

## **Project Management Body of Knowledge Revisited - Part 2**

### **The Framework Rationale**

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#### ***Foreword***

Please read this paper together with this month's Musings: "A Look Back at the original (PMBOK) Framework – Part 2".

This paper is a repeat of what I wrote more than thirty years ago (1987).<sup>1</sup> Again, I think it is worth repeating because while parts have been quoted quite often, to my knowledge it was never pursued officially in the development of the PMP (Project Management Professional) examinations of the day.

So this paper represents what we saw in those days as the typical environment of a project.

#### **Projects and PMI**

The idea of establishing projects, and the consequential need to manage them, has been around for a very longtime. In fact, since early civilization major projects like the pyramids of Egypt, or the Great Wall of China, or more recently, the Suez and Panama canals, have been successfully implemented. In their day, these were prolonged and complex undertakings and no doubt they exhibited many of the "management" difficulties experienced even at the present time.

The essential feature of these projects, indeed of any project, is to bring about change. That projects are designed to create change is not new. What is new is the rapidity with which change is currently taking place and which we may be confidently expected to continue to take place.

For example, the marvels of modern electronic communications have made almost everyone acutely aware of the disparities, which exist between and within communities, countries and continents of the world. Improvements in this situation are only going to be brought about by even more and widespread change, often with unprecedented degrees of urgency. Since our resources are clearly limited, be they global or be they local, we must ensure that such change is brought about as effectively and efficiently as possible.

Through its primary dedication of "advancing the state-of-the-art in the management of projects", the Project Management Institute aspires to improve the effectiveness and efficiency of the management of change for the benefit of all mankind. The effort to identify and establish standards associated with the Project Management Body of Knowledge (PMBOK) follows naturally from PMI's primary dedication. It represents a major Institute endeavor and is the PMBOK's primary purpose. Secondary to this purpose, but equally consistent with PMI's dedication, is to provide the basis and support for PMI's professionalism programs, which include Accreditation, Education and Certification. These programs are described in other PMI publications.

#### **Project management is unique**

Managing a project is different from managing an established on-going enterprise. To mention but a few of the obvious differences:

- Life in an on-going enterprise is relatively simple and certain for extended periods of time.
- Relatively large quantities of goods or services are produced per given time period.

- Tasks are generally repetitive, continuous or exhibit substantial similarity.
- Roles and relationships are well understood, having developed and adjusted over long periods of time, and
- The work environment is relatively stable.

None of these are true in a project environment. In a sense every project is unique, if only by virtue of its own set of constraints, although indeed there may be many projects of a similar nature. Some typical examples of projects include:

- Launching a new venture
- Developing a new product
- Effecting a change in structure, staffing, system or style in an existing organization
- Turning a poor performance situation into a satisfactory one within a target period
- Designing and producing a new transportation vehicle
- Designing and constructing a building or facility
- Implementing an urban or rural development program

## **PMBOK Standards**

Let us begin by identifying a *project*. Really, it is any undertaking with an established starting point and defined objectives, the achievement of which clearly signify the conclusion of the project. In practice most projects are constrained by limits on the resources available to achieve the required objectives. The whole process of managing such a project is, of course, known as Project Management.

However, project management is merely a catchall phrase for a number of major sub-functions. It is the very identification and on-going analysis of these *functions*, which establishes the PMBOK. The representation of the PMBOK as a *matrix* provides flexibility in describing the various function inter-relationships. However, the *function chart structure* contained within each of these functions is presented as a *work breakdown structure*. The major project management functions which have been identified are briefly described below.

Many texts have been written about both traditional- and project- management. Doubtless many more will be written as our understanding continually advances. Here, therefore, we can only touch on some of the basic reasons for including the present range of functions within the PMBOK Standards.

## **Basic Project Management Functions**

The definition of the project's objectives together with all the activities involved in their achievement, and the resources consumed, is known as the project scope. Since the scope of a project has the habit of changing during the life of a project, this gives rise to the need for *Scope Management*.

