

# 2

## 2

## ORGANIZATIONAL INFLUENCES AND PROJECT LIFE CYCLE

Projects and project management take place in an environment that is broader than that of the project itself. Understanding this broader context helps ensure that work is carried out in alignment with the organization's goals and managed in accordance with the organization's established practices. This section describes how organizational influences affect the methods used for staffing, managing, and executing the project. It discusses the influence of stakeholders on the project and its governance, the project team's structure and membership, and different approaches to the phasing and relationship of activities within the project's life cycle. The following major sections are addressed:

### **2.1 Organizational Influences on Project Management**

### **2.2 Project Stakeholders and Governance**

### **2.3 Project Team**

### **2.4 Project Life Cycle**

## 2.1 Organizational Influences on Project Management

An organization's culture, style, and structure influence how its projects are performed. The organization's level of project management maturity and its project management systems can also influence the project. When a project involves external entities such as those that are part of a joint venture or partnering agreement, the project will be influenced by more than one organization. The following sections describe organizational characteristics, factors, and assets within an enterprise that are likely to influence the project.

### 2.1.1 Organizational Cultures and Styles

Organizations are systematic arrangements of entities (persons and/or departments) aimed at accomplishing a purpose, which may involve undertaking projects. An organization's culture and style affect how it conducts projects. Cultures and styles are group phenomena known as cultural norms, which develop over time. The norms include established approaches to initiating and planning projects, the means considered acceptable for getting the work done, and recognized authorities who make or influence decisions.

Organizational culture is shaped by the common experiences of members of the organization and most organizations have developed unique cultures over time by practice and common usage. Common experiences include, but are not limited to:

- Shared visions, mission, values, beliefs, and expectations;
- Regulations, policies, methods, and procedures;
- Motivation and reward systems;
- Risk tolerance;
- View of leadership, hierarchy, and authority relationships;
- Code of conduct, work ethic, and work hours; and
- Operating environments.

The organization's culture is an enterprise environmental factor, as described in Section 2.1.5. Cultures and styles are learned and shared and may have a strong influence on a project's ability to meet its objectives. A project manager should therefore understand the different organizational styles and cultures that may affect a project. The project manager needs to know which individuals in the organization are the decision makers or influencers and work with them to increase the probability of project success.

In light of globalization, understanding the impact of cultural influences is critical in projects involving diverse organizations and locations around the world. Culture becomes a critical factor in defining project success, and multi-cultural competence becomes critical for the project manager.

### 2.1.2 Organizational Communications

Project management success in an organization is highly dependent on an effective organizational communication style, especially in the face of globalization of the project management profession. Organizational communications capabilities have great influence on how projects are conducted. As a consequence, project managers in distant locations are able to more effectively communicate with all relevant stakeholders within the organizational structure to facilitate decision making. Stakeholders and project team members can also use electronic communications (including e-mail, texting, instant messaging, social media, video and web conferencing, and other forms of electronic media) to communicate with the project manager formally or informally.

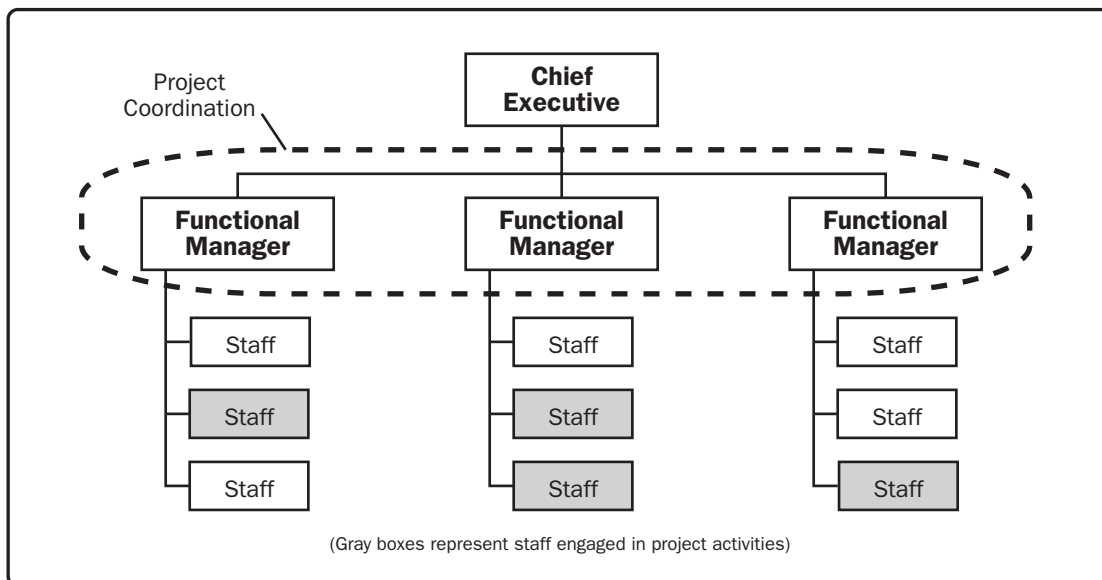
### 2.1.3 Organizational Structures

Organizational structure is an enterprise environmental factor, which can affect the availability of resources and influence how projects are conducted (see also Section 2.1.5). Organizational structures range from functional to projectized, with a variety of matrix structures in between. Table 2-1 shows key project-related characteristics of the major types of organizational structures.

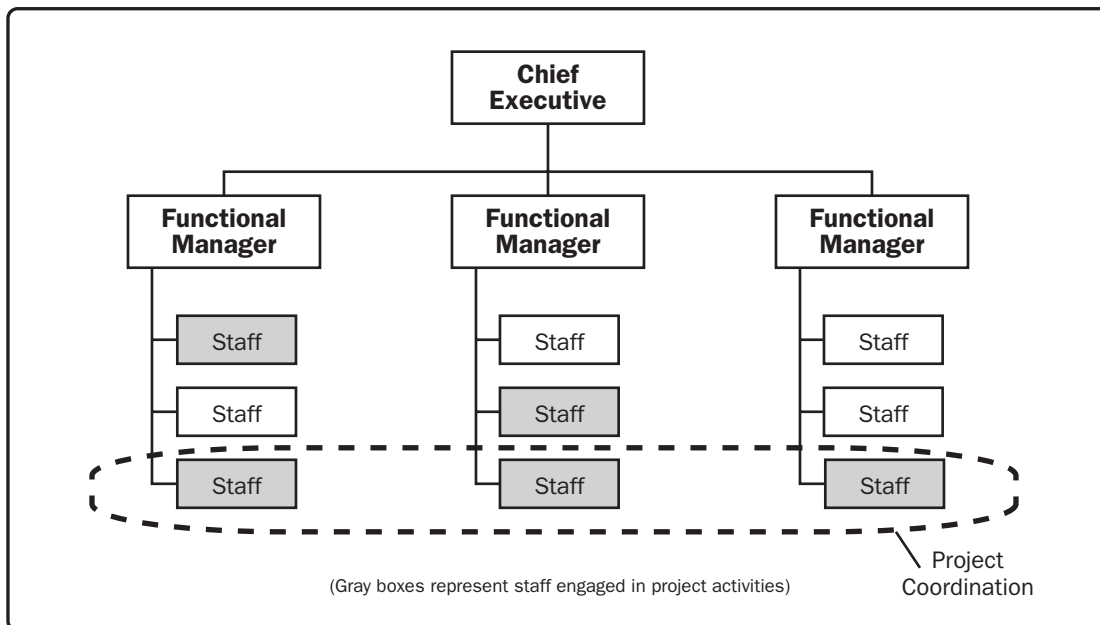
**Table 2-1. Influence of Organizational Structures on Projects**

