MODULE- 5

Project Management

Project

- An entrepreneur takes numerous decisions to convert his business idea into a running concern. His/ Her decision making process starts with project/product selection. The project selection is the first corner stone to be laid down in setting up an enterprise.
- The success or failure of an enterprise largely depends upon the project.
- A project has typically has a distinct mission that it is designed to achieve and clear termination point, the achievement of the mission.
- As a whole complex of activities involved in using resources to gain benefits.
- Project can differ in their size, nature of objectives, time duration and complexity.

A Project: Search for a Business idea

Introduction

- Industrialization is widely recognized not only as one of the important means to users in socio-economic transformation and achieving self-sufficiency but also for the accelerated development of agriculture, transport, trade, service and other potential sectors through forward and backward linkages.
- It is a process which accelerates economic growth.
- Real progress must ultimately depend on industrialization.

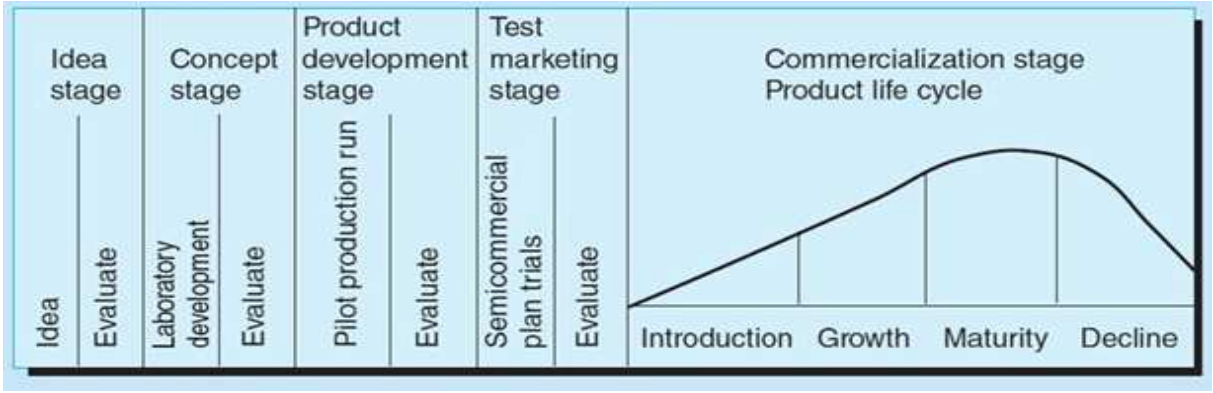
Choosing an Idea

- Establishing as a successful entrepreneur depends, in part, upon choosing a good idea.
- Idea must not only be good for the market, but good for the project and good for the entrepreneurs.
- It should be manageable by you without much dependence on others.
- The idea should give satisfaction results.
- As an entrepreneur develop more idea in parallel until one emerges so appropriate that it begins to dominate.
- To adopt one idea at a time had some disadvantage because constantly receiving random information from what we read and from people talk to. Also if pursuing a single idea by commitment then we may put our self in tight corner.
- Choosing an idea is difficult and the entrepreneur has to weigh objectively his intrinsic capabilities in finalizing an idea.
- In the idea stage, suggestions for new products are obtained from all possible sources: customers, competitors, R&D, distributors and company employees.
- Established objectives and defined areas provide a base for development.

Selection of product

- At this stage, the entrepreneur is concerned with identifying a particular product that hopes to market successfully at a reasonable profit.
- The selection of the right product is very essential for being successful in the business.
- The product should be marketed at a reasonable profit for the business growth.
- Various factors influence the entrepreneur in selecting the right product are:

- Whether import restrictions or the items selected are banned items would considerably weigh favorably or otherwise in the selection of the products.
- If the entrepreneur himself or his partners have gathered, substantial amount of experience in the manufacture and marketing of certain products , then selection of such product is advantage.
- The selection of product will also be based upon the degree of profitability that generally rules in the market.
- Many concessions are available from the government for producing a product which serves as an import substitute or even essential item.
- May products belongs to the priority industries or small-scale sector.
- The market for the product also plays a significant role in the selection of the product.
- Certain products are permitted for production only if the license is obtained from the appropriate authority while others belongs to the de-license category.
- Many products enjoy specific advantages in regard to the scale of manufacture or carry location advantage.
- If a product belongs to an ancillary unit and serves as a major component for the parent industry, it provides a ready demand.



