

UNIT-1

CONCEPTS OF PROJECT MANAGEMENT: Concepts of a Project, Categories of projects, Phases of project life cycle, Roles and responsibility of project leader, tools and techniques for project management.

PROJECT PLANNING AND ESTIMATING: Feasibility report phased planning, Project planning steps, Objective and goals of the project, preparation of cost estimation.

Introduction:

A project is temporary in that it has a defined beginning and end in time, and therefore defined scope and resources. A project is **unique** in that it is not a routine operation, but a specific set of operations designed to accomplish a singular goal. So a project team often includes people who don't usually work together – sometimes from different organizations and across multiple geographies.

A project is a unique, transient endeavor, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefits. A project is usually deemed to be a success if it achieves the objectives according to their acceptance criteria, within an agreed timescale and budget.

The development of software for an improved business process, the construction of a building or bridge, the relief effort after a natural disaster, the expansion of sales into a new geographic market — all are projects. And all must be expertly managed to deliver the on-time, on-budget results, learning and integration that organizations need.

Project management, then, is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.

Project is a unique process, consist of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective confirming to specific requirements, including the constraints of time cost and resource.

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. The planning and organization of an organization's resources in order to move a specific task, event or duty toward completion. Project management typically involves a one-time project rather than an ongoing activity, and resources managed include both human and financial capital. Project management is often

closely associated with engineering projects, which typically have a complex set of components that have to be completed and assembled in a set fashion in order to create a functioning product. Project managers use visual representations of work flow such as Gantt charts and PERT charts to determine which tasks are to be completed by which departments.

Examples of project include developing a watershed, creating irrigation facility, developing new variety of a crop, developing new breed of an animal, developing agro-processing centre, Construction of farm building, sting of a concentrated feed plant etc. It may be noted that each of these projects differ in composition, type, scope, size and time.

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.

The key to successful project management its to focus on the 4ps:

1. People: The most important element of a successful project.
2. Product: The project product to be built.
3. Process: The set of framework and people tasks to get the job done.
4. Project: all work required to make the product a reality.

It is synergy of all four Ps working together that yields the successful management of products.

Figure 1.1 shows the elements associated with a project.



Figure1.1 Elements associated with project management

A project manager is typically paid more salary to oversee a project. They run every aspect of a project, from scheduling to new innovations, to helping a project reach its completion date on time. They know how to run a project by spending the least amount of money possible, saving the company money and allowing the company to pass the savings on to the customer. Project managers develop a strategy that allows them to organize and lead employees, meet deadlines and see a project through to its conclusion. They are expected to deal with any problems that arise during the course of a project, leaving the executives to deal with other aspects of the business.

Project Characteristics: Despite above diversities, projects share the following common characteristics.

- Unique in nature.
- Have definite objectives (goals) to achieve.
- Requires set of resources.
- Have a specific time frame for completion with a definite start and finish.
- Involves risk and uncertainty.
- Requires cross-functional teams and interdisciplinary approach.

Managing Projects:

Project management is the art of planning, controlling and executing a project in a way that ensures successful delivery of the desired outcome. It is widely used in organizations as a complex of tools for delivering strategic goals and objectives.

The key advantages of using project management within a company's business environment can be described as:

- Accelerating improvement and strengthening of the company's management through implementing the ideas of participatory management. Projects help involve employees in decision making
- Adopting systems engineering approach that helps deal with risks effectively
- Accomplishing specific changes that are linked to the company's strategies

Categories of projects:

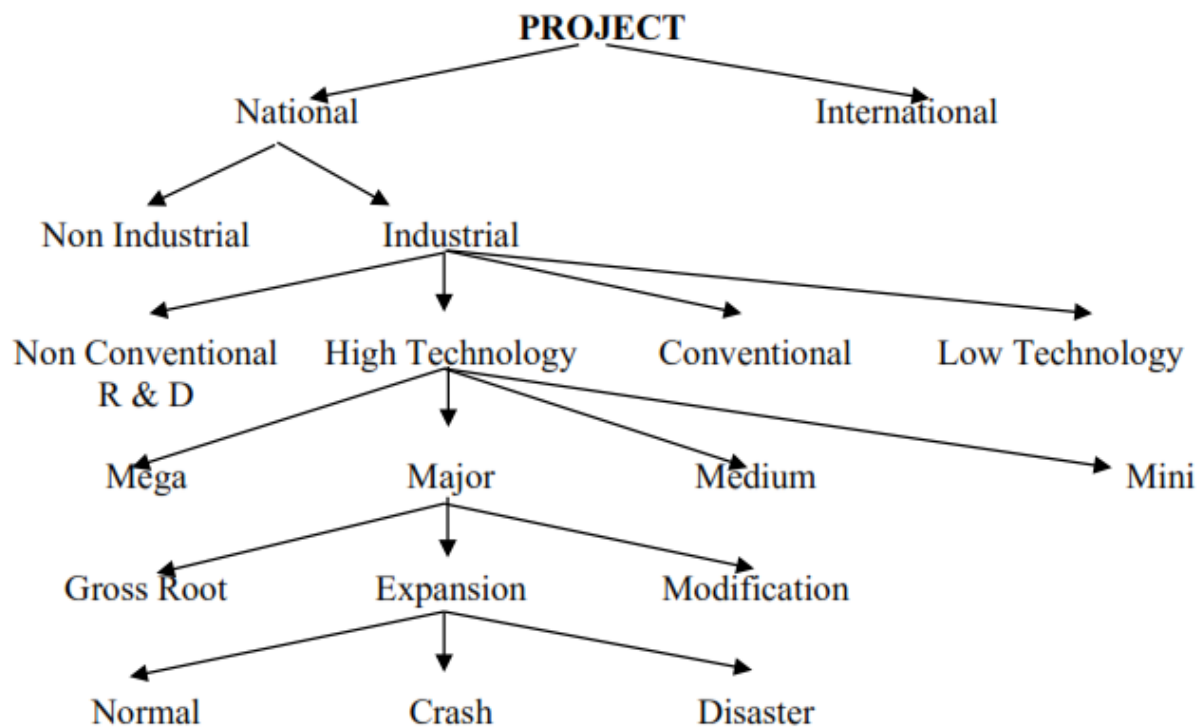


Figure 1.1 categories of projects

Much of what the project will comprise and consequently its management will depend on the category it belongs to. The location, type, technology, size, scope and speed are normally the factors which determine the effort needed in executing a project. Though the characteristics of all projects are the same, they cannot be treated alike. Recognition of this distinction is important for management. Classification of project helps in graphically expressing and highlighting the essential features of the project. Figure 1.1 shows the different categories of project. Projects are often categorized in terms of their speed of implementation as follows:

NORMAL PROJECTS

- Adequate time is allowed for implementation.
- All the phases in a project are allowed to take their normal time.
- Minimum requirement of capital.

No sacrifice in terms of quality.

CRASH PROJECTS

Requires additional costs to gain time

Maximum overlapping of phases is encouraged.

DISASTER PROJECTS

Anything needed to gain time is allowed in these projects. Around the clock work is done at the construction site. Capital cost will go will go up very high. Project time will get drastically reduced. Besides that, projects in general are classified on several basis as give in the following illustrative list.

Classification of Project

The project can be classified on several basis. Major classification of the projects are given below:

1. On the basis of Expansion:

- I. Project expanding the capacity
2. Project expanding the supply of knowledge.

