



Project Life Cycle and its Classification

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Received- 08.08.2020, Revised- 12.08.2020, Accepted - 15.08.2020 Email : dr.ramnyadav@gmail.com

Abstract: *Definition of Project- PMBOK (Project Management Body of Knowledge) defines project as a temporary endeavor undertaken to create a unique product or service. Temporary means that every project has a definite end, and Unique means that the product or service is different from all similar products or services. Turner defines projects as an endeavor in which human (or machine), materials, financial and knowledge resources are organized in a novel way, to undertake a unique scope of work of given specification, within constraints of cost and time, so as to deliver quantitative, qualitative, and consumer oriented product and service.*

Key Words: Project Management, temporary, endeavor, create, unique product, service, scope.

Project management is a methodical approach to planning and guiding project processes from start to finish. It is the method of planning the plan. It starts from project definitions and ends with goal achievement. PMBOK defines project management as the application of knowledge, skill, tool and techniques to project activities in order to meet stakeholder's needs and expectations from a project.

Bridge group defines it as the methods and disciplines used to define goals, plan and monitor tasks and resources, identify and resolve issues, and control costs and budgets for a specific project.

Project life cycle and its phases- Project life cycle divides the sequence of operations of project in to different phases. Regardless of scope or complexity, any project goes through a series of stages during its life. Project activities must be grouped into phases to facilitate project manager and his team to plan and organize various inputs effectively. It also helps in identifying deviations and thus helps in decision making with regard to continuation or termination of the project. Generally, there are four stages of project life cycle which are:

1. Idea Generation

Anyone who is planning to invest starts searching everywhere for new ideas.

One can start a new project by defining its objectives, scope, purpose and deliverables to be produced. He will also hire his project team, set up the project office and review the project, to gain

approval to begin the next phase. The basic processes of this initiation phase are

- * Project document: This is a statement describing the characteristics of the project undertaken.

- * Project feasibility document: This contains constraints and alternative solutions. The four steps in the project feasibility study are:

- * Problem description
- * Approach to be used
- * Alternate generations for solving the problem

- * Preliminary recommendations

- * Project concept document: It will answer the following questions

- * What is to be done?
- * How will it be done?
- * Why is it to be done?

- * Project charter: Project charter formally communicates the initiation of the project. It consists of project scope, project authority and KSF (Key Success Factors).

Project Planning Phase

Project planning phase follows the project initiation phase. Countless hours during the succeeding phases can be saved with proper planning. The purpose of the project planning phase is to:

- * Determine project requirements
- * Decide project cost and schedules
- * Search for sources of all resources

The basic processes of the project planning phase



are:

- * Defining the scope: Define the scope of the project and its limitations.

- * Preparing the work breakdown structure: Divide the whole project into smaller activities

- * Role assignment: Assign jobs to individuals or group of individuals as predefined activities or tasks.

- * Project scheduling: Determine optimum schedule of the project and show it on a Gantt Chart.

- * Fund allocation: Allocation of funds for individual activities

Other subsidiary processes in the planning stage are:

- * Risk management planning: It includes identification of possible causes and effect of the risks and trying to reduce the impact of risk.

- * Procurement planning: Decisions regarding all products, services or resources needed to accomplish the project.

In the planning stage, various steps are taken which includes:

- * Final techno-economic feasibility of the project: This is the last chance for changing the decision, as after this stage, it proves too closely to shut down the project or change the project.

- * Basic engineering and process design: The process is selected and basic engineering is done. The documents with respect to equipment specification are prepared.

- * Division of work/responsibilities: Different activities are allocated to individuals or groups.

- * Identify potential vendors and subcontractors: No project is complete without the help of outside expert agencies called subcontractors. The potential suppliers of various equipment, civil construction agencies and similar agencies are identified and negotiated.

- * Detailed engineering design: based on the designs of equipment supplier, detailed engineering is performed. The final layout is prepared and the work schedule prepared.

- * Final estimation of the cost of the project: The above steps lead to finalizing quite accurate cost of the project. This is essential as the next step would involve arrangement of funds.

- * Decision of capital structure and means of finance: The final decision with respect to financing the project is needed during the planning phase. It is a crucial decision generally taken by core strategic group with the advice of finance managers.

