SYLLABUS

Class – B.B.A. V Sem.

Subject – Project Management

UNIT – I	Introduction to project and projects. Characteristics and types of projects. Gaining importance, project life cycle and its phases. Project selection, non quantitative and scoring models, technical analysis and technology selection, market potential analysis and techniques of long term forecasting.
UNIT – II	Financial feasibility, determinants of cost of project, its financing and deciding optimum capital structure. Cash flows from project and owner's perspective. Project Appraisal. Financial feasibility with risk. Types of risk, techniques of risk evaluation and its mitigation. Sensitivity analysis, Hiller's model, scenario analysis, simulation.
UNIT – III	Network analysis, construction of networks, CPM, various types of floats and their application, PERT and its applications. Time cost relationship, crashing for optimum cost and optimum time. Resource leveling.
UNIT – IV	Introduction to project software and applications of MS Project.
UNIT – V	Human Aspects of Project management: project manager's skills and functions, matrix organization, Social Cost Benefit Analysis, UNIDO approach, shadow pricing.
UNIT – VI	Project monitoring, Earned Value Analysis, abandonment analysis, Ph,41S, Project Termination and Audit. Reasons for failure.

UNIT-I
PROJECT MANAGEMENT

Meaning of Project –
Mos
t of the organizations are required to perform various tasks as a routine. Each task is unique with a specific purpose of need. The projects are different in size and type.
A project is a combination of inter-related activities with well defined objectives to be completed in a specific time period. The activities are to be performed in a specified sequence or order and require resources such as money, materials, facilities and space.

Definitions –
"A project is a temporary Endeavour undertaken to create a unique product or service."
- Institute of project Management

"A project is a specific, finite task to be accomplished, whether it is large or small scale and whether it is long or short run is not particularly relevant."
- Meredith and Camuel

Characteristics of Projects –
1) Well-defined objectives
2) Large and complex
3) Non-recurring
4) Uncertain duration
5) Completion dead line
6) Project life cycle
7) Uniqueness
8) Team work
9) Conflict for resources
10) A separate disposable team
11) Inter-dependencies
12) Performance measurement

"Project management is the process of achieving project objectives through the traditional organizational structure and over the specialties of the individuals concerned. Project management is applicable for any (unique, one time, one of a kind) undertaking concerned with a specify and objectives"
- Professor Harold Kerzner

Objectives of Project Management –
1) Interdependency and complexity
2) Sharing of resources
3) Size of the project
4) Importance of the project
5) Changes in the market

Significance of project management –

1) Shortening of the product life cycle
2) Global competition
3) Cost control
4) Explosion of knowledge
5) Focus on customer

Meaning of Project Life Cycle –

Every project is unique and is composed of a number of activities. These activities are inter-related and dependent on each other. There is a systematic and logical sequence of performing these activities. The sequence follows the order in which these activities are to be carried out. The duration in which these activities are to be performed is known as its life span. Hence, the entire sequence of activities to be performed from the beginning to the end of a project is called 'Project Life Cycle' (PLC).

Life Cycle of a Project –

The sequence of the groups of activities through which the project passes from 'conception to completion' is known as its life cycle.

Phases of Project Life Cycle –

Broadly, the life cycle of a project may e divided into following five phases –
Phase 1 : Project Conception
Phase 2 : Project feasibility analysis
Phase 3 : Project Appraisal Phase
Phase 4 : Project Implementation, Monitoring and Control
Phase 5 : Project Evaluation and termination

SELECTION OF THE PROJECT

Meaning of Project Selection –

Project selection is making a commitment for the future. It is the process of evaluating individual projects or groups of projects and, then choosing a set of them to implement so that, the objectives of the organization are achieved. The selection process is conducted by a committee of senior managers.

Criteria for choosing a project selection model –

1) Based on Reality
2) Capability
3) Flexibility
4) Convenience in Use
5) Cost Effective
6) Firm's Objectives

Significance of Project Selection –

1) Long term effects
2) Irreversible decision
3) Effect on competitive strength of the firm

4) Huge funds
5) High degree of risk

Types of Project Selection Models –
Project Selection Model:
Numeric (Quantitative) and Non-numeric

Choosing a project selection model –
Selection of the type of model depends on the philosophy of management. In a survey conducted among 40 high level staff persons, it was found that 80% of them use one of more financial models for R&D project decision making. None of the respondent used mathematical programming techniques for project selection or research allocations.

