Chapter-1: Introduction

Project:
Project can be defined as a temporary endeavor undertaken to create a unique product or service. It has a definite beginning and a definite end, is driven by objectives, and is independent of the person-effort or duration.

Examples of projects:
- Developing a new product or service
- Constructing a building or infrastructure
- Implementing a new business process in an organization
- Effecting a change in the structure, staffing, or style of an organization

Project management:
Project management is all about application of knowledge, Skills, tools, and techniques to project activities to meet & exceed stakeholders’ needs and expectations. As per PMI concept, this objective is accomplished through processes; such as: initiating processes, planning processes, executing processes, monitoring & controlling processes and closing processes. The object of project management is to ensure that all the project constraints are managed thoroughly and completely to ensure end to end management of project.

Program:
A program can be defined as group of related projects and operations work, managed in a coordinated way to obtain benefits and control, which is not available from managing them individually.

Portfolio:
Portfolio can be defined as a collection of projects and/or programs and other work, that are grouped together to facilitate effective management of that work to meet strategic business objectives. Portfolios are a collection of projects and programs, wherein programs are collection of projects.
Comparison of Project, Program, and Portfolio:

<table>
<thead>
<tr>
<th></th>
<th>Project</th>
<th>Program</th>
<th>Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope</td>
<td>Has defined objectives and the scope is progressively elaborated throughout the project lifecycle</td>
<td>Has a larger scope and provides more significant benefits than a project</td>
<td>Has a business scope that changes with the strategic goals of the organization</td>
</tr>
<tr>
<td>Change</td>
<td>Project managers expect change and implement processes to keep change managed and controlled</td>
<td>Program managers must expect change from both inside and outside the program, and be prepared to manage it</td>
<td>Portfolio managers continually monitor changes in the broad environment</td>
</tr>
<tr>
<td>Planning</td>
<td>Project managers progressively transform high-level information into detailed plans throughout the project lifecycle</td>
<td>Program managers develop the overall program plan and create high-level plans to guide detailed planning at the component level</td>
<td>Portfolio managers create and maintain necessary processes and communication about to the overall portfolio</td>
</tr>
<tr>
<td>Management</td>
<td>Project managers manage the project team to meet the project objectives</td>
<td>Program managers manage the program staff and the project managers. They provide vision and overall leadership</td>
<td>Portfolio managers may manage or coordinate the portfolio management staff</td>
</tr>
<tr>
<td>Success</td>
<td>Success is measured by product and project quality, timeliness, budget compliance, and degree of customer satisfaction</td>
<td>Success is measured by the degree to which the program satisfies the needs and benefits for which it was undertaken</td>
<td>Success is measured in terms of the aggregate performance of the portfolio components</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Project managers monitor and control the task of producing the products, services, or results that the project was undertaken to produce</td>
<td>Program managers monitor the progress of program components to ensure that the overall goals, schedules, budget, and benefits of the program are met</td>
<td>Portfolio managers monitor aggregate performance and value indicators</td>
</tr>
</tbody>
</table>

Operations:
Operations are organizational functions performing the ongoing execution of activities that produce the same product or provide the same service. Examples of operations include production, manufacturing, and accounting.

Projects and Strategic Planning:
Projects are often used as a means of achieving an organization’s strategic plan. Projects are authorized typically as a result of one or more of the following strategic considerations:

- Market demand (e.g., a car company authorizing a project to build more fuel-efficient cars in response to gasoline shortage);
- Strategic opportunity/business need (e.g., a training company authorizing a project to create a new course to increase its revenues);
- Customer request (e.g., an electric utility authorizing a project to build a new substation to serve a new industrial park);
- Technological advancement (e.g., an electronics firm authorizing a new project to develop a faster, cheaper, and smaller laptop after advancements in computer memory and electronics technology); and
- Legal requirements (e.g., a chemical manufacturer authorizes a project to establish guidelines for the handling of a new toxic material).

Project Manager:
The Project Manager is the individual who’s responsible for managing the project. As per PMI, the project manager must be identified and assigned as early as possible, preferably before the planning phase starts. The Project manager
must have authority and accountability to complete the project successfully. However the level of authority of the PM depends on the nature of the organization.

