

UNIT-III

Project Management in Construction: Introduction to project management processes -

Initiating, Planning, Executing, Controlling, and Closing processes; Project Integration Management - Project plan development, Project plan execution, and Overall change control; Project Scope Management - Initiation, Scope planning, Scope definition, Scope verification, and Scope change control.

Introduction: Projects are the building blocks to meet the enterprise objectives. Project Management is essentially involved in executing the projects. It is recognized as a management philosophy in the recent past in addition to that of discipline. Project Management has always been central to the existence of industries like Construction, aerospace and defense, where schedule and cost goals are contract Fundamentals.

DEFINITION OF PROJECT

A Project is a one-shot, time limited, goal directed, major undertaking, requiring the commitment of varied skills and resources. It has also been described as a combination of human and non-human resources pooled together in a temporary organization to achieve a specific purpose. The purpose and the set of activities which can achieve that purpose distinguish one project from another.

Project Management:

"We mean by a project any scheme, or part of a scheme, for investing resources which can reasonably be analyzed and evaluated as an independent unit. The definition is thus arbitrary. Almost any project could be broken down into parts for separate consideration; each of these parts would then by definition a project".

"A specific activity with a specific starting point and a specific ending point intended to accomplish a specific objective. It is something you draw a boundary around at least a conceptual boundary and say this is the Project".

FEATURES OF A PROJECT

A project can be identified by its features. The special features of a project that would differentiate from any other ongoing activity are given below

- A project fixed set of objectives. Once the objectives have been achieved,
- The project ceases to exist.
- It has a specific life span.
- Project has for a teamwork,
- Project has a life cycle reflected by growth, maturity and decline similar.
- Change is an inherent feature in any project out its life.
- Project is based on successive principle and hence it is difficult to learnfully the end results at any stage.
- A project works for a specific set of goals with the complex set of diversified activities.
- High level of sub-contraction of work can be done in a project.

- Every project has risk and uncertainty associated with it.
- Project needs feasibility any appraisal studies. So that the sponsors sweet
- Dream becomes realizable.

Types 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. 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 up very high. Project time will get drastically reduced.

Besides that, projects in general are classified on several basis as give in the

PROJECT CLASSIFICATION

- National International
- Non Industrial
- Non-Conventional
- R & D
- High Technology Conventional Low Technology
- Mega Major Medium Mini
- Gross Root Expansion Modification
- Normal Crash Disaster

Project management processes can be organized into five groups of one or more Processes each:

• **Initiating processes**—recognizing that a project or phase should begin and committing to do so. The planning process, for example, must not only provide details of the work to be done to

bring the current phase of the project to successful completion but must also provide some preliminary description of work to be done in later phases. This progressive detailing of the project plan is often called Rolling wave planning.

- **Planning processes**—devising and maintaining a workable scheme to accomplish the business need that the project was undertaken to address. Planning is of major importance to a project because the project involves doing something which has not been done before. As a result, there are relatively more processes in this section. However, the number of processes does not mean that project management is primarily planning—the amount of planning performed should be commensurate with the scope of the project and the usefulness of the information developed.

- **Executing processes**—coordinating people and other resources to carry out the plan. The executing processes include core processes and facilitating processes as described carrying out the project plan by performing the activities included therein normalizing acceptance of the project scope.

- Quality Assurance —evaluating overall project performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.

- Team Development —developing individual and group skills to enhance project performance.

- Information Distribution —making needed information available to project stakeholders in a timely manner.

- Solicitation obtaining quotations, bids, offers, or proposals as appropriate.

- Source Selection choosing from among potential sellers.

- Contract Administration managing the relationship with the seller.

- **Controlling processes**—ensuring that project objectives are met by monitoring and measuring progress and taking corrective action when necessary.

- **Closing processes**—formalizing acceptance of the project or phase and bringing it to an orderly end.

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:

1. Project expanding the capacity
2. Project expanding the supply of knowledge.

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

1. 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:

1. Quantifiable project
2. Non-quantifiable project

7. On the basis of government priorities:

1. 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

1. Project with present impact
2. Project with future impact

12. On the basis of National policy

1. 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 tern 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

PROJECT LIFE CYCLE

Every programme, 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 desired goals.