Project Characteristics / Organization Structure	Functional	Matrix			Projectized
		Weak Matrix	Balanced Matrix	Strong Matrix	
Project Manager's Authority	Little or None	Low	Low to Moderate	Moderate to High	High to Almost Total
Resource Availability	Little or None	Low	Low to Moderate	Moderate to High	High to Almost Total
Who manages the project budget	Functional Manager	Functional Manager	Mixed	Project Manager	Project Manager
Project Manager's Role	Part-time	Part-time	Full-time	Full-time	Full-time
Project Management Administrative Staff	Part-time	Part-time	Part-time	Full-time	Full-time

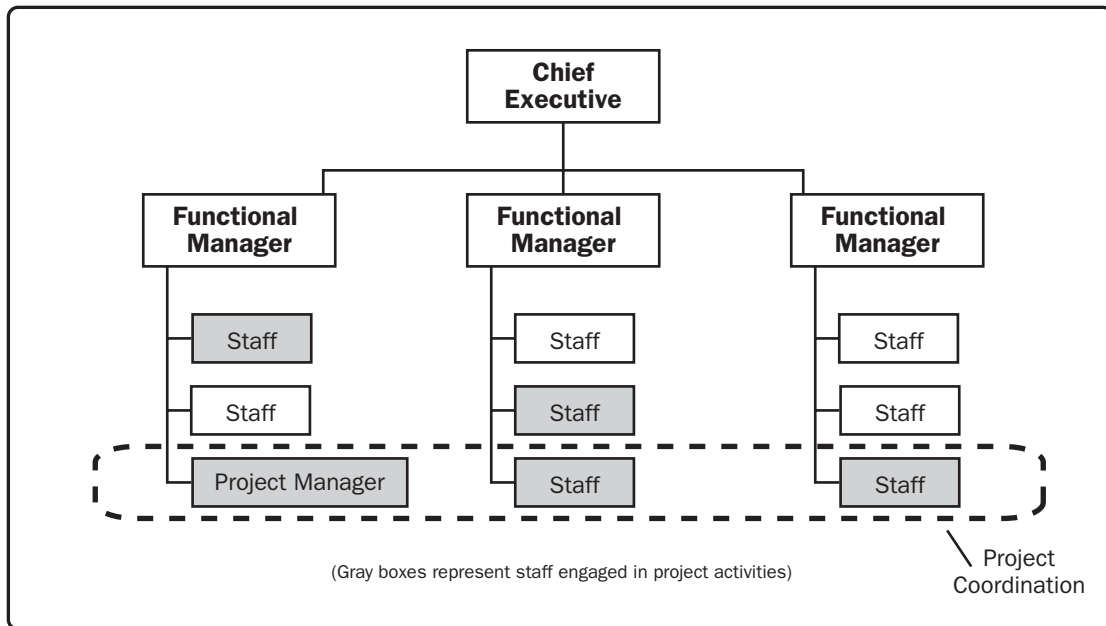
The classic functional organization, shown in Figure 2-1, is a hierarchy where each employee has one clear superior. Staff members are grouped by specialty, such as production, marketing, engineering, and accounting at the top level. Specialties may be further subdivided into focused functional units, such as mechanical and electrical engineering. Each department in a functional organization will do its project work independently of other departments.

**Figure 2-1. Functional Organization**

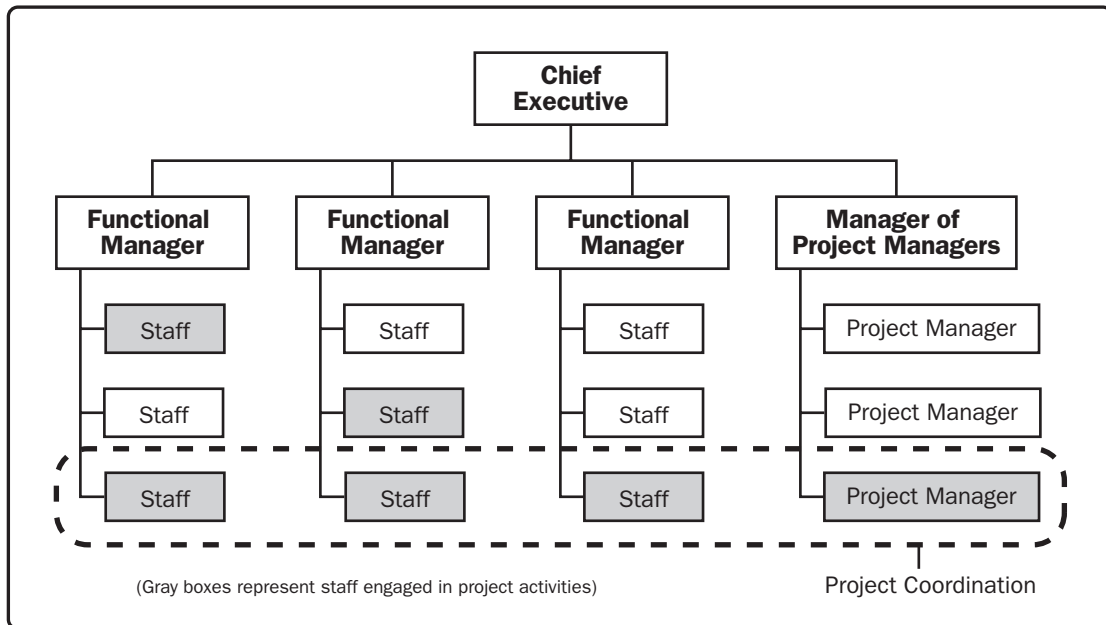
Matrix organizations, as shown in Figures 2-2 through 2-4, reflect a blend of functional and projectized characteristics. Matrix organizations can be classified as weak, balanced, or strong depending on the relative level of power and influence between functional and project managers. Weak matrix organizations maintain many of the characteristics of a functional organization, and the role of the project manager is more of a coordinator or expeditor. A project expeditor works as staff assistant and communications coordinator. The expeditor cannot personally make or enforce decisions. Project coordinators have power to make some decisions, have some authority, and report to a higher-level manager. Strong matrix organizations have many of the characteristics of the projectized organization, and have full-time project managers with considerable authority and full-time project administrative staff. While the balanced matrix organization recognizes the need for a project manager, it does not provide the project manager with the full authority over the project and project funding. Table 2-1 provides additional details of the various matrix organizational structures.



