

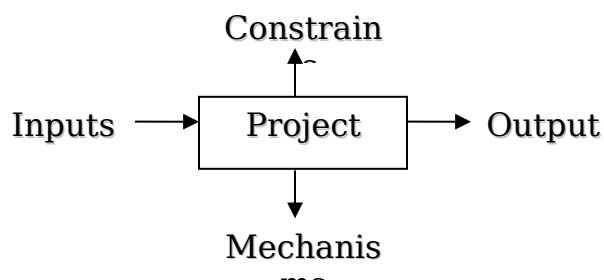
Unit 1: Overview of Projects and Project Analysis

1.1 Introduction

Project is a means of implementing the firm's plans. As a means of plan implementation, project involves a complex process. Before discussing the complex process of project, it is reasonable to introduce basic concepts of projects. This unit highlights the nature of project, types of projects, importance of projects, difficulties in projects, objectives of projects, the phases of projects.

1.2 Project Concept/Definition

The term 'project' may be defined as a complex of economic activities in which scarce resources are committed in expectation of benefits that exceed the costs of resources consumed. Projects require resources. They are also expected to derive benefits. Projects are said to be desirable if their benefits are greater than the costs incurred on them. A project can also be referred to as a non-repetitive activity. A project is viewed as a conversion process. This implies that a project involves a transformation of some form of inputs into an output. *(See the following diagram).*



In the above diagram, we observe that project is a conversion process which serves in transforming inputs into outputs. Inputs represent want or need whereas outputs represent satisfied need. Constraints consist of factors such as financial, legal, ethical, environmental, time, and quality. Mechanisms include people, knowledge of expertise, capital, tools and techniques, and technology.

1.3 Types of Capital Investments/Projects

The term capital refers to investments in fixed assets. Capital investments deal with the whole process of identifying and analyzing which projects should be pursued. Capital investments may be classified in different ways. Capital investments may be **classified into physical** assets, **monetary assets**, and **intangible assets**. Capital investments in physical assets include investments in building, machinery, equipment, vehicles, and computers. Investments in monetary assets include investments in debt or equity securities. Debt securities involve bonds, notes, deposits etc whereas equity securities include equity shares (common stock and preferred stock), options, warrants and the like.

Projects may also be classified into **cost reduction** (replacement) investments, **revenue expansion projects**, or mandatory investments. Replacement investments aim at replacing the worn out equipment with new equipment to reduce operating costs (material, labor and/or overhead costs), increase the yield (productivity), and/or improve quality. An expansion investment is meant to increase the capacity to cater to a growing demand in the form of entering new markets (market development), introducing new products to the existing market (product development), operating with the same products in the existing markets (penetration), or introducing the new product for new market (diversification). **A mandatory investment** is a capital expenditure required to comply with statutory requirements, such as pollution control, firefighting, medical dispensary and so on.

Projects may also be classified into **development projects** and **business projects**. While business (industrial) projects aim at profit or value

maximization of the owners, development projects aim at reducing poverty and are pursued by the government or NGOs.

1.4 Importance of Capital Investment

Capital investment decisions have several importances. Among them are:

- 1. *They have long-term effects***

Capital investments have the consequences that extend far in to the future. They provide the framework for future activities and have a significant impact on the basic character of a firm.

- 2. *Irreversibility.*** A wrong capital investment decision often cannot be reversed without incurring a substantial loss. This is due to the fact that the market for used capital assets (equipment) in general is ill-organized i.e., the investment may be sold below purchase price or the market for such as second hand investment may be non-existent.

- 3. *Substantial outlays***

Capital investments require substantial outlays. This is especially the case with investments in advanced technology.

1.5 Difficulties of Capital Investments

What are the major difficulties in capital investments? What are the sources of these difficulties?

Although capital investments are so important, they are not without difficulties. These difficulties arise from three major sources; namely,

- 1. *Measurement problems***

It is difficult to identify and measure the costs and benefits of capital investment proposals.

- 2. *Uncertainty***

The costs and benefits of capital investments are characterized by a great deal of uncertainty. It is impossible to predict exactly what will happen in the future.