For a project to be considered effective or successful, certain standards of *quality* must also be stated or presumed. Establishing and maintaining these standards during the life of the project leads to the need for Quality Management.

Since a project is determinate, it is clearly set in the context of a finite period of time. Unfortunately, time is a completely inflexible resource, so that activities must be carefully planned and scheduled. This is referred to as *Time Management*.

Because in our society "time is also money," money is a closely associated resource. Fortunately, it is somewhat more flexible. Nevertheless, it too needs careful managing, so we have *Cost Management*. Scope, quality, time and cost, form the basic core of project management. However, as yet we have not discussed some of the special circumstances that arise in the *management* of projects.

## The Project Life Cycle

To achieve any kind of output or product, an effort is required. In the case of a project, however, the relation between effort and time is very distinctive. To visualize this relationship, consider a curve of effort plotted against time. Clearly the effort starts at zero (before the project has commenced) and ends at zero (when the project has been completed).

In between these two points, the effort-time curve invariably has a very characteristic profile. This may be likened to a pear sliced neatly down the middle, one half of which rests flat face downwards, with the stem at time zero. The vertical profile is then typical of the time-effort relationship.

Moreover, through the work of contributors to PMI, it has been reasonably established that every project, generically speaking, passes through four distinct *project phases*. These are known collectively as the *project life cycle*. Individually and according to the area of project application, these four phases may be known by different terms, for example: *concept, development, execution* and *finishing*. This happens to be my preference because the sequence C, D, E, F, is very easy to remember. Others may use successively terms such as Initiation, Planning, Implementation and Termination or Commissioning.

This project life cycle should not be confused with *Facility/Product Life Cycle* or even *Corporate Business Life Cycle*. It is of course related to these other life cycles and these relationships are shown diagrammatically in Figure 1. It may be noted that in the diagram the project phases are further divided into project stages. Thus *stages are subsets of phases*.

Like the profile of the pear mentioned above, the time-effort curve starts to rise up in the concept phase, tends to level off during development, rises again sharply to a high peak during execution, and then even more rapidly drops to zero in the finishing phase. This typical profile is shown in Figure 2.

This phenomenon is fundamental to the concept and needs of project management. The rapidly changing situation depicted by the time-effort curve through project life cycle places special emphasis and requirements on a number of areas of otherwise traditional management science. For this reason, these areas are considered to be essential knowledge for the effective management of projects.

