

Chapter IV

The Project Management Discipline

Those who cannot remember the past are condemned to repeat it.

(George Santayana)

Professional organizations that have developed around the world to foster the project management discipline (Morris, 2001) have recognized that a distinct skill set is necessary to ensure successful project managers, and these organizations are devoted to assisting their members develop, improve, and keep these skills current (Boyatzis, 1982; Caupin, Knopfel, & Morris, 1998). In this chapter, I discuss the methods, techniques, and standards that these organizations have formalized.

Project Management Organizations

The Project Management Institute (PMI) is the largest organization in the world devoted to project management. Other major international organizations include the Association for Project Management (APM), British Standard Institute (BSI), Engineering Advancement Association (ENAA) of Japan, Australian Institute of Project Management, and the International Project Management Association (IPMA). Each of these organizations has developed a set of project management standards as has the ISO (International Organization for Standards) with its ISO 10006 *Guide to Quality in Project Management*. These various project management standards can be compared using word size (Crawford, 2004):

PMBOK—56,000
 APMBoK—13,000
 IPMA ICB—10,000
 ENAA P2M—36,000

The APM has developed a Body of Knowledge (BoK) of Project Management Competencies, which identifies 40 key competencies grouped as follows:

- *Project Management*: Covering the key elements that differentiate projects from general management
- *Organizations and People*: Detailing the main qualitative skills of a project manager
- *Techniques and Procedures*: Details the quantitative methods
- *General Management*: Covers industry specific concepts

The APM Body of Knowledge also provides a focal point for many of the programs run by the APM, including their Certification Programme, which assesses a person's competence in managing a project; the Course Accreditation Programme, which reviews training courses run by both commercial private training companies and higher education institutes; and the Project Management Capability Test, which assesses a person's knowledge in the APM Body of Knowledge.

The British Standards Institute publishes the *Guide to Project Management* (BS6079). This standard has been adopted by the British government and industry, and establishes commonly accepted terminology. The stated objectives of BS6079 are to provide guidance to

- General managers, to enable them to provide proper support for project managers and their teams;
- Project managers, to improve their ability to manage their projects;
- Project support staff, to help them understand project management issues and solutions; and
- Educators and trainers, to help them understand the project management environment and the context in which project management methods are deployed.

The International Project Management Association is a federation of national project management associations for several European countries. It publishes the IPMA Competency Baseline (ICB) in English, French, and German (it was first published in 1998). The content is similar to the APM BoK, but the organization is different and is termed the *Sunflower*. The IPMA encourages each national organization to form its own competency baselines, called "National Competency Baselines." There are now about 30 countries with NCBs throughout Europe, Egypt, India, and China.

The Engineering Advancement Association (ENAA) of Japan has also issued a project management body of knowledge: P2M (*A Guidebook of Project and Program Management for Enterprise Innovation*). Their PM standard is different from that of the PMI or APM, and is based on how project management can be used to increase business value for an organization and promote innovation. This P2M was a multiyear joint effort between the Japanese Project Management Forum (JPMF) and the Japanese Ministry of Economy, Trade and Industry (METI); it was supported by both the Japanese industry and government with a very significant contribution from academic research. The Japanese P2M is based on a tower structure, which, according to the Japanese Standard Committee, focuses on aligning project management to the business units (as opposed to the European and North American approach, which is dedicated to the management of a single project). The four areas of certification in the Japanese program are Objectives, Strategy, Value Management, and Finance.

Terminology, methodology, and, sometimes, concepts in project management, differ somewhat in these different organizations and in different parts of the world. In the United States, a concept may be commonly associated with a certain term and in other parts of the world a different term or terms may be used. Even within the United States, terms and concepts may differ in the federal agencies (i.e., NASA, DOD, etc.) versus the private sector. In this book we have tried to show alternative terms for the same concept and differing concepts used in similar ways.