The Adoption process

- An adoption process is a process bringing about a change in a buyer's attitude and perception.
- Customer adoption process covers the steps that a consumer usually goes through in determining the feasibility of buying new products:
  - Awareness: A person learns about a new idea, product or practice. He has general information about it. He has however, limited knowledge about special qualities, usefulness, performance, etc.
  - Interest: He now develops an interest in the innovation. He demands more detailed information about the new product, its utility, its performance, and so on. He listens to radio, TV ads, reads press ads, and learns more about it from others.
  - Evaluation: The accumulated information and evidences are weighed by the person in order to assess the basic soundness or worth of the innovation. He tries to weight the value of the new product and the extent to which it is good for him.
  - Trial: The person now is ready to put the idea into practice. Competent personal assistance is necessary to put the innovation to use.

- Adoption: It is the final stage in which he makes a decision to buy. The person now decides to adopt the new idea, product or practice for continued use. If post purchase experience is good, he becomes a repeat buyer and a talking advertisement of the innovation.

Product Innovation

- Business enterprise must have two basic functions: marketing and innovation
- Innovation alone assures growth and survival while customers orientation assures survival. The evolution of new products is a practical business function and it is described as a process product management.
- The process of product planning and development is always adopted for product innovation.

Product Planning and Development Strategy

- Marketing have four alternative ways of bringing about an increase in sales and profit:
- Market penetration: It involves the expansion of sales of the existing products in the existing markets by selling more to present customers or gaining new customers in the existing markets. The firm can market its present products to existing markets. May have a temporary price cut to raise the volume of sales and penetrate the market in a big way. Penetrating the current market for higher usage rate is a conservative choice.

- Market development: In market development, a present product is introduced to a new market or segment. Market development is the creation of a new market by discovering new applications for existing goods. This is another alternative to expand market opportunity, prolong product life cycles, profitability and survival.
- Product development: Product development occurs when a firm introduces new products into market in which it is well established. Product development is the introduction of new products in the present market. The firms by offering new or improved products to present markets can satisfy the present customers better and stand assured of their loyalty.
- Product diversification: Diversification occurs when a firm seeks to enter a new market with a completely new product. Such a firm has neither market enterprise nor product knowledge. The firm may adopt a daring strategy by creating new products for entirely new markets. The innovations are introduced for the first time in the new market.

Product Planning and Development Process

- There are seven steps in planning and development of a new product.
- New Product Ideas: We visualize the detailed features of a model product. Ideas may be contributed by scientists, professional designers, rivals, customers. Sales force, top management, dealers, etc. We may need many ideas to get one commercially viable product.

- Idea Screening: We have to evaluate all ideas and inventions. Poor or bad ideas are dropped and through the process of elimination, only the most promising and profitable ideas are picked up for further detailed investigation and research.
- Concept Development and Testing: All ideas that survive the process of screening will be studied in detail. They will be developed into mature product concepts. We will have a precise description of the ideas and features of the proposed product. We can incorporate customer preference also.
- Business Analysis: Once the best product concept is picked up, it will be subjected to rigorous scrutiny to evaluate its market potential, capital investment, rate of return on capital, etc. Business analysis is a combination of marketing research, cost benefit analysis and assessment of competition. It eill prove the economic prospects of the new product concept.
- Product Development Programme: We have three steps in this stage when a paper idea is duly converted into a physical product.
    - Prototype development, giving a visual image of the product
    - Consumer testing of the model or prototype
    - Branding, packaging and labeling.
- Test Marketing: The entire product marketing programme is tried out for the first time in a small number of well-selected test markets. Test marketing is necessary to find out the viability of a full marketing programme for national distribution. Customer reactions can be tested under normal market conditions.
- Commercialization: Once the test marketing gives the green signal for the product with or without expected modifications, the company can proceed to finalize all features of the product. Mass production will start and all distribution channels will be duly organized. The product is now born and will start the life cycle.

