

**SEMETER NOTES**

**PROJECT MANAGEMENT**

**SIXTH semester BBA**

**Prepared by :-**

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**Core course**

**BACHELOR OF BUSINESS ADMINISTRATION**

**BBA6B 14 PROJECT MANAGEMENT**

**Lecture Hours per week: 3 Credits: 2**

**Internal: 15: External : 60**

**Objective:** To enable the students to acquire basic knowledge of different facets of Project Management.

**Learning Outcome :** On learning the course the students will be able to-

1. Understand the different concepts of managing a project
2. Analyse the viability of a project.

**Module I: Project Management ;**Meaning, Characteristics and importance project management;

Classification of Projects, Project Life Cycle and its Phases- identification, formulation and implementation . Appraisal of Projects – Market feasibility, technical feasibility, financial feasibility -

– feasibility report. . Financial Appraisal of a Project – Project Evaluation Techniques – traditional and modern (theory only).

**20 Hours**

**Module II:**

**Project Financing;** Project Financing Capital structure, sources of finance Margin money, promoter's contribution, consortium lending and local syndication by banks, financing through markets and public issues, Term loans and debentures

**10 Hours**

**Module III:**

**Project Implementation and Control:** Organizing human resources, systems and procedure for project implementation. Working of systems, Design of systems, project work system

design, work breakdown structure, project execution plan, project control system, project diary, project control –scope/progress control, performance control, schedule control and cost control

**18 Hours**

**Reference Books**

1. Clifford F Gray, Erik W Larson, "Project Management-The Managerial Process" McGraw-Hill
2. Prasanna Chandra, Projects Planning Analysis selection, financing, Implementation, McGraw Hill
3. S.Choudhury, Project Management Tata McGraw Hill publishing.,
4. Vasanth Desai, Project Management, Himalaya Publishing House
- 5 Goel B.B. Project Management, Deep & Deep Publications Pvt. Ltd
6. Bhavesh M Patel . Project Management: Strategic Financial Planning, Evaluation, and Control, ,  
Vikas Publishing House

## **MODULE I**

### **PROJECT MANAGEMENT**

#### **1.1 Meaning and Definition**

Project in general refers to a new endeavour with specific objective and varies so widely that it is very difficult to precisely define it. Project is a temporary endeavour undertaken to create a unique product or service or result.

Project is a unique process, consist of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time cost and resource. Examples of project include Developing a watershed, creating irrigation facility, developing new variety of a crop, developing new breed of an animal, developing agro-processing centre, construction of farm building, sting of a concentrated feed plant etc. It may be noted that each of these projects differ in composition, type, scope, size and time.

#### **1.2 Characteristics and Importance of Project Management**

**1. Temporary:** Projects are temporary in nature. Every project has a beginning and end. The word 'temporary' here may refer to an hour, a day or a year. Operational work is an ongoing effort which is executed to sustain the business. But projects are not ongoing efforts. A project is considered to end when the project's objectives have been achieved or the project is completed or discontinued. Only projects are temporary in characteristic and not the project's outcomes. It will not generally be applied to the product, service or result created by the project. Projects also may often have intended and unintended social, economic and environmental impacts that long last.

**2. Definite Beginning and Completion:** Project is said to be complete when the project's objectives have been achieved. When it is clear that the project objectives will not or cannot be met the need for the project no longer exists and the project is terminated. Thus, projects are not ongoing efforts. Thus, every project has a definite beginning and end.

**3. Definite Objective/Scope and Unique:** All the projects have their own defined scopes/objectives for which they are carried out. Every project is undertaken to create a unique product, service, or result. E.g., Hundreds of house buildings may have been built by a builder, but each individual building is unique in itself like they have different owner, different design, different structure, different location, different sub-contractors, and so on. Thus, each house building is to be considered as a Project and each Project produces unique outcome.

**4. Defined Time and Resources:** As the projects have definite beginning and end, they are to be carried out within the time and resources constraints. Each project will have defined time and resources for its execution.

**5. Multiple Talents:** As projects involve many interrelated tasks done by many specialists, the involvement of people from several departments is very much essential. Thus, the use of multiple talents from various departments (sometimes from different organizations and across multiple geographies) becomes the key for successful project management. For example, take the construction of house building; the expertise of very many professionals and skills

of various people from various fields like architect, engineers, carpenters, painters, plumber, electrician, interior decorator, etc, are being coordinated to complete the house project.

### **1.3 Classification of Projects**

The projects can be classified into various types:

#### **(1) Based on Ownership**

**(a) Public Projects:** These are the projects which are done by public projects. E.g. Construction of Roads & Bridges, Adult Education Programmes, etc.

**(b) Private Projects:** These are the projects which are undertaken by private enterprises. Eg. Any business related projects such as a construction of houses by real estate builders, software development, marriage contracts, etc.

**(c) Public Private Partnerships:** These projects which are undertaken by both government and private enterprises together. E.g., Generation of Electricity by Windmill, Garbage Collection, etc.

#### **(2) Based on Investment**

**(a) Large Scale Project:** These projects involve a huge outlay or investments, say, crores. Eg. Real Estate Projects, Road Construction of manufacturing facilities, Satellite sending projects of ISRO, Unique Identification Number project of India, etc.

**(b) Medium Scale Project:** These projects involve medium level investment and are technology oriented. Example: Computer industry and electronic industry.

**(c) Small Scale Project:** These projects involve only a lesser investments. E.g., agricultural projects, manufacturing projects.

#### **(3) Based on Research in Academia**

**(a) Major Projects:** In academia, the major projects are those projects which involve more than one year to 3 or 5 years and minimum funding of Rs. 3 lakhs in case of social sciences and Rs. 5 lakh in case of sciences.

**(b) Minor Projects:** The minor projects in academia are those projects which will be completed within a year and have a maximum funding of Rs. 1 lakh in social science and Rs. 3 lakh in case of sciences.

#### **(4) Based on Sector**

**(a) Agricultural Projects:** These are the projects which are related to agricultural sector like irrigation projects, well digging projects, manuring projects, soil upgrading project, etc.

**(b) Industrial Projects:** These are the projects which are related to the industrial manufacturing sectors like cement industry, steel industry, textile industry, etc. For example, technology transfer project, marketing project, capital issue project like IPO, etc.

**(c) Service Projects:** These are the projects which are related to the services sectors like education, tourism, health, public utilities, etc. For example, adult literacy project, medical camp, general health check up camp, etc.

#### **(5) Based on Objective**

**(a) Commercial Projects:** These projects are undertaken for commercial purpose and return on investment is expected out these projects. For example, Toll roads

ased on BOLT – Build Own Lease Transfer Model or BOOT – Build Own Operate and Transfer Model, Product Launching project.

**(b) Social Projects:** These projects are undertaken for social purposes and welfare of the people is the aim of these projects. These projects are undertaken either by the Government or Service oriented Non-Governmental Organizations. For example, Polio immunization Project, Child Welfare Projects, Adult Literacy Projects, etc.

#### **(6) Based on Nature**

**(a) Conventional Projects:** These projects are traditional projects which do not apply any innovative ideas or technology or method. For example, conventional irrigational projects, handicraft projects, etc.

**(b) Innovative Projects:** These projects involve the use of technology, high R&D, development of new products and services. These innovative projects can be further classified into

- Low-Tech projects which relay on the existing and well established base technologies;
- Medium-Tech projects which rest mainly on existing base technologies but incorporate some new technology or feature;
- High-Tech projects in which most of the technologies employed are new, but existent, having been developed prior to the project's initiation; and

*i) Technology: Depending on the level of technological uncertainty at the time of initiation of projects, the projects can be classified into:*

- Super High-Tech projects which are based primarily on new, not entirely existent technologies.

#### **(7) Based on Time**

**(a) Long term projects:** These projects take a very long duration to complete. These projects are run for many years till the objective is reached. For example, Eradication of diseases like Polio, Filariasis, etc.

*ii) Research: Based on the type of research, projects can be classified into: Exploratory research projects which may generate novel idea in the domain of knowledge; constructive research projects which are mainly done by many technological corporate to find new or alternative solutions to any particular crisis or problems, eg., renewable energy research or development of the capacity of optical fiber; and Empirical research projects are very impressive observational type of research in which testing on real life data or analysis of pattern of some specific events in order to identify the nature or the class of trend that specific phenomenon maintains. New product development: These projects are undertaken in the life cycle of a product. These projects can be classified into advance development projects which aim at inventing new science or capturing new know-how for the organization; breakthrough development projects which create the first generation of an entirely new product and involve significant change in the product and process technology; platform or next generation development projects which provide a basis for a product and process family and thus establish the basic architecture for follow-on derivative projects; and derivative development projects which refine and improve selected performance dimensions. iii)*

- **(b) Medium term projects:** These projects take a medium term duration like 3 to 5 years. For example, Modernization projects, computerization of operations, etc.

- **(c) Short term projects:** These projects are executed within a short period, normally within a year. For example, Pond cleaning project, health camps, software development, etc.

- **(d) Very short term projects:** By very name you can understand that these projects are completed within a very short period, say, within a day. For example, product launch project.

#### **(8) Based on Functions**

Based on the functional area of management, the projects can be classified into:

- **(a) Marketing Projects** which are taken up in the area of marketing a product or service of an organization. Marketing road shows, implementing a marketing strategy, etc.

- **(b) Financial Projects** are undertaken to raise finance or restructure capital structure. For example, IPO Project, share split project, etc.

- (c) Human Resources Projects are undertaken in the area of human resources of an organization, e.g., Induction training project, campus recruitment project, etc.
- (d) IT and Technology Projects which are undertaken in the area of IT companies or IT related requirement of any organization, e.g., development of Human Resources Information System, Marketing Information System, etc.
- (e) Production Projects are undertaken in the area of production or operations. For example, overhauling projects, preventive maintenance projects, getting an ISO certification, etc.
- (f) Strategic Projects are taken by the organizations to execute a strategy, for example, mergers and acquisition projects, Core Banking Solution project introduced in banks, etc.
- **(9) Based on Risk**
  - (a) High Risk Projects: These projects involve a very high degree of risk, for example, nuclear energy project, thermal energy project, satellite projects, etc. If the project is not handled properly, the effect will be very adverse. Thus, high precautionary measures are to be taken to commission these projects.
  - (b) Low Risk Projects: These projects do not involve risk and they are carried out in the normal course of action. For example, road and bridge construction, house construction.
- **(10) Based on Investment Decisions**

On the basis how the projects influence the investment decision products, project can be classified into

- (a) Independent Projects: An independent project is one, where the acceptance or rejection does not directly eliminate other projects from consideration or affect the likelihood of their selection. For example, if management plans to introduce a new product line, as well as, replace a machine which is currently producing a different product. These two projects can be considered independent of each other, if there are
  - sufficient resources to adopt both, provided, they meet the firm's investment criteria.
- (b) Mutually exclusive Projects: The mutually exclusive projects are projects that cannot be followed at the same time. The acceptance of one prevents the substitute proposal from accepting. Most of them have 'either or' decisions. You will not be able to follow more than one project at the same time. The evaluation is done on a separate basis so that one that brings the highest value to the company is chosen.

- **(c) Contingent Projects:** A contingent project is one where the acceptance or rejection depends on the decision to accept or reject multiple numbers of other projects. Such projects may be complementary or substitutes. Let us take the example of bio fuel plant cultivation in a large scale and the decision to set up a bio fuel manufacturing unit. In this case, the projects are complementary to each other. The cash flows of the plant cultivation will be enhanced by the existence of a nearby manufacturing plant. Conversely, the cash flows of the manufacturing unit will be enhanced by the existence of a nearby cultivation farm.

- **(11) Based on Output**

Based on output, projects are classified into quantifiable and non-quantifiable ones.

- **(a) Quantifiable projects:** In these projects, the benefits / goals of which are amenable for measurement. Quantitative expression of the outcomes is possible. It is easy to understand and appreciate quantitative projects as it is easy to communicate them. For instance, enterprises engaged in the production of various goods and services come under this category.
- **(b) Non-quantifiable projects:** In these projects quantification of the benefits / outcome may not always be possible as the impact of the project is spread over a longer period. The benefits accrue to the intended beneficiaries in the long run. Projects concerning health, education, and environment fall under this category.

- **(12) Based on Techno-Economic Characteristics**

Based on the technology intensity, size of the investment, and scope of the project, projects are also classified as techno-economic projects. For instance, the United Nations Organization (UNO) and its various developmental agencies use the Standard Industrial Classification of all economic activities in collection and compilation of economic data regarding projects. On the basis of Techno-economic factors, projects can be further classified into a) Factor Intensity Oriented; b) Causation Oriented and c) Magnitude Oriented.

- **(a) Factor Intensity Projects:** It is anybody's knowledge that some projects are capital intensive while some are labour intensive. However, as technological advancements are taking place in every sector in a big way, many projects are becoming more technology intensive and less labour intensive. The gestation period of some of the projects also is quite long. Large scale investments are made in the plant and machinery. Economies of scale and the associated cost competitiveness also prompt the establishment of large scale organizations.
- **(b) Causation-Oriented Projects:** The availability of a particular raw material in abundance in a particular region could be the reason for conceiving projects at times. To make use of the locally available raw material, skilled workforce and to promote development of a backward region, some projects are conceived and formulated. Similarly, in a few cases, where the supply of a particular



good falls short of demand necessitating imports from abroad, entrepreneurial projects are conceived. Thus, in some case, the existing demand for goods and services cause the establishment of business organizations. The demand pull plays a dominant role in such projects.

