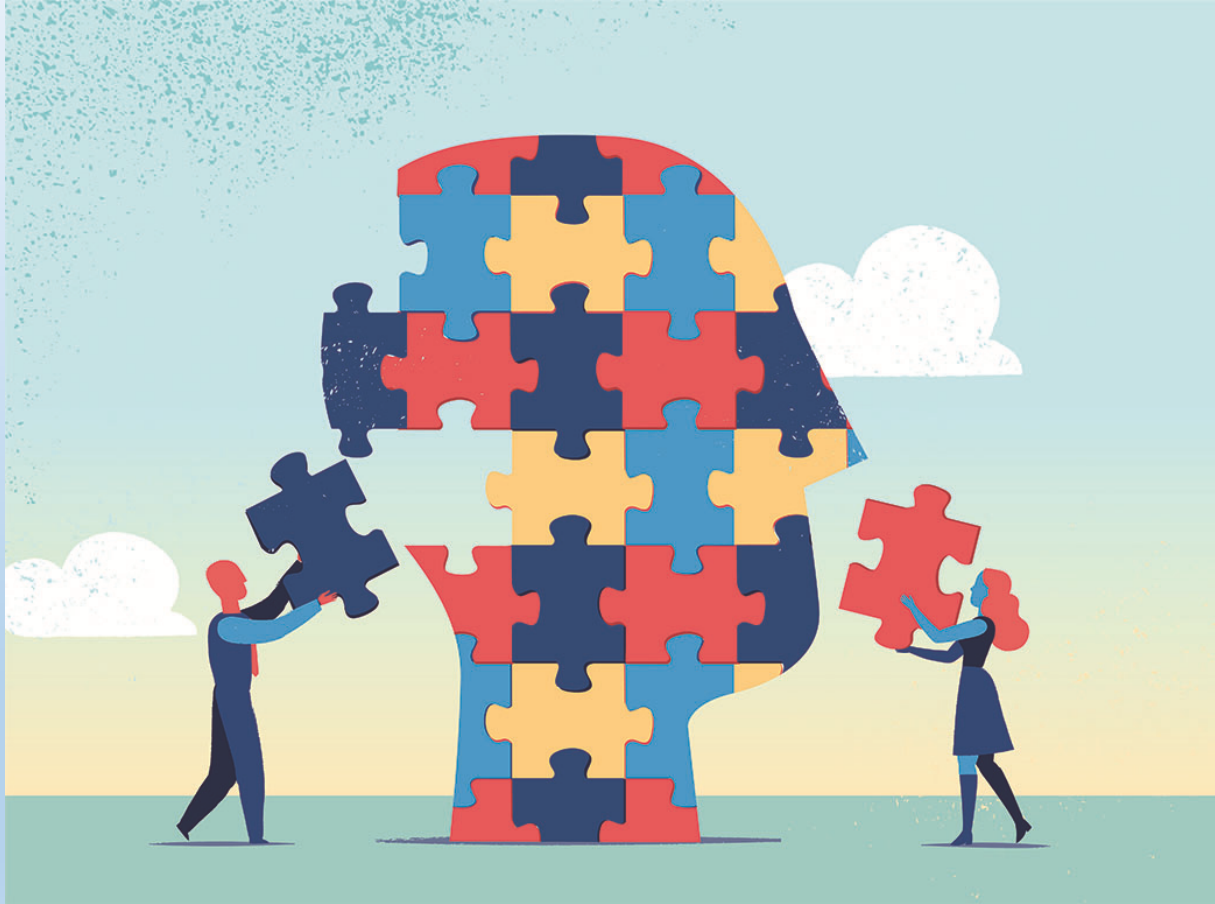


PROJECT MANAGEMENT AND FINANCE



UNIT - 3

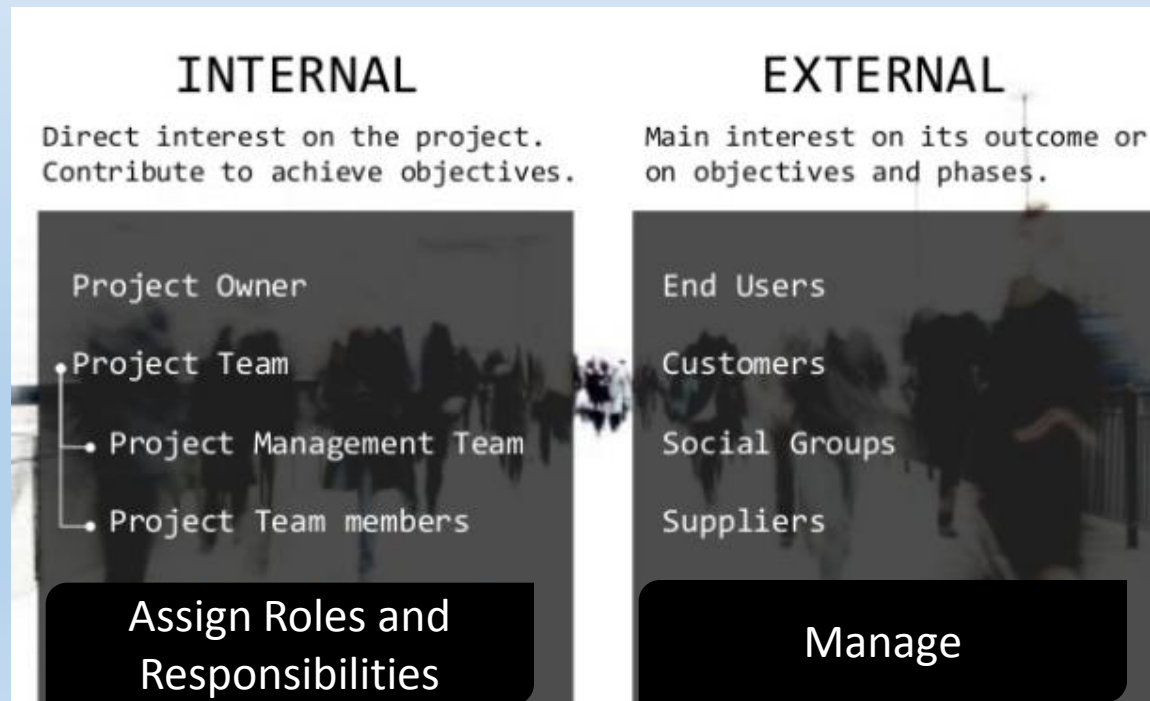
IDENTIFICATION AND FORMATION

CONTENT

- Project environment
- Identification of investment opportunities
- Project screening
- Project selection
- Project formulation
- Stages in project formulation
- Project report preparation

PROJECT ENVIRONMENT

- Project environment represents a connection, where the project is processed. It impacts the project and is, therefore, conditioned.
- Such an interaction is provided by numerous factors as **operational, physical, ecological, social, cultural, economic, psychological, financial, organizational** etc. The environment not only formulates the project but also estimates it.



PROJECT ENVIRONMENT

INTERNAL VS EXTERNAL

INTERNAL

Project Owner

- initiates the project
- benefits from its final result
- responsible to monitor the project objectives
- provides financial or other resources to the project

Project Team

Project Management Team

project management tasks

- Project Manager
- Project Planner/Scheduler
- Project Cost Controls Manager
- Project Procurement Manager
- Project Quality Manager

Team members

carry out the project work

EXTERNAL

End Users, Customers, Social Groups, Suppliers

- Identify needs, expectations, power
- Develop Managing Strategy
- Involve them actively in decision making
- Meet their expectations
- Communicate the benefits

The Project Environment Analysis – PESTLE ANALYSIS

- A tool that helps project managers identify these threats, as well as opportunities, is the **PESTLE analysis**.
- This method takes a big picture or birds view approach

P	E	S	T	L	E
Political	Economic	Social	Technological	Legal	Environmental
<ul style="list-style-type: none">• Increasing political focus on healthcare• Global governments look for healthcare savings• Britain voted to leave Europe causes political turmoil	<ul style="list-style-type: none">• Increasing labor cost• Inflation• Consumer confidence is low• Low fuel prices and interest rates helps promote growth in market capacity	<ul style="list-style-type: none">• Increasing attention in healthcare	<ul style="list-style-type: none">• Opportunity: Advertise through social media	<ul style="list-style-type: none">• Hello World Pharmacy was fined \$450m for pollution issues	<ul style="list-style-type: none">• Adverse weather condition causes the temporary suspension of some factories• Growing attention to environmental protection