- 3. *Temporal spread***

The costs and benefits with a capital expenditure decision spread out over a long-period of time, such as 10 – 20 years, or 20 – 40 years this creates problems in estimating the discount rates and establishing equivalences.

1.6 Objectives of Capital Projects/Investments

According to financial theory, the goal of financial management is to maximize the present wealth of the firm's stockholders' equity. The wealth of equity stockholders is reflected in the market value of the equity shares.

Wealth maximization, as objective of financial decision making, contributes to an efficient allocation of capital. The expected return and risk serves as the bases for allocation of capital. Since equity share prices are based on expected return and risk, efforts to maximize equity share prices would result in an efficient allocation of resources. Thus, the objective of capital investment decision is to maximize the value (wealth) of equity shareholders.

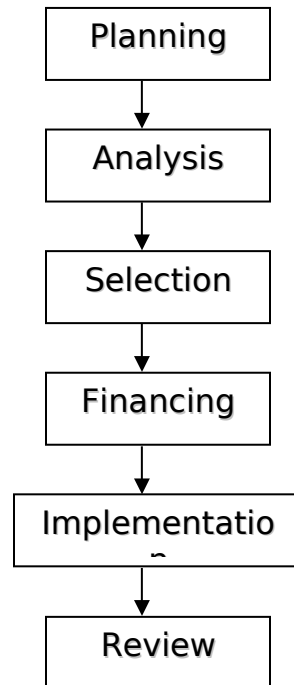
Should firms solely act to further the shareholders' welfare? In fact, firms may pursue several goals at a time. Some of other goals the firms may pursue include:

- seek to achieve a high rate of growth
- increase market share
- attain product and technology leadership
- promote employee welfare
- further customer satisfaction
- improve community life and other societal problems

Most of the above goals are in congruence with the goal of maximizing the wealth of equity shareholders. When they seem to conflict with wealth maximization, it is useful to know the cost of pursuing these goals. However, it should be understood that wealth maximization is regard as the normative goal from the financial point of view.

1.7 Phases of Capital Investments/Capital Budgeting

What are the major phases of capital budgeting? As it involves a complex process, capital budgeting process is divided into six broad phases.



Each of them is described below:

1. Planning

This phase is concerned with the articulation of the firm's broad investment strategy and the generation and preliminary screening of project proposals. The firm's investment strategy delineates the broad areas or types of investments the firm plans to undertake. This provides the framework which shapes, guides, and circumscribes the identification of individual project opportunities.

Followed by the identification of a project proposal, a preliminary project analysis is done which is performed before the full blown feasibility study. The purpose of preliminary project analysis is:

- a) To assess whether the project is prima facie (at first sight) worthwhile to justify a feasibility study.
- b) To assess what aspects of the project are critical to its viability and hence warrant an in-depth investigation

2. Analysis

If the preliminary screening suggests that the project is prima facie worthwhile, a detailed analysis of the project will be undertaken in terms of marketing, technical, financial, economic, and ecological aspects. This phase involves the detailed analysis of the project. It focuses on gathering, preparing, and summarizing relevant information about various project proposals. The information developed in this analysis becomes the basis for costs and benefits of the project.

3. Selection

The analysis of the project is followed by selection. Selection phase addresses the question, "Is the project viable?" In order to select the project, a wide range of appraisal techniques can be used. These techniques are classified into non-discounted criteria and discounted cash flows techniques. These techniques will be discussed in detail in unit 7.

4. Financing

Once a project is selected, suitable financing arrangements have to be made. There are two possible sources of financing the projects; namely, debt financing (loans, bonds etc) and equity financing (common stock, preferred stock, retained earnings etc.)

The firm should decide on the optimal mix of debt and equity financing. The key business considerations that influence the mix are flexibility, risk, income, control, and taxes (FRICT) you can find a more detailed discussion on financing in unit 7.

5. Implementation

For industrial projects, the implementation phase involves setting up of manufacturing facilities that consists of the following stages.