2. On the basis of Magnitude of the resources to be invested:

- I. Giant projects affecting total economy
2. Big projects affecting at one sector of the economy
3. Medium size projects
4. Small size projects (depending on size, investment & impact)

3. On the basis of Sector:

1. Industrial project
2. Agricultural project
3. Educational project
4. Health project
5. Social project

4. On the basis of objective:

1. Social objective project
2. Economic objective project

5. On the basis of productivity:

1. Directivity productive project
2. Interactively productive project

6. On the basis of nature of benefits:

- I. Quantifiable project
2. Non-quantifiable project

7. On the basis of government priorities:

- I. Project without specific priorities
2. Project with specific priorities

8. On the basis of dependency

1. Independent project
2. Dependent project

9. On the basis of ownership

1. Public sector project
2. Private sector project
3. Joint sector project

10. On the basis of location

1. Project with determined location
2. Project with future impact

11. On the basis of social time value of the project

- I. Project with present impact
2. Project with future impact

12. On the basis of National policy

- I. Project determined by inward looking policy
2. Project determined by outward looking policy

13. On the basis of risk involved in the project

1. High risks project
2. Normal risks project
3. Low risks project

14. On the basis of economic life of the project

1. Long term project

2. Medium term project

3. Short term project

15. On the basis of technology involved in the project

1. High sophisticated technology project

2. Advance technology project

3. Foreign technology project

4. Indigenous technology project

16. On the basis of resources required by the projects

1. Project with domestic resources

2. Project with foreign resources

17. On the basis of employment opportunities available in the project

1. Capital intensive project

2. Labour intensive project

18. On the basis of management of project

1. High degree of decision making attitude

2. Normal degree of decision making attitude

3. Low degree of decision making attitude

19. On the basis of sources of finance

1. Project with domestic financing

2. Project with foreign financing

3. Project with mixed financing

4. Project with financial institutions

20. On the basis of legal entity

1. Project with their own legal entity

2. Project without their own legal entity

21. On the basis of role played by the project

1. Pilot project

2. Demonstration project

22. On the basis of speed required for execution of the project

1. Normal project

2. Crash project

3. Disaster project

Phases of project life cycle:**PROJECT LIFE CYCLE**

Every, project or product has certain phases of development. The different phases of development in an investment proposal or project is called life cycle. A clear understanding of these phases permits entrepreneurs, managers and executives to have better control over existing and potential resources in the achievement of the desire goals.

PHASES OF PROJECT LIFE CYCLE

Project life cycle is complex process consisting of different steps arranged in a sequential order. Different authors have described these steps in different sequential manner but the concept of the cycle is almost similar in each case.

According to United Nations Guidelines for Rural Centre Planning, there are 7 steps in the project life cycle such as project identification and appraisal, pre-feasibility study, feasibility study, detailed design, project implementation, operation maintenance, monitoring and evaluation. Rondinelli, Dennis & Apsy Palia in their book “Project Planning and implementation in Developing countries” identified the following 12 steps in the project life cycle. Project identification and definition, project formation, preparation and feasibility analysis, project design, project analysis, project selection, project activation and organization, project implementation and operation, project supervision (monitoring and control), project completion or termination, output diffusion and transition to normal administration, project evaluation follow-up and action. World Bank Guidelines reveals the following six major steps in the project life cycle. Conception (identification), Formation (preparation), Analysis (appraisal), Implementation (supervision), operation and evaluation. All the steps given in different studies can be grouped into three main phases viz.,

- Pre-investment phase
- Implementation phase and
- Operational phase

A brief description of each of these phases is given below:

PRE-INVESTMENT PHASE

The first phase of the cycle describes the preliminary evaluation of an idea. It consists of identification of investment opportunities, preliminary project analysis, feasibility study and decision-making. Project idea emanates from the following problems; potential and the needs of the people of an area; plan priorities when planning is done by the government demand and supply projection of various goods and services; Pattern of imports and exports over a period of

time; natural resources which can serve as the base for potential manufacturing activity; scope of extending existing lines of activity; consumption pattern in other countries at comparable stages of economic stages of economic development.

On the basis of the investment opportunities, it is possible to conceive a number of projects out of which a particular project may be consistent with development objectives of the area. During this phase, the following aspects of a project must be carefully designed so as to enable implementation.

- Project infrastructure and enabling services
- System design and basic engineering packages
- Organization and manpower
- Schedule and budgets
- Licensing and government clearances
- Finance
- Systems and procedure
- Identification of project manager
- Design basis, general condition for purchase and contracts
- Construction resources and materials
- Work packaging

This phase is involved with preparation for the project to take out smoothly. Once a project opportunity is conceived, it needs to be examined. Preliminary project analysis concerns with marketing, technical, financial and economic aspects of the project. It seeks to determine whether the project is prima facie worthwhile to justify a feasibility study and what aspects of the projects are critical to its viability and hence call for an in depth investigation. More details, through and complete feasibility study results in a reasonably adequate formulation of the projects in terms of location, production capacity production technology and material inputs. The feasibility study contains fairly specific estimates of projects cost, means of financing sales revenues, production costs, financial profitability and social profitability.

Based on the thorough feasibility study the project owner or sponsors or financiers can decide whether to accept or reject particular project. In other words, the decision whether investment on the project should be made or not has to be made at this stage.

IMPLEMENTATION PHASE

The implementation phase of an industrial project involves setting up of manufacturing facilities. After judging the worthiness, project needs to be designed for implementation.

Drawing, blue prints and the sequences in which the various activities concerning the project need to be carried out. The main activities under this phase are:

Project and engineering design: It consists of site probing and prospecting,

preparation of blue prints, plant design, plant engineering, selection of machinery, equipment.

Negotiations and contractions: It covers the activities like project financing, acquisition of technology, construction of building and civil works, provision of utilities supply of machine and equipment, marketing arrangement etc.

Construction: This step involves the activities like site preparation, construction of building, erection and installation of machinery and equipment. Training engineers, technicians and workers.

Plant commissioning

OPERATION PHASE

It is the longest phase in terms of time span. It begins when the project is commissioned and ends when the project is wound up. This is a transition phase in which the hardware built with the active involvement of various agencies is physically handed over for production. This phase is basically a clean up phase for project personnel. The main concern of this phase is on smooth and uninterrupted operation of machinery and plant, development of suitable norms of productivity, establishment of a good quality for the product and securing the market acceptance of the product. It aims to realize the projection made in the project regarding sales, production, cost and profits. Project monitoring and project evaluation are two vital activities under this phase.

Project monitoring is a step towards achieving properly identified objectives through a carefully laid down strategy. Each activity in the project implementation should be carefully watched so that, the progress may be measured and any deviation from the expected progress be identified in time.

Project evaluation refers to post-investment analysis. It aims at finding out whether the project has achieved the objectives for which it was taken up and whether it has created the anticipated or intended impact. This helps in developing an insight for future investment and better planning. Thus the life cycle of a project narrates the methodology of developing, maintaining and controlling an investment proposal at its various phases in the life cycle. The various steps in the project life cycle are given in the figure 1.2.