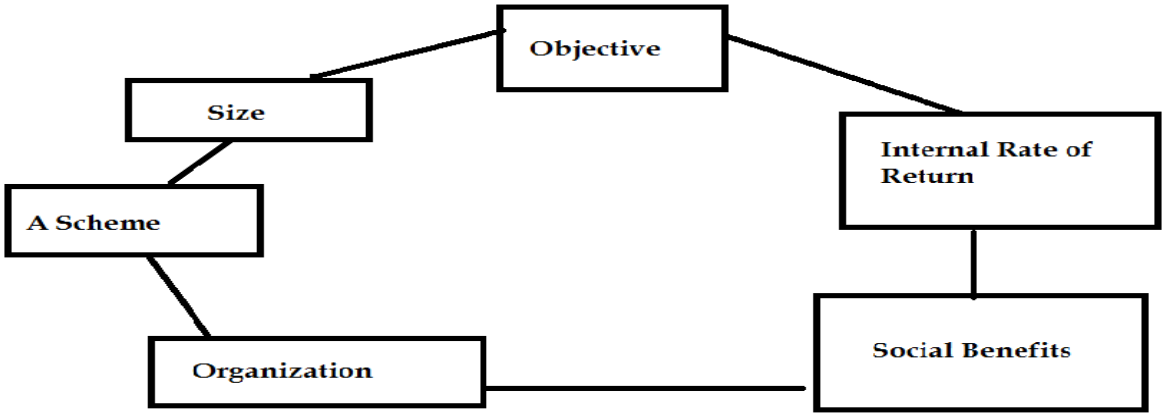
Concepts of Projects and Classification

Introduction :

- The project is an important groundwork of an enterprise and is also very crucial to the entrepreneur. Project is speculative imagination; a scheme of something to be done; a proposal for an undertaking. Two important aspects have to be borne in mind ie. A scheme and speculative imagination.

Meaning of Projects:

- The smallest unit of investment activity to be considered in the case of programming.
- It may be any item of investment activity which can separately be evaluated.
- The whole complex of activities involved in using resources to gain benefits.
- A project may be defined as a scientifically evolved work plan devised to achieve a specific objective with a specified period of time. The three basic attributes are a course of action, specific objective and defined time perspective.
- A project is a productive activity, which can be analyzed appraised and monitored independently.
- A project has specific objective in terms of a geographic location, specific starting and end point
- Serve the target population by achieving good returns on investment.
- Has an organization to implement it.



Basic Components of a project

Characteristics of a Project

- The four basic characteristics are:
  - Investment pattern
  - Benefits or gains
  - Time limit
  - Location
- The project is an economic activity with well-defined objectives and having a specific beginning and end.
- A well planned project includes a correct consideration of alternatives, identification of key issues, broad participation, compactness and enforceability. It should be neat, clear cut and specific.
- A project will involve allocation and consumption of resources, on the one hand and generation of resources, goods, or services, on the other.

