

# CHAPTER 3 & 4

## **Project Analysis, Appraisal and Selection Models**

# A. Project Analysis

- Project analysis refers to analyzing a project from various perspectives so as to determine its viability and sustainability.
- ❖ Project analysis consists of :
  - Market/Demand analysis
  - Technical analysis
  - Financial analysis
  - Economic Analysis (Environmental and social cost benefit analysis)
  - Risk Analysis

# 1. Market/Demand Analysis

- This step in project analysis aims to **estimate the potential size of the market for the product** proposed to be manufactured (or service planned to be offered) and to get an idea about the **market share** that is likely to be captured.
- Hence, the two broad issues raised are:
  1. What is the likely aggregate demand for the product/ service?
  2. What will be the share of the market for the proposed product/service?

# 1. Market/Demand Analysis

Answers to these two questions call for an in-depth study of various factors like:

- patterns of consumption growth,
- income and price elasticity of demand,
- composition of the market, nature of competition,
- availability of substitutes,
- reach of distribution channels, etc.

# The objectives of market/demand analysis

Market/demand analysis for new/improved products development has objectives of the following questions:

- Who are the buyers?
- What is the total current demand for the product?
- How is demand distributed geographically?
- What is the demand for the product segmented in different sizes?
- What price will the customers be willing to pay for the improved product?
- How can potential customers be convinced about the superiority of the new product?
- What price and warranty will ensure its acceptance?
- What channels of distribution are most suited for the product?
- What trade margins will induce distributors to carry it?

# Process of market/demand analysis

- Situational analysis
- Collection of secondary information
- Conduct market survey
- Characterization of the market
- Demand forecasting
- Market planning

# i. Situation analysis

- In order to get an understanding of the relationship between the product and its market, the project analyst may informally talk to
  - ❖ customers,
  - ❖ competitors,
  - ❖ middlemen,
  - ❖ and others in the industry.
- Wherever possible, s/he may look at the experience of the company to learn about
  - the preferences and purchasing power of customers,
  - actions and strategies of competitors, and
  - practices of the middlemen.

## ii. Collection of secondary information

- Gathering information help to better understand the market situation.
- information may be obtained from secondary and/ or primary sources.
- Secondary information is information that has been gathered in some other context and is already available.
- Primary information, on the other hand, represents information that is collected for the first time to meet the specific purpose on hand.
- Secondary information provides the base and the starting point for market and demand analysis.
- It indicates what is known and often provides leads and clues for gathering primary information required for further analysis.

# Evaluation of Secondary Information

While secondary information is available economically and readily provided, the market analyst is able to locate

- its reliability,
- accuracy, and
- relevance for the purpose under consideration.

## The market analyst should seek to know:

- Who gathered the information and for what objective?
- When was the information gathered? When was it published?
- How representative was the period for which the information was gathered?
- What was the target population?
- How was the sample chosen?
- How representative was the sample?
- How satisfactory was the process of information gathering?
- How accurately was the information edited, tabulated, and analyzed?
- Was statistical analysis properly applied?

### iii. Conduct Market Survey

- Secondary information, though useful, often does not provide a comprehensive basis for market and demand analysis.
- It needs to be supplemented with primary information gathered through a market survey, specific to the project being appraised.
- The market survey may be a census survey or a sample survey.

# iii. Conduct Market Survey

The information sought in a market survey may relate to one or more of the following:

- Total demand and rate of growth of demand
- Demand in different segments of the market
- Income and price elasticity of demand
- Motives for buying
- Purchasing plans and intentions
- Satisfaction with existing products
- Unsatisfied needs
- Attitudes toward various products
- Distributive trade practices and preferences
- Socio-economic characteristics of buyers

# Steps in market survey

- 1. Define the Target Population*
- 2. Select the Sampling frame and Sample Size*
- 3. Develop the Questionnaire*
- 4. Recruit and Train the Field Investigators*
- 5. Obtain Information as per the Questionnaire from the Sample of Respondents*
- 6. Scrutinize the Information Gathered*
- 7. Analyze and Interpret the Information*

## 2. Technical Analysis

**Analysis of technical and engineering aspects is done continually when a project is being examined and formulated. The technical analysis is made to identify and evaluate:**

- The availability of technology
- The availability of technical experts
- The appropriateness of technology
- The affordability of technology
- **Technical analysis is concerned primarily with:**
- Material inputs and utilities
- Manufacturing process/ technology
- Product mix
- Plant capacity
- Location and site
- Machineries and equipments
- Structures and civil works
- Work schedule

