

Chapter 8

Technical Feasibility Study

Technical Feasibility Study

What is a technical feasibility study ?

- The Technical Feasibility Study assesses the details of how you will deliver a product or service (i.e., materials, labor, transportation, where your business will be located, technology needed, etc.).
- Think of the technical feasibility study as the logistical or tactical plan of *how* your business will produce, store, deliver, and track its products or services.

Technical Feasibility Study

Preparing an Outline for Writing Technical Feasibility Study

- Materials and Supplies
- Location, Site and Environment
- Engineering and Technology
- Human Resources

Technical Feasibility Study answers the following questions

- Are enough raw materials available of the correct quality when needed for year-round production?
- Is the cost of the raw materials satisfactory?
- Is the correct size and type of equipment available for the expected production level and at a reasonable cost?
- Are maintenance and repair costs affordable?

Technical Feasibility Study answers the following questions

- Are distribution procedures to retailers or other sellers established?
- Is a suitable building available and what modifications are needed?
- Are services (fuel, water, electricity etc.) available?
- Are trained workers available and are their salaries affordable?

Row material and Supplies

1. Characteristics of raw materials and factory supplies

- Specify list sources of materials and inputs, classified into raw materials,
- Processed industrial materials, components, auxiliary materials, factory supplies and utilities)

2. Supply program, you have to study the following:

Specify list sources of materials and inputs, classified into raw materials,

Row material and Supplies

1. Material inputs (approximate input requirements, their present and potential supply positions, and a rough estimate of annual costs of local and foreign material inputs):
 - Raw materials
 - Processed industrial materials
 - Components
 - Factory supplies (Auxiliary materials, utilities (especially power and energy requirements))

Row material and Supplies

Supply program:

- Quantitative supply program, seasonal variations, subdivided into a program for the entire plant, project components, and cost centers
- Development of supplies, seasonal restrictions
- Possible substitutes
- Organization of supplies (purchase, transport etc.)
- Prices
- Annual cost of supplies, seasonal variations
- Inventory of materials and inputs in terms of quantities and seasonal variations, as well as book and market value of inventories

Location, site and environment:

Location, site and environment, includes the following

- re-selection, including, if appropriate, an estimate of the cost of land
- Preliminary environmental impact assessment

Location

- Describe the location of the plant and show it on appropriate maps
- Give country, district, town
- Show connections to existing infrastructure (traffic, electricity, water, population etc.)
- Describe socio-economic environment, nearness to market etc.

Location, site and environment:

Site

- State town, street, number
- Show situation and size on geodetic maps
- Existing rights of way, easements etc.
- Value of land
- Annual costs of rights of way, rents, taxes, payments to neighbors etc.

Local conditions and environment

- Describe impacts of project on population, infrastructure, landscape, etc.
- Evaluate the tendency of impacts (positive or negative)
- Assessment of environmental impacts, public and corporate policies, conflicts, costs and environmental forecast

Engineering and Technology

- Technology and equipment, includes the following:
 - A. Technologies and processes that can be adopted,
 - B. Technology description and forecast
 - C. Environmental impacts of technologies
 - D. Rough estimate of costs of local and foreign technology
 - E. Rough layout of proposed equipment (major components):
 - E.1. Production equipment
 - E.2. Auxiliary equipment
 - E.3. Service equipment
 - E.4. Spare parts, wear and tear parts, tools

Rough estimate of investment cost of equipment
classified as above.

Engineering and Technology

Production programme

- Production programme of products and by-products: quality specifications, quantities produced, time schedule of production (seasonal variations),
- percentage of spoilage and waste

Plant capacity

- Installed nominal maximum capacity
- Feasible nominal plant capacity of entire plant, main departments, major equipment units
- Plant layouts and charts (show existing structure of plant on physical layouts and on functional charts and layouts)
- Scope of enterprise (show scope of enterprise on layout drawings, and divide it into project components and cost centres)

Engineering and Technology

Technology

- List and describe technologies used, historic development
- Sources of technology
- Type of acquisition: licensing, purchase, joint venture
- Experiences (positive or negative)
- Technology forecast
- Annual costs of technologies (royalties, fixed payments)