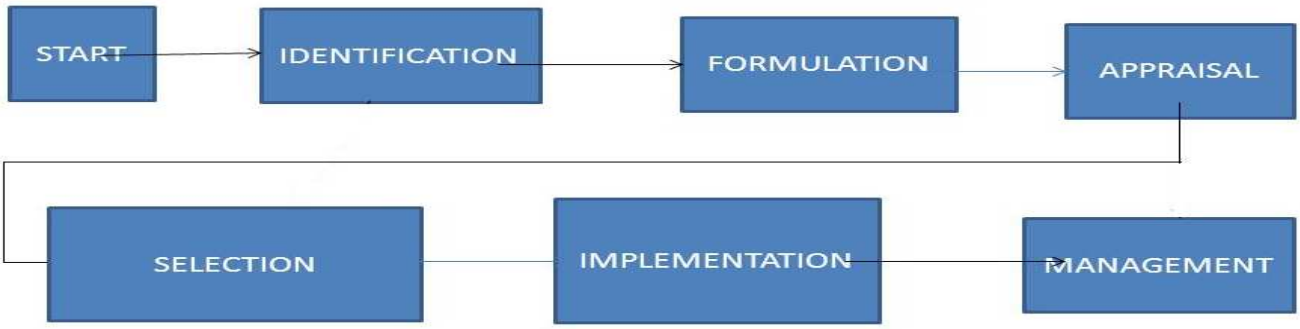
Project Levels

- The three levels are:
- At the national level, where national investment plans are formulated, priorities among sectors are established, and the macroeconomic framework of policies for economic growth is put in place.
- At the sector level, where priorities for investment within each sector are determined and the issues and problems affecting the development of the sector are addressed.
- At the project level, where individual projects are identified, prepared and implemented and attention is given to their technical, economical, financial, social, institutional and other dimensions.

Features and Phases of Project management

- Project Features
  - Simplicity and clarity
  - Availability of attractive technology to promote the project.
  - Integration of basic production services, especially those of input supply, credit, marketing and extension.
  - Compatibility of the project within the existing administrative mix.

- Phases of Project management
  - An entrepreneur has to consider carefully various factors from the start to the finish in converting profitable opportunities into realities.
  - The process of project management may be divided into six broad phases – identification, formulation, appraisal, selection, implementation and management of projects.



PHASES OF A PROJECT		
Sl.no.	**PHASE**	**REQUIREMENTS**
1	Identification	Selection of a project after a careful scanning of the environment of investment opportunity and its likely return
2	Formulation	Translation of the idea into a concrete project with scrutiny of its important preliminary aspects. Preparation of feasibility reports.
3	Appraisal	Searching scrutiny, analysis and evaluation of market technical, financial and economic variables. Assessing the profitability, return investment and break even points.
4	Selection	Rational choice of a project in the light of objectives and inherent constraints.
5	Implementation	Expeditious completion within the allocated resources
6	Management	Judicious operation of a project / enterprise with objectives like maximisation of net present value, maximisation of return and increase and increase in the rate of return of low risk.

Project Management Processes

- Operational Management Process
  - Planning
  - Executing
  - Controlling
- Additional management Process
  - Initiating
  - Closing
- Technical Processes

Project Identification

Feasibility Report

- Before starting a small-scale industry, it is mandatory for entrepreneurs to consult the Director of Industries Service Institute (SISI).
- The SISI guides entrepreneurs as to the type of industry to start, where to start and how to start it.
- The SISI help them odd select the various items of manufacture which have scope for development in different areas.
- It suggests the lines on which project report for the proposed units should be prepared for the consideration of various financial institution with a view to securing financial assistance.
- Similarly, technical guidance in the selection of proper raw materials and type of machinery is also provided.
- The SISI gives valuable information on various incentives available to the small-scale industries from various organizations.

  Project Feasibility Analysis
- A project feasibility analysis includes market analysis, technical analysis, financial analysis and social profitability analysis.
- The starting point of a project analysis is the establishment of objectives to be attained. The next stage is the pre – selection stage – the advisability of having an in depth study. The analysis stage consists mainly of three factors – market, technical and financial analysis. A market analysis is a method of screening project ideas as well as means of evaluating a project's feasibility in terms of the market. A market analysis should cover the following areas:
    - A brief market description including the market are, methods of transportation, existing rates of transport, channels of distribution and general trade practices.
    - An analysis of past and present demand, determination of quantity value of consumption and identification of the major consumers of the product.
    - An analysis of past and present supply, broken down as source (whether imported or domestic) as well as information to assist in determining the competitive position of the product such as selling process quality and marketing practices of competitors.
- The technical analysis of a project feasibility study establishes whether project is technically feasible or not, and whether if offers basis for the estimation of costs. Moreover it provides an opportunity for a consideration of the effect of various technical alternatives on employment, ecology, infrastructure demands, capital services, support of other industries, balance of payments and other factors. A technical analysis should review the techniques or processes to be applied and should incorporate.
    - A description of the product including specification relating to its physical, mechanical and chemical properties, as well as the uses of the product.
    - A description of the selected manufacturing process, showing detailed flow charts and presenting alternative processes which may have been considered and the justification for the adoption of the selected process.
    - A determination of the plant size and production schedule which includes the expected volume for a given time period on the basis of start up and technical factors.
    - Selection of machinery and equipment including specifications, equipment to be purchased and its origin, quotations from suppliers, delivery dates, terms of payment and

