Project Feasibility

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Project Feasibility

- A project feasibility study is an analysis of how successfully a project can be completed, accounting for factors that affect it such as economic, technological, legal and scheduling factors.
- Project Managers use feasibility studies to determine potential positive and negative outcomes of a project before investing a considerable amount of time and money into it.

Importance of Project Feasibility

- Benefit analysis
- Understanding demand
- Assessing resources
- Marketing feasibility
- Marking a timeline

Scope of Feasibility Study

- Need Analysis
- Process Work
- Engineering and design
- Cost Estimates
- Financial Analysis
- Project Impacts

Market Feasibility

- Market feasibility tries to gain a sufficiently detailed understanding of the fundamentals of a market.
- A market feasibility study is needed to ensure that the product or business is something that people want.

Market Feasibility

- Some questions which will be addressed in Market feasibility study-

- ✓ How big is the market?
- ✓ How fast the market is growing?
- ✓ PESTEL environment
- ✓ Who are the existing competitors and what market shares do they have?
- ✓ The extent of branding and customer loyalty in the market
- ✓ How is the market segmented?
- ✓ Customer preferences etc.

Market feasibility

- It is important for tasks such as
- ✓ Forecasting sales for new products or investment into new markets
- ✓ Gathering evidence to support a finance raising exercise
- ✓ To support new marketing strategy or significant changes to the marketing objectives
- ✓ To help make decisions in relation to significant organizational or operational change

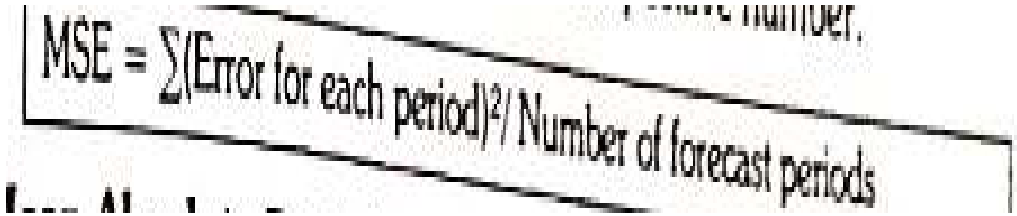
Market Feasibility- Moving Average Method

- A moving average is a technique to get an overall idea of the trends in a data set; it is an average of any subset of numbers.
- The moving average is extremely useful for forecasting long-term trends.

Errors in Forecasting

- **Mean Square Error (MSE)**

- ✓ In Statistics, Mean Squared Error (MSE) is defined as Mean or Average of the square of the difference between actual and estimated values.
- ✓ Smaller the MSE value, more stable is the forecasting model.



Errors in Forecasting

- **Mean Absolute Deviation (MAD)**

✓ Mean Absolute Deviation (MAD) is used as a measurement of accuracy for your forecasted data.

✓ MAD plays an important role in understanding how accurate and reliable your forecasts are.

$$MAD = \sum |A - F| / n$$

Where:

$|A - F|$ = Total of absolute forecast errors for the periods

n = Number of periods

Errors in Forecasting

- **Mean Absolute Percentage Error (MAPE)**

✓ It is a useful variant of the MAD calculation because it shows the ratio, or percentage, of the absolute errors to the actual demand for a given period of time.

$$MAPE = \sum(|A - F| / A) \% / n$$

Techno Economic Feasibility Study

- Project background and history
- Demand and market study
- Demand projections
- Forecasting techniques
- Market penetration
- Sensitivity analysis
- Sales forecast and marketing
- Production programme
- Plant capacity
- Materials and inputs
- Supply programme
- Project location
- Plant site, within the location

Techno Economic Feasibility Study

- Local conditions
- Layout and physical coverage of project
- Technology and equipment
- Civil engineering
- Plant organization
- Overhead costs
- Labour
- Staff
- Implementation scheduling
- Financial evaluation
- Economic evaluation

Project Background And History

- The economic, industrial, financial and other relevant policies should be briefly described.
- There should also be information on the project promoters or sponsors and the reasons for their specific interest in the project.
- The nature of preliminary and subsequent studies that have proceeded from the feasibility study should be mentioned, giving the highlights and the costs incurred.

Demand And Market Study

- After identifying the data requirements of the demand and market study, an appropriate method of data collection and evaluation will have to be chosen from among the alternative approaches available.
- Estimations about the extent of market penetration by products should also be given.
- The proposed sales programme has to be spelt out, indicating the progress expected during the project life.
- The marketing strategy that has been chosen should be elaborated, presenting its rationale.
- Estimated revenue from sales and the estimated costs of marketing and distribution need to be shown.

Demand Projections

- It should cover
- ✓ The estimate of the potential demand for the product or products;
- ✓ The estimates of the potential supplies;
- ✓ The degree of market penetration that the project is expected to achieve.