- * Final schedule of implementation (next phase): The next phase will be implementation. A proper schedule of implementation is essential to avoid confusions. The schedule of implementation tells all the members of the team when a particular activity should start and end. It will provide the milestones of every activity. The techniques used are PERT, CPM, Gantt chart, crashing resource allocation and resource leveling.

Implementation or Execution Phase-

Project execution is characterized by the actual work on the tasks planned and project control involves the comparison of the actual performance with the planned performance and taking appropriate corrective action to get the desired output. During this phase, project team is responsible for the following activities:

- * The team members perform the tasks allocated in the earlier phase under the supervision of the project manager and report to him.

- * Project manager is responsible for performance measurement, which includes finding variances with respect to cost, schedule and scope.

- * Project manager is responsible for providing project status report to all key stakeholders. He should specifically inform the deviation from the plan to the stakeholders. He should also determine the root cause for the deviations and suggest the alternate actions to encounter the deviation caused or expected. This helps stakeholders to decide the corrective action to be taken.

- * All project key stakeholders are responsible for the review of the variances.

- * All project key stakeholders are responsible for taking necessary action of the variances thus determined so as to complete the project within time and cost.

The basic process of the project execution can be:

- * Execution of the project plan

- * Handle the changes



* Project control
The subsidiary processes during project execution can be:

- * Quality control
- * Performance monitoring
- * Project administration
- * Risk monitoring and control
- * Scope and control
- * Schedule and cost control
- * Management of outside agencies (subcontractors)

The key activities during this phase of execution include:

- * Award contracts to contractors, vendors, subcontractors: Final selection of suppliers of various supplies of services (generally termed contractors) and physical equipment (generally termed vendors).
- * Procure equipment and services: After continuously monitoring the suppliers, the project team has to procure the goods and services.
- * Erection of equipment: The procured equipment needs to be placed on the designed place after preparing the required foundation.
- * Control and monitor project cost, schedule and scope: As majority of efforts, time and cost are incurred during this phase, it is critical to monitor the project schedule and cost during this phase. This is generally done using various tools like Gantt chart and Earned Value Analysis.
- * Motivation of project team: As this phase consumes maximum energy of the team members, motivating them during this phase is critical to the success of the project.

Termination Phase- The last step performed to say good bye to a project is the termination phase. The termination of a project is inevitable, but how it is terminated and when may have a profound and long lasting impact on the organization and its employees. In the end, all projects, both successful and unsuccessful, will have to be terminated. During the termination phase, the project's resources are redistributed, financial records are closed, and project personnel are reassigned. The organization's sensitivity to the concerns of the project team can have a lasting

impact on their commitment and productivity. Lastly, a final report, which discusses the project's successes and shortcomings, is prepared for senior management. This report can significantly influence how the organization manages projects in the future. According to Meredith and Mantel (1995), there are three ways to terminate a project: extinction, inclusion, or integration. Termination by extinction means the project is completed. For example, the new project has been developed and given to the client, the building has been completed and accepted by the purchaser, or the software has been installed and is running.

Project Audit- Ideally, a project audit should be conducted by an independent examiner, who can remain objective in the assessment of information. Key activities during this phase are:

- * Ensure completion and acceptance: The project manager should ensure that all project related activities are completed and the project is acceptable to all the stakeholders, including owners, customers and the new team for operations.
- * Prepare a final report: A final report regarding the deviations from scope, cost and schedule should be submitted along with the operations manual and risk perceived during operations.
- * Ensure payments: The project manager should ensure that all the payments to vendors, contractors and subcontractors have been done.
- * Assign personnel: Some team members of the project should be assigned duties in operations management team, which will help the new team in managing operations smoothly, as it is not a totally new team for the management then.

Classification of Projects Based On Different Criteria:

Projects can be classified based on duration, quantum of investment and the risk involved:

- * Classification based on duration: It can be long term, medium term and short term. Long-term projects have a life of more than 10 years, whereas mid-term projects have a life of 5 to 10 years. Short-term projects last only for less than 5 years.
- * Classification based on investments: It is based on how much initial investment is needed to



start the project. In India, investment outlay of above Rs.20 crore is considered high investment, whereas an investment outlay between Rs.5 crore to Rs.20 crore is considered medium sized industry. And investment below Rs.5 crore is considered low investment industry. Industry with initial outlay below Rs.50 lac is considered cottage industry.