- (c) Magnitude Oriented Projects: Based on the size of the project, projects may be classified under large, medium and small scale projects. The size of the investment, gestation period, employment generation, etc. is some of the factors that influence the size of the project.

- **(13) Based on Financial Institutions' Classification**

Financial institutions – both central and state level have classified projects into profit-oriented projects and service-oriented projects.

- (a) Profit-Oriented Projects: They are classified into
  - i) New Projects;
  - ii) Expansion Projects or Development projects;
  - iii) Modernization Projects or Technology Projects and
  - iv) Diversification Projects.
- (b) Service-Oriented Projects: They are classified into
  - i) Welfare Projects;
  - ii) Service Projects;
  - iii) Research and Development Projects and
  - iv) Educational Projects.

## **1.4 Project Life Cycle and Its Phases**

Every project, from conception to completion, passes through various phases of a life cycle synonym to life cycle of living beings. There is no universal consensus on the number of phases in a project cycle. An understanding of the life cycle is important to successful completion of the project as it facilitates to understand the logical sequence of events in the continuum of progress from start to finish. Typical project consists of four phases- Conceptualization, Planning, Execution and Termination. Each phase is marked by one or more deliverables such as Concept note, Feasibility report, Implementation Plan, HRD plan, Resource allocation plan, Evaluation report etc.

### **➤ Conceptualization Phase**

Conception phase, starting with the seed of an idea, it covers identification of the product / service, Pre-feasibility, Feasibility studies and Appraisal and Approval. The project idea is conceptualized with initial considerations of all possible alternatives for achieving the project objectives. As the idea becomes established a proposal is developed setting out rationale, method, estimated costs, benefits and other details for appraisal of the stakeholders. After reaching a broad consensus on the proposal the feasibility dimensions are analysed in detail.

#### ➤ Planning Phase

In this phase the project structure is planned based on project appraisal and approvals. Detailed plans for activity, finance, and resources are developed and integrated to the quality parameters. In the process major tasks need to be performed in this phase are :

- Identification of activities and their sequencing
- Time frame for execution
- Estimation and budgeting
- Staffing

A Detailed Project Report (DPR) specifying various aspects of the project is finalized to facilitate execution in this phase.

#### ➤ Execution Phase

This phase of the project witnesses the concentrated activity where the plans are put into operation. Each activity is monitored, controlled and coordinated to achieve project objectives. Important activities in this phase are

- Communicating with stakeholders
- Reviewing progress
- Monitoring cost and time
- Controlling quality
- Managing changes

#### ➤ Termination Phase

This phase marks the completion of the project wherein the agreed deliverables are installed and project is put in to operation with arrangements for follow-up and evaluation.

## **Life Cycle path**

The life cycle of a project from start to completion follows either a “S” shaped path or a “J” shaped path. In “S” shape path the progress is slow at the starting and terminal phase and is fast in the implementation phase. For example, implementation of watershed project. At the beginning detailed sectoral planning and coordination among various implementing agencies etc. makes progress slow and similarly towards termination, creating institutional arrangement for transfer and maintenance of assets to the stakeholders progresses slowly.

In “J” type cycle path the progress in beginning is slow and as the time moves on the progress of the project improves at fast rate. Example, in a developing an energy plantation. In this the land preparation progresses slowly and as soon as the land and seedling are transplantation is under taken.

### **1.5 Project Identification**

Project identification is an important step in project formulation. These are conceived with the objective of meeting the market demand, exploiting natural resources or creating wealth. The project ideas for developmental projects come mainly from the national planning process, whereas industrial projects usually stem from identification of commercial prospects and profit potential. As projects are a means to achieving certain objectives, there may be several alternative projects that will meet these objectives. It is important to indicate all the other alternatives considered with justification in favour of the specific project proposed for consideration. Sectoral studies, opportunity studies, support studies, project identification essentially focuses on screening the number of project ideas that come up based on information and data available and based on expert opinions and to come up with a limited number of project options which are promising.

### **1.6 Project Formulation**

“Project Formulation” is the processes of presenting a project idea in a form in which it can be subjected to comparative appraisals for the purpose of determining in definite terms the priority that should be attached to a project under sever resource constraints. Project Formulation involves the following steps

Project formulation

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Opportunity studies/support studies

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Identification of product/service



Prefeasibility study



Feasibility study (techno economic feasibility)



Project appraisal



Detailed project report.

#### ❖ Opportunity Studies

An opportunity study identifies investment opportunities and is normally undertaken at macro level by agencies involved in economic planning and development. In general opportunity studies there are three types of study – Area Study, sectoral and Sub-sectoral Studies and Resource Based Studies. Opportunity Studies and Support studies provide sound basis for project identification.

#### ❖ Pre-feasibility Studies / Opportunity Studies

A pre-feasibility study should be viewed as an intermediate stage between a project opportunity study and a detailed feasibility study, the difference being primarily the extent of details of the information obtained. It is the process of gathering facts and opinions pertaining to the project. This information is then vested for the purpose of tentatively determining whether the project idea is worth pursuing furthering. Pre-feasibility study lays stress on assessing market potential, magnitude of investment, technical feasibility, financial analysis, risk analysis etc. The breadth and depth of pre-feasibility depend upon the time available and the confidence of the decision maker. Pre-feasibility studies help in preparing a project profile for presentation to various stakeholders including funding agencies to solicit their support to the project. It also throws light on aspects of the project that are critical in nature and necessitate further investigation through functional support studies.

Support studies are carried out before commissioning pre-feasibility or a feasibility study of projects requiring large-scale investments. These studies also form an integral part of the feasibility studies. They cover one or more critical aspects of project in detail. The contents of the Support Study vary depending on the nature of the study and the project contemplated. Since

it relates to a vital aspect of the project the conclusions should be clear enough to give a direction to the subsequent stage of project preparation.

#### ❖ Feasibility Study

Feasibility Study forms the backbone of Project Formulation and presents a balanced picture incorporating all aspects of possible concern. The study investigates practicalities, ways of achieving objectives, strategy options, methodology, and predict likely outcome, risk and the consequences of each course of action. It becomes the foundation on which project definition and rationale will be based so that the quality is reflected in subsequent project activity. A well conducted study provides a sound base for decisions, clarifications of objectives, logical planning, minimal risk, and a successful cost-effective project. Assessing feasibility of a proposal requires understanding of the STEEP factors. These are as under Social, Technological, Ecological, Economic, and Political. A feasibility study is not an end in itself but only a means to arrive at an investment decision. The preparation of a feasibility study report is often made difficult by the number of alternatives (regarding the choice of technology, plant capacity, location, financing etc.) and assumptions on which the decisions are made. The project feasibility studies focus on

✓ Economic and Market Analysis

✓ Technical Analysis

✓ Market Analysis

✓ Financial Analysis

✓ Economic Benefits

✓ Project Risk and Uncertainty

✓ Management Aspects

#### **a) Economic and Market Analysis**

In the recent years the market analysis has undergone a paradigm shift. The demand forecast and projection of demand supply gap for products / services can no longer be based on extrapolation of past trends using statistical tools and techniques. One has to look at multiple parameters that influence the market. Demand projections are to be made keeping in view all possible developments. Review of the projects executed over the years suggests that many projects have failed not because of technological and financial problems but mainly because of the fact that the projects ignored customer requirements and market forces. In market analysis a number of factors need to be considered covering – product specifications, pricing, channels of distribution, trade practices, threat of substitutes, domestic and international competition, opportunities for

exports etc. It should aim at providing analysis of future market scenario so that the decision on project investment can be taken in an objective manner keeping in view the market risk and uncertainty.

### **b) Technical Analysis**

Technical analysis is based on the description of the product and specifications and also the requirements of quality standards. The analysis encompasses available alternative technologies, selection of the most appropriate technology in terms of optimum combination of project

components, implications of the acquisition of technology, and contractual aspects of licensing. Special attention is given to technical dimensions such as in project selection. The technology chosen should also keep in view the requirements of raw materials and other inputs in terms of quality and should ensure that the cost of production would be competitive.

### **c) Environmental Impact Studies:**

Almost all projects have some impact on environment. Current concern of environmental quality requires the environmental clearance for all projects. Therefore, environmental impact analysis needs to be undertaken before commencement of feasibility study. Objectives of Environmental Impact Studies are as follows

- • To identify and describe the environmental resources/values or the environmental attributes which will be affected by the project (in a quantified manner as far as possible).
- • To describe, measure and assess the environmental effects that the proposed project will have on the environmental resources/values.
- • To describe the alternatives to the proposed project which could accomplish the same results but with a different set of environmental effects.

The environmental impact studies would facilitate providing necessary remedial measures in terms of the equipment's and facilities to be provided in the project to comply with the environmental regulation specifications.

### **d) Financial Analysis**

The objective of financial analysis is to develop the project from the financial angle. Financial analysis concerns itself with the estimation of the project costs, estimation of project funds requirements. It involves the appraisal of the financial characteristics of the project so as to establish the relative merits and demerits of the project as compared to other investment opportunities. Financial analysis reduces investment proposition in diverse fields of human activity to one common scale, thereby simplifying the project in developing project financial forecasts. The Financial Analysis, examines the viability of the project from financial or

commercial considerations and indicates the return on the investments. Some of the commonly used techniques for financial analysis are as follows.

- Pay-back period.
- Return on Investment (ROI)
- Net Present Value (NPV)
- Profitability Index (PI)/Benefit Cost Ratio
- Internal Rate of Return (IRR)

#### **e) Risk and Uncertainty**

Risk and Uncertainty are associated with every project. Risk is related to occurrence of adverse consequences and is quantifiable. It is analysed through probability of occurrences. Whereas uncertainty refers to inherently unpredictable dimensions and is assessed through sensitivity analysis. It is therefore necessary to analyse these dimensions during formulation and appraisal phase of the programme. Factors attributing to risk and uncertainties of a project are grouped under the following;

- • Technical –relates to project scope, change in technology, quality and quantity of inputs, activity times, estimation errors etc.
- • Economical- pertains to market, cost, competitive environment, change in policy, exchange rate etc.
- • Socio-political- includes dimensions such as labour, stakeholders etc.
- • Environmental – factors could be level of pollution, environmental degradation etc.

#### **f) Economic Benefits:**

Apart from the financial benefits (in terms of Return on Investment) the economic benefits of the project are also analysed in the feasibility study. The economic benefits include employment generation, economic development of the area where the project is located, foreign exchange savings in case of import substitutes or earning of foreign exchange in case of export-oriented projects and others.

#### **g) Management Aspects:**

Management aspects are becoming very important in project feasibility studies. The management aspects cover the background of promoters, management philosophy, the organization set up and

staffing for project implementation phase as well as operational phase, the aspects of decentralization and delegation, systems and procedures, the method of execution and finally the accountability.

❖ Time Frame for Project Implementation:

The feasibility study also presents a broad time frame for project implementation. The time frame influences preoperative expenses and cost escalations which will impact the profitability and viability of the project.

❖ Feasibility Report:

Based on the feasibility studies the Techno economic feasibility report or the project report is prepared to facilitate

project evaluation and appraisal and investment decisions. A feasibility report is an investment proposal based on certain information and factual data appraising the project. This type of feasibility study may be required by the financing institutions, project sponsor, project owner. The feasibility report enables the project holder to know the inputs required and if rightly prepared confirms to the convictions that he is proceeding in the right direction. In other words, a project needs to be fully defined in order to provide terms of reference for the management of the project.

❖ Format of Feasibility Report

The sketch of feasibility report of project is given below:

1. Introduction
2. Summary and Recommendations
3. Product- Capacity, Chemistry, specifications, properties, application and uses.
4. Market potential
5. Process and know-how
6. Plant and machinery
7. Location of the unit
8. Plot plan and building
9. Raw materials availability
10. Utilities, requirements



11. Effluent's treatment
12. Personnel requirement
13. Capital cost
14. Working capital
15. Mode of finance
16. Manufacturing cost
17. Financial analysis
18. Implementation schedule.

❖ Check List for Feasibility Report

The following key elements must be presented in the feasibility report.

1. Examination of public policy with respect to the industry project
2. Broad specification of outputs and alternative techniques of production.
3. Listing and description of alternative locations
4. Preliminary estimates of sales revenue, capital costs and operating costs of different alternatives
5. Preliminary analysis of profitability for different alternatives.
6. Marketing analysis
7. Specification of product pattern and product price
8. Raw material investigation and specification of sources of raw material supply.
9. Estimation of material energy, flow balance and input prices.
10. Listing of major equipment by type, size and cost.
11. Listing of auxiliary equipment by type, size and cost.
12. Specification of sources of supply for equipment and process know-how.
13. Specification of site and completion of necessary investigation.
14. Listing of buildings, structures and yard facilities by type size and cost.

15. Specification of supply sources connection costs and other costs for transportation services, water supply and power
16. Preparation of layout.
17. Specification of skill-wise labour requirements and labour costs.
18. Estimation of working capital requirements
19. Phasing of activities, and expenditure during construction
20. Analysis of profitability
21. Determination of measures of combating environmental problems
22. State the preparedness to implement the project rapidly.