Important issues of technical analysis –
1) Material inputes
2) Manufacturing process/technology
3) Product mix
4) Plant capacity
5) Location and site
6) Requirement of machineries and equipments
7) Structures and civil works
8) Project charts and layouts
9) Work schedule

Conduct of Market Survey –
Though the secondary information is useful but it does not often provide a comprehensive basis for market and demand analysis. It must be supplemented with primary information which is gathered through a market survey.

The market survey may be a census survey or a sample survey. In a census survey, the entire population is covered. Here, the term 'population' means totality of all units under consideration e.g. all students pursuing MBA or all readers of Economics Times etc.

Demand Forecasting –
Forecast is an estimate of future events and trends and is arrived at by systematically combining past data and projecting it forward in a pre-determined manner. All business planning starts with forecasting. Capital investment, life procurement of raw materials and production planning has to relate to demand forecasting. High volume, high technology, mass production systems have further highlighted the importance of accurate demand forecasts.

Techniques of Long term forecasting –

1) Collective opinion survey
2) Survey of customers intension
3) Delphi method
4) Nominal group technique
5) Simple average method
6) Moving average method
7) Weighted moving average
8) Exponential smoothing methods
9) Regression analysis
10) Econometric models

UNIT-II

(i) Financial Feasibility & Project Appraisal

Meaning of Financial Feasibility

Financial feasibility is of critical importance to the success of the project. In order to judge a project from the financial point of view, information about the following aspects is needed:

(a) Cost of Project
(b) Means of Financing
(c) Estimated production and sales
(d) Cost of Production
(e) Working capital requirement and its Financing
(f) Estimated of working results
(g) Breaks-even point
(h) Projected cash flows
(i) Projected balance sheets

Cost of Project & its Determinants

Estimated of project cost is required for determining financial requirement as well as economic viability of the project. It is a difficult exercise because one has to predict in detail not only all the possible elements of capital cost but also to estimate them with a fair degree of accuracy in the changing environment of economy.

The cost of project represents the total of all items of outflows associated with a project which are supported by long term funds.

Means of Finance

Availability of financial resources is essential for managing projects. To meet the cost of project, the following means of finance are available.

1. Share Capital:
2. Debenture:
3. Team Loans:
4. Deferred Credit:
5. Miscellaneous Sources:

Break-Even Point

The estimated of working results are based on the assumption that the project would operate at a given level of capacity utilization. It is also helpful to know at what level of capacity, the project would be profitable and what level of operation should be to avoid losses. For this purpose, break-even point is calculated which refer to the level of operation at which the project neither makes profit nor incurs loss.

For calculating the break-even point, the costs are divided into two broad categories-

1. Fixed costs
2. Variable costs

$$\text{Break-Even} = \frac{\text{Fixed Costs}}{\text{S.P. Per Unit} - \text{V.C Per Unit}}$$

Projected Cash Flow Statements

The cash flow statement is prepared to know the movement of cash in and out of the firm and its net impact on the cash balance with the firm. The format of cash flow statement which is a cash flow budget.

Meaning of Capital Structure

Capital structure may be defined as a mix of long-term sources of funds e.g. equity share capital, preference share capital, debentures, long-term debts, reserve and surplus, etc. some companies do not plan their capital structure and it is developed by the decisions of financial manager without any normal planning.