* **Classification based on ownership:** A project can be owned by government, public sector, corporate, cooperative, partnership firm or proprietorship firm.

* **Greenfield project** Greenfield project is a totally new venture by a fresh entrepreneur. It is also known as grass-root projects. Such projects are fresh and are exposed to very high risk due to lack of expertise of entrepreneur and infrastructure.

* **Brownfield projects** In brown field projects, an existing promoter company or existing project goes for addition of product/capacity. It is of three types.

* **Expansion project** In expansion project, there is increase in the capacity of existing plant without any other change. There is no change or very nominal change in the product, e.g. a biscuit industry increasing its capacity from 20MT/month to 35MT/month. It can either be achieved through market intensification or market development.

* **Vertical integration project** The degree to which a firm owns its upstream suppliers and downstream customers is called vertical integration. It is of two types.

* **Forward integration project:** Downstream expansion is called forward integration. The product of existing industry becomes raw material for the proposed project, i.e., a mango pulp making industry moves to soft drink manufacturing.

* **Backward integration project:** Upstream expansion is called backward integration. The raw material needed for the existing industry is proposed to be manufactured by a new project, i.e., a Mango pulp making industry establishing its own orchard for raw material or soft drink Company establishing Mango Pulp making unit.

* **Diversification project:** Financial synergy may be obtained by combining two firms: one with better financial resources but poor technical

capabilities and another firm with strong technical capabilities but poor financial resources. Firms also try to obtain certainty in businesses by combining two or more businesses with seasonal or cyclic demand factors such as cotton industries and wheat flour mill.

This combination can certainly lead to strategic fit in operations and enhance the overall efficiency of the merged firms. This can also lead to better and cheaper purchasing through higher bargaining power. Diversification leads to reduced risk in operations.

This can also lead to management synergy as management expertise and experience is applied in different situations. Management synergy can be achieved when management experience and expertise is applied to different situations. There are two ways of diversifications

* **Concentric diversification project:** firms adds related products

* **Conglomerate diversification:** firm diversifies into areas that are unrelated to its current line of business.

Divestment project:

* **Obsolescence of product/service:** If a current product or service becomes obsolete or non-profit able, a firm may decide to divest from the product or service. A product tending to reach premature life cycle phase of decline needs to be divested.

* **Increased level of competition:** After taking advantage of monopoly or near monopoly situations, if the competition increases to such an extent that the firm feels difficult to sustain, the product or

* **Strategic failure:** Strategic failure is another big cause for the divestment strategy. Many companies go for diversifications and sometimes feel that the chosen strategy was not correct. In that case, it may decide to divest before it is too late.

* **Increase concentration on fewer product lines:** Many times, firms go for very high levels of diversifications and find it difficult to handle so much varied lines. They may wish to concentrate on fewer lines to perform better. They may prefer to be master of few rather than jack of all. Tata decided to divest from various product lines like Tata Oil,



Tata Tea, etc., in the 1990s to concentrate on fewer core areas like steel and automobiles.

* Better opportunity of investment: Sometimes, profitable business or product lines are discontinued to take the opportunity of better and more lucrative business opportunity. This is another major driver of divestment strategy.

Modernization/Replacement Project

In recent times, technology up-gradation has been very rapid. Only those organizations can survive which cope up with the ongoing technological changes. Firms need to upgrade their technology. Such projects up-gradation of technology may need capital investments and are called modernization projects. While manufacturing a food product, a company is applying steam drying method, and recently a new technology of vacuum drying has been introduced. The new process improves the quality of the product, leading to better customer satisfaction, which is of utmost importance in the food industry.

The company has to change over to the new technology of drying. This will attract

additional capital investment and is an example of partial modernization. Replacement projects may also be classified into two categories: replacement of the equipment which is no longer able to work and which deteriorates with time and attracts higher maintenance costs. In both the above situations, the equipment would be required to be replaced and will cause additional capital investment.

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