

An Introduction to Project Management



Michael D. Taylor

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AN INTRODUCTION TO PROJECT MANAGEMENT

WHAT IS PROJECT MANAGEMENT?

In years past there have existed many views as to what project management comprises, both in its functions and processes. Prior to 1996 it was open to anyone's definition. Books written prior to this time had widely varying content with little consistency between authors. Even today corporate job postings for the position of project manager are inconsistent. It wasn't until the Project Management Institute established its Guide to the Project Management Body of Knowledge (PMBOK) that standardization took place. With its nine knowledge areas project management is no longer an amorphous field.

The Project Management Institute defines project management as the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. A project is a temporary endeavor undertaken to create a unique product, service, or result.¹

PROJECT MANAGEMENT TITLES

Titles such as *project manager*, *program manager*, and *product manager* are often used interchangeably even though there is a definite role distinction between them.

Project managers working in a matrix organization usually have overall project authority and responsibility, including schedule, cost, and scope. They are generalists, rather than technical overseers. Their job is to achieve a project goal while working within the constraints of time, money, product or service features, quality, and risks. In a matrix organization the project manager has no one reporting to him/her administratively. Instead, needed skills are "borrowed" from the functional managers. The project managers own the work while the functional managers own the resources.

¹ *A Guide to the Project Management Body of Knowledge, Third Edition* (Project Management Institute: Newton Square, PA, 2004), P. 368.

Program managers perform a role which is similar to project managers except it may extend over a longer period of time and may consist of several individual projects, usually similar in nature. Program managers often play a key role in conceiving and planning long-term project objectives, along with functional managers, production managers and financial managers. When a company commits to a new project, the program manager may be the individual who charters the project and selects the project manager.

Product managers are usually those individuals who are given authority to oversee all aspects of a product's lifecycle, including marketing, initial development, testing, production, upgrades, and sales. In this role they are sometimes referred to as product-line managers. Product managers may have project managers reporting to them during the initial product design, development and test phases.

Other Roles Confused with the Project Manager Title. There are times when a technical individual is promoted to the position of "project manager" but their role is simply to oversee the technical portions of a project and to keep it on track using commercial schedule software. Their role is primarily one of a technical project coordinator, or project expeditor. They are really not project managers since they do not have overall project authority and responsibility.

Functional managers may sometimes be called project managers but in fact they are not because they perform an entirely different role. Theirs is to bring in highly skilled personnel to the corporation and assign them to the projects in a matrix organization. They also ensure that skilled specialists are kept current in their field through training and development. Functional managers generally provide the technical input to the projects, supplying skilled individuals, as needed, to support suggested technologies and processes.

WHAT MAKES PROJECTS SUCCESSFUL

The Standish Group's CHAOS 2001 research report shows that, compared to 1994 when its research began, there has been a threefold increase in project success!² This study, and others, has revealed at least ten factors that contribute to a project's success.

Factor No. 1: Successful projects reached agreement among stakeholders on the goals of the project. Though this may sound easy to accomplish but in real life it can be one of the most challenging aspects of a new project. This is because each stakeholder has a different interest in the project, and often they conflict with each other.

² *Extreme Chaos by the Standish Group International*
[http://www.vertexlogic.com/processOnline/processData/documents/pdf/extreme_chaos.pdf].

Factor No. 2: Successful projects placed overall project responsibility on a project manager (schedule, technical, cost). Until one individual was given overall project responsibility, each manager had a “piece of the pie.” The result was having customers who became frustrated when no one could give them the overall status of the project.

Factor No. 3: Successful projects established clear stakeholder responsibilities. Many key stakeholders today are unclear about their role in a new project. Successful projects were found to have defined roles and responsibilities described for each key stakeholder. This was often achieved using responsibility allocation matrices.

Factor No. 4: Successful projects had a means of measuring project progress. In order to know the true status of a project, its progress had to be measurable. Methods such as Earned-Value Management (EVM) were often used to measure and track project progress.

Factor No. 5: Successful projects had constant open communications between stakeholders. As projects progressed, key stakeholders met often to examine the status of a project and to exchange vital information that kept them aligned around project goals.

Factor No. 6: Successful projects controlled project scope. Unsuccessful projects often faced random changes to the product, most often by adding features that were not necessarily desired by the customer. As a result, scope increased. Successful projects had mature change-control processes that minimized scope creep.