**Figure 2-2. Weak Matrix Organization**

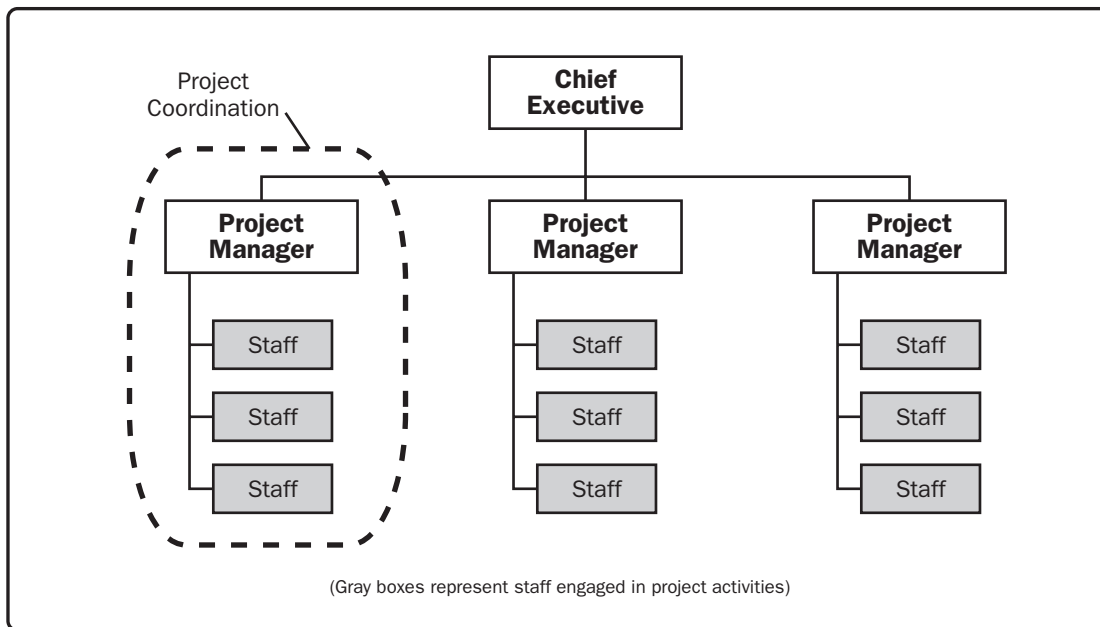


**Figure 2-3. Balanced Matrix Organization**



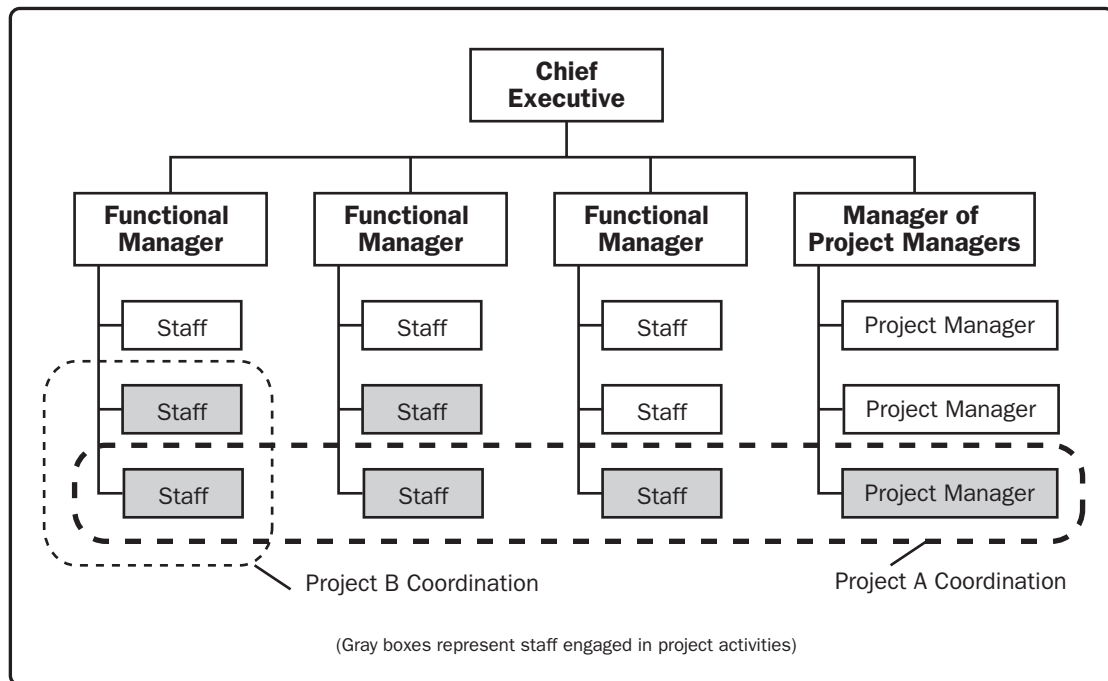
**Figure 2-4. Strong Matrix Organization**

At the opposite end of the spectrum to the functional organization is the projectized organization, shown in Figure 2-5. In a projectized organization, team members are often colocated. Most of the organization's resources are involved in project work, and project managers have a great deal of independence and authority. Virtual collaboration techniques are often used to accomplish the benefits of colocated teams. Projectized organizations often have organizational units called departments, but they can either report directly to the project manager or provide support services to the various projects.



**Figure 2-5. Projectized Organization**

Many organizations involve all these structures at various levels, often referred to as a composite organization, as shown in Figure 2-6. For example, even a fundamentally functional organization may create a special project team to handle a critical project. Such a team may have many of the characteristics of a project team in a projectized organization. The team may include full-time staff from different functional departments, may develop its own set of operating procedures, and may even operate outside of the standard, formalized reporting structure during the project. Also, an organization may manage most of its projects in a strong matrix, but allow small projects to be managed by functional departments.



**Figure 2-6. Composite Organization**

Many organizational structures include strategic, middle management, and operational levels. The project manager may interact with all three levels depending on factors such as:

- Strategic importance of the project,
- Capacity of stakeholders to exert influence on the project,
- Degree of project management maturity,
- Project management systems, and
- Organizational communications.

This interaction determines project characteristics such as:

- Project manager's level of authority,
- Resource availability and management,
- Entity controlling the project budget,
- Project manager's role, and
- Project team composition.



## 2.1.4 Organizational Process Assets

Organizational process assets are the plans, processes, policies, procedures, and knowledge bases specific to and used by the performing organization. They include any artifact, practice, or knowledge from any or all of the organizations involved in the project that can be used to perform or govern the project. These process assets include formal and informal plans, processes, policies, procedures, and knowledge bases, specific to and used by the performing organization. The process assets also include the organization's knowledge bases such as lessons learned and historical information. Organizational process assets may include completed schedules, risk data, and earned value data. Organizational process assets are inputs to most planning processes. Throughout the project, the project team members may update and add to the organizational process assets as necessary. Organizational process assets may be grouped into two categories: (1) processes and procedures, and (2) corporate knowledge base.

### 2.1.4.1 Processes and Procedures

The organization's processes and procedures for conducting project work include, but are not limited to:

- *Initiating and Planning:*
  - Guidelines and criteria for tailoring the organization's set of standard processes and procedures to satisfy the specific needs of the project;
  - Specific organizational standards such as policies (e.g., human resources policies, health and safety policies, ethics policies, and project management policies), product and project life cycles, and quality policies and procedures (e.g., process audits, improvement targets, checklists, and standardized process definitions for use in the organization); and
  - Templates (e.g., risk register, work breakdown structure, project schedule network diagram, and contract templates).
- *Executing, Monitoring and Controlling:*
  - Change control procedures, including the steps by which performing organization standards, policies, plans, and procedures or any project documents will be modified, and how any changes will be approved and validated;
  - Financial controls procedures (e.g., time reporting, required expenditure and disbursement reviews, accounting codes, and standard contract provisions);
  - Issue and defect management procedures defining issue and defect controls, issue and defect identification and resolution, and action item tracking;

- Organizational communication requirements (e.g., specific communication technology available, authorized communication media, record retention policies, and security requirements);
- Procedures for prioritizing, approving, and issuing work authorizations;
- Risk control procedures, including risk categories, risk statement templates, probability and impact definitions, and probability and impact matrix; and
- Standardized guidelines, work instructions, proposal evaluation criteria, and performance measurement criteria.
- *Closing:*
  - Project closure guidelines or requirements (e.g., lessons learned, final project audits, project evaluations, product validations, and acceptance criteria).

#### 2.1.4.2 Corporate Knowledge Base

The organizational knowledge base for storing and retrieving information includes, but is not limited to:

- Configuration management knowledge bases containing the versions and baselines of all performing organization standards, policies, procedures, and any project documents;
- Financial databases containing information such as labor hours, incurred costs, budgets, and any project cost overruns;
- Historical information and lessons learned knowledge bases (e.g., project records and documents, all project closure information and documentation, information regarding both the results of previous project selection decisions and previous project performance information, and information from risk management activities);
- Issue and defect management databases containing issue and defect status, control information, issue and defect resolution, and action item results;
- Process measurement databases used to collect and make available measurement data on processes and products; and
- Project files from previous projects (e.g., scope, cost, schedule, and performance measurement baselines, project calendars, project schedule network diagrams, risk registers, planned response actions, and defined risk impact).