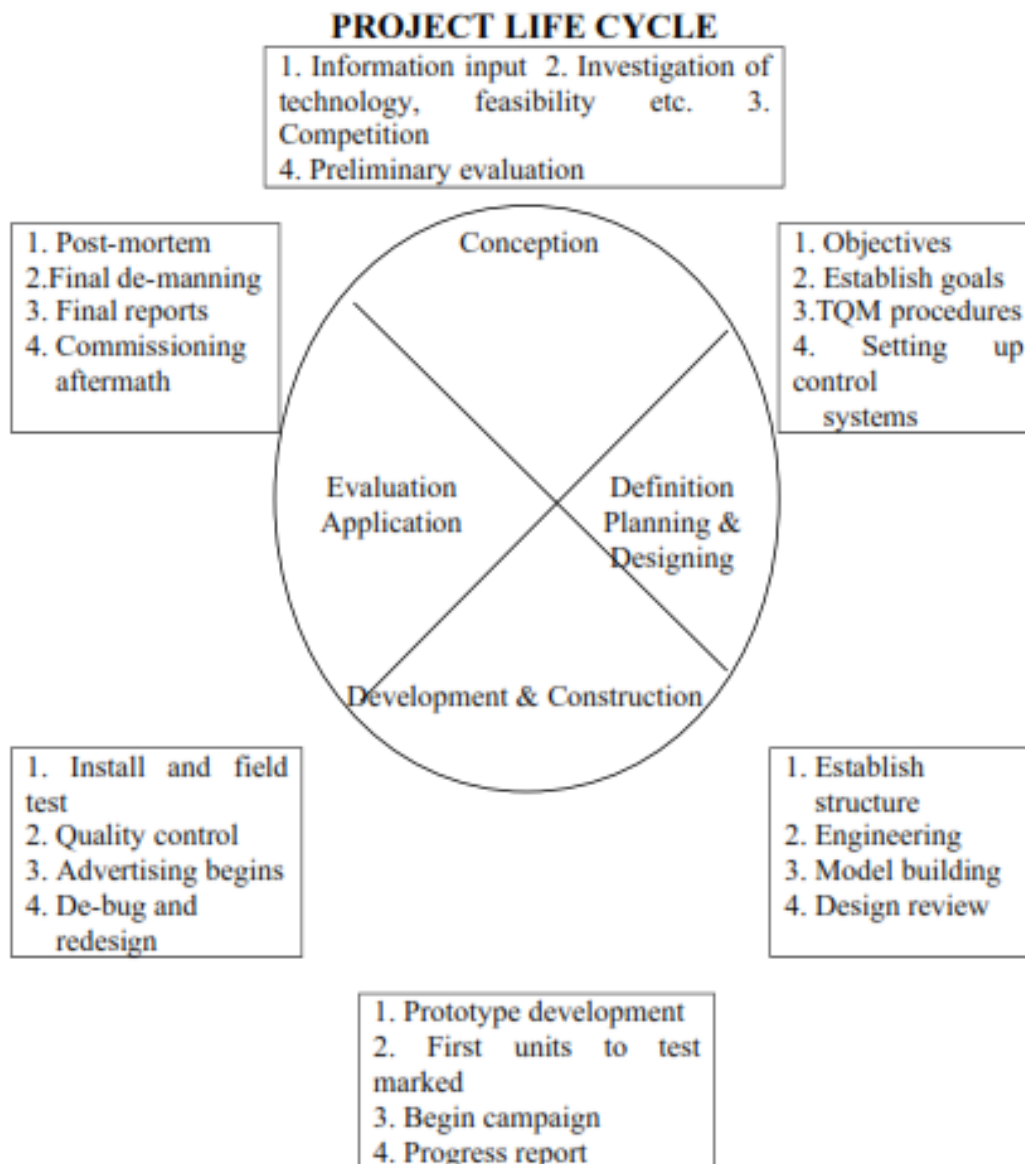


Figure 1.2 steps in the project life cycle

PROJECT LIFE CYCLE CURVES

The project life cycle phases form an interesting pattern indicative of growth, maturity and decline almost similar to product life cycle. The figure 1.3 shows the typical project life cycle curve.

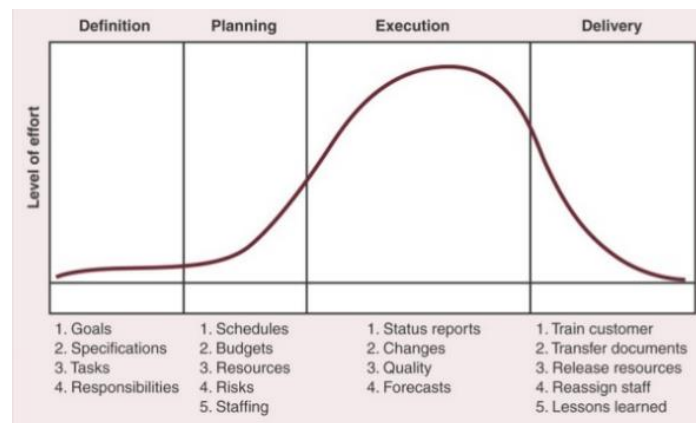


Figure 1.3 Project life cycle curve

5 Phases of Project Management

Project management is the application of knowledge, skills, tools, and techniques to a broad range of activities in order to meet the requirements of a particular project. There are five phases of project management and if the lifecycle provides a high-level view of the project, the phases are the roadmap to accomplishing it. Figure 1.4 shows the redefined project phases



Figure: 1.4 Redefined project phase

Phase 1: Project Initiation

This is the start of the project, and the goal of this phase is to define the project at a broad level. This phase usually begins with a business case. This is when you will research whether the project is feasible and if it should be undertaken. If feasibility testing needs to be done, this is the stage of the project in which that will be completed.

Important stakeholders will do their due diligence to help decide if the project is a “go.” If it is given the green light, you will need to create a project charter or a project initiation document (PID) that outlines the purpose and requirements of the project. It should include business needs, stakeholders, and the business case.

Phase 2: Project Planning

This phase is key to successful project management and focuses on developing a roadmap that everyone will follow. This phase typically begins with setting goals. Two of the more popular methods for setting goals are S.M.A.R.T. and CLEAR:



Figure:1.5: SMART goals

S.M.A.R.T. Goals – This method helps ensure that the goals have been thoroughly vetted. It also provides a way to clearly understand the implications of the goal-setting process.

Specific – To set specific goals, answer the following questions: who, what, where, when, which, and why.

Measurable – Create criteria that you can use to measure the success of a goal.

Attainable – Identify the most important goals and what it will take to achieve them.

Realistic – You should be willing and able to work toward a particular goal.

Timely – Create a timeframe to achieve the goal.

C.L.E.A.R. Goals – A newer method for setting goals that takes into consideration the environment of today’s fast-paced businesses.

Collaborative – The goal should encourage employees to work together.

Limited – They should be limited in scope and time to keep it manageable.

Emotional – Goals should tap into the passion of employees and be something they can form an emotional connection to. This can optimize the quality of work.

Appreciable – Break larger goals into smaller tasks that can be quickly achieved.

Refinable – As new situations arise, be flexible and refine goals as needed.

During this phase, the scope of the project is defined and a project management plan is developed. It involves identifying the cost, quality, available resources, and a realistic timetable. The project plans also includes establishing baselines or performance measures. These are generated using the scope, schedule and cost of a project. A baseline is essential to determine if a project is on track.

At this time, roles and responsibilities are clearly defined, so everyone involved knows what they are accountable for. Here are some of the documents a PM will create during this phase to ensure the project will stay on track:

- **Scope Statement** – A document that clearly defines the business need, benefits of the project, objectives, deliverables, and key milestones. A scope statement may change during the project, but it shouldn't be done without the approval of the project manager and the sponsor.
- **Work Breakdown Schedule (WBS)** – This is a visual representation that breaks down the scope of the project into manageable sections for the team.
- **Milestones** – Identify high-level goals that need to be met throughout the project and include them in the Gantt chart.
- **Gantt Chart** – A visual timeline that you can use to plan out tasks and visualize your project timeline.
- **Communication Plan** – This is of particular importance if your project involves outside stakeholders. Develop the proper messaging around the project and create a schedule of when to communicate with team members based on deliverables and milestones.

Risk Management Plan – Identify all foreseeable risks. Common risks include unrealistic time and cost estimates, customer review cycle, budget cuts, changing requirements, and lack of committed resources.

Phase 3: Project Execution

This is the phase where deliverables are developed and completed. This often feels like the meat of the project since a lot is happening during this time, like status reports and meetings,

development updates, and performance reports. A “kick-off” meeting usually marks the start of the Project Execution phase where the teams involved are informed of their responsibilities.