Features of an Appropriate Capital Structure

1. Profitability
2. Solvency
3. Flexibility
4. Capacity
5. Control

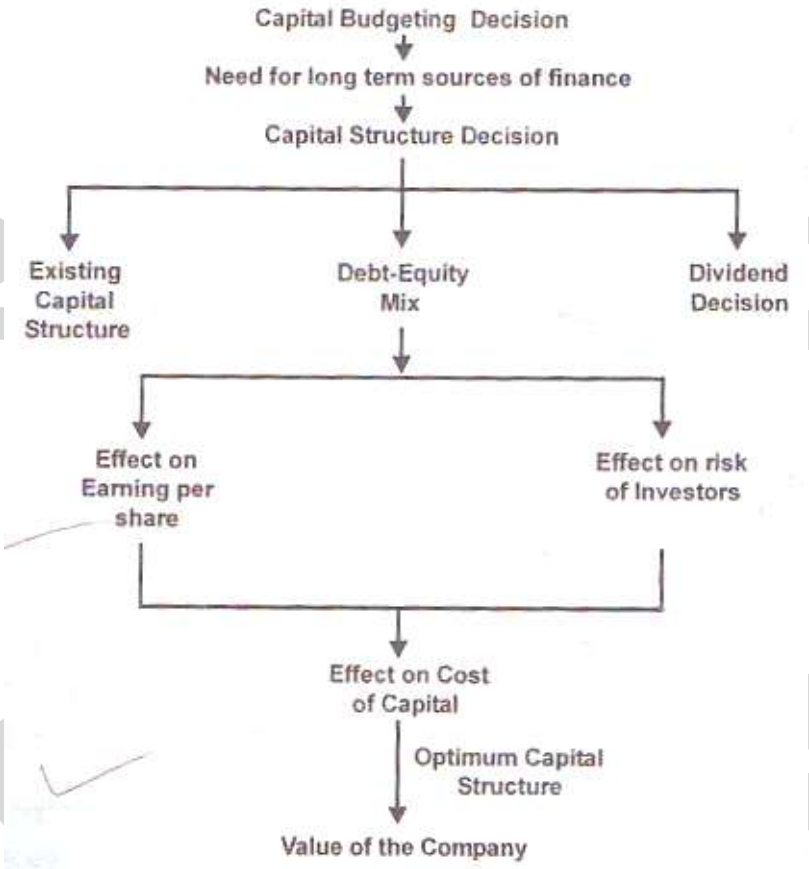


Fig.: Capital Structure Decision Process

Determinants of Capital Structure

The factors which affect the capital structure decision, may be classified as:

1. Internal Factors,
2. External Factors and
3. General Factors.

Determinants of Capital Structure

1. Internal Factors

(i) Risk Factor
(ii) Cost of Capital
(iii) Control

(iv) Trading on Equity

2. External Factors

(i) General Economic Condition
(i) Level of Interest Rates
(ii) Policy of Lending Institution
(iii) Taxation Policy
(iv) Government policies

3. General Factors

(i) Nature of Enterprise
(ii) Size of the Company
(iii) Purpose of Financing
(iv) Period of Finance
(v) Flexibility
(vi) Timing
(vii) Provision for Future
(viii) Marketability
(ix) Requirement of Investors.

Project Cash Flows

The financial costs and benefits of a project are known as project cash flows. Estimation of project cash flows is one of the basic steps in determining whether a project I worthwhile or not. The project cash flows stream consists of cash outflows and cash inflows.

Basic Principal for Measuring Project Cash Flows

Following are the principles which must be kept in view while developing the stream of financial costs and benefits:

1. Increments Principle
2. Long Term Fund Principle
3. Exclusion of Financing Costs Principle
4. Post Tax Principle.

Components of the Cash Flow Stream -

The cash flow associated with a project may be divided into three basic components:

1. Initial investment
2. Operating cash flows
3. Terminal cash flow

Project Appraisal or Capital Budgeting

Capital budgeting means planning for capital assets. It is to be decided whether money should be invested in long term projects like setting up a new factory or installing machinery etc. There may be various proposals regarding capital expenditure.