a comparative analysis of alternatives in terms of cost reliability performance and spare parts availability.

- An identification of plant's location and as assessment of its desirability in terms of its distance from raw material sources and markets. For a new project this part may include a comparative study of different sites, indicating the advantages and disadvantages of each.
- A design of the plant layout and an estimate of the cost of the erection of the proposed buildings and land improvements.
- A study of the availability of raw materials and utilizes including a description of physical and chemical properties, quantities needed, current and prospective costs, terms of payment, location of sources of supply and continuity of supply.
- An estimate of labour requirements, including a detailed break – down of direct and indirect labour requirements and the supervision required for the manufacture of the product.
- A determination of the type and quantity of waste to be disposed of together with a description of the waste disposal method, its costs and the necessary clearance from proper authorities.
- An estimate of the production cost of the product.

- In the financial analysis of this feasibility study, the emphasis is on the preparation of financial statements, so that the project may be evaluated in terms of the different measures of commercial profitability followed by the magnitude of financing which requires the assembly of the market and also technical cost estimated in various proforma statements. If it is necessary to have more information on which to base an investment decision a sensitivity analysis or possibly a risk analysis may be conducted. This financial analysis should include:
    - For projects that involve new companies, statements of total project cost, for initial capital requirements and cash flows relative to the project schedule. For all projects financial projections for future time periods including income statements, cash flows and balance sheets.
    - For all projects supporting schedules for financial projection, stating the assumption made as to the collection period of sales, inventory levels, payment period of purchases and expenses and the element of production cost, selling, administrative and financial expenses.
    - For all projects a financial analysis showing returns on investments returns on equity , break even volume and price analysis.
    - For all projects, if necessary a sensitivity analysis to identify which have a substantial impact on profitability or possibly a risk analysis.
- For the small entrepreneur, the studies conducted during the analysis stage of the project provide the material for an assessment. If positive results are obtained, the entrepreneur in seeking finance, will want to prepare an investment proposal. The planners or government officials, however having obtained positive conclusions from the economic feasibility study will want to evaluate the element of social profitability.
- The purpose of the investment or loan application is to convince a lender (financial institution) that the project is a desirable investment; that it not only possesses the potential for profit but

that the proposed management team has the capability to achieve the potential. The investment proposal normally contains:

- General information on the product, company history, the nature of the industry and the reputation and qualifications of the existing or proposed management.
- A description of the project, which usually consists of extracts from economic feasibility selected manufacturing methods (with detailed indication of the cost of equipment and operational expenses) and a financial statement.
- Miscellaneous information such as the steps taken for the implementation of the project and the qualifications of the technical partners envisaged or selected.

Project Formulation

- **Meaning**
- Project formulation is defined as taking a first a look carefully and critically at a project idea by an entrepreneur to build up an all round beneficial to project after carefully weighing its various components.
- It is formulated by the entrepreneur with the assistance of specialists or consultants.
- The aim of project formulation is to achieve the project objectives with the minimum expenditure and adequate resources.
- In other words it is to derive maximum benefits from minimum expenses in a short span of time.

Fig: Phases of Project Formulation

Steps in Project formulation

- The objectives may be social, economic, or a combination of both and they can be defined under the following categories:
  - General objectives
  - Operational objectives
- A general objective merely states in broad terms the achievements expected whereas an operational objective specifically mentions results expected from the implementation of the project or scheme.
- The definition of objective in clear terms helps in quantifying physical, financial, human and other resources requirements.

