible for transferring data in the online world and this transmission can only be possible if two devices are safely connected. IoT standards and protocols involve an invisible language allowing physical objects to communicate with one another.

The choice of network depends on factors such as power consumption, speed of data transfer, range, bandwidth and overall efficiency. Some of the most popular IoT wireless protocols and standards include Bluetooth, Wi-Fi, ZigBee, LoRaWAN, DDS, MQTT, cellular, etc. These and other channels make it easy as well as secure to transfer and exchange data to the next IoT layer for processing.

IoT gateways

Incoming, raw data from the sensors must pass through gateways to reach the cloud. Gateways translate network protocols ensuring seamless communication of all devices within the network. Essentially this makes the gateways a crucial communication point and is responsible for easy management of data traffic.

Moreover, gateways offer security by protecting the system from unauthorized access and malicious attacks. It can also be considered as a security layer as the data flowing through it protected by the latest encryption practices.

Gateways can also preprocess data from the sensors before sending it to the cloud. In other words they minimize the large volumes of data ‘sensed’ in the previous stage. Not all, but some intelligent IoT gateways have the ability to also analyze and average data to transfer only the relevant data to the cloud.

3. IoT cloud

Once the data has been collected and it has traveled to the cloud, it needs to be processed. The cloud is where the “smart stuff” takes place! This high-performance facility majorly ties the components to the IoT ecosystem together. It handles the data, stores it and makes decisions to make or break a deal. All of this is performed for colossal amounts of data in just under milliseconds – the time is critical for IoT, as especially in critical concerns such as health and safety, latency cannot be compromised.

While the main purpose of IoT solutions is to provide and act on real-time information, there needs to be a component that is able to handle enormous amounts of data to cater to the time-sensitive nature of the IoT model. This is where cloud systems come into play. They form the brain of the IoT ecosystem as they are typically responsible for processing, commanding or taking analytics into account for the collected data. Devices, protocols, gateway and storage are combined for efficient real-time data analysis.

With their immense computing power, storage capabilities, networking options, analytics and other service components, clouds make information effectively available for the consumers.

While the cloud is not necessary for IoT, since local processing with **Edge** or Fog computing is an option too, the cloud may be preferred being a high-performance facility that offers massive scalability and decreased operational costs. Edge computing on the other hand is preferred when large amounts of data processing and storage are required on-premises.

4. IoT analytics and data management

Data may be a small word but it holds immense power that can pose a huge effect on any business. IoT Analytics is used to make sense of the vast amounts of analog data. This for example can include the determination of key performance indicators in a certain application where one may be interested in viewing errors or irregularities in real-time.

Once identified an immediate action would be required to prevent any undesirable scenarios. To put it differently, analytics involves converting raw data into useful insights that later are interpreted or analyzed to drive decision making.

Smart analytics is useful in multiple scenarios. The basic role is to analyze a situation and formulate a decision based on this. This can be basic such as analyzing if a room's temperature falls in an acceptable range, or complex if for example a car is just about to crash. Data analytics helps determine vital business insights. Deep learning models can be used for predictive analysis.

Various learnings can be derived from the data to predict trends, plan ahead and make useful business decisions.

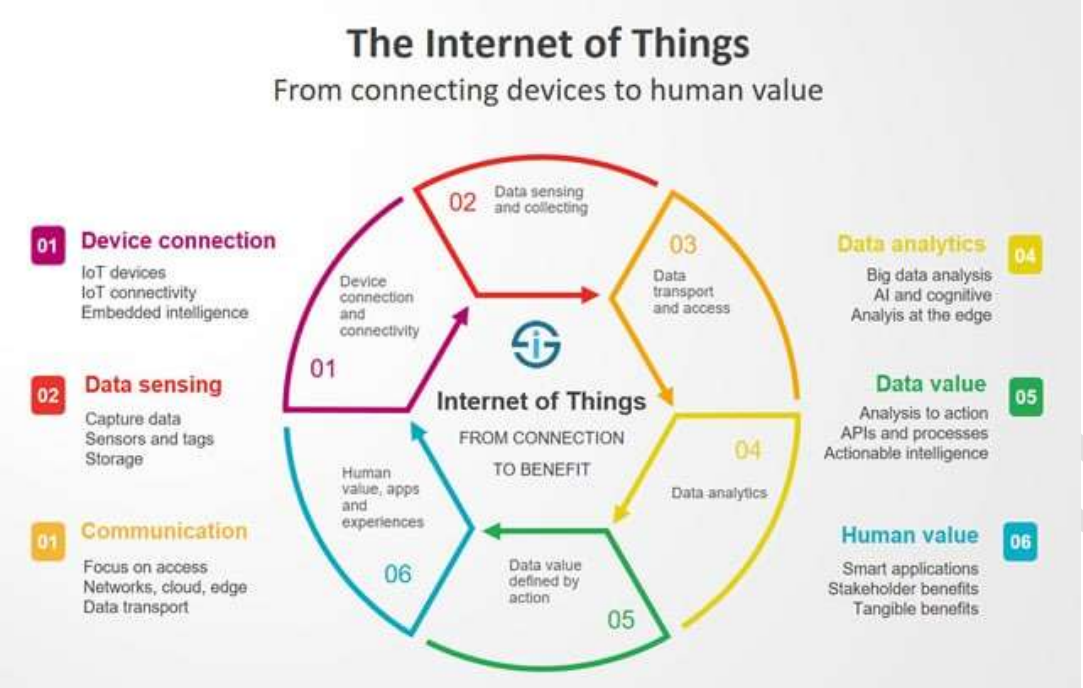
Analytics requires storage power and intelligent computation to be able to make sense of any data. Tasks such as this can be hosted on the cloud, depending on the IoT architecture.