PHASES OF PROJECT LIFE CYCLE

Project life cycle is a 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 of 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 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 project 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 contracts: 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.

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 cleanup 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 of rate 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 lifecycle. The various steps in the project life cycle .

PROJECT LIFE CYCLE

1. Information input
2. Investigation of technology, feasibility etc.
3. Competition
4. Preliminary evaluation

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 following figure shows the typical project life cycle curve.

TIME

It can be seen from that curve that effort built up in a project is very slow but effort withdrawals is very sharp. It can also be seen that time taken in the formative and clean up stages together is more than the implementation stage. These parabolic patterns of growth, maturity and decline itself in all phases of the project life. This curve enable a project manager to ascertain the state of health of any project at any point of time.

Project Integration Management

Project management is an existing new profession which receives much attention in these days. It is concerned with the management of resources successfully to complete the project, the resources being time, money, materials and equipment and the most expensive resources of all – namely the human resources. Project management is concerned with achieving a specific goal in a given time using resources available for that period only.

Project management can mean different things to different people. Project management as regards ongoing projects within a company refers to the art of creating that illusion that any outcome is the result of a series of predetermined, deliberate acts when, in fact, it was dumb luck. It is designed to make better use of existing resources by getting work to flow horizontally as well as, vertically, within a company.

Project management resembles functional management in all aspects for all practical purposes with a little difference. It is concerned with the management of resources successfully to complete the project, the resources being time, money, materials and equipment and the most expensive resource of all – namely the human resource. To understand the project management one must first understand the basic concepts and different approaches to the study of management. An overview of different management approaches with specific emphasis on System approach to management approaches with specific emphasis on System approach to management and its relevance to project management, brief mention about the steps in project management, benefits and limitations of project management, and also an outline about effective project management are discussed in this lesson. Thus, the project management is designed to manage or control company resources on a given activity, within time, within cost and within performance.

OVERVIEW OF PROJECT MANAGEMENT

- GOOD CUSTOMER RELATIONS
- TIME
- COST
- RESOURCES
- PERFORMANCE

Project management involves project planning and project monitoring and includes such items as

- Project planning
- Definition of work requirements
- Definition of quantity of work
- Definition of resources needed
- Project monitoring
- Tracking progress, comparing actual to predicted

Analysis, impact and making adjustments. Thus, the successful project management can be defined as the process of achieving the project objectives within the cost (budget), at the desired performance and within the allocated time.

Development of a Project system

The three major groups of management theorists – the structuralists, the functionalists and the behaviorists – differ somewhat on how the project manager deals with problems shifting job environments but they are unanimous on the utility of the task force as a useful device in group problem solving situations.

The structuralists argue that the project manager, as a unifying agent, integrates the parochial interests of autonomous organizational elements towards a common objective through the formation of some standard organization instead of functional or product departmentalization. The functionalists argue that project management is in reality simply the application of the systems concept to organizational problems. They visualize integration into a separate organizational system of activities related to particular projects or programmes, Management science techniques, computer simulation approaches and information decision systems are just a few of the tools that will make it possible for management to visualize the firm as a total system.

The behaviorists see the task force as organized around problems (not products, programmes, projects or tasks) arranged in an organic rather than a mechanical model in which the executive becomes the link pin or coordinator but human speaking the diverse languages or research and who has skills to relay information and mediate between groups. People will be differentiated not vertically according to rank and status but flexibly and functionally according to skill and professional training and replacing bureaucracy as we know it.

Components of a Project Management System

The vital components of a project from the systems perspective are:

Objective: The fundamental rationale of a system that must be accomplished.

Requirement: A sine qua non or a fundamental and irreducible constituent of a whole system that may even satisfy the objective to some extent.

Alternative: A surrogate, a secondary course of action, if one fails out the other will substitute and fulfill the needs of a system.

Selection criteria: The matter of 'carrying out' is focused on assessing the choice and selecting the best course of action.

Constrain: A demarcation point which describes the frontiers of a system within which the alternatives must move and devote their resources.