Sequential Stages of Project Formulation

- The process of project development has been categorized into seven distinct and sequential stages. They are:
- **Feasibility analysis:** This is the very first stage in project formulation. At this stage the project idea is examined from the point of view of whether to go in for a detailed investment proposal or not. As project for a detailed investment proposal or not. As project idea is examined in the context of internal and external constraints three alternatives could be considered. First the project idea seems to be feasible, second the project idea is not a feasible one and third, unable

to arrive at a conclusion for want of adequate data. If it is feasible we proceed to the second step if not feasible we abandon the idea and if sufficient data are not available, we make more efforts to collect the required data and design development.

- **Techno – economic analysis:** In this step estimation of project demand potential and choice of optimal technology is made.
- **Project Design and Network analysis:** This important step defines individual activities which constitute the project and their inter – relationship with each other. The sequence of events of the project is presented. A detailed work plan of the project is prepared with time allocation for each activity and presented in a network drawing. Project design is the heart of the project entity. This paves the way for detailed identification and qualification of the project inputs, an essential step in the development of the financial and cost – benefit profile of the project.
- **Input analysis:** The step process the input requirements during the construction of the project and also during the operation of the project. In the earlier step a project was divided into several activities. Now it is better to see the inputs required for each activity and sum it up to get the total input requirements on qualitative and quantitative terms. Inputs include materials, human resources.
- **Financial analysis:** This stage mainly involves estimating the project costs, estimating its operating costs and fund requirements. Financial analysis also help in comparing various project proposals on a common scale, thereby aiding the decision maker. Some of the analytical tools used in financial analysis are discounted cash flow, cost – volume – profit relationship and ratio analysis.
- **Social cost benefit analysis:** When we talk of cost benefit analysis we not only take in to account the apparent direct costs and direct benefits of the project but also the costs which all entities connected with the project have to bear and the benefits which will be enjoyed by all such entities.
- **Pre – investment analysis:** The project proposal gets a formal and final shape at this stage. All the results obtained in the above steps are consolidated and various conclusions arrived at to present a clear picture. At his stage, the project is presented in such a way that the project – sponsoring body, the project – implementing body and the external consulting agencies are able to decide whether to accept the proposal or not.

Project Evaluation

- With a view to evaluate the project, the social cost-benefit analysis is used.
- All cost and benefits can be classified into three categories as:
    - Primary costs and benefits
    - Secondary costs and benefits
    - Tertiary costs and benefits.

Project Design and Network Analysis:

Introduction

- The execution of a project follows a definite path of planning, scheduling and controlling. The first and the foremost aspect of a project is the project design.
- It defines the individual activities which go into the corpus of the project and their interrelationship with each other.

- Project design enables to identify the flow of event which must take place for the successful implementation of the project.
- Network techniques help the management of an organization in performing these functions efficiently and effectively.