5. End-user devices and user interface

The user interface is the visible component that is easily accessible and in control of the IoT user. This is where a user can control the system and set their preferences. The more user-friendly this component of the IoT ecosystem is, the easier is a user's interaction.

A user may interact with the system via the device itself, or this interaction can be conducted remotely via smartphones, tablets, and laptops. Smart home systems such as Amazon Alexa or Google Home etc. also allow users to communicate with their "things".

Design is a major consideration in today's fast-paced world and one IoT device can set itself apart from a competitor on the basis of a strong design. Touch interfaces, use of colors, font, voice, and more are some of the factors that come to play here. While an attractive design is necessary, the interface should be user-friendly enough to avoid any difficulties for the user.



There are 7 crucial IoT characteristics:

1. **Connectivity.** This doesn't need too much further explanation. With everything going on in IoT devices and hardware, with sensors and other electronics and connected hardware and control systems there needs to be a connection between various levels.
2. **Things**. Anything that can be tagged or connected as such as it's designed to be connected. From sensors and household appliances to tagged livestock. Devices can contain sensors or sensing materials can be attached to devices and items.
3. **Data**. Data is the glue of the Internet of Things, the first step towards action and intelligence.
4. **Communication**. Devices get connected so they can communicate data and this data can be analyzed. Communication can occur over short distances or over a long range to very long range. Examples: Wi-Fi, LPWA network technologies such as LoRa or NB-IoT.
5. **Intelligence**. The aspect of intelligence as in the sensing capabilities in IoT devices and the intelligence gathered from big data analytics (also artificial intelligence).
6. **Action**. The consequence of intelligence. This can be manual action, action based upon debates regarding phenomena (for instance in smart factory decisions) and automation, often the most important piece.

7. **Ecosystem**. The place of the Internet of Things from a perspective of other technologies, communities, goals and the picture in which the Internet of Things fits. The Internet of Everything dimension, the platform dimension and the need for solid partnerships.

Types Of IOT Networks :

1. Cellular

Cellular networks use the same mobile networks as smartphones to allow IoT devices to communicate. Because these networks were originally designed for power-hungry devices like smartphones, they weren't always considered the best fit for IoT devices. Eventually, the cellular industry developed new technologies that were more appropriate for IoT use cases. Today, this type of wireless network is very popular, and is considered a reliable and secure method of IoT connectivity. Cell service is available in most locations in the U.S., and this type of network covers a very large area. However, cell connectivity often isn't available in the places that most need monitoring sensors—for example, inside utility closets, elevator shafts, basements, etc. (Another IoT wireless technology class, LPWAN, might be a better fit for these locations.) And even though cellular connectivity is now less expensive and more power efficient than traditional telecom standards, cellular-connected IoT devices still require a great deal more power and energy than some other types of wireless networks.

Two cellular IoT wireless protocols currently vying for dominance are **LTE-M** and **Narrowband IoT (NB-IoT).** LTE-M is a great option for IoT connectivity if you're willing to pay the price, and if your use case requires low power. In addition, LTE-M networks are already in place in the U.S., which means you can start taking advantage of this option today. NB-IoT is somewhat less costly than LTE-M and uses less battery power, but there's not enough coverage everywhere to reliably deploy an NB-IoT solution *yet*.