ELEMENTS OF PESTLE ANALYSIS

P	E	S	T	E	L
Political	Economic	Social	Technological	Environmental	Legal
<ul style="list-style-type: none"> • Government policy • Political stability or instability overseas • Foreign trade policy • Tax policy • Labor laws • Terrorism and military considerations • Environmental laws • Funding grants and initiatives • Trade restrictions • Fiscal policy 	<ul style="list-style-type: none"> • Economic Growth • Interest Rates • Exchange rates • Inflation • Disposable income of consumers • Disposable income of businesses • Taxation • Interstate taxes • Wages rates • Financing capabilities 	<ul style="list-style-type: none"> • Population growth • Age distribution • Health consciousness • Career attitudes • Customer buying trends • Cultural trends • Demographics • Industrial reviews and consumer confidence • Organizational image 	<ul style="list-style-type: none"> • Producing goods and services • Emerging technologies • Technological maturity • Distributing goods and services • Target Market Communication • Potential Copyright infringements • Increased training to use innovation • Potential Return on Investment (ROI) 	<ul style="list-style-type: none"> • The decline of raw materials • Pollution and green house gas emissions • Promoting positive business ethics and sustainability • Reduction of their carbon foot print. • Climate and weather • Environmental Legislation • Geographical location (and accessibility) 	<ul style="list-style-type: none"> • Health & Safety • Equal Opportunities • Advertising Standards • Consumer Rights and laws • Product Labeling • Product Safety • Safety Standards • Labor Laws • Future Legislation • Competitive Legislation

PESTLE structure of the Indian Business Environment

- Political, economic, social, technological, legal, and environmental (PESTLE) structure of the Indian Business Environment.
- Each of the PESTLE factors is explored in terms of four parameters:
 - I. Current strengths,
 - II. Current challenges,
 - III. Future prospects, and
 - IV. Future risks.

PESTLE structure of the Indian Business Environment (Contd...)

Political analysis

Current strengths	Current challenges
<ul style="list-style-type: none">• Strong democratic setup▪ Improved relations with Europe and North America	<ul style="list-style-type: none">▪ Allegations of corruption▪ Lack of a comprehensive peace deal with Pakistan▪ Terrorism
Future prospects	Future risks
<ul style="list-style-type: none">▪ The new finance minister is expected to bring in economic reforms▪ Improved accountability of government	<ul style="list-style-type: none">Emergence of strong regional parties▪ Social and communal tensions▪ Politics of fast

Economic analysis

Current strengths	Current challenges
<ul style="list-style-type: none">• Inherent strength of the economy▪ Second largest working age population pool in the world▪ Highly favored FDI destination	<ul style="list-style-type: none">• Unemployment▪ Energy constraints and overdependence on oil imports▪ Agricultural output fluctuates with monsoons▪ Imbalanced regional development and widening economic disparities▪ High inflation
Future prospects	Future risks
<ul style="list-style-type: none">• Manufacturing hub▪ Expanding domestic market	<ul style="list-style-type: none">• Poor infrastructure▪ High fiscal deficit and public debt▪ Elevated current account deficit▪ Spillover risks from advanced economies

PESTLE structure of the Indian Business Environment (Contd...)

Social analysis

Current strengths	Current challenges
<ul style="list-style-type: none">▪ Growing proportion of young people▪ Rapid urbanization	<ul style="list-style-type: none">▪ Healthcare remains a major concern▪ Weak social security system▪ Poor literacy rate▪ Low HDI rank
Future prospects	Future risks
<ul style="list-style-type: none">▪ Employment guarantee scheme▪ Rising life expectancy	<ul style="list-style-type: none">▪ Government's authority challenged▪ Inability to control birth and fertility rates

Technological analysis

Current strengths	Current challenges
<ul style="list-style-type: none">▪ Strong knowledge base▪ Cost advantage▪ Strong English language skills	<ul style="list-style-type: none">▪ Gross expenditure on R&D remains below 1% of GDP▪ The talent pool requires further vocational training
Future prospects	Future risks
<ul style="list-style-type: none">▪ Government policies promoting R&D▪ Significant competitive advantage in biotechnology research	<ul style="list-style-type: none">▪ Low proportion of high technology exports

PESTLE structure of the Indian Business Environment (Contd...)

Legal analysis

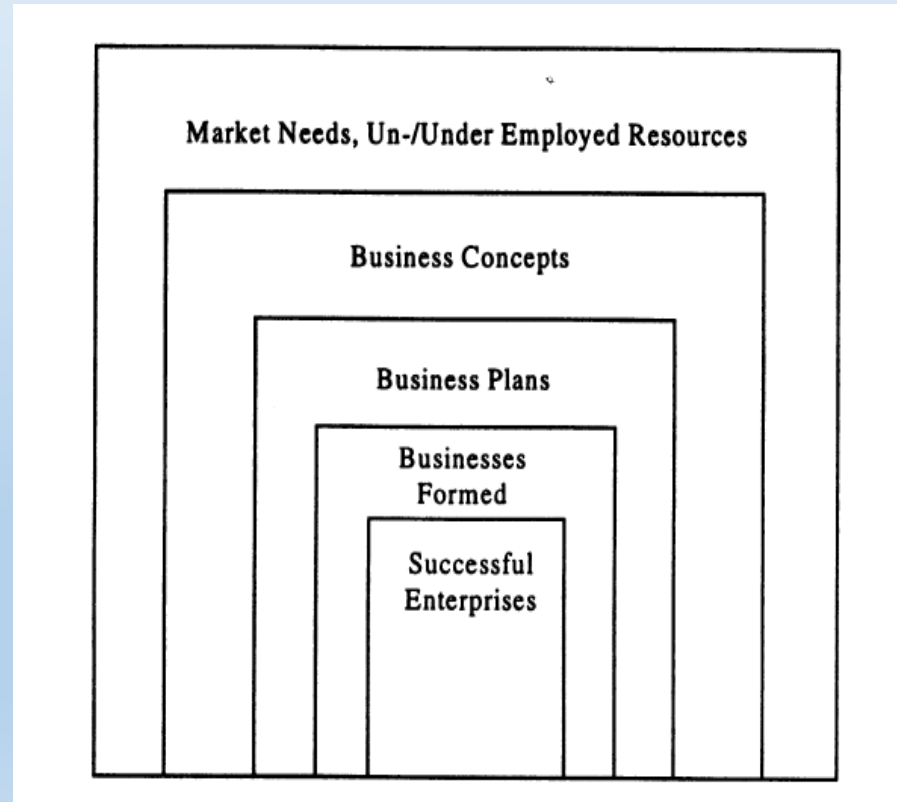
Current strengths	Current challenges
<ul style="list-style-type: none">• Comprehensive legal framework for business entities▪ Taxation policy driving foreign investment▪ Implementation of VAT	<ul style="list-style-type: none">▪ Corporate governance▪ Weak implementation of intellectual property laws▪ Judicial delays
Future prospects	Future risks
<ul style="list-style-type: none">▪ Tax reforms▪ Good prospects in legal process outsourcing	<ul style="list-style-type: none">▪ Implementation of regulations▪ Lack of a single financial market regulator.

Environmental analysis

Current strengths	Current challenges
<ul style="list-style-type: none">▪ Biodiversity▪ Right to information▪ Comprehensive environmental policy framework	<ul style="list-style-type: none">▪ Air pollution▪ Depleted water resources▪ Poor performance on environmental indicators▪ Dependence on fossil fuels for energy requirements
Future prospects	Future risks
<ul style="list-style-type: none">▪ Reduction of carbon footprint▪ Public-private partnership and ecotourism▪ Increased activism	<ul style="list-style-type: none">▪ The adverse impact of economic growth▪ Enforcement deterrents

WHAT IS OPPORTUNITY?

- “Opportunity is defined as a **situation** that enables an entrepreneur to offer marketable products or services to interested buyers or end users”.
- An opportunity may be the **chance to meet a market need (or interest or want)** through a creative combination of resources to deliver superior value



EMERGENCE OF OPPORTUNITY

- when people decide they have certain needs and want to be satisfied, or when people discovered a problem of some kind that can be helped by a product or service.
- The presence of unfulfilled needs and want and/or problems alerts the entrepreneur to the potential opportunity.
- The entrepreneur later creates a business that is able to fulfill the needs or want and/or solve the problem.