### **1.7 Appraisal of Projects**

The exercise of project appraisal simply means the assessment of a project in terms of its economic, social and financial viability. This exercise basically aimed at determining the viability of a project and sometimes also in reshaping the project so as to upgrade its viability i.e., it aims at sizing up the quality of projects and their long-term profitability. Appraisal of term loan proposals (projects) is an important exercise for the financial institutions and investing companies in credit decisions. The art of project appraisal puts more emphasis on the economic and technical soundness of the project and its earning potential than on the

adequacy and liquidity of the security offered. Hence, the process of appraisal should require more dynamic approach as it is linked with a sense of uncertainty. The appraisal process generally concentrates on the following aspects.

#### **❖ Market and demand Appraisal:**

Appraisal of commercial viability means assessment of marketability of the end-product. Therefore, at the time of assessment of commercial viability, the following points require careful consideration.

- Size and prospective growth of the market which the unit is required to cater like nature of population, their purchasing power, their educational background, fashion etc.
- Demand and supply position of the product in the national and international market
- Nature of competition

- Pricing policy including prospective prices vis-a-vis the quality of the product
- Marketing strategy and selling arrangements made by the unit adequacy of sales force
- Export potential

❖ **Technical Appraisal:** A project is considered to be technically feasible, if it is found to be 'sound' from technical and engineering point of view. It is an attempt to find out how well the technical requirements of the unit can be met, which location would be most suitable and what the size of plant and machinery should be. Technical Appraisal covering product mix, Capacity, Process of manufacture engineering know-how and technical collaboration, Raw materials and consumables, Location and site, Building, Plant and

equipment, Manpower requirements and Breakeven point.

❖ **Environmental Appraisal:** Impact on land use and micro-environment, commitment of natural resources, and Government policy.

❖ **Financial Appraisal:** The basic purpose of financial appraisal is to assess whether the unit will generate sufficient surplus so as to meet the outside obligations. Financial appraisal usually examines two aspects of finance: The cost of the project i.e., the amount required to complete the project and bring it to normal operation. The means of financing the cost i.e., the sources from which the required funds are to be raised. After computing the cost of the project and means of finance, the various factors required for assessment of financial viability which a banker should carefully examine, are as under Capital, rate of return, specifications, contingencies, cost projection, capacity utilization, and financing pattern.

❖ **Economic Appraisal:** Considered as a supportive appraisal it reviews economic rate of return, effective rate of protection and domestic resource cost.

❖ **Managerial Appraisal:** This is the most difficult job to evaluate the “MAN or MEN” behind the project. It has been the practical experience of the bank/ financial institutions that even the most technically feasible and financially/commercially viable project has been a total failure because of lack of management experience. The problem may become all the more serious if the management is dishonest/delinquent rather than inefficient and ineffective. Unfortunately, there is no scientific yardstick by which managerial competence can be judged objectively.

❖ **Social Cost Benefit Analysis (SCBA):** Social Cost Benefit Analysis is a methodology for evaluating projects from the social point of view and focuses on social cost and benefits of a project. There often tend to differ from the costs incurred in monetary terms and benefits earned in monetary terms by the project SCBA may be based on UNIDO method or the Little-Mirriles (L-M) approach. Under UNIDO method the net benefits of the project are considered in terms of economic (efficiency) prices also referred to as shadow prices. As per the L-M approach the

outputs and inputs of a project are classified into (1) traded goods and services (2) Non traded goods and services; and (3) Labor. All over the world including India currently the focus is on Economic Rate of Return (ERR) based on SCBA assume importance in project formulation and investment decisions.

### **1.8 Components of Feasibility Study**

The analysis is mainly interested only in the commercial profitability and thus examining only the market, technical and financial aspects of the project. But, generally the gamut of feasibility of a project covers the following areas. 1. Commercial and economic feasibility 2. Technical feasibility 3. Financial feasibility 4. Managerial feasibility 5. Social feasibility or acceptability

#### **A) Commercial and Economic Feasibility**

The economic feasibility aspect of a project relates to the earning capacity of the project. Earnings of the project depends on the volume of sales. If taken into consideration the following important indicators.

- ✓ Present demand of the goods produced through the project. i.e., market facility (or) getting a feel of the market.
- ✓ Future demand: a projection may be made about the future demand. The period normally depends upon the scale of investment.
- ✓ Determining the extent of supply to meet the expected demand and arriving at the gap.
- ✓ Deciding in what way the project under consideration will have a reasonable chance to share the market.
- ✓ Anticipated rate of return on investment. If it is positive the project justifies the economic norm in the relationship between cost and demand

Future demand can be estimated after failing into consideration the potentialities of the export market, the charges in the income and prices, the multiples use of the product, the probable expansion of industries and the growth of new industries. The share of the proposed project in the market could be identified by considering the factors affecting the supply position such as competitive position of the unit, existing and potential competitors, the extent of capacity utilisation, units' costs advantages and disadvantages, structural changes and technological innovations bringing substitute into the market.

The commercial feasibility of a project involves a study of the proposed arrangements for the purchase of raw materials and sale of finished products etc. This study comprises the following two aspects.

- ✓ Arriving at the physical requirement of production input such as raw materials, power, labour etc., at

various level of output and converting them into cost. In other words, deciding costing pattern.

- ✓ Matching costs with revenues with a view to estimating the profitability of the project and the break-even point. The possibility ultimately decides whether the project will be a feasible proposition.

## **B) Technical Feasibility**

The examination of this aspect requires a thorough assessment of the various requirements of the actual production process and includes a detailed estimate of the goods and services needed for the project. So, the feasibility report should give a description of the project in terms of technology to be used, requirement of equipment, labour and other inputs. Location of the project should be given special attention in relevance to technical feasibility. Another important feature of technical feasibility relates the types of technology to be adopted for the project. The exercise of technical feasibility is not done in isolation. The scheme has also to be viewed from economic considerations; otherwise, it may not be a practical proposition however sound technically it may be.

The promoters of the project can approach the problem of preparation of technical feasibility studies in the following order

- ✓ Undertaking a preliminary study of technical requirements to have a quick evaluation.

- ✓ If preliminary investigation indicates favourable prospects working out further details of the project.

The exercise begins with engineering and technical specifications and covers the requirements of the proposed project as to quality, quantity and specification type of

components of plant & machinery, accessories, raw materials, labour, fuel, power, water, effluent disposal transportation etc

Thus, the technical feasibility analysis is an attempt to study the project basically from a technician's angle. The main aspects to be considered under this study are: technology of the

project, size of the plant, location of the project, pollution caused by the project production capacity of the project, strength of the project. Emergency or stand-by facilities required by the project sophistication such as automation, mechanical handling etc. required collaboration agreements, production inputs and implementation of the project.

### **C) Financial Feasibility**

The main objective of this feasibility study is to assess the financial viability of the project. Here, the main emphasis is in the preparation of financial statement, so that the project can be evaluated in terms of various measures of commercial profitability and the magnitude of financing required can be determined. The decision about the financial feasibility of a project should be arrived at based on the following consideration:

- ✓ For existing companies, audited financial statements such as balance sheets, income statements and cash flow statements.
- ✓ For projects that involve new companies, statements of total project cost, initial capital requirements, and cash flow relative to the projective time table.
- ✓ Financial projections for future time periods, including income statements, cash flows and balance sheets.
- ✓ Supporting schedules for financial projections stating assumptions used as to collection period of sales, inventory levels, payment period of purchases and expenses and elements of production cost, selling administrative and financial expenses.
- ✓ Financial analysis showing return on investment return on equity, break-even volume and price analysis.
- ✓ If necessary, sensibility analysis to identify items that have a large impact on profitability or possibly a risk analysis

### **D) Managerial Feasibility**

The success or failure of a project largely depends upon the ability of the project holder to manage the project. Project is a bundle of activities and each activity has its own role. For the success of a project, a project holder has to co-ordinate all the activities in such a way that the additive impact of different inputs can produce the desired result. The ability to manage and organise all such inter related activities come within the concept of management. If the person in charge of the project, has the ability, has the ability to manage all such activities, the desired result can be anticipated. There are three ways to measure the managerial efficiency

- a. Heredity skill
- b. Skill acquired through training.
- c. Skill acquired in course of work

## **E) Social Feasibility**

A project may cross all the above barriers mentioned above and found very suitable but it will lose its entire creditability, if it has no social acceptance. Though the social customs, conventions such as caste community, regional influence etc. are creating hindrance for development of a project should avoid all such social conflicts which will stand on the successful implementation of the project. (e.g.) Considering the interests of the general public; projects which offer large employment potential, which channelise the income from less developed areas will stimulate small industries. In a nut shell, the feasibility report should highlight on these five testing stones before it can be declared as complete and only after judging through these indicators a project can be declared as viable and can be submitted for finance or any other assistance from any institutions.

## **1.9 Financial Appraisal of a Project**

The basic purpose of financial appraisal is to assess whether the unit will generate sufficient surplus so as to meet the outside obligations. Financial appraisal usually examines two aspects of finance: The cost of the project i.e., the amount required to complete the project and bring it to normal operation The means of financing the cost i.e., the sources from which the required funds are to be raised.

Financial evaluation has the objective of ascertaining the financial viability of the project by close scrutiny of the capital cost, operating cost and revenue projections. Following are the parameters of the financial evaluation of the project:

- **Debt-equity ratio:** the equity shareholding in the total capital structure of the company is determined by the agreed debt equity ratio. While the institutions have the stipulated norms for the debt equity compositions for different categories of industries, these are not very rigid.
- **Promoters' contribution:** The promoter is expected to bring in his share of cost, representative his financial stake in the project. This is referred to as the promoters' contribution. The financial institutions stipulate the quantum of such contributions as a precondition to their project financing. Industries located in the specified categories of backward areas are eligible for central investment subsidies which get reckoned as part of equity.
- **Debt-service coverage:** The cash flow represented but the profit after tax but before depreciation and interest on terms of loans is related to the sum of the instalment due on the

principal and the interest on the term loan outstanding. If the cash flow is 1.5 to 2 times the total amount due as above, the project is deemed to be sound and viable.

- **• Repayment schedule:** Usually, the institutions allow a moratorium of 2 years from the commencement of commercial production before the repayment of the loan starts. The loan repayment is generally expected to be completed in 8 – 10 years of the commencement of the commercial production

- **• Syndication:** where a group of institutions participate in financing the project, they come to an understanding on the proportion in which they will be providing funds. IDBI is generally expected to take a substantial share in such joint financing.

- **• Conversion:** The financial institutions stipulate that they will have a discretion or option to convert term loan and/or debentures into equity on agreed terms. However, such conversion will not lead to equity holding of the institutions being in excess of 40% of

- the company's issued capital and conversion option will be available only after three years of commencement of production.

- **• Nominee directors:** Nominee directors should be appointed on the boards of all the MRTTP companies assisted by the institutions in respect of the non MRTTP companies, the nominee directors are to be appointed on the selective basis. One or more of the following conditions should be found to exist for having their nominee directors appointed in such instances

➤ The unit has run into rough weather and is likely to become sick.

➤ The financial institution holds more than 26% of the share capital.

➤ Where the stake of the financial institution by way of loan/ investments exceeds Rs. crores.

- **• Operating Costs and Revenue:** Projects operating costs and revenues, on an annual basis have to be made for a 10-year period, which is scrutinised by the project team of the financial institution. The assumption pertaining to quantities, rates, availability of inputs and services, market demands, price realisation and expectation of capacity utilisation are all subjected to close review.

- **• Extent of financing:** The amount and modes of financing depend on the nature and size of the project, the accepted norms in respect of promoter's contribution, debt-equity ratio, debt service coverage, etc. besides factors such as the resources of the financial institution and requirement in respect of listing of securities in the Stock Exchanges



- **Returns:** Financial institution use the different techniques of financial evaluation including pay-back period, internal rate of return, return on investment etc. depending on the nature of projects being reviewed. It is expected that the project will have a debt service ratio ranging from 1.5 to 2 and will be able to pay a dividend on equity of not less than 10 % within three years of commencement of production.
- **Risks:** Careful assessment of the risk is associated with the project is a prime necessity associated may be industry-specific, particular project, its product, the concerned market conditions, the company's capital structure and the nature securities offered by it.

Eventually financial evaluation of project has 4 important aspects

- The appropriateness of the capital cost estimate;
- The reliability of the estimates of the operating costs, revenues and surpluses;
- The adequacy of return on investment to service equity and debt; and
- The matching of financing pattern to the project's requirements.

#### 1.10 Project Evaluation Techniques

It is the final stage of project management. The process of measuring the progress made and assessment of the results of a project is known as project evaluation.

#### Meaning of Project Evaluation

It is derived from the Latin word 'Valuere'. It means determination of value of an activity or a thing. It is the process of appraising the progress and performance in relation to the project's initial or revised plan. It also appraises the project against the project goals and objectives. It measures how far the objectives have been achieved so far.

#### Importance of Project Evaluation

Project Evaluation helps the organization improve its projects management skills on future projects. It helps to know whether the project is moving according to plan or not. It brings into light the project's strengths and weaknesses. It gives the management a good idea of how the project is progressing. Thus, project evaluation measures the success of a project.

#### Methods of Project Appraisal

The most important and popular of these can be classified into two broad categories as follows:

**Non-Discounting Techniques or Traditional Methods:** - It does not take into consideration the time value of money. Important traditional methods may be discussed as follows:

**a.Urgency Method:** - Urgency or degree of necessity plays an important role and project that cannot be postponed is undertaken first.