# 3. Economic and Social Benefit Analysis

- Aims at assessing the increasing wealth of the nation resulting from project implementation
- Concerns on the benefits enjoyed by the society as the result of project undertaking
- **Is the project proposed good from the view point of the national development interest???**
- Social cost-benefit analysis identifies the effect of a project on the economy as a whole by setting out & evaluating the social-cost benefits of investment projects
- The comparison b/n the two helps to decide whether the project should be undertaken

### 3. Economic and Social Benefit Analysis

- The aim is to measure the **loss and gains in economic welfare** of the society in which a project is implemented.
- Issues to be considered include:
  - a. The price of inputs and outputs
  - b. The evaluation of the outputs of certain services
  - c. The evaluation of indirect effects-externalities

# 4. Environmental Analysis

- ENVIRONMENTAL ANALYSIS (the EA Process) is a systematic, **interdisciplinary** process used to identify the purpose of a proposed action, develop practical alternatives to the proposed action, and predict potential environmental effects of the action.
- **A few examples** of proposed actions are road construction, tree clearing for disease control, reforestation, building a hydroelectric dam, or developing a quarry.

# 4. Environmental Analysis

- The EA process can provide many benefits to the road builder, local agencies, and the communities who will be affected by road construction and maintenance activities.
- The process and resulting reports are tools that road managers can use to guide their decisions, produce better road designs and maintenance plans, identify and avoid problems, and gain public support for their activities.
- **An EA document can be long and complex for major, potentially high impact projects, or it may only be a few pages long for a simple road project presents an eight-step process that is useful for doing Environmental Analysis.**

# 4. Environmental Analysis

- An Environmental Analysis identifies problems, conflicts, or resource constraints that may affect the natural environment or the viability of a project.
- It also examines how a proposed action might affect people, their communities, and their livelihoods.
- *The analysis should be conducted by an **Interdisciplinary Team** consisting of personnel with a range of skills and disciplines relevant to the project.*
- Team members should include a team leader and may include: Engineers, geologists, biologists, archaeologists, and social workers.

# 4. Environmental Analysis

- The EA process and Interdisciplinary Team studies can reveal sound environmental, social, or economic reasons for improving a project.
- After predicting potential issues, the EA identifies measures to minimize problems and outlines ways to improve the project's feasibility.
- Environmental mitigations a designer can use to avoid potential impacts on wildlife, such as use of animal underpasses and culvert requirements for fish passage

# 4. Environmental Analysis

- The EA process and findings are communicated to the various affected individuals and groups.
- At the same time, the interested public helps provide input and comment on the proposed project.
- *The document produced as a result of the EA guides the decision maker toward a logical, rational, informed decision about the proposed action.*

# 5. Risk Analysis

- Political economy
- Political stability/predictability
- Political commitment of the authorities to the public
- Incentives
- Subsidies

# Projects & Risks

- Project managers manage projects in uncertain situations.
- **Project risk:** the likelihood of the occurrence of an uncertain event, usually a negative one that may adversely affect the successful completion of a project.
- Project risk indicates that projects travel through rough roads.
- This makes the field of project management very distinct and requiring competitive knowledge, skills, tools and techniques.
- In most cases, project management may spend much time in an attempt to adapt to unpredicted change.

# 6. Project Sustainability Analysis

- Based on the belief that project implementation should result in benefits that have a **lasting effect**
- Inherent with sustainable development
- Acceptable with the existing norms and values
- See the criterion..... next slide

# Major criterion for Sustainable Project

- Low investment cost
- Adaptability to local skills
- Use of local raw materials
- Output to meet the needs of the local people
- Import substitution & foreign exchange savings
- Creation of employment
- Profit generation
- Environmental harmony
- Continuity of production
- Supportive institutions
- Gender balance

# 7. Financial Analysis

- Financial analysis involves evaluating the **viability or the capability** of the project to raise the appropriate funds needed to implement the proposed project.
- The concern of financial analysis is whether the profit seeking enterprise is **able to maximize its profit**
- Investment proposal involves both benefits and costs during one or more time periods
- When benefits exceed the associated expenditures, we speak of the **net benefits or cash proceeds**
- If the cost exceeds the benefits , we are doing with **net expenditures or cash outlays**