Tasks completed during the Execution Phase include:

- Develop team
- Assign resources
- Execute project management plans
- Procurement management if needed
- PM directs and manages project execution
- Set up tracking systems
- Task assignments are executed
- Status meetings
- Update project schedule
- Modify project plans as needed

While the project monitoring phase has a different set of requirements, these two phases often occur simultaneously.

Phase 4: Project Performance/Monitoring

This is all about measuring project progression and performance and ensuring that everything happening aligns with the project management plan. Project managers will use key performance indicators (KPIs) to determine if the project is on track. A PM will typically pick two to five of these KPIs to measure project performance:

- **Project Objectives:** Measuring if a project is on schedule and budget is an indication if the project will meet stakeholder objectives.
- **Quality Deliverables:** This determines if specific task deliverables are being met.
- **Effort and Cost Tracking:** PMs will account for the effort and cost of resources to see if the budget is on track. This type of tracking informs if a project will meet its completion date based on current performance.
- **Project Performance:** This monitors changes in the project. It takes into consideration the amount and types of issues that arise and how quickly they are addressed. These can occur from unforeseen hurdles and scope changes.

During this time, PMs may need to adjust schedules and resources to ensure the project is on track.

Phase 5: Project Closure

This phase represents the completed project. Contractors hired to work specifically on the project are terminated at this time. Valuable team members are recognized. Some PMs even organize small work events for people who participated in the project to thank them for their efforts. Once a project is complete, a PM will often hold a meeting – sometimes referred to as a “post mortem” – to evaluate what went well in a project and identify project failures. This is especially helpful to understand lessons learned so that improvements can be made for future projects.

Once the project is complete, PMs still have a few tasks to complete. They will need to create a project punch list of things that didn’t get accomplished during the project and work with team members to complete them. Perform a final project budget and prepare a final project report. Finally, they will need to collect all project documents and deliverables and store them in a single place.

Project management and Functional management

Project management is the process of initiating, planning, executing, controlling, and closing the work of a project to achieve a specific objective. Functional management is managing the routing activities in the organization relating to various functions such as production, sales, and marketing, finance etc.

Each project management model requires a different management approach and the rules under which the game is played are also different. Different project structures can exist within the same company for different projects depending on the needs of the project as long as the role players understand which model is being used and all agree on the rules pertaining to that specific management model. The different project management models or approaches can be classified as:

- Series of functional teams;
- Functional project teams;
- Matrix project teams;
- Dedicated project teams, and;
- Autonomous project teams.

The different project management types along with decision parameters for determining the most suitable approach are shown in Figure 1.6. Increased complexity, design constraints,

novelty, and sensitivity to cost and lead time would indicate moving to a more dedicated project team environment.

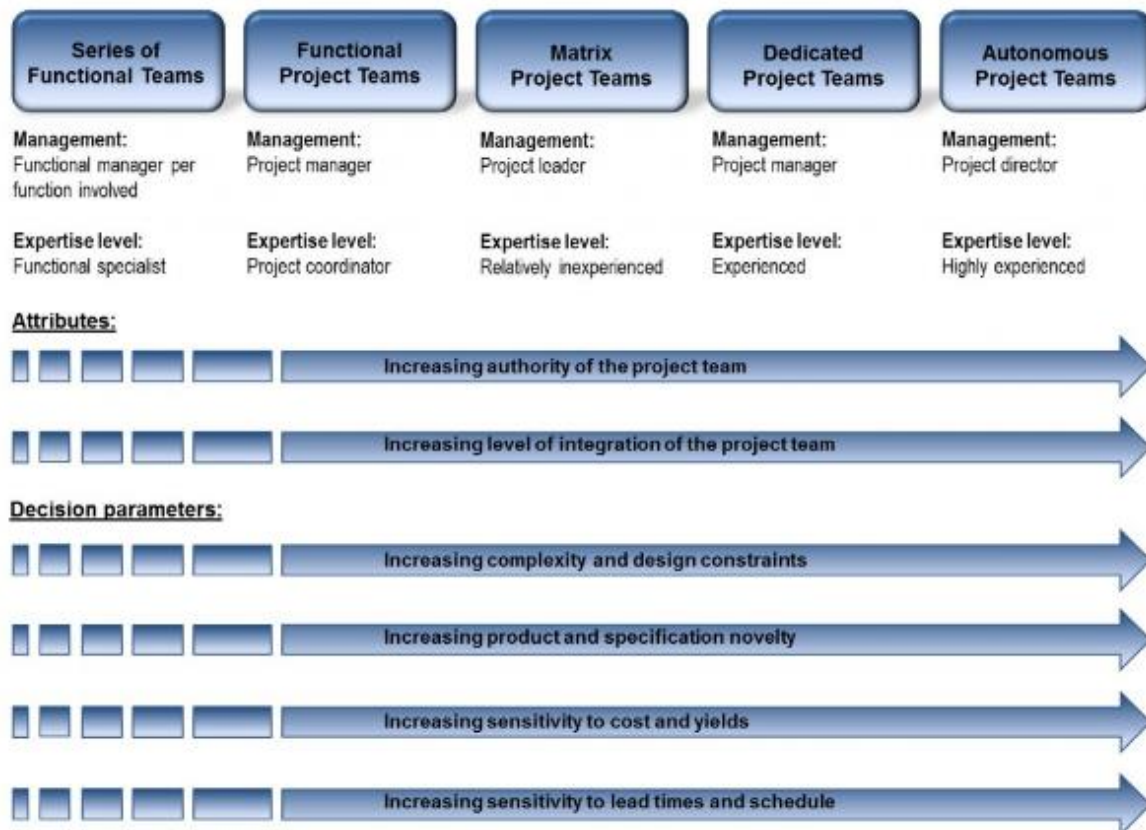


Figure 1.6 Project management types and decision parameters

Project Type 1: Series of Functional Teams

In this classical approach the project is divided into functional segments which are assigned to individual functional managers. They retain full control over their specific part of the project and redistribute the tasks amongst their staff while ensuring coordination with other functions particularly the one to which they will pass the baton. There is no project manager assigned to the project.

These projects are executed by completing specified and agreed deliverables and then handing the package to the next function. This approach can be used for very simple projects or for complex one-of-a-kind projects driven by R&D or engineering excellence, rather than time or marketing constraints. The series of functional teams model often co-exists with other more advanced project management models and is used for smaller jobs while management reverts to more autonomous teams for more complex projects.

This approach reminds one of a relay race (passing the baton) and exhibits the following traits:

- Quality of handover and smooth handover is critical;
- It is highly dependent on harmony between the functional heads;

- The party that completed the work up to a specific point must “sell” the completed package to the receiving party who can accept or reject it;
- For proper transfer and acceptance of responsibilities the party who has to execute the next steps must develop the deliverables for their phase of the project and obtain approval for the execution of that phase;
- The responsibility of executing a specific phase of the project rests totally with the function executing the work;
- Quality and integration is dictated by the quality of cooperation between function heads, and;
- The loyalty of the team members to their functions far outweighs their loyalty to the project.

Project Type 2: Functional Project Teams

This approach, a functional project team with some coordination, is the weakest possible form of project management. It features a project manager, often without much executive power acting as project coordinator (administrator, time keeper and secretary). The project coordinator is responsible for smoothing project transfer across functions and keeping everyone on target with respect to schedule and budget. In practice, he or she depends totally on the goodwill of the participating functional

managers who keep ultimate control over the content and staffing of the project. Like the project type 1, of which it is an extension, it works best on simple or routine projects or, alternatively, on very large one- of-a-kind projects for which technological or engineering excellence is the determining factor (single discipline projects) and time is less of an issue.