TYPES OF SITUATIONAL FACTORS

1. Product or service is still not in existence
2. Product or service is already in the market but failed to satisfy the customers – so need to be improved

APPROACH TO OPPORTUNITY IDENTIFICATION

1. Observe changes in the environment
2. Recognize a need that customers have that is not being satisfied
3. Recognize problems and find ways to solve it

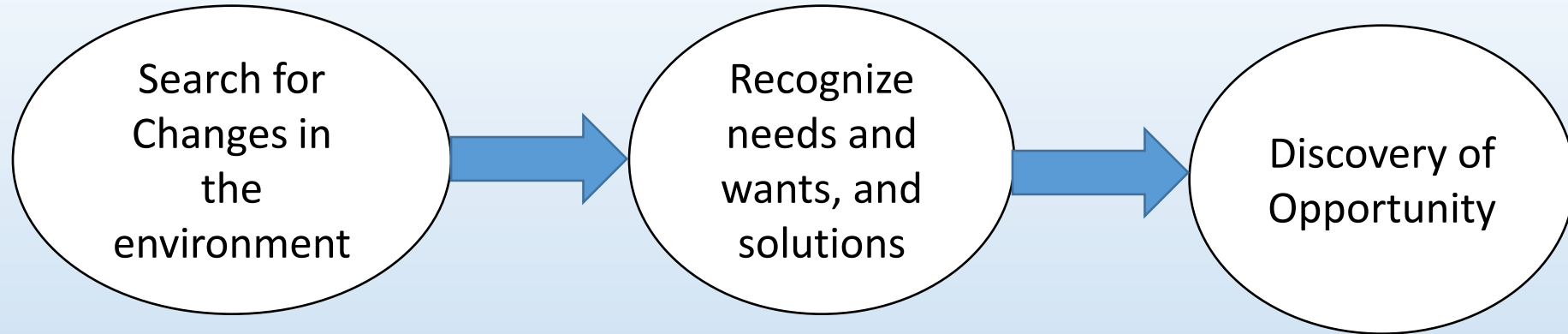
RECOGNIZE NEEDS AND WANTS

- Opportunity occurs whenever there is a need and want to fulfill. The term “needs” refer to basic needs that the consumer must have in order to live while the term “wants” refers to a personal desire for something that is more than a basic need.

Examples of How Changes in the Environment Provides Openings for New Product and Service Opportunities

Structure of Population and Income	Number of teenagers higher than number of elderly and children	Cyber cafes, Cineplex's, recording studios
	People have higher purchasing power	Passenger cars, household furniture, DVD
Social	Increase incident of housebreaking	Grills, alarm, sensor, security systems
	Increase interest in fitness	Fitness center, dancing class, in-house exercise equipment, health food store
	Increase mobility of population	Hand phone, laptop computers
	Increasing predominance of dual-income families leaves less time to cook at home	Restaurants, food delivery services
Technological Advances	Advances in biotechnology	Biotech-related pharmaceutical products, food products, veterinary products
	Development of the internet	E-commerce, improved communication
	Increase pressure to improve economic performance	Online marketing, cost control services
Government Policies and Regulations	Increased driving standards	Smoke emission control, helmet, seatbelt

OPPORTUNITY IDENTIFICATION PROCESS



ABILITY TO SEARCH AND DISCOVER BUSINESS OPPORTUNITIES

- Experience and exposure
- Knowledge and skills
- “Special alertness”
- Social network
- Creativity
- Vigilant

MECHANISM TO IDENTIFY OPPORTUNITIES

- Customers
- Retailers and distributors
- Business associates
- Bankers
- Consultants
- Employees
- Others

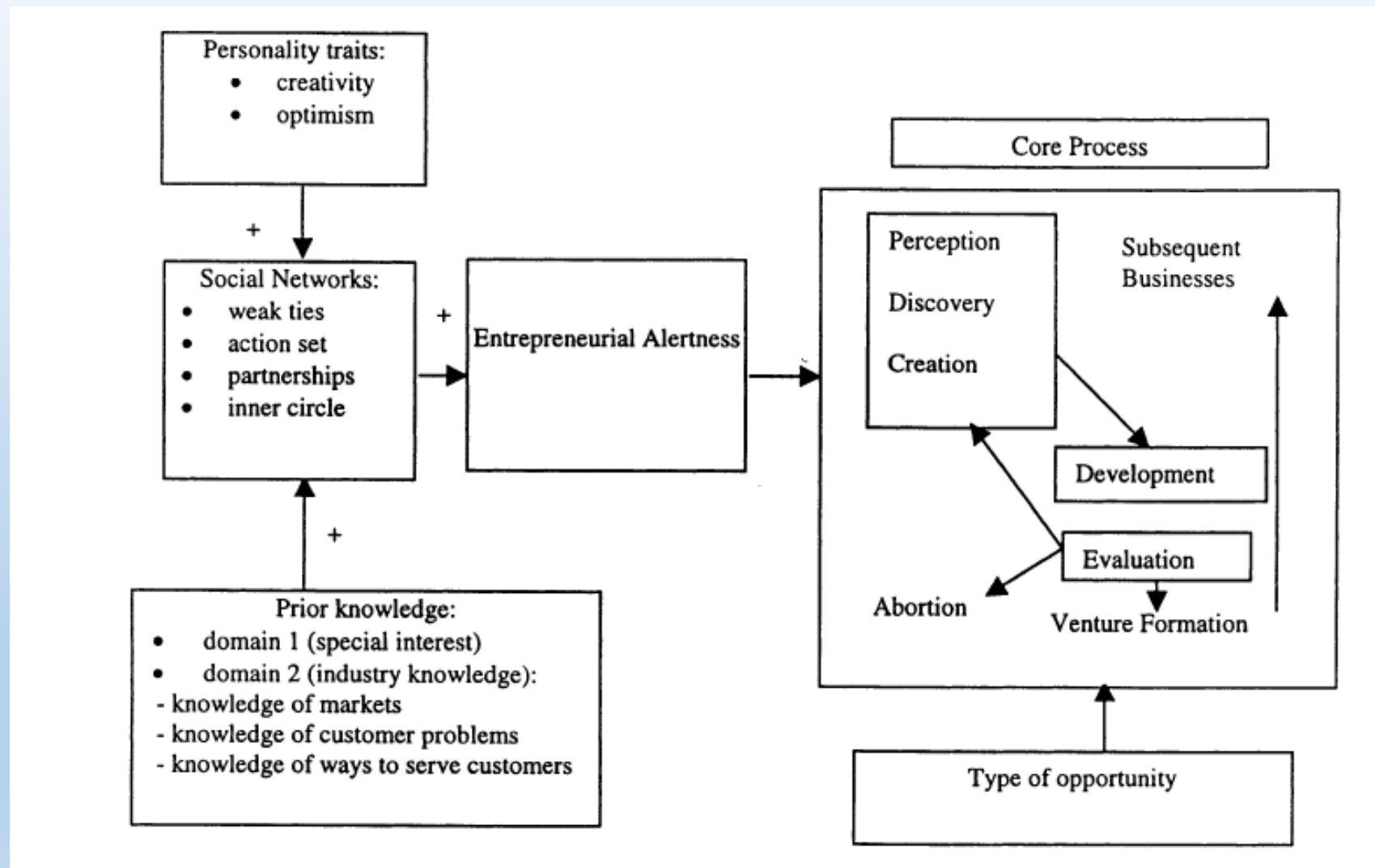
Factors that influence the way Opportunities are identified and developed by Entrepreneurs

1. Entrepreneurial alertness;
2. Information asymmetry and prior knowledge;
3. Discovery versus purposeful search;
4. Social networks;
5. Personality traits, including risk-taking, optimism and self efficacy, and creativity.

TYPES OF OPPORTUNITY

		VALUE SOUGHT	
		Unidentified	Identified
VALUE CREATION CAPABILITY	Undefined	"Dreams" I	Problem solving II
	Defined	Technology Transfer III	Business Formation IV

MODEL FOR THE OPPORTUNITY IDENTIFICATION AND DEVELOPMENT THEORY



Factors Contributing to Successful Growth of a Start-up Enterprise

1. Proof and clarity of innovative concept
2. Leadership
3. Significant investment in infrastructure –the basic systems, technologies and resources
4. Business planning and marketing
5. Triple bottom line planning (economic, social and environmental benefits)
6. Long term success
7. Risk management
8. Value creation as a outcome

Factors which Lead to Start-up Business Failure

1. Inadequate planning of the business
2. Insufficient initial capital for start-up period and development stages due to inadequate planning
3. Mistaken estimate of market demand for product or service
4. Lack of management ability
5. Failure to select and use appropriate outside professional advisors
6. Inability to market product or services effectively
7. Over dependence on a single individual or on a predicted specific event
8. Failure to understand capital requirements of a growing business
9. Poor timing of expenditures due to poor planning
10. Expedient rather than reasoned decision-making

CHARACTERISTIC OF INVESTMENT IDENTIFICATION:

- Investment is capital expenditure in nature which will yield returns only in the long run.
- Investments made are irreversible and hence one must be careful in decision making and take decision after expert opinion.
- Viability of the project and risk aspects should be analyzed thoroughly.
- Investment opportunities should consider the following elements/principles: Cost, timing, risk, flexibility, uncertainty and control.
- Capital expenditure is basically classified as replacement, expansion, diversification, R&D, union, and achievement etc.,

GENERATION AND SCREENING OF A PROJECT IDEA – PROJECT MANAGEMENT

Generation and Screening of a project idea begins when someone with specialized knowledge or expertise or some other competence feels that he can offer a product or service