### 2.1.5 Enterprise Environmental Factors

Enterprise environmental factors refer to conditions, not under the control of the project team, that influence, constrain, or direct the project. Enterprise environmental factors are considered inputs to most planning processes, may enhance or constrain project management options, and may have a positive or negative influence on the outcome.

Enterprise environmental factors vary widely in type or nature. Enterprise environmental factors include, but are not limited to:

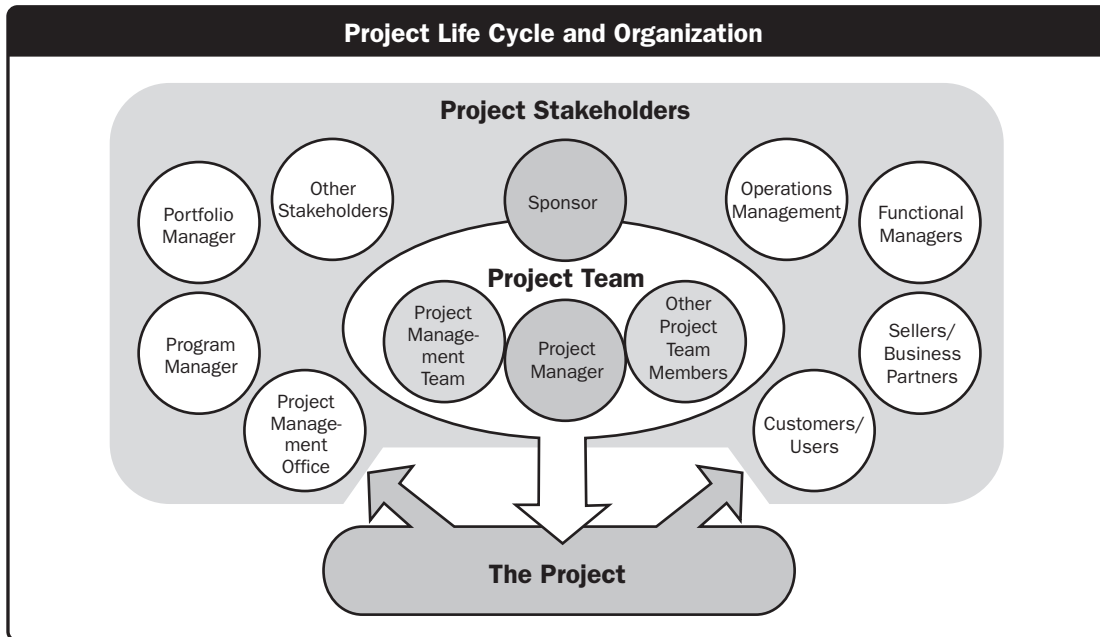
- Organizational culture, structure, and governance;
- Geographic distribution of facilities and resources;
- Government or industry standards (e.g., regulatory agency regulations, codes of conduct, product standards, quality standards, and workmanship standards);
- Infrastructure (e.g., existing facilities and capital equipment);
- Existing human resources (e.g., skills, disciplines, and knowledge, such as design, development, legal, contracting, and purchasing);
- Personnel administration (e.g., staffing and retention guidelines, employee performance reviews and training records, reward and overtime policy, and time tracking);
- Company work authorization systems;
- Marketplace conditions;
- Stakeholder risk tolerances;
- Political climate;
- Organization's established communications channels;
- Commercial databases (e.g., standardized cost estimating data, industry risk study information, and risk databases); and
- Project management information system (e.g., an automated tool, such as a scheduling software tool, a configuration management system, an information collection and distribution system, or web interfaces to other online automated systems).

## 2.2 Project Stakeholders and Governance

A stakeholder is an individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project. Stakeholders may be actively involved in the project or have interests that may be positively or negatively affected by the performance or completion of the project. Different stakeholders may have competing expectations that might create conflicts within the project. Stakeholders may also exert influence over the project, its deliverables, and the project team in order to achieve a set of outcomes that satisfy strategic business objectives or other needs. Project governance—the alignment of the project with stakeholders' needs or objectives—is critical to the successful management of stakeholder engagement and the achievement of organizational objectives. Project governance enables organizations to consistently manage projects and maximize the value of project outcomes and align the projects with business strategy. It provides a framework in which the project manager and sponsors can make decisions that satisfy both stakeholder needs and expectations and organizational strategic objectives or address circumstances where these may not be in alignment.

### 2.2.1 Project Stakeholders

Stakeholders include all members of the project team as well as all interested entities that are internal or external to the organization. The project team identifies internal and external, positive and negative, and performing and advising stakeholders in order to determine the project requirements and the expectations of all parties involved. The project manager should manage the influences of these various stakeholders in relation to the project requirements to ensure a successful outcome. Figure 2-7 illustrates the relationship between the project, the project team, and various stakeholders.



**Figure 2-7. The Relationship Between Stakeholders and the Project**

Stakeholders have varying levels of responsibility and authority when participating on a project. This level can change over the course of the project's life cycle. Their involvement may range from occasional contributions in surveys and focus groups to full project sponsorship which includes providing financial, political, or other support. Some stakeholders may also detract from the success of the project, either passively or actively. These stakeholders require the project manager's attention throughout the project's life cycle, as well as planning to address any issues they may raise.

Stakeholder identification is a continuous process throughout the entire project life cycle. Identifying stakeholders, understanding their relative degree of influence on a project, and balancing their demands, needs, and expectations are critical to the success of the project. Failure to do so can lead to delays, cost increases, unexpected issues, and other negative consequences including project cancellation. An example is late recognition that the legal department is a significant stakeholder, which results in delays and increased expenses due to legal requirements that are required to be met before the project can be completed or the product scope is delivered.

Just as stakeholders can positively or adversely impact a project's objectives, a project can be perceived by the stakeholders as having positive or negative results. For example, business leaders from a community who will benefit from an industrial expansion project will see positive economic benefits to the community in the form of additional jobs, supporting infrastructure, and taxes. In the case of stakeholders with positive expectations for the project, their interests are best served by making the project successful. In contrast, the interests of negatively affected stakeholders, such as nearby homeowners or small business owners who may lose property, be forced to relocate, or accept unwanted changes in the local environment, are served by impeding the project's progress. Overlooking negative stakeholder interests can result in an increased likelihood of failures, delays, or other negative consequences to the project.

An important part of a project manager's responsibility is to manage stakeholder expectations, which can be difficult because stakeholders often have very different or conflicting objectives. Part of the project manager's responsibility is to balance these interests and ensure that the project team interacts with stakeholders in a professional and cooperative manner. Project managers may involve the project's sponsor or other team members from different locations to identify and manage stakeholders that could be dispersed around the world.

The following are some examples of project stakeholders:

- **Sponsor.** A sponsor is the person or group who provides resources and support for the project and is accountable for enabling success. The sponsor may be external or internal to the project manager's organization. From initial conception through project closure, the sponsor promotes the project. This includes serving as spokesperson to higher levels of management to gather support throughout the organization and promoting the benefits the project brings. The sponsor leads the project through the initiating processes until formally authorized, and plays a significant role in the development of the initial scope and charter. For issues that are beyond the control of the project manager, the sponsor serves as an escalation path. The sponsor may also be involved in other important issues such as authorizing changes in scope, phase-end reviews, and go/no-go decisions when risks are particularly high. The sponsor also ensures a smooth transfer of the project's deliverables into the business of the requesting organization after project closure.
- **Customers and users.** Customers are the persons or organizations who will approve and manage the project's product, service, or result. Users are the persons or organizations who will use the project's product, service, or result. Customers and users may be internal or external to the performing organization and may also exist in multiple layers. For example, the customers for a new pharmaceutical product could include the doctors who prescribe it, the patients who use it and the insurers who pay for it. In some application areas, customers and users are synonymous, while in others, customers refer to the entity acquiring the project's product, and users refer to those who will directly utilize the project's product.