Factor No. 7: Successful projects had effective upper management support. It was not only at the beginning of a new project that key stakeholders provided vital support, but they also maintained support to the project manager throughout the project lifecycle.

Factor No. 8: Successful projects captured customer needs and prevented design drift. Reviewing customer requirements (needs) based on modern marketing techniques enabled corporations to identify what the customer actually needed. They recognized that customers are unsure of their needs until they knew what could be provided. These projects had a keen awareness of how easily the product design could slip away from what the customer actually wanted—sometimes called “design drift.”

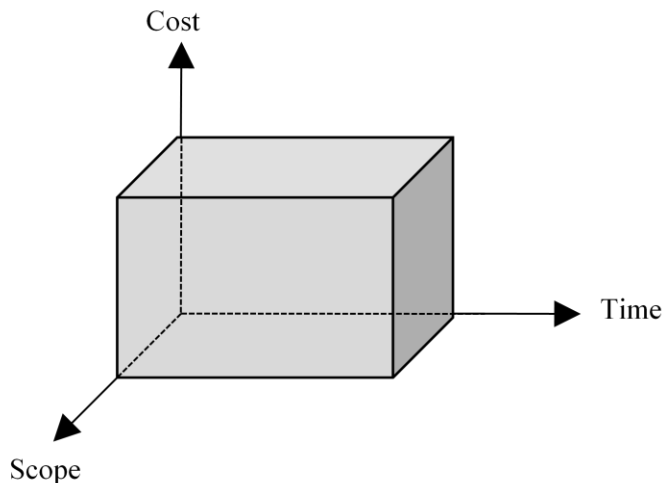
Factor No. 9: Successful projects empowered multifunctional teams. Unsuccessful projects had teams with little or no decision-making authority. Often they were micromanaged. Successful projects delegated proper decision-making authority to their teams after providing clear team objectives.

Factor No. 10: Successful projects emphasized risk management. Not only were risks identified throughout the project lifecycle but they were quantified, prioritized, and effective risk responses were developed.

THE TRIPLE CONSTRAINT

Projects are usually based on three major factors, time, cost, and scope. Once these three aspects are defined it is the project manager's responsibility to manage within the constrained values. For instance, if a project's scope must be met at a maximum budget of \$5 Million, and completed within fifteen months, then the project manager must continually evaluate the impact on cost, and time, if additional project scope is proposed.

This places the project manager in a unique role. Technical personnel tend to place their highest priority on the technical aspects of the product (scope), and give lower priority to the schedule (time) and budget (cost). Finance personnel tend to place their highest interest on cost, and generally remained unconcerned about time or scope.



When project managers face the need to trade-off one of these three constraints against another a problem arises. Which of the three is to be sacrificed in order to meet the more important one? In other words, if a proposed change in scope is being considered, and it can be accomplished by adding more personnel (cost increase), or by extending the project completion date by working within the number of available people, which is the best choice? The only way for the project manager to make an intelligence choice is by knowing the priorities of the triple constraint factors.

While the term "triple constraint" implies that only three factors are important in many cases other constraints must be considered. These may include vital aspects such as customer satisfaction, product quality, and project risks. Whatever the established constraints are, it is the project manager's role to maintain a balance between them based on their priorities. Project managers must avoid the mistake of establishing these priorities unilaterally. Instead, there must be agreement by the project's key stakeholders.

CRITICAL PROJECT MANAGER SKILLS

If there is any field that requires a broad set of skills it is project management. Three in particular are technical skills, leadership skills, and business skills.

Technical Skills. Having technical skills is important for project managers working in today's high-technology fields is critical but it is not the only needed skill. They must have proven leadership skills and pragmatic business skills.

Although it would be impossible for a project manager to master all disciplines participating on a project, it is vital that managers have a working knowledge of each discipline. This level of knowledge should enable them to communicate effectively with technical personnel, and to recognize and understand technical problems.