**Project Management Office:**
A project management office (PMO) is an organizational body or entity assigned various responsibilities related to the centralized and coordinated management of the projects under its domain.

The functions of PMO are as follows:
- Managing shared resources across all projects administered by the PMO
- Identifying and developing project management methodology, best practices, and standards
- Coaching, mentoring, training, and oversight
- Monitoring compliance with project management standard policies, procedures, and templates via project audits
- Developing and managing project policies, procedures, templates, and other shared documentation (organizational process assets)

**Project Management Body of Knowledge (PMBOK®)**
It is the collection of generally accepted practices and knowledge for project management. It should be interpreted, practiced and advanced by the project managers. The PMBOK® is the guide book for project management published by PMI.
Chapter-2: Organizational Influences and Project Lifecycle

Organizational structure:
We can classify the various organizations based on their culture and style that is related to expectations, cultural norms, shared visions & values, policies and procedures, authority relationship, work ethics etc.

Based on these parameters, we mainly have three organizational structures:
- Functional Organization
- Projectized Organization
- Matrix Organization
  - Weak Matrix Organization
  - Balanced Matrix Organization
  - Strong Matrix Organization

Functional organization:
A functional organization is mainly structured through various functional departments. As shown in the diagram below, in a functional organization, there are various functional departments, headed by the functional managers. The functional managers report into the senior management. In this type of an organization there is no direct role of a project manager. The project manager rather works like a project coordinator. The projects are led by the functional managers.

The main characteristics of a functional organization are:
- Each team member is assigned one supervisor, who is the functional department head. This leads to easier management of human resources.
- The project manager always needs to go through the functional manager for any decision making.
- There is more emphasis on functional specialties and no career path for project management.
**Projectized organization**

In a projectized organization, the organization structure mainly revolves around the projects. In a projectized organization, the staff functions would directly report into the project manager and the project manager would directly report into the senior management.

The main characteristics of a projectized organization are:

- The team members are collocated; hence the communication is more effective.
- There is strict adherence to rules of the project.
- There is no home department where the team members can go back to after project is complete.
- As there is a dedicated project team under the project manager, there is duplication of work function.

**Matrix organization**

A matrix organization is a blend of functional and projectized organization. There is a role of a project manager and he/she works with dedicated team members. There is a role of functional managers as well and they head the specialized departments. The staff functions would report into the functional head while they are part of their respective departments. Once a project is initiated, the staff functions would start reporting into the project manager. Once the project is complete, the team members would once again go back to the functional departments. Hence, the team members maintain a home department. However, they need to report to two bosses. In case, there are conflicting priorities between functional manager and project manager, management of human resources becomes complicated.

Matrix organization can be further categorized into:

- **Weak matrix organization** - have more functions of a functional organization, and less features of a projectized organization.
- **Strong matrix organization** - strong matrix organizations carry many features of projectized organization and fewer characteristics of functional organizations.
- **Balanced matrix organization** - The balanced matrix organization is a balanced or 50-50 blend of projectized and functional organization.
There are two more sub categories under the matrix organization:

- **Composite matrix organization** - Various organizational structures are visible at various layers of the organization. This normally happens when an organization grows big in size, has employee base in various locations and caters into various line of business.

- **Tight matrix organization** - It is not an organization structure. It is very similar to collocation, which indicates locating the project teams in a common location or building in order to build the trust relationship among them.

### Organizational Process Assets

Organizational process assets can be categorized into organization’s processes and procedures and the corporate knowledge base. The organization’s processes and procedures include the standard organizational processes; such as: policies, project lifecycle, quality processes, quality policies and procedures, guidelines, work instructions, defined methodologies, templates etc. The corporate knowledge base indicates the data repository of an organization wherein all project-related information is stored.

The project manager is expected to abide by the organizational policies and procedures while planning and executing a project. Also, he/she should always consult the corporate knowledge base to find out if there is something reusable from the historical records. Information is available from previously undertaken similar projects which would benefit the current projects. These include, but are not limited to: the best practices, the lessons learnt and other project related documents. Organizational process assets are common input to most of the planning processes.