The functional project team approach exhibits the following traits:

- The project manager act as a facilitator to ensure smooth transfer between functions;
- The project manager coordinates and feeds back schedule and budget information to the functional managers for them to act upon;
- The functional manager plans and executes the work within his or her function, and;
- The loyalty of the team members to their functions outweighs their loyalty to the project.

Figure 1.7 shows schematic diagram of functional project teams

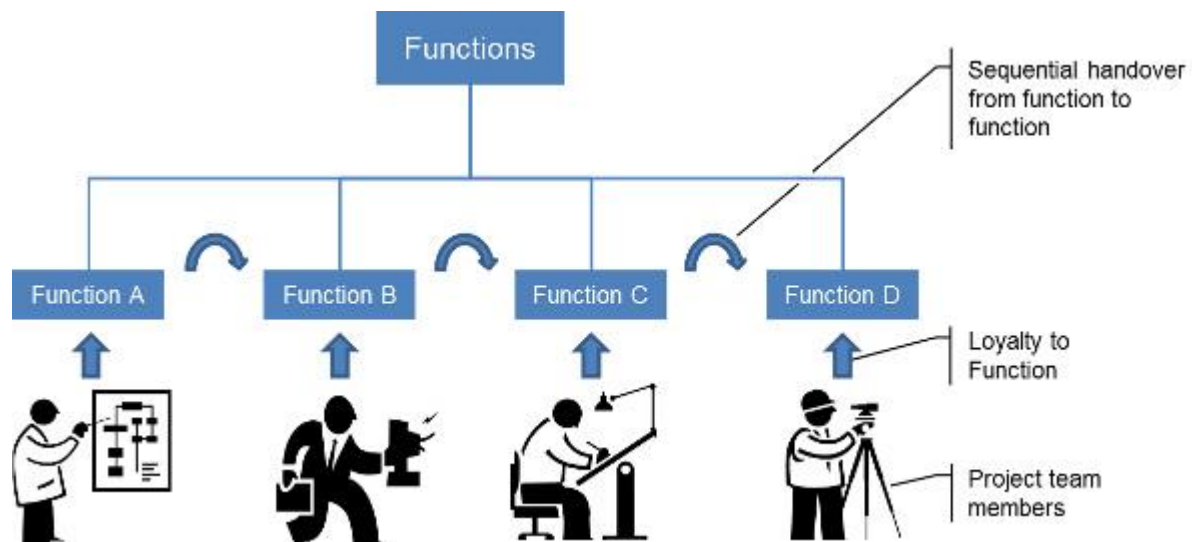


Figure 1.7 shows schematic diagram of functional project teams

Project Type 3: Matrix Project Teams

This matrix approach is probably amongst the most widely practiced forms of project management around. It is also called the balanced matrix model alluding to the equilibrium which is supposed to prevail between the two dimensions of the matrix. The project leader is expected to define what needs to be accomplished. This includes overall plans and schedules, integrating the contributions of different disciplines, and monitoring progress according to plan. Functional managers, on the other hand, are supposed to define how to accomplish the tasks, to assign resources and to execute segments of the project according to budgets and schedules.

Although used widely, this model is often equally resented by project managers and functional managers. Its ambiguity as to who is really in charge underscores the classical problems of most matrix organisations. The project leader who is theoretically accountable for success has often no real authority regarding the content of the work or the resources provided by the functional departments. The latter remain free to re-deploy their troops as they see fit. This model works best with projects without major time constraints, where innovation is not an issue and cost constraints are not extreme.

The matrix project team approach exhibits the following traits:

- Project leader's level of authority is dependent on delegation by function heads;
- The project manager defines what needs to be done, plans and schedules work and develops budgets;

- The functional managers define how and by whom work under their jurisdiction is accomplished; Special attention needs to be paid to clarify roles and responsibilities of project manager vs. functional managers, and;
- “Equal” degree of loyalty to project and function by team members.

Figure 1.8 shows matrix project teams

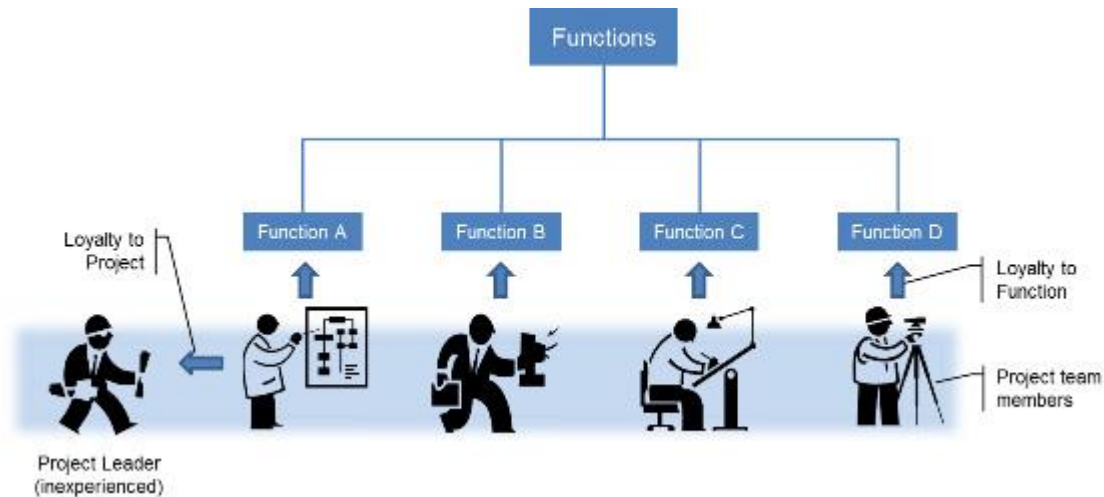


Figure 1.8: Matrix Project Teams

Project Type 4: Dedicated Project Teams

The approach of dedicated project teams provides the right balance between the project leader, to whom the team dedicated to the project reports, and the functional organisation. The combination has become the model of contemporary programme management. It is also often called the “project matrix” to highlight the fact that, even though the relationships of the team with the project manager and the functional hierarchy are of a matrix type, the power balance is tilted in favour of the project.

In this model, the project manager is fully responsible for the completion of the project. He or she contracts the resources necessary to do the work with the different functional managers concerned and maintains direct authority over both resources and work flow. In that sense, the project manager has the ultimate power to decide about anything related to the project and to make trade-offs in the best interest of the project and the company. The functional manager assigns resources, provides services, gives advisory expertise and ensures that adequate skills are available within the functional organisation. This approach is particularly suited for the development of complex products requiring a high degree of functional integration, to meet pressures on lead times and for projects that require an innovative approach or are under extreme time and cost constraints.

The dedicated project team approach exhibits the following traits:

- Project manager is ultimately responsible for overall performance of the project;
- The project manager defines what needs to be done, plans and schedules work, determines resource needs, develops budgets and controls resources allocated to him;
- Functional managers must ensure capable resources are allocated to the project;
- Functional managers only provides advisory expertise to project team or additional services, if requested, and;
- Loyalty to the project or programme outweighs loyalty to the function.