# 7.1 The Logic and Derivation of Cash Flow

- It is the series of cash proceeds/net benefits and cash outlays (net expenditures) associated with an investment
- The roots of the derivation are the project assumptions or the conditions that must be realized in order to execute project activities
- On the bases of project assumptions & data collected on the technical, social, economical, and env'tal aspects of the project various parameters are quantitatively established

## 7.2 Sensitivity Analysis

- Project planning starts by establishing assumptions & conditions on which the project is based
- They are generally based on inputs, outputs, costs, prices, and revenues
- Since the planner cannot make assumptions that will hold true with certainty, it is usual to check **what will happen if this base changes.**
- This study of assumption under varied assumptions is called **sensitivity analysis**

# Sensitivity Analysis Examples...

- What will happen to our project if all costs are increased by 10%?
- What will be the profitability of the project if the price of one unit of output drops by 20%?
- What will be the net income of a farming project if the output drops by 10% as an effect of bad rains?
- N.B All these changes will affect the revenues, the costs, and the financial results of the project directly or indirectly through other means

## **7.3 Measures of Project Worth/Project Appraisal/**

1. Non-Discounted Measures of Project Worth
2. Discounted Measures of Project Worth

# 1. The Non-Discounted Measures(NDM)

- Use the cash flow as obtained through the project period without taking into account the present value of future cash flows
- There are 3 most commonly used NDM of project worth are:
  - a. Ranking by inspection
  - b. Payback period
  - c. Return on Investment

# A. Ranking by Inspection (RI)

- Basic question: Given alternative investments/projects, which one should be implemented and which one should be discarded in a **mutually exclusive investments**
- There may be an alternatives as **to build a hotel or a factory on the same site.**
- The investor might choose to start one with limited resources he/she has.
- **RI consists of choosing the best investment by comparing the net proceeds of alternative investments.**
- The projects which have more cash proceeds will be preferred though are some peculiarities on inspections.

# Selection of project using Ranking by Inspection

- Comparing the net proceeds of A & B projects, we can find out which project has shorter life period
- Compare the **net proceeds/profits** of the short lived project with long lived one
- If the two have the same initial investment & proceeds throughout the period of the short lived investment; & if the long lived investment continues to earn income after the end of the short lived one, then the **long lived one is more desirable** as the second project continues to earn proceeds while the first one has ended

# Net Cash Flow of 4 Hypothetical Projects with Identical Initial Investment Outlays & Life Periods

Project Investment	Initial Cost	Net Cash Proceeds in Years		
		1	2	Total
A	20,000	20,000	-	20,000
B	20,000	20,000	2000	22,000
C	20,000	14,625	9825	24,000
D	20,000	16325	8125	24,000

Q: which one is more desirable taking into account the net proceeds?

# Project Selection Based on RI

- Although the total net proceeds of C & D are identical, D earns more income earlier than C.

Thus, D is more desirable than C

- Why????

## B. Payback Period (PP)

- PP is dealing with the question of **how long will it take to earn an amount of proceeds equal to the initial cost of investment?**
- It involves with the calculation of the length of the period that is required for the stream of the earned cash proceeds to equal the initial cost of investment
- **If the net annual proceeds are constant, the payback period in years is found by dividing the total initial outlay by the amount of expected annual cash proceeds**

## B. Payback Period (PP)

- **Example:** If the total initial cost of investment was \$500, & if the net amount proceeds is \$100, for 10 yrs, the PP would be  $\$500/\$100=5\text{yrs}$
- The implication is the investment cost would be covered in 5 yrs period.
- If the annual proceeds are **not constant**, the payback period will be obtained by finding out after how many years the total net proceeds will equal the original outlay.
- This is done by adding up the net proceeds year to year, until the amount of the initial investment cost is reached.

# Net Cash Flow of 4 Hypothetical Projects with Identical Initial Investment Outlays & Life Periods

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Q: which one is more desirable taking into account the net proceeds?