Project Management Institute

The Project Management Institute (PMI) is the world's largest project management organization, with about 150,000 members in more than 125 countries. PMI has also established more than 200 local chapters around the world. The PMI Web site (www.pmi.org) records over 4 million visitors per year. Founded in 1969, PMI establishes project management standards, provides seminars and other vehicles for professional growth, promotes educational programs, funds and encourages research, and provides professional certification that many of the world's organizations desire for their project personnel. PMI produces a number of publications, including the *Project Management Journal*, *Project Management Quarterly*, *PM Network*, and *PMI Today*. This book will closely follow the PMI standards, however other and broader standards and concepts found in the other major project management organizations will also be included.

Project Management Body of Knowledge

PMI established its first body of knowledge in 1976, which around 1987 became *A Guide to the Project Management Body of Knowledge* (PMBOK; PMI, 2000). It was revised

several times with major releases in 1996, 2000, and 2005; there are approximately 1.5 million copies of all PMBOK versions in circulation. The PMBOK embodies generally accepted best of practice procedures, methods, and general tools, which are derived by a structured consensus of its vast membership. The PMBOK an approved American National Standard (ANS) by the American National Standards Institute (ANSI). There is some overlap among project management best practices, general management practices, and practices specific to various fields, as illustrated in Figure 4.1.

The PMBOK’s content is organized into processes, and each of the 37 key processes are defined as procedures that receive various input, produce various output, and use various methods (such as management techniques, mathematical techniques, statistical techniques, etc.), perhaps with the assistance of some general tools (typically, some type of software). These processes are shown pictorially in Figure 4.2.

These processes are grouped into five process groups that relate to how project work is managed:

1. Initiation
2. Planning
3. Execution
4. Control
5. Closing

Figure 4.1. PMBOK components

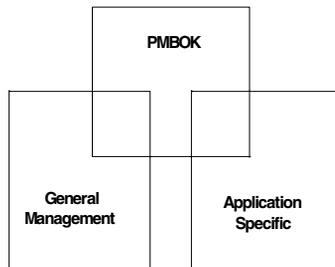
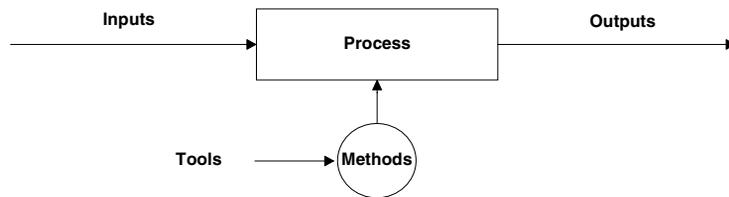


Figure 4.2. Process representation



These processes are further subdivided into nine knowledge areas:

1. Integration Management [3 processes]
2. Scope Management [5 processes]
3. Time Management [5 processes]
4. Cost Management [4 processes]
5. Quality Management [3 processes]
6. Human Resource Management [3 processes]
7. Communication Management [4 processes]
8. Risk Management [4 processes]
9. Procurement Management [6 processes]

There are also overall project management activities. The process groups are often called project management phases or stages, which are distinguished from project phases that are discussed later. Figure 4.3 shows the general sequencing of the process groups in the timeline for a project. In practice, however, there may be considerable overlap; that is, all initiation processes will not be complete before all the planning processes begin. Output from one process-group process will typically be the input to another process, either in the same process group or the next one in the sequence.

The overall organization of the PMBOK and the relationship among the processes, process groups, and knowledge areas is shown in Figure 4.4.

Large projects typically are broken down into phases, and the organization of those project phases is discipline specific and typically follows some type of methodology. Various types of IT methodology are detailed later in this book. Each project phase has a beginning and an end, and the five process groups are a part of each phase. Deliverables from one phase are typically inputs to the next phase; there may be phase overlap in some methodologies. Figure 4.5 shows how effort is generally distributed across project phases.