Importance of Capital Budgeting Decision -

1. Growth
2. Large Amount
3. Irreversibility
4. Company
5. Risk
6. Long Term Implications

Types of Capital Investment Decisions

Capital investment decisions are associated with application of long-term resources. There are many ways to classify the capital budgeting decision. Generally, capital investment decisions are classified in to two ways:

1. On the basis of firm's existence
2. On the basis of decision situation.

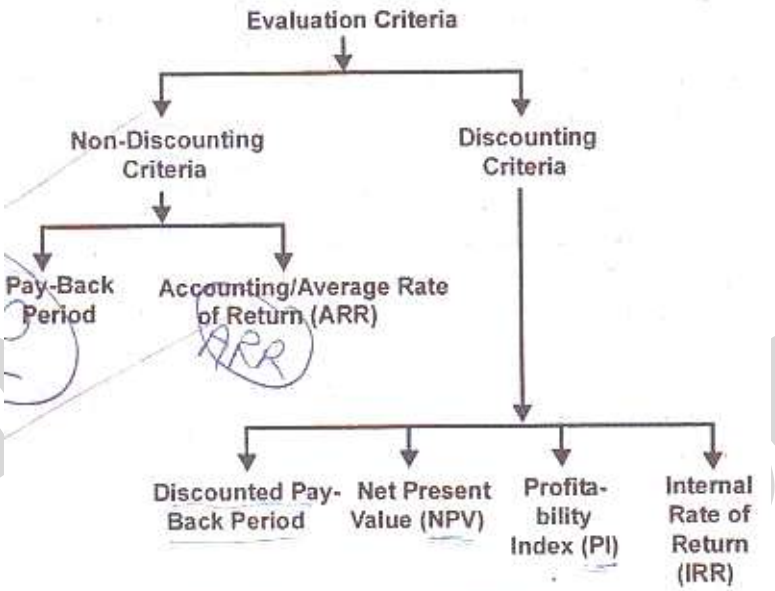


Fig.: Project Evaluation Methods

(ii) Techniques of Risk Evaluation

Meaning of Risk

Risk is defined as an exposure to loss or injury. It refers to the chance that some unfavorable event may occur. In the situation of risk, the possible events are known but which of those will actually occurs is not known. However, the probability of their occurrence can be determined. Thus, the risk may be defined as the variability which may likely to occur in future between the expected results and the actual results of the project.

Types of Risk :-

Types of Risk Associated with Project

1. Price Risk
2. Technology Risk
3. Invest Rate Risk
4. Project Competition Risk
5. Investment Risk
6. Political Risk
7. Company Specific Risk
8. Market Risk
9. Investment Risk
10. Project Specific Risk
11. General Economic Conditions
12. Industrial Conditions

Techniques or Risk Evaluation

Risk evaluation and its management is not a separate project activity but it is a part of project implementation. the project manager must consider the risk factor at the time of project selection decision. Different techniques have been suggested for analysis of risk associated with a project. These techniques have been drawn from the field of mathematics, logic, economics and psychology. They are helpful for the decision maker to make decision under condition of risk and uncertainly. However, no single technique can be deemed as best in all situations.

The risk evaluation techniques may be broadly classified into two categories:

1. General Techniques

2. Quantitative Techniques.

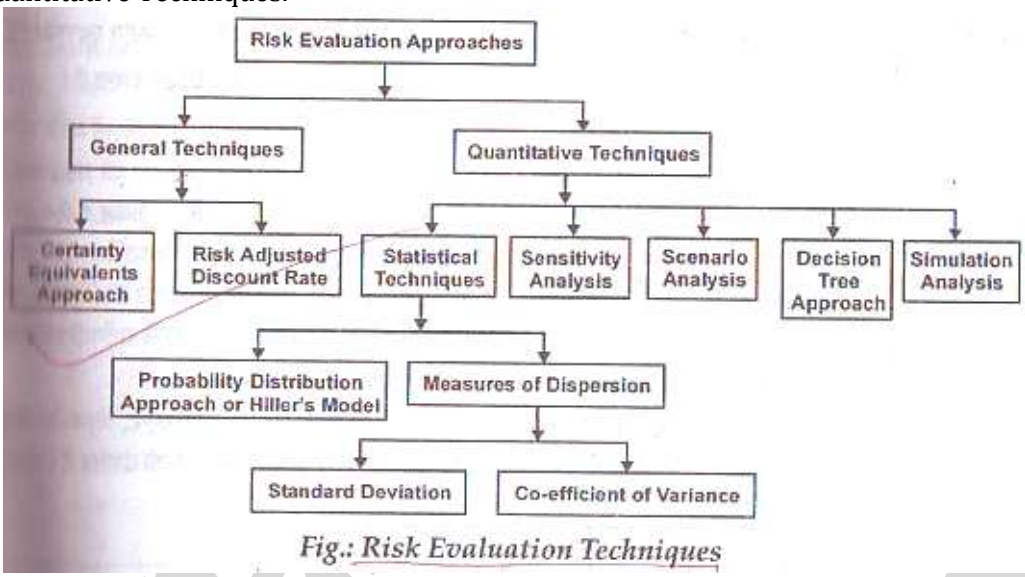


Fig.: Risk Evaluation Techniques

Sensitivity Analysis:-

Sensitivity analysis is an important technique which helps the financial manager to know what will happen to the outcomes of the project when some variable like sales or costs deviates from its expected value.

Objectives of Sensitivity Analysis

Following are the basic objectives of sensitivity analysis:

(i) To Identify the Sensitivity Variables:
(ii) To indentify the effect of Such Variables:
(iii) Trace the Variable about which Detailed Information is Required:

Steps Involved in the use of Sensitivity Analysis:

(j) Identification of all those variables, which have an influence on the NPV or IRR of the project.
(ii) Establish underlying mathematical relationship between these variables.
(iii) Analysis of the impact of the changes in each of the variables on the project's NPV or IRR.

Advantages of Sensitivity Analysis

(i) Identification of Variable
(ii) Helpful in Developing Alternative Plans
(iii) Assessment of Strength and Weakness
(iv) Indicates Need for Further Investigation
(v) Indicates the Areas of Improvement
(vi) Produce Useful Information about Projects

Limitation of Sensitivity Analysis

(i) Study of One Variable at a Time
(ii) Variables Changes in Arbitrary Manner
(iii) Does not Provide any Remedy
(iv) Subjective Analysis
(v) Does not Disclose the Probability
(vi) Variable may be independent

Scenario Analysis :-

In sensitivity analysis, it is assumed that the variable are independent and any one variable varies at a time. However, in practice, most of the time we face the situation where two or more variables change at the same time and the changes are inter-related.

In scenario analysis, different scenarios are generated and the desirability of the project is studied in each scenario.

UNIT-III & IV

NETWORK MODELS FOR PROJECT MANAGEMENT

Basic Concepts of Network –

Everyone is required to handle some project in his life. A successful implementation of the project will involve planning, co-ordination and control of the activities constituting the project.

First step in the management of the projects is to understand the inter-relationship between the various activities which constitute the project. The activities may be inter-linked with each other in various ways.

Meaning of Network Diagram –

A network diagram is a graph that uses small circles (nodes) connected by arrows to represent precedence relationships.

Activity-On-Node (AON): Activity on Node (AON) diagrams use circles (or rectangles) to represent project activity and arrows to show the required sequence.

Activity-On-Arrow (AOA): Activity on Arrow (AOA) diagrams use arrows to represent activities and nodes (or circles) to represent events.

The activities of a project are interrelated. Network techniques are found very useful for proper planning, scheduling and control of the activities of a project. A network is a graphical representation of a project. It shows the flow as well as the sequence of well defined activities and events. As a planning tool, it helps the manager to estimate the requirements of materials, equipments, manpower, costs and time for each activity or task of the project.

Critical Path Method (CPM) –

John L. Burbidge, *"One of the purpose of critical path analysis is to find the sequence of activities with ehe largest sum of duration times, and thus find the minimum time necessary to complete the project. This critical series of activities is known as the* ***Critical Path****".*

Main Objectives of CPM –

i) To find the difficulties and obstacles in the course of production process.
ii) To assign time for each operation.
iii) To ascertain the starting and finishing times of the work.
iv) To find the critical path and the minimum duration time for the project as a whole.

Situation where CPM can be effectively used –

a) In production planning
b) Location of and deliveries from a warehouse
c) Road systems and traffic schedules
d) Communication network

Various types of floats and their applications –

a) The amount of time each activity is likely to consume.
b) The earliest time by which an event can take place
c) The latest time by which an event can be completed without causing delay in scheduled termination date.
d) Identification of critical path and other paths through the network.
e) The amount of total float available between various jobs.