## An example of calculation of the PP period on the basis of the Previous Table

Project	Payback period (Yrs)	Ranking
A	1	1
B	1	1
C	1.5	4
D	1.4	3

*N.B : Although investment A & B have the same payback period, investment B is preferable, b/s it earns more proceeds than investment A.*

*Both investment C & D have identical 2 yrs PP, but looking at the proceeds earned, investment D will have earned \$1,700 more than investment C only in the first year. Therefore, although investment C&D have the same PP, investment D is preferable than C . B/S it earns more than investment C in the earlier period.*

# Weakness of Payback period of Project Worth

- It fails to take into account the proceeds earned after the PP
- It does not account for the timing of proceeds earned prior to the PP date

## C. Return on Investment (RI)

- Also called average income on cost
- Calculated by dividing the average income by the cost of investment
- Some planner prefer to take the ratio of the average income to the book value (cost of investment after depreciation)

# E.g of RI Computations

Investment	Cost (\$)	Average income (\$)	Average income on cost (%)	Ranking
A	20,000	0	0	4
B	20,000	660	3.3	3
C	20,000	800	4	1
D	20,000	800	4	1

N.B: Project C & D are preferred than A or B, but B is preferred than A.

Weakness of RI: It doesn't take into account the timing of the cash flow.

## 2. Discounted Measures (DM) of Project Worth

- DM takes into account the difference between the value of money today, & the same value tomorrow-timing value of money.
- This measure is based on the concept that *“to receive some today is better than to receive more tomorrow”*
- The three major techniques in Discounted Measure project worth computation are:
  - a. Net Present Value (NPV)
  - b. Benefit - Cost Ratio (BCR)
  - c. Internal Rate of Return (IRR)

## A. Net Present Value (NPV)

- The philosophy is “better today than tomorrow”- principle of the wise.
- One dollar today is worth more than one dollar tomorrow- the concept NPV is based on this wisdom (**time value of money**)
- E.g the present value of \$100 payable after 3 yrs from now can be defined as “ that amount of dollars necessary to invest today at compound interest in order to obtain \$100 in 3 yrs”
- The amount to invest today/the present value will depend on the rate of interest at which the money will grow & the frequency at which the rate of interest will be compounded

## A. Net Present Value (NPV)

- The NPV represents the net benefit over and above the compensation for time and risk. Hence, **the decision rule associated with the net present value criterion is: accept the project if the NPV is positive and reject it if NPV is negative.**

### Properties of NPV

- NPVs are **additive**:- The NPV of a package of projects is simply the sum of the net present values of individual projects included in the package.
- NPV calculation permits **time-varying discount rates**:- when the discount rate changes over time

## A. Net Present Value (NPV)

- The Net Present Value (NPV) of a project is the sum of the project values of all the cash flows-positive as well as negative-that are expected to occur over the life of the project.
- The general formula for NPV is:

$$NPV = \sum_{t=1}^n \frac{C_t}{(1+r)^t} - I$$

- $C_t$  = cash flow at the end of year  $t$
- $n$  = *life of the project*
- $r$  = *discount rate*

# A. Net Present Value (NPV)

- The formula of the NPV of a project is generally the sum of the flows obtained as follows:

Let  $x$  be the cash flow

$t$ =the particular year from initial year (0) to the last ( $n$ )

$r$ =the discount rate of the investment

- ❖ The NPV of a project then is the sum of the flows ( $x_t$ ) discounted:

$$NPV = \sum_{t=1}^n \frac{c_t}{(1+r)^t} - I$$

$$= -(x_0 / (1+r)^0) + x_1 / (1+r)^1 + x_2 / (1+r)^2 \dots x_n / (1+r)^n$$

# A. Net Present Value (NPV)

- All project cash flows are discounted back to today's prices at a firm's discount rate – the target rate.
- The NPV is the SUM of the individual present values

# Example

Year	Cash flow
0	(1,000,000)
1	200,000
2	200,000
3	300,000
4	300,000
5	350,000

*If Cost of capital= $r=10\%$ , what is NPV?*

# Example

$$\begin{aligned} & -1000000/(1.1)^0 + 200000/(1.1)^1 + 200000/ \\ & (1.1)^2 + 300000/(1.1)^3 + 300000/(1.1)^4 + \\ & 350000/(1.1)^5 \end{aligned}$$

**=5273**

**Decision: Accept the project as NPV is positive.**

**❖ What if the investment is 1006000?**

## B. Benefit-Cost Ratio (BCR)

- The ratio of the present worth of Gross benefits to the present worth of Gross Costs

- $$\text{BCR} = \frac{\text{Present worth of Gross Benefits}}{\text{Present Worth of Gross Costs}}$$

Or

Present value benefits/Investment

- If the ratio is greater than 1, the implication is the investor will recover the investment
- If the bank interest rate is as equal as or less than the discount rate used for the computation that gives 1, it is better to invest the money in the project than save in the bank