**CORPORATE BUSINESS LIFE CYCLE**

Policy Planning	Identify Needs	Project Conception	Realization	Product in Service	Disposal
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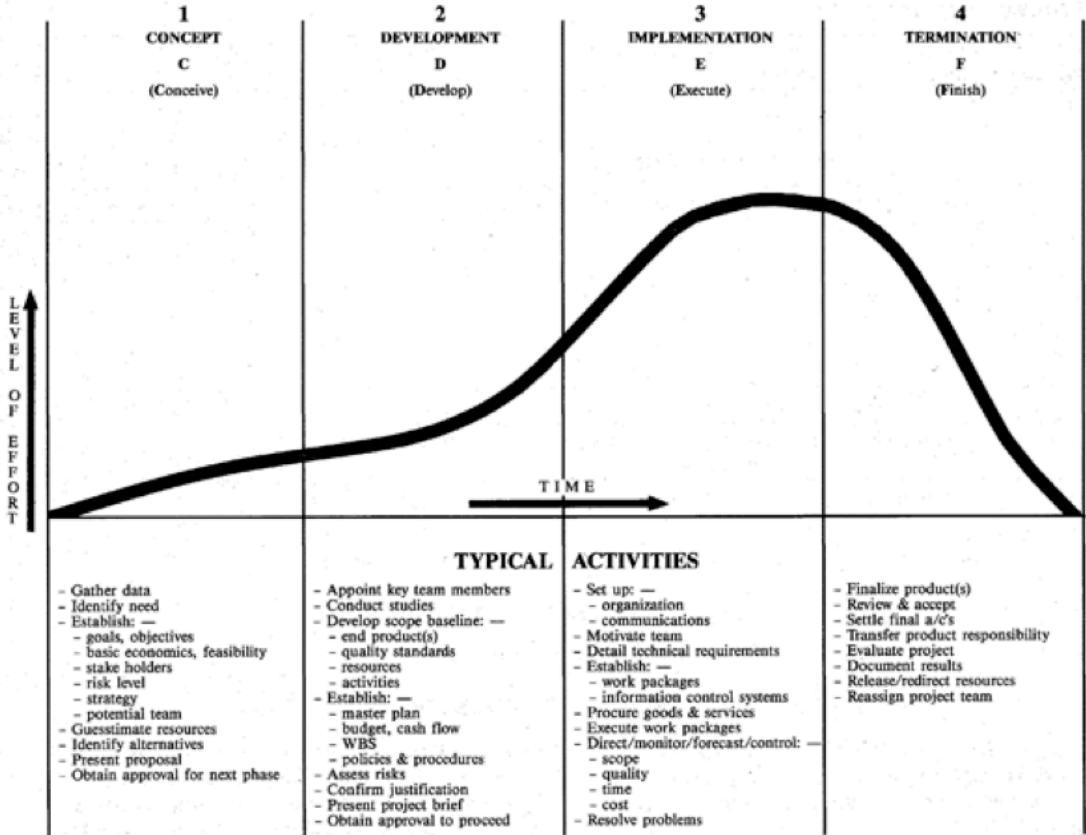
**FACILITY/PRODUCT LIFE CYCLE**

Feasibility	Acquisition	Operation	Disposal
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Concept	Development	Implementation	Termination	Four Basic "Phases" Intermediate "Stages" added	
Scope	Planning	Definition/ Procurement	Execution		Commission
Initiation	Prelim Engrg	Drgs & Specs	Build		Start Up

←----- PROJECT LIFE CYCLE ----->

**Figure 1: PROJECT DEFINITION –TYPICAL PROJECT LIFE CYCLE compared with CORPORATE BUSINESS and FACILITY/PRODUCT LIFE CYCLE**



**Figure 2: PROJECT LIFE CYCLE – FOUR BASIC PHASES**

## Other Essential Functions

Projects are achieved through people and their respective skills and abilities. But the number of people and their types of skill varies considerably during the project life cycle according to the level of effort required as we have already seen. Consequently, many of these people are required only for relatively short periods of time. Normally there will be a core group referred to as the *project team*, led by a Project Manager

Indeed, even the project team is required only temporarily. Thus, careful attention must be given to the assembly of people working together effectively through a clear understanding of their respective *roles* and *responsibilities* in a temporary organizational environment. This requires *Human Resources Management*.

Often these temporary organizational arrangements take place within a traditional management organizational setting. This introduces the concept of a *Matrix Organization*.

Projects are only launched for purposes of achieving change through predetermined objectives, or at least they should be! Because of the relative uniqueness of every project and the rapidly changing conditions as depicted by the time-effort curve, both mentioned above, the final outcome of every project is always uncertain.

This gives rise to the need for special and constant attention to the forecast final results in terms of meeting the ultimate objectives, including all resources consumed. Based on this forecast, especially if the forecast is unfavorable, it is possible to modify direction by exercising control.

Control is only achieved if all parties to the project clearly understand their respective roles and responsibilities as a result of careful planning and communication. Moreover, the *status* of the project at any given time is only apparent through consistent and accurate *feedback*. Often this feedback can only be fully understood through a proper interpretation of the *project environment*, both internal and external. Responding to the project environment is usually referred to as *Public Relations*.

Collectively, these activities come under the heading of *Communications Management*.

People and communication alone are not enough to implement a project. It is the service that people offer that is needed to execute the project. It is a common experience that a major portion of a project manager's time must be given over to procuring peoples' commitment to the objectives of the project. In addition, materials and equipment are also most likely required. The *commitment* of these goods and services are obtained through *Contract/Procurement Management*.