Figure 1.9 shows : Dedicated Project Teams

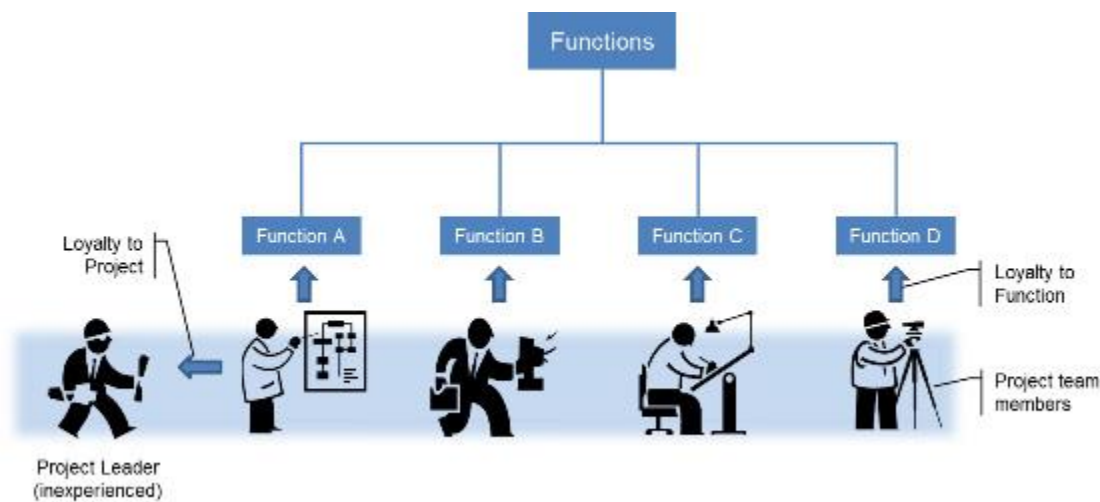


Figure 1.9: Dedicated Project Teams

Project Type 5: Autonomous Project Teams

The approach of autonomous project teams is sometimes adopted to correct the perceived deficiencies of the dedicated project team model. Management, frustrated by the ineffective handling of previous projects or hard pressed by external events to move fast, decides to set up a powerful “project boss”. This form of extreme project management is sometimes called “skunk works” or “commando team”.

In this model, the project team becomes a self-contained organisational entity with fully dedicated members, physically and organisationally separate from their normal functional units. The project director reports directly to top management, bypassing normal reporting lines. He or she is likely to have full authority, sometimes even carte-blanche over all product and project decisions and is fully accountable for the project’s success. In practice, this approach may be warranted for exceptional projects falling completely outside the current scope of the company or it may be used on a pilot basis to break completely new ground, for example to meet impossible deadlines set by management. In other words, it should remain the exception rather than the rule. It cannot be extended to all projects because of the organisational

disruptions it is bound to create. Such teams may work effectively while the project goes on; however, extra speed and efficiency are often gained to the detriment of smooth functional relations and continuity. The re-entry of such teams into the functional organisation is generally difficult, more so when many toes have been stepped upon during the project.

The autonomous project exhibits the following traits:

- Project director is totally responsible for overall performance of the project;
- Project team is removed from the normal organisational structure;
- Only suitable for exceptional projects requiring, for example, radical innovation;
- Unstable and conflict prone, and;
- Difficult to assimilate members back into the company.

Figure 2.0 shows autonomous project teams

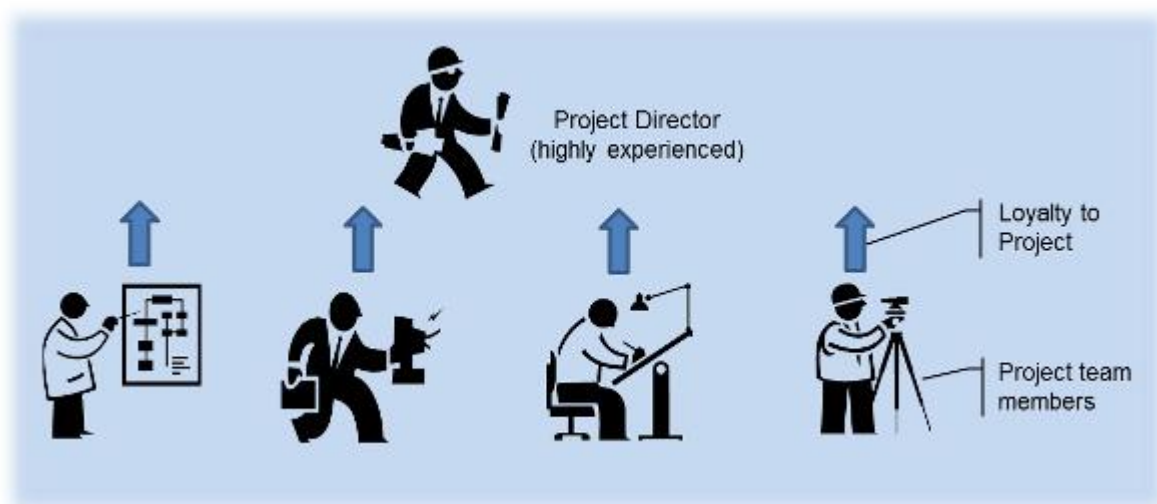


Figure 2.0 shows autonomous project teams

Roles and responsibility of project leader

As things stand today, none of the present generation project manager including the very successful ones, come from any of our management schools. They were just given the job-some succeeded and others did not. Those who succeeded are not many. because only a handful of projects in India were ever completed on time, within budget and performed to expectations. While the failures of these projects had been analysed in many seminars and workshops. the role of project managers and their development did not form the subject of any serious discussion. There could be two reasons for this: (a) Perhaps no one thinks that success or failure of a project depends on the project manager: and (b) It may also be that no one considers them

as a special breed of managers. Surprisingly, even some of the practicing project managers themselves subscribe to these views. The basic roles and responsibilities of a project manager that we are referring to could be grouped under twelve heads:

- 1 .Defining and maintaining the integrity of a project:
2. Development of project execution plan;
- 3 .Organization for execution of the plan:
4. Setting of targets and development of systems and procedures for accomplishment of project objectives and targets:
5. Negotiation for commitments;
6. Direction, coordination and control of project activities:
- 7 .Contract management:
8. Non-human resource management including fiscal matters;
- 9 .Problem-solving:
10. Man management:
11. Satisfaction of customer. Government and the public: and
- 12 .Achievement of project objectives, cash surplus and higher productivity.

A project is an organized programme of pre-determined group of activities that are non-routine in nature and that must be completed using the available resources within the given time limit. Project management is an organized venture for managing projects. The location, type, technology, size, scope and speed are normally the factors which determine the effort needed in executing a project. Project can be classified under different heads. The project ideas as a process of identification of a project begins with an analytical survey of the economy. Project life cycle is spread over a period of time. Project report is a kind of course of action what the entrepreneur hopes to achieve in his business and how he is going to achieve it. Project appraisal is made for both proposed and executed projects. For appraising a project. its economic, financial, technical, market and social aspect are analyzed. There are several tools and techniques which contribute significantly towards effective project management.

Tools and Techniques for Project Management

There are several tools and techniques which would contribute significantly towards effective project management these can be broadly grouped under the following heads:

1. Project selection techniques
 - (a) Cost benefit analysis and

- (b) Risk and sensitivity analysis

2. Project execution planning techniques

- (a) Work breakdown structure (WBS)
- (b) project execution plan (PEP)
- (c) Project responsibility matrix and
- (d) Project management manual

3. Project scheduling and coordinating techniques

- (a) Bar charts
- (b) Life cycle curves
- (c) Line of balance (LOB) and
- (d) Networking techniques(PERT/CPM)

4. Project monitoring and progressing techniques

- (a) Progress measurement technique (PROM PT)
- (b) Performance monitoring technique (PERMIT) and
- (c) Updating, reviewing and reporting technique (U RT)

5. Project cost and productivity control techniques

- (a) Productivity budgeting techniques
- (b) Value engineering(VE) and

6. Project communication and clean-up techniques

- (a) Control room and
- (b) Computerized information systems

PROJECT PLANNING AND ESTIMATING: Feasibility report based planning

A feasibility report is an investment proposal base on certain information and factual data appraising the project. This type of feasibility study may be required by the financing institutions, project sponsor, project owner. The feasibility report enables the project holder to know the inputs required and if rightly prepared confirms to the convictions that he is proceeding in the right direction. In other words, a project needs to be fully defined in order to provide terms of reference for the management of the project. A project can be considered to have been fully established when the following conditions are fulfilled.