## B. Benefit-Cost Ratio (BCR)

- It is usual to compare the present worth of the net benefits with the present worth of the investment cost plus operating costs.
- Thus, **Net Benefits = Gross Benefit – Production Costs**
- **BCR is used in economic analysis – in the evaluation of economic benefits vis-à-vis the entire economy.**
- **For private investment, Internal rate of Return is widely used**

## C. Internal Rate of Return (IRR)

- It is the rate of discount at which the total discounted cash proceeds/benefits expected from the project equals the total discounted cash outlays/costs required by the investments

## C. Internal Rate of Return (IRR)

- The internal rate of return is defined as the rate of discount, which brings about equality between the present value of future net benefits & initial investment. **It is the value of  $r$  in the following equation.**

$$I = \sum_{t=1}^n \frac{C_t}{(1+r)^t}$$

- $I$  – investment cost
- $C_t$  – Net benefit for year  $t$
- $r$  - IRR
- $n$  - Life of the project
- **IRR can be found by trial and error**

# Measures of Project Worth

Year	0	1	2	3	4
Cash flow	(100,000)	30,000	30,000	40,000	45,000

IRR is the value of  $r$  which satisfies the following equation:

$$100,000 = \frac{30,000}{(1+r)^1} + \frac{30,000}{(1+r)^2} + \frac{40,000}{(1+r)^3} + \frac{45,000}{(1+r)^4}$$

- **The calculation of  $r$  involves a process of trial and error.** We try different values of “ $r$ ” till we find that the right-hand side of the above equation is equal to 100,000. Let us try to use 15%. This makes the right-hand side to be:

$$100,000 = \frac{30,000}{(1.15)} + \frac{30,000}{(1.15)^2} + \frac{40,000}{(1.15)^3} + \frac{45,000}{(1.15)^4} = 100,802$$

Since the value is slightly higher than our target value, which is 100,000, we increase the value to 16%.

$$100,000 = \frac{30,000}{(1.16)} + \frac{30,000}{(1.16)^2} + \frac{40,000}{(1.16)^3} + \frac{45,000}{(1.16)^4} = 98,641$$

## C. Internal Rate of Return (IRR)

- Since this value is now less than 100,000, we conclude that the value of  $r$  lies **between 15 and 16%**. For most of the purposes, this indication suffices.
- If a more refined estimate of  $r$  is needed, we use the following procedure:
  1. Determine the NPV of the two closest rates of return
$$(\text{NPV}/15\%) = 802$$
$$(\text{NPV}/16\%) = 1,359$$
  2. Find the sum of the absolute values of the NPVs obtained in Step 1
$$802 + 1,359 = 2,161$$
  3. Calculate the ratio of the NPV of the smaller discount rate, identified in Step 1, to the sum obtained in Step 2
$$802/2,161 = 0.37$$
  4. Add the number obtained in Step 3 to the smallest discount rate
$$15 + 0.37 = 15.37$$

# IRR...

- Can be described as the rate of growth of an investment
- Can be interpreted as the highest rate of interest an investor could afford to pay, without losing money, if all the funds to finance the investment are borrowed, and if the debt services (loan and accrued interests) was repaid by use of cash proceeds from the investment.

# Criterion of IRR

- When using IRR, the investment criterion is that the IRR should be greater than the discounted rate

## IRR Relationship with other methods

- When the NPV (the discounted benefits are excess of the discounted costs) is positive, then the IRR is greater than the rate of discount
- When the NPV is 0, then the IRR is equal to the rate of discount and the discounted benefits are equal to the discounted costs
- When the NPV is negative, then the IRR is smaller than the discount rate and the discounted benefits are smaller than the discounted costs

# Conditions of Financial Viability of a Project

- The acceptance criterion for an investment is:
  - ✓ NPV positive,
  - ✓ IRR greater than the discounted rate; and
  - ✓ discounted benefits greater than discounted costs

# Project Selection

- The selection of the right project for future investment is a crucial decision for the long-term survival of the company.
- The selection of the wrong project may well precipitate project failure leading to company bankruptcy .
- The execution of a project will tie up company resources, and as an opportunity cost the selection of one project may preclude the company from pursuing another project.
- We live in a world of finite resources and therefore cannot carry out all the projects we may want or need.
- Therefore a process is required to select and rank projects on the basis of beneficial change to the company.

# CRITERIA FOR PROJECT SELECTION

- Project selection is the process of evaluating proposed projects or groups of projects, and then choosing to implement some set of them so that the objectives of the parent organization will be achieved.