- a) Project and engineering designs
- b) Negotiations and contracting
- c) Construction
- d) Training
- e) Plant commission (start the actual operation)

6. Review

Once the project is commissioned, the review phase has to be set in motion. Performance review should be done periodically to compare actual performance with projected performance. Review is helpful:

- a) to throw light on how realistic were the assumptions underlying the project
- b) to provide a documented log of experience that is highly valuable in future decision making
- c) to take corrective action in light of actual performance
- d) in uncovering judgmental biases
- e) To induce a desired caution among project sponsors.

The phases of capital budgeting that are suggested by World Bank and United Nations Industrial Development Organization (UNIDO) will be discussed at great length in unit 2.

Unit 2: PROJECT LIFE CYCLE

2.1. Introduction

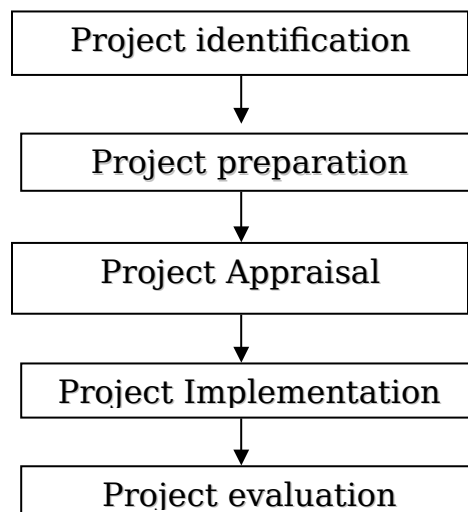
Project passes through series of activities called stages. There are different approaches to describing the project cycle. In the first chapter, we present one way of describing the project cycle or stages in capital investments. This chapter highlights two other approaches to project cycle; namely, the World Bank and United Nations Industrial Development organizations (UNIDO).

2.2. Definition of Project Cycle

Project cycle refers to the various stages through which project planning proceeds from the inception to implementation. In other words, it is the life cycle through which a project advances from infancy to maturity. The main features of this cycle are information gathering, analysis, and decision-making. What is the primary preoccupation at each stage in the project cycle? Throughout the project cycle, the primary preoccupation of the analysis is to consider alternatives, evaluate them and to make decisions on which of them should be advanced to the next stage.

2.3. Project Life cycle - Baum (World Bank) Approach

According to World Bank, project cycle involves five stages; namely, project identification, project preparation, project appraisal, project implementation, and project evaluation. See the following diagram:



Let's highlight the major activities in each stage

1. Project identification

This stage is also called pre-feasibility studies. In this stage, projects that can contribute towards achieving the specified objectives are identified (listed). Project ideas may come from:

- ❖ New experiments from previous project failures
- ❖ New experiments from expansion
- ❖ Replication of successful project tested elsewhere
- ❖ New experiments from shortages or excess of resources
- ❖ External threats
- ❖ Opportunities
- ❖ Internal strengths and/or weaknesses
- ❖ Other sources

Project identification is also concerned with elimination of inferior alternatives (projects) from the identified ones. The output of this stage is project that is prima-facie (at first sight or based on first impression) promising and further work is justified. Chapter three will present pre-feasibility study in more detail.

2. Project preparation

Project preparation is the most important stage in project planning. Project preparation stage, also called feasibility study, is concerned with the detailed study of all aspects of the projects. Project feasibility study is the center of this course and will be explored in detail in chapter four to seven.

3. Project Appraisal

Appraisal is the comprehensive and systematic assessment of all aspects of the proposed project. The project is reviewed (appraised) to confirm that it accords with the broad objectives. It is to ensure that the project represents a high priority use of the firm's resources. What aspects of the project

should be appraised? The project is appraised from different perspectives: technical, commercial (market), financial, economic and ecological.

4. Project implementation

It is the stage at which the conclusions are reached & decisions made are put into action. What activities should be done during project implementation? Some of the major activities in during project implementation phase include:

- ❖ Detailed designs and specifications are drawn;
- ❖ Tender documents are prepared;
- ❖ Bids are invited and evaluated,
- ❖ Orders for imputes are placed;
- ❖ Contracts are signed; workers are hired, trained and put to work;
- ❖ Materials are moved to sites etc.