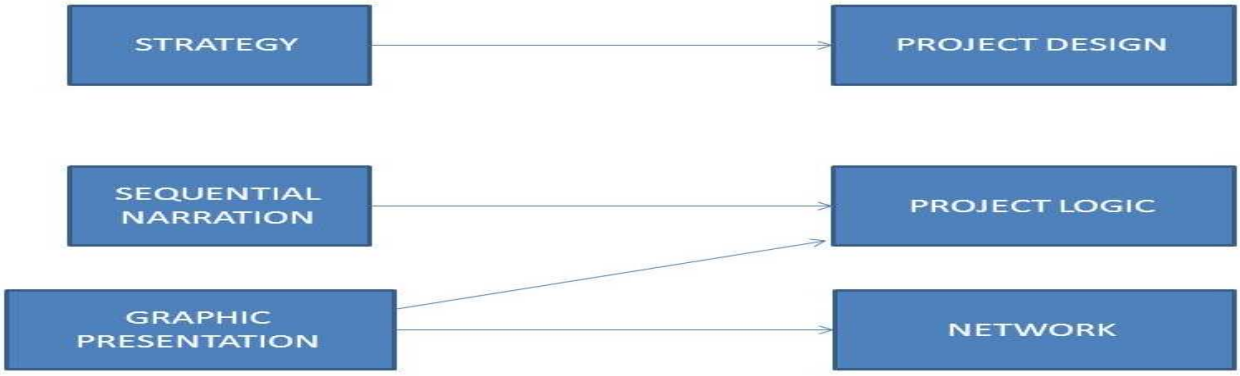


Fig: Relation between Project Design and Network

Importance of Network Analysis

- The network analysis has the potential to unfolding unknown snags involved in project estimates which, when detected, may provide management not only to improve on the ongoing project estimates but also to take serious lesson for future applications.
    - The whole project should be considered with reference to the sequence of activities and events.
    - This would also require that the events should be thought of in different streams of operations and their relationship understood clearly.
    - The whole project may be put on one network while different segments of the project may be detailed out in separate networks for final integration in the overall network.
    - The time estimates may be made taking into view two discrete aspects: one projects in which previous experience does not exist and two, time estimates may be deterministic.
    - Cost estimates would depend on the project time estimates and the changes in the prices of different factors of production.
    - The physical progress of the projects, individuality and simultaneity of events, jobs farmed out snags in different areas of project work would all require adequate notice and application of correctives in proper time.

Origin of PERT and CPM

- The Programme Evaluation and Review Techniques (PERT) and Critical Path Method (CPM) techniques were developed in U.S. independently, while CPM came into focus about 1957 as an offshoot of collaboration between Du Pont and Remington Rand.
- The emphasis was on the trade-off between the cost of the project and its overall completion time.
- PERT, which was developed about 1958 as a result of collaboration between the Operational Research Division of the United States Navy and a firm of business consultants.
- The emphasis was on completing the program in the shortest possible time. In addition PERT had the ability to cope with uncertain activity completion times.

Network

- A network comprises a set of exponents connected with each other in a sequential relationship with each step till the completion of a project.
- Network analysis is a system which plans both large and small projects by analyzing the project activities.
- Projects are broken down into simple activities, which are then arranged in a logical sequence.
- It is also decided as to which task will be performed simultaneously and which other sequentially.

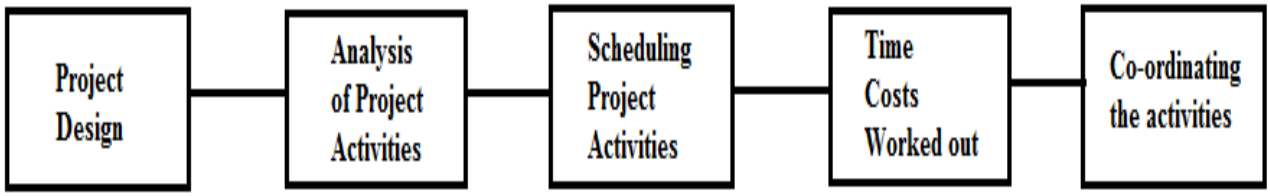


Fig: Network Design

Network Techniques

- Several techniques of project scheduling and control such as Bar charts, Programme Evaluation and Review Techniques (PERT) and Critical path method (CPM) are used.
- Of these CPM have some to be widely used in project management as they are very useful in the basic management functions of planning, scheduling and control.
- These techniques can be applied in diverse kinds of projects like construction of a projects, scheduling ship construction and repairs, end of the month closing of accounts, large, research projects etc.

Need for Network Techniques

- Network analysis helps in designing, planning, coordinating, controlling and decision-making in order to accomplish the project economically in the minimum available time with the limited available resources. The conventional planning method like bar chart had limitations the following disadvantages are:
    - A bar chart becomes too cumbersome while dealing with big and complex projects.
    - A bar chart does not point out which tasks should be given priority as regards resources.
    - The effect of changes in schedule cannot be evaluated with the help of a bar chart.
    - A bar chart neither satisfactorily tells the time at which the activates begin and end nor does it indicate tolerances in activity timing.
- PERT is one of the management techniques which is considerably more useful.
- It works a method of minimizing production delays, interruptions, and conflicts; of co-ordinating and synchronizing the various parts of the overall job; and of expediting of projects.
- PERT is concerned with two concepts:
    - **Events:** An event is a specific accomplishment that occurs at a recognizable point of time and does not call for either the need of time or resources.
    - **Activities:** An activity is the work required to complete a specific event.