# CRITERIA FOR PROJECT SELECTION

- Each project will have different costs, benefits, and risks.
- Rarely are these known with certainty.
- In the face of such differences, the selection of one project out of a set is a difficult task.
- Choosing a number of different projects, a *portfolio*, is even more complex.

# CRITERIA FOR PROJECT SELECTION

- Project selection is only one of many decisions associated with project management.
- To deal with all of these problems, we use models. We need such models because they abstract the relevant issues about a problem from the mass of detail in which the problem is embedded—reality is far too complex to deal with in its entirety.

# CRITERIA FOR PROJECT SELECTION

- The model allows us to strip away almost all the reality from a problem, leaving only the relevant aspects of the “real” situation for us to deal with.
- This process of carving away the unwanted reality from the bones of a problem is called *modelling the problem*.

# CRITERIA FOR PROJECT SELECTION

- The model represents the problem's *structure, its form*.
- *We will use many models such as, analogies, diagrams, as well as flow graph and network models to help solve scheduling problems, and symbolic (mathematical) models for a number of purposes.*

# CRITERIA FOR PROJECT SELECTION

- Models may be quite simple to understand, or they may be extremely complex.
- In general, introducing more reality into a model tends to make the model more difficult to manipulate.
- If the input data for a model are not known precisely, we often use probabilistic information; that is, the model is said to be *stochastic rather than deterministic*.
- *Again, in general, stochastic models are more difficult to manipulate.*

# Project Selection

- Project selection is the process of **evaluating individual projects** or groups of projects, and **then choosing to implement** some set of them so that the objectives of the parent organization will be achieved
- Managers often use *decision-aiding models* to extract the relevant issues of a problem from the details in which the problem is embedded
- Models represent the problem's structure and can be useful in selecting and evaluating projects

# Nature of Project Selection Models

- 2 Basic Types of Models

- Numeric
- Nonnumeric

- 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

# Project Selection Models

- A numeric model is usually financially focused and quantifies the project in terms of either time to repay the investment (*payback*) or *return on investment*.
- *While non-numeric models look at a much wider view of the project considering items from market share to environmental issues.*
- ❖ The main purpose of these models is to aid decision-making leading to project selection.

# Nonnumeric 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

# Numeric Models: Profit/Profitability

- ***Payback period*** - initial fixed investment/estimated annual cash inflows from the project
- ***Average Rate of Return*** - average annual profit/average investment
- ***Present Value method- Discounted Cash Flow***
- ***Internal Rate of Return*** - Finds rate of return that equates present value of inflows and outflows

# Criteria for Project Selection Models

- **Realism** - reality of manager's decision
- **Capability**- able to simulate different scenarios and optimize the decision
- **Flexibility** - provide valid results within the range of conditions
- **Ease of Use** - reasonably convenient, easy execution, and easily understood
- **Cost** - Data gathering and modeling costs should be low relative to the cost of the project
- **Easy Computerization** - must be easy and convenient to gather, store and manipulate data in the model

# 9 Project Management Knowledge Areas

1. Project Integration Management
2. Project Scope Management
3. Project Time Management
4. Project Cost Management
5. Project Quality Management
6. Project Human Resource Management
7. Project Communications Management
8. Project Risk Management
9. Project Procurement Management

# 1. Project integration

- **Bringing it all together:**
  - Making sure all the right parts of the project come together in the right order, at the right time
  - Building the project plan
  - Project execution
  - Integrated change control
- **Processes:**
  - Develop Project Charter
  - Develop Preliminary Project Scope Statement
  - Direct and Manage Project Execution
  - Integrated Change Control
  - Close Project

# 2. Project Scope Management

- The scope of a project can be either the work content or components of the project.
- It can be fully described by
  - naming all activities performed,
  - the end products which will result, &
  - the resources consumed.
- Project scope mgt refers to defining and containing scope throughout the Project.
- **Processes:**
  - Scope Planning
  - Scope Definition
  - Create WBS
  - Scope Verification
  - Scope Control

# 3. Project Time Management

- **Determining what gets done and when**
- **Processes:**
  - **Activity Definition**
  - **Activity Sequencing**
  - **Activity Resource Estimating**
  - **Activity Duration Estimating**
  - **Schedule Development**
  - **Schedule Control**

# 4. Project Cost Management

- **Planning for Resources**
- **Processes:**
  - Cost Estimating (assembling & predicting costs of a project over its life cycle)
  - Cost Budgeting (Create the Budget)
  - Cost Control (Managing/Controlling the Budget).