- **Sellers.** Sellers, also called vendors, suppliers, or contractors, are external companies that enter into a contractual agreement to provide components or services necessary for the project.
- **Business partners.** Business partners are external organizations that have a special relationship with the enterprise, sometimes attained through a certification process. Business partners provide specialized expertise or fill a specified role such as installation, customization, training, or support.
- **Organizational groups.** Organizational groups are internal stakeholders who are affected by the activities of the project team. Examples of various business elements of an organization that may be affected by the project include marketing and sales, human resources, legal, finance, operations, manufacturing, and customer service. These groups support the business environment where projects are executed, and are therefore affected by the activities of the project. As a result, there is generally a significant amount of interaction between the various business elements of an organization and the project team as they work together to achieve project goals. These groups may provide input to requirements and accept deliverables necessary for a smooth transition to production or related operations.
- **Functional managers.** Functional managers are key individuals who play a management role within an administrative or functional area of the business, such as human resources, finance, accounting, or procurement. They are assigned their own permanent staff to carry out the ongoing work, and they have a clear directive to manage all tasks within their functional area of responsibility. The functional manager may provide subject matter expertise or their function may provide services to the project.
- **Other stakeholders.** Additional stakeholders, such as procurement entities, financial institutions, government regulators, subject matter experts, consultants, and others, may have a financial interest in the project, contribute inputs to the project, or have an interest in the outcome of the project.

Project stakeholders and stakeholder engagement are further defined in Section 13 on Project Stakeholder Management.

### 2.2.2 Project Governance

Project governance is an oversight function that is aligned with the organization's governance model and that encompasses the project life cycle. Project governance framework provides the project manager and team with structure, processes, decision-making models and tools for managing the project, while supporting and controlling the project for successful delivery. Project governance is a critical element of any project, especially on complex and risky projects. It provides a comprehensive, consistent method of controlling the project and ensuring its success by defining and documenting and communicating reliable, repeatable project practices. It includes a framework for making project decisions; defines roles, responsibilities, and accountabilities for the success of the project; and determines the effectiveness of the project manager. A project's governance is defined by and fits within the larger context of the portfolio, program, or organization sponsoring it but is separate from organizational governance.

For project governance, the PMO may also play some decisive role. Project governance involves stakeholders as well as documented policies, procedures, and standards; responsibilities; and authorities. Examples of the elements of a project governance framework include:

- Project success and deliverable acceptance criteria;
- Process to identify, escalate, and resolve issues that arise during the project;
- Relationship among the project team, organizational groups, and external stakeholders;
- Project organization chart that identifies project roles;
- Processes and procedures for the communication of information;
- Project decision-making processes;
- Guidelines for aligning project governance and organizational strategy;
- Project life cycle approach;
- Process for stage gate or phase reviews;
- Process for review and approval for changes to budget, scope, quality, and schedule which are beyond the authority of the project manager; and
- Process to align internal stakeholders with project process requirements.



Within those constraints, as well as the additional limitations of time and budget, it is up to the project manager and the project team to determine the most appropriate method of carrying out the project. While project governance is the framework in which the project team performs, the team is still responsible for planning, executing, controlling, and closing the project. The project governance approach should be described in the project management plan. Decisions are made regarding who will be involved, the escalation procedures, what resources are necessary, and the general approach to completing the work. Another important consideration is whether more than one phase will be involved and, if so, the specific life cycle for the individual project.

### 2.2.3 Project Success

Since projects are temporary in nature, the success of the project should be measured in terms of completing the project within the constraints of scope, time, cost, quality, resources, and risk as approved between the project managers and senior management. To ensure realization of benefits for the undertaken project, a test period (such as soft launch in services) can be part of the total project time before handing it over to the permanent operations. Project success should be referred to the last baselines approved by the authorized stakeholders.

The project manager is responsible and accountable for setting realistic and achievable boundaries for the project and to accomplish the project within the approved baselines.

## 2.3 Project Team

The project team includes the project manager and the group of individuals who act together in performing the work of the project to achieve its objectives. The project team includes the project manager, project management staff, and other team members who carry out the work but who are not necessarily involved with management of the project. This team is comprised of individuals from different groups with specific subject matter knowledge or with a specific skill set to carry out the work of the project. The structure and characteristics of a project team can vary widely, but one constant is the project manager's role as the leader of the team, regardless of what authority the project manager may have over its members.

Project teams include roles such as:

- **Project management staff.** The members of the team who perform project management activities such as scheduling, budgeting, reporting and control, communications, risk management and administrative support. This role may be performed or supported by a project management office (PMO).
- **Project staff.** The members of the team who carry out the work of creating the project deliverables.
- **Supporting experts.** Supporting experts perform activities required to develop or execute the project management plan. These can include such roles as contracting, financial management, logistics, legal, safety, engineering, test, or quality control. Depending on the size of the project and level of support required, supporting experts may be assigned to work full time or may just participate on the team when their particular skills are required.
- **User or Customer Representatives.** Members of the organization who will accept the deliverables or products of the project may be assigned to act as representatives or liaisons to ensure proper coordination, advise on requirements, or validate the acceptability of the project's results.
- **Sellers.** Sellers, also called vendors, suppliers, or contractors, are external companies that enter into a contractual agreement to provide components or services necessary for the project. The project team is often assigned the responsibility to oversee the performance and acceptance of sellers' deliverables or services. If the sellers bear a large share of the risk for delivering the project's results, they may play a significant role on the project team.
- **Business partner members.** Members of business partners' organizations may be assigned as members of the project team to ensure proper coordination.
- **Business partners.** Business partners are also external companies, but they have a special relationship with the enterprise, sometimes attained through a certification process. Business partners provide specialized expertise or fill a specified role such as installation, customization, training, or support.

### 2.3.1 Composition of Project Teams

The composition of project teams varies based on factors such as organizational culture, scope, and location. The relationship between the project manager and the team varies depending on the authority of the project manager. In some cases, a project manager may be the team's line manager, with full authority over its members. In other cases, a project manager may have little or no direct organizational authority over the team members and may have been brought in to lead the project on a part-time basis or under contract. The following are examples of basic project team compositions:

- **Dedicated.** In a dedicated team, all or a majority of the project team members are assigned to work full-time on the project. The project team may be colocated or virtual and usually reports directly to the project manager. This is the simplest structure for a project manager, as the lines of authority are clear and team members can focus on the project's objectives.
- **Part-Time.** Some projects are established as temporary additional work, with the project manager and team members working on the project while remaining in their existing organizations and continuing to carry out their normal functions. The functional managers maintain control over the team members and the resources allocated to the project, and the project manager is likely to continue performing other management duties. Part-time team members may also be assigned to more than one project at a time.

Dedicated and part-time project team compositions may exist in any of the organizational structures. Dedicated project teams are often seen in projectized organizations, where most of the organization's resources are involved in project work and project managers have a great deal of independence and authority. Part-time project teams are common within functional organizations, and matrix organizations use both dedicated and part-time project teams. Other members who have limited involvement at various stages of a project can be thought of as part-time project team members.