Free Float = Total Float – Slack of Head Event

Independent Float = Free Float – Slack of Tail Event

Program Evaluation and Review Technique (PERT) –
PERT is a time-event network analysis technique designed to watch how the parts of a programme fit together during the passage of time and events.

Major features of PERT or Requirement for PERT –

i) All individual tasks should be shown in a network. Events are shown by circles. Each circle represents an event – a subsidiary plan whose completion can be measured at a given time.
ii) Each arrow represents an activity – the time-consuming element of a programme, the effort that must be made between events.

$$t_e = \frac{t_0 + 4t_m + t_p}{6}$$

$$S.D. = \left(\frac{t_p - t_0}{6}\right) \qquad V = \left(\frac{t_p - t_0}{6}\right)^2$$

Advantages of PERT –

1) It provides clear objectives.
2) It provides an analytical approach to the achievement of an objective.
3) It enumerates detailed plans and important programmes events.
4) It establishes sequence of activities and their inter-relationship.
5) It focuses attention on important and critical activities and events.
6) It provides a logical plan of formulating a realistic schedule of activities.

Limitations of PERT –

1) It is a time-consuming and expensive technique.
2) It is based on Beta Distribution and the assumption of Beta Distribution may not always be true.
3) The expected time and the corresponding variance are only estimated values.

Difference Between PERT and CPM –

S.No.	PERT	CPM
1	PERT is appropriate where time estimates are uncertain in duration.	CPM is good when time estimate are found with certainty.
2	PERT is suitable for non-repetitive projects.	CPM is designed for repetitive projects.
3	PERT is event-oriented approach.	CPM is an activity oriented system.
4	PERT does not demarcate between critical and non-critical activities.	CPM makes critical activities.
5	PERT has three time estimates.	CPM has one time estimate.
6	PERT is suitable in defence, project and R&D where activity times cannot be predicted reliably.	CPM is suitable for problems in industrial setting, plant maintenance, expansion schemes.
7	PERT is primarily concerned with time. It helps the manager to schedule and co-ordinate activities so that the project can be completed on scheduled time.	CPM establishes a relationship between time and cost to evaluate project cost and project time.
8	A probabilistic model with uncertainty in activity duration. Expected time is calculated from t_0, t_m and t_p.	A deterministic model with well-activity, single time based upon past experience. It assumes that the expected actual time is the time taken.

CRASHING OF A PROJECT

Introduction –

Crashing can be done only if it is possible to reduce the duration of any activity by incurring extra expenditure.

Project Crashing –

The basic concept of time-cost trade off is that the duration of the project can be reduced by employing additional resources like men, material and equipments. It is important to note that only those activities which are lying on critical path should be crashed to minimize the duration of the project. When an activity is crashed, the direct costs increase because additional resources are employed but the indirect cost decreases because it is linked with the duration of the project. If the objective of crashing the project is to minimize the total costs.

Terms used in connection with the crashing of the network –

i) Crash cost
ii) Normal time
iii) Normal cost
iv) Cost-time slope(s)

$$S = \frac{(Crash\ cost - Normal\ cost)}{(Normal\ Time - Crash\ Time)}$$

$$Crash\ Cost\ Slope = \frac{Crash\ Cost - Normal\ Cost}{Normal\ time - Crash\ time}$$

Resources Leveling –

One of the major issues in project scheduling is allocation of resources. Resources include materials, labour, machine, time, funds, etc. The problem of resource allocation has two aspects: one, finding the peak level requirements and trying to arrange the resources so that the project is completed on time and two, adjusting the activities within the available slacks, so that the additional resources to be brought in are minimized.

Meaning of Resource Leveling –

Resource leveling is a technique to resolve the conflict among resources by delaying tasks. It is a form of network analysis in which resource management concerns scheduling decisions.