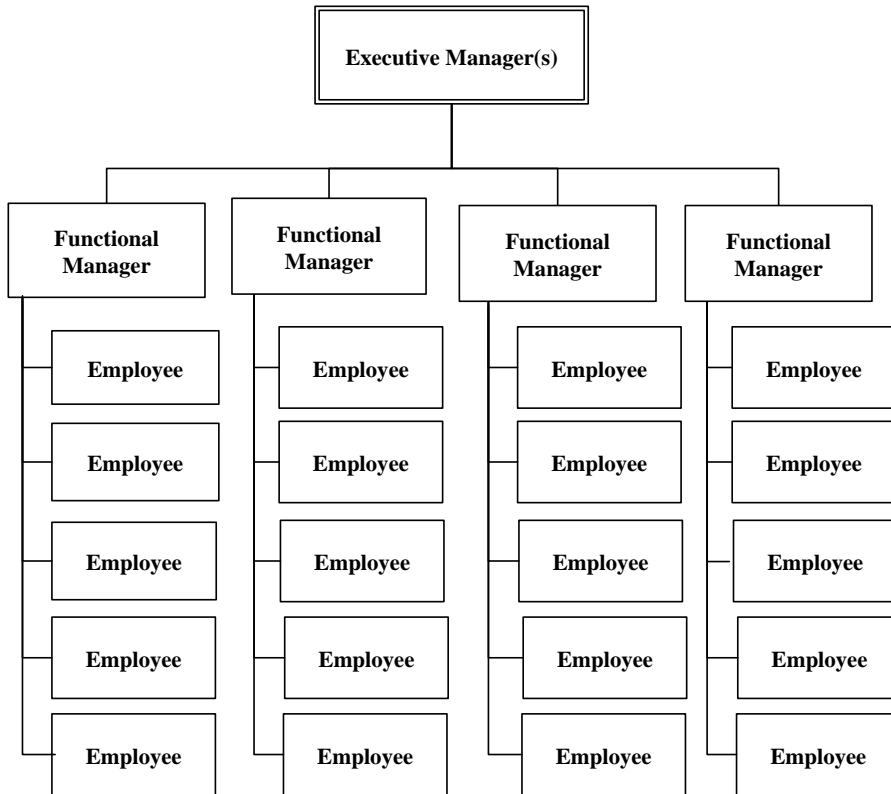
Leadership Skills. If a project manager has a solid grasp of project management techniques, principles and processes, yet has inadequate leadership skills, the results will often be disastrous. Leadership skills include the ability to communicate effectively, to negotiate with peers, subordinates and superiors, and the ability to use the proper leadership style. A common mistake made by corporate stakeholders is assuming that because an individual is strong technically he must be strong in the area of leadership.

Business Skills. Modern-day corporations are realizing that the most effective way to manage project costs is to delegate responsibility to project managers and hold them accountable. As a result, project managers must have a working knowledge of the financial aspects, and understand the "language" spoken by business personnel. Terms such as then-dollars and constant dollars must be understood. Project managers must know what NPV, ROI, and B/C ratios are, and how to adjust for the time-value of money.

ORGANIZATION STRUCTURES

While there are various types of organizations used today, the two most prominent are the functional and matrix forms.

Functional Organization Structure. Prior to about 1960 most corporate organizations favored a functional organization structure, also called a traditional organizational structure. The structure was very vertical with each employee having one boss. The simplified diagram below illustrates the basic form of this structure. Division managers and department heads were also included in some cases. Organizations still using this structure tend to be in the public sector where there is little if any competition and pressures to produce new products quickly are minimal.