### **Merits**

- ✓ It is a very simple technique.
- ✓ It is useful in case of short-term projects requiring lesser investment.

### **Demerits**

- ✓ Selection is not made on the basis of economical consideration but just on the basis of situation.
- ✓ It is not based on scientific analysis.
- It is simple to understand and easy to apply.
- It is very important for cash forecasting, budgeting and cash flow analysis.

**Decision Rule (Or Selection Criterion):** - According to pay back criterion, the shorter the payback period, the better the project.

**b) Pay Back Method:** It is cash-based technique. It is a period over which the investment would be paid back. It is a breakeven point of the project, where the accumulated returns equal investment. It is also called 'pay-out' or 'pay-off' period or 'recoupment' or 'replacement period'.

1. When Annual Cash Inflows Are Equal: - when cash inflows/ benefits are even or equal pay back period is calculated as follows: -

2. When Annual Cash Inflows Are Unequal: when cash inflows/ benefits are not equal pay back period is calculated in the form of cumulative cash inflows as follows: -

**Advantages of Pay Back Method** • It minimizes the possibility of losses through obsolescence.

- It takes into account liquidity.
- It is easier for projects yielding returns in initial years • It ignores the time value of money.
- It completely ignores cash inflows after the payback period.
- This method does not measure profitability of projects.

- It does not measure the rate of return.
- It may become misleading because it is based on a single factor.

❖ Disadvantages of pay back method

❖ It insists only on recovery of the cost of the project.

**C) Post Pay Back Method:** - The post pay back method has been evolved to overcome the limitations of pay back method. Under this method, the entire cash inflows generated from a project during its working life are taken into account. It is calculated as under:

Post Pay Back Profitability = Total Cash Inflows in Life - Initial Cost

Or

Annual Cash Inflows  $\times$  (Total Life – Pay Back Period)

The second alternate formula is useful only when annual cash inflows are equal

#### **D) Average Rate of Return Method (ARR)**

It represents the ratio of the average annual profits to the average investment in the project. It is based on accounting profits and not cash flows. This is also known as Accounting Rate of Return Method or Return on Investment Method or Unadjusted Rate of Return Method. ARR is found out by dividing average income by the average investment. It is calculated with the help of the following formula:

**Decision Rule (Or Selection Criterion)** The higher the ARR, the better the project. If the projects are mutually exclusive, the project with highest rate of return is selected. If the calculated ARR is equal to or more than the company's target rate of return, the project will be accepted. If the calculated ARR is less than the company's target rate of return, the project will be totally rejected.

#### **Advantage of ARR**

- It is simple to understand and easy to apply.
- It takes into consideration earnings over the entire life of the project.
- It considers profitability of the investment.
- Projects of different character can be compared.
- Rate of return may be readily calculated with the help of accounting data.

#### **Disadvantages of ARR**

- This method does not give any importance to the time value of money.
- It does not differentiate between the size of the investment required for each project
- It is based upon accounting profits, instead of cash flow.
- It considers only the rate of return and not the life of the project.
- It ignores the fact that profit can be reinvested.

**Discounting Techniques or Modern Methods:** - It take into consideration the time value of money. Important modern methods may be discussed as follows:

- **a) Discounted Pay Back Period**

A major short coming of the payback period method is that it does not take into account the time value of money. To overcome this limitation, the discounted pay back method is suggested. In this method, cash flows are first converted into their present values (by applying suitable discounting factors) and then added to ascertain the period of time required to recover the initial outlay on the project.

- **b) Net Present Value Method (NPV): -**

NPV method involves discounting future cash flows to present values. The cash outflow (i.e., initial investment whose present value is the same) is deducted from the sum of the present values of future cash inflows (returns or benefits). The balance amount is NPV which may be either positive or negative. If the NPV is positive, it means that the actual rate of return is more than the discount rate and it contributes to the wealth of the shareholders. A negative

- It takes into account the time value of money.
- It focuses attention on the objective of maximization of the wealth of the project.
- It considers the cash flow stream over the entire life of the project.
- It is highly useful in case of mutually exclusive projects.
- This method is most suitable when cash inflows are not uniform.
- This method is generally preferred by economists • It involves complicated calculations.
- It is difficult to select the discount rate.
- This method is not suitable in case of projects involving different amounts of investment.

- • The relative desirability of project will change with a change in the discount rate.
- • Not suitable in case of two projects having different useful lives.

NPV indicates that the project is not even covering the cost of capital. It means that the actual rate of return is less than the discount rate.

### **Advantages of NPV**

➤ Disadvantages of NPV

#### **c) Benefit Cost Ratio (Profitability Index Method): -**

Two projects having different investment outlay cannot be compared by Net Present Value method because it indicates the NPV in absolute terms. In such a situation Benefit Cost

Ratio should be applied. It is the ratio of benefits (cash inflows) to (cash outflows). It is the ratio present value of cash inflows to present value of cash outflows. Thus, it measures present value of returns. This method is also known as Profitability Index or Present Value Index Method.

**Decision Rule (Or Selection Criterion)** “Accept the project if it’s PI (Profitability Index) is more than one and reject the project if its PI is less than one. In the case of mutually exclusive projects, the project with higher PI is to be selected. Higher the Profitability Index better is the project.

### **Advantages of Benefit Cost Ratio / Profitability Index**

- It is very scientific and logical
- It is based upon the real profitability of projects.
- It is very useful to compare the projects having different investments.
- It reflects time value of money.
- It considers all cash flows during the life of the project.

### **Disadvantages of Benefit Cost Ratio / Profitability Index**

- It is comparatively difficult to understand and follow
- This method is not in accordance with accounting principals
- It cannot be used for comparing those projects having unequal lives.
- It is difficult to estimate effective life of a project.

#### **D) Internal Rate of Return (IRR): -**

IRR was first introduced by Joel Dean. In IRR, we try discounting at different discount rates until we reach the rate at which the present value of cash inflows to present value of cash outflows (investment). Thus, internal rate of return is the rate at which total present value of future cash flows is equal to initial investment. In other words, it is the rate at which NPV is zero. This rate is called the internal rate because it exclusively depends on the initial outlay and cash proceeds associated with the project and not by any other rate outside the investment.

#### **Calculation of IRR**

NPV indicates the present value of the cash flows of a project at a particular discount rate. IRR attempts to ascertain the interest rate at which the present value of cash inflow is made equal to the initial investment is a time adjusted rate of return which equates present value of cash flows with original cash outflow can be calculated through the following steps.

1. Obtain the annuity table factor using formula

**F = Investment of the project/Annual cash inflow**

1. Locate the factor in the annuity table, corresponding to the number of years of the project, to obtain the discount percentage intervals.
2. Ascertain the exact discount percentage using interpolation

**Decision Rule (Or Selection Criterion):** - The calculated IRR is compared with the desired minimum rate of return. If the IRR is greater than the desired minimum rate of return, the project is accepted and if it is less than the desired minimum rate of return, then the project is rejected.

#### **Advantages of IRR**

1. This method considers all the cash flows over the entire life of the project.
2. Cost of capital need not be calculated.
3. IRR gives a true picture of the profitability of the project even in the absence of cost of capital.
4. Projects having different degrees of risk can easily be compared.
5. It takes into account the time value of money.

#### **Disadvantages**

1. It is difficult to understand and use in practice because it involves tedious and complicated calculation.
2. Sometimes it may yield negative rate or multiple rates which is rather confusing.

3. It is applicable mainly in large projects.
4. It yields results inconsistent with the NPV method if projects differ in their expected life span, investment timing of cash flows.

## **Module II**

### **PROJECT FINANCING**

Project Finance can be characterised in a variety of ways and there is no universally adopted definition but as a financing technique, the definition is:

*“the raising of finance on a Limited Recourse basis, for the purposes of developing a large capital intensive infrastructure project, where the borrower is a special purpose vehicle and repayment of the financing by the borrower will be dependent on the internally generated cash flows of the project”.*

The terms ‘Project Finance’ and ‘Limited Recourse Finance’ are typically used interchangeably and should be viewed as one in the same. Indeed, it is debatable the extent to which a financing where the Lenders have significant collateral with (or other form of contractual remedy against) the project shareholders of the borrower can be truly regarded as a project financing. The ‘limited’ recourse that financiers have to a project’s shareholders in a true project financing is a major motivation for corporates adopting this approach to infrastructure investment.

Project financing is largely an exercise in the equitable allocation of a project’s risks between the various stakeholders of the project. Indeed, the genesis of the financing technique can be traced back to this principle.

### **Pre-requisites to Project Finance**

There are clear advantages to using Project Finance as a tool for financing large infrastructure projects. Nevertheless, there are a number of practical pre-conditions to financing a project on a Limited Recourse basis:

**3. Accessible financing:** From both Sponsor and (if applicable) Procurer perspectives, high leverage and long-tenor financing is a de facto requirement to achieving attractive economics for large infrastructure financings. **2. Identifiable risks:** An unidentified and unmitigated risk could potentially jeopardise the stability of a project. **1. Sustainable economics:** Whilst comfort can be gained from (a) undertaking detailed financial due diligence and modelling to stress-test the projected cashflows of the asset and (b) contractually mitigating revenue risk, experienced investors and bankers will ultimately look for a clearly identifiable demand for the project’s goods or services in order to ‘rationalise the credit’. **4. Political stability:** Even if political ‘force majeure’ risk is contractually born by the government (as is common practise in many PPP programs), the efficacy of that remedy to Lenders/investors would be negated by a strategic sovereign default – expropriation/nationalisation of assets being one potential example. Whilst such risks cannot be mitigated against in the insurance markets, varying degrees of political risk insurance can be obtained through the use of financing products available from multilateral and export credit agencies.

If the pre-conditions above are satisfied, there is good chance that a project financing for an infrastructure asset is achievable.

Nevertheless, the complex legal, technical and financial structures inherent to a Limited Recourse financing generally necessitate higher upfront transactional costs than traditional corporate lending (through advisors fees and higher debt pricing) as well as a longer execution timetable. However:



- additional transactional costs are usually capitalised into the overall project budget to be financed and will therefore represent a minor percentage of total Project Costs for a large infrastructure endeavour. Moreover, Project Finance debt facilities are typically structured with long repayment tenors (to better match the economic life of the underlying asset) and hence all capitalised costs are amortised over a long period of time; and
- although the execution timeline for a greenfield project financing can be anything from 12-18 months (from inception to financial close), this is principally a function of the sophisticated risk allocation and lender due diligence processes of Limited Recourse finance – processes which, it can be argued, provide a critical governance mechanism to the Sponsors/Procurer.

## **Stakeholder's Role in Project Financing**

### **Sponsors**

- The equity investor(s) and owner(s) of the Project Company – can be a single party, or more frequently, a consortium of Sponsors
- Subsidiaries of the Sponsors may also act as sub-contractors, feedstock providers, or off-taker to the Project Company
- In PPP projects, the Government/Procurer may also retain an ownership stake in the project and therefore also be a Sponsor

### **Procurer**

Only relevant for PPP - the Procurer will be the municipality, council or department of state responsible for tendering the project to the private sector, running the tender competition, evaluating the proposals and selecting the preferred Sponsor consortium to implement the project.

### **Government**

The government may contractually provide a number of undertakings to the Project Company, Sponsors, or Lenders which may include credit support in respect of the Procurer's payment obligations (real or contingent) under a concession agreement.

### **Contractors**

The substantive performance obligations of the Project Company to construct and operate the project will usually be done through engineering procurement and construction (EPC) and operations and maintenance (O&M) contracts respectively.

### **Feedstock provider(s) and/or Off-taker**

- • More typically found in utility, industrial, oil & gas and petrochemical projects
- • One or more parties will be contractually obligated to provide feedstock (raw materials or fuel) to the project in return for payment
- • One or more parties will be contractually obligated to 'off-take' (purchase) some or all of the product or service produced by the project
- • Feedstock/Off-take contracts are typically a key area of lender due diligence given their criticality to the overall economics of the project (i.e. the input and output prices of the goods or services being provided)

## **Lenders**

Typically including one or more commercial banks and/or multilateral agencies and/or export credit agencies and/or bond holders.

## **Project Financing Capital structure**

### **1. Cost of Project**

Conceptually, the cost of project represents the total of all items of outlay associated with a project which are supported by long-term funds. It is the sum of the outlays on the following:

- **a) Land and site development**
- **b) Buildings and civil works**
- **c) Plant and machinery**
- **d) Technical know how and engineering fees**
- **e) Expenses on foreign technicians and training of Indian technicians abroad**
- **f) Miscellaneous fixed assets**
- **g) Preliminary and capital issue expenses**
- **h) Pre-operative expenses**
- **i) Margin money for working capital**
- **j) Initial cash losses**
- **2. Land and Site Development**

The cost of land and site development is the sum of the following:

- **a) Basic cost of land including conveyance and other allied charges**
- **b) Premium payable on leasehold and conveyance charges**
- **c) Cost of levelling and development**
- **d) Cost of laying approach roads and internal roads**
- **e) Cost of gates**
- **f) Cost of tube wells**

The cost of land varies considerably from one location to another. While it is very high in urban and even semi-urban locations, it is relatively low in rural locations. The expenditure on site development, too, varies widely depending on the location and topography of the land.