Project team composition may also vary based on organizational structure. An example of this is a partnership-based project. A project may be established as a partnership, joint venture, consortium, or alliance among several organizations through contracts or agreements. In this structure, one organization takes the lead and assigns a project manager to coordinate the efforts among the partners. Partnership-based projects can offer flexibility at lower cost. These advantages may be offset by the project manager's lower degree of control over team members and the need for strong mechanisms for communication and monitoring progress. Partnership projects may be set up to exploit industrial synergies, to undertake ventures that one partner could not afford alone, or for other political and strategic reasons.

Project team composition may also vary based on the geographic location of its members. An example of this is virtual project teams. Communication technologies allow team members in different locations or countries to work as virtual teams. Virtual teams rely on collaborative tools, such as shared online workspaces and video conferences, to coordinate their activities and exchange information about the project. A virtual team can exist with any type of organizational structure and team composition. Virtual teams are often necessary for projects where resources are located onsite or offsite or both, depending on the project activities. A project manager who is leading a virtual team needs to accommodate differences in the culture, working hours, time zones, local conditions, and languages.

## 2.4 Project Life Cycle

A project life cycle is the series of phases that a project passes through from its initiation to its closure. The phases are generally sequential, and their names and numbers are determined by the management and control needs of the organization or organizations involved in the project, the nature of the project itself, and its area of application. The phases can be broken down by functional or partial objectives, intermediate results or deliverables, specific milestones within the overall scope of work, or financial availability. Phases are generally time bounded, with a start and ending or control point. A life cycle can be documented within a methodology. The project life cycle can be determined or shaped by the unique aspects of the organization, industry, or technology employed. While every project has a definite start and a definite end, the specific deliverables and activities that take place in between will vary widely with the project. The life cycle provides the basic framework for managing the project, regardless of the specific work involved.

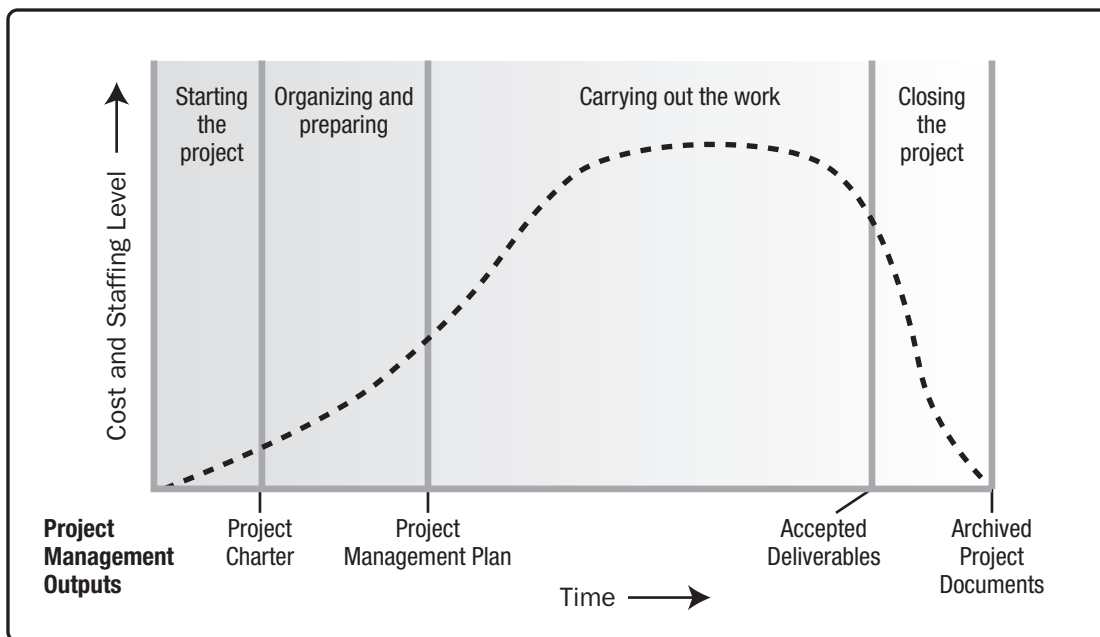
Project life cycles can range along a continuum from predictive or plan-driven approaches at one end to adaptive or change-driven approaches at the other. In a predictive life cycle (Section 2.4.2.2), the product and deliverables are defined at the beginning of the project and any changes to scope are carefully managed. In an adaptive life cycle (Section 2.4.2.4), the product is developed over multiple iterations and detailed scope is defined for each iteration only as the iteration begins.

### 2.4.1 Characteristics of the Project Life Cycle

Projects vary in size and complexity. All projects can be mapped to the following generic life cycle structure (see Figure 2-8):

- Starting the project,
- Organizing and preparing,
- Carrying out the project work, and
- Closing the project.

This generic life cycle structure is often referred to when communicating with upper management or other entities less familiar with the details of the project. It should not be confused with the Project Management Process Groups, because the processes in a Process Group consist of activities that may be performed and recur within each phase of a project as well as for the project as a whole. The project life cycle is independent from the life cycle of the product produced by or modified by the project. However, the project should take the current life-cycle phase of the product into consideration. This high-level view can provide a common frame of reference for comparing projects—even if they are dissimilar in nature.

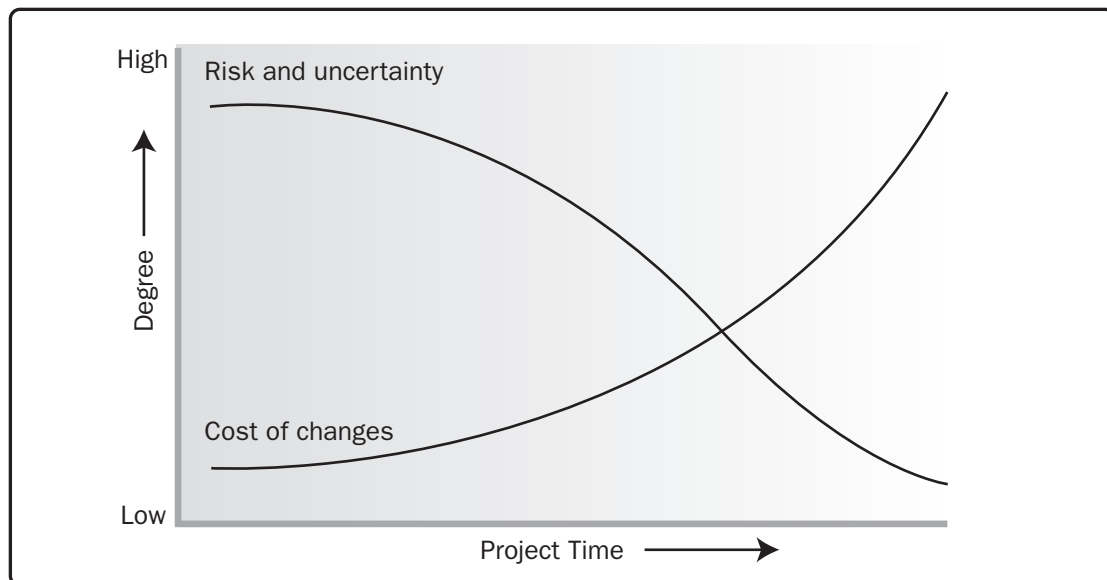


**Figure 2-8. Typical Cost and Staffing Levels Across a Generic Project Life Cycle Structure**

The generic life cycle structure generally displays the following characteristics:

- **Cost and staffing levels** are low at the start, peak as the work is carried out, and drop rapidly as the project draws to a close. Figure 2-8 illustrates this typical pattern.
- The typical cost and staffing curve above may not apply to all projects. A project may require significant expenditures to secure needed resources early in its life cycle, for instance, or be fully staffed from a point very early in its life cycle.
- **Risk and uncertainty** (as illustrated in Figure 2-9) are greatest at the start of the project. These factors decrease over the life of the project as decisions are reached and as deliverables are accepted.
- The ability to influence the final characteristics of the project's product, without significantly impacting cost, is highest at the start of the project and decreases as the project progresses towards completion. Figure 2-9 illustrates the idea that the cost of making changes and correcting errors typically increases substantially as the project approaches completion.