Forecasting Techniques

- There are different forecasting techniques that can be adopted and an appropriate choice has to be made depending on the nature of the products and markets.
- The demand forecasting techniques that are normally used are:
- ✓ The trend method, also referred to as extrapolation method;
- ✓ The consumption level method (taking note of the income and price elasticities of demand);
- ✓ The end-use method, also known as the consumption coefficient method;
- ✓ The leading indicator method;
- ✓ Regression models;
- ✓ Market survey

Market Penetration

- The market penetration that the proposed product can achieve is assessed with reference to the following factors:

- ✓ The degree of domestic and/or foreign competition;
- ✓ The consumer preferences or responses; and
- ✓ The scope for substitution that exists, or might develop.

Sensitivity Analysis

- To reduce the uncertainties from these diverse possibilities to a minimum, statistical sensitivity analysis provides a systematic approach.
- This technique can be used to assess the impact on costs and revenue, when the factors influencing demand turn out to be less or more favourable to demand than was assumed.

Sales Forecast and Marketing

- Volume of production and sales have a critical bearing on the production and selling costs and, therefore, these estimates have to be carefully prepared, after considering possible interruptions, delays, etc. that affects production volume.
- Choice of promotional methods and distribution systems, have significant implications for product costs and these have to be clearly defined and properly estimated.

Production Programme

- Having arrived at the sales projections for the different stages of production in the operating phase of the project, the feasibility study should spell out the detailed production programme.
- The levels of output and capacity utilization during the specified periods should be clearly indicated.
- The costs on inputs have to be worked out in detail for the different categories.
- The production programme provides the basis on which the cash flow projections for the production periods can be drawn up.

Plant Capacity

- It refers to the volume or number of units that can be manufactured during the given period of time.
- It is also known as production capacity.
- Plant capacity can be ***Feasible Normal Capacity and Nominal Maximum Capacity***

Plant Capacity- Feasible Normal Capacity

- This represents the capacity that is achievable under normal working conditions taking into account not only the installed equipment and technical conditions of the plant, such as normal stoppages, downtime, holidays, maintenance, tool changes, desired shift patterns and indivisibilities of major machines to be combines, but also the management system applied.

Plant Capacity- Nominal Maximum Capacity

- This is technically feasible capacity and frequently corresponds to the installed capacity as guaranteed by the supplier of the plant.
- To reach maximum output figure, overtime as well as excessive consumption of factory supplies, utilities, spare parts, and wear and tear, will inflate the normal level of production costs.

Materials and Inputs

- As for the requirements of material and other inputs, detailed information has to be provided about their nature, quantities, sources of procurement, and their costs.
- Materials and inputs can be classified into:

- ✓ Raw materials;
- ✓ Processed industrial materials (intermediates or components);
- ✓ Manufactured (subassemblies):
- ✓ Auxiliary materials;
- ✓ Factory supplies;
- ✓ Utilities.

Supply Programme

- The procurement plan should be linked to the anticipated production and inventory levels and the annual costs of consumption determined for the classified groups of materials and inputs.
- The utilities required have to be assessed in detail, taking note of the location, technology, and plant capacity.
- Their availability and proximity of sources of supply are critical for the success of the project.
- Supply programmes for these should also be drawn up.

Location

- Specific requirements that the locations have to fulfil for smooth plant operations have to be spelt out.
- Alternatives locations that are likely to be suitable should be identified.
- The reasons for the choice of the optimal location from among considered alternatives should be substantiated.

Plant Site

- Choice of site, in a given location, for erecting the plant involves selection from available alternatives, with due consideration for the terrain, transport facilities, water supply, power supply, manpower availability, etc.
- The cost estimates should take note of the magnitude of work involved in preparing the site for plant erection.

Local Conditions

- A good understanding if the local conditions in terms of infrastructure and socio-economic environment is very essential and the relevant information has to be gathered for the feasibility study.

Layout and Physical Coverage of Project

- It is necessary to consider the requirements or structures and civil works for the considerable construction and erection work that has to be undertaken during project implantation.
- Such constructions/erections have to be defined and their costs estimates prepared.

Layout and Physical Coverage of Project

- Project layouts have to be determined with reference to:

- ✓ The production programme;
- ✓ The procurement programme for materials, supplies and services;
- ✓ The technology chosen;
- ✓ The equipment selected;
- ✓ The civil work involved; and
- ✓ Significant factors, if any, with reference to the local conditions.

Technology and Equipments

- The feasibility study should also describe the technologies considered and the rationale for the ultimate choice of technology.
- The costs of technology in terms of investments, or lump sum payment of technology fees, or royalty or annualized payments have to be determined and detailed.
- Equipment have to be categorized as belonging to the production, infrastructure or other categories, the basis of their choice elaborated and their costs estimated, with appropriate details of quantities and rates.

Plant Organization

- Organizational planning is as important as project engineering.
- Effective implantation is difficult if the organizational structure is vague; there is likely to be overlap of functions and duplication of responsibilities, causing delays and interruptions in project construction.

Overhead Costs

- If the plant is organized into production, service and administrative cost centres, it should be possible to obtain realistic assessment of overhead costs.
- The cost items accruing in the different production, service and other cost centres should be identified, listed and the expenditure under the individual items estimated.

Labour

- After deciding on the projected production capacity and the layout, process, etc.
- The requisite personnel at various levels of operations have to be assessed.
- The cost of recruitment, training, employment, and promotions have to be estimated and reckoned for working out the economics of the project.