# 5. Project Quality Management

- **Quality refers to conformance to requirements/specifications by the customer.**
  - **If the requirements for the product of the project are consistent with the real, or perceived, needs of the customer/client, then the customer/client is likely to be satisfied with the product of the project.**
- **Processes:**
  - **Quality Planning**
  - **Perform Quality Assurance**
  - **Perform Quality Control**

# 6. Project Human Resource Management

- The project manager is responsible for developing the project & building it into a cohesive group to complete the project.
- The finite life & unique nature of projects places a premium on knowledge & skills in managing human resources.
- Processes:
  - Human Resource Planning
  - Acquire Project Team
  - Develop Project Team
  - Manage Project Team
    - Motivating
    - Conflict mgt
    - Team building/integrating
    - Employee relations

# Project Human Resource Management

- **Human Resource Planning**-Identifying and documenting project roles, responsibilities, and reporting relationships, as well as creating the staffing management plan.
- **Acquire Project Team**- obtaining the human resources needed to complete the project.
- **Develop Project Team**- Improving the competencies and interaction of team members to enhance performance.
- **Manage Project Team**- Tracking team member performance, providing feedback, resolving issues, and coordinating changes to enhance project performance

# Acquiring Project Team

- Acquiring qualified people for teams is crucial.
- The project manager who is the smartest person on the team should do a good job of recruiting people
- Staffing plans and good hiring procedures are important, as are incentives for recruiting and retention.
  - Some companies give their employees one dollar for every hour that a new person who they helped hire works.
  - Some organizations allow people to work from home as an incentive.

# Develop Project Team

Develop project team improves the competencies and interactions of team members to enhance project performance.

Objectives include:

- Improve skills of team members in order to increase their ability to complete project activities
- Improve feelings of trust and cohesiveness among team members in order to raise productivity through greater teamwork  
Examples of effective teamwork include assisting one another when workloads are unbalanced, communicating in ways that fit individual preferences, and sharing information and resources.
- Team development efforts have greater benefit when conducted early, but should take place throughout the life cycle.

# Developing Project Team

- The main goal of **team development** is to help people work together more effectively to improve project performance.
- It takes teamwork to successfully complete most projects.

# Training

- Training can help people understand themselves and each other, and understand how to work better in teams.
- Team building activities include:
  - Physical challenges
  - Psychological preference indicator tools

# Manage Project Team

Manage project team involves tracking team members performance, providing feedback, resolving issues, and coordinating changes to enhance project performance.

The project management team observes team behavior, manages conflict, resolves issues, and appraises team member performance.

As a result of managing the project team, the staffing management plan is updated, change requests are submitted, issues are resolved, inputs is given to organizational performance appraisals, and lessons learned are added to the organizations database.

Management of the project team is complicated when team members are accountable to both a functional manager and a project manager within a matrix organization.

Effective management of this dual reporting relationship is often critical success factor for the project, and is gradually the responsibility of the project manager.

# 7. Project Communications Management

- Keeping Stakeholders Informed and Involved.
- Successful project managers are constantly building consensus or confidence in decisions at critical junctures in a project by practicing active communications skills.
- The project manager must communicate to upper mgt, to the project team, & to other stakeholders.
- Processes:
  - Communications Planning
  - Information Distribution
  - Performance Reporting
  - Manage Stakeholders

# 8. Project Risk Management

- Risk mgt in the project context is the art and science of identifying, analyzing, & responding to the risk factors throughout the life of the project and in the best interests of its objectives.
- Risk mgt must be seen as preparation for possible events in advance, rather than simply reacting to them as they happen.
- Expect the Unexpected! Think of Opportunities, too!!
- Processes:
  - Risk Management Planning
  - Risk Identification
  - Qualitative Risk Analysis
  - Quantitative Risk Analysis
  - Risk Response Planning
  - Risk Monitoring and Control

# 9. Project Procurement Management

- Inherent in the process of managing a project is the procurement of a wide variety of resources.
- In most instances, this requires the negotiation of a formal written document, generally called a contract.
- Thus, for Projects Using Outside Resources:
  - Plan Purchases and Acquisitions
  - Plan Contracting
  - Request Seller Responses
  - Select Sellers
  - Contract Administration
  - Contract Closure.

THE END !