While these characteristics remain present to some extent in almost all project life cycles, they are not always present to the same degree. Adaptive life cycles, in particular, are developed with the intent of keeping stakeholder influences higher and the costs of changes lower throughout the life cycle than in predictive life cycles.



**Figure 2-9. Impact of Variable Based on Project Time**

Within the context of the generic life cycle structure, a project manager may determine the need for more effective control over certain deliverables or that certain deliverables are required to be completed before the project scope can be completely defined. Large and complex projects in particular may require this additional level of control. In such instances, the work carried out to complete the project's objective may benefit from being formally divided into phases.

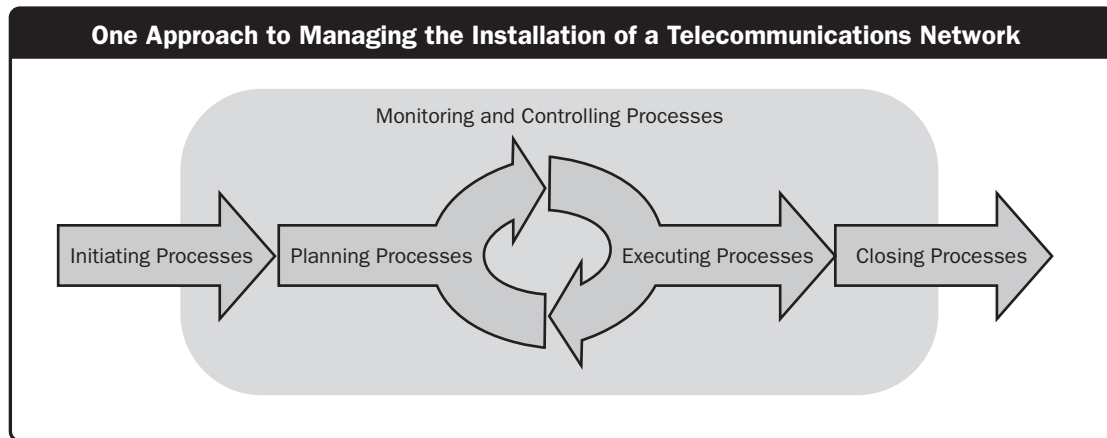
## 2.4.2 Project Phases

A project may be divided into any number of phases. A project phase is a collection of logically related project activities that culminates in the completion of one or more deliverables. Project phases are used when the nature of the work to be performed is unique to a portion of the project, and are typically linked to the development of a specific major deliverable. A phase may emphasize processes from a particular Project Management Process Group, but it is likely that most or all processes will be executed in some form in each phase. Project phases typically are completed sequentially, but can overlap in some project situations. Different phases typically have a different duration or effort. The high-level nature of project phases makes them an element of the project life cycle.

The phase structure allows the project to be segmented into logical subsets for ease of management, planning, and control. The number of phases, the need for phases, and the degree of control applied depend on the size, complexity, and potential impact of the project. Regardless of the number of phases comprising a project, all phases have similar characteristics:

- The work has a distinct focus that differs from any other phase. This often involves different organizations, locations, and skill sets.
- Achieving the primary deliverable or objective of the phase requires controls or processes unique to the phase or its activities. The repetition of processes across all five Process Groups, as described in Section 3, provides an additional degree of control and defines the boundaries of the phase.
- The closure of a phase ends with some form of transfer or hand-off of the work product produced as the phase deliverable. This phase end represents a natural point to reassess the activities underway and to change or terminate the project if necessary. This point may be referred to as a stage gate, milestone, phase review, phase gate or kill point. In many cases, the closure of a phase is required to be approved in some form before it can be considered closed.

There is no single ideal structure that will apply to all projects. Although industry common practices will often lead to the use of a preferred structure, projects in the same industry—or even in the same organization—may have significant variation. Some will have only one phase, as shown in Figure 2-10. Other projects may have two or more phases.



**Figure 2-10. Example of a Single-Phase Project**

Some organizations have established policies that standardize all projects, while others allow the project team to choose and tailor the most appropriate approach for their individual project. For instance, one organization may treat a feasibility study as routine pre-project work, another may treat it as the first phase of a project, and a third may treat the feasibility study as a separate, stand-alone project. Likewise, one project team may divide a project into two phases whereas another project team may choose to manage all the work as a single phase. Much depends on the nature of the specific project and the style of the project team or organization.

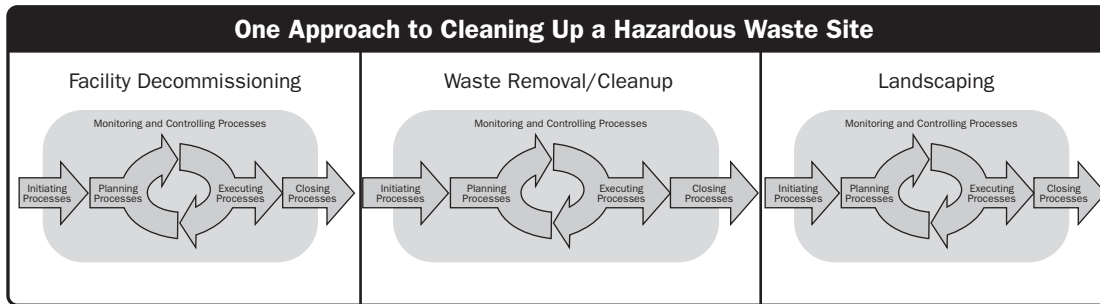
### 2.4.2.1 Phase-to-Phase Relationships

When projects have more than one phase, the phases are part of a generally sequential process designed to ensure proper control of the project and attain the desired product, service, or result. However, there are situations when a project might benefit from overlapping or concurrent phases.

There are two basic types of phase-to-phase relationships:

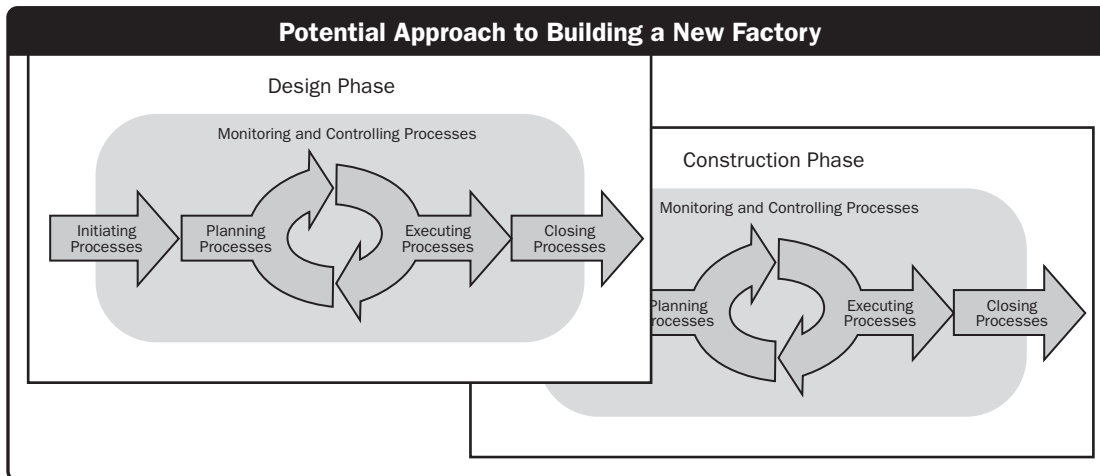
- **Sequential relationship.** In a sequential relationship, a phase starts only when the previous phase is complete. Figure 2-11 shows an example of a project with three entirely sequential phases. The step-by-step nature of this approach reduces uncertainty, but may eliminate options for reducing the overall schedule.