### Enterprise Environmental Factors

Enterprise environmental factors refer to both internal and external environmental factors that surround or influence a project’s success. These factors may come from any or all of the enterprises involved in the project. Enterprise environmental factors may enhance or constrain project management options and may have a positive or negative influence on the outcome. They are also considered as inputs to most planning processes.
Examples of environmental factors:
- Government and industry standards
- Infrastructure availability
- Existing human resource
- Personnel administration
- Marketplace conditions
- Economic and political condition in the country
- Stakeholders’ risk tolerance

Stakeholders
Stakeholders are the individuals and organizations who are actively involved in the project or whose interest may be positively or negatively affected as a result of project execution or project completion. Stakeholders have varying level of responsibility and authority when participating in a project which can change over the course of project lifecycle. They may have a positive or negative influence on the project.

Examples of stakeholders:
- Project Manager – manages the project
- Customer/User – uses the product/service of the project
- Performing organization – the enterprise involved in performing the work
- Project team members – the group that performs the work
- Project management team – the team that is directly involved in project management activities
- Sponsors – those who provide financial resources
- Other stakeholders – influencers, PMO, owners, investors, suppliers, end users, society, citizens

Stakeholder Management
The primary responsibilities of the project manager are to identify all stakeholders as soon as a project is initiated, then determine their needs and expectations, and thereafter influence the requirements to ensure a successful project. The project manager must try to maximize the influences of a positive stakeholder and try to reduce the influences of the negative stakeholder.

**Project Lifecycle**

The project lifecycle can be broken down to four main phases; that is: starting a project, organizing and preparing, carrying out the project work and closing the project. The focus of the project manager varies depending on what stage project management lifecycle the project is in. As shown in the diagram below, cost and staffing level are low in the beginning of the project; they gradually increase while the project work is carried out and then drop down during the closure of the project. Also, the risks and uncertainties are at the peak during the initiation of the project and gradually drop as the project progresses. On the other side, cost of changes are lowest in the beginning of the project and increases as and when the project progresses. So while managing a project end to end, the focus of the project manager needs to be aligned with the project constraints specific to the project lifecycle element.

![Project Lifecycle Diagram](image)

**Product V/s Project Life cycle**

Product lifecycle consists of generally sequential and non-overlapping product phases. The last product life cycle phase for a product is generally the product’s retirement. For example, if a new product is launched in the market, that’s the beginning of product life cycle. Gradually the market demand increases and the popularity of that product increases and reaches peak. Over the period of time when there are competitive products in the market, gradually the demand of the product decreases and finally the product retires from the market.

Project lifecycle occur in one or more phases of product lifecycle. For example developing a new product is a project on its own. Performing feasibility study, conducting market research, running advertisements, campaigning can be individual projects. Since one product may have many projects associated with it, additional efficiencies may be gained by managing all related projects collectively.

**Project Governance**

Project governance provides a comprehensive, consistent method of controlling the project and ensuring its success. Approach is described in the project management plan. The project management team is supposed to determine the most appropriate method of carrying out the project and the same is documented in project management plan.

**Projects Phases**
Project phases refer to divisions within the project where extra control is needed for effectively managing the completion of a major deliverables. Project phases are completed sequentially, but can overlap in some project situations. A project phase is not a project management process group. All phases in a project always have similar characteristics. Although many projects may have similar phase names with similar deliverables, few are identical.

The diagrams below elaborate the concept of single-phase project and multiple-phase project.

The diagram below is an example of a single phase project; implementation of new software application across the domain. It is considered as one phase project and simply executed from initiation till closure.

**Single-phase project: implementation of a new software application across a domain**

The diagram below elaborates a multiple & sequential-phase project, constructing a five storied building. The project is broken down into three sequential phases: design phase, construction phase and decoration phase. It depends on the approach of the organization and the decision of the project management team to take it up as a single phase project or to break it down into multiple phases.

**Multiple, sequential-phase project: construction of a five-story building**

Phases can overlap with each other as well. The diagram below is an example of overlapping-phase project for application development. Before the design phase is complete, the development phase is started. However, the development phase cannot be completed before the design phase is complete.
Multiple, overlapping-phase project: an application development project