2. Local and Personal Area Networks (LAN/PAN)

Networks that cover fairly short distances are called personal area networks (PAN) and local area networks (LAN). PAN and LAN networks are considered to be fairly cost-effective, but the transfer of data can sometimes be unreliable.

Wireless personal and local area network technologies that are commonly incorporated into IoT connectivity solutions are **WiFi** and **Bluetooth.** WiFi can be used for applications that run in a local environment, or in a distributed setting if there are multiple access points integrated into a larger network. One downside to WiFi is that it works only if the signal is strong and you're close to the access point. Also, WiFi is generally more power-hungry than

people think, but it is possible to operate it in a way that's a little more power-efficient (for example, your device only connects periodically to send data, then goes back to sleep).

Bluetooth Low Energy (BLE) is a more energy-efficient wireless network protocol—if you're not receiving data constantly, a single battery running BLE could last up to five years. However, compared to WiFi it is slower to transmit and is more limited in the amount of data it is capable of sending.

Both WiFi and Bluetooth are easy to connect in most cases, although WiFi does have some security challenges that may be difficult to overcome.

3. Low Power Wide Area Networks (LPWAN)

IoT devices that run on LPWANs send small packets of information infrequently and over long distances. This type of wireless network was developed in response to the early challenges of cellular connectivity. Proponents of LPWAN position it as longer-range than WiFi and Bluetooth, but using less power than cellular. Sigfox built the first LPWAN network in France and is considered the driving force behind its growth (despite the fact that Sigfox never took off in the U.S.).

A well-known and commonly used IoT network protocol in this category is **LoRaWAN** (long range wireless area network), which runs on the LoRa (long range) communication network. Advantages of LoRaWAN for IoT devices are its low power requirement (for long battery life) and relatively low-cost chipsets. Plus, under the right conditions, a single base station or gateway running on a long-range network is capable of providing service to a very large area—a few kilometers in dense urban areas and up to 15–30 kilometers in rural areas.

4. Mesh Networks

Mesh networks are best described by their connectivity configuration—how the components communicate with each other. In mesh networks, all the sensor nodes cooperate to distribute data amongst each other to reach the gateway. (A star topology, in contrast, is where all sensor nodes communicate to a central hub.)

Zigbee is one example of an IoT wireless network technology. Mesh networks are very short range and may require extra sensors throughout a building or the use of repeaters to get the coverage your application needs. Also, the nature of the way these networks communicate can result in high power consumption, especially if you need instant messaging, such as for a smart lighting application. (IoT applications that require only occasional information updates use less power.) However, mesh networks are also fairly robust, able

to find the fastest and most reliable paths to send data, and easy to install, making them a popular choice for in-building use.

IoT & Smart City :

IoT has the potential to tame the pressure of urbanization, create new experience for city residents, and make day-to-day living more comfortable and secure.

IoT-enabled smart city use cases span multiple areas: from contributing to a healthier environment and improving traffic to enhancing public safety and optimizing street lighting. Below, we provide an overview of the most popular use cases that are already implemented in smart cities across the globe.

Road traffic

Smart cities ensure that their citizens get from point A to point B as safely and efficiently as possible. To achieve this, municipalities turn to IoT development and implement smart traffic solutions.

Smart traffic solutions use different types of sensors, as well as fetch GPS data from drivers' smart phones to determine the number, location and the speed of vehicles. At the same time, smart traffic lights connected to a cloud management platform allow monitoring green light timings and automatically alter the lights based on current traffic situation to prevent congestion. Additionally, using historical data, smart solutions for traffic management can predict where the traffic could go and take measures to prevent potential congestion.

For example, being one of the most traffic-affected cities in the world, Los Angeles has implemented a smart traffic solution to control traffic flow. Road-surface sensors and closed-circuit television cameras send real-time updates about the traffic flow to a central traffic management platform. The platform analyzes the data and notifies the platform users of congestion and traffic signal malfunctions via desktop user apps. Additionally, the city is deploying a network of smart controllers to automatically make second-by-second traffic lights adjustments, reacting to changing traffic conditions in real time.

Smart parking

With the help of GPS data from drivers' smartphones (or road-surface sensors embedded in the ground on parking spots), smart parking solutions determine whether the parking spots are occupied or available and create a real-time parking map. When the closest parking spot becomes free, drivers receive a notification and use the map on their phone to find a parking spot faster and easier instead of blindly driving around.