Steps in PERT

- The first step in the development of a PERT network is the establishment of objectives.
- The second step is to schedule work breakdown in great detail.

- In the third step both technical and managerial persons should begin to work together.
- The fourth step is that each person who participants in the application of PERT to the control of the project should have some basic familiarity with the general nature of the work and with the ultimate objective desired.
- In PERT, time is the basic measure. It is usually expressed in calendar weeks the project should be completed within stipulated optimistic time.
- In order to arrive at the most reliable estimate of time, three time estimates are usually employed under this technique as given below:
    - **The optimistic time:** It is the shortest time possible if everything goes perfectly well with no complications, the chance of this optimum actually occurring might be one in a hundred.
    - **The pessimistic time:** It is longest time conceivable, it includes time for unusual delays and thus the chance of its happening might be only one in a hundred;
    - **The most likely time:** It would be the best estimate of what normally would occur.
- The difference in these three times give a measure of the relative uncertainty involved in the activity.
- **ADVANTAGES OF PERT**
    - This technique gives the management the ability to plan the best possible use of resource to achieve a given goal within the overall time and cost limitations.
    - It helps management to handle the uncertainties involved in programmes where no standard time data of the Taylor – Gantt variety are available.
    - Use of this technique for active control of project requires frequent updating and revising the PERT calculations and this proves quite a costly affair.
- **LIMITATIONS OF PERT**
    - The basic difficulty comes in the way of time estimates for the completion of activities because activities are of non – repetitive type.
    - This technique does not consider resources required at various stages of the project.
    - Use of this technique for active control of a project requires updating and revising the PERT calculations and this proves quite a costly affair.
- **CRITICAL PATH METHODS (CPM)**
- CPM was developed in 1956 at the E.I. Dupont Nemours & Co. U.S.A in connection with the Periodic overhauling and maintenance of a chemical plant. It resulted in reducing the shut down period from 130 hours to 90 hours and saving hours and saving the company $ 1 million. CPM has two time cost estimates for each activity (one time cost estimates for the normal situation and the other estimate for the crash situation) but does not incorporate any statistical analysis in determining such time estimates. CPM operates on the assumptions that there is a precise known time that each activity in the project will take.
- **ADVANTAGES OF CPM**
    - It helps in ascertaining the time schedule.
    - With its aid, control by the management is made easy.
    - It makes better and detailed planning possible.

- It proves a standard method for communicating project plans, schedules time and cost performance.
- It identifies most critical elements and thus more attention can be paid to these activities.

- **LIMITATIONS OF CPM**
  - CPM fails to incorporate statistical analysis in determining the time estimates.
  - It operates on the assumption that there is a precise known time that each activity in the project will take but his may not be true in actual life.
  - It is difficult to use CPM as a controlling device for the simple reason that one must repeat the entire evaluation of the project each time when changes are introduced into the network. It may be remembered that CPM was initially developed as a static planning model and not as a dynamic controlling device .

Differences between PERT and CPM

PERT	CPM
The origin is military (Naval)	The origin is industrial.
It is an event-oriented approach.	It is an activity-oriented system.
There is allowance for uncertainty.	No such allowance.
It has three time estimates.	There is only one single estimate of time and the emphasis is on cost.
It is a probabilistic model with uncertainty in activity duration.	It is a deterministic model with well-known activity time based upon past experience.
It does not demarcate between critical and non-critical activities.	It marks critical activities
It is especially suitable when high prediction is required in time estimates.	It is suitable when reasonable prediction is required.
Time is averaged	No averaging of time is involved.
The concept of ‘crashing’ is not applied.	The concept of crashing is applied.
It is time - based.	It is cost - based.