**Figure 2-11. Example of a Three-Phase Project**

- Overlapping relationship.** In an overlapping relationship, a phase starts prior to completion of the previous one (see Figure 2-12). This can sometimes be applied as an example of the schedule compression technique called fast tracking. Overlapping phases may require additional resources to allow work to be done in parallel, may increase risk, and can result in rework if a subsequent phase progresses before accurate information is available from the previous phase.



**Figure 2-12. Example of a Project with Overlapping Phases**

For projects with more than one phase, there may be different relationships (overlapping, sequential, parallel) between individual phases. Considerations such as level of control required, effectiveness, and degree of uncertainty determine the relationship to be applied between phases. Based on those considerations, both relationships could occur between different phases of a single project.

#### 2.4.2.2 Predictive Life Cycles

Predictive life cycles (also known as fully plan-driven) are ones in which the project scope, and the time and cost required to deliver that scope, are determined as early in the project life cycle as practically possible. As shown in Figure 2-13, these projects proceed through a series of sequential or overlapping phases, with each phase generally focusing on a subset of project activities and project management processes. The work performed in each phase is usually different in nature to that in the preceding and subsequent phases, therefore, the makeup and skills required of the project team may vary from phase to phase.

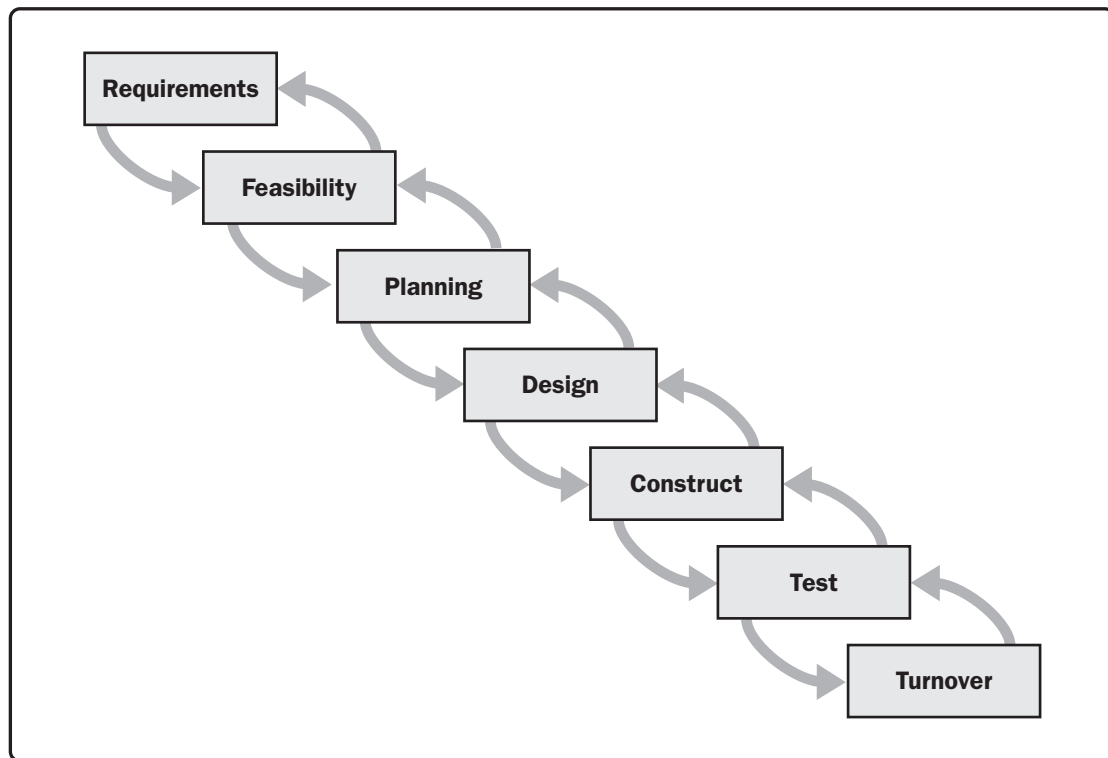


Figure 2-13. Example of Predictive Life Cycle

When the project is initiated, the project team will focus on defining the overall scope for the product and project, develop a plan to deliver the product (and any associated deliverables), and then proceed through phases to execute the plan within that scope. Changes to the project scope are carefully managed and require re planning and formal acceptance of the new scope.

Predictive life cycles are generally preferred when the product to be delivered is well understood, there is a substantial base of industry practice, or where a product is required to be delivered in full to have value to stakeholder groups.

Even projects with predictive life cycles may use the concept of rolling wave planning, where a more general, high-level plan is available and more detailed planning is executed for appropriate time windows, as new work activities are approaching and resources are to be assigned.

### 2.4.2.3 Iterative and Incremental Life Cycles

Iterative and incremental life cycles are ones in which project phases (also called iterations) intentionally repeat one or more project activities as the project team's understanding of the product increases. Iterations develop the product through a series of repeated cycles, while increments successively add to the functionality of the product. These life cycles develop the product both iteratively and incrementally.

Iterative and incremental projects may proceed in phases, and the iterations themselves will be performed in a sequential or overlapping fashion. During an iteration, activities from all Project Management Process Groups will be performed. At the end of each iteration, a deliverable or set of deliverables will be completed. Future iterations may enhance those deliverables or create new ones. Each iteration incrementally builds the deliverables until the exit criteria for the phase are met, allowing the project team to incorporate feedback.

In most iterative life cycles, a high-level vision will be developed for the overall undertaking, but the detailed scope is elaborated one iteration at a time. Often the planning for the next iteration is carried out as work progresses on the current iteration's scope and deliverables. The work required for a given set of deliverables may vary in duration and effort, and the project team may change between or during iterations. Those deliverables that are not addressed within the scope of the current iteration are typically scoped at a high level only and may be tentatively assigned to a specific future iteration. Changes to the scope of an iteration are carefully managed once work begins.

Iterative and incremental life cycles are generally preferred when an organization needs to manage changing objectives and scope, to reduce the complexity of a project, or when the partial delivery of a product is beneficial and provides value for one or more stakeholder groups without impact to the final deliverable or set of deliverables. Large and complex projects are frequently executed in an iterative fashion to reduce risk by allowing the team to incorporate feedback and lessons learned between iterations.

### **2.4.2.4 Adaptive Life Cycles**

Adaptive life cycles (also known as change-driven or agile methods) are intended to respond to high levels of change and ongoing stakeholder involvement. Adaptive methods are also iterative and incremental, but differ in that iterations are very rapid (usually with a duration of 2 to 4 weeks) and are fixed in time and cost. Adaptive projects generally perform several processes in each iteration, although early iterations may concentrate more on planning activities.

The overall scope of the project will be decomposed into a set of requirements and work to be performed, sometimes referred to as a product backlog. At the beginning of an iteration, the team will work to determine how many of the highest priority items on the backlog list can be delivered within the next iteration. At the end of each iteration, the product should be ready for review by the customer. This does not mean that the customer is required to accept delivery, just that the product should not include unfinished, incomplete, or unusable features. The sponsor and customer representatives should be continuously engaged with the project to provide feedback on deliverables as they are created and to ensure that the product backlog reflects their current needs.

Adaptive methods are generally preferred when dealing with a rapidly changing environment, when requirements and scope are difficult to define in advance, and when it is possible to define small incremental improvements that will deliver value to stakeholders.