### **3. Buildings and Civil Works**

Buildings and civil works cover the following:

- **a) Buildings for the main plant and equipment.**
- **b) Buildings for auxiliary services like steam supply, workshops, laboratory, water supply, etc.**
- **c) Godowns, warehouses, and open yard facilities.**
- **d) Non-factory buildings like canteen, guest houses, time office, excise house, etc.**
- **e) Quarters for essential staff.**
- **f) Silos, tanks, wells, chests, basins, cisterns, hoppers, bins, and other structures necessary for installation of the plant and equipment.**
- **g) Garages Sewers, drainage, etc.**
- **h) Other civil engineering works.**

The cost of the buildings and civil works depends on the kinds of structures required which, in turn, are dictated largely by the requirements of the manufacturing process. Once the kinds of

structures required are specified, cost estimates are based on the plinth area and the rates for various types of structures. These rates, of course, vary with the location to some extent.

#### **4. Plant and Machinery**

The cost of the plant and machinery, typically the most significant component of the project cost, consists of the following:

- **a) Cost of Imported Machinery:** This is the sum of
  - (i) FOB (free on board) value,
  - (ii) shipping, freight, and insurance cost,
  - (iii) import duty, and
  - (iv) clearing, loading, unloading and transportation charges.
- **b) Cost of Indigenous Machinery:** This consists of
  - (i) FOR (free on rail) cost,
  - (ii) sales tax, octroi, and other taxes, if any, and
  - (iii) railway freight and transport charges to the site

#### **5. Cost of Stores and Spares**

#### **6. Foundation and Installation Charges**

The cost of the plant and machinery is based on the latest available quotation adjusted for possible escalation. Generally, the provision for escalation is equal to the following product: (latest rate of annual inflation applicable to the plant and machinery)  $\times$  (length of the delivery period).

#### **7. Technical Know-how and Engineering Fees**

Often it is necessary to engage technical consultants or collaborators from India and/or abroad for advice and help in various technical matters like preparation of the project report, choice of technology, selection of the plant and machinery, detailed engineering and so on. While the amount payable for obtaining the technical know-how and engineering services for setting up the project is a component of the project cost, the royalty payable annually, which is typically a

percentage of sales, is an operating expense taken into account in the preparation of the projected profitability statements.

## **8. Expenses on Foreign Technicians and Training of Indian Technicians Abroad**

Services of foreign technicians may be required in India for setting up the project and supervising the trial runs. Expenses on their travel, boarding, and lodging along with their salaries and allowances must be shown here. Likewise, expenses on Indian technicians who require training abroad must also be included here.

## **9. Miscellaneous Fixed Assets**

Fixed assets and machinery which are not part of the direct manufacturing process may be referred to as miscellaneous fixed assets. They include items like furniture, office *School of* machinery and equipment, tools, vehicles, railway siding, diesel generating sets, transformers, boilers, piping systems, laboratory equipment, workshop equipment, effluent treatment plants, fire fighting equipment, and so on. Expenses incurred for the procurement or use of patents, licences, trade marks, copyrights, etc. and deposits made with the electricity board may also be included here.

## **10. Preliminary and Capital Issue Expenses**

Expenses incurred for identifying the project, conducting the market survey, preparing the feasibility report, drafting the memorandum and articles of association, and incorporating the company are, referred to as preliminary expenses. Expenses borne in connection with the raising of capital from the public are referred to as capital issue expenses. The major components of capital issue expenses are: underwriting commission, brokerage, fees to managers and registrars, printing and postage expenses, advertising and publicity expenses, listing fees, and stamp duty.

## **11. Pre-operative Expenses**

Expenses of the following types incurred till the commencement of commercial production are referred to as pre-operative expenses:

- i        (i) establishment expenses,
- ii       (ii) rent, rates, and taxes,
- iii      (iii) travelling expenses,
- iv       (iv) interest and commitment charges on-borrowings,

- v (v) insurance charges,
- vi (vi) mortgage expenses,
- vii (vii) interest on deferred payments,
- i (viii) start-up expenses, and
- ii (ix) miscellaneous expenses.
- iii **12. Provision for Contingencies**

A provision for contingencies is made to provide for certain unforeseen expenses and price increases over and above the normal inflation rate which is already incorporated in the cost estimates. To estimate the provision for contingencies the following procedure may be followed:

- i (i) Divide the project cost items into two categories, viz., 'firm' cost items and 'non-firm' cost items (firm cost items are those which have already been acquired or for which definite arrangements have been made).
- ii (ii) Set the provision for contingencies at 5 to 10 percent of the estimated cost of non-firm cost items. Alternatively, make a provision of 10 percent for all items (including the margin money for working capital) if the implementation period is one year or less. For every additional one year, make an additional provision of 5 percent.

### iii **13. Margin Money for Working Capital**

The principal support for working capital is provided by commercial banks and trade creditors. However, a certain part of the working capital requirement has to come from long-term sources of finance. Referred to as the 'margin money for working capital', this is an important element of the project cost. The margin money for working capital is sometimes utilised for meeting over runs in capital cost. This leads to a working capital problem (and sometimes a crisis) when the project is commissioned. To mitigate this problem, financial institutions stipulate that a portion of the loan amount, equal to the margin money for working capital, be

blocked initially so that it can be released when the project is completed.

### **14. Initial Cash Losses**

Most of the projects incur cash losses in the initial years. Yet, promoters typically do not disclose the initial cash losses because they want the project to appear attractive to the financial institutions and the investing public. Failure to make a provision for such cash losses in the project cost generally affects the liquidity position and impairs the operations. Hence prudence calls for making a provision, overt or covert, for the estimated initial cash losses.

## **Sources of Finance Margin Money**

The major classification of long-term sources is debt financing (outsider's liability) and equity financing (insider's liability).

### **Debt Financing**

Debt funds are the outsider's liability. The funding agencies evaluate the project and provide finance for the same with predetermined terms of returns and repayments. The repayment schedule is predetermined and so is the interest rate. The term, or time limit to pay a debt, is generally commensurate with the value of an item or

investment. Business and governmental bodies carry long-term debt in the form of loans or bonds. Loans are taken from institutes or banks and are paid back with an agreed interest rate. Bonds or debentures are similar to loans, but are usually purchased by individuals or other businesses.

### **Types of Debts**

There are two broad classifications of debts: loans and debentures

#### **Loans**

Loans are the most common source of financing. There are several development banks/institutions and commercial banks providing finance with a predefined rate of interest. The repayment schedule is also predefined. Repayments are generally made in installments (quarterly/semi annually/annually) whereas interest payment is generally on quarterly basis in India. There are various banks/institutes providing loans. Some of them are:

- • Central financial institutions/development banks: Financial intuitions like IFCI (Industrial Financial Corporations of India), IRBI (Industrial Reconstruction Bank of India), and development banks like IDBI (Industrial Development Bank of India), ICICI Bank, SIDBI, GIC, EXIM, etc.
- • State Financial Corporations (SFCs): All major states have their own SFC for funding medium sized projects. They all are refinanced by IDBI. For example, APSFC (Andhra Pradesh State Financial Corporation) in Andhra Pradesh, UPFC (Uttar Pradesh Financial Corporation), etc.
- • State Industrial Development Corporations (SIDCs): The role of SIDC is not restricted to financing but they
- are also responsible for zones for industrial developments and infrastructural facility. Pithampur (near Indore) and Mandideep (near Bhopal) are developed by MPAKVN (Madhya Pradesh Audhyogic Kendra Vikas Nigam), Similarly, MIDC (Maharashtra Industrial

Development Corporation) and GIDC (Gujarat Industrial Development Corporation) have developed a number of industrial areas in their respective states and contributed towards its development.

## **Debentures**

Debentures are loans that are usually secured and are said to have either fixed or floating charges with them. They are different from loans as loan is provided by a bank or an institution whereas debenture is funded by public or group of people.

A secured debenture is one that is specifically tied to the financing of a particular asset such as a building or a machine. Then, just like a mortgage for a private house, the debenture holder has a legal interest in that asset and the

• **Commercial banks:** All commercial banks finance long-term debt at a predefined rate of interest, generally with collateral security. Both nationalized and private commercial banks are playing a major role in financing agro industries and service projects. • **Private financing:** Private companies and NBFC are also providing long term loans for projects. • **International financial institutions:** These institutions provide funding to the projects of great magnitude. World Bank, International Finance Corporation, Asian Development Bank, Overseas Economic Co – operation Fund, etc.

company cannot dispose of it unless the debenture holder agrees. If the debenture is for land and/or buildings, it can be called a mortgage debenture. Debenture holders have the right to receive their interest payments before any dividend is payable to shareholders and, most importantly, even if a company makes a loss, it still has to pay its interest charges. If the business fails, the debenture holders will be preferential creditors and will be entitled to the repayment of all of their money before the shareholders receive anything. This provides safety to the holders of debentures.

## **Equity Financing**

Although owners of equity instruments are the owners of a company, it is actually equity shareholders who are the real owners of the company. There are various sources of equity financing.

- • Preference shares
- • Equity shares
- • Returned earnings



## **Preferential Shares**

Preference shares offer their owners preferences over ordinary shareholders. There are two major differences between ordinary and preference shares:

1. Preference shareholders are often entitled to a fixed dividend even when ordinary shareholders are not.
2. Preference shareholders cannot normally vote at general meetings.

## **Equity Shares**

Equity shareholders are the true owners of the company. They have the voting rights and right on all the remainder profit after paying interest to debt and preferential dividends. Who owns Reliance Industries? Mukesh Ambani? No, he is just holding majority stake of the company, and so he is controlling the company. All shareholders of Reliance industries are the owners of the company. The equity shares are generally not subjected to buy back and under no circumstances can an equity shareholders be forced for the buy back. Companies may offer a buy back but can never force buy back on shareholder. Returns to shareholders are in the form of dividends, right shares or bonus shares. Generally, the return expected by shareholders is in the form of increased market prices. Future aspects, profits, reserves and all the aspects of the company are depicted by its share prices. The value of the company is determined by market price/share x No. of shares issued.

## **Retained Earnings**

Retained earnings is the cheapest of equity source of capital. Companies do not declare dividends equal to their earnings; they retain some portions of their earnings for various reasons. One of the major reasons is future prospects. Such reserves are used as source of funding of a new project (generally in the case of brown field projects).

## **Short-Term Sources for Working Capital**

The various short term sources of funds are

- Cash credit limit/overdraft by banks: This is a form of loan provided by a bank. This is a cheaper means of fund as interest is payable on the amount which is withdrawn on a particular date. Banks offer a drawing limit to business for meeting its requirement of funds for working capital needs for remainder profit after paying interest to debt and preferential dividends. Who owns Reliance Industries? Mukesh Ambani? No, he is just holding majority stake of the company, and so he is controlling the company. All shareholders of Reliance industries are the owners of the company. The equity shares are generally not subjected to buy back and under no circumstances can an equity shareholders be forced for the buy back. Companies may offer a buy back but can never force buy back on shareholder. Returns to shareholders are in the form of

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- raw material storage, work in progress, finished goods stock and debtors.

- - Commercial papers: Commercial paper is an unsecured, short-term debt instrument issued by a company, typically for the financing of accounts receivable, inventories and meeting short-term liabilities.

- - Factoring: Factoring is a financial option used for the management of receivables.

- - Hundies: It is very ancient source of financing short-term funds. A firm needing short-term funds for meeting its working capital needs raise the funds privately at a predefined rate of interest through money market. This is generally dependent on the goodwill earned by the borrower.

- - Trade credit: Firm do take advantage of their good will during purchasing goods on credit thus reducing working capital requirement. Many firms also take deposits from their distributors which in turn provide them funds for working capital. Some firms also sell their product after receiving advances, which also provide funds for their working capital requirement.

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- **Newer Sources of Finance**

- 1. International financing: The International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA), and International Project Financing Agency (IPFA) give

loans to promote private sector, corporate investment in developing countries, under the theory that such investment will provide economic growth. Other major sources of international financing include Euro Currency loans,

- Euro Bonds, Global Depositary Receipt and American Depositary Receipts.
- 2. Leasing: Lease is an agreement between two parties, the lessee and the lessor. The lessor purchases capital goods for the use of the lessee and the lessee uses it by payment of predefined rentals. The lessee continues to be the owner of the asset. Leasing is generally used for financing capital goods.
- 3. Hire purchase: It is a form of installment credit. Hire purchase is similar to leasing with the exception that ownership of the goods passes to the hire purchase customer as soon as the final installment is paid, whereas a lessee never becomes the owner of the goods.
- 4. Venture Capital Financing: Venture capital is the capital provided by outside inventors for financing of new, innovative or struggling business. Venture capital investments generally are high risk investments, but offer the chance for above average returns. A venture capitalist (also called angel investor) is a person who makes such investments. A venture capital funds is a pooled investment vehicle (often a partnership) that primarily invests the financial capital of third-party investors in enterprises that are too risky for the standard capital markets or bank loans. A venture capitalist is an expert not only in acquiring capital, but can also provide support and direction to early startups.
- **Promoters Contribution:**
- An entrepreneur who promotes the project will also participate in the scheme of finance of the project. The extent of promoter's participation is considered as sign of interest the promoters show in the project. When the bank/financial
- institution is asked to participate in the scheme of finance, they would ask the promoters to bring a certain portion, normally between 25 to 50% of the project cost into the equity share capital of the company.
- A part of the contribution can be arranged by the promoters from outside sources like arranging investment in capital from friends and relatives. For eligibility of financing, the financial institutions will stipulate minimum promoters contribution which is to be arranged by the promoter. The financial institutions always press for the slightly higher participation in the project.
- This is to ensure a long and continued involvement of the promoter in the project. Promoters contribution indicates the extent of their involvement in the project in terms of their own financial stake. The promoters contribution will be provided in the form of subscribing to

equity and preference shares issued by the company, unsecured loans, seed capital assistance, venture capital assistance, internal accrual of funds.