Uncertainty was mentioned earlier. Uncertainty is associated with *probability* and *risk*. Prudent management will take steps to mitigate the possibility of a less-than-favorable outcome by reducing the project risk wherever this can be achieved cost effectively. This leads to the need for a comprehensive understanding of the nature of the project in the first place, especially if it is a complex and interdisciplinary project. These activities are identified as *Risk Management*.

Finally, to tie all these PM Functions together, the PMBOK Standards Committee concluded that a further PMBOK section would be required to provide a frame of reference or overview. This section, which is not strictly a project management function, has been given the name *Project Management Framework*.

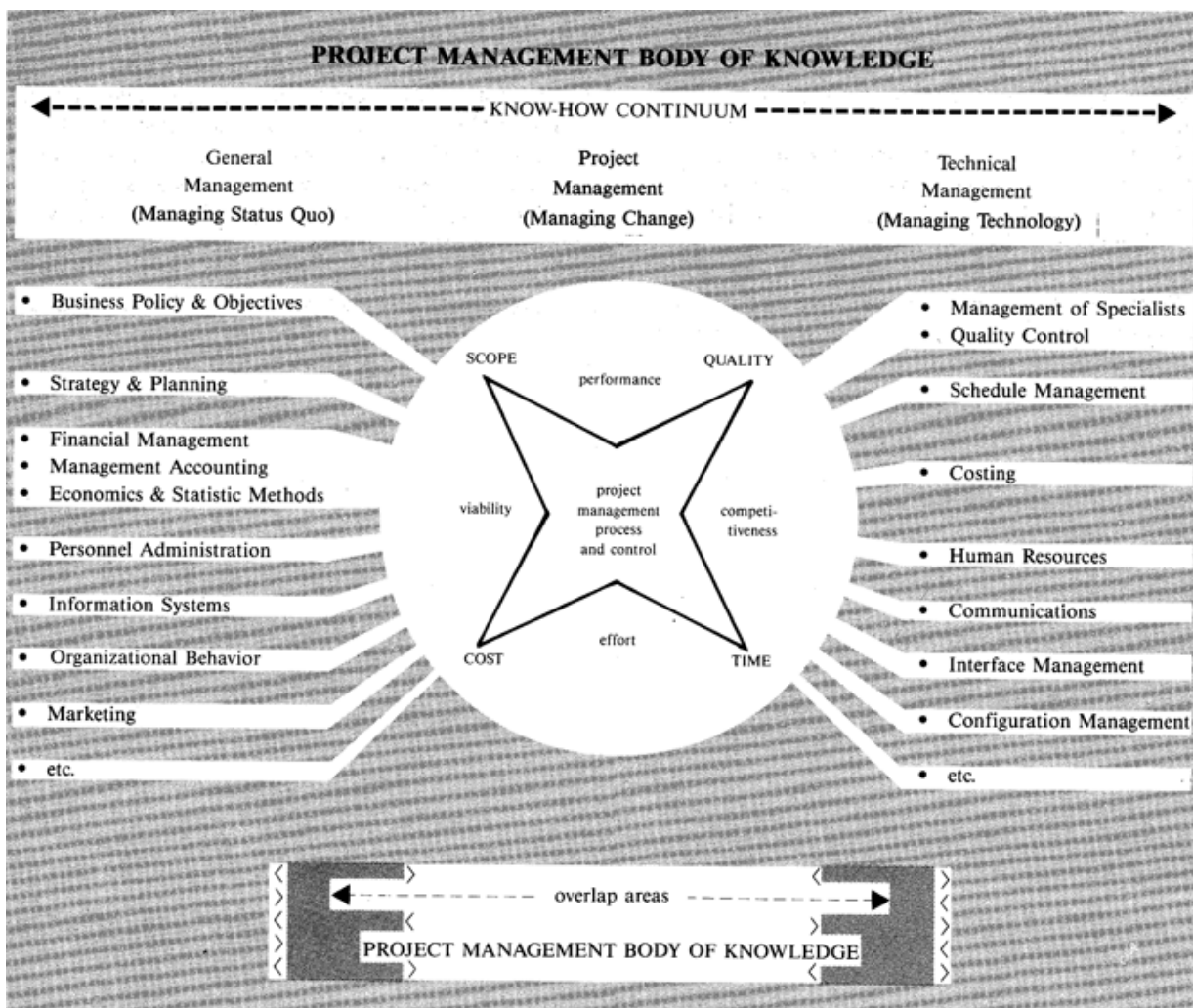
From an educational standpoint, however, it is another subject area in its own right.