Project Software: MS Project –

Micro-computers are frequently used in business. A lot of project management software packages are now available for the users at reasonable price. There are some costly softwares with wider functions and better quality. However, many low priced softwar packages also offers similar services. These project management software programmes support the planning and control of various elements like project timing, budgeting, human resources and communications.

Features of PM Softwares –

i) It should be easy to learn and implement.
ii) It should have capacity to solve a wide range of problems.
iii) There should be facility to produce the reports required by management in the desired format.
iv) It should support graphs and reports in different formats.

Microsoft Project (MS Project) –

Microsoft Project (MS Project) is the most popular among the available project management software packages. This software system carries its own database and is compatible with SQL, server or oracle database. MS project provides the facility to manage multiple projects. It also provides for linking of resources between the projects and export/import of project data among the multiple projects being handled.

MS Project software supports many project management areas like scheduling, budgeting, resource management, charting, performance monitoring, risk management, analysis, reporting and communication.

Features of MS Project –

i) It can distribute resources among multiple projects from a common resource pool. The main idea is to share resources among different projects.
ii) E-mail facility can be used for communication among team members.
iii) It 'flags' certain tasks as reminder.
iv) It provides facilities for splitting tasks.
v) It analyzes project completion if 'worst' and 'most likely' cases are given.

UNIT-V

HUMAN ASPECTS OF PROJECT MANAGEMENT

Human aspects of project management –

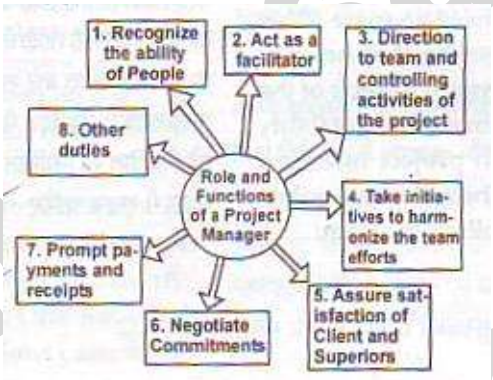
Project Management can be viewed as a process which comprises two phases – planning and control. Good planning provides the comprehensive framework for better control while good control processors generate sufficient and reliable data for planning of a new project.

The problems relating to human resource can not be solved generally in the short duration of project life.

Role and Functions of a Project Manager –

In any organization, there are two types of people: Those who give excellent ideas from their knowledge and experience but are not good at getting things done and those who are quite good at handling men and matters but are not as sound in technical matters. Project ideas generally originate from the first type of people but those who have great ideas are not necessarily good implementers.

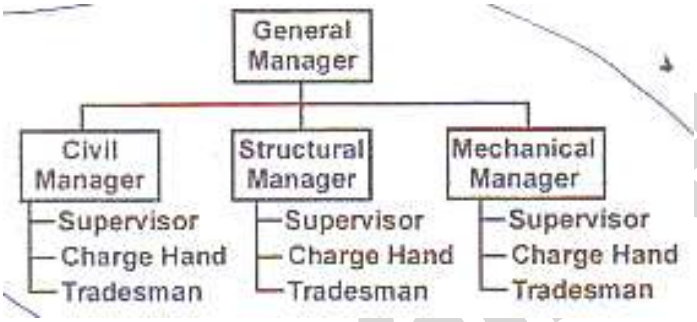
The role of a project manager is exciting and tends to be at the centre in most organizations.



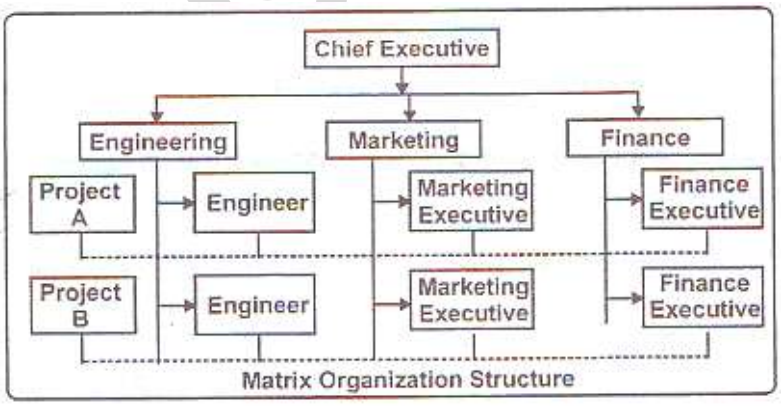
Essentials for being a successful project manager –

1) Be able to make decisions.
2) Be able to learn from past mistakes
3) Know that is going on in project in detail
4) Communicate effectively with line managers.
5) Be open to new methods.
6) Understand the team members.
7) Know how to use project tools and methods effectively.