Engineering and Technology

Equipment:

- List and specify equipment, classify into production, auxiliary and service equipment
- Show equipment on plant layouts
- Describe sources, age, type (automatic, semi-automatic etc.)
- State capacity, condition (up-to-date, obsolete etc.)
- Value of installed equipment
- Annual depreciation and repair costs
- Estimated life and replacement costs

Engineering and Technology

➤ Civil engineering works, includes the following:

- A. Rough layout of civil engineering works,
- B. Arrangement of buildings,
- C. Short description of construction materials to be used,
- D. Site preparation and development
- E. Buildings and special civil works
- F. Outdoor works

Rough estimate of investment cost of civil engineering works (local and foreign), classified as above.

Human resources:

- Estimated human resource requirements
- Estimated annual human resource costs

Labor

- List and describe labour force
- Describe skill and availability
- State annual cost of labour at nominal feasible capacity, subdivide into production labour (variable) and non-production labour (fixed)

Staff

- List and describe staff, show structure on manning tables
- State annual staff cost

Costs

Capital expenditures (CAPEX)

Capital expenditures (CAPEX) are expenditures creating future benefits. A capital expenditure is incurred when a business spends money either to buy fixed assets or to add to the value of an existing fixed asset with a useful life extending beyond the taxable year.

Capital expenditures include:

- ✓ acquiring fixed, and in some cases, intangible assets
- ✓ repairing an existing asset so as to improve its useful life
- ✓ upgrading an existing asset
- ✓ preparing an asset to be used in business
- ✓ starting or acquiring a new business

Operational expenditures (OPEX)

Operational expenditure (OPEX) **OPEX** is an ongoing cost for running a product, business, or system.

Operational expenditures include:

- ✓ License fees
- ✓ maintenance and repairs
- ✓ advertising
- ✓ office expenses
- ✓ Supplies
- ✓ legal fees
- ✓ utilities, such as telephone
- ✓ Insurance
- ✓ property taxes
- ✓ travel and vehicle expenses

Estimation of working capital

Example :

Suppose you have the following data related to chairs production project.

Months	Expected monthly costs	Expected monthly Revenues
1	50	15
2	50	15
3	50	30
4	50	30
5	50	30
6	50	30
7	50	60
8	50	60
9	50	60
10	50	60
11	50	60
12	150	250
Total	700	700

Estimate the working capital according to the monthly cash flow cycle ?

Solution

Months (1)	Expected monthly costs (2)	Cumulative costs (3)	Expected monthly Revenues (4)	Cumulative Revenues (5)	Required cash for the working capital (6) = (3) – (5)
1	50	50	15	15	35
2	50	100	15	30	70
3	50	150	30	60	90
4	50	200	30	90	110
5	50	250	30	120	130
6	50	300	30	150	150
7	50	350	60	210	140
8	50	400	60	270	130
9	50	450	60	330	120
10	50	500	60	390	110
11	50	550	60	450	100
12	150	700	250	700	0
Total	700		700		

The required cash for working capital is the highest value which is (150)

Estimation of Operation Cost

Suppose that the estimation of cost function for number of an existence projects during the last 10 years was as follow :

$$C_t = 2Q_t^{0.5} P_t$$

Where :

C_t : The Operation Cost

Q_t = Quantity produced

P_t = Price index for inputs

And the estimated time line of input price index function for the same period was as follow :

$$P_t = 1 + 0.1 T$$

Estimate the operational cost for the proposed project ?

Comment : (Q_t) the expected sales data for the period are given and (P_t) should be calculated using the formula

Solution

Years	The expected quantity of sales (Qt) is given	Input Price Index (Pt)	Expected Operation Cost (Ct)
0	1640	2	162
1	1800	2.1	178.2
2	1900	2.2	191.8
3	1940	2.3	202.6
4	1980	2.4	213.6
5	1980	2.5	222.5
6	2000	2.6	232.6
7	2000	2.7	241.5
8	2000	2.8	250.4
9	2000	2.9	259.4