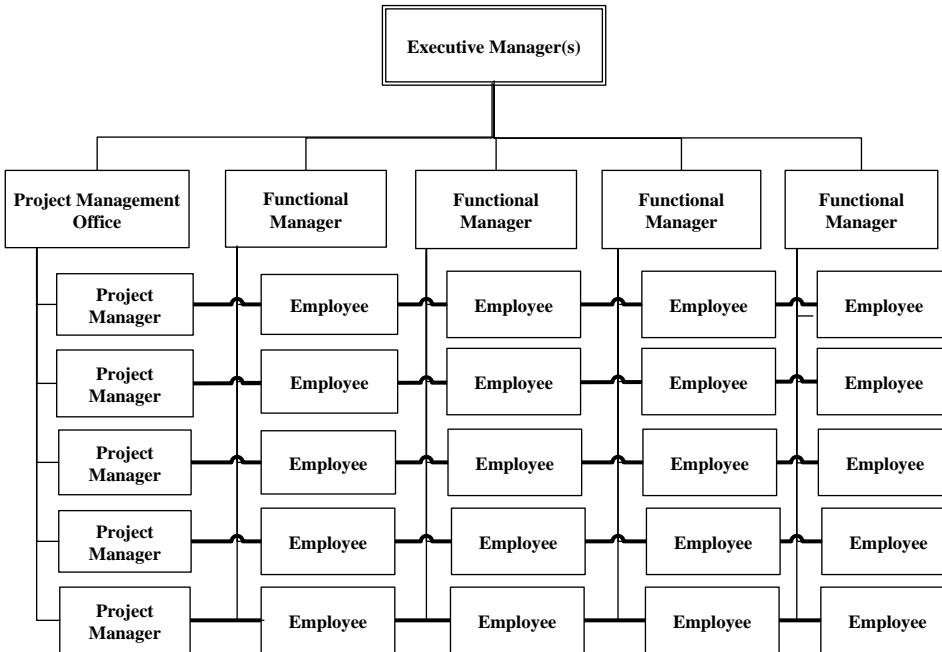


Each functional manager was responsible for hiring employees having a specific field of knowledge or skill set. For instance, one functional manager would be responsible for hiring and administering individuals who were mechanical engineers. Another functional manager would be responsible for hiring and administering electrical engineers.

The advantage of this type of organization structure is that all specialists within a functional group tend to keep each other current with the latest technology. They “cross-pollinated” each other. Also, each employee had only one boss, making the chain of command simple and easy to understand.

There are several disadvantages to this type of structure. First, no one has overall responsibility for a given project. Each has his own “piece of the pie.” Second, many employees within a group are not gainfully employed all the time. Often they are challenged with attempting to find ways to fill up their work day. Third, customers become frustrated when trying to understand the status of their product. Each functional manager may know a specific aspect of the product’s development but none have a full knowledge of product development. This type of organization structure is very weak in product development integration.

Matrix Organization Structure. Many corporations today have moved toward the matrix form of organization structure. This structure has been found to alleviate many of the deficiencies with the functional form. As seen in the figure below, lines of authority flow both vertically and horizontally. Hence, the term “matrix.”



While employees still report administratively to their functional managers, they are assigned to project managers for the duration of their need. Once their support to a project is completed they return to their functional group ready to be assigned to another project. Project managers “extract” employees from the functional organizations as needed.

In many cases employees are assigned to multiple projects. This creates the problem of spreading an employee over too many projects resulting in lost time as they transition physically or mentally between projects. As the number of projects supported increases so does the lost time due to transitioning. An employee assigned to four projects is not available for 25% of their time to each one as might be expected. The available time is actually closer to 19%.³ The lost time, 6% is due to transitioning.

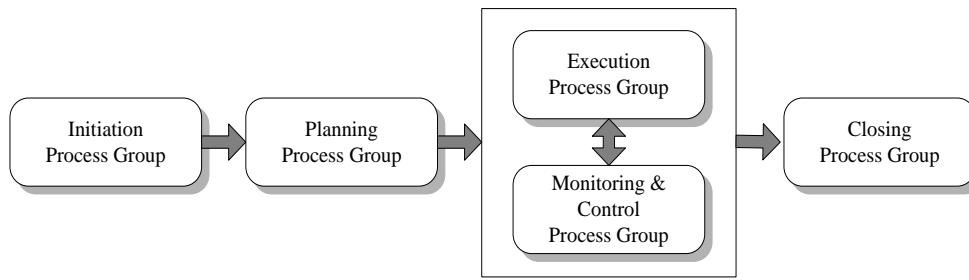
The tendency to spread employees over too many projects is precipitated by functional managers who are required to keep their assigned budgets to a minimum. In order to accomplish this they must assign their employees to projects which have their own budgets. These same pressures on functional managers cause them to hire fewer people than needed to prevent unassigned personnel from charging against their budgets.

³ Preston G. Smith, and Donald G. Reinertsen, *Developing Products in Half the Time, 2nd Ed.* (New York; John Wiley & Sons, 1998).

PROJECT MANAGEMENT PROCESS GROUPS

The Project Management Institute has posited five major process groups. A process is defined as a set of interrelated actions & activities performed to achieve a pre-specified product, result, or service. Each process is characterized by its inputs, the tools and techniques that can be applied, and the resulting outputs.

The five groups consist of project initiation, planning, executing, monitoring and controlling, and closing processes.



Initiating Process Group. Those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project.

Planning Process Group. Those processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.

Executing Process Group. Those processes performed to complete the work defined in the project management plan to satisfy the project specifications.

Monitoring and Controlling Process Group. Those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.

Closing Process Group. Those processes performed to finalize all activities across all Project Management Process Groups to formally close the project.⁴

⁴ A Guide to the Project Management Body of Knowledge, Third Edition (Project Management Institute: Newton Square, PA, 2004), p. 41.

NOTES