Functional Organization Structure –



Matrix Organization Structure –



Pure Project Organization Structure –

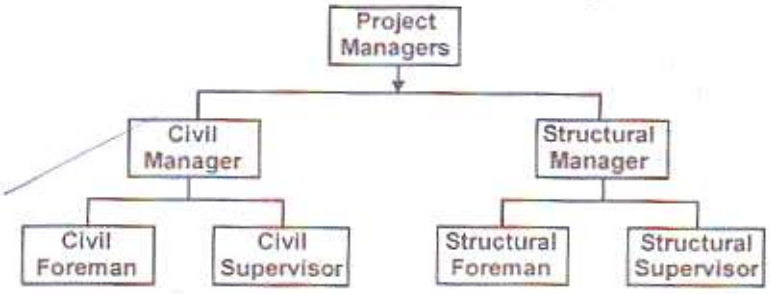


Fig.: Pure Project Organization Structure

UNIT-VI

PROJECT MONITORING

Project Monitoring –

Every organization attempts to complete the project within the given constraints of time cost and performance in terms of quality as well as quantity. The increasing size of project, complexity of organizations and technological advancements also demand that there is no lagging at any stage on any account.

Meaning of Project Management –

Monitoring involves watching the progress of a project against time, resources and performance during its execution and identifying the areas which require timely attention.

Definition –

"Monitoring means periodic checking of progress of works against the targets laid down in order to ensure timely completion of the project." – **M. Thyagarajan**

Essentials about Monitoring –

1) The primary responsibility of monitoring lies with the agency responsible for execution of the project.
2) Monitoring is a group effort. It cannot be entrusted to a single individual.
3) Monitoring team should be honest and fearless in reporting.
4) In small projects, scheduling and monitoring should be performed by one person.

Abondonment Analysis –

Generally, a project is analyzed on the assumption that the firm will operate it for a given period. However, it may be possible to abandon the project before this period. When the possibility of abandonment is considered in project analysis, it may change the decision itself.

In abandonment value analysis, the decision to abandon or not is evaluated for the present. That is, the evaluation is done to check whether, the project should be closed down now or whether it can be held for one more year. The analysis can be described in four steps.

PROJECT MANAGEMENT INFORMATION SYSTEM (PMIS)

Definition –

"PMIS can be defined as a framework and methodology through which the entire planning and control information passes back and forth between the top management and those executives of middle and lower levels engaged in the project management."

Levels:

1) Top Level Management (Project Managers)
2) Middle Level Management (Functional Managers)

Benefits of computer Based PMIS –

1) Speed
2) Capacity
3) Accuracy
4) Efficiency
5) Economy
6) Helpful in optimum decision

Features of computer based PMIS –

1) Project scheduling
2) Resource management
3) Budgeting
4) Performance analysis
5) Reporting and communication
6) Flexibility

Difference between financial audit and project audit –

Base of Difference	Financial Audit	Project Audit
1. Scope	Financial audit is concerned with efficient utilization of resources.	Project Audit attempts to ensure that the project is managed efficiently.
2. Qualification	It is carried out by qualified auditor e.g. CA.	It is carried out either by project manager or by an independent team.
3. Record keeping	Standard formats are maintained as per legal requirements.	No standard system is recommended.
4. Objective	To know the financial soundness of the project.	To assess the status of the project.
5. Measurement Tools	Accounting records and financial reports.	Budgets, schedule and progress reports.

Reasons of Project failure –

1) Inaccurate data
2) Improperly defined goal
3) Poor leadership
4) Poor planning
5) Poor project reporting
6) Labour unrest