5. Project Evaluation

What is the major focus of project evaluation phase? Where it begins? Implementation phase is followed by supervision and follow up. The execution of the project should be supervised closely and progress should be reported regularly to ensure that the implementation is progressing without deviating from the envisaged path and the objectives of the project have been reached. Project evaluation is a monitoring (checking) activity in order to:

- ❖ Find out how things are going
- ❖ Encourage the project team
- ❖ Check that promised resources are in fact working on project tasks
- ❖ Rapidly learn about concerns and difficulties
- ❖ Show concern for the success of the project
- ❖ Take corrective action if things go wrong

2.4. Project Life cycle - UNIDO Approach

According to UNIDO, project cycle involves three major phases. These are:

1. Pre-investment phase
2. Investment phase (Implementation phase)
3. Operation phase (operation and ex-post evaluation)

Each of the above stages (phases) will be explained in the section that follows:

2.4.1 Pre-investment phase

The pre-investment phase includes four major activities; namely, project identification, pre-selection, project preparation, and appraisal.

Project Identification / opportunity study/

Opportunity study is the main instrument used to quantify the parameters, information and data required to develop a project idea in to a proposal. What aspects of the project should be analyzed in opportunity study? In opportunity study, the firm is required to analysis the following:

- ❖ Availability of resources
- ❖ Future demand for goods, increasing population and increasing purchasing power.
- ❖ Import and export substitutions
- ❖ Environmental impact
- ❖ Success of similar projects elsewhere
- ❖ Possible inter-linkage with other industries
- ❖ Expansion through backward linkages (Backward integration) and forward linkages (Forward integration)
- ❖ Industrial policies of the government
- ❖ General investment climate of the country
- ❖ Export potentials
- ❖ Availability and cost of production

❖ etc

Generally, opportunity studies can be categorized into Area studies, Industry studies, and Resource based studies.

Pre-selection /pre-feasibility study/

This phase involves the analysis of the following factors:

1. Examination (investigation) of all possible project alternatives
2. Ensure that the detailed analysis of the project is justified.
3. In-depth investigation of critical areas of the project
4. Examine the attractiveness (viability) of the project
5. Investigate the stability of the environmental situation at the location site

The above analyses are based on guess-estimated data.

Preparation (feasibility study)

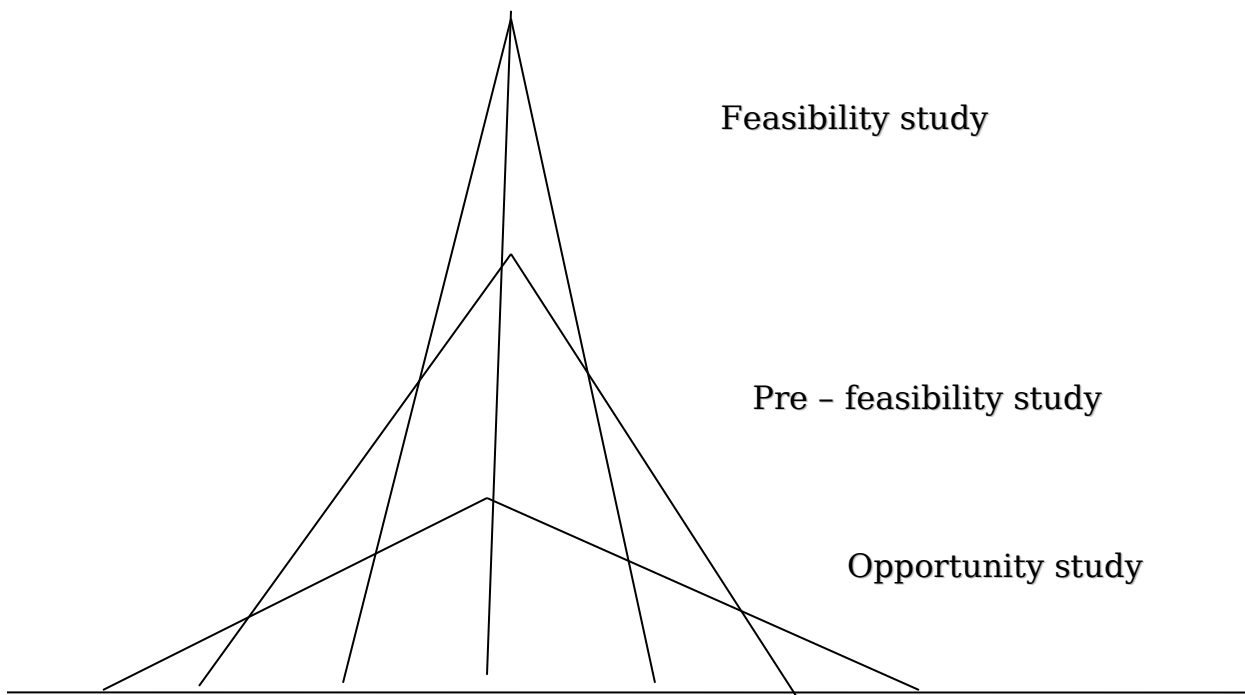
The projects justified by pre-feasibility study enter this phase for detailed analysis based on investigated efforts than on guess-estimated. This stage provides all data, define, and critically examine the commercial, technical, financial, economic, and environmental aspects for each projects. In feasibility study phase, window dressing approach should be avoided. What should be the major components of feasibility study?