A typical phasing for very large IT projects might look like the following:

Figure 4.3. Process group interaction

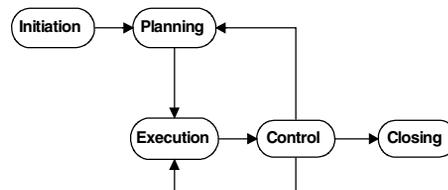
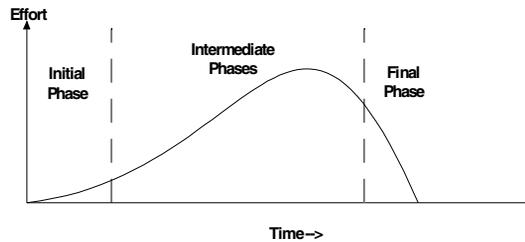


Figure 4.4. PMBOK process groups vs. knowledge areas

PMI Process Groups and Knowledge Areas					
	Initiation	Planning	Executing	Controlling	Closing
Integration		Project Plan Development	Project Plan Execution	Overall Change Control	
Scope	Initiation	Scope Planning	Scope Verification	Scope Change Control	Scope Verification
		Scope Definition			
Time		Activity Definition		Schedule Control	
		Activity Sequencing			
		Activity Duration Estimation			
		Schedule Development			
Cost		Resource Planning		Cost Control	
		Cost Estimating			
		Cost Budgeting			
Quality		Quality Planning	Quality Assurance	Quality Control	
Human Resources		Organizational Planning	Staff Acquisition	Team Development	
Communications		Communications Planning	Information Distribution	Performance Reporting	Administrative Closure
Risk	Risk Identification	Risk Identification		Risk Response Control	
		Risk Quantification			
		Risk Response Development			
Procurement		Procurement Planning	Solicitation	Contract Administration	Contract Closeout
		Solicitation Planning	Source Selection		
			Contract Administration		

Figure 4.5. Project phasing



Feasibility, Proposal, Business Plan

Requirements Specification

Design

Overall design

External (user interaction) specifications

Detail design

“As designed” internal documentation

Test plans

Deployment and integration specifications

Implementation

- Coding
- Unit testing
- Module and Feature Testing
- User documentation
- “As built” internal documentation

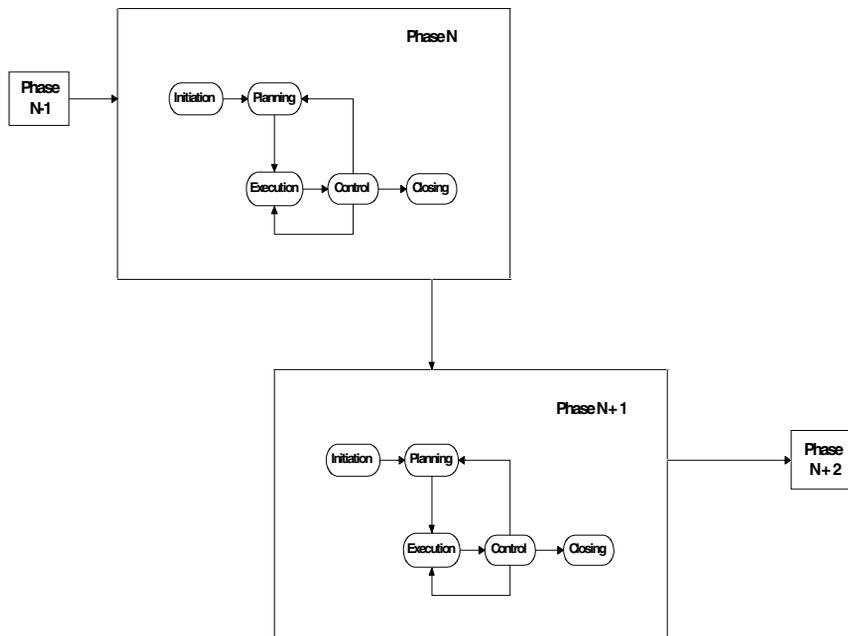
Installation

- Conversion
- Training
- Network and site preparation
- Hardware install and integration
- Software install and integration
- Integration and acceptance testing
- Parallel operation

Operation and Maintenance (O & M)

As stated previously, in large phased projects the five process groups occur in each project phase, as is illustrated in Figure 4.6. For some industries and in some methodologies there may be overlap in project phases. IT may also have some project phase overlap,

Figure 4.6. Process groups in each phase



depending on the type of methodology adopted and the type of contracting arrangement; both of these aspects are discussed in more detail later in the book.

