
Project Management Processes

The major knowledge areas of project management are administered in a structured outline covering six basic clusters as depicted in Figure 3.3. The implementation clusters represent five process groups that are followed throughout the project life cycle. Each cluster itself consists of several functions and operational steps. When the clusters are overlaid on the nine knowledge areas, we obtain a two-dimensional matrix that spans 44 major process steps.

Table 3.1 shows an overlay of the project management knowledge areas and the implementation clusters. The monitoring and controlling clusters are usually administered as one lumped process group (monitoring and controlling). In some cases, it may be helpful to separate them to highlight the essential attributes of each cluster of functions over the project life cycle. In practice, the processes and clusters do overlap. Thus, there is no crisp demarcation of when and where one process ends and where another one begins over the project life cycle. In general, project life cycle defines the following:

1. Resources that will be needed in each phase of the project life cycle
2. Specific work to be accomplished in each phase of the project life cycle

Figure 3.4 shows the major phases of project life cycle going from the conceptual phase through the close-out phase. It should be noted that project life cycle is distinguished from product life cycle. Project life cycle does not explicitly address operational issues whereas product life cycle is mostly about operational issues starting from the product's delivery to the end of its useful life. Note that for oil and gas projects, the shape of the life cycle curve may be expedited due to the rapid developments that often occur in technology. For example, for an exploration technology project, the entire life cycle may be shortened, with a very rapid initial phase, even though the

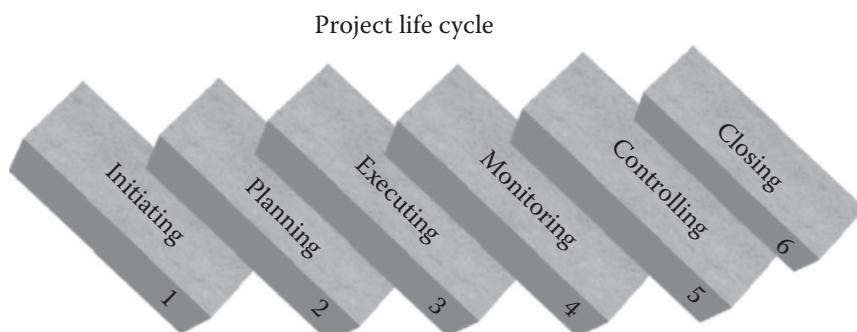
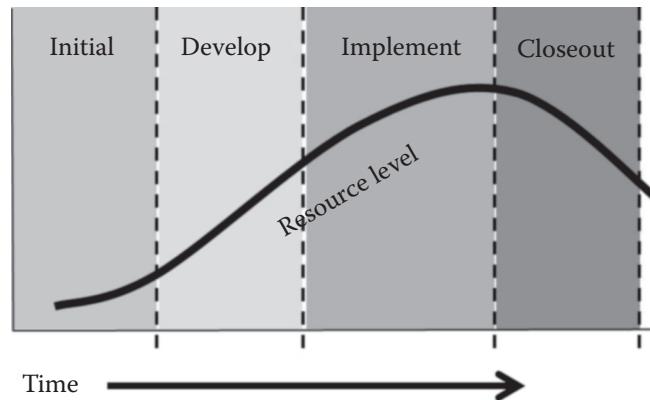


FIGURE 3.3

Implementation clusters for project life cycle.

TABLE 3.1
Overlay of Project Management Areas and Implementation Clusters

		← Project Management Process Clusters →				
Knowledge Areas	Initiating	Planning	Executing	Monitoring and Controlling	Closing	
Project integration	Develop project charter	Develop project management plan	Direct and manage project execution	Monitor and control project work		
	Develop preliminary project scope			Integrated change control		
		Scope planning		Scope verification		
Scope		Scope definition		Scope control		
		Create WBS				
Time		Activity definition		Schedule control		
		Activity sequencing				
		Activity resource estimating				
Cost		Activity duration estimating				
		Schedule development		Cost control		
		Cost estimating				
Quality		Cost budgeting		Perform quality control		
		Quality planning		Perform quality assurance		
Human resources		Human resource planning		Acquire project team		
				Develop project team		
Communication		Communication planning		Information distribution		
				Performance reporting		
Risk				Manage stakeholders		
		Risk management planning		Risk monitoring and control		
		Risk identification				
Procurement		Qualitative risk analysis				
		Quantitative risk analysis				
		Risk response planning				
		Plan purchases and acquisitions		Request seller responses		
		Plan contracting		Select sellers		
				Contract administration		
				Contract closure		

**FIGURE 3.4**

Phases of project life cycle.

conceptualization stage may be very long. Typical characteristics of project life cycle include the following:

1. Cost and staffing requirements are lowest at the beginning of the project and ramp up during the initial and development stages.
2. The probability of successfully completing the project is lowest at the beginning and highest at the end. This is because many unknowns (risks and uncertainties) exist at the beginning of the project. As the project nears its end, there are fewer opportunities for risks and uncertainties.
3. The risks to the project organization (project owner) are lowest at the beginning and highest at the end. This is because not much investment has gone into the project at the beginning, whereas much has been committed by the end of the project. There is a higher sunk cost manifested at the end of the project.
4. The ability of the stakeholders to influence the final project outcome (cost, quality, and schedule) is highest at the beginning and gets progressively lower toward the end of the project. This is intuitive because influence is best exerted at the beginning of an endeavor.
5. The value of scope changes decreases over time during the project life cycle while the cost of scope changes increases over time. The suggestion is to decide and finalize scope as early as possible. If there are to be scope changes, do them as early as possible.

The specific application context will determine the essential elements contained in the life cycle of the endeavor. Life cycles of business entities, products, and projects have their own nuances that must be understood and managed within the prevailing organizational strategic plan. The

components of corporate, product, and project life cycles are summarized as follows:

Corporate (business) life cycle:

Planning → Needs → Business conceptualization →
Realization → Portfolio management

Product life cycle:

Feasibility studies → Development → Operations → Product obsolescence

Project life cycle:

Initiation → Planning → Execution → Monitoring and control → Closeout

This book covers the knowledge areas sequentially in Chapters 2 through 10 in the order listed above. There is no strict sequence for the application of the knowledge areas to a specific project. The areas represent a mixed bag of processes that must be followed in order to achieve a successful project. Thus, some aspects of integration may be found under the knowledge area for communications. In a similar vein, a project may start with the risk management process before proceeding into the integration process. The knowledge areas provide general guidelines. Each project must adapt and tailor the recommended techniques to the specific need and unique circumstances of the project. PMBOK seeks to standardize project management terms and definitions by presenting a common lexicon for project management activities.

Specific strategic, operational, and tactical goals and objectives are embedded within each step in the loop. For example, "initiating" may consist of project conceptualization and description. Part of "executing" may include resource allocation and scheduling. "Monitoring" may involve project tracking, data collection, and parameter measurement. "Controlling" implies taking corrective action based on the items that are monitored and evaluated. "Closing" involves phasing out or terminating a project. Closing does not necessarily mean a death sentence for a project, as the end of one project may be used as the stepping stone to the next series of endeavors.

Factors of STEP Project Success or Failure

There are several factors that impinge on the success or failure of a project. In oil and gas projects, factors that enhance project success include the following:

- Well-defined scope
- Communication among project team members