It can be inferred that the basic theories and philosophies, governing the age-old corps and projects had a stormy attack by the systems approach to management. Owing to the fact that project management is a subset of total management cult, it would be comforting oneself to describe the principles of general systems theory. The general systems approach can be squared with a management approach which attempts to integrate and unify scientific information across many fields of knowledge. Systems theory attempts to strike at problems with a holistic view rather than through an analysis of the individual components.

SCOPES IN PROJECT MANAGEMENT

Project Management basically consist of the following steps:

Grouping work into packages which acquires the properties of a project. This means that the works so grounded are related on each other, contribute to the same goals and can be bound by definite time, cost and performance targets. Entrusting the whole project to a single responsibility centre known as the project manager, for coordinating directing and controlling the project.

Supporting and servicing the project internally within the organization by Matrix or through total project station, and Building up commitment through negotiations, coordinating and directing towards goals through schedules, budgets and contracts. Ensuring adherence through negotiations, coordinating and directing towards goals through schedules, budgets and contracts.

Defining what is to be done, maintaining its integrity and ensuring that it is done and performed as desired, within time and cost budgets fixed for it through a modular work approach, using organizational and extra-organizational resources is what is project management.

PROJECT MANAGEMENT ENVIRONMENT

Project management performance will largely depend on the real-world environment. The project management environment in India, is very different from any other country. There are many problems which are peculiar to our country and these are experienced by all those who are concerned in the execution of both small and big projects. One has to be aware of these problems in order to be able to cope with the same for successful implementation of a project. The most important problem is lack of mutual trust and respect among the participating agencies: owner, financial institutions, consultants, vendors and contractors. The owner believes that the agencies/contractors would take his for a ride and, therefore, he should, as far as possible, do things himself. When consultants are not appointed, projects are likely to have congenial weaknesses such as wrong selection of technology, wrong site, high risk element, etc.

Benefits of project management

Project management helps to avail the following benefits:

- Identification of functional responsibilities to ensure that all activities are
- Accounted for regardless of personnel turnover.
- Minimizing the need for continuous reporting.
- Identification of time limits for scheduling.
- Identification of a methodology for trade-off analysis.
- Measurement of accomplishment against plans.
- Early identification of problems so that corrective action may follow.
- Improved estimating capability for future planning.
- Knowing when objectives cannot be met or will be exceeded.

Obstacles in project management

To enjoy the various benefits of project management given above, the following obstacles be overcome carefully.

- Project complexities
- Execution of customer's special requirements
- Organization restructuring is a typical task
- Project risks
- Changes in technology
- Forward planning and pricing.
- Project Management – A Profession

Project management has been evolved as a distinct ever since the Second project management are related, the degree of professional approach is highly essential for the efficient management of project. The project management is mainly driven by intellectual operation and skilled and mechanical operations. Project management is covered by the matrix form of organization structure where a roles are defined according to a combination rather than functional.

Project Manager and his role

This is to signify a person who has the overall control of the project and shoulders responsibilities for its execution and performance. Therefore, he is thoroughly involved in planning the work and monitoring, directing and leading the participants and seeks to reach the project goal in time-cost-quality conundrum. The project manager is either a specialist or having predominantly technical background with sufficient experience, exposure, expertise on multifaceted, multidimensional and multi-disciplinary project. It is well evident from the monumental constructions and project that have been around us since heydays, that the role of a project manager is quite distinct and demands an all-round performance.

A project manager is always found shared in the following aspects

- Flexible and adaptable
- Preference for significant initiative and leadership
- Aggressiveness, confidence, persuasiveness, verbal fluency;
- Ambition, activity, forcefulness;
- Effectiveness as communicator and integrator;
- Broad scope of personal interests;
- Poised with enthusiasm, in agitation, spontaneity;
- Able or willing to devote most of his time to planning and controlling,
- Able to identify problems;
- Willing to make decisions that are acceptable;
- Able to maintain a proper balance in the use of time,

CONCLUSION

Thus, this chapter has explained the various aspects of projects and project management. This conceptual knowledge will certainly help you to know about the features of project and project

managements, which is an emerging unique discipline. And this chapter has also explained the various stages of project lifecycle, which helps the project manager to ascertain the strength and weakness of any project at any point of time.