- **Project Appraisal Process by Banks and Financial Institutions**

- Banks and Financial institutions such as IDBI Bank, ICICI Bank, and the Industrial Finance Corporation of India (IFCI), and the State Industrial Development Corporations (SIDCs) and State Financial Corporations (SFCs) of different States, as also Investment Finance Institutions such as the Life Insurance Corporation (LIC), the General Insurance Corporation (GIC) and the Unit Trust of India (UTI) have for long been actively involved in promoting industrial projects and participating in their operational phases and have emerged as major stockholders in most enterprises. They participate in and underwrite equity and debentures and provide medium and long-term loans, often

- accounting for the major part of funds employed in enterprises. Before they commit their funds, they have to necessarily satisfy themselves about the feasibility of the projects to be assisted.

- **The Appraisal Process**

- Small projects get assistance from a single institution, and in the case of larger projects, the institutions extend assistance jointly through syndication.

- **1. Single Institution Assistance - The Process**

- The evaluation proceeds in the following sequence, where a single financial institution is involved:

- (a) Application is received from the promoter.

- (b) The institution deputs a financial expert and technical expert to carry out the project appraisal;

- (c) After a preliminary review, the team submits its report to the management, recommending acceptance or rejection. If accepted in principle, further details for closer scrutiny are obtained from the promoter.

- (d) The crucial aspects of the project proposal are subjected to in-depth study. Elaborate discussions are held with the promoter, and the underlying assumptions get certified and substantiated. Comparisons with similar projects, assessment of the technical suitability of the basic engineering package, verification of the collaboration agreements, scrutiny of price bids of contractors and suppliers' quotations, verification of market studies, inspection of the site, and seeking expert opinions where required are all essential steps in this in-depth analysis.

- (e) Detailed evaluation of the technical, commercial, financial, economic and management aspects are taken up for ascertaining the project's viability, and its acceptability for project financing.
- (f) The senior executives of the institution have a close look at the proposal, with reference to available reports and comments.
- (g) Further discussions are held with the promoter and necessary modifications are agreed upon.
- (h) The final appraisal memorandum is prepared and submitted to the managing director.
- (i) The final appraisal memorandum goes to the board of directors for approval.
- (j) The promoter is informed of board's approval.

- **2. Loan Syndication**

- Syndicate as term in general sense has originated in the U.S. Loan Syndication refers to a lending process wherein a borrower approaches a bank for a loan amount that is comparatively heavy and also involves international transactions and different currencies. Here, as and when a bank is approached by a client for availing a loan, the said bank fixes up the interests and other borrowing terms and conditions of the loan with the client and itself approaches other banks for selling of this loan. The other banks, if agree, "Purchase" a part of the loan on the same or different terms and conditions.

- In a Loan Syndication process, the client deals with one Bank only. The bank approached by the borrower to arrange credit is referred to as Managing Bank that is responsible for negotiating conditions and arranging the loan amount. Here it is important to note that the Managing Bank

- need not be the "Majority lender" or "Lead bank" but only plays the role of manager in arranging the loan amount in association with other banks. Depending on the terms and conditions of the agreement any bank can play the role of Managing Bank. The lead bank acts as recruiting bank of other sufficient banks in the process of producing of loan, negotiating the terms, negotiating details of the agreement and preparing documentation. The bank that is awarded/ given the mandate by prospective borrower and is responsible for placing and managing the loan process, its terms and conditions and finalizing the same is known as Lead Manager, Lead Bank, Syndicate Bank. They are entitled to arrangement fees and undergo a reputation risk during this process.

- A borrower takes resort of Loan Syndication for Working Capital credit, Export Finance, Capital goods financing, Mergers and Acquisitions, Project Finance, Standby facility, Trade finance, guarantees etc.

- **Advantages**

- 1. Allows the borrower to access from diverse group of financial institutions.
- 2. Saves funds. The interest rates, other terms and conditions are agreed upon by one bank that has to approach the pool of banks for the loan; this process saves money and time on part of the borrower.
- 3. Raise substantial financing facilities on pre-agreed terms which would exceed the capacity of any single bank

- **Disadvantages**

- 1. Each bank has to come to an understanding about business and how its financial activities take place.
- 2. Comfort level must be arrived at, that requires time and effort.
- 3. Negotiating the documents and other terms with one bank takes days. Here the borrower has to negotiate with numerous banks and is time consuming.

- **Consortium**

- There arise cases where a borrower approaches a bank for huge loans; this high amount means high risk to a single lender. In such cases banks resort to a lending mechanism known as Consortium to reduce the risk involved in the Loan Process. A consortium is successful where it is not possible for a single bank to finance the loan amount to the borrower; it has nothing to do with international transactions unlike Loan Syndication, simply the loan amount is too large or risky for a single lender to provide. Consortium financing occurs for transactions that might not take place with a single lender. Here when a borrower approaches a bank for loan, several banks club together to supervise the said loan amount. **A common appraisal, documentation, joint supervision and follow-up play the key role.**

- These banks have a common agreement between them. Sometimes the participating banks form a new consortium bank to look after the process of funding of loan, leveraging assets from each institution and ultimately disbanding after completion of the project. The lender who has taken the highest risk (by giving the highest amount of loan) acts as a leader and administers all the transactions, agreements etc. between the consortium and the borrower.

- The consortium agreement is a crucial document and not easy to draft. It must be clear on the rights and obligations of the parties, which need to be focused firmly on the purpose of the consortium.

- **Advantages of consortium**

- 1. No capital is required to create a consortium.
- 2. Ease of formation, no formal procedures need to be followed.
- 3. It is easy to terminate because it can be set to expiry on a particular date and happening of an event without any formal requirements.
- 4. It is easy to terminate, can be set to expiry on a given date or on the occurrence of certain events without the formal requirements needed in the case of dissolution of a corporation.
- 5. The individual members are subject to tax and not the consortium.

- **Disadvantages of consortium**

- 1. A consortium member can't restrict or limit its liability. Members may even become liable to third parties for the non-performance of other members of the consortium or the debts of such members incurred in undertaking the common project.
- 2. Third parties often find it difficult to enter into contract with a non-legal entity like a consortium. Because it is a non-legal entity funding is also normally only available to the individual members and not the consortium itself. So it becomes difficult to maintain External relationship and funding.
- 3. The lack of a permanent structure makes it difficult for a consortium to establish long-term business relationships with third parties.

- **Role of Lead Bank in Consortium**

- 1. Conducting consortium meetings.
- 2. Obtaining of necessary documents, clarification etc. from the borrower.
- 3. Making arrangements for joint appraisal of loan proposal by all member Banks. Preparation of joint appraisal report and sending the same to all member Banks and finalization of decision after discussions.
- 4. Fixing and Deciding of Loan limit.

- 5. Custody, Verification of documents, securities etc., on behalf of itself and consortium Banks.
- 6. To maintain mutual interest between consortium Banks and term loan lending institutions, making correspondence with National/State level Financial Institutions.
- 7. Obtaining stock statement and other legal obligations every month and ensuring maintenance of adequate stock for the loan.
- 8. Passing on recoveries on pro rata basis to the entire consortium Banks.
- 9. Ensuring of all transactions by borrower through Cash Credit A/c maintained with the Lead Bank and that the utilization of the loan advanced is only for production activities.

- **Role of Consortium Banks**

- 1. Participating in consortium meetings and using their expertise in the general interest of consortium.
- 2. Authorizing the Lead Bank to take decision in the interest of consortium Banks.
- 3. The Consortium Banks are not supposed to demand the loss incurred and change their lending share without obtaining prior approval from the consortium members.
- 4. Act in accordance with the terms and conditions agreed upon between the Lead Bank and other banks.
- Faced with higher defaults, banks have become more cautious on non-investment-grade corporate loans. They have started pushing more corporate loan accounts to enter into consortium lending arrangements, to improve the access to information and avoid surprises.
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## **MODULE III**

### **PROJECT IMPLEMENTATION AND CONTROL**

- **Project Execution/Implementation**

- The whole point of a project is to produce deliverables of some sort and the execution phase is where this happens. Essentially, work is done according to the project plan and that work is monitored and the results feedback to the people responsible for the plan so that it can be updated to reflect the progress made.
- It is possible to see this phase of the project as consisting of two processes: the 'doing' or executing, implementing and the monitoring and controlling.



- This phase is often called ‘Execution and Control’ because it does not represent a blind implementation of the initial project plan but rather a cyclical process. As you can see from the diagram above, the planning, executing, and the monitoring and controlling processes are all interdependent.

- Executing consists of the processes used to complete the work defined in the project plan to accomplish the project’s requirements. Execution process involves coordinating people and resources, as well as integrating and performing the activities of the project in accordance with the project plan. The main output of project execution is the project deliverables and producing these will be the responsibility of the project team who will be working to the project plan.

- The actions performed during this process include:

- - Performing the activities needed to meet the project objectives
  - Obtaining and manage quotations, bids and proposals as needed
  - Managing the project team and manage other resources
  - Collecting and analyze performance data Generating project data for status reports and forecasts

- - Managing risks

- - Conducting change control and implementing approved changes

- - Establishing and managing project communication channels

- - Collecting and documenting lessons learned

- Monitoring and controlling consists of monitoring project execution so that potential problems can be identified in a timely manner and corrective action taken as necessary. Monitoring and controlling includes measuring the ongoing project activities and the project variables (cost, effort, scope, etc.) against the project plan and the project performance baseline. It then identifies what needs to be done in order to get the project back on track.

- Over the course of any project, the scope may change either as the result of necessary design modifications, differing site conditions, material availability, contractor-requested changes, value engineering and impacts from third parties, to name a few.

- **Project Implementation Process**

- The change normally needs to be documented to show what was actually done; this is referred to as change management. No matter how carefully planned a project has been, changes will need to be made as it progresses. These will result from both external influences as well as problems that arise within the project environment. The four main sources of change are:

- **1) Organizational:** High level business decisions may change the basic terms of reference of the project – for example there may be a change to the overall scope of the project.
- **2) Environmental:** resulting from changes in legislation or changes in government policy or changes in business strategy.
- **3) Technical:** New technology may offer a better solution to that originally planned. Alternatively, technical problems may prevent a product from working in the way that it was supposed to.
- **4) End-User:** resulting from changes in customer requirements. It is also possible that feedback gained during the review or testing of a product may show that it is unsuitable in some unexpected way.
- Any person associated with a project should be able to raise any concern they have at any time. The concern may involve a perceived problem or a suggestion for an improvement to some area of the work, documentation or project organization. These issues should be reviewed at regular meetings. There are three possible outcomes when an issue is considered:
  - A change to the design or features of a product may be agreed. This will mean changing the way the product is specified in the plans and updating any costs and timescales accordingly. An impact analysis should also be performed. This process looks at the knock-on effects of the change on other deliverables, and also the effect if the changes are not implemented. The purpose of the impact analysis is to arrive at a balanced view of the effect of the proposed change on the projects ability to satisfy its mandate. This will enable project management to decide whether to proceed with the change or not.
  - The proposed change is rejected because it is not felt to represent a significant concern.
  - The third option is unusual but it does occasionally happen that a deliverable does not agree with its specification but changing the specification is a better solution than changing the deliverable.
- Where changing the deliverable is thought to be the best option, the project manager should use the impact analysis to assess the change in terms of its effect on timescales, cost, benefit, quality, personnel and risk and to decide at what level the decision to proceed should be taken. He or she should then determine whether or not the proposed change is significant enough to be referred back to the sponsor.

- **Working of Systems**

- **The Three Sphere model for Systems in Project Management**

- The three-sphere model of systems management deals with the business, organizational and technological aspects and/or issues related to the project that should be defined and

considered in order to select and manage projects effectively and successfully. In terms of addressing its advantage on the business side, a project should supplement or serve as an answer to the business goals; whereas, the technological sphere should state the proper hardware and software issues to be resolved. As for the organizational aspect, matters involving the stakeholders should be taken into full consideration. If the project manager would be able to point out as early as possible the aforementioned issues and integrate it to the project it would definitely aid in determining if an organization should invest and produce the project.

- **Design of Systems**

- Every project must have its own management structure defined at the start and dismantled at the end. The definition of the management roles, responsibilities, relationships and accountabilities and authorities provides the basis of the governance arrangements for the project. Note that it is unlikely that an existing line management structure will be sufficient or appropriate to use as a project management organisation, except perhaps where a small task is being run within a single business unit with no external impact.

- A typical organisation structure is depicted in the figure below:

- A well-designed organisation will involve the right people with the right skills and the right levels of authority so that, once approved, the project may proceed with minimal requirements to refer outside the project organisation other than to deal with exception situations outside authority of the project's Senior Responsible Owner.