Staff

- Lack of qualified and competent supervisory and managerial staff has very often been a major handicap for many a project.
- Advance planning and action is necessary to determine the manpower needs for supervisory and managerial positions, for the proposed organization structure and plant layout, and for requiting, inducting and training the key personnel in order to ensure smooth and efficient operations from the commencement of commercial production.

Implementation Scheduling

- The implementation phase commences from the time the decision to invest is taken, and extends up to commencement of commercial production.
- The feasibility study should spell out the project implementation programme and time schedule and describe the proposed action plans and time frames for acquisition of technology, detailed engineering of equipment, tendering, evaluation of bids and awards of contact thereof.
- Bar Charts, CPM, PERT techniques can be of immense help in effective implementation planning and management.

Financial Evaluation

- Conceding that the estimates and projections have been well and adequately prepared, the final acts in the feasibly study are the financial and economic valuations of the project.
- The inter-relationship between the estimated capital costs, the estimated annual revenues have to be analyzed to see whether the project is likely to pay its keep and leave a reasonable surplus for further growth.
- The discounted cash flow analysis and the sensitivity analysis are very useful tools to be applied at this stage of evaluation of financial and economic aspects of the project.

Economic Evaluation

- In the case of the projects, it is particularly necessary to evaluate the contribution of the projects to the national economy.
- Rising of aggregate consumption could be one of the basic objectives in the project evaluation.
- Redistribution of income could be another.
- These different objectives will have to be weighted and combined to establish the net contribution of the project to the national economy.

Detailed Project Report (DPR)

- Detailed Project Report is one which contains the complete details of the project and it is required to be submitted to banks and financial institutions for obtaining the financial assistance.
- Usually, all the contents of techno-economic feasibility studies will be covered in the DPR.
- Detailed project report is a complete document for investment decision making, approval.
- Detailed project report is base document for planning the project and implementing the project.

Components of DPR

- Availability of raw materials and tie up (MOU document)/ willingness certification
- Availability of land and tie up (Lease document)/ willingness certification
- Organization type and structure like (Entrepreneur/ Proprietary, Private limited, Entrepreneur/ Public limited, Co-operative, NGO etc.
- Brief project description
- Tie up with technology, equipment suppliers
- Financial analysis and profitability study.

Components of DPR

- Incentives, concessions expected from other Government and public bodies for demonstration and future multiplications.
- Initial contribution in terms of finance, technology development, technical and equipment tie up by the promoter and user agency (mention separately).
- Organizations to operate and maintain the demonstration project.
- Organization to replicate the project in a specific region or throughout India.
- Fulfilment of statutory requirements (like PCB clearance, environmental clearance/ safety, etc.)

Legal Aspects of Project Management

- ***Risk Insurance:***

✓ When a project is initiated, there are obviously certain risks involved.

✓ Not only accessing these risks is important, but creating ways to overcome these risks while incorporating them in contract is equally important.

Legal Aspects of Project Management

- ***Project Contract***

- ✓ A project will always include numerous contracts.
- ✓ The drafting of the project contract includes the most of lawyer's contribution.
- ✓ While contracting, he would have to go through the nature of obligations that would arise from the contract and also, the evolution of agreements whilst making business-related decisions.
- ✓ After he is done with the contractual phase, the lawyer needs to deal with the post-contractual phase as well.
- ✓ The post contractual phase will include his' and party's hidden obligations which he needs to analyze and perform.

Legal Aspects of Project Management

- ***Change control***
- A contract for project when proposed must also include a procedure for change in the contract including the conditions of change and sometimes, listing of the situations only in which the changes can be made.
- However, any kind of change in the contract terms is highly discouraged.
- After the changes are made, they must be documented concretely and also numbered for future needs that may arise.

Legal Aspects of Project Management

- ***Imposing restrictions***
- In a project contract between two parties, it is common that the restrictions would be imposed on party by another.
- It is the duty of the lawyer to check that the restrictions are in consonance with Section 27 of the Indian Contract Act, 1872 which states that “Every agreement by which anyone is restrained from exercising lawful profession, trade or business of any kind, is to that extent void”.

Legal Aspects of Project Management

- ***Interpretation of Contract***

- ✓ The very first part of interpreting any contract is its recitals.
- ✓ The introductory part of a contract is usually referred to as ‘recitals’.
- ✓ Further, in a contract, there are certain things which are explicitly provided while certain are implied.
- ✓ Certain terms of contract are clear while certain are tacit and it requires legal expertise to understand the tacit terms and work as per those.
- ✓ Thus, the interpretation of contract is as important as making the contract itself.

Legal Aspects of Project Management

- ***Arbitration or mediation***
- It is quite important to include arbitration or mediation clause in the project contract. In case of small disputes between contracting parties, one cannot always approach the Court for that, then the cases would last till eternity and it would become impossible to accomplish the project.
- Also, it must be added that which law would govern either parties in cases like, if both the contracting parties are foreign entities or either of them is and such other cases.
- It is also vital to decide the jurisdiction beforehand in case anyone approaches the Court.