PMI's summarization of key activities by process group follow:

Key Initiation Activities

- Project feasibility (high-level ROI approximation)
- High-level planning
- Project charter document (memo, letter)

Key Planning Activities (order important)

- Develop scope statement
- Assemble project team
- Develop work breakdown structure (WBS)
- Finalize project team
- Do network type diagram (showing activity dependencies)
- Estimate cost and time, find the "critical path"
- Determine overall schedule and budget
- Procurement plan
- Quality plan
- Identify risks, quantify them, develop risk responses
- Other plans: change control plan, communications plan, management plan
- Overall project plan
- Project plan approval
- "Kickoff meeting"

Key Execution Activities

- Execute the project plan
- Complete work packets (activities)
- Information distribution
- Quality assurance
- Team development
- Scope verification
- Progress meetings

Key Control Activities

- Overall change control
- Performance reporting
- Scope control
- Quality control
- Risk response control
- Schedule control
- Cost control
- Manage by exception to the project plan

Key Closing Activities

- Procurement audits and contract(s) close out
- Product verification
- Formal acceptance
- Lessons learned documentation
- Update all project records
- Archive records
- Release team

PMI established a certification program in 1984 for the project management discipline. The highest certification level is that of a PMP (project management professional). The requirements for an individual to be awarded that certification level include

- 4,500 hours of documented project management experience over 3-6 years
- BS/BA Degree and at least 35 contact hours in PM training
- Passing a very comprehensive 4 hour exam on the PMBOK
- Adherence to the PMI professional code of ethics

There are about 100,000 certified PMPs in the world. Those who have been granted PMP certification must demonstrate an ongoing professional commitment to the field of project management by satisfying PMI's Continuing Certification Requirements Program to retain their PMP status. In 1999, PMI became the first organization in the world to have its Certification Program attain International Organization for Standardization (ISO) 9001 recognition. The IPMA also has certification processes with four levels of certification: practitioner, professional, manager, and director. ENAA's P2M has three levels of certification: architect, manager, specialist (Crawford, 2004).

The PMP certification (or equivalent certification from another international organization) is now being required (or highly recommended) by many large corporations for one

Figure 4.7. Book contents and PMI process groups

PMI Process Group	Book Chapter
Initiation	III, V, VI
Planning	VI, VII, VIII, IX, X, XI, XII, XIII
Execution	XIII, IX, X, XI, XII, XIII, XVI
Controlling	XIV, XV, XVI
Closing	XI, XII, XVI

Figure 4.8. PMBOK and SDLC

PMBOK		SDLC	
Process Group	Outputs	Stage	Outputs
Initiation	Business Plan		
	Project Charter		
Plan	Overall Plan		
	Management Plan		
	Scope Statement	Definition	Project Plan:
			Communications Plan
			Change Management Plan
		Requirements	Requirements Document
	WBS Document		
	Network Diagram		
	Schedule		
	Resource Plan		
	Cost Plan		
	Procurement Plan		
	Quality Plan		
	Risk Plan		
Execute/Control	Performance Reports	Analysis	Overall Design Documents:
	Stage Gate Reviews		Use Cases
			Preliminary Users Manual
			Test Plan
		Design	Detail Design Documents:
			Menu/Navigation Design
			Screen Designs and Storyboards
			Report Designs
			Database Design
			Algorithms Design
			Prototypes
		Construction	Development Objects:
			Commented Code
			Test Scripts
			Help Screens
		Testing	Test Results Documents
			User Manual
			Training Material
		Installation	Install Documents
Closing	Project Close Out		
	Contract Close Out		
	Lessons Learned		

to become a project manager in their organization. Additionally many companies expect vendors to provide certified project managers for contracted work.

Chapter Summary

The formal discipline of project management was introduced and international organizations that foster the project management discipline were discussed. The PMI body of knowledge was illustrated (in later chapters the key processes and activities that are a part of each process group will be discussed in detail for IT projects). Figure 4.7 shows the chapters in which PMI process groups are covered.

In IT projects, there will be a correlation between the PMI process groups (and their outputs) and the chosen software engineering methodology (and its outputs). Chapter V discusses software engineering and IT methodologies; Figure 4.8 is an example of a correlation between PMI process groups and the classical software development life cycle (SDLC) of a single phase project.

References

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