- There is not a 'one-size fits all' model for the project organisation; you must design it to suit such things as a project's:

- - Criticality to the business
- - Size/complexity
- - Degree of impact within the parent body
- - Degree of impact on external bodies (OGDs, Private Sector)
- - Cost
- - Staff resources required
- - Types/levels of interested parties

- Designing the structure and getting people to agree to take on roles takes time and may require many discussions/negotiations with management at appropriately senior levels.

- **Project Work System Design (The Key Roles)**

- **1. Top management: (in certain circumstances/ environments known as Project Sponsor (PS) or Programme Director).** The management is the project's owner and champion and is ultimately accountable for delivery of the project and so must:

- • provide leadership and direction to other members of the Project Board and to the Project Manager
- • ensure that all key stakeholders are committed to the project and adequately represented in the project's organisation structure
- • ensure that budget holders and resource owners are committed to the project and that the necessary funds and other resources are made available when required
- • ensure that project governance arrangements of appropriate rigour are put in place
- • brief senior stakeholders on the current and forecast status of the project
- • receive, consider and act on regular frequent reports/briefings from the Project Manager
- • chair meetings of the Project Board
- • ensure that all members of the Project Board understand their roles the commitments they must make in order that the required outcomes/benefits from the project are achieved
- • ensure that the Project Manager is empowered to lead the project on a day to day basis
- • ensure that the Project Manager is aware of the limits of her/his authority and understands that issues outside those limits must be escalated to the PS at the earliest opportunity.
- • negotiate with senior stakeholders to broker solutions to project issues that are outside the level of authority of the Project Manager

- As you can see, the PS is not just a figurehead, it is an active role as a key member of the project management team. If the project involves a number of organisations working together and/or has a cross cutting impact, it may require more than one person to be the decision-making authority. If this is the case, you may wish to set up a Project Board with the PS as Chair.

- **2. The Project Board:** The Project Board should include:

- • the Top Management representing the 'business' interests of the sponsoring organisation as a whole

- • senior representative(s) from areas that will be impacted by the outcome and must adopt changes;
- • senior representative(s) from the organisation(s) that will design, build and implement the solution to meet the business need, (Senior Supplier role).
- The Project Board must jointly:
  - • create an environment where the project can succeed in delivering the changes necessary for the benefits to be realised
  - • set the direction for the project and to approve key milestones
  - • approve the Project Initiation Document
  - • ensure the appropriate resources required by the projects within the project are made available in accordance with the latest agreed version of the Project Plan
  - • take decisions as necessary throughout the life of the project
  - • give the Project Manager the authority to lead the project on a day to day basis.
- Members of the Project Board should decide how they will assure themselves that the integrity of those aspects of the project for which they are accountable is being maintained.
- **3. Project Manager:** The Project Manager will be responsible on behalf of the PS for day to day execution of the project plan and for dealing with issues that might affect achievement of the plan. The Project Manager must:
  - prepare the Project Initiation Document(PID)
  - submit the PID to the Project Board for approval
  - submit any revised versions of the Project Plan and Business Case to the Project Board for approval
  - monitor progress of the project and identify and take action to deal with any potential/actual exceptions that might jeopardise achievement of the project's objectives,
  - maintain a Risk Register/Log and actively manage risks using resources and approaches within limits of delegated authority
  - escalate to the Project Board recommendations for risk mitigations actions outside the scope of delegated authority limits
  - report progress to, and take advice from, the PS at regular intervals as agreed between PS and Project Manager during Project Initiation

- manage stakeholder relationships and communications (in accordance with an agreed Communications Plan);
- liaise with any nominated Project Assurance staff throughout the project.

instead of being a typical manager. He should be problem solver for his team and make his team feel that they have to work for him and make him successful.

**Traits of Project Manager**

**1) Human Skills or Soft Skills**

**a) Leadership:** The project manager should be a leader

**b) Influencing:** A project manager should not just be influencing his team but he should be able to influence the project owners or top management. This can help him get the required resources and support for the project in a timely manner.

**c) Decision making skills:** It is one of the most important skills expected of a manager. But it becomes a crucial skill for a project manager. This is because the teams and proper supportive decision makers are not generally available during project implementation and he has to take various decisions himself. A functional manager is always helped by other functional managers or experts but a project manager may not be able to get such skilful hands for his support in decision making process.

**d) Alertness and quickness:** The project manager has to respond to problems and take fast decisions. He should be well aware about the environment as it affects the progress and effectivity of the project.

**e) Communicator:** The project manager has to deal with many categories of people. It includes the project owners, the subordinate teams, the subcontractors and vendors. He needs multi-communication skills to deal with all of them simultaneously. He should set proper channels for communications and frequency of communications with various agencies.

**f) Negotiating skills:** A project comprises purchasing of various equipment and contracting with many contractors and subcontractors. A project manager should possess good negotiation skills to deal with all of them.

**g) Training:** Project team may or may not possess experienced staff members, the project manager has to play the role of a trainer for his team members. This also helps himself to become a leader of heart for the project team members.

**h) Time management skills:** Schedule is a major success parameter of any project. Time management becomes a

- crucial activity in project management. The project manager should possess skills to manage the time.
- **i) Flexibility and versatility:** Project management cannot be completed with rigid structures and sticking religiously to the principles. A project manager should have quality of versatility and flexibility depending on the situation.
- j) Presentation skills:** A project manager's first job is to get the project appraised and funded by the project manager. He should have skills to present the project to get it appraised by the project owners and funding agencies.
- k) Resourcefulness and creativity:** A project needs variety of resources during its implementation. The project may be planned to perfection, but there are still chances of unavoidable uncertainties. The project manager needs to apply his creativity to solve out the problem of inadequate

resources or be resourceful to manage the gap between planning and execution. **l) Act like cheer leader:** The project manager should not be a miser in applauding or appreciating success of his team members and keep them cheerful and feel rewarded for the smallest of the successes. **m) Les bons comptes font les bons amis:** This is a French saying, which means good accounts always lead to good friends. The project manager although seats at the apex of the project organization, he should maintain good accounts and should understand his shortcomings and mistakes. He should be willing to learn from mistakes as learning from smaller mistakes avoids big mistakes and leads to long-term success.

- **2) Hard Skills**

- The project manager does have support from technical experts, but he should also have technical skills up to some extent to be able to solve problems in project implementation. He should be able to at least follow the advice of his technical staff managers.

- **a) Financial skills:** Cost is a major success criterion of any project. Basic knowledge of Finance and financial transaction is an essential skill required in any project manager.

- **b) Risk management skills:** Project management is full of risks and uncertainty. Uncertainty always leads to huge costs. The project manager should possess skill to anticipate the upcoming deviation and uncertainty as a diagnosed problem is half cured itself. Any diagnosed deviation with respect to any of the objective of the project like time, cost or scope can lead to corrective actions and keep project safe from risk or at least minimize its impact on the project. He should also have the ability to rapid planning as situations of fire fighting may arise due to unforeseen happening in the environment.

- **c) Generalist:** The project manager should be a generalist with the knowledge of various fields rather than specialized in one particular sector. Very high level technocrats may not be very good at project management as they may be specialized in their fields but may lack knowledge about various other fields.

- **Approaches in Project Implementation**

- After developing the project, the Information System (IS) is transferred successfully from the development and test environment to the operational environment of the

**(i) Direct cutover**

- customer. Choosing an inappropriate implementation approach can negatively impact the project's remaining schedule and budget. In general, the project team can take one of four approaches for implementing the IS. These approaches are (i) direct cutover (ii) parallel (iii) pilot and (iv) phased.

- The direct cutover approach, as illustrated below, produces the changeover from old system to the new system instantly. This approach can be effective when quick delivery of the new system is critical and this approach may also be appropriate when the system's failure will not have a major impact on the organization i.e., the system is not mission critical.
- Subsequently, there is no going back to the old system to the new system. As a result, the organization could experience major delays, lost revenues and missed deadlines. The pressure of assuring that everything is right can create a great deal of stress for the project team.

## **(ii) Parallel**

### **(iii) Pilot**

- Parallel approach as shown in below, is the method in which both the new system and the old system will operate at the same time, for a specified period of time, in order to check the new system for complexities.
- This approach is impractical if the systems are dissimilar or does not support each other. The cost using this approach is relatively high, because both systems are operating requiring more man power in terms of management. Using this approach provides confidence that the new system is functioning and performing properly before relying on it entirely. It is also impractical to use this approach as the new system and old system technically incompatible.
- It is the combination of both direct cutover and parallel approach. The pilot method involves implementing the new system at a selected location like a branch office, one department in a company, etc. – called pilot site, and the old system continues to operate for the entire organization.
- Risk and cost, associated in this method are relatively less, because only one location runs the system and the new **(iv) Phased**
- system is only installed and implemented at pilot sites; reducing the risk of failure. After the new system proves that the system is successfully at the pilot site, it is implementing in the rest of the organization, usually using the direct cutover method.
- The Phased approach allows implementing the new system in phases or modules or stages in different parts of the organization incrementally as shown in below, an organization may implement an accounting information system package by first implementing the general ledger component, then accounts payable etc.,
- This method is one of the least risky because implementation only takes effect in part, in case an error goes wrong with the new system, only that particular affected part is at risk. A phased approach may also allow the project team to learn from its experiences during the initial implementation so that the later implementations run smoothly.



- Although the phased approach may take more time than the direct cutover approach, it may be less risky and much manageable. After all the modules have been tested independently it is possible to implement the new system in the organization, which would be error free. Also, overly optimistic target dates or problems experienced during the early phases of implementation may create a chain reaction that pushes back the scheduled dates of the remaining planned implantations.

- **Work Breakdown Structure (WBS)**

The Work Breakdown Structure (WBS) is a tree structure, which shows a subdivision of effort required to achieve an objective; for example a program, project, and contract. The WBS may be hardware, product, service, or process oriented. A WBS can be developed by starting with the end objective and successively subdividing it into manageable components in terms of size, duration, and responsibility (e.g., systems, subsystems, components, tasks, subtasks, and work packages), which include all steps necessary to achieve the objective. The WBS provides a common framework for the natural development of the overall planning and control of a contract and is the basis for dividing work into definable increments from which the statement of work can be developed and technical, schedule, cost, and labor hour reporting can be established. Work Breakdown Structure (WBS) is defined by PMBOK Guide as: “A deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables.” The following figure shows the hierarchical breakdown of the WBS.

- **Purpose for Creating a WBS for Projects**

There are three reasons to use a WBS in your projects.

a) The first is that it helps more accurately and specifically define and organize the scope of the total project. The most common way this is done is by using a hierarchical tree structure. Each level of this structure breaks the project deliverables or objectives down to more specific and measurable chunks.

b) The second reason for using a WBS in your projects is to help with assigning responsibilities, resource allocation, monitoring the project, and controlling the project. The WBS makes the deliverables more precise and concrete so that the project team knows exactly what has to be accomplished within each deliverable. This also allows for better estimating of cost, risk, and time because you can work from the smaller tasks back up to the level of the entire project.

- c) Finally, it allows you to double check all the deliverables’ specifics with the stakeholders and make sure there is nothing missing or overlapping.

## **Process of Creating a WBS**

There are several inputs you will need to get you off on the right foot:

- The Project Scope Statement
- The Project Scope Management Plan
- Organizational Process Assets
- Approved Change Requests
- These inputs should give you all the information you and your team needs to create your WBS. Along with these inputs, you will use certain tools as well. Finally, using these inputs and tools you will create the following outputs:
- Work Breakdown Structure

- WBS Dictionary
  - Scope Baseline
  - Project Scope Statement (updates)
  - Project Scope Management Plan (updates)
  - Requested Changes

The first step to creating your WBS is to get all your team, and possibly key stakeholders, together in one room. Although your team is not listed as an input or tool in the above sections, they are probably your most vital asset to this process. Your team possesses all the expertise, experience, and creative thinking that will be needed to get down to the specifics of each deliverable. Next, we have to get the first two levels setup. The first level is the project title, and the second level is made up of all the deliverables for the project. At this stage it is important to function under the 100% Rule. This rule basically states that the WBS (specifically the first two levels) includes 100% of all the work defined in the project scope statement and management plan. Also, it must capture 100% of all the deliverables for the project including internal, external, and interim. In reality the WBS usually only captures between 90-95%, and 100% is our goal.

### **Pitfalls to Creating WBS**

Let's understand the five common pitfalls in creating a WBS. If you can keep these few possible issues in mind when you are creating your WBS, you and your team will be much more successful at creating a useful and accurate Work Breakdown Structure.

1. Level of Work Package Detail: When deciding how specific and detailed to make your work packages, you must be careful to not get too detailed. This will lead to the project manager to have to micromanage the project and eventually slow down project progress. On the other hand, work packages whose details are too broad or large become impossible for the project manager to manage as a whole.

2. Deliverables Not Activities or Tasks: The WBS should contain a list of broken down deliverables. In other words, what the customer/stakeholder will get when the project is complete. It is NOT a list of specific activities and tasks used to accomplish the deliverables. How the work is completed (tasks and activities) can vary and change throughout the project, but deliverables cannot without a change request, so you do not want to list activities and tasks in the WBS.

3. WBS is not a Plan or Schedule: The WBS cannot be used as a replacement for the project plan or schedule. A WBS is not required to be created in any type of order or sequence. It is simply a visual breakdown of deliverables.