The components of feasibility study are:

1. Project Background and history
 - ◆ Name and address of the promoter
 - ◆ Project Background
 - ◆ Project objectives
 - ◆ Outline of the proposed basic project strategies
 - ◆ Project location
 - ◆ Economic and industrial policies supporting the project
2. Summary of market analysis and marketing concepts (will be explored in detail in Chapter four)

3. Raw materials and supplies (see chapter 5)
4. Location, site, and environment (see chapter 5)
5. Engineering and Technology (see chapter 5)
6. Organization and Management (see chapter 6)
7. Implementation planning & budgeting (see chapter 6)
8. Financial Analysis and investment appraisal (see chapter 7)

After the three phases (opportunity study, pre- feasibility, and feasibility study), the supporting data should fulfill the following minimum reliability standards.



30% -20% 10% 0 10% 20% 30%

The above figure is interpreted as follows:

- I. After opportunity studies, the project should be reliable about 70% for implementation
- II. The project should be reliable about 80% for implementation after pre- feasibility studies
- III. After feasibility studies, the project should be about 90% reliable for implementation.

Project Appraisal

After feasibility studies are completed, the projects should be presented to the appraising parties. The appraisal of project is based on the objectives set earlier, the expected risk, costs, and gains. The quality of feasibility studies makes easier the appraisal work. If the objective of the appraiser is Return on investment, the project is appraised on this base.

Types of decisions to be taken during each pre-investment phases

Decision	Type of study	Decision goal
Identification	Opportunity studies	◆ Identify opportunity ◆ Determine critical areas for support studies ◆ Determine area for pre-feasibility or feasibility study.

Pre-selection	Support study	Determine which of the possible choices is the most viable
	Pre- feasibility study	◆ Determine provisional viability of the project ◆ Appraise whether the feasibility study should be launched.
Final analysis	Support studies	Investigate in detail selected criteria requiring in-depth study
	Feasibility study	◆ Make the final choices of project characteristics ◆ Determine the feasibility of the project and selected criteria
Project evaluation	Evaluation study	Make final investment decision
Project Appraisal	Appraisal report	

2.4.2. Investment Phase

The investment phase, also called implementation phase, includes the following activities:

1. Establish legal, financial and organizational basis
2. Technology acquisition and transfer
3. Detailed engineering, design, contracting, tending & negotiations.
4. Acquisition of land, construction works, and installations
5. Pre- production marketing, securing of supplies, and setting up administration.
6. Recruitment, training, and placement of workers.
7. Plant commissioning and startup

2.4.3. Operating phase

Once activities listed under investment phase are completed, the project will go in to actual operation. The operation involves producing the envisaged goods, and sale to the target market, or renders the envisaged service to the target market. The project also needs evaluation, which deals with the review of whether the project is being implemented as per expectation. The necessary corrective actions should also be taken if deviation is identified.