The technical configuration of the project has been fully defined. The performance requirement for the various technical system and the key equipment have been specified. Cost estimate for the project is frozen.

Techno-economic viability of the project has been examined, appraised and approved. An overall schedule for implementation of the project has been drawn-up. The feasibility report is

prepared during the definition phase of a project. It lies in between project formulation stage and appraisal and sanction stage. It is prepared to present an in-depths techno-commercial analysis carried out on the project idea for consideration of the financial institutions and other authorities empowered to take the investment decision.

Nature of Project Feasibility Analysis

In the broad sense, every rational decision to make new investment is preceded by an investigation of the feasibility of the project, whether or not this carried out in a formal manner. The larger the project and greater the investment, the more formalized the investigation. Assurance is needed that the market exists or can be developed, that raw materials can be obtained, that sufficient labour supply is available, that local services vital to the project are at hand, and that the overall costs for plant equipment, labour and raw material input will be of a certain order. Most importantly it must be determined that income will exceed costs by a margin sufficient to make the project financially attractive. When the project is small, the study format may be quite informal, perhaps there will be no formal study at all and little accumulation of actual data. Nevertheless, the feasibility calculations will have to be computed and evaluated, even if in an informal manner before the ultimate step of actual investment is taken.

Need for Feasibility Studies

A company is incorporated for the purpose of setting up a project. The promoters obviously have, to start with, some broad idea about the proposed industrial activity. They make mental picture as to how the idea, when translated into reality would result in a profitable project, given the demand supply pattern, probable cost of production etc. It is quite likely that the originators get attracted by the favorable aspects of the project known to them, while they may have overlooked the dark side of the picture, which can only be revealed by a detailed objective study. Too many projects have floundered, at considerable loss to the investors and indeed to the national economy through waste of scarce resources, because the investment decisions were taken without objective and in depth techno-economic feasibility studies. The need for such careful studies is further underscored on two counts: In modern times, business operations are complex, requiring carefully prepared plans. The shareholders, creditors, term leaders etc., insist on as complete an analysis of the scheme as possible without their co-operation, it would not be possible to translate the idea into action. This feasibility study helps the promoter to make the investment decisions correctly and to obtain funds without much difficulties. It allows the promoters to anticipate the problems likely to be encountered in the

execution of the project and phases them in a better position to answer the queries that may be raised by the financial institutions and others who would have to be involved in the project.

Complements of Feasibility Study

Project feasibility study comprises of market analysis, technical analysis, financial analysis, and social profitability analysis. The analysis is mainly interested only in the commercial profitability and thus examining only the market, technical and financial aspects of the project. But, generally the gamut of feasibility of a project covers the following areas:

- Commercial and economic feasibility
- Technical feasibility
- Financial feasibility
- Managerial feasibility
- Social feasibility or acceptability

Commercial and Economic Feasibility

The economic feasibility aspect of a project relates to the earning capacity of the project. Earnings of the project depends on the volume of sales. If taken into consideration the following important indicators.

Present demand of the goods produced through the project. i.e. market facility (or) getting a feel of the market.

Future demand: a projection may be made about the future demand.

The period normally depend upon the scale of investment.

Determining the extent of supply to meet the expected demand and arriving at the gap.

Deciding in what way the project under consideration will have a reasonable chance to share the market.

Anticipated rate of return on investment. If it is positive the project justifies the economic norm in the relationship between cost and demand. Future demand can be estimated after failing into consideration the potentialities of the export market the charges in the income and prices, the multiples use of the product, the probable expansion of industries and the growth of new industries. The share of the proposed project in the market could be identified by considering the factors affecting the supply position such as competitive position of the unit, existing and potential competitors, the extent of capacity utilization, unit cost advantages and disadvantages, structural changes and technological innovations bringing substitute into the market.

The commercial feasibility of a project involves a study of the proposed arrangements for the purchase of raw materials and sale of finished products etc. This study comprises the following two aspects.

Arriving at the physical requirement of production input such as raw materials, power, labour etc., at various level of output and converting them into cost. In other words, deciding costing pattern. Matching costs with revenues with a view to estimating the profitability of the project and the break-even point. The possibility ultimately decides whether the project will be a feasible proposition. The technical analysis of a project feasibility study serves to establish whether or to the project is technically feasible and it also provides a basis for cost estimating.

TECHNICAL FEASIBILITY

The examination of this aspect requires a thorough assessment of the various requirements of the actual production process and includes a detailed estimate of the goods and services needed for the project. So, the feasibility report should give a description of the project in terms of technology to be used, requirement of equipment, labour and other inputs. Location of the project should be given special attention in relevance to technical feasibility. Another important feature of technical feasibility relates the types of technology to be adopted for the project. The exercise of technical feasibility is not done in isolation.

The scheme has also to be viewed from economic considerations; otherwise, it may not be a practical proposition however sound technically it may be. The promoter of the project can approach the problem of preparation of technical feasibility studies in the following order:

Undertaking a preliminary study of technical requirements to have a quick evaluation. If preliminary investigation indicate favourable prospects working out further details of the project.

The exercise begins with engineering and technical specifications and covers the requirements of the proposed project as to quality, quantity and specification type of components of plant & machinery, accessories, raw materials, labour fuel, power, water, effluent disposal transportation etc.

Thus, the technical feasibility analysis is an attempt to study the project basically from a technician's angle. The main aspects to be considered under this study are: technology of the project, size of the plant, location of the project, pollution caused by the project production capacity of the project, strength of the project. Emergency or stand-by facilities required by the project sophistication such as automation, mechanical handling etc. required collaboration agreements, production inputs and implementation of the project.

Financial Feasibility

The main objectives of this feasibility study is to assess the financial viability of the project. Here, the main emphasis is in the preparation of financial statement, so that the project can be evaluated in terms of various measures of commercial profitability and the magnitude of financing required can be determined. The decision about the financial feasibility of project should be arrived at based on the following consideration:

For existing companies, audited financial statements such as balance sheets, income statements and cash flow statements.

For projects that involve new companies, statement of total projects cost, initial capital requirements, and flow relative to the projective time table.

Financial projections for future time periods, including income statements, cash flows and balance sheets. Supporting schedule for financial projections stating assumptions used as to collection period of sales, inventory levels, payment period of purchases and expenses and elements of production cost, selling administrative and financial expenses.

Financial analysis showing return on investment return on equity, breakeven volume and price analysis. If necessary sensibility analysis to identify items that have a large impact on profitability or possibly a risk analysis.

Managerial Feasibility

The success or failure of a project largely depends upon the ability of the project holder to manager the project. Project is a bundle of activities and each activity has its own role. For the success of a project, a project holder has to coordinate all the activities in such a way that the additive impact of different inputs can produce the desired result. The ability to manage and organize all such inter related activities come within the concept of management. If the person in-charge of the project, has the ability, has the ability to manage all such activities, the desired result can be anticipated.

Social Feasibility

A project may cross all the above barriers mentioned above an found very suitable but is will lose its entire creditability, if it has no social acceptance. Though the social customs, conventions such as caste community, regional influence etc. are creating hindrance for development of a project should avoid all such social conflicts which will stand on the successful implementation of the project, (e.g.) Considering the interests of the general public; projects which offer large employment potential, which channelize the income from less developed areas will stimulate small industries. The feasibility report should highlight on these

five testing stones before it can be declared as complete and only after judging through these indicators a project can be declared as viable and can be submitted for finance or any other assistance from any institutions.