Public transport

The data from IoT sensors can help to reveal patterns of how citizens use transport. Public transportation operators can use this data to enhance traveling experience, achieve a higher level of safety and punctuality. To carry out a more sophisticated analysis, smart public transport solutions can combine multiple sources, such as ticket sales and traffic information.

In London, for instance, some train operators predict the loading of train passenger cars on their trips in and out of the city. They combine the data from ticket sales, movement sensors, and CCTV cameras installed along the platform. Analyzing this data, train operators can predict how each car will load up with passengers. When a train comes into a station, train operators encourage passengers to spread along the train to maximize the loading. By maximizing the capacity use, train operators avoid train delays.

Utilities

IoT-equipped smart cities allow citizens to save money by giving them more control over their home utilities. IoT enables different approaches to smart utilities:

- Smart meters & billing

With a network of smart meters, municipalities can provide citizens with cost-effective connectivity to utilities companies' IT systems. Now, smart connected meters can send data directly to a public utility over a telecom network, providing it with reliable meter readings. Smart metering allows

utilities companies to bill accurately for the amount of water, energy and gas consumed by each household.

- Revealing consumption patterns

A network of smart meters enables utilities companies to gain greater visibility and see how their customers consume energy and water. With a network of smart meters, utilities companies can monitor demand in real time and redirect resources as necessary or encourage consumers to use less energy or water at times of shortage.

- Remote monitoring

IoT smart city solutions can also provide citizens with utility management services. These services allow citizens to use their smart meters to track and control their usage remotely. For instance, a householder can turn off their home central heating using a mobile phone. Additionally, if a problem (e.g., a water leakage) occurs, utilities companies can notify householders and send specialists to fix it.

Street lighting

IoT-based smart cities make maintenance and control of street lamps more straightforward and cost-effective. Equipping streetlights with sensors and connecting them to a cloud management solution helps to adapt lighting schedule to the lighting zone.

Smart lighting solutions gather data on illuminance, movement of people and vehicles, and combine it with historical and contextual data (e.g., special events, public transport schedule, time of day and year, etc.) and analyze it to improve the lighting schedule. As a result, a smart lighting solution “tells” a streetlight to dim, brighten, switch on or switch off the lights based on the outer conditions.

For instance, when pedestrians cross the road, the lights around the crossings can switch to a brighter setting; when a bus is expected to arrive at a bus stop, the streetlights around it can be automatically set brighter than those further away, etc.

Waste management

Most waste collection operators empty containers according to predefined schedules. This is not a very efficient approach since it leads to the unproductive use of waste containers and unnecessary fuel consumption by waste collecting trucks.

IoT-enabled smart city solutions help to optimize waste collecting schedules by tracking waste levels, as well as providing route optimization and operational analytics.

Each waste container gets a sensor that gathers the data about the level of the waste in a container. Once it is close to a certain threshold, the waste management solution receives a sensor record, processes it, and sends a notification to a truck driver's mobile app. Thus, the truck driver empties a full container, avoiding emptying half-full ones.

Environment

IoT-driven smart city solutions allow tracking parameters critical for a healthy environment in order to maintain them at an optimal level. For example, to monitor water quality, a city can deploy a network of sensors across the water grid and connect them to a cloud management platform. Sensors measure pH level, the amount of dissolved oxygen and dissolved ions. If leakage occurs and the chemical composition of water changes, the cloud platform triggers an output defined by the users. For example, if a Nitrate (NO3-) level exceeds 1 mg/L, a water quality management solution alerts maintenance teams of contamination and automatically creates a case for field workers, who then start fixing the issue.

Another use case is monitoring air quality. For that, a network of sensors is deployed along busy roads and around plants. Sensors gather data on the amount of CO, nitrogen, and sulfur oxides, while the central cloud platform analyzes and visualizes sensor readings, so that platform users can view the map of air quality and use this data to point out areas where air pollution is critical and work out recommendations for citizens.

Public safety

For enhancing public safety, IoT-based smart city technologies offer real-time monitoring, analytics, and decision-making tools. Combining data from acoustic sensors and CCTV cameras deployed throughout the city with the data from social media feed and analyzing it, public safety solutions can predict potential crime scenes. This will allow the police to stop potential perpetrators or successfully track them.

For example, more than 90 cities across the United States use a gunshot detection solution. The solution uses connected microphones installed throughout a city. The data from microphones passes over to the cloud platform, which analyzes the sounds and detects a gunshot. The platform measures the time it took for the sound to reach the microphone and estimates the location of the gun. When the gunshot and its location are identified, cloud software alerts the police via a mobile app.