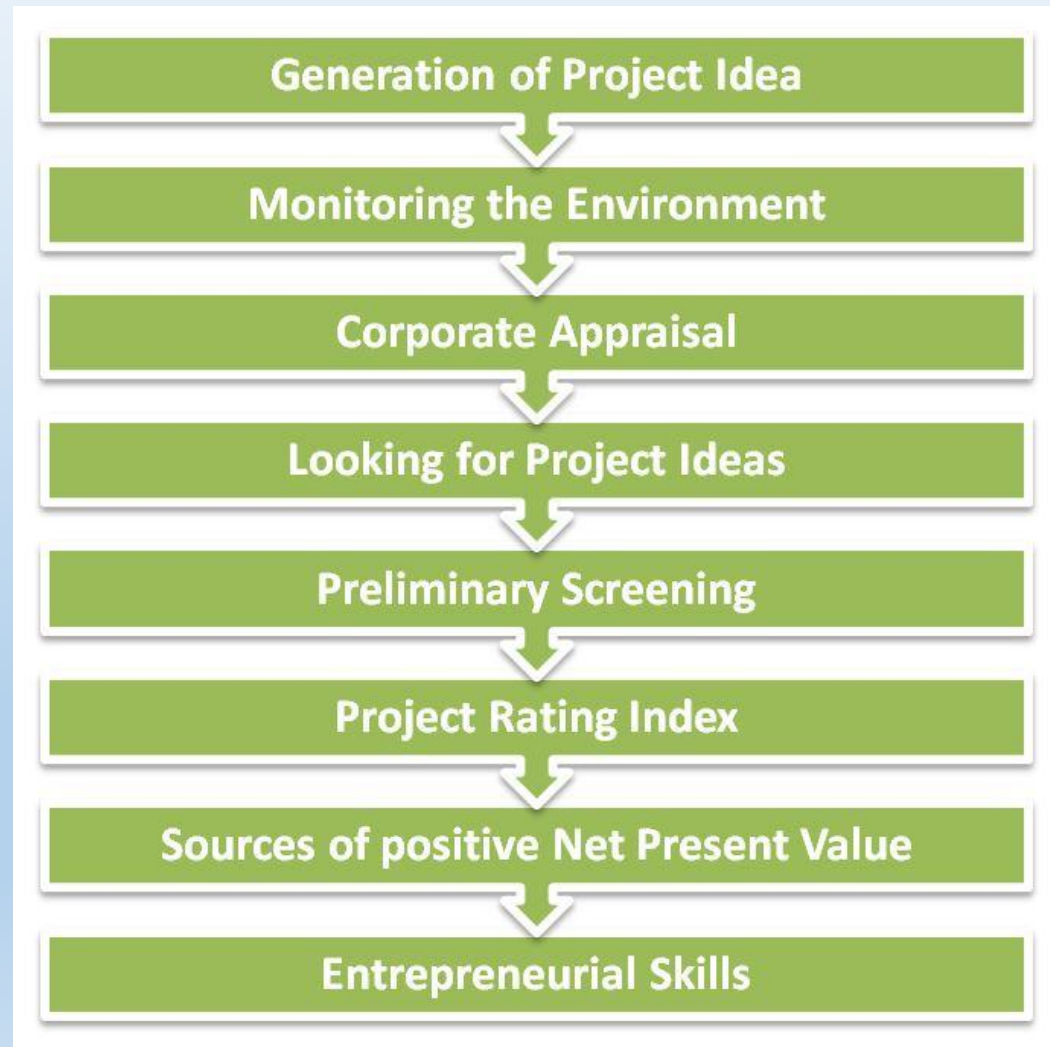
- ◆ which can cater to a presently unmet need and demand

- ◆ To serve a market where demand exceeds supply

- ◆ which can effectively compete with similar products or services due to its better quality/price etc.



Tasks involved in Generation and Screening of a project idea



1. GENERATION OF IDEA

Most of the project idea involve combining existing field of technology or offering variants of present product & services.

A panel is formed for the purpose of identifying investment opportunities. It involves the following tasks which must be carried out in order to come up with a creative idea –

- (a)SWOT analysis
- (b)Determination of objectives
- (c)Creating Good environment



SWOT is an acronym for:

S – Strengths

W – Weaknesses

O – Opportunities

T – Threats

Internal Environment

External Environment

2. MONITORING OF ENVIRONMENT

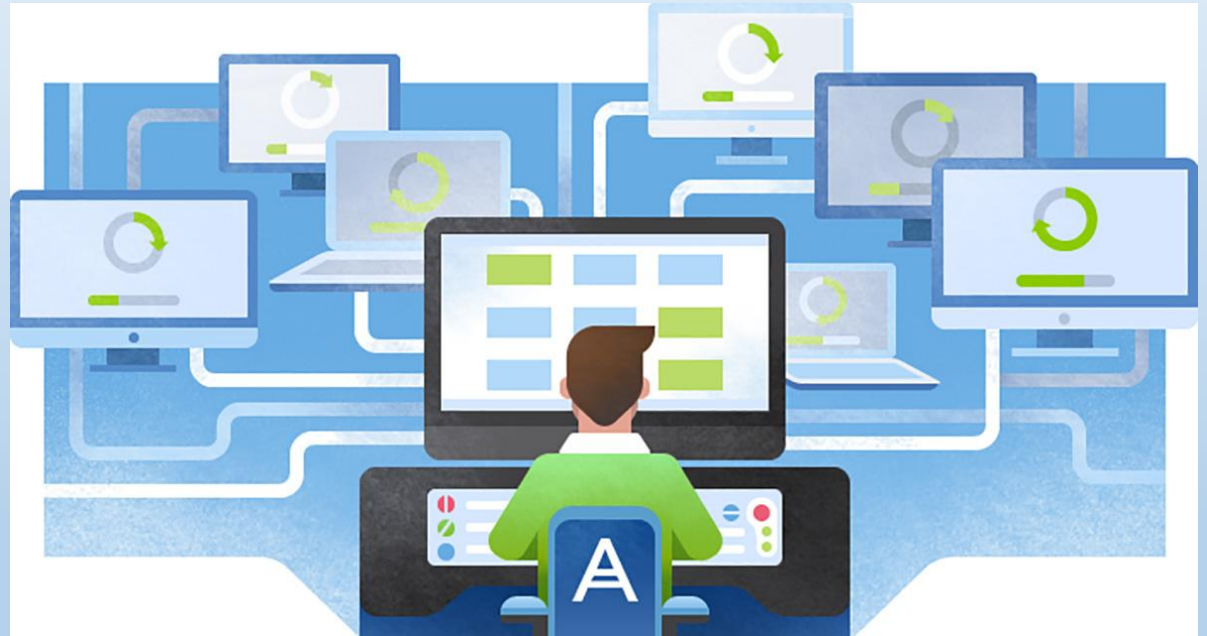
An Organization should systematically monitor the environment and assess its competitive abilities in order to profitably exploit opportunities present in the environment. The key sectors of the environment that are to be studied are :-

(a) Economic Sector –

- i.State of economy
- ii.Overall rate of Growth
- iii.Growth of primary, secondary and tertiary sectors
- iv.Inflation rate
- v.Linkage with world economy
- vii. Trade Surplus/Deficit

(b) Government Sector –

- i.Industrial policy
- ii.Government programmes and projects
- iii.Tax framework
- iv.Subsidies, incentives, concessions
- v.Import and export policies



(c) Technological Sector –

- i. State of technology
- ii. Emergence of new technology
- iii. Receptiveness of the industry
- iv. Access to technical know how

(d) Socio-demographic sector –

- i. Population trends
- ii. Income distribution
- iii. Educational profile
- iv. Employment of women
- v. Attitude towards consumption and investment

(e) Competition Sector –

- i. No. of firms and their market share
- ii. Degree of homogeneity and production differentiation
- iii. Entry barriers
- iv. Marketing policies and prices
- v. Comparison with substitutes in terms of quality/price/appeal etc.