4. WBS Updates Require Change Control: The WBS is a formal project document, and any changes to it require the use of the project change control process. Any changes to the WBS change the deliverables and, therefore, the scope of the project. This is an important point to help control scope creep.

5. WBS is not an Organizational Hierarchy: The WBS and Organizational Hierarchy chart is never the same thing. Although often similar in appearance, these two documents are very different. The Organizational Hierarchy shows things like chain of command and lines of communication, but the WBS is restricted simply to a project and shows only the deliverables and scope of that project.

The WBS is an extremely valuable tool to the project management methodology. It can make or break a project. It sets the foundation for the rest of the project planning. A solid WBS helps ensure proper project baselines, estimating, resource use, scheduling, risk analysis, and procurement.

## **Project Diary**

A project diary, history, journal or log is a record of a project which is compiled while it is being done. This record might be used as legal evidence if there is a dispute about the outcome of the project such as a cost overrun. To facilitate this, entries should be indelible, time-stamped and signed so that they may not be easily altered in retrospect. The details kept would typically include a record of the time and content of communications such as orders and instructions; events, incidents and their remediation; and the names of the people and parties responsible.

## **Project Control**

There are subtle but important differences between project control and project management. The Association for Project Management explains these as follows:

- • Project—“The process by which projects are defined, planned, monitored, controlled and delivered so that agreed benefits are realised.”
- • Project management—“The management of a combination of numerous individual processes, many of which relate to the subsidiary discipline of project control.”
- • Project control—“The application of processes to measure project performance against the project plan, to enable variances to be identified and corrected, so that project objectives are achieved.”

Simply put, project management ensures the successful completion of a number of different processes, while project control makes sure those processes actually head in the right direction (to be classed as “successful”). It ensures projects are done correctly and the “right” projects are chosen in the first place.

In practical terms, project control is about managing project scope, meeting quality requirements, keeping projects to schedule and budget, managing risks, identifying issues, and ensuring projects benefit the company. A lot of that comes down to collecting and managing data, finding trends, forecasting outcomes, reporting on progress and actually actively putting learnings into practice. Without controlling for these, projects quickly become wildly ineffective and expensive.

## **Project Control Process**

The first stage of project management is planning and outlining your fundamentals: the issues you need to solve, the people who need to be involved, the actual work you’ll do. You need to identify stakeholders and define project objectives that set the boundaries for project success.

Part of that success depends on providing realistic cost and time estimations, both of which form part of project control. So many projects fail simply because they underestimate time or money constraints, so you need to forecast these variables as tightly as possible. The best way to do that is by analyzing performance data from similar past projects. In particular, take note of:

- • All the tasks involved in the project
- • How long each project phase took

### **1. The Planning Phase**

- • Budget spend per individual task
- • How project activity was spread across your team

- The billable to non-billable ratio of project work

The build-up or development phase of project management is all about getting the ball rolling. This is where the team assembles, stakeholders meet and assignments are planned. And once again, project control is key to success. Your cost estimates become budgets and time estimates become schedules, and project control is responsible for four important aspects:

- **Planning and scheduling:** the beginning of a project plan and schedule, the accurate monitoring and reporting of scheduled work, and the rapid detection and correction of any “deviations” to bring your schedule back on-course.
- **Cost Control:** monitoring expenses and performance, monitoring budget spend, and taking action to hit minimum costs
- **Cost Estimation:** the foundation of cost control and cost management, predicting the quantities and prices for the resources required.
- **Cost and schedule risk analysis:** an assessment of risk on the project’s schedule and cost. Analysis takes into account the predicted delivery date, the likelihood of meeting deadlines, and the recognition of risks to the project’s cost.

On to putting your plan into action! While super rewarding, this stage comes with a lot of frustrations. You

## 2. The Development Phase 3. The Implementation Phase

need to keep your team focused with clear agendas to make sure no one gets side tracked. A lot of that depends on being able to accurately diagnose your team’s progress and activity.

Invest in a team management tool that lets you quickly identify time drains, quality issues and team allocation problems. In particular, make sure it shows you:

- Individual and total employee capacity
- Activity breakdown per employee
- How long employees spend on each task
- Hours worked per employee
- Budget spend per employee

In this phase, we need to be able to review its total performance, understanding trends and processes that led to success so you can repeat them for future projects. So do a thorough project

post-mortem—compile performance data and break it down to the project task level to uncover new learnings.

You should charter exactly how your project transpired where time was spent, where activity veered off course, and what limited productivity—and build effective measures into your new projects to control for them further.

## **Types of Project Control and Reports**

Following are the various types of project controls and reports:

**4. The Closeout Phase (a) Business Case:** The Business Case effectively describes what is the value of project outcome to the sponsoring organization? Managing the Business Case is about

- value management of benefits, costs, time scales and risks.
- **i)** To ensure that the project has a complete and sound basis before there is any major commitment to the project
- **ii)** To act as a base document against which the project can assess progress, change management issues, and ongoing viability questions.

For construction projects, the content of the Project Initiation Document is set out in the Project Execution Plan.

**(b) Project Plan:** A comprehensive plan which clearly defines the products to be produced, resources and time needed for all activities, any dependencies between activities and points at which progress will be monitored and controlled with any agreed tolerances. **(c) Project Initiation Document (PID):** This document defines all major aspects of the project and forms the basis for its management and the assessment of overall success. There are two primary uses of the document: **(d) Stage Plan:** Provides detail of how and when the objectives for the stage are to be met by showing the deliverables, activities and resources required. The Stage Plan provides a baseline against which stage progress will be measured and is used as the basis of management control throughout the stage. **(e) Work Package:** Sets out all information needed to deliver one or more specialist products. The necessary information is collated by the Project Manager and used to formally pass responsibility for work or delivery to a team leader or member.

**(f) Change Control Strategy:** The Strategy documents the procedure to ensure that the processing of all Project Issues is controlled, including the submission, analysis and decision making. **(g) Highlight Reports:** The highlight reports are used to provide the Project Board (and possibly other stakeholders) with a summary of the stage status at intervals defined by them and to monitor stage and project progress. The Project Manager also uses it to advise the Project Board of any potential problems or areas where the Project Board could help. **(h) Checkpoint**

**Report:** From the Team Manager to the Project Manager at a frequency defined in the stage plan and/or work package detailing the status of work for each member of a team. **(i) Project Issue Log:** A project issue is a generic term for any matter that has to be brought to the attention of the Project Team and requires an answer. An issue can have a negative or positive impact on the project and includes items such as requests for change, off specifications (this is an item not included in the original specification or errors or omissions found in work already completed which would result in the agreed specification or acceptance criteria not being met), questions and statements of concern. **(j) Risk Management Log:** Risks can be threats to the successful delivery of the Project. Usually they are recorded in a risk register which is used to manage the project's exposure to risk that is the probability of specific risks occurring and the potential impact if they did.

## **Schedule Control**

Control Schedule is the process of monitoring the status of the project to update the project schedule and managing changes to the schedule baseline. The key benefit of this process is that the schedule baseline is maintained

**(n) Post Project Review:** Documents whether business benefits have been realized and recommendations for future improvements have been recorded. This is viewed as part of the project evaluation review which includes the End Project Report and Lessons Learned Report. **(m) Lessons Learned Report:** A report which describes the lessons learned in undertaking a project and which includes statistics from the quality control of the project's management products. It is approved by the Project Board then held centrally for the benefit of future projects. If the project is one of a number attached to a programme this document will also be used as input to the programme review. **(l) End Project Report:** A report sent from the Project Manager to the Project Board, which confirms the hand-over of all deliverables, provides an updated business case, and an assessment of how well the project has done against its Project Initiation Document. **(k) End Stage Report:** It Summarizes progress to date and provides an overview of the project as a whole, including impact of the stage on the project plan, the business case and identified risks. The project board uses the information to decide what action to take with the project; approve the next stage; ask for revised plans, amend the project scope or stop the project. throughout the project. This process is performed throughout the project.

## **Performance & Progress Control/Reporting**

1. Performance reporting involves collecting, processing and communicating information to key stakeholders, regarding the performance of the project. Performance reporting can be conducted using various tools and techniques, most of which have been already described in the previous paragraphs. The most widely used techniques for performance reporting are:

2. Performance review meetings that take place to assess the project's progress or/and status.

3. Variance analysis which is about comparing actual project results (in terms of schedule, resources, cost, scope, quality and risk) against planned or expected ones.
4. Earned Value Analysis (EVA) used to assess project performance in terms of time (schedule) and cost (or resources).
5. Financial and Output Performance Indicators used to measure financial and physical progress of the project
6. Information of project's performance is usually communicated via Progress Reports and Project Status Reports which are described in the paragraphs below.

### **Progress Report**

The Progress Report is a document prepared by the Project Team members (in case of in-house production) or by the Management Team of the Contractor (in case that the implementation of the project is totally outsourced) to provide regular feedback to the Project Manager regarding the progress of the project. Progress reports should be submitted on a regular basis to enable the Project Manager to update the Activities Schedule, identify any schedule problems or potential problems and act proactively for their resolution. Progress Reports are usually asked to be submitted every two weeks or every month, when the project is implemented with own resources. However, in case that the project is implemented by a Contractor, the progress reports are usually asked every three or six months. Generally, a Progress Report should include the following information:

- • Reporting period to which it refers
- • Project Title
- • Project Manager's name
- • Authors of the report
- • Date of submission
- • Project synopsis (i.e. project goals and objectives, expected results, project activities, duration, etc.)

Project progress in the reporting period (i.e. activities/ tasks executed, actual work accomplished, deliverables submitted, deviations for baseline schedule, estimation of the effort required to complete activities/ tasks).

Work programme for the following reporting period (i.e. activities/ tasks to be executed, deliverables to be submitted, schedule estimates for key milestones, etc.).



Updated/ revised Activities Schedule showing the percentage of work completed so far and the estimated start or finish dates for activities/ tasks.

It should be noted that in case of small projects with only few team members, the Progress Report can be substituted by personal judgment and observations of the Project Manager or by day-to-day discussions with the team members on the progress of the deliverables. On the contrary, in case of large and complex projects, where progress reporting is an important aspect of communication management, the Progress Reports should be formally submitted to the Project Manager by the Team Manager(s) (or by the Contractor), who have to prepare them by collecting the relative progress information from individual team members.

### **Project Status Report:**

The Project Status Report is a document prepared by the Project Manager - using the information provided by the Progress Reports - to present the status of the project to key stakeholders, including the Project Steering Committee, the Project Owner and the Funding Agency. Depending on the duration and size of the project, as well as on specific communication requirements of the Project Owner or/and the Funding Agency, the Status Report can be prepared monthly, quarterly or biannually. Usually, Status Reports are prepared with the same or less frequency than Progress Reports since they require input from them.

The aim of the Project Status Report is to:

- • Provide an overview of project's progress up to date
- • Ensure that the key stakeholders are regularly informed on the progress of the project
- • Inform the key stakeholders about issues that require immediate action or resolution

Normally the Status Report becomes the point of discussion for the Status Meeting, which is a regularly scheduled event, where the Project Manager presents the status of the project to the Steering Committee (and maybe to the Project Owner or /and the Funding Agency). In these meetings the Project Manager can invite members of the Project Team who have expertise in a certain area of the discussion. It is, however recommended that the Project Manager invites periodically the Project Team to review the status of the project, discuss their accomplishments and communicate any issues or concerns in an open, honest and constructive forum. On large projects where gathering the entire team is not always possible, the Project Team members can be represented in the meeting by the respective Team Manager(s), who can communicate the status of their team work since they have a better insight into the day-to-day activities of their team members.

### **Cost Control**

No matter how good the cost and control system is, problems can occur. Common causes of cost problem include:

- • Poor estimating techniques and/or standards, resulting in unrealistic budgets
- • Out-of-sequence starting and completion of activities and events
- • Inadequate work breakdown structure
- • No management policy on reporting and control practices
- • Poor work definition at the lower levels of the organization
- • Management reducing budgets or bids to be competitive or to eliminate “fat”
- • Inadequate formal planning that results in unnoticed, or often uncontrolled, increases in scope of effort
- • Poor comparison of actual and planned costs
- • Comparison of actual and planned costs at the wrong level of management
- • Unforeseen technical problems
- • Schedule delays that require overtime or idle time costing
- • Material escalation factors that are unrealistic

**Cost overruns can occur in any phase of project development. The most common causes for cost overruns are:**

- • Proposal phase
- • Failure to understand customer requirements
- • Unrealistic appraisal of in-house capabilities
- • Underestimating time requirements
- • Planning phase
- • Omissions
- • Inaccuracy of the work breakdown structure
- • Misinterpretation of information
- • Use of wrong estimating techniques

- • Failure to identify and concentrate on major cost elements
- • Failure to assess and provide for risks
- • Negotiation phase
- • Forcing a speedy compromise
- • Procurement ceiling costs
- • Negotiation team that must “win this one”
- • Contractual phase
- • Contractual discrepancies
- • SOW different from RFP requirements
- • Proposal team different from project team
- • Design phase
- • Accepting customer requests without management approval
- • Problems in customer communications channels and data items
- • Problems in design review meetings
- • Production phase
- • Excessive material costs
- • Specifications that are not acceptable
- • Manufacturing and engineering disagreement.