Project Management Framework provides the opportunity in which the concept of a matrix can be developed to demonstrate the interdependencies and *inter faces* between the respective functions. It also provides the opportunity to take an overview perspective of a number of other aspects of project management. Examples include the process of control, typical project life cycles, the need for *project integration* and *interface management*, and the place and impact of project management in the various public and private sectors.

It can also be the repository of some general project management background and information as well perhaps as some of the more universal tools and *techniques* of project management.

### The PMBOK Setting

It is possible to depict the environment of project management and its related body of knowledge in a number of different ways. Venn diagrams and three dimensional matrices or boxes are all feasible. The Figure 3 diagram attempts to show the role of the PMBOK as a vehicle for the creation of change between General Management and Technical Management.



**Figure 3: The role of PMBOK sitting between General Management and Technical Management**  
**Note:**

The overlap areas at the bottom of the diagram infer that the project management staff must have sufficient understanding of the various specialist disciplines to appreciate project requirements and issues. They must also be able to communicate appropriate direction and means of conflict resolution to these specialists in order to reach a successful project conclusion.

The explanation of the diagram is as follows:

- The striped gray background represents abstract space. Into this space is introduced the top strip which is intended to portray the whole spectrum of know-ledge which is required to successfully conduct industry and business. Of course this includes both the public and private sectors. As the diagram shows, this spectrum ranges from the know-how of general management on the left, through project management, to technical management on the right
- The next series of strips immediately below are intended to elaborate on the top strip. The central over- lay circle encompasses the process and control that is project management.
- The star points to the four key restraints of scope, cost, time and quality.

As every project manager knows, these restraints are inextricably intertwined. Scope-quality represents performance, scope-cost represents viability, cost-time represents effort, and quality-time represents competitiveness.

As stated in the note below the diagram, for the project team to function effectively, "PM staff must have sufficient understanding of the various specialist disciplines to appreciate project requirements and issues. They must also be able to communicate appropriate direction and means of conflict resolution to these specialists in order to reach a successful project conclusion." One might add the corollary that, because of their particular bias, specialists frequently have difficulty in becoming good project managers.

This "sufficient understanding" is represented by the "fingers" which reach from the central project management circle into the areas of general management on the left and technical management on the right. Further, if these fingers are traced horizontally, then each depicts a typical functional management area which itself ranges from the general application on the left to the specific technical application on the right. Perhaps the best example is the strip ranging from Information Systems in general to Communications in particular.

Clearly, the Project Management Body of Knowledge cannot possibly encompass the whole know-how continuum. Nor would it be appropriate because Project Management has its own unique special area of expertise. This is shown by the white area within the bottom strip in the diagram. The two "overlap" areas of gray on this strip reflect the extent to which this knowledge must necessarily extend into the two areas on the left and right of the diagram.

I would add that the gray area on the left is knowledge that every project manager should have. The gray area on the right, on the other hand, is specific to the technical field. This is what makes an individual project manager a specialist in a given area of application.

Thus, sound project management is what enables general management to come together with technical management for purposes of managing progress and change effectively and efficiently for the benefit of all.

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<sup>1</sup> From the Project Management Body of Knowledge (PMBOK) of the Project Management Institute, developed by the PMBOK Standards Committee and approved by the PMI Board of Directors, PA, USA, March 1987.