(f) Supplier Sector – Availability and cost of raw material, energy and money



3. CORPORATE APPRAISAL

It involves identification of corporate strengths and weaknesses. The important aspects that are to be considered are:-

(a) Market and Distribution –

- i. Market Image & Market share.
- ii. Product line
- iii. Marketing and Distribution cost
- iv. Distribution Network

(b) Production and Operations –

- i. Condition and capacity of plant and machinery
- ii. Availability of raw materials and power
- iii. Degree of vertical integration
- iv. Location advantage
- v. Cost structure – Fixed and Variable costs

(c) Research and Development –

- i. Research capabilities of a firm
- ii. Track record of new product developments
- iii. Laboratories and testing facilities
- iv. Coordination between research and other departments of the organization

(d) Corporate Resources and Personnel –

- i. Corporate Image
- ii. Clout with government and regulatory agencies
- iii. Dynamism of top management
- iv. Competence and commitment of employees
- v. State of industrial relations

(e) Finance and Accounting –

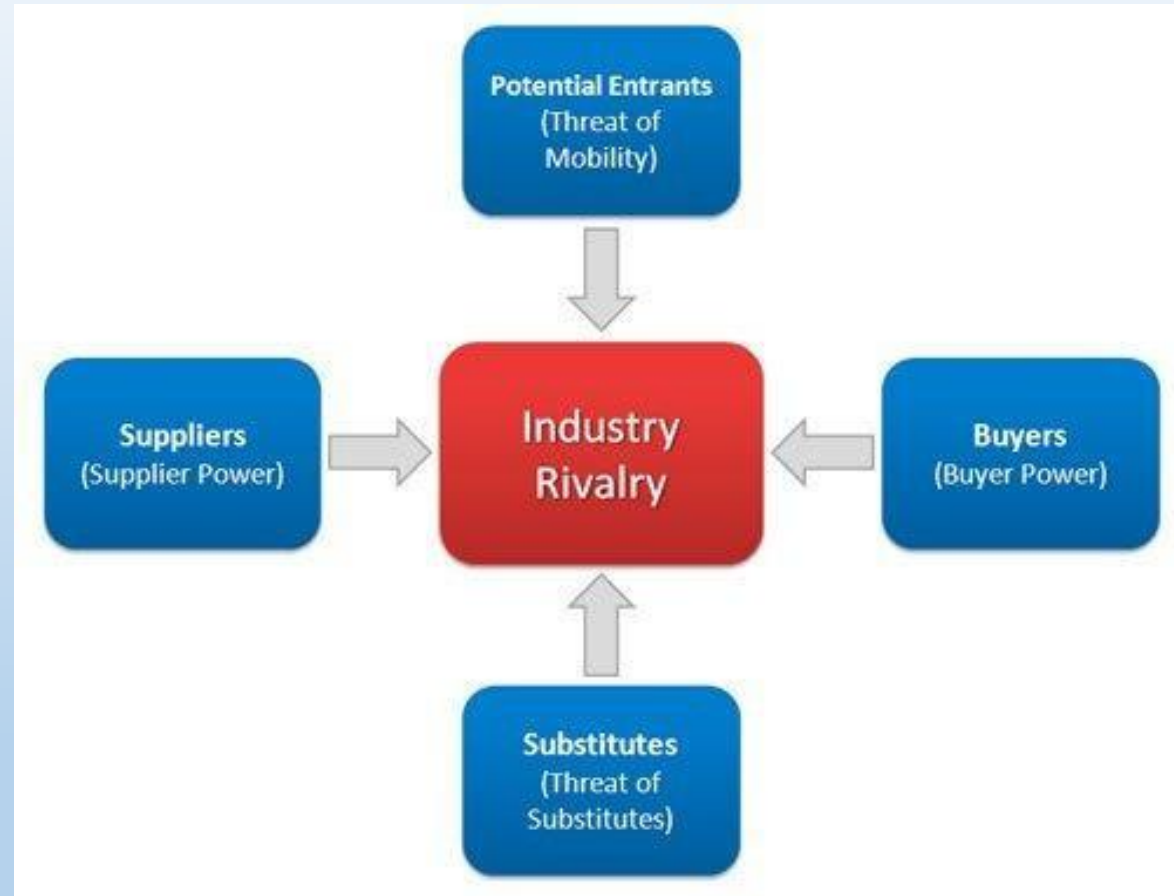
- i. Financial leverage and borrowing capacity
- ii. Cost of capital
- iii. Tax situation
- iv. Relations with shareholders and creditors
- v. Accounting and control system
- vi. Cash flows and liquidity

TOOLS FOR IDENTIFYING INVESTMENT OPPORTUNITIES–

(I) Porter 5 forces Model

It helps in analyzing profit potential of an industry depending upon strength of –

- i. Threat of new entrants
- ii. Rivalry amongst existing companies
- iii. Pressure from substitute products
- iv. Bargaining power of buyer
- v. Bargaining power of seller



(II) Life cycle Approach → There are four stages a product goes through during his life cycle:

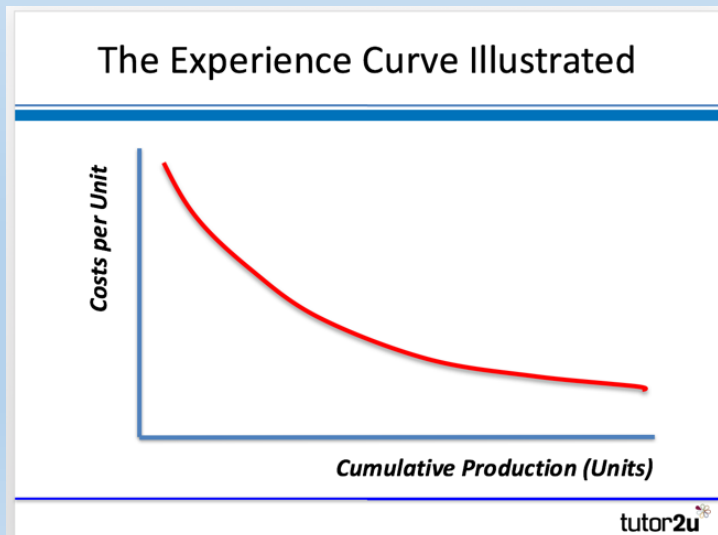
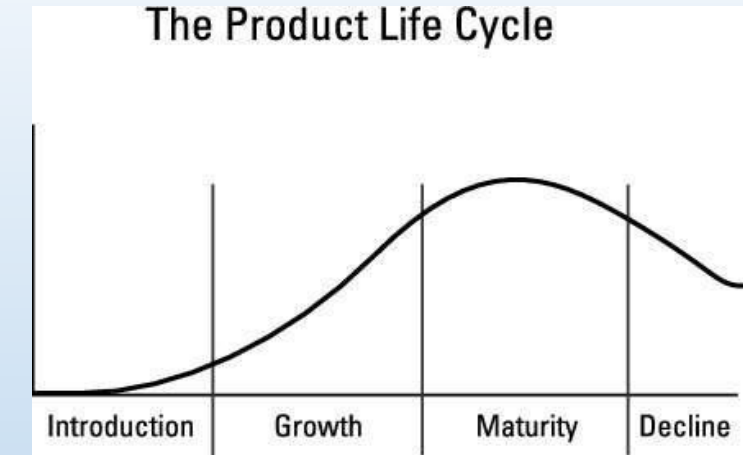
(a)Pioneering Stage – In this stage the technology and product is new, there is high competition and very few entrants survive this stage.

(b)Rapid Growth Stage – This stage witnesses a significant expansion in sales and profit.

(c)Maturity Stage – It marks developed industries with mature product and steady growth rate.

(d)Decline Stage – Due to introduction of new products and changes in customer preference the industry incurs a decline in market share and profits.

(III) Experience Curve → Experience curve analyzes how cost per unit changes with respect to accumulated volume of production.



4. LOOKING FOR PROJECT IDEAS

Various sources to look for good project ideas include:-

- i. Trade fairs and exhibitions
- ii. Studying Government plans and guidelines
- iii. Suggestion of financial institutions and development agencies
- iv. Investigating local materials and resources
- v. Analyzing performance of existing industries
- vi. Analyzing social and economic trends
- vii. Analyzing new technological developments
- viii. Studying the consumption pattern of people abroad
- ix. Stimulating creativity to produce



5. PRELIMINARY SCREENING

It refers to elimination of project ideas which are not promising. The factors to be considered while screening for ideas are:-

- Compatibility with the promoter** – The idea must be consistent with the interest, personality and resources of entrepreneur.
- Consistency with Government priorities** – The idea must be feasible with national goals and government regulations.
- Availability of inputs** – Availability of power, raw material, capital requirements, technology.
- Adequacy of Market** – Growth in market, prospect of adequate sale, reasonable Return on Investment.
- Reasonableness of cost** – The project must be able to make reasonable profits with respect to the costs involved.
- Acceptability of risk level** – The desirability of the project also depends upon risks involved in executing it.

6. PROJECT RATING INDEX

It is a tool used for evaluating large number of project ideas. It helps in streamlining the process of preliminary screening. Hence a preliminary evaluation may be converted in project rating index.

Steps to calculate project rating index:

I. Identifying the factors relevant for project rating

II. Assigning weights to these factors according to their relative importance (FW)

III. Rate the project proposal on various factors using suitable rating scale (FR) (5 point scale or 7 point scale)

IV. For each factor multiply the factor rating with factor weight to get factor scores ($FR \times FW = FS$)

V. All the factor scores are added to get the overall project rating index. Organization determines a cut off value and the project below this cut off value are rejected.