Format of Feasibility Report

The sketch of feasibility report of the project covers the following

1. Introduction
2. Summary and Recommendations
3. Project Capacity, Chemistry of the product, specifications, properties. application and uses.
4. Market potential
5. Process and know-how
6. Plant and machinery
7. Location of the unit
8. Plot plan and building
9. Raw materials availability
10. Utilities, requirements
11. Effluents treatment
12. Personnel requirement
13. Capital cost
14. Working capital
15. Mode of finance
16. Manufacturing cost
17. Financial analysis
18. Implementation schedule

Check for Feasibility Report

The following key elements must be presented in the feasibility report,

Examination of public policy with respect to the industry project

Broad specification of outputs and alternative techniques of production

Listing and description of alternative locations.

Preliminary estimates of sales revenue, capital costs and operating costs of different alternatives Preliminary analysis of profitability for different alternatives

- Marketing analysis
- Specification of product pattern and product prices
- Listing of major equipment by type. size and cost

- Listing of auxiliary equipment and process know-how
- Specification of site and completion of necessary investigation
- Listing of buildings, structures and yard facilities by type size and cost
- Specification of supply sources connection costs and other costs and other costs for transportation services, water supply and power
- Preparation of layout
- Specification of skill-wise labour requirements and labour costs.
- Estimation of working capital requirement
- Phasing of activities, and expenditure during construction
- Analysis of profitability
- Determination of measures of combating environmental problems
- State the preparedness to implement the project rapidly

Objective and goals of the project:

Objectives are usually expressed as succinct, one-sentence statements. There is some discrepancy between how specific the verbs may be. Some guides insist that only general quality and quantity verbs be used (increase, decrease, improve), while community groups and nonprofits seem to tolerate looser expressions (develop, educate, setup, estimate).

Keep in mind that an objective should not specify how something is done, and consider the context and guidelines the organization you're writing for use.

Here are a few suggestions to help you as you write the statement:

- Write the objective before starting the project.
- Identify all objectives at the beginning.
- An objective cannot be written in isolation. Get support from all levels of the team. If the team doesn't believe in the objective, they won't work towards it and stakeholders won't provide resources. If stakeholders disagree with the objective, work with them until you get a statement you can all stand behind.
- Be brief; it increases the chances of objectives being read and understood.
- Be clear; don't give a list of options or a range of target numbers. Ask for what you need and what you expect.
- Use plain English, not jargon so everyone can understand your objective.

Examples of Well Written Objectives

- Personal: Your goal may be to buy a house, but your objective is to get a condominium for under Rs 50,00,0000 with two bedrooms by August.
- Business: The goal is to build up the company in the near future. The objective is to increase sales of Super Widget by 10 percent by the second quarter of next year.
- Business: The goal is to make existing customers happier. The objective is to improve customer satisfaction rates by 50 percent by June 30 through training of customer service team.
- Nonprofit: The goal is to restore a native habitat around the retention pond near the Old Road to encourage native bird and animal species to visit and improve water filtration. The objective is to support residential homeowners around the pond to remove and replace non-native plants on one-third of the designated area by December.

The Differences between Goal and Objective:

	Goal	Objective
Most appropriate definition	Something one wishes to accomplish. Broader, more timeless than an objective. Expressed as a desired and targeted happening.	A concrete statement describing what the project is trying to achieve. The objective should be written at a low level, so that it can be evaluated at the conclusion of a project to see whether it was achieved or not. A well-worded objective will be Specific, Measurable, Attainable/ Achievable, Realistic and Time bound (SMART)
Measure	It can be qualitative and/or quantitative.	It should be quantitative.
Link with the project effort	Indirect. External factors may influence the ability to attain the project goal.	Direct. If the project tasks are correctly implemented, project objectives should be achieved.

Time frame to measure the achievement	Normally some time has to pass after the project end in order to see the effect on the project goal.	Normally right after the conclusion of the project/deliverable/ actions/tasks that should achieve the objective.
Impact type	Normally measured in business terms (sales increase, costs reduction, market share, time to market, agility, reputation etc.).	Normally measured in technical terms (acceptance of the solution, respect of schedule and budget etc.).
Numerosity	One or just a few.	One to many relationships with goals. There can be up to a few dozen.

Preparation of cost estimation.

Cost estimation is the predictive process used to quantify, cost, and price the resources required by the scope of the project, to better manage budgets and deliver projects that do not exceed the identified scope, and that are on time throughout the development process.

The objective of the estimate is to provide the most realistic prediction possible of the total cash expenditure and time that will be necessary to complete the project ready for operation. Cost estimates provided for road projects in developing countries in the past have generally proved to be wildly inaccurate, with two main results: · Tendered contract bids have often proved to be considerably higher than the engineer's feasibility study estimate · Considerable cost overruns have occurred during projection execution.

Traditionally, unit pricing techniques have been used for project costing, but these have been shown to be deficient in several important areas. This section recommends the use of analytical techniques and rigorous procedures of risk management to produce realistic estimates of cost at all stages of the project cycle. Expected values of project costs and construction periods should reflect past experience that actual values achieved have normally been far in excess of those estimated originally, particularly those estimates produced at the early stages of project preparation. It is worth expending considerable effort to produce realistic estimates of cost at all stages of the project

COST ESTIMATING STAGES

The stages of a project in which estimates of cost and time may be needed are illustrated in Table 1. The result required at each stage and the information normally available are set out. It is appreciated that, in particular projects, some stages may be omitted or be indistinguishable from adjacent stages.

Table 1: cost estimation stages

Stage						
	Identification	Feasibility	Design	Commitment	Implementation	Operation/ evaluation
Activities	Identification of project	Appraisal of the identified project, including basic requirements, alternative schemes, and recommendation of preferred scheme. Normally requires a cost-benefit analysis.	Definition of preferred scheme including basic design data, conceptual design, technical specifications, construction appraisal, contract strategies and estimate of final cash cost.	Consideration of submission for funding	Implementation of approved project including - detailed design - issue of tender enquiries - assessment of tenders - placing of contracts - construction - completion - commissioning	Operation of new asset by client. Evaluation of project.
Result	Inclusion in forward programme	Recommendation of preferred scheme	Project definition report for use in a subaission for funding	Funding approved for defined project. Basis for cost control	Basis for assessment of tenders and ongoing monitoring of costs and progress against approved estimate	Historical cost and productivity data bank
Available information for estimate	No design capacity/size only	Preliminary designs of alternatives	Conceptual design	Conceptual design	Tender documents	Completed contract

The sequence of estimates throughout the life of a typical project is given below.

1. Preliminary

The quick estimate needed at the project identification stage, with no design available, and only the barest statement of capacity or size.

2. Feasibility: Estimates or alternative schemes under consideration in the feasibility study stage of the project. The essential property of these estimates is that they are directly comparable with each other and therefore base estimates could suffice so long as the same estimating technique and price base data are used. The differences between alternatives will not necessarily be absolute and the danger of their use for forward budgeting must be avoided.

3. Design: The cost estimate for the selected scheme using the design (usually conceptual) and specifications resulting from the design study and forming part of the project definition report.

This estimate would provide the figures for capital cost, cash flow and currency requirements which would then be used in viability calculations for the project and in the submission for donor aid, where appropriate. It must be a cash estimate.

4. Commitment: The proposal estimate as modified and approved for financing, together with the associated modifications to the project definition and/or the programme. This must be a cash estimate, and will provide the basis for the cost control of the project.

5. Pre-tender: A refinement of the approved estimate in the light of further design work done during the tender period and using the information given in the enquiry documents.

This estimate therefore would use the same information as is available to the tendering contractors and should be a good basis for the assessment of bids.

6. Post contract award: A further refinement of the approved estimate in the light of the contract(s) awarded. It includes redistribution of the monies within the approved total to allow more effective cost monitoring of the project to completion.

7. Achieved cost: A record of the actual costs achieved in order to review the cost performance of the project and for project evaluation. It should include a reconciliation of the actual use of contingencies and of the use of tolerance for dealing with major risks.