EXAMPLE FOR PROJECT RATING INDEX

Construction of Rating Index

Factors	Factor Weight	Rating					Factor Score
		VG-5	G-4	A-3	P-2	VP-1	
Technical know-how	0.25			√			0.75
Adequacy of market	0.15			√			0.45
Input Availability	0.10		√				0.40
Consistency with Govt. policies	0.20		√				0.80
Reasonableness of cost of raw materials	0.30				√		0.60
Rating Index							3.00

7. SOURCES OF THE NET PRESENT VALUE

In order to select a profitable and feasible project, a project manager must carry out a fundamental analysis of the product and factor market to know about entry barriers which lead to positive net present value. There are six entry barriers which result in a positive NPV project. They are –

- i. Economies of scale
- ii. Product differentiation
- iii. Cost advantage
- iv. Marketing reach
- v. Technological edge
- vi. Government policy



8. ENTREPRENEURIAL SKILLS

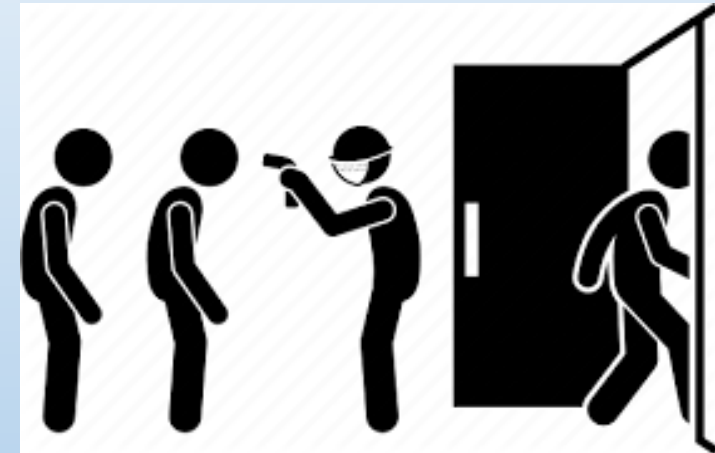
An individual must possess the following traits and qualities in order to be a successful entrepreneur –

- i. He must be willing to make sacrifices
- ii. He must be a good Leader
- iii. He must be able to make quick and rational decisions
- iv. He must have confidence in the project
- v. He must be able to exploit market opportunities
- vi. He must have strong ego in order to survive ups and downs of a business



PROJECT SCREENING

- **Project Screening** is an assessment of project applications to select those **which are not suitable for further consideration**. Project screening **includes completing a preliminary examination** of the project opportunity (project application) to obtain an idea of whether the more time-consuming and costly effort for further business case development is reasonable.
- Project screening embraces the **preliminary indications for decision-making on pursuing the project opportunities**, so the next stage after screening is the project selection where the most advisable projects are chosen.
- Specialists, conducting this procedure, utilize special project screening criteria which allow them to qualify applicant projects as **suitable or not-suitable**.
- One of the instruments used during the project screening process is a special table (so called **project screening matrix**) that lists applicant projects against the categories of screening criteria.



STEPS IN PROJECT IDENTIFICATION:

- Project ideas are like other ideas which don't take concrete shape immediately.
- An idea is first born, it is under incubation for sometimes and subsequently it begins to take some definite shape.

FOUR STAGES IN PROJECT IDENTIFICATION:

A. Conceptual stage – where project ideas are generated

B. Screening stage – at which unviable ideas are eliminated.

C. Identification stage – at which viable projects are selected

D. Pre-feasibility state – at which pre-feasibility studies are taking up.

- The third & fourth stages may be called as investment opportunity study.

SCREENING PROJECT IDEAS /

PROCESS OF ELIMINATING NON VIABLE PROJECT IDEAS:

- After gathering the project ideas, it is essential to eliminate ideas which are not promising. This process of eliminating the irrelevant and unviable ideas is called **screening of project ideas**.

- 1) *Compatibility with the promoter*
- 2) *Consistency with governmental priorities*
- 3) *Availability of inputs*
- 4) *Adequacy of market*
- 5) *Reasonableness of cost*
- 6) *Acceptability of risk level etc.*



- The project idea must be compatible with interest personality and resources of the entrepreneur.
- It should be accessible to him and also it offers him the prospects of rapid growth and high return on invested capital.
- The project idea must satisfy or go along with the governmental priorities, National goals and governmental regulatory framework.

PROJECT SELECTION

Nature of Project Selection Models

- 2 Basic Types of Models

- (1) Non-numeric

- (2) Numeric

- Two Critical Facts:

- Models do not make decisions - People do!

- All models, however sophisticated, are only partial representations of the reality they are meant to reflect

Types of Non-numeric Models

- ***Sacred Cow*** - project is suggested by a senior and powerful official in the organization
- ***Operating Necessity*** - the project is required to keep the system running
- ***Competitive Necessity*** - project is necessary to sustain a competitive position
- ***Product Line Extension*** - projects are judged on how they fit with current product line, fill a gap, strengthen a weak link, or extend the line in a new desirable way
- ***Comparative Benefit Model*** - several projects are considered and the one with the most benefit to the firm is selected

TYPES OF NUMERIC MODELS

Scoring Models

- ☐ Unweighted 0-1 Factor Model
- ☐ Unweighted Factor Scoring Model
- ☐ Weighted Factor Scoring Model
- ☐ Constrained Weighted Factor Scoring Model
- ☐ Goal Programming with Multiple Objectives

Financial Models (Profit/Profitability)

- ☐ Pay back period
- ☐ Average Rate of return
- ☐ Discounted cash flow
- ☐ Internal rate of return
- ☐ Profitability Index

NUMERIC MODELS – SCORING

1. UNWEIGHTED 0-1 FACTOR MODEL

A set of relevant factors is selected by management & then listed in a preprinted form. One or more raters score the project on each factor, whether or not it qualifies for an individual criterion.

Project_____

Rater_____

Date_____

	Qualify	Does not qualify
Potential market size	*	
Time to break-even less than 3 years	*	
No quality compromise		*
Need for external consultants	*	
Impact on work force safety		*
Estimated annual profits \$250,000	*	
Total	4	2

NUMERIC MODELS – SCORING

2. UNWEIGHTED FACTOR SCORING MODEL

- The earlier model had the drawback of considering all criteria equally important & involves no gradation of the degree to which a specific project meets the various criteria.
- This model addresses the second drawback by constructing a simple linear measure of the degree to which the project being evaluated meets each of the criteria contained in the list

Unweighted Factor Scoring Model

Score		Performance level
5	Very good	Grows by 40%
4	Good	Grows by 25%
3	Fair	Grows by 10%
2	Poor	Not affected at all
1	Very Poor	Negatively affected

Eg: Potential market size:

Total score should exceed some set critical value

NUMERIC MODELS – SCORING

3. WEIGHTED FACTOR SCORING MODEL

- Numeric weights reflecting the relative importance of each individual factor are added. It is the sum of products of scores and weights on each criterion.
- The weight may be generated by any of the following techniques:
 1. Delphi technique (developing numerical values which are equivalent to subjective , verbal measures of relative value.
 2. Analytical hierarchy process
 3. Successive comparison / pair wise comparisons

Performance measures and scores for automobile selection

Criteria	1	2	3	4	5
Appearance	Ugh	Poor	Adequate	Good	Wow
Braking	>165	165-150	150-140	140-130	<130
Comfort	Bad	Poor	Adequate	Good	Excellent
Cost (Operating)	>\$2.5	2.1-2.5\$	1.9-2.1\$	1.6-1.9\$	<1.6\$
Cost (Original)	>\$32.5	26-32.5\$	21-26\$	17-21\$	<\$17
Handling	<45	45-49.5	49.5-55	55-59	>59
Reliability	Worst	Poor	Adequate	Good	Excellent

EXERCISE

Use a weighted scoring model to choose an automobile. The performance measures and scores, as also the relative weights of each criterion are shown in the following table.

The criteria and weights for automobile purchase are given below.

Criteria	Weight		A	B	C	D
Appearance	.1	3	3	2	5	
Braking	.07	1	3	1	4	
Comfort	.17	4	2	4	3	
Cost, operating	.12	2	5	4	2	
Cost, original	.24	1	4	3	2	
Handling	.17	2	2	1	5	
Reliability	.12	3	4	3	2	

Develop a weighted scoring model for making an automobile choice.

Scores for automobiles

□ A=2.23

□ B=3.23

□ C=2.68

□ D=3.10

□ B is the best option

NUMERIC MODELS – SCORING

4.SENSITIVITY ANALYSIS

- A weighted scoring model can also be used for project improvement.
- For any given criterion, the difference between the criterion's score and the highest possible score on that criterion, multiplied by the weight of the criterion, is a measure of the potential improvement in the project score that would result, were the project's performance on the specific criterion sufficiently improved.
- It may be that such an improvement is not feasible.
- Such an analysis yields valuable statement of comparative benefits of project improvements.
- By adding resources we can study the degree to which a project's score is sensitive to attempts for improvement.


NUMERIC MODELS – SCORING

5. CONSTRAINED WEIGHTED FACTOR SCORING MODEL

- Involves constraints representing project characteristics that must be present or absent in order for the project to be acceptable.
- It is the sum of products of scores and weights on each criterion, multiplied by a value of 1, if the i_{th} project satisfies the k_{th} constraint & 0 if it does not.
- Other elements in this model are the same as in the previous model.
- A company may have decided that they would not undertake any project that would significantly lower the quality of the final product.


NUMERIC MODELS - Financial

(1) Payback period




Payback Period
Formula

=


Initial Investment Made


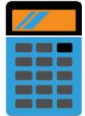

Net Annual Cash Inflow



- It is the no. of years required for the project to repay the initial fixed investment.
- The faster the investment recovered, the less the risk

NUMERIC MODELS - Financial

2.Average rate of return


$$\text{Average Rate of Return Formula} = \frac{\text{Average Annual Profit}}{\text{Initial Investment}}$$


- Does not take into account the time value of money

NUMERIC MODELS - Financial

3. Discounted Cash flow/NPV

$$DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \dots + \frac{CF_n}{(1+r)^n} - I_0$$

CF=net cash flow in period t

r=required rate of return

I_0 =Initial cash investment

NUMERIC MODELS - Financial

4. Internal Rate of Return (IRR)

$$IRR = \frac{(\text{Cash flows})}{(1+r)^i} - \text{Initial Investment}$$

Where:

Cash flows= Cash flows in the time period

r = Discount rate

i = Time period

- Internal Rate of Return (IRR) IRR=discount rate that equates the present values of the cash inflows and outflows.
- IRR is simply the rate of return that the firm earns on its capital budgeting projects.

NUMERIC MODELS - Financial

5. Profitability index



**Profitability
Index
Formula**

=

PV of Future Cash Flows

Initial Investment



- Profitability index is the ratio of payoff to investment of a proposed project.
- If this ratio is greater than 1.0, the project may be accepted.

Advantages of Numeric Model :

- ☐ Simple to use and understand.
- ☐ Readily available accounting data to determine cash flow.
- ☐ Direct reflection of managerial policy.
- ☐ Easily altered to accommodate changes in environment or managerial policy.
- ☐ Can assess project risk.
- ☐ Weighted scoring models allow for the fact that some criteria are more important than the others.
- ☐ Allow sensitivity analysis.

Disadvantages:

- ☐ It ignores qualitative aspects
- ☐ The output of a scoring model is strictly a relative measure.
- ☐ Project scores do not represent the value or utility associated with a
- ☐ Biased
- ☐ Other limitations of individual profitability models

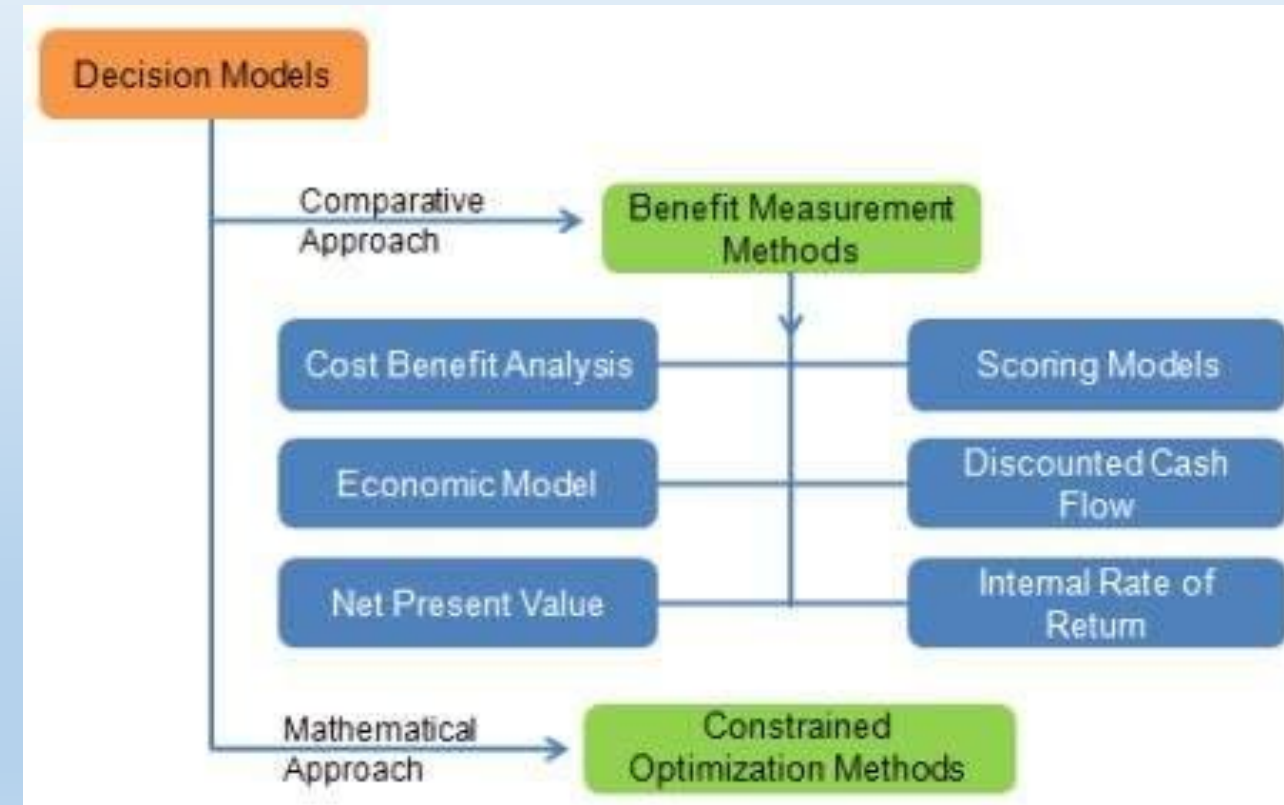
TWO CATEGORIES OF PROJECT SELECTION METHODS:

There are two categories of project selection methods:

- 1. Benefit Measurement Methods**
- 2. Constrained Optimization Methods**

The basic thumb rule is:

- for small projects that aren't very complex, the Benefit Measurement Model is useful.
- whereas if it's a large, complex project, the Constrained Optimization Method is a better fit.



Benefit Measurement Methods

- Benefit Measurement is a project selection technique based on the present value of estimated cash outflow and inflow.
- Cost benefits are calculated and then compared to other projects to make a decision.

Benefit/Cost Ratio

Cost/Benefit Ratio, as the name suggests, is ***the ratio between the Present Value of Inflow or the cost invested in a project to the Present Value of Outflow***, which is the value of return from the project. Projects that have a higher Benefit Cost Ratio or lower Cost Benefit Ratio are generally chosen over others.

Economic Model

EVA, or Economic Value Added, is ***the performance metric that calculates the worth-creation of the organization while defining the return on capital. It is also defined as the net profit after the deduction of taxes and capital expenditure.***

If there are several projects assigned to a project manager, the project that has the highest Economic Value Added is picked. The EVA is always expressed in numerical terms and not as a percentage.

Scoring Model

The scoring model is an objective technique: the project selection committee lists relevant criteria, ***weighs them according to their importance and their priorities, then adds the weighted values.*** Once the scoring of these projects is completed, the project with the highest score is chosen.

Benefit Measurement Methods

Payback Period

Payback Period is the ratio of the total cash to the average per period cash. ***It is the time necessary to recover the cost invested in the project.*** The Payback Period is a basic project selection method. As the name suggests, the payback period takes into consideration the payback period of an investment. It is the time frame that is required for the return on an investment to repay the original cost that was invested. The calculation for payback is fairly simple:

Cost of the project/ average annual cash inflow

When the Payback period is used as the Project Selection Method, ***the project that has the shortest Payback period is preferred since the organization can regain the original investment faster.***

There are, however, a few limitations to this method:

- It does not consider the time value of money.
- Benefits accrued after the payback period are not considered; it focuses more on the liquidity while profitability is neglected.
- Risks involved in individual projects are neglected.

Net Present Value

Net Present Value is the difference between the project's current value of cash inflow and the current value of cash outflow. The NPV must always be positive. When picking a project, one with a higher NPV is preferred. The advantage of considering the NPV over the Payback Period is that it takes into consideration the future value of money. However, there are limitations of the NPV, too:

Benefit Measurement Methods

Discounted Cash Flow

Discounted cash flow (DCF) is a valuation method used to estimate the value of an investment based on its future **cash flows**. It's well-known that the future value of money will not be the same as it is today. For example, \$20,000 won't have the same worth ten years from now. Therefore, during calculations of cost investment and ROI, be sure to consider the concept of discounted cash flow.

Internal Rate Of Return

The Internal Rate of Return is the interest rate at which the Net Present Value is zero—attained when the present value of outflow is equal to the present value of inflow. Internal Rate of Return is defined as the “annualized effective compounded return rate” or the “discount rate that makes the net present value of all cash flows (both positive and negative) from a particular investment equal to zero.”

The IRR is used to select the project with the best profitability; when picking a project, the one with the higher IRR is chosen.

Opportunity Cost

Opportunity Cost is the cost that is given up when selecting another project. During project selection, the project that has the lower opportunity cost is chosen.

Constrained Optimization Methods



LINEAR PROGRAMMING: In this method, you look towards *reducing the project cost by efficiently reducing the duration of the project*. You look for running an activity in its normal time or the crash time. The crash time of the activity enables you to reduce the activity time or the project as a whole.

INTEGER PROGRAMMING: In this method, *you look towards a decision that works on integer values and not on fractional values*. For example, producing a number of cars can never be fractional.

DYNAMIC PROGRAMMING: In this method, you break a complex problem into a sequence of simpler problems. This method provides a general framework of analyzing many problem types. In this framework, you use various optimization techniques to solve a specific aspect of the problem. This method requires your creativity before you can decide if the problem needs to use dynamic programming for its solution.

Constrained Optimization Methods

MULTIPLE OBJECTIVE PROGRAMMING:

In this method, you make decision for multiple problems with mathematical optimization. In case, in a multi objective programming, *a single solution cannot optimize each of the problems, then the problems are said to be in conflict and there is a probability of multiple optimal solutions.* A solution is called as non-dominated if values of none of the problem can be optimized without degrading values of another problem.

Non-Financial Considerations

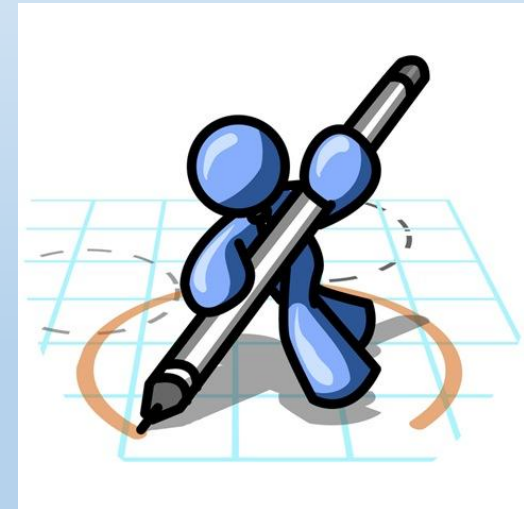
- There are non-financial gains that an organization must consider; these factors are related to the overall organization goals.
- The organizational strategy is a major factor in project selection methods that will affect the organization's choice in the choice of project.
- Customer service relationships are chief among these organizational goals. An important necessity in today's business world is to build effective, cordial customer relationships. Other organizational factors may include political issues, change of management, speculative purposes, shareholders' requests, etc.

PROJECT FORMULATION

Project Formulation is a concise, **exact statement of a project to set the boundaries or limits of work to be performed by the project**. It is a formal document that gives a distinctive identity of the project and precise meaning of project work to prevent conflict, confusion, or overlap.

This stage aims to:

- Carefully identify and weight **various components** of project work
- Analyze project **feasibility and cost-effectiveness**
- Examine and approve project **inputs and outputs**
- Identify **stakeholders** and their involvement and contribution
- Define **benefits** and expectations
- Estimate **resources** needed
- Perform a preliminary **analysis of risks**
- Make an outline of **project schedule**



STAGES/ASPECTS OF PROJECT FORMULATION:

- 1) Feasibility analysis
- 2) Techno-Economic Analysis
- 3) Project Design and network analysis
- 4) Input analysis
- 5) Financial analysis
- 6) Cost-benefit analysis
- 7) Pre-investment analysis

STAGES/ASPECTS OF PROJECT FORMULATION:

Feasibility Analysis

- First stage in project formulation
- Examination to see whether to go in for a **detailed investment proposal or not**
- Screening for internal and external constraints

Techno-Economic Analysis

Screens the idea to

- **Estimate of potential** of the demand of goods/services choice of optimal technology.
- This analysis gives the project a platform for **preparation of detailed project design**

Project Design and Network Analysis

- It is the heart of the project entity
- It defines the sequences of events of the project
- Time is allocated for each activity
- It is presented in a form of a network drawing
- It helps to identify project inputs, finance needed and cost benefit profile of the project

STAGES/ASPECTS OF PROJECT FORMULATION:

-

Input Analysis

- It's assesses the input requirement during the construction and operation of the project
- It defines the inputs required for each activity
- Inputs include materials, human resources
- It evaluates the feasibility of the project from the point of view the availability of necessary resources
- This aids in assessing the project cost

Financial Analysis:

- It involves estimating the project costs, operating cost and fund requirements
- It helps in comparing various project proposals on a common scale
- Analytical tools used are discounted cash flow, cost-volume-profit relationship and ratio analysis
- Investment decision involve commitment of resources in future, with a long horizon
- It needs caution and foresight in developing financial forecasts

STAGES/ASPECTS OF PROJECT FORMULATION:

Cost Benefit analysis

- **Pre-**The overall worth of a project is considered
- The project design forms the basis of evaluation
- It considers costs that all entities have to bear and the benefit connected to it.

Investment Analysis

- The results obtained in previous stages are consolidated to arrive at clear conclusions.
- Helps the project-sponsoring body, the project implementing body and the external consulting agencies to accept/reject the proposal

PROJECT REPORT PREPARATION:

If a company seeking financial assistance for implementation of its business idea is required to prepare a Project Report covering certain important aspects of the project as detailed below:

1. Promoters background/experience
2. Product with capacity to be built up and processes involved
3. Project location
4. Cost of the Project and Means of financing thereof
5. Availability of utilities
6. Technical arrangements
7. Market Prospects and Selling arrangements
8. Environmental aspects
9. Profitability projections and Cash flows for the entire repayment period of financial assistance

Management Evaluation

- **Memorandum and Articles of Association** : Object, authorised and paid-up share capital, promoter's contribution, borrowing powers, list of directors on the Board, terms of appointment of directors
- **Your company as the Promoter** : Corporate plan of the Company, projects promoted/implemented/under implementation, Bankers' report on dealings and repayment of past loan assistance, details of group companies, operations, balance sheet and profit & loss account of the promoter company
- **New Promoters** : Educational background, any industrial experience, family background, sources of income, details of personal properties, banker's reference, income tax/ wealth tax returns
- **Management and Organisation set up** : Broad composition of the Board, details of full time directors and their responsibilities, details of Chief executive and functional executives including qualification, experience, organisation set-up for existing company and during project implementation for new company.

Technical Feasibility

- **Technology and manufacturing process** : Proven/new technology, basis of selection of technology, competing technologies, performance data of plants based on the technology, details of licensor of technology, process flow chart and description
- **Location of the Project** : Locational advantage, availability of raw material and other utilities, infrastructure facilities, availability of labour, environmental aspects
- **Plant and Machinery** : List of machinery & equipment, details of suppliers, competitive quotations, technical & commercial evaluation of major equipment
- **Raw material, Utilities and Manpower** : Details of raw materials and suppliers, electricity and water supply, basis of manpower estimates, details of manpower eg. managerial, supervisory, skilled/unskilled, training needs
- **Contracts** : Agreement with contractors detailing on know-how, engineering, procurement, construction, financial soundness and experience of contractors
- **Project monitoring and implementation** : Mode of implementation, details of monitoring team, detailed schedule of implementation.

Financial Appraisal

Cost of the Project : This includes the cost of land & site development, building, plant & machinery, technical know-how & engineering fees, miscellaneous fixed assets, preliminary & preoperative expenses, contingencies, margin money for working capital. Your company is expected to submit realistic estimates and reasonableness of the cost of the project will be examined with reference to various factors such as implementation period, inflation, various agreements, quotations etc.

Means of Financing : Means of financing shall have to conform to proper mix of share capital and debt. This includes share capital, unsecured loans from Promoters/associates, internal accruals, term loans, Government subsidy/grant. Reasonableness of Promoters' contribution in the form of equity and interest-free unsecured loans, if any, is ascertained in view of commitment to the Project.

Profitability Projections : Past records of financial performance of Your company will be examined. Your company needs to submit profitability estimates, cash flow and projected balance sheet for the project and for the Company as a whole. Based on the projections, various financial ratios such as Debt -Equity ratio, Current ratio, Fixed asset coverage ratio, Gross profit, Operating profit, Net profit ratios, Internal rate of return(over the economic life of the project), Debt Service Coverage ratio, Earning per share, Dividend payable etc. would be worked out to ascertain financial soundness of your Project.

Environmental Aspects:

Air, Water and Soil Pollution, list of pollutants / Hazardous substances, their safety, handling and disposal arrangements, compliance with national and International Standards, Clearances and No objection certificates required and obtained etc.

Commercial Viability:

- Existing and potential market demand and supply for the proposed product in respect of volume and pattern
- Share of the proposed product of the company in the total market through marketing strategy
- Selling price of the product and export potential, if any.
- Buy-back arrangements, if any.

Economic Viability

- Your company will have to take real value of input as against the value accounted in financial analysis for the purpose of economic evaluation of the project.
- Your company should carry out social cost benefit analysis as a measure of the costs and benefits of the project to Society and the Economy.
- Economic analysis is therefore aimed at inherent strength of the Project to withstand